Wednesday November 4, 1:30 – 3:00pm

T-OR-2000
Romantic, Sexual, and Sexual Risk Behavior of Severely Obese Adolescent Females
Jennifer Becnel Cincinnati OH, Meg Zeller Cincinnati OH, Jennie Noll State College PA, David Sarwer Blue Bell PA, Jennifer Reiter-Purtill Cincinnati OH, Marc Michalsky Columbus Ohio, James Peugh Cincinnati Ohio, Frank Biro Cincinnati OH

Background: To document romantic, sexual and HIV/sexual risk behaviors as well as information sources for sexual and reproductive health in a clinical sample of severely obese (SO) adolescent females seeking weight loss intervention compared to healthy weight (HW) adolescent females.

Methods: This multi-site study—an ancillary to a prospective longitudinal observational study documenting health in adolescents having weight loss surgery (WLS)—presents pre-operative/baseline data from 108 females undergoing WLS, 78 SO females seeking lifestyle intervention, and 118 HW females. Romantic, sexual, and HIV/sexual risk behavior, sexual health outcomes (i.e., STIs/HIV and unintended pregnancy) were assessed using the Sexual Activities and Attitudes Questionnaire (SAAQ). Adolescent females also reported birth control information sources.

Results: These SO clinical groups were engaging in fewer romantic and sexual behaviors compared to HW females. However, and like HW females, there was a subgroup (25%) of SO females engaging in higher rates of HIV/sexual risk behaviors with WLS females reporting previous pregnancy (13%) and STIs (17.4%) prior to surgery. There were a considerable number (28-44%) of SO adolescent females who reported they received no birth control information from their physicians.

Conclusions: Despite lower engagement in general, SO females engaged in clinical weight management who were sexually active were at heightened risk for negative sexual health outcomes. Given the comorbidities of severe obesity, it is important to discuss sexual health to reduce the risk profile for SO females.

T-OR-2001
Perceived Parental Monitoring of Teen Activities: Differences between Adolescents of Healthy Weight and Excess Weight
Mary Beth Mccullough Cincinnati OH, Jennifer Becnel Cincinnati OH, Jennifer Reiter-Purtill Cincinnati OH, Yelena Wu Salt Lake City UT, James Peugh Cincinnati Ohio, Meg Zeller Cincinnati OH

Background: Parental monitoring of teen activities is associated with positive health outcomes among adolescents. We examined whether adolescent engagement and perceived parental monitoring of teen activities varied for youth of excess weight (overweight, obese, severely obese) compared to healthy weight (HW).

Methods: Using the 2008-2009 Monitoring the Future Study, adolescent perceived parental monitoring behaviors (e.g., checking homework, limiting TV) and self-reported engagement in these activities (e.g., doing homework, watching TV) were determined by weight status groups (CDC-defined BMI percentile) for a sample of 23,209 10th grade students (M age = 15.61 + 0.58 years; 53% female). Logistic regression analyses examined the impact of excess weight status group on adolescent perceived parental monitoring and adolescent activities, separately for males and females.

Results: Relative to HW adolescents of the same gender, males and females of excess weight reported greater odds of engaging in many activities, including those that are positive (i.e., doing homework) or obesity-promoting (i.e., watching TV). Interestingly, males and females of excess weight also perceived more parental monitoring in these areas relative to same gender HW adolescents.

Conclusions: Using a nationally representative sample, youth of excess weight perceived both greater rates and more perceived parental monitoring of their TV watching. Future research should examine what type of parental monitoring is effective in reducing obesity-promoting behaviors within clinical samples.

T-OR-2002
Weight Stigmatization Inhibits Feelings of Social Connectedness and Fuels Avoidance of Health Promoting Activities
Stephanie Nelson Phoenix Arizona, Alexandra Brewis Tempe AZ, Meg Bruening Phoenix Arizona

Background: The associated factors for overweight/obesity are an ongoing public health concern; however, no research has been conducted examining the relationship between weight stigmatizing situations and social connectedness. College freshmen are vulnerable as they transition into college environments and may experience shifts in their weight and social connectedness.

Methods: A cross-sectional survey was administered to college freshmen (n=221: 61.4% female; 52.5% non-white) living in dormitories while attending a large southwestern public university during the 2014-2015 school year. Multivariate linear regression models, adjusted for race/ethnicity, gender, parental education, Pell grant status, and dormitory residence assessed the relationship between weight stigmatizing situations and social connectedness. College freshmen are vulnerable as they transition into college environments and may experience shifts in their weight and social connectedness.

Results: The prevalence of overweight/obesity was 34.8%. Avoiding public places in fear of comments being made about size (β=0.12; p=0.007) and being too embarrassed to participate in physical activity (PA) in public places because of weight status (β=0.11; p=0.002) were inversely associated with social connectedness. Being overweight/obese was positively associated with avoiding public places (β=0.34; p<0.001) and not participating in PA out of embarrassment (β=0.34; p=0.006). No association was seen between social connectedness and overweight/obese status (β=0.05; p=0.434).

Conclusions: Overweight/obese students were more likely to avoid public places in fear of comments being made out of size and more likely to not engage in PA due to their size. Individuals who avoid going to places and were embarrassed of their size were less likely to report being socially connected. Resources are needed to help overweight/obese individuals overcome weight stigmatizing situations. Aid is needed for stigmatized individuals to become more socially connected and feel comfortable engaging in health promoting activities during this critical life stage.
Secretive Eating Among Youth Who are Overweight or Obese
Andrea Kass Chicago Illinois, Denise Wilfley St. Louis Missouri, Kamryn Eddy Boston MA, Kerri Boutelle La Jolla California, Nancy Zucker DURHAM North Carolina, Carol Peterson Minneapolis MN, Daniel Le Grange San Francisco CA, Angela Celio Doyle Seattle wa, Andrea Goldschmidt Chicago IL

**Background:** Secretive eating (SE) is characterized by eating privately to conceal being seen. SE may reflect eating- or body-related shame and may be a correlate of binge eating, which predicts excess weight gain over time and eating disorder onset. Parents often notice signs of SE in youth before other eating disorder behaviors are recognized, suggesting that increasing understanding of SE may facilitate efforts to improve weight outcomes and reduce eating disorder risk. This study aimed to evaluate the prevalence and psychosocial correlates of SE in youth who were overweight or obese.

**Methods:** Youth who were overweight or obese (N=577; age range: 6-18; mean age=11.2±2.5, 55% Caucasian, 66% female, 90% obese) presented to five research institutions. Height and weight were measured, and youth and their parents completed self-report measures of psychopathology. Analysis of covariance was used to compare youth who endorsed vs. denied SE, controlling for study site and age.

**Results:** SE was endorsed by 111 youth (19.2%). Youth who endorsed SE were older than their counterparts (p<.001), but there were no differences in race/ethnicity, sex, or zBMI (p>0.065). Compared to youth who denied SE, youth who endorsed SE had higher dietary restraint, eating concerns, shape concerns, and weight concerns and were more likely to endorse binge eating and purging (p<.001). Groups did not differ in behavioral problems, depression, or self-esteem (p>.109). When split by children (<13y) vs. adolescents (≥13y), dietary restraint and purging were elevated among adolescents (p<.024) but not among children (p>.06) who endorsed SE.

**Conclusions:** Youth who endorsed SE were older and had elevated eating-related psychopathology, suggesting a heightened risk for eating disorders. Screening for SE, particularly among older youth, may inform early identification of problematic eating behaviors, and understanding factors motivating SE and its implications for weight and eating pathology over time may improve intervention tailoring.

Prospective relationship of emotional and externally-induced eating with subsequent weight gain
Alison Field Boston Massachusetts, Kendrin Sonneville Ann Arbor MI, Melanie Kornides Boston Massachusetts, Jess Haines Guelph ON, Bernard Rosner Boston MA, Carlos Camargo Boston Massachusetts

**Background:** Emotional and externally-induced eating are more prevalent among overweight and obese youth, but it is unknown whether these constructs predict subsequent weight gain.

**Methods:** Using data from 1675 adolescent females in the ongoing Growing Up Today Study 2, we examined the prospective association between emotional and externally-induced eating, measured in 2011 with the Dutch Eating Behavior Questionnaire, and BMI change between 2011 and 2014. BMI was computed from self-reported weight and height collected on all questionnaires. International Obesity Task Force cut-offs were used to define weight status. Generalized estimating equations were used for the analysis, which controlled for age, BMI, and time spent watching TV in 2011. Emotional and externally-induced eating were both included in all models.

**Results:** In 2011, 21.5% of females were overweight or obese. Overweight and obese females had higher scores for emotional (p<0.0001) and externally-induced (p<0.02) eating than their leaner peers. Among healthy weight females, emotional and externally-induced eating were unrelated to BMI change, but among the overweight and obese females, quintile of emotional eating was inversely (B=-3.6, 95% confidence interval (CI) -4.0,-3.1) associated with BMI change, whereas, quintile of externally-induced eating was positively predictive of BMI gains (B=4.2, 95% CI 3.6, 4.8). Previous BMI change (2008-
Background: Acid ratio transmission via mother's milk to infants has increased metabolic risk. The ratio of essential dietary ω-6 to sucrose diet. Mice exposed to the low ω-6 diet in adults maintained on chow were challenged with high ω-6 diets. Perinatal exposure to a high ω-6 diet resulted in subcutaneous adipose with more adipocytes smaller in size. Genes associated with lipogenesis, inflammation, and cell cycle were decreased by low ω-6 in Fat-1 animals vs. WT. Lipid mass spectrometry was used to analyze milk fatty acid composition. Adipocyte cellularity of subcutaneous adipose in postnatal day 14 (PND14) was quantified using Cell Counting Analysis Program, and adipose gene expression by Affymetrix microarray. Body composition was measured by qMRI and energy balance quantified by indirect calorimetry.

Results: Milk fatty acid composition analysis by GC/MS revealed the ω-6/ω-3 ratio (20:4 ω-6/20:5 ω-3 + 22:6 ω-3) was significantly reduced (p=0.002), while total MUFA, PUFA and the ratio of 18:2 ω-6/18:3 ω-3 were unchanged in Fat-1 milk. By PND14, exposure to a low ω-6/ω-3 fatty acid ratio resulted in subcutaneous adipose with more adipocytes smaller in size. Genes associated with lipogenesis, inflammation, and cell cycle were decreased by low ω-6/ω-3 exposure. 17-week adults maintained on Chow were challenged with high fat/sucrose diet. Mice exposed to the low ω-6/ω-3 fatty acid ratio as pups gained significantly less body weight, had 50% less body fat but equal lean mass, and had normal glucose tolerance.

Conclusions: These data suggest that perinatal exposure to a low ω-6/ω-3 fatty acid ratio alters adipogenesis and lipid deposition in offspring by PND14, leading to profound resistance to HFD-induced obesity and metabolic disease later in life.

T-OR-2007
Potential Effects of Embryo Genotype on Maternal Glucose Homeostasis: An Example of “fetal drive”

Peng Li FROM Birmingham AL, David Allison FROM Birmingham AL, Brandon George FROM Birmingham AL, Tonia Schwartz

Background: After birth, rapid fat accumulation in the first 6 months of life is a powerful predictor of later obesity and metabolic risk. The ratio of essential dietary ω-6 to ω-3 fatty acids transmitted via mother’s milk to infants has increased concordantly with the prevalence of obesity and metabolic diseases. Perinatal exposure to a high ω-6 to ω-3 milk fatty acid ratio (ω-6/ω-3) in both humans and rodent models is directly linked to increased adiposity later in life. We hypothesized that reducing the perinatal ω-6/ω-3 fatty acid ratio would program the adipose resulting in a healthier response to adult diet-induced obesity.

Methods: Dams overexpressing the C. elegans ω-6 fatty acid desaturase Fat-1 were used vs. WT. WT Lipid mass spectrometry was used to analyze milk fatty acid composition. Adipocyte cellularity of subcutaneous adipose in postnatal day 14 (PND14) was quantified using Cell Counting Analysis Program, and adipose gene expression by Affymetrix microarray. Body composition was measured by qMRI and energy balance quantified by indirect calorimetry.

Results: Milk fatty acid composition analysis by GC/MS revealed the ω-6/ω-3 ratio (20:4 ω-6/20:5 ω-3 + 22:6 ω-3) was significantly reduced (p=0.002), while total MUFA, PUFA and the ratio of 18:2 ω-6/18:3 ω-3 were unchanged in Fat-1 milk. By PND14, exposure to a low ω-6/ω-3 fatty acid ratio resulted in subcutaneous adipose with more adipocytes smaller in size. Genes associated with lipogenesis, inflammation, and cell cycle were decreased by low ω-6/ω-3 exposure. 17-week adults maintained on Chow were challenged with high fat/sucrose diet. Mice exposed to the low ω-6/ω-3 fatty acid ratio as pups gained significantly less body weight, had 50% less body fat but equal lean mass, and had normal glucose tolerance.

Conclusions: These data suggest that perinatal exposure to a low ω-6/ω-3 fatty acid ratio alters adipogenesis and lipid deposition in offspring by PND14, leading to profound resistance to HFD-induced obesity and metabolic disease later in life.

T-OR-2008
Prenatal Exposure to Bisphenol A Perturbs Gene Networks and Key Regulators of Metabolic Disorders

Le Shu FROM Los Angeles CA, Qingying Meng FROM Los Angeles CA, Brandon Tsai FROM Irvine CA, Xia Yang FROM Los Angeles CA

Background: Both human epidemiology and animal model studies have revealed associations between Bisphenol A (BPA) exposure, especially exposure during early development, and metabolic disorders including obesity, cardiovascular disease, and type 2 diabetes. The underlying molecular mechanisms, however, remain elusive.

Methods: We profiled the transcriptome of hypothalamus and liver tissues that are important for metabolic control from 3-week-old mice that were prenatally exposed to BPA through oral gavaging the dams with BPA at 5 mg/kg body weight/day (no-observed-adverse-effect level) using RNA sequencing, followed by integrative network modeling.

Results: Prenatal BPA exposure led to low birth weight, dyslipidemia, and altered glucose homeostasis. These phenotypic changes were accompanied by large-scale transcriptomic alterations in the hypothalamus (101 genes and 48 transcripts with differential expression, and 66 genes with alternatively spliced exons) and liver (812 differential genes, 532 differential transcripts, and 64 alternatively spliced exons) at p<0.001. These gene signatures were enriched for diverse pathways related to pre- and postsynaptic nicotinic acetylcholine receptors, lipid metabolism, cholesterol biosynthesis, oxidative processes, and the extracellular matrix. Human homologues of these mouse transcriptomic signatures were significantly enriched for genetic signals uncovered from genome-wide association studies of obesity, type 2 diabetes, hypertension, and dyslipidemia. Using network biology, we
T-OR-2009

Contribution of Pre-pregnancy Lean Body Mass to Glucose Metabolism Before and During Pregnancy in Untrained Women
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Background: Lean body mass (LBM) is generally associated with better insulin sensitivity. However, some studies have linked LBM with higher insulin levels in obese and post-menopausal women. These findings may relate to unique qualities of the skeletal muscle. The purpose of this study was to assess the contribution of prepregnancy (PP) LBM to glucose homeostasis before and during pregnancy.

Methods: Body composition was assessed in 43 women (31±3 yrs.) at PP. Insulin and glucose levels were measured at PP and gestation week 10 and 30. An oral glucose tolerance test (OGTT) was performed at 30 wks. β cell function (%β) and insulin resistance (IR) were estimated by the homeostatic model assessment (HOMA2). Metabolic clearance rate of glucose (MCR) and 1st and 2nd phase insulin responses were estimated from the OGTT. Multiple linear regression analyses were performed with LBM index (LBMI), %FM, waist circumference, waist to hip ratio and gestational weight gain as independent variables.

Results: LBMI was positively associated with insulin levels and IR at PP and 30 wks. At PP, 10 and 30 wks. LBMI was positively associated with %β. LBMI was positively associated with 1st and 2nd insulin response, and negatively associated with MCR of glucose. LBMI explained 17% and 23% of the variation in insulin levels at PP (p=0.008) and 30 wks. (p=0.006). It also explained 15% and 23% of the variation of IR at PP (p=0.014) and 30 wks. (p=0.007). LBMI explained 23%, 15% and 27% of %β at PP (p=0.002), 10 (p=0.015) and 30 wks. (p=0.002). At 30 wks., LBMI explained 17% of variation in MCR (p=0.024) and 16% and 19% of the variation in 1st and 2nd phase insulin response (p<0.05).

Conclusions: PP LBMI was associated with higher insulin levels and an increased β-cell response before and during pregnancy in untrained women. PP LBMI is associated with lower glucose disposal at 30 wks. of gestation. Further studies of the impact of skeletal muscle quality on metabolic regulation during pregnancy are warranted.

T-OR-2011

Characterization of Hypothalamic Gene Expression in a Rat Model of Roux-en-Y Gastric Bypass
Pernille Barkholt Harsholm DK, Philip J. Pedersen Hoersholm Denmark, Kristoffer Rigbott HA, Anders Hay-Schmidt Copenhagen Copenhagen, Niels Vrang Harsholm Denmark, Jacob Jelsing Harsholm N/A

Background: Roux-en-Y gastric bypass (RYGB) promotes robust weight loss and resolution of type II diabetes. Here, we aimed at identifying adaptations in hypothalamic gene expression pattern of neuroptides known to be involved in the homeostatic regulation of energy balance in a rat RYGB model.

Methods: Lean male Sprague-Dawley rats underwent either RYGB or SHAM surgery (n=9 per group). Body weight and food intake was monitored daily and animals were terminated 60 days post-surgery. Semi-quantitative in situ hybridization using 33P-labelled probes against AgRP, NPY, CART, POMC and MCH mRNA was applied to systematic uniform randomly sampled hypothalamic sections from RYGB and SHAM animals, as well as ad-libitum fed and food restricted Sprague-Dawley rats.

Results: RYGB led to a sustained 35% body weight loss compared with SHAM. Expression of the orexigenic AgRP and NPY mRNA was significantly upregulated in the arcuate nucleus (ARC) of RYGB rats (by 83% and 95% respectively) versus SHAM, whereas no changes were seen in the CART and POMC mRNA levels. A similar pattern was seen in food
restricted versus ad-libitum fed rats. In the lateral hypothalamus (LHA), expression of orexigenic MCH was upregulated in food restricted versus ad-libitum fed animals, whereas RYGB and SHAM showed equal levels MCH mRNA.

Conclusions: Our findings indicate that RYGB rats exhibit a molecular signature of increased hunger-drive in the ARC, however, this signaling pathway is suppressed upstream at the level of the LHA, a key relay for control of food intake. In conclusion, suppressed appetite function in RYGB may be associated with uncoupling of hypothalamic orexigenic pathways.

T-OR-2012
Deletion of the Leptin Receptor on Vagal Afferent Neurons Alters Meal Patterns and Expression of the Estrogen Receptor in Female Mice
Charlotte Ronveaux Davis California, Helen Raybould Davis CA, Guillaume de Lartigue New Haven CT

Background: Signals from the gut act via vagal afferent neurons (VAN) to induce satiation and influence meal patterns. Meal patterns differ inherently between genders. Leptin and estrogen interact to regulate food intake; estrogen (ERα) and lepton (LepR) receptors are colocalized on VAN. We hypothesized that estrogen acting at ERα on VAN plays a role in inducing gender-specific differences in meal patterns.

Methods: We used a conditional knockout mouse to delete LepR specifically from VAN (Nav1.8/LepR (fl/fl) mice; de Lartigue et al Mol. Met. 2014). Body composition, meal patterns, and inhibition of food intake in response to peripheral administration of cholecystokinin (CCK) and leptin were assessed in male and female Nav1.8/LepR (fl/fl) mice on a chow diet. ERα expression on VAN in female Nav1.8/LepR (fl/fl) and WT mice in the different phases of the estrus cycle was detected by immunofluorescence.

Results: Nav1.8/LepR (fl/fl) mice have increased food intake, body weight, adiposity and a reduced response to CCK and lepton compared to WT, irrespective of gender. Weight gain was more rapid in female vs male Nav1.8/LepR (fl/fl) mice. Female WT mice ate longer and larger meals compared to male WT mice. Male Nav1.8/LepR (fl/fl) mice consumed longer and larger meals than WT mice, consistent with disruption of intestinal satiety signals; in contrast, female Nav1.8/LepR (fl/fl) ate smaller, shorter and more frequent meals compared WT females. ERα immunoreactivity was significantly decreased by 27% in female Nav1.8/LepR (fl/fl) compared to WT mice (p<0.05). ERα expression changed significantly according to phase of estrus cycle in female WT mice with higher expression during estrus; this was attenuated in Nav1.8/LepR (fl/fl) mice (p<0.05).

Conclusions: Deletion of LepR on VAN changes meal patterns differently depending on gender and disrupts estrogen signaling, which may result in the gender-specific difference in feeding behavior.

T-OR-2013
Baseline mesolimbic and cognitive control circuitry activity predicts change in emotional eating behaviors post-surgery in vertical sleeve gastrectomy patients

Background: Emotional eating (EE) is implicated in weight loss maintenance efficacy following bariatric surgery. Baseline reward sensitivity and capacity to employ cognitive regulation strategies, and the neural and hormonal pathways guiding these, may be predictive of changes in EE post-surgery.

Methods: The goal of this study was to investigate relationships between neural pathways associated with food craving and cognitive regulation and changes in EE and appetite peptides at 6 months post-surgery in vertical sleeve gastrectomy patients. Seven patients completed baseline (pre-surgery) and 6-month (post-surgery) follow-up visits. Both visits comprised a blood draw and EE assessment; the pre-surgery visit also included an fMRI scan with a food-related emotion regulation task with 2 strategies: upregulation of food craving and cognitive reappraisal. fMRI data were analyzed using SPM8 (p<0.05, FWE-corrected); contrasts: Upregulation>0; Reappraisal>0.

Results: Greater pre-surgery activity in the ventral tegmental area (VTA) and medial orbitofrontal cortex (mOFC) during Upregulation>0, and in the dorsomedial prefrontal cortex (DMPFC) during Reappraisal>0, were related to lower attenuation of EE behaviors from pre- to post-surgery (VTA: r=-0.79, p=0.03; mOFC: r=-0.70, p=0.08; DMPFC: r=-0.73, p=0.06). Greater decrease in EE was also significantly associated with greater pre- to post-surgery decrease in acylated ghrelin (r=-0.87, p=0.06).

Conclusions: These results suggest unique coupling between baseline neural activity during up and downregulation of food craving and attenuation of maladaptive emotional eating behaviors post-surgery. Patients who demonstrated the greatest decreases in EE also showed the most significant decreases in ghrelin, which plays a role in reward signaling in mesolimbic regions. These preliminary data identify potential mechanisms driving successful outcomes post-surgery, and reveal pathways to target in novel treatments for those vulnerable to post-surgical weight regain.

T-OR-2014
Brain Imaging Demonstrates Changes in Memory- As Well As Reward-Related Activation Greater Than One Year After Bariatric Surgery
Nancy Pazziferrri Dallas Texas, Jeffrey Zigman Dallas Texas, Uma Yezhuval, Sina Aslan Frisco TX, Carol Tamminga Dallas Texas, Francesca Filbey Dallas TX

Background: Women with severe obesity, before bariatric surgery, have neural responses postprandially which fail to attenuate compared to lean controls. We followed these women at 6- and >12-mo. after surgery to determine surgery-induced brain response to food cues in the fasted and fed states.

Methods: 16 women undergoing gastric bypass or sleeve gastrectomy were scanned during a food task in fasted and fed states. Subjective hunger, and blood-oxygen-level-dependent functional MRI activation were measured. We analyzed differences across-state (fasted vs. fed) and over time (pre- versus 6- or 12-mo. post surgery) with t-tests, and factorial analyses. Tests were thresholded at uncorrected p-levels of 0.005 (cluster threshold > 20).

Results: Seven gastric bypass and 9 sleeve gastrectomy women (mean BMI 43kg/m2; SD 4.8) provided post-surgery measures. Mean weight loss >12 mo. was 32.3 (SD 9.7). At 6-mo. post-surgery analyses indicated a time (pre-, post-surgery) x state (fasted, fed) interaction of greater neural activity in the ventral striatum, orbitofrontal gyrus, medial prefrontal cortex,
Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society

Oral Abstracts Wednesday November 4 to Friday November 6, 2015

T-OR-2015

GLP-1 Receptors Expressed on NTS Astrocytes Regulate Energy Balance


Background: Accumulating evidence indicates that the anorectic effects of glucagon-like peptide-1 receptor (GLP-1R) agonists are due in part to direct GLP-1R signaling in the central nervous system (CNS). A small body of literature has shown that GLP-1Rs are expressed on CNS astrocytes. Since astrocytes play a critical role in modulating extracellular glutamate, and the hypoglycemic effects of GLP-1R activation are partially mediated via glutamatergic signaling, we hypothesize that GLP-1R agonists act directly on astrocytes in feed-ing-relevant nuclei to regulate energy balance. The nucleus tractus solitarius (NTS) is the first CNS site to receive and process within-meal vagally-mediated glutamatergic signals arising from the GI tract; it also acts as a sensor for circulating endocrine factors and expresses GLP-1Rs. Therefore, we test the hypothesis that GLP-1R ligands act on astrocytes within the NTS to affect feeding and body weight.

Methods: First, the immortalized rat type-1 astrocyte D1-TNC1 cell line was treated with GLP-1R agonists (GLP-1, exendin-4 [Ex4] or liraglutide; 0.1-20nM) and cAMP signaling was assessed. Next, ex vivo live calcium signaling in NTS astrocytes was measured following bath application of Ex4 (100nM). Lastly, food intake and body weight of male rats was measured following NTS treatment with the astrocyte Krebs cycle inhibitor fluorocitrate (FC; 50mM) and Ex4 (0.05μg).

Results: In vitro analyses show that GLP-1R activation by all three GLP-1R ligands dose-dependently increased cAMP signaling in D1-TNC1 cells. Additionally, calcium imaging data show a prolonged activation in 36% of NTS astrocytes after Ex4, with a magnitude of response 90±12% of that evoked by ATP/glutamate. Preliminary behavioral data indicate that NTS pre-treatment with FC attenuated the 24h intake- and body weight-suppressive effects of NTS GLP-1R activation with Ex4.

Conclusions: Collectively, these data offer complementary evidence that GLP-1R signaling on NTS astrocytes affects energy balance control.

T-OR-2016

Preventing excessive gestational weight gain among African American women: a randomized clinical trial

Sharon Herring Philadelphia Pennsylvania, Jane Crucie Phila PA, Gary Bennett Raleigh NC, Marisa Rose Philadelphia PA, Adam Davey Philadelphia PA, Gary Foster New York NY

Background: Evidence is lacking regarding effective weight control treatments in pregnancy for ethnic minority women with obesity. This study evaluated whether a technology-based, behavioral intervention could decrease the proportion of overweight or obese African American women who exceeded the 2009 Institute of Medicine (IOM) guidelines for gestational weight gain.

Methods: We conducted a 2-arm randomized clinical trial. Participants were 66 socioeconomically disadvantaged African American pregnant women (12.5 ± 3.7 weeks’ gestation; 36% overweight, 64% obese) recruited from 2 outpatient obstetric practices at Temple University between 2013 and 2014. We randomized participants to usual care (n = 33) or a behavioral intervention (n = 33) that promoted weight control in pregnancy. The intervention included: 1) empirically-supported behavior change goals; 2) interactive self-monitoring text messages; 3) biweekly health coach calls; and 4) skills training and support through Facebook.

Results: The intervention reduced the proportion of women who exceeded IOM guidelines compared to usual care (37.0% vs. 65.5%, p = 0.033; adjusted odds ratio: 0.3, 95% confidence interval [CI]: 0.10, 1.0, p = 0.0497). Intervention participants gained less weight during pregnancy (8.7 vs. 12.3 kg, adjusted mean difference -3.1 kg, 95% CI 6.2, 01, p = 0.045). No group differences in neonatal or obstetric outcomes were found.

Conclusions: The intervention resulted in lower prevalence of excessive gestational weight gain. Preventing excessive weight gain in pregnancy in this population may have significant public health implications for the prevalence of persistent obesity and obesity-related chronic disease – which could benefit both African American mothers and their offspring.

T-OR-2017

Does the Addition of Online Individual Motivational Interviewing Chat Sessions Enhance Weight Loss Outcomes in a Group-Based Online Weight Control Program?

Delia West Columbia South Carolina, Jean Harvey Burlington VT, Rebecca Krukowski Memphis Tennessee

Background: Online behavioral obesity treatment offers advantages in accessibility and cost, but weight losses are lower than those achieved in in-person programs. Incorporating motivational interviewing (MI) to face-to-face behavioral weight management significantly improves weight loss outcomes. The current study examines whether the addition of online MI chats to a web-based, group behavioral obesity treatment program augments weight loss outcomes relative to the web-based online weight control program alone.

Methods: Healthy overweight and obese subjects (N=398, 24% minority) were recruited from two sites (AR and VT) and randomized to: 1) an 18-month group internet behavioral weight control treatment (Internet) or 2) the same group internet treatment plus individual MI sessions (Internet+MI). Both conditions received weekly synchronous online chat group sessions for 6 months and 12 monthly group chats. Participants in both groups received identical behavioral
lessons and individualized therapist feedback on progress toward meeting exercise and calorie goals. Internet+MI also received 6 individual MI sessions delivered by a separate MI counselor via web chat. Weight was measured at baseline, 6 and 18 months.

**Results:** There were no significant differences in weight loss between Internet (-5.5 ± 6.0 kg) and Internet+MI (-5.1 ± 6.3 kg) at 6-months or at 18-months (-3.3 ± 7.1 vs. -3.5 ± 7.7 kg for Internet and Internet+MI, respectively). Attendance at group chats did not differ between groups, nor did self-monitoring patterns, suggesting comparable engagement in the weight control program in both conditions.

**Conclusions:** Outcomes with online group obesity treatment replicated earlier studies, confirming the potency of internet-delivered programs for producing clinically significant weight loss. However, adding MI to the group-based program did not improve weight loss induction or weight loss maintenance. Future research should continue to focus on strategies to enhance online weight control approaches.

**T-OR-2018**

*Modulation in Eating Behaviors by Alternate Day Fasting Versus Daily Calorie Restriction: Impact on Weight Loss and Weight Maintenance Success*


**Background:** Alternate day fasting (ADF; 75% restriction fast day alternated with 125% intake feed day) is effective for weight loss. What remains unknown, however, is how ADF impacts behavioral components of dietary intake, and how these modulations impact weight loss and weight maintenance. Accordingly, this study examined whether ADF improves eating behaviors (i.e. appetite ratings, dietary restraint, and self-efficacy) in a way that promotes successful weight loss and weight loss maintenance.

**Methods:** Obese subjects (n = 106) were randomized into 1 of 3 groups: 1) ADF, 2) calorie restriction (CR; 25% restriction daily), or 3) control, for a 24-week weight loss period. After weight loss, subjects began a modified ADF program (50% restriction fast day; 150% intake feed day) or CR-maintenance program (100% energy intake daily) for an additional 24 weeks.

**Results:** During the weight loss phase, percent energy restriction in both the ADF (21 ± 4%) and CR group (24 ± 4%) was close to the prescribed 25% level, with no differences between groups. Physical activity did not change between groups over the course of the trial. Body weight decreased (P < 0.001) in the ADF and CR groups (-5.7 ± 0.8 kg and -6.5 ± 0.9 kg, respectively) during the weight loss phase when compared to control. During the weight loss maintenance phase, body weight did not change for any group. When compared to the control group, there were no changes in appetite ratings (hunger, satisfaction, and fullness), dietary restraint, emotional eating, uncontrolled eating, or self-efficacy in either the ADF or CR group at any time point.

**Conclusions:** Findings from this study suggest that ADF is indeed an effective strategy for weight loss maintenance, but whether these effects are mediated by beneficial modulations in eating behaviors remains unclear.

**T-OR-2019**

*Reaching Men with Weight Loss: Randomized Trial of the REFIT Program for Men*

Melissa Crane Chapel Hill North Carolina, Lesley Lutes Greenville North Carolina, Dianne Ward Chapel Hill North Carolina, James Bowling Chapel Hill North Carolina, Deborah Tate Chapel Hill NC

**Background:** Despite the high prevalence of overweight and obesity among men, men are underrepresented in behavioral weight control programs. The purpose of this study was to test the efficacy of an Internet-delivered weight loss program designed to appeal to men as compared to a waitlist control group.

**Methods:** The REFIT (Rethinking Eating and FItness) program used a novel approach to weight loss, which included reducing calories by making six 100-calorie changes to diet per day, increasing physical activity, and using simplified self-monitoring. Participants self-selected specific diet strategies to change each week, increasing the personalization of the program. The program included weekly online contact for three months and monthly contact for three months. Assessments included objective measurement of weight and self-report use of recommended behaviors.

**Results:** Participants (N=107, 44.2±11.4 years, 31.4±3.9 kg/m2, 76.6% white) randomized into the study did not differ by group at baseline (p’s > 0.05) nor by retention to the study (p=0.98; 90.1% retention at 6m). REFIT participants lost -5.0 kg (95% CI: -6.1, -3.9) at 3 months, which was maintained through 6 months (-5.3 kg, 95% CI: -6.5, -4.2); this was greater than change in the control group (p=0.001; 6-month: -0.6, 95% CI: -1.8, 0.5). More REFIT participants (49%) achieved a 5% weight loss as compared to the control group (19%; OR 9.4; 95% CI: 3.2, 27.4). Weight loss in the REFIT group was associated with the number of online contacts completed, self-reported frequency of making 100-calorie changes to diet, using the simplified self-monitoring form, using a mobile application to track diet, and frequency of self-weighing (p’s<0.05). REFIT participants completed 86.2% of online contacts and 95.7% reported they would recommend to a friend.

**Conclusions:** In a well utilized and positively evaluated men’s weight loss program, adherence to recommendations was associated with weight losses. The program was effective in producing clinically relevant weight loss.

**T-OR-2020**

*Dietary lapses during behavioral weight loss: Characteristics and relationships with later success*


**Background:** Despite the central importance that dietary lapses play in weight loss failure, we know relatively little about their nature, how they combine with early weight loss to predict later weight loss success, what factors trigger them and how they change over time.

**Methods:** 190 participants entering a 25-session, 12-month behavioral weight loss program reported on potential lapse triggers (sight of food, boredom, emotion) as well as instances and characteristics of lapses using ecological momentary assessment (EMA) for 14 days at start, and 7 days at mid-point and end of treatment. The EMA protocol included 6 semi-
random prompts/day and event-contingent reporting. **Results:** At baseline, participants reported M=4.45 (SD = 3.15) lapses/week, of which 44% were eating a food that hadn’t been intended, 31% were eating at a time not intended, and 25% were eating a larger portion than intended. Most lapses occurred in the evening (53%) and most occurred at home (49%). Frequency of early lapses (r=.20, p <.01), and in particular eating at a time not intended (r=.27, p<.01) predicted end-of-treatment weight loss, even controlling for early weight loss (beta = .16, p<.05). Preliminary results indicate that boredom, fatigue and deprivation most strongly predicted lapses prospectively, and that lapse frequency was relatively stable from pre- to mid-treatment but increased by 10% between mid and end-of-treatment. **Conclusions:** Results thus far offer a rare window into in-the-moment lapse behavior among those in a behavioral weight loss program, and suggest that interventions should attempt to prevent early lapse behavior (perhaps by targeting boredom) even among those whose weight loss is on track. Results also suggest that we could use early lapses to predict long-term outcomes, allowing for the development of tailored and sequenced treatment protocols. Increases in self-reported lapses may be due to more stringent lapse definitions and decreasing motivation.

**T-OR-2021**

**Traffic-Light Labels at University Dining Halls**  
Michael Seward *Winchester Massachusetts*, Jason Block *Boston MA*, Avik Chatterjee *Cambridge Massachusetts*

**Background:** During college, many students make independent food choices for the first time, and they eat most of their meals on campus. We examined whether traffic-light labeling and choice architecture interventions could improve the dietary choices in college dining halls.  
**Methods:** In 6 dining halls at one university in the northeastern US, we designed and implemented a 13-week intervention including traffic-light labels (red, yellow, green), choice architecture (make healthy items more accessible), and “healthy plate” tray stickers. During the 2014-15 academic year, 2 dining halls received all 3 interventions, 2 only received the choice architecture, and 2 dining halls served as controls. We collected sales of all food and beverage items during a 6 week period before the intervention and 7 weeks during the intervention. Using an interrupted time series analysis, we measured changes in proportions of red, yellow, and green items consumed per week. We also surveyed 779 students about the interventions.  
**Results:** We labeled menu items 34% red, 21% yellow, and 45% green. We analyzed 2.6 million portions served over 13 weeks. Although we saw trends toward decreased consumption of red items (-0.8% change in sales per week, P=0.199) and increased consumption of green items (1.1% increase in sales per week, P=0.400) in intervention sites compared to controls, we found no statistically significant changes. Subgroup analyses of beverages, entrees, and hot food similarly showed trends toward dietary improvement, but no significant changes. Despite these findings, 58% of intervention students used traffic-light labels at least a few times per week, 60% thought they were helpful, and 73% of total respondents said they should continue to be used.  
**Conclusions:** While many students reported regularly using the traffic-light labels and even more wanted the labels and plate stickers to remain in the dining halls, we did not find a combination of these interventions to significantly change dietary choices of college students.

**T-OR-2022**

**Evaluation of the CATCH Early Childhood Program for Obesity Prevention among Preschoolers in Texas: The TX CORD Study**  
Shirela Sharma *Houston Texas*, Courtney Byrd-Williams *Austin TX*, Elizabeth Vandewater *Austin TX*, Ru-Iye Chuang *Houston Texas*, Nancy Butte *Houston TX*, Deanna Hoelscher *Austin Texas*

**Background:** The Texas Childhood Obesity Research Demonstration (TX CORD) study was implemented to prevent childhood obesity among children ages 2 to 12 from low-income minority populations. As part of TX CORD, we evaluated the effects of the CATCH Early Childhood (CATCH EC) program on BMI, diet, physical activity and screen time behaviors of children ages 3 to 5 in Head Start centers.  
**Methods:** Quasi-experimental study design with serial cross-sectional data collected from intervention and comparison catchment areas in Houston and Austin, TX (Intervention: n=17 Head Start centers, 843 parent-child dyads; Comparison: n=16 Head Start centers, 690 parent-child dyads). CATCH EC, a preschool-based nutrition and physical activity program, was implemented across the participating Head Start centers in the intervention areas while those in the comparison areas did usual program. Data were collected in 2012 (baseline, prior to CATCH EC) and 2014. Primary outcomes were child BMI percentiles, BMI z-scores using measured height and weight, and parent-reported frequency of intakes of fruits, vegetables, fried foods, sweets, sugary beverages, frequency of physical activity, and screen time. Mixed linear and logistic regression models were used to analyze intervention effects.  
**Results:** At baseline, 36.7% of the preschoolers were overweight or obese; 72.9% were Hispanic, 21.8% African-American, and 5.3% other. Results showed significant decreases in BMI percentiles (p=0.044), decreased frequency of intake of sugary beverages (p=0.028), 100% fruit juice (p=0.028), eating dinner from a restaurant (p=0.006), and reduced screen time on weekends (p=0.050) among preschoolers attending Head Start centers in the intervention areas receiving CATCH EC compared to those in comparison Head Starts.  
**Conclusions:** A primary prevention program can demonstrate positive effects on reducing obesity and promoting healthy behaviors among preschoolers from low-income minority populations.

**T-OR-2023**

**Maternal Obesity and Early Childhood Development**  
Edwina Yeung *Bethesda Maryland*, Rajeshwari Sundaram *Rockville Maryland*, Yunlong Xie *Rockville MD*, Christopher Kus *Albany NY*, Germaine Buck *Louis Rockville MD*

**Background:** Over 20% of pregnant women in the United States are obese (BMI≥30 kg/m2). Few studies have examined the association between maternal obesity and early childhood development.  
**Methods:** Upstate KIDS (2008-2010) is a population-based cohort which recruited mothers from New York State (excluding New York City) at 4 months postpartum. Mothers completed the Ages and Stages Questionnaire® (ASQ) when their children were 4, 8, 12, 18, 24, 30, and 36 months of age.
corrected for gestation. The ASQ is a validated screen designed to detect delays in 5 developmental domains (i.e., fine motor, gross motor, communication, personal-social functioning and problem solving ability). 3788 singletons and 2078 twins had information returned from one or more ASQs. Prepregnancy BMI was calculated using weight and height data from vital records. Odds ratios (aOR) and 95% confidence intervals (CI) were estimated using generalized linear mixed models adjusting for maternal age, race, education, insurance, cohabitation, prior live birth, pregnancy smoking, and paternal BMI. Analyses were stratified by plurality and correlations between twins were accounted for by clustering on family. Multiple imputations were used for missing paternal BMI data (n=515, 11%).

Results: The prevalence of prepregnancy obesity was 26%. Compared to normal (46%) or underweight (3%) mothers (BMI<25 kg/m2), children of obese mothers (BMI≥30) had increased odds of failing the fine motor domain whether a singleton (aOR 1.71; 95% CI: 1.14-2.61) or twin (2.10; 1.33-3.30). No other significant associations between the ASQ domains and maternal obesity were found among singletons. Among twins, maternal obesity was also associated with increased risk of failing the problem solving domain (1.78; 1.08-2.96). Removing paternal BMI from the model did not meaningfully alter results.

Conclusions: Screening by the ASQ suggested that fine motor development may be delayed among children of obese mothers compared to children of normal/underweight mothers.

T-OR-2024
Food Security in Pregnancy and Infant Feeding at 3 Months

Background: We evaluated food security in pregnancy and maternal infant feeding method and style at 3 months post-partum. We hypothesized that food insecurity would be associated with controlling feeding, and that this relationship would differ for women participating in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) or the Special Supplemental Nutrition Assistance Program (SNAP).

Methods: We studied 340 women recruited in pregnancy and followed until their infants were 3 months of age. We conducted logistic and linear regressions examining adjusted associations of food security in pregnancy with infant outcomes of breastfeeding (exclusive or partial) and feeding style (responsive, laissez-faire, pressuring, restrictive, and indulgent). We explored effect modification by modeling an interaction between food insecurity and WIC or SNAP participation.

Results: Food insecurity in pregnancy was not associated with breastfeeding at 3 months. Food insecurity was associated with a 0.25 point (95% CI 0.06, 0.44; p=0.01) increase in pressuring score, driven by the finishing (estimate 0.29; 95% CI 0.05, 0.53; p=0.02) and soothing (estimate 0.27; 95% CI 0.03, 0.50; p=0.03) sub-constructs. We did not observe differing effects of food insecurity by WIC or SNAP participation on breastfeeding (interaction p=0.07), but we did for the pressuring sub-construct soothing (interaction p=0.005). Food insecurity was associated with a 0.45 higher soothing score (95% CI 0.19, 0.71; p=0.001) for women participating in WIC or SNAP.

Conclusions: The pressuring feeding style and soothing sub-construct represent potential mechanisms linking food insecurity to obesity in early childhood. Our finding that WIC or SNAP participation was associated with higher soothing scores warrants further investigation.

T-OR-2025
Genetic Influence on Appetite Strengthens from Toddlerhood to Early Childhood

Background: Food responsiveness (FR) and satiety responsiveness (SR) are two key aspects of appetite hypothesized to play a causal role in the development of obesity. The relative importance of genetic and environmental influences on SR and FR in the post-weaning phase are unknown; and it is unclear if influences change once the transition to solid foods is established in early childhood. The aim of this study was to establish genetic and environmental contributions to FR and SR in toddlerhood and early childhood.

Methods: Data were from Gemini, a population-based sample of 2402 British twin pairs born in 2007. Parents completed the SR and FR scales of the Child Eating Behavior Questionnaire for each twin when they were 15 months and 5 years old. Longitudinal quantitative genetic modelling was used to estimate genetic and environmental contributions to SR and FR at 15 months and 5 years.

Results: SR and FR were moderately stable from 15 months to 5 years (SR: r=0.40, p<0.001; FR: r=0.42, p<0.001). Genetic influences increased significantly from 15 months to 5 years for both SR (15 months: 0.46 [0.42-0.50]; 5 years: 0.72 [0.68-0.76]) and FR (15 months: 0.41 [0.38-0.45]; 5 years: 0.61 [0.54-0.68]), while shared environmental contributions decreased significantly for both SR (15 months: 0.43 [0.47-0.48]; 5 years: 0.04 [0.01-0.09]) and FR (15 months: 0.50 [0.45-0.55]; 5 years: 0.28 [0.19-0.37]).

Conclusions: SR and FR are moderately stable from the post-weaning phase through to early childhood when eating behavior is more established. In line with many other behavioral traits, genetic influence on SR and FR increased substantially from toddlerhood to early childhood, while the impact of the shared environment diminished. Strengthening genetic effects may reflect increasing independence of children to act in line with their genetic predispositions towards food as they get older. Toddlerhood may offer an important window of opportunity for interventions to establish good appetite regulation.

T-OR-2026
Genetic and environmental influences on children’s BMI trajectories from age 2 to 9 years
Jody Ganiban Washington District of Columbia, Samuel Simmons Washington DC, Jenae Neiderhiser University Park PA, Misaki Natsuaki Riverside CA, David Reiss New Haven CT, Daniel Shaw Pittsburgh PA, Leslie Leve Eugene OR

Background: Children’s risk for obesity is shaped by genes, prenatal factors, and by their growth rate during early infancy. In most studies, however, these influences are confounded...
Conclusions:
weights than Groups 2 and 3. Furthermore, children in Group 1 tended to have higher birth early growth, when compared to children in Group 3. Birth Mother’s prepregnancy BMI, AC’s BMIPCT was assessed via BMIs’ reports of their prepregnancy BMI. AC’s birth weight percentile was used as an index of fetal growth and nutrition. Change in AC’s weight z-scores from birth to 9-months was used to index early growth rate, a known postnatal predictor of childhood obesity.

Methods: Participants included 239 adoption triads (the adopted child (AC), Adoptive Mother (AM), and Birth Mother (BM)) from the Early Growth and Development Study. AMs’ reports of children’s weight and height at 2.25, 4.5, 5, 6, 7, and 9 years were used to compute BMI percentiles (BMI percentile) and assess changes over time. Genetic influences on AC’s BMIPCT included 47 ACs with stable, low-healthy BMIPCTs. Group 2 included 62 ACs who demonstrated high-healthy BMIPCTs (slope=-2.44). Group 3 included 47 ACs with stable, low-healthy BMIPCTs (intercept=39.7). Birth Mother’s prepregnancy BMI, AC’s birthweight and early growth rate were associated with group membership. Children in Groups 1 and 2 tended to have Birth Mothers with higher BMIs and to demonstrate accelerated early growth, when compared to children in Group 3. Furthermore, children in Group 1 tended to have higher birth weights than Groups 2 and 3.

Conclusions: Analyses different patterns of BMIPCT change over time that were related to children's genetic makeup, fetal growth, and early postnatal growth rate. Furthermore, as illustrated by Group 1, heightened risks in all three domains predict increasing BMIPCT across childhood.

Wednesday November 4, 3:30-5:00 PM

T-OR-2027
Adipocyte Progenitors as Determinants of Adipose Tissue Remodeling in Obesity
Mikhail Kolonin Houston Texas, Zhanguo Gao Houston TX, Alexis Daquinag Houston TX, Brad Snyder Houston Texas

Background: Overgrowth of white adipose tissue (WAT) is the hallmark of obesity. Thermogenic energy expenditure by brown adipose tissue counteracts obesity and metabolic disease. Better understanding of the cellular processes controlling the balance of white and brown adipocytes is needed. Renewal of adipocytes relies on adipocyte progenitors. Recently, we demonstrated that pharmacological depletion of white adipocyte progenitors (WAP) in mice with a targeted pro-apoptotic peptide D-WAT suppresses obesity development. This indicates that WAP self-renewal and differentiation limits WAT expansion. Interestingly, WAP depletion resulted in recruitment of brown adipocyte progenitors (BAP), a distinct population of precursor cells that differentiate into brown adipocytes.

Methods: We have discovered that WAP and BAP can be identified as PDGFRα-PDGFRβ+ and PDGFRα+PDGFRβ- cells, respectively, in mouse WAT. Here, we investigated PDGFRα and PDGFRβ as markers of human BAP and WAP using specimens of subcutaneous and visceral WAT from patients undergoing bariatric surgery.

Results: Our data show that human PDGFRα-PDGFRβ+ cells and PDGFRα+PDGFRβ- cells comprise distinct WAT progenitor populations. Like in mice the PDGFRβ+ cells are perivascular cells attached to the basement membrane, while PDGFRα+ stromal cells are located further away from the vasculature. Importantly, like in mice, human PDGFRα-PDGFRβ+ stromal cells, are specifically killed by D-WAT.

Conclusions: Our data indicate the presence of distinct progenitors populations maintaining white and brown adipocytes in humans. These results suggest that human adipose tissue composition could be pharmacologically modulated at the precursor cell level, which may have implications for the development of drugs enabling sustained obesity suppression and metabolism activation.

T-OR-2028
Senescent preadipocytes in obesity
Ana Espinosa De Ycza Rochester Minnesota, Maria Morgan-Bathke Rochester MN, Barbara Carranza Leon Rochester Minnesota, Ian Lanza, Deb Harteneck Rochester MN, Michael Jensen Rochester MN

Background: Senescent preadipocytes are adipocyte precursors that have lost the ability to differentiate and replicate. Cell and animal models suggest an association between senescent preadipocytes, obesity and adipose tissue dysfunction. Our aims were to: 1) assess whether there are regional differences in adipose senescent cell populations; 2) evaluate the relationship between senescent cells and adiposity fat distribution in humans.

Methods: 49 overweight and obese adults (10 men) underwent body composition studies with DXA, abdominal imaging to measure visceral fat, and subcutaneous femoral (n= 31) and abdominal (n= 47) fat biopsies for fat cell size and senescent cells determination. Senescent cells were identified by senescence associated β-galactosidase staining and expressed as proportion of total number of nucleated cells (measured by DAPI staining).

Results: The median age and BMI were 35 years and 33.3 kg/m2, respectively. To our surprise, the proportion of senescent cells was 1.9 times greater in femoral than abdominal adipose tissue (AT) (4.2 % and 2.5 % respectively, p<0.001). There was a positive (spearman correlation rs= 0.66, p=0.003) relationship between abdominal and femoral senescent cells and between senescent cells and percent body fat (rs= 0.33, p=0.024 and rs= 0.47, p=0.0075 for abdominal and femoral senescent cells, respectively). This relationship persisted after adjusting for femoral fat cell size (p=0.003) but not for abdominal fat cell size (p=0.09). We found no correlation between senescent cells and visceral fat area, upper body subcutaneous fat or BMI in this overweight/obese population.

Conclusions: In overweight/obese men and women, femoral adipose tissue contains more senescent cells than abdominal fat; there is no detectable relationship between subcutaneous adipose senescent cells and visceral fat, but there is a relationship between senescent preadipocytes and adiposity; this relationship is stronger for femoral fat.

T-OR-2029
Diet-Induced Obese MMP-12 Deficient Mice Exhibit Impaired Total, M1, and M2 Adipose Tissue Macrophage Recruitment.
Alii Antar Houston Texas, C. Wayne Smith Houston Texas

Background: Throughout the progression of obesity, white adipose tissue (WAT) expansion is marked by WAT
inflammation and the recruitment of leukocytes to WAT. Matrix metalloprotease-12 (MMP-12) is a macrophage-secreted elastase that has been shown to play an important role in the degradation of elastin and other extracellular matrix proteins, thereby modulating tissue remodeling during the inflammatory response and the migration of leukocytes to sites of inflammation. MMP-12 expression in WAT is increased in diet-induced obesity.

**Methods:** In order to test the hypothesis that MMP-12 activity influences the recruitment of macrophages to expanding adipose tissue depots, we fed MMP-12 knockout (MMP12−/−) and wildtype (wt) littermate controls either low fat, low sucrose chow diet (CD) or high fat, high sucrose Western-type diet (WD) for 14 weeks.

**Results:** Although diet-induced weight gain and adiposity were not influenced by genotype on either diet, recruitment of total F4/80+, pro-inflammatory (M1) CD11c+, and alternatively activated (M2) CD301+ macrophages was significantly reduced in epididymal “visceral” white adipose (eWAT) depots taken from WD-fed MMP12−/− mice in comparison with wt controls. Similarly, although adipocyte size did not differ between genotypes, numbers of crown-like structures in eWAT were also significantly reduced in WD-fed MMP12−/− mice relative to wt controls.

**Conclusions:** Our findings suggest that MMP-12 may play an important role in the recruitment of total, M1, and M2 macrophages to visceral WAT in the context of diet-induced obesity.

**T-OR-2030**

**BET Proteins Regulate Inflammation in Obesity-Associated Breast Cancer**

Guillaume Andrieu Boston Massachusetts, Katherine Strissel Boston MA, Gerald Denis Boston MA

**Background:** Obesity is a risk factor for cancer, but not all obesity types convey the same cancer risk. Metabolically-abnormal obesity (MAO) features chronic systemic and local inflammation of adipose tissue linked to breast cancer outcome. About 30% of obese women are metabolically healthy (MHO), low inflamed and with lower risks for cardiovascular disease and breast cancer. Reduced inflammatory signaling in the tumor microenvironment is likely a critical mechanism of protection. Small molecule inhibitors of BET (Bromodomain and Extraterminal) proteins with anti-cancer and anti-inflammatory properties have been reported. BET protein inhibition reduces inflammation and protect adipocytes from TNF-alpha-induced insulin resistance. Brd2-hypomorphic mice exhibit a MHO phenotype suggesting that BET proteins may couple obesity to metabolic disease. We hypothesized that BET protein inhibition reduces inflammation in breast adipose tissue and impairs breast cancer cell behavior. Thus, BET protein inhibition may break an obesity-cancer link in MAO-associated breast cancer.

**Methods:** Blood and breast adipose tissue samples were obtained from MAO and MHO patients. Conditioned media from isolated adipocytes or stromal-vascular cells or co-culture experiments were used to assay breast cancer cell proliferation, survival, migration and invasion.

**Results:** Human MHO abdominal fat had lower Brd2 expression than MAO. BET protein inhibition reduces inflammation in breast adipose tissue. BET protein targeting slows breast cancer cell proliferation and dramatically reduces migration and invasion stimulated by breast adipose tissue.

**Conclusions:** Our results suggest that BET protein inhibition not only reduces tumor cell proliferation and invasiveness, but improves inflammation and metabolism in the breast cancer microenvironment. BET proteins regulate tumor-proximal adipocyte and macrophage properties, thereby modulating tumor aggressiveness, and must be considered as potential therapeutic targets in MAO-associated breast cancer.

**T-OR-2031**

**Cellular Mediators and Inflammatory Cytokine Profile in Breast Adipose Tissue and Plasma Stratify Obese Phenotype of African American Women**

Katherine Strissel Boston Massachusetts, Christopher Gromisch Boston Massachusetts, Guillaume Andrieu Boston Massachusetts, Gerald Denis Boston MA

**Background:** Crown-like structures (CLS) have been identified in human subcutaneous, visceral and breast adipose depots associated with both cardiometabolic and cancer risk. Our hypothesis was that measures of metabolic health in breast adipose tissue (AT) such as CLS, adipocyte size, and adipose stromal cell (SCV) phenotypes, would meaningfully associate with a pro-inflammatory imbalance of specific cytokines and adipokines in plasma of obese women.

**Methods:** Breast AT histological samples and matched plasma of obese/unhealthy African American (AA) women from the Komen Tissue Bank, the Black Women’s Health Study and from elective breast reduction surgery patients were compared to matched obese/healthy subjects and to a matched lean/healthy cohort. CLS were quantified and adipocyte size determined. Breast STL vascular fraction (SVF) of collagenase digested tissue were phenotyped by FACS. 41 plasma cytokines/adipokines were measured by multiplex assay.

**Results:** CLS were infrequent in breast AT. Thus far, 5 of 17 obese/unhealthy samples had CLS (none in metabolically healthy). Mean cell area was significantly larger in metabolically unhealthy subjects (4579.2 SD=713.2 micron, N=7, compared to 3231.9 SD=923.3 micron, N=10, P=0.004). A majority of pro-inflammatory cytokines trend toward increases with BMI. Non-biased computational analyses revealed cytokines and metabolic parameters stratify subjects to distinct groups. Phenotyping and analysis of breast AT immune cells are ongoing.

**Conclusions:** Cytokine expression patterns and measures of tissue immunometabolism were evaluated. We found that obese/healthy women can be resolved from obese/unhealthy as well as from lean and healthy, and that a limited number of cytokines/adipokines might be sufficient to begin to define risk cross-sectionally. The impact of our results is that the immunometabolic profile of patient plasma may provide a robust tool used to inform clinical outcomes for high risk patients. Supported by NCI: U01 CA182898

**T-OR-2032**

**Disrupted adipose tissue homeostasis in obese adipocyte-specific OSMR knockout mice.**

Carrie Elks Baton Rouge Louisiana, Peng Zhao Ann Arbor MI, Anik Boudreau Baton Rouge LA, Randall Myatt Baton Rouge LA, Jacqueline Stephens

**Background:** Our recently published data demonstrate that oncostatin M (OSM), a gp130 cytokine, is produced by adipose tissue macrophages and highly up-regulated in obesity. In cultured adipocytes, OSM significantly decreases insulin
FKO mice. Targeted arrays revealed that the most highly up-regulation of STAT3 phosphorylation, is substantially reduced in OSMR FKO mice. As expected, adipose tissue OSM signaling, as judged by inflammatory gene expression in OSMR FKO adipose tissue.

**Methods:** Gene and protein expression analyses were conducted on visceral adipose tissues from control and adipocyte-specific OSMR knockout (OSMR FKO) mice after 24 weeks of high-fat diet feeding.

**Results:** Our studies revealed increased macrophage and T-cell infiltration as well as increased pro-inflammatory and pro-fibrotic gene expression in OSMR FKO adipose tissue. As expected, adipose tissue OSM signaling, as judged by STAT3 phosphorylation, is substantially reduced in OSMR FKO mice. Targeted arrays revealed that the most highly up-regulated genes in OSMR FKO visceral fat were matrix metalloproteinase 7 and E-cadherin, two putative STAT3 regulated genes in OSMR FKO visceral fat were matrix metalloproteinase 7 and E-cadherin, two putative STAT3 regulated genes not normally considered to have major roles in adipose tissue.

**Conclusions:** Adipose tissue homeostasis in the OSMR FKO mouse may be regulated by genes not traditionally considered to affect adipose tissue function. Further studies are now underway to elucidate the importance of these genes in adipose tissue homeostasis and how their dysregulation may contribute to obesity.

**T-OR-2033**

*The Relationship between Sugar-Sweetened Beverage Intake, Cortisol Response and Fat Partitioning*

Grace Shearer, Austin Texas, Michael Goran, Los Angeles CA, Donna Spruijt-Metz, Los Angeles California, Marc Weigensberg, Los Angeles CA, Jaimie Davis, Austin TX

**Background:** Previous research has shown a correlation between cortisol activity and adiposity, specifically visceral adipose tissue (VAT). However, the effect of sugar-sweetened beverage (SSB) intake on cortisol and adiposity is unknown. Our objective is to examine the relationship between SSB intake, VAT, hepatic fat fraction (HFF), and cortisol response in minority youth.

**Methods:** A cross-sectional study with 82 overweight/obese African American and Hispanic adolescents (14-18 y) from the Oh My LA study conducted at University of Southern California with the following measures: VAT and HFF via MRI, cortisol awakening response (CAR) and morning cortisol (MC) via multiple salivary samples, and SSB intake via multiple 24-hour diet recalls. SSB intake was divided into the following: low (<0.5 serv/d), medium (0.5 to <1 serv/d), high (1 to <2 serv/d), and very high intake (≥ 2 serv/d). Multivariate analysis of variance was used to model the relationship between VAT, HFF, and CAR or MC (dependent variables) and SSB intake categories (independent variable) with the following a priori covariates: sex, Tanner stage, ethnicity, caloric intake, and body mass index.

**Results:** Subjects with very high SSB intake compared to subjects with low SSB intake had 5% higher VAT (p<0.01), independent of covariates. Subjects with very high SSB intake compared to those with low SSB consumers had 16% higher MC (p<0.01) and 43% higher CAR (p<0.01) independent of adiposity and other covariates. The interaction between SSB intake and MC and SSB with CAR were both associated with VAT (p<0.01), (p=0.03).

**Conclusions:** High SSB intake appears to be related to higher VAT and higher cortisol response, independent of adiposity. These findings suggest that SSB intake directly affects both adiposity and cortisol response in adolescents. This may suggest SSB and cortisol interact to influence fat partitioning in adolescents.

**T-OR-2034**

*Identification of a Fatty Acid Binding Protein-UCP2 Axis Regulating Microglial Mediated Neuroinflammation*

Cayla Duffy, Minneapolis Minnesota, Ce Yuan, Minneapolis Minnesota, Joshua Nixon, Minneapolis MN, David Bernlohr, Minneapolis Minnesota, Tammy Butterick, Minneapolis MN

**Background:** Hypothalamic inflammation contributes to metabolic dysregulation and the onset of obesity. Dietary saturated fats activate microglia via an NFκB mediated pathway to release pro-inflammatory cytokines, resulting in dysfunction or death of surrounding neurons. Fatty acid binding proteins (FABP) are lipid chaperones regulating metabolic and inflammatory pathways in response to fatty acids. Although inhibiting FABP4 in peripheral macrophages results in reduced obesity-induced inflammation via a UCP2-redox based mechanism, the expression of FABP4 and a potential FABP4-UCP2 axis in microglia cells is largely uncharacterized. We hypothesized that microglial cells express FABP4 and that inhibition would up regulate UCP2 and attenuate lipopolysaccharide (LPS)-induced pro-inflammatory response.

**Methods:** Embryonic murine brain tissue and immortalized murine microglial cells (designated BV2) were evaluated for the presence of FABP4 by qRT-PCR. To assess the role of FABP4 in microglial inflammation, BV2 cells were pretreated in the presence or absence of a pan-FABP inhibitor (HTS01037; 30 μM) for 3h, and then treated with or without LPS (100 ng/ml) for 12h. Microglial cells were collected for qRT-PCR analysis of gene expression.

**Results:** Gene expression analysis reveals that embryonic mouse brain and BV2 cells express FABP4. Exposure of the FABP inhibitor HTS01037 in the presence or absence of LPS increased expression of UCP2 (p<0.0001 vs. control and LPS only) and arginase (p<0.05 vs. control and p<0.001 vs. LPS only). Moreover, cells exposed to HTS01037 exhibited attenuated expression of inducible nitric oxide synthase compared to LPS alone (p<0.0001) indicating reduced NFκB signaling.

**Conclusions:** To our knowledge, this is the first report demonstrating an FABP-UCP2 axis with the potential to modulate the microglial inflammatory response.

**T-OR-2035**

*Simple Index of Insulin Secretion and Body Fat are Associated with Cognitive Decision-Making Measured by the Iowa Gambling Task*

Douglas Chang, Phoenix AZ, Marie Thearle, Phoenix AZ, Susanne Votruba, Phoenix AZ, Jonathan Krakoff, Phoenix AZ, Marci Gluck, Phoenix AZ

**Background:** Obesity and type 2 diabetes are risk factors for cognitive dysfunction. Obese subjects may perform worse than non-obese subjects on the Iowa Gambling Task (IGT), a test of decision making. Evidence has emerged for a role of brain insulin signaling on cognition, though the directionality of the association is inconsistent. We therefore evaluated anthropometric measures and indices of insulin action and secretion on IGT performance.
Methods: IGW was administered to 196 non-diabetic adults (age: 35 years ±10 (mean ±SD); male: 65%; education=12 years: 46%; BMI: 32±8 kg/m², %fat: 36±12 by DXA) ~30 minutes after a standardized breakfast. All had a 75g oral glucose tolerance test to calculate the insulinogenic index at 30 min (ratio of insulin concentration at 30 min minus fasting insulin to difference of glucose at same time, IGI30). All subjects were healthy except for possible impaired glucose regulation (n=84).

Results: Fasting insulin, %fat, and IGI30 were correlated with poorer IGT scores (r=-0.20, p<0.004; r=-0.16, p=0.03; r=-0.25, p=0.0005, respectively). In a multivariate model adjusting for age, sex, race, and education, %fat (β=2.53, p=0.030) and IGI30 (β=51.26, p=0.010) were associated with IGT. An interaction between %fat and IGI30 was also observed (β=1.00, p=0.050), such that subjects with low IGI30 and low %fat had the best mean IGT score (12±27), those with high IGI30 and either high or low %fat had lowest scores (-3±19; -3±22, respectively), and those with low IGI30 and high %fat had an intermediate score (±26).

Conclusions: Both greater adiposity and insulin secretion were independently associated with poorer decision making on the IGT. Our results indicate negative, additive effects of adiposity and insulin on cognition. The interaction between insulin and %fat on IGT may represent brain insulin-stimulated pathways under regulation by heterologous agents (e.g. tumor necrosis factor, free fatty acids) that are associated with body fat and are themselves regulated by insulin.

T-OR-2036
Dynamism of the Hypothalamic Transcriptome Uncovers "Stages" During the Development of Diet-Induced Obesity in Mice
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Background: Hypothalamus plays a central role in energy homeostasis. Although high-fat diet (HFD)-provoked hypothalamic injury has been implicated in leptin resistance, precise molecular mechanisms remain unveiled. Here, we dissected the transcriptomic changes in the three major energy centers of the hypothalamus: arcuate (ARC), paraventricular (PVN), and lateral (LH) nuclei, during the course of the development of diet-induced obesity.

Methods: ARC, PVN, and LH were micro-dissected from B6 mice fed either HFD or control low-fat diet (LFD) for 3 days, 2, 6 and 16 weeks, and transcripts were analyzed by RNA sequencing (n=3). We defined a transcript as an "Altered transcript" (AT) when the expression level under HFD was >1.5 or <1/1.5 fold of control and statistically significant (P<0.05). (1) Numbers of ATs counted, (2) ATs analyzed by cluster analysis, (3) Gene ontology (GO) assigned on each cluster, and (4) Upstream regulator (UR) analyzed using whole transcriptome data by IPA®.

Results: (1) Total numbers of transcripts included in ATs at one or more time points were 1486 (ARC), 1585 (PVN), and 1398 (LH). The number of ATs peaked at 6 weeks in ARC and LH, whereas at 3 days in PVN. (2) ATs in every nucleus were clustered into 5 groups: one with commonly downregulated transcripts throughout four time points, and the other four groups each consisting of transcripts specifically upregulated at only one time point. (3) GO terms assigned to each cluster were unique to the nucleus/time point combination. (4) On the 3rd day of HFD, three nuclei shared URs associated with cell cycle/proliferation. After 16 weeks of HFD, URs were commonly associated with inflammation.

Conclusions: We define “stages” of obesity by a specific group of upregulated hypothalamic transcripts that corresponds to a specific set of subcellular locations or molecular functions. Furthermore, earlier and later stages of obesity were characterized by cell cycle/proliferation and inflammation, respectively.

T-OR-2037
Proteoglycans of the Extracellular Matrix Influence Body Composition and Glucose Homeostasis During High Fructose Consumption
Emily Noble Los Angeles California, Qingying Meng Los Angeles CA, Zhe Ying Los Angeles CA, Fernando Gomez-Pinilla Los Angeles California, Xia Yang Los Angeles CA

Background: Fructose consumption has been identified as a main contributor to the current epidemic of metabolic disorders. The brain plays an important role in the regulation of whole body energy balance and glucose homeostasis, yet surprisingly little is known about how fructose affects the brain. Using a systems genomic approach to integrate brain gene regulatory networks constructed from multiple rodent populations, we derived hypothalamic gene networks to identify interactions among genes affected by a high fructose diet. Through these analyses, the biglycan gene (BGN) emerged as a central node in the network of fructose-aFFECTed genes. BGN is a small leucine rich proteoglycan found in the extracelluar matrix, which is known to bind and modulate the activity of growth factors, such as TGFβ. We hypothesized that BGN plays a key role in mediating fructose-induced metabolic disease.

Methods: BGN knockout mice (BKO) or wild type littermates (WT) were fed either fructose solution (15% w/v) or regular water for 10 weeks. Body weight, body composition, plasma lipids and glucose clearance were our primary endpoints. Using a combination of immunoblotting and immunohistochemical analyses, we further analyzed the activity of central transforming growth factor TGFβ receptor-1, which promotes hyperglycemia and glucose intolerance.

Results: BKO mice were heavier than controls, mainly due to elevated lean mass (p<0.001). During the fructose intervention, BKO mice continued to gain weight as lean mass, and were protected against fructose effects to increase body fat %. BKO mice had improved glucose clearance, but total cholesterol and triglycerides were elevated and liver sizes were enlarged. BKO mice had reduced phosphorylation of TGFβ receptor-1 in brain.

Conclusions: These data support a role for biglycan as a contributor to fructose-induced glucose regulatory aberrations and highlight the importance of the extracellular matrix in mediating aspects of diet-induced metabolic disease.

T-OR-2038
Neurochemical Characterisation of the Sympathetic Neural Input to 'Beige' Fat Cells
Brian Oldfield Clayton VIC, Nicole Wiedmann Monash University Victoria, Aneta Stefanidis Clayton Vic

Background: One of the most intriguing recent developments in the already exciting field of brown fat biology is the potential to recruit functionally active 'beige' fat. We have
recently shown that coincident with exposure of rats to cold (8 degrees C) and the subsequent increased formation of beige fat cells in rat inguinal white adipose tissue (iWAT). There is an increase in central neural input specifically to this fat pad. In order to gain an appreciation of the neurotransmitters and other elements that directly control brown fat function we have focused on the T13/L1 sympathetic ganglia that provide the sympathetic outflow to iWAT.

Methods: In order to identify synaptically-connected neural input to beige iWAT, the neurotropic tracer PRV614 was injected into iWAT of rats housed at 8 and 27 degrees C for 1 week. Other rats kept under these same conditions were perfused under saline and the T13/L1 ganglia removed for RNA extraction and subsequent RNA-seq using Illumina HiSeq1500 with approx 25 million reads. Comparison was made between T13/L1 ganglia under each temperature condition using quantified normalised expression values for mRNA in each sample.

Results: Following injection of PRV614 into iWAT there was no difference in numbers of neurons in T13/L1 in rats exposed to either temperature; however, there were increased numbers of neurons directed to iWAT at supraspinal levels when exposed to cold. RNA-seq analyses comparing mRNA and gene expression profiles between ganglia projecting to iWAT and beiged iWAT yielded a unique set of candidates representative of a neurochemical signature of the innervation of beige fat.

Conclusions: These data provide the first insight into the neurochemical profile of the innervation of beige fat. Such observations are fundamental to the identification of elements that may be modified in order to specifically recruit beige fat, increase energy expenditure and potentially reduce body weight.

T-OR-2039
Promoting healthy family meals to prevent childhood obesity: HOME Plus, a randomized controlled trial
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Background: In spite of the strong correlational evidence suggesting the importance of family meals, there have been very few evaluations of family-meals-focused interventions, and none of these have utilized randomized controlled trials (RCTs) to examine impact on obesity in youth. This presentation will describe weight-related outcomes of the HOME Plus study, the first family meals-focused RCT to prevent excess weight gain among youth.

Methods: Families (n=160 8-12-year-old children and their parents/guardians) were randomized to intervention (n=81) or control (n=79) groups. Data were collected at baseline (2011-2012), post-intervention (12-months post-baseline) and follow-up (21-months post-baseline). The intervention included ten monthly group sessions (nutrition education; hands-on meal and snack planning, preparation, and skill development; screen time reductions) and five motivational, goal-setting phone calls. The main outcome was child body mass index (BMI) z-score.

Results: General linear models, adjusted for baseline values and demographics, showed no significant treatment group differences in BMI-z-scores at post-intervention or follow-up; however, a promising reduction in excess weight gain was observed. Post-hoc stratification by pubertal onset indicated prepubescent children in the intervention group had significantly lower BMI-z-scores than their control group counterparts.

Conclusions: The study used a strong theoretical framework, rigorous design, quality measurement and a program with high fidelity to test a family meals-focused obesity prevention intervention. It showed a modest decrease in weight gain. The significant and provocative intervention effect among prepubescent children suggests the intervention may be more effective among relatively young children.

T-OR-2040
Effects of Interrupting Sedentary Behavior with Short Bouts of Moderate Physical Activity on Glucose Tolerance in Healthy Children: A Randomized, Crossover Trial

Background: Limited data suggest interrupting sedentary behavior (SB) with physical activity (PA) improves metabolic parameters in adults. We tested if interrupting sitting with bouts of moderate PA would improve glucose tolerance in children.

Methods: In this cross-over study, normal weight (N=28; 54% male; 61% white) 7-11 year old children underwent 2 experimental conditions in random order on different days: continuous sitting (3 hours sitting) or sitting interrupted by walking breaks (3 min moderate-intensity walking (80% of anaerobic threshold) every 30 min). Insulin, C-peptide, and glucose were measured every 30 min for 3 hours during an oral glucose tolerance test, and area-under-the-curve (AUC) was calculated for each. Children were given a 9800 kcal buffet meal following each experimental condition. Anxiety, affect, and cognitive function (working memory, attention/inhibition) were assessed at post-test. Paired t-tests assessed differences in AUC, energy intake, anxiety, affect, and cognitive function. Mixed models assessed changes in insulin, C-peptide, and glucose over 3 hours.

Results: Interrupting sitting resulted in a 32% lower insulin AUC (p<0.001), 17% lower C-peptide AUC (p<0.001), and 7% lower glucose AUC (p=0.02) vs. continuous sitting. Mixed model results found that insulin secretion over the 3 hour tests were significantly lower in the interrupted vs. the continuous sitting condition (p<0.001). Subsequent energy intake, anxiety, affect, or cognitive function did not differ by condition.

Conclusions: Interrupting SB with brief moderate-intensity walking breaks improved short-term metabolic function in non-overweight children, likely by increasing glucose effectiveness, without increasing subsequent energy intake. These findings suggest interrupting sedentary time with activity breaks may be a promising intervention strategy for reducing cardiometabolic risk in children. Future studies that investigate the longer-term metabolic effects of interrupting sitting are warranted.
T-OR-2041
A Parenting Intervention in the First Year after Birth Impacts Feeding Practices and Styles Related to Child Obesity Risk
Emily Hohman University Park PA, Jennifer Savage University Park Pennsylvania, Michele Marini University Park PA, Ian Paul Hershey PA, Leann Birch Athens GA - Georgia

Background: What, when, how much, and how often foods are fed as well as bottle feeding practices have been associated with childhood obesity risk. In addition, nocturnal feeding has been associated with shorter sleep duration, another risk factor for overweight.

Methods: The Intervention Nurses Start Infants Growing on Healthy Trajectories (INSIGHT) study is an ongoing randomized, controlled trial where a parenting intervention designed to prevent childhood obesity is being compared with a safety control group. Primiparous mother-newborn dyads (n=291) were recruited and randomized 2 weeks after birth. The responsive parenting curriculum was delivered at nurse home visits 3, 16, 28 and 40 weeks after birth. Infant feeding practices were assessed by phone interviews at 8, 20, and 32 weeks. The Infant Feeding Style Questionnaire (IFSQ) was assessed at 28 weeks.

Results: Mothers in the parenting group reported fewer night time feedings at 20 and 32 weeks (p<0.01) and feeding fewer snacks at 32 weeks (p<.05). Parenting group mothers introduced solid foods later (p<0.05) and were more likely to introduce vegetables as the first solid food compared to safety group mothers (p<0.01). At 1 year of age, children in the parenting group were less likely to be using a bottle (p<0.05). Lastly, mothers in the parenting group reported lower pressuring to eat scores (i.e, pressuring to finish, pressuring with cereal, pressuring as soothing) compared to safety group mothers (p<0.001).

Conclusions: This behavioral intervention was successful at impacting parent feeding practices during infancy that influence obesity risk.

T-OR-2042
Effect of Changes in Time in Bed on Children’s Eating Behaviors
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Background: Adult experimental studies demonstrate that short sleep may affect obesity risk via changes in food intake, particularly for energy-dense snack foods. Our experimental study with school-aged children demonstrated that compared to a rested condition, sleep restriction was associated with a reported 134 kcal/day increased intake, but no difference in macronutrients; children weighed 0.2 kg more. The purpose of the present work is to determine whether changes in specific eating behaviors, particularly increased energy-dense snack foods and beverages, account for reported change in kcal intake.

Methods: Using a within-subject, crossover design, 36 children 8-11 years (mean=9.6+/-.10); 20 boys; 81% nonHispanic White; mean BMI percentile=54.9+/-.27.6 who reported sleeping 9.5 hrs/night completed the study. Children first slept their typical amount for 1 wk and were then randomized to increase (INC) or decrease (DEC) time in bed (TIB) by 1.5 hrs/night for 1 wk (& completed the alternate the last wk). All wks children wore actigraphs, completed sleep diaries, and 3 day 24-hour dietary recalls (variables of interest include kcal/day of: energy-dense snack foods (EDSF), sweetened beverages (SB), fruits and vegetables). No order effect was detected; bivariate correlations and paired t-tests were used. Data was transformed given non-normality of distributions.

Results: Children reported greater kcal consumption of SBs during DEC (129+/-.119) than INC (98+/-.89) (t=-2.19, p=.04). There were no reported differences in EDSF, fruits or vegetables. Reported kcal intake in each category was moderately/highly correlated in the INC and DEC conditions: EDSF (r=.54, p=.001); SB (r=.71,p<.001); fruit (r=.76,p<.001); vegetables (r=.62, p<.001).

Conclusions: Findings underscore that increased caloric intake due to short sleep may be due, in part, to increased sweetened beverage intake(e.g., caffeinated drinks). This may be particularly problematic for weight regulation given lack of compensation for liquid kcal intake.

T-OR-2043
Translating Basic Behavioral Science of Learning and Motivation into an Adaptive Community-Based Obesity Treatment for African American Adolescents
Sylvie Naar-King Detroit MI, Deborah Ellis Detroit MI, Angela Jacques-Tiura Detroit Michigan, April Carcone Detroit MI, Kathryn Brogan Hartlieb Miami FL

Background: African American adolescents are disproportionately affected by obesity, and the few trials focusing on this group have had limited success.

Methods: In a sequential multiple assignment randomized trial, 181 youth ages 12 to 16 years with primary obesity and their caregiver were first randomized to 3 months of home-based versus office-based delivery of motivational interviewing (MI) plus skills building. After 3 months, non-responders to first phase treatment were re-randomized to continued home-based skills or contingency management. Primary outcome was percent overweight and hypothesized moderators were adolescent executive functioning, the relative reinforcing value of food.

Results: There were no significant differences in primary outcome between home-based or office-based delivery or between continued home-based skills or contingency management for non-responders to first-phase treatment. However, families receiving home-based treatment initially attended significantly more sessions in both phases of the trial, and families receiving contingency management attended more sessions in the second phase. Overall, participants demonstrated decreases in percent overweight over the course of the trial, and adolescents with higher executive functioning and lower RRV lost more weight and improved metabolic syndrome risk factors in certain sequences.

Conclusions: Home based treatment and CM increase session attendance for in AA youth, but more potent obesity interventions are needed. Future directions include a basic behavioral science study underway to understand the relationship between RRV, executive functioning, fmRI and food and activity choices in this group and the development of PA interventions to improve executive function and metabolic syndrome outcomes.
T-OR-2044
Childhood Obesity Preventive Intervention Improves Infant Sleep Duration and Sleep Hygiene
Jennifer Savage, Stephanie Anzman-Frasca Boston MA, Michele Marin University Park PA, Jodi Mindell Philadelphia Pennsylvania, Leann Birch Athens Pennsylvania, Ian Paul Hershey PA

**Background:** The Intervention Nurses Start Infants Growing on Healthy Trajectories (INSIGHT) study is an ongoing randomized, controlled trial comparing a responsive parenting intervention designed to prevent childhood obesity with a safety control. The parenting intervention has been shown to protect against faster weight gain during the first 6 months after birth. This analysis examines the effect of this parenting intervention on infant sleep hygiene and duration which have been associated with childhood obesity.

**Methods:** Primiparous mother-newborn dyads (n=291) were recruited and randomized 2 weeks after birth. Parenting and safety curricula were delivered via nurse home visits 3, 16, 28 and 40 weeks after birth. The parenting intervention used a responsive parenting framework with obesity prevention messages that correspond to infant/toddler behavior states and included a sleep curriculum. Mothers completed online surveys about infant sleep at 8, 16, and 40 weeks.

**Results:** Parenting group infants slept longer at night than control group infants at 8, 16 and 40 weeks (p<.05); effect did not vary by feeding mode. Parenting group mothers were more likely to put their baby to bed by 8 PM (p<.001) at 16 and 40 weeks, swaddle their infant at night at 16 weeks (p<.01), and use white noise at bedtime at 40 weeks (p<.05). At 16 and 40 weeks, parenting group infants were more likely to sleep in a crib in their own room (p<.05). At 40 weeks, more parenting group mothers allowed their infant to self-soothe to sleep (fall asleep in crib) (p<.05), while more safety group infants fell asleep while being held and/or bottle fed (p<.05). For night awakenings at 40 weeks, safety group mothers were more likely to rock and/or feed their child back to sleep (p<.05 for both).

**Conclusions:** This responsive parenting intervention improved sleep hygiene and duration, factors that have been associated with childhood obesity.

T-OR-2045
Prediction of Percent Body Fat Measurements in Americans 8 Years and Older
June Stevens Chapel Hill North Carolina, Fang-Shu Ou Chapel Hill NC, Jianwen Cai Chapel Hill NC, Steven Heymsfield Baton Rouge Louisiana, Truesdale Kimberly Chapel Hill NC

**Background:** Equations for the prediction of percent body fat (%BF) are usually developed in narrowly defined groups and therefore limited in generalizability. The few equations that have been developed using a nationally representative sample studied less than half of the available anthropometrics and targeted either children or adults.

**Methods:** We randomly selected ¾ of 21,099 participants aged 8 years and older from the 1999-2006 NHANES to generate equations for the prediction of %BF. DXA assessed %BF was used as the response variable for development of 14 equations for each gender that included demographics and between 2 and 10 anthropometric measurements. Linear, non-linear and interaction terms were studied, and between 16 and 52 mathematical terms were selected for inclusion using the Least Absolute Shrinkage and Selection Operator (LASSO). Equation performance was evaluated in ¼ of the sample reserved for internal validation by examining R² and systematic under or over estimation (mean signed difference (MSD)).

**Results:** In the final models R² ranged from 0.664 to 0.845 in males and from 0.748 to 0.809 in females. R² was not improved by development of equations within, rather than across, age and ethnic groups. Three models under-estimated %BF in underweight males, but otherwise bias was within acceptable limits across BMI, age (adult/youth) and ethnic (white, black, Mexican American) subgroups. Seven of the 14 gender-specific models showed low bias and had R² values above 0.80 in males and 0.795 in females.

**Conclusions:** Use of the LASSO technique to select terms for the prediction of %BF was novel and facilitated the testing of a large number of candidate terms for selection of complex models. To our knowledge these are the first equations for the prediction of %BF that are valid and unbiased over such a wide range of ages and ethnicities and are generalizable to the US population. We hope that these attributes will lead to widespread use by obesity researchers.

T-OR-2046
The Validity of Using Early First Trimester Weight as Pregravid Weight
Rebecca Kruckowski Memphis Tennessee, Delia West Columbia SC, Marisha DiCarlo Little Rock AR, Kartik Shankar , Aline Andres Little Rock AR

**Background:** Obtaining an accurate and proximal pregravid weight is a challenge, as many pregnancies are not planned and the amount of time between deciding to conceive and actual conception is variable. Having an accurate and proximal pregravid weight is important to determine the appropriate Institute of Medicine gestational weight gain range, and it is not clear whether an early first trimester weight is a good proxy for pregravid weight.

**Methods:** Under identical conditions with a calibrated scale, a pregravid weight and two weights during the first trimester (i.e., 4-10 weeks gestation and 12 week gestation) were obtained on 55 participants (93% Caucasian, mean (SD) age= 29.44(3.51) years, 51% overweight/obese). At the pre-pregnancy visit, participants were advised to remain weight stable during the first trimester. The 4-10 week weight was obtained, on average, at 5.65 weeks.

**Results:** Pregravid and 4-10 week weight were highly correlated (r=0.99, p<0.0001), controlling for the time interval between the visits. The mean weight gain from the pregravid visit to 4-10 week visit was 0.77 (1.91) kg over an average interval of 139 days. There were no significant differences in weight change between the normal weight (mean=+0.53 kg (1.66)) and overweight/obese women (mean=+1.01 kg (2.13), p=0.36). Overall, 50 women (91% of the sample) were classified in the same BMI category based on their pregravid and 4-10 week weights. Four of the five participants who changed BMI category experienced a weight gain. Using the 12-week weight resulted in 8 participants changing BMI category and a slightly lower correlation between pregravid and 12 week weight (r=0.96, p<0.0001).

**Conclusions:** Pregravid weight and first trimester weight were highly correlated, and few participants in this sample would have been assigned an inaccurate weight gain goal, particularly at 4-10 weeks gestation; thus, it may be appropriate to assign
gestational weight gain guidelines based on an early first trimester weight.

**T-OR-2047**  
Use of Self-Reported Height and Weight in the Prediction of Body Mass Index in Longitudinal Studies of Young Adults  
Zhaoxu Cui Chapel Hill NC, June Stevens Chapel Hill North Carolina, Kimberly Truesdale Chapel Hill North Carolina, Donglin Zeng Chapel Hill NC, Simone French Minneapolis Minnesota, Penny Gordon-larsen Chapel Hill North Carolina

**Background:** In longitudinal cohort studies and trials, missing BMI data at follow-up is often imputed using BMI constructed from measured height and weight. BMI derived from self-reported height and weight relevant to the time of follow-up is rarely used despite its strong correlation with BMI derived from measured anthropometry. We compared the performance of BMI measured at the prior examination and BMI self-reported at follow-up for the prediction of BMI at follow-up.

**Methods:** Data from 11,008 participants at Wave III (2001-2002, aged 18-26 years) and Wave IV (2007-2008, aged 24-32 years) in the National Longitudinal Study of Adolescent to Adult Health Study were randomly divided into 5 sets of training datasets (80%) and the testing datasets (20%). In a single home-based interview at each Wave, participants self-reported their height and weight and were measured subsequently by a technician. We developed 2 models for the prediction of BMI measured at Wave IV respectively using BMI measured at Wave III and BMI self-reported at Wave IV in the training dataset. In the testing dataset, R² and root mean square error (RMSE) were obtained by regressing BMI measured at Wave IV on its predicted values. Bias was calculated as the mean of predicted minus BMI measured at Wave IV. Differential bias was calculated as bias in normal weight group minus bias in obese group.

**Results:** In the testing dataset, the Wave IV BMI self-reported model produced a larger R² (0.91 vs. 0.69), smaller RMSE (2.1 vs. 3.8 kg/m²) and differential bias (1.0 vs. 4.2 kg/m²) compared to the Wave III BMI measured model. Adding demographics, BMI self-reported and BMI measured at Wave III, and perceived weight status at Wave IV to the Wave IV BMI self-reported model resulted in less than 0.01 of increase in R².

**Conclusions:** Our study indicated that investigators should consider collection of self-reported height and weight to help in the imputation of missing BMI in longitudinal studies.

**T-OR-2048**  
Evaluation of Novel Estimations of Energy Intake Based on Energy Balance  
Robin Shook Ames Iowa, Gregory Hand Morgantown WV, Daniel O'Connor Houston TX, Clemens Drenowatz Columbia SC, Gregory Welk Ames IA, Thomas Hurley Columbia SC, James Hebert Columbia SC, Steven Blair Columbia South Carolina

**Background:** Assessments of energy intake (EI) are frequently adversely affected by measurement error. Recently, a simple equation has been developed and validated to estimate EI based on the energy balance equation (EI= energy storage + energy expenditure). Our goal was to compare multiple estimates of EI, including two calculated from the energy balance equation.

**Methods:** Body composition of participants (N=195, mean age= 27.9 years, 46% female) was measured at the beginning and end of a two-week assessment period using dual-energy X-ray absorptiometry. Resting metabolic rate (RMR) was measured by indirect calorimetry. Energy expenditure (EE) was assessed using the doubly-labeled water technique and an arm-based activity monitor (Sensewear® Mini, SWA). Self-reported EI was calculated using dietician-administered 24-hour dietary recalls (three days, including at least one weekend day). Two estimates of EI were calculated using a validated equation: changes in fat mass and fat-free mass occurring over the assessment period, plus EE from either DLW or SWA. To compare estimates of EI, reporting bias ([estimated EI – EE from DLW]/EE from DLW x 100) and Goldberg Cut-offs (estimated EI/RMR) were calculated.

**Results:** Mean±SD EE from DLW and SWA was 2731±494 and 2729±559 kcals/day, respectively. Self-reported EI was 2113±638 kcals/day, EI derived from DLW was 2723±469, and EI derived from SWA was 2720±730. Reporting bias for self-reported EI, DLW EI, and SWA EI are as follows: -21.5±22.2%, -7.7±18.5%, and 0.2±20.8%, respectively. Goldberg Cut-offs for self-reported EI, DLW EI, and SWA EI are as follows: 1.39±0.39, 1.77±0.38, respectively.

**Conclusions:** These results suggest that estimates of EI based on the energy balance equation can provide reasonable estimates of group mean EI. When EE derived from DLW is not feasible, an activity monitor that provides a valid estimate of EE can be used to estimate EI with similar results.

**T-OR-2049**  
Comparing the Predictive Ability of Two Comprehensive Clinical Staging Systems: Edmonton Obesity Staging System (EOSS) and Cardiometabolic Disease Staging (CMDS)  
Keisuke Ejima Birmingham Alabama, Tapan Mehta Birmingham Alabama

**Background:** While body mass index (BMI) has been used as a guide for treating and screening excess adiposity, its limitation in the clinical-setting as the only screening tool for obesity treatment is widely accepted. Two alternative clinical staging systems were proposed in recent years: Edmonton Obesity Staging System (EOSS) and Cardiometabolic Disease Staging (CMDS). Both of these are superior to BMI because they include assessment of obesity-associated medical and functional conditions. However, it is unclear which of these two staging systems have a greater ability in predicting mortality.

**Methods:** In this study we tested for differences in the ability of EOSS and CMDS to accurately predict mortality. We compared the predictive ability of EOSS and CMDS using data from National Health and Nutrition Examination Survey III (NHANES III) with corresponding mortality follow-up data through to the end of 2006. First, we identified individuals in NHANES III who participated in the morning examination session and restricted our analytic sample to this group. Second, we used Cox regression models developed and published for EOSS and CMDS and estimated respective R2s as a measure of predictive accuracy. We generated a 95% percentile based bootstrap confidence interval for the differences in the respective R2s by creating 1000 sets of bootstrap samples. These analyses were done separately for adults aged 20 to 39 and aged 40 to 74 respectively.

**Results:** The 95% confidence interval estimates for the
differences in R² for adults aged 20 to 39 were -0.0069 (-0.0068, 0.0130). The 95% confidence interval estimates for the differences in R² for adults aged 40 to 74 were -0.0069 (-0.0258, 0.0110).

**Conclusions:** Our results suggest that across both age groups there is no statistically significant difference in the predictive ability of EOSS and CMDS when predicting mortality. Further, research would include testing for differences in the predictive and discriminative ability using other measures.

**T-OR-2050**

**Trends in Appetite for Policy Change for Obesity Prevention: Canadian Views 2009-2014**

Kim Raine Edmonton Alberta, Jennifer McGetrick, Candace Nykiforuk

**Background:** As increasing evidence links rates of obesity to changes in environments, the development of healthy public policy has been identified as a key intervention strategy. Our objective was to identify readiness for policy change among key policy-influencers, identify strategies for advocacy, and monitor trends in appetite for policy change over time.

**Methods:** In 2009, a survey was developed to assess the acceptability of policy actions to prevent obesity among key policy influencers in Alberta and Manitoba, Canada. Surveys were mailed to census samples of key influencers from government, school boards, print media, and large workplaces. Following two years of policy advocacy in Alberta, post-surveys were administered in 2011. Differences between Alberta and Manitoba (control) enabled assessment of the impact of advocacy. Inferentially, cross tabulations with 2-sided exact chi-squared statistics were used to assess provincial differences. The survey was repeated in 2014 (Alberta only) and descriptive statistics were used to assess trends in policy support.

**Results:** Baseline surveys revealed almost universal support for individually-focused policies (e.g. public education campaigns, school nutrition and physical education curricula) in both provinces, but lower support for economic policies (e.g. taxing unhealthy foods and beverages) and legislative changes (e.g. zoning by-laws to restrict fast food outlets or vehicle traffic). In 2011, non-significant trends showed increasing support for almost all policy options in Alberta, with little change in Manitoba. Over 5 years, support for all policy options increased in Alberta, with some policies achieving over 10% increase in support (e.g. prohibit advertising of unhealthy food to youth, mandatory calorie listing in restaurants, monetary incentives for physical activity participation).

**Conclusions:** Positive trends in support suggest public policy for obesity prevention is a promising intervention. The role of advocacy in increasing support holds potential.

**T-OR-2051**

**SSB taxes in preschool children and associated changes in 2010 Healthy Eating Index score**

Christopher Ford Houston Texas, Shu Wen Ng Chapel Hill North Carolina, Barry Popkin Chapel Hill North Carolina

**Background:** Placing taxes on sugar-sweetened beverages (SSBs) has been proposed as a strategy to combat child obesity. Yet, it is unclear how a tax on SSBs might influence the overall diet quality of preschool children. To explore the relationship between SSB taxes and diet quality in preschool children, we examined the relationship between SSB price increases and the 2010 Healthy Eating Index (HEI).

**Methods:** To estimate demand relationships between SSB prices and foods/beverages purchases, purchase and price data from the 2009-2012 Nielsen Homescan Panel was used. A two-part marginal effects model was used to estimate relative changes in purchases associated with a 20% increase in the price of SSBs while controlling for the prices of other foods/beverages. Resulting estimates were applied to dietary intake data from children aged 2-5y from the National Health and Nutrition Examination Survey (NHANES) 2009-10 and 2011-12. HEI scores were computed using the dietary intake data before and after simulating SSB price increases.

**Results:** With no price increases applied, the overall mean 2010-HEI score was 46.48 (+0.55) of a possible 100 points (higher score indicates better quality). A simulated 20% increase in the prices of SSBs was associated with a slightly lower total 2010-HEI score (-0.85, p<0.01), decreased scores for total fatty acids (-1.03, p<0.01) and total protein (-0.55, p<0.01), and increased scores for refined grains (+0.94, p<0.01) and total intake of solid fats and added sugars (+0.89, p<0.01). A simulated 20% increase in the prices of SSBs was also associated with lower total caloric intake (-171 kcal/d, p=0.01), lower intakes of juice drinks (-117 kcal/d, p<0.01), refined grains (-125 kcal/d, p<0.01), and oils (-108 kcal/d, p<0.01).

**Conclusions:** Our findings suggest that a 20% tax on SSBs would decrease total caloric intake among US preschool children. Moreover, such a tax could decrease intakes of foods and beverages high in fats and sugar without appreciably influencing diet quality.

**T-OR-2053**

**Consumers Report That Health Insurance Does Not Often Cover Obesity Treatment, Even When Wellness Programs Target BMI**

Theodore Kyle , Joseph Nadglowski Tampa Florida, Fatima Cody Stanford Boston Massachusetts

**Background:** Under the Affordable Care Act, obesity treatment and bariatric surgery is often not defined as an essential health benefit. Wellness programs with substantial financial incentives based upon biometric outcomes such as BMI are permitted and reportedly being adopted by employers with increasing frequency. The present study measured consumer perceptions of coverage for obesity treatment by their health insurance and the prevalence of wellness programs with financial incentives based on weight or BMI.

**Methods:** A total of 9,388 respondents completed anonymous, voluntary online surveys in February 2015. Respondents answered questions about medical services covered by their health insurance. Employed respondents answered questions about employer wellness programs with financial incentives based on weight or BMI. Descriptive statistics were calculated and analyzed to identify significant patterns.

**Results:** Most respondents reported having health insurance that would pay for hospitalization (70%), a doctor’s visit (65%), or prescription blood pressure medication (57%). Only 15-20% reported not having coverage; the remainder were unsure. Reports of coverage for a registered dietitian (RD, 28%), medical weight management (23%), bariatric surgery (26%), or obesity drugs (24%) were significantly less frequent. Among employed respondents, 16% reported that their employer had a wellness program with incentives or penalties
based on their weight or BMI. Respondents with such wellness programs reported more coverage for obesity treatment: 60% reported coverage for an RD, 53% for medical weight management, 32% for bariatric surgery, and 30% for obesity drugs.

**Conclusions:** Consumers most often report not having health insurance that will cover obesity treatment. Even when employers target BMI in wellness programs, as they increasingly do, health insurance often excludes obesity treatment.

**T-OR-2054**

**Review of Obesity-Related Items on the United States Medical Licensing Examination (USMLE) Examinations for Medical Students: What is Being Tested?**


**Background:** The USMLE is a three-step examination required for medical licensure in the United States. Steps 1 and 2 are taken in the second and fourth year of medical school respectively and Step 3 is usually taken after internship. Since the USMLE examinations test the ability of future generations of doctors to recognize and manage important diseases, this study was designed to describe the coverage and distribution of obesity-related items in the examinations.

**Methods:** All test item cases that included obesity-related keywords (e.g., obesity, obese, body mass index (BMI) ≥25, weight loss) were identified by USMLE staff and provided to a panel of six content experts who reviewed all items at the National Board of Medical Examiners (NBME) headquarters. The American Board of Obesity Medicine (ABOM) test outline rubric was used to code items into 4 domains: Basic Concepts (BC); Diagnosis and Evaluation (DE); Treatment (T); Practice Management (PM) and subtopics.

**Results:** A total of 802 items were reviewed: Only 53% of 119 items from Step 1, 45.2% of 336 items from Step 2 and 21% of 347 items from Step 3 were related to obesity or its co-morbidities. Among these items, the domain distribution was: 11.8% BC, 60.2% DE, 26% T, and 2% PM. Although there was variability between the 3 Steps, obesity-related items were primarily concentrated in the cardiovascular, endocrinology, female reproductive, musculoskeletal, and respiratory organ systems. The identified DE and T items were almost entirely based on obesity co-morbidities, such as diabetes, rather than the diagnosis or treatment of obesity per se.

**Conclusions:** Although obesity and associated co-morbidities are addressed in the three exams, there is insufficient coverage of its pathophysiology and treatment of obesity as a chronic disease. These results speak to the need for improving the coverage of obesity in medical education and licensure examinations, and to ensure that future generations of doctors are better equipped to manage the epidemic of obesity.

**T-OR-2055**

**Improving Nutrition in Child Care Through State Policy: Evaluation of a Natural Experiment in South Carolina**

Meghan Mayhew Durham NC, Sara Benjamin Neelon Durham NC, Brian Neelon Charleston SC, Jennifer O’Neill Columbia SC, Russell Pate Columbia SC

**Background:** State policies to promote healthy eating in young children appear promising, but are largely untested. Recently, South Carolina (SC) implemented mandatory nutrition standards governing child care centers serving low-income children. The purpose of this study was to evaluate compliance with the standards before and after the policy took effect.

**Methods:** We conducted a quasi-experimental study evaluating compliance with the nutrition standards in SC, using North Carolina (NC)—a state not making policy changes—as the comparison. We conducted assessments in a longitudinal sample of centers and a cross-sectional sample of children before and about 9 months after the standards took effect. Trained observers recorded foods and beverages served to 102 children from 34 centers in SC and 90 children from 30 centers in NC at baseline. At follow-up, the research team observed 99 children from 33 centers in SC and 78 children from 26 centers in NC. The policy was implemented in April 2012 and included 13 standards governing the nutritional quality of foods and beverages served to children, and staff behaviors related to feeding children in care. We conducted logistic regression analyses to examine compliance with each standard at follow-up in SC, compared to NC, adjusting for baseline compliance and other covariates.

**Results:** Compared to NC, SC centers were more likely to meet the standard prohibiting using food as a reward or punishment (OR 1.36 (CI 1.08, 1.71), p=0.01). Results did not reach statistical significance for the standards requiring at least 2 different fruits served 2 times per day (OR 1.24 (CI 0.99, 1.54), p=0.06) and limiting sweet foods to 2 times per week or less (OR 1.22 (CI 0.98, 1.51), p=0.07). The states did not differ on the number of centers meeting the other ten nutrition standards.

**Conclusions:** New standards modestly improved nutrition practices in SC, but additional support is needed to bring all centers into compliance.

**T-OR-2056**

**Initial evaluation of systems capacity, integration and sustainability of the Texas Child Obesity Research Demonstration (TX CORD) Study**

Terry Huang New York New York, Elizabeth Vandewater Austin TX, Steven Kelder Austin Texas, Shilpa Iyyer Burke VA, Nancy Butte Houston TX, Deanna Hoelscher Austin Texas

**Background:** Though systems strategies to address obesity are recognized as critical to program success, they are rarely used and poorly understood. TX CORD integrated primary and secondary prevention across multiple community settings. We report initial results from a new tool to assess systems capacity, integration and sustainability in TX CORD.

**Methods:** TX CORD was conducted in disadvantaged communities in Austin and Houston, TX. Primary prevention centered at Head Start, public primary schools, and primary care clinics. Secondary prevention included an intensive family-based program at the YMCA, with referral from clinics. An interview tool was developed to assess the level and quality of 1) setting-specific leadership and management, staffing, facilities, and commitment to sustained resources and effort; and 2) cross-setting coordination and communication. Thirty items were scored on a scale of 1 (not at all) to 10 (highly). Scores across indicators were added up and divided by the total possible score within each systems domain, giving a percentage where 100% represented the perfect score in that domain. Respondents were 31 administrators across the four
settings in both cities. 

**Results:** Leadership and management scores ranged from 67.7% (clinics) to 83.2% (Head Starts). Staffing capacity ranged from 52.8% (clinics) to 78% (Head Starts). All sites scored ≥79.5% on facilities. Site commitment to sustainability ranged from 52.8% (clinics) to 78% (Head Starts). All sites scored ≥75.8% on integration. Coordination (M=20.5%) were the weakest aspects of system integration.

**Conclusions:** This study illustrates a tool to study integrated interventions and highlights the need to explicitly intervene on systems domains beyond behavioral or environmental targets. Feedbacks in communication and activities are central to a systems approach but often missing in interventions. Assessing these systems dimensions can inform both sustainability plans and future intervention design.

**Thursday November 5, 3:45-5:15 PM**

**T-OR-2057**

**Metformin Counters a Pro-Inflammatory T Cell Profile in Obesity**

Barbara Nikolajczyk Boston Massachusetts, Min Zha Boston MA, Nicholas Cifone Cambridge Massachusetts, Forum Raval, Jose Cacicedo Boston MA, Douglas Lauffenburger Cambridge MA, Caroline Apovian Boston MA

**Background:** Reports disagree on whether the diabetes drug metformin impacts obesity-associated type 2 diabetes (T2D) by activating anti-inflammatory mechanisms that include the metformin target AMPK.

**Methods:** We compared the effect of metformin on inflammation and AMPK activation in PBMCs and T cells from 3 groups of people with obesity: normoglycemic (ND), pre-T2D or fulminant T2D. Half of the pre-T2D and all the T2D subjects took metformin (500mg 2x/daily; N=8/group). We stimulated T cells (+/- additional metformin) in the context of PBMCs from all subjects and quantified cytokine production by bioplex. We used cytokine-by-cytokine analyses and multivariate mathematical methods, including principal components and partial least squares analyses, to identify T cell cytokine profiles for each sample. Western blots or extracellular flux analysis quantified AMPK/AMPK targets or oxygen consumption.

**Results:** Single cytokine comparisons showed many inflammatory T cell cytokines were maximally expressed by T2D samples, despite more AMPK activation and oxygen consumption in T cells from T2D compared to ND samples. Multivariate analyses showed Th17 cytokines uniquely separated T2D cytokine profiles from pre-T2D or ND profiles, and that Th2 cytokines were surprisingly critical to separate ND from pre-T2D profiles. In vitro metformin blunted production of single cytokines (p<0.05) in all samples, but only at supra physiological concentrations. In contrast, projection of cytokine profiles from pre-T2D samples exposed to metformin in vivo onto the multivariate model showed profiles from 5 (of 8) subjects clustered with ND profiles. Surprisingly, in vivo metformin did not alter AMPK in pre-T2D.

**Conclusions:** T cell cytokine profiles differentiate subjects with obesity according to metabolic health. A majority of pre-T2D subjects on metformin have less inflammatory profiles, similar to Th2 profiles of ND subjects. The anti-inflammatory action of in vivo metformin occurs in the absence of increased AMPK activation.

**T-OR-2058**

**Perilipin 5 (Plin5) Deletion Alters Skeletal Muscle Lipid and Glucose Metabolism**

Ruzaidi Azli Mohd Mokhtar Clayton VIC, Clinton Bruce Burwood VIC, Matthew Watt Clayton Not required for this country

**Background:** Plin5 is a lipid droplet associated protein that is highly expressed in oxidative tissues, such as skeletal muscle and heart, and plays a major role in regulating lipid metabolism in most tissues. The aim of this study was to delineate the role of Plin5 in regulating substrate metabolism in muscle.

**Methods:** Lipid and glucose metabolism were assessed by radiometric methods in primary myotubes produced from wild-type and whole body Plin5 null mice. Mice with conditional targeted deletion of Plin5 in skeletal and cardiac muscle were generated by Cre-Lox approaches and used to examine metabolism in muscle in vivo. Wild-type (Wt) and Plin5 muscle-specific knockout (Plin5MKO) mice were fed either a Chow or a high-fat diet (HFD) for 12 weeks before experiments.

**Results:** Plin5 deletion did not affect the oxidation or storage of extracellular-derived fatty acids, glucose oxidation or glycogen synthesis in vitro but did remodel the intracellular lipid pool, resulting in increased ceramide content. Plin5MKO mice had normal body weight, food intake and energy expenditure. The respiratory exchange ratio was reduced in Plin5MKO mice, demonstrating an increase in whole-body fatty acid oxidation and decrease in carbohydrate oxidation. Intriguingly, fatty acid and glucose oxidation were not different between genotypes when assessed in skeletal muscle ex vivo. In mice fed a HFD, glucose tolerance was markedly better in Plin5MKO compared with Wt mice and this was associated with increased glucose clearance without changes in endogenous glucose production.

**Conclusions:** Plin5 ablation increases intracellular lipolysis and remodels the skeletal muscle lipidome, without marked effects on glucose metabolism in vitro. In contrast, Plin5 ablation enhances glucose disposal in the setting of rodent obesity in vivo. This mismatch in glucose metabolism and the discrepancy between whole-body and skeletal muscle fatty acid oxidation suggests that Plin5 ablation may alter endocrine signalling to modulate whole body metabolism.

**T-OR-2059**

**Endurance exercise affects adipose tissue fatty acid storage across different metabolic conditions**

Kazanna Hames Rochester Minnesota, Shichun Du Shanghai Shanghai, Lendia Zhou Rochester MN, Barbara Norby Rochester MN, Michael Jensen Rochester MN

**Background:** We sought to examine how exercise affects free fatty acid (FFA) storage in subcutaneous (SQ) fat depots across metabolic conditions, and examine how this relates to markers of the fat storage pathway.

**Methods:** FFA storage rates in abdomen and thigh SQ fat were measured in sedentary adults (n=9; VO2peak: 38.2±4.1 ml/min/kg FFM) and endurance athletes (n=9; VO2peak: 55.6±6.0 ml/min/kg FFM) under conditions of (1) high FFA (732±188 µM) using somatostatin to suppress insulin (0.2±0.1 uIU/ml) while fasted, and (2) reduced plasma FFA (319±92 uIU/ml) while fasted, and (2) reduced plasma FFA (319±92 uIU/ml) while fasted, and (2) reduced plasma FFA (319±92 uIU/ml) while fasted,
μM) created by fatty meal ingestion to raise insulin (9.7±5.5 μIU/ml). Continuous infusions of [U-13C]palmitate and [U-13C]oleate traced FFA kinetics and boluses of [3H] and [14C]palmitate were used with biopsies measured SQ fat FFA storage. We assayed for adipocyte acetyl-CoA synthetase (ACS) and diacylglycerol acetyltransferase (DGAT) activity.

**Results:** The sedentary adults increased abdomen SQ fat palmitate storage rates by 47% from the fasted to fed state (p=0.04), while the athletes did not change palmitate storage rates in this depot (p=0.41; across groups: p=0.19). Sedentary adults also increased thigh SQ fat palmitate storage rates by 27% from the fasted to fed state (p=0.05), while again the athletes had no change (p=0.20; across group: p= 0.02). This resulted in almost double the palmitate storage rates in thigh SQ fat in the sedentary adults (0.55±0.22 µmol/min/kg lipid) compared to the athletes (0.29±0.14 µmol/min/kg lipid; p=0.01). Changes in adipocyte ACS and DGAT activity did not explain the differences in SQ fat FFA storage rates across metabolic conditions within or across groups.

**Conclusions:** We expected sedentary adults to have greater SQ fat FFA storage than athletes, particularly during the fasted state’s high FFA conditions. However, our results indicated sedentary adults had greater FFA storage only in thigh SQ fat during the fed state’s low FFA conditions. The mechanism for differences in SQ fat’s FFA storage is yet identified.

T-OR-2060
Quantitation of dietary fat incorporation into intramuscular lipid species in humans
Qiong Hu
Columbia Missouri, Phillip Sanders
Indianapolis Indiana, Miriam Jacome-Sosa
Columbia Missouri, Ming-Shang Kuo
Indianapolis IN, Sudha Shankar
Cranford New Jersey, Elizabeth Parks
Columbia MO

**Background:** Elevated lipid content in skeletal muscle contributes to insulin resistance. Thus far, no reports have compared the quantitative contributions of dietary saturated (SatFA) and monounsaturated fat (MUFA) to intramuscular lipid pool. The goal of the present study was to develop a method to quantify the rate of incorporation of dietary fat into skeletal muscle lipids in humans.

**Methods:** Nondiabetic adults (n=4, 2M, 2F, BMI 24.8 ± 4.6 kg/m2) were fed a high-fat breakfast and lunch of identical composition (40% fat, 42% CHO, 17% protein), and underwent vastus lateralis muscle biopsies before (fasting) and 9-h after the two meals. A stable isotope (d31-palmitate or d34-oleate) was added to the meals to label triglyceride-rich lipoproteins (TRL). Infusion-based quadruple time-of-flight (Q-TOF) mass spectrometry was used to analyze the triglyceride (TG) labeling pattern in TRL and in muscle biopsy samples. TRL-TG enrichment was used as the precursor pool to calculate muscle lipid fractional synthesis rate (FSR).

**Results:** Intramuscular TG (IMTG) contents ranged from 0.98-1.26 mg/g wet weight in the fasting state, and 0.77-1.33 mg/g in the fed state. The FSR of IMTG from dietary fat ranged from 0.31%/h-1.13%/h, which was, surprisingly, higher than reported synthesis rates of IMTG from the plasma FFA pool (0.28%/h). The isotope enrichment and labeling pattern were measured in other muscle lipid species, and desaturation and elongation products of d31-palmitate were detected. IMTG FSR was higher when SatFA was fed in the meal.

**Conclusions:** In summary, these data demonstrate the extent to which dietary fat can directly and significantly contribute to intramuscular lipid synthesis. This methodology could be applied to determine how dietary fat composition (SatFA vs MUFA) influences muscle lipid handling and impacts insulin sensitivity.

T-OR-2061
Regulatory Processes in the Cellular Uptake of Long Chain Fatty Acids (LCFA).
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New York New York, Mehryar
Torgahabeh
new york NY, Gregory Dakin
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Pomp New York NY, Dianne Anglade
New York NY, Faith Ebel
New York NY, Paul Berk
New York New York

**Background:** The principal process by which LCFA enter adipocytes is facilitated transport, an important control point for adiposity. While large adipocytes from obese subjects take up LCFA faster than small non-obese cells, the relative contributions to LCFA uptake of cell size per se, regulated expression of LCFA transport machinery, and other processes remain unclear.

**Methods:** We obtained omental & subcutaneous fat biopsies & blood samples at each operation from 10 super-obese (SO) participants in a 2-stage bariatric surgical study. Ten non-obese (NO) surgical patients & 10 obese (O) bariatric surgical patients were controls. Adipocyte suspensions were isolated from each biopsy, and mean cell surface areas (SA) & cell volumes determined. 3H-Oleic acid uptake kinetics were studied to define the Vmax for LCFA uptake (pmol/sec/50,000 cells) and to compute Vmax’, defined as Vmax/SA (pmol/sec/µ2 of adipocyte SA), a measure of the plasma membrane density of LCFA transport “machinery”.

**Results:** Results: [1] Pre-operatively Vmax increased exponentially ~8-fold as a function of BMI (BMI 20-73, r=0.86, p<0.01). [2] Vmax’ also increased exponentially by ~3-fold. [3] During a >1 year post-surgical weight loss of ~120 lbs, Vmax decreased by 40%, remaining within the range associated with obesity, but adipocyte sizes in many patients fell into the normal range. The greater proportional decline in SA than in Vmax therefore resulted in an overall increase in Vmax’ in those patients.

**Conclusions:** Conclusions: [1] When LCFA uptake data are expressed per cell (e.g. Vmax), a single variable, Vmax, quantitatively dominates the process, [2] Expressed per cell surface area (e.g. Vmax’) the result depends on both the total cellular uptake capacity and the cell surface area. [3] The current data suggest that some degree of regulation of adipocyte size may be independent of LCFA uptake and intracellular lipid accumulation.

T-OR-2062
Activation of mTORC1 in Muscle Results in Increased Intramyocellular Glycogen and Triglycerides Along with Reduced Adiposity
Dave Bridges
Memphis Tennessee, Erin Stephenson
Memphis TN, JeAnna Redd
Memphis TN, Matthew Peloquin
Orlando FL, Binbin Lu, Kathryn Cyrus
Memphis TN, Alan Saltiel

**Background:** mTORC1 is a nutrient sensing kinase expressed in many tissues. mTORC1 has been implicated in lipid storage, insulin sensitivity and glycogen accumulation. mTORC1 is activated in muscle tissues both in normal conditions such as growth and after a meal, but its activity is also elevated in chronic conditions including obesity and aging.

**Methods:** We generated mice in which mTORC1 is activated in muscle tissue, by deleting its negative regulator TSC1. We then tested whether these mice had any changes in both
muscle-specific and systemic changes in glucose or carbohydrate homeostasis. We also evaluated transcriptional changes in these muscles by RNA sequencing.

**Results:** We found that the muscles from these mice had elevated triglycerides and glycogen, the latter of which was associated with increases in the glycogenic enzyme PTG. With respect to triglycerides we did not observe any elevations in lipogenic enzymes, or reductions in beta-oxidation enzymes but we did observe and up regulation of fatty acid transport machinery. In contrast to our expectations, these animals had normal insulin sensitivity, though they did have a reduced glucose tolerance. We evaluated glucose-stimulated insulin secretion and found that these mice had impaired insulin release after a glucose injection. We also found that these mice have dramatically reduced adiposity.

**Conclusions:** Endurance athletes have paradoxical elevations in both intramyocellular glycogen and triglycerides but no decreases in insulin sensitivity. We have generated an animal model that mimics these effects. These results also implicate muscle and mTORC1 signaling in particular in the regulation of obesity as these animals have reduced fat mass, potentially due to partitioning of lipids to the muscle for oxidation rather than storage in adipose tissue. Finally, these studies point to a previously undescribed process by which muscle can directly regulate insulin secretion.

**T-OR-2063**

**Sex Differences in the Association of Body Mass Index with Anatomical Architecture of Reward Network Regions in Healthy Subjects**

Arpna Gupta Los Angeles California, Emeran Mayer Los Angeles California, Mher Alaverdyan Los Angeles CA, Connor Fling Los Angeles CA, Claudia Sanmiguel Los Angeles California, Kirsten Tillisch Los Angeles CA, Jennifer Labus Los Angeles CA

**Background:** Recent advances in computationally intensive mathematical algorithms has made it possible to characterize the architecture of regions in large-scale brain networks within obesity. The most fundamental network measures are degree and local clustering efficiency, which are associated with increased transfer of information between regions.

**Methods:** 99 subjects completed diffusion tensor imaging scans. Regional parcellation was conducted and resulted in 74 bilateral cortical and 7 subcortical structures, including the cerebellum. Relative fiber density between regions was obtained. Anatomical network metrics were constructed from the thresholded correlation matrix. A general linear model was applied to examine the influence of sex, BMI, and sex*BMI interaction on the degree and local efficiency of the anatomical network architecture of regions within the reward network is associated with BMI. Findings indicate that higher BMI and being female is associated with more local and regional communication between regions involved in dopamine signaling, and less information propagation was observed in the cognitive frontal regions.

**Conclusions:** The anatomical network architecture of regions within the reward network is associated with BMI. Findings indicate that higher BMI and being female is associated with more local and regional communication between regions involved in dopamine signaling, and less information propagation was observed in the cognitive frontal regions.

**T-OR-2064**

**Obesity-Related Proinflammatory Environment is Associated with Variations in the Brain’s Reward System Architecture**

Claudia Sanmiguel Los Angeles California, Arpna Gupta Los Angeles California, Jennifer Labus Los Angeles CA, Iordanes Karagiannides Los Angeles CA, Kirsten Tillisch Los Angeles CA, Mher Alaverdyan Los Angeles CA, Kirsten Coveleskie Los Angeles CA, Cody Ashe-McNalley Los Angeles CA, Jean Stains LA CA, Suzanne Smith Los Angeles CA, Lin Chang Los Angeles CA, Emeran Mayer Los Angeles California

**Background:** Multivariate analyses are able to discriminate between individuals with normal and high BMI based on morphological brain measures. The mechanisms behind these differences are not well understood. A plausible explanation is the presence of a proinflammatory environment affecting the brain’s structure. Hypothesis: 1) Overweight/Obese (O/O) subjects display differences in the reward network’s architecture when compared to lean subjects 2) Brain morphometric differences are related to adipokines levels

**Methods:** 37 adult subjects (26 females) - 22 lean (BMI: 21.8±1.7) and 15 O/O subjects (BMI: 29±4.9) - underwent brain MRIs. Freesurfer analysis yielded 165 parcellated regions with 4 gray matter (GM) metrics: volume (V); cortical thickness; surface area; mean curvature. A magnetic bead-based multiplex assay measured serum adipokines levels. Pearson correlations explored associations between GM measures, adipokines and BMI. General linear models examined interactions of obesity with adipokines on GM parameters.

**Results:** 1) BMI positively correlated with Leptin and GM metrics of the insula (INS) and posterior cingulate cortex (PCC), and negatively with the orbital frontal gyrus (OFG) and Adiponectin. 2) Leptin correlated positively with anterior CC and INS. 3) Monocyte chemotactic protein 1 (CMP-1) correlated positively with PCC, INS, amygdala, frontal cortex and post-central gyrus. 4) IL-1β, IL-6 and IL-8 correlated negatively with INS. 5) Higher BMI was associated with lower V in parahippocampal gyrus (F=5.8, p=0.02), and OFG (F=12.8, p=0.001). With increasing Adiponectin levels, women had smaller posterior cingulate gyrus and larger OFG V (F=6.7, p=0.01). **Conclusions:** Higher BMI was related to greater Leptin levels and lower GM volume in the parahippocampal and OFC. Larger OFC volumes were seen with increasing levels of Adiponectin. Adipokine-related differences in brain’s reward system architecture could result in anomalous top-down regulation of food-related behaviors and possibly lead to obesity.

**T-OR-2065**

**Energy density influences interaction between FTO and DRD2 gene variants in brain reward system responses to food evaluation**

Andrianos Yiorkas London NA, Christina Prechtl , Michelle Sleeth , Alexander Miras LONDON LONDON, Samantha Scholtz London London, Giuliana Durighel LONDON
**Obesity 2015 Abstract Book**
**Oral Abstracts Wednesday November 4 to Friday November 6, 2015**

**T-OR-2066**  
A pilot study with the synthetic peptide RM-493, a melanocortin-4 receptor (MC4R) agonist, for the treatment of heterozygous MC4R deficiency obesity  

**Background:** The hypothalamic Leptin-Proopiomelanocortin (POMC)-MC4R pathway is a critical regulator of appetite and weight. Monogenic defects in the POMC and the downstream MC4R gene lead to severe early onset obesity. Similarly, in Prader-Willi Syndrome (PWS), where the function of genes such as MAGEL2 are impaired, the MAGE2/-/- mouse model revealed decreased POMC neuronal functioning as one critical mechanism of severe obesity in PWS. The MC4R agonist peptide RM-493, a first in class, weight-loss efficacious MC4R agonist, is ideally positioned to bypass genetic deficiencies in this pathway. To test this hypothesis, we conducted a pilot study in patients with a heterozygous MC4R deficiency, who represent 1-3% of the obese population.

**Methods:** Obese (BMI = 30 kg/m²) patients with a heterozygous MC4R loss of function mutation were enrolled in a pilot, double-blind, placebo (pbo) controlled, randomized, parallel group study for 4 weeks. Eight patients (6 active/2 pbo) received pbo or RM-493 at 0.01 mg/kg/day (~1 mg/day) by continuous subcutaneous infusion. Key endpoints were safety, weight loss, waist circumference (WC) and caloric intake.

**Results:** RM-493 was well tolerated over 4 weeks, with no SAEs or discontinuations. The most common side effects were headache and skin tanning (the latter due to off-target activity at the related MC1R). RM-493 demonstrated strong trends for placebo-subtracted weight loss (2.62 kg; p=0.08); WC (5.1 cm; p=0.188) and daily caloric intake (351 kcal/day; NS), without measurable effects on heart rate or blood pressure.

**Conclusions:** In this small pilot study, 4-week clinical data suggest that the MC4R agonist RM-493 leads to weight loss in obese patients with a genetic MC4R deficiency. This result will need to be confirmed in larger studies, and in trials in patients with other genetic defects in this important pathway where the spectrum of partial and full loss of function mutations that may differentially impact clinical outcomes can be understood.

**T-OR-2067**  
Greater Hunger and Less Restraint Predict Weight Loss Success with Phentermine Treatment  
Elizabeth Thomas, Aurora Colorado, Bryan McNair, Jamie Bechtell, Aurora CO, Annie Ferland, Aurora CO, Marc-Andre Cornier, Aurora CO, Robert Eckel, Aurora Colorado

**Background:** Phentermine is the most widely prescribed weight loss medication, but individual response to treatment is variable. As phentermine is thought to cause weight loss through a reduction in hunger and subsequent energy intake, we hypothesized that higher subjective ratings of hunger would be predictive of greater weight loss with phentermine treatment.

**Methods:** This is an observational pilot study in which all subjects were treated with phentermine hydrochloride 30mg daily for 8 weeks. Subjective ratings of appetite (hunger, satiety, desire to eat, and prospective food consumption [PFC]) were measured with visual analog scales prior to and after a test breakfast meal, as well as before meals at home for 3 days, at baseline and at week 8. In addition, eating behaviors (hunger, disinhibition and cognitive restraint [CR]) were measured with the Three Factor Eating Questionnaire at baseline and week 8. Appetite ratings and eating behaviors were compared in subjects with ≥5% vs <5% weight loss, and linear regression was used to identify predictors of percent weight loss.

**Results:** 27 healthy obese adults (37 ± 4.5 yrs, 93.8 ± 12.1 kg, BMI 33.8 ± 3.1 kg/m²) completed the study, with a mean weight loss of -5.4 (-11.8, 1.1) kg or -5.7 ± 3.2%. Subjects with ≥5% weight loss had higher baseline pre-breakfast hunger (p=0.017), desire to eat (p=0.003), and PFC (0.006), and lower baseline CR (p=0.01). In addition, higher baseline home PFC (0.002) and greater reduction in PFC at week 8 (p=0.017) predicted greater weight loss, as did lower baseline CR (p=0.001) and greater increase in CR at week 8 (p=0.026).

**Conclusions:** These results suggest that individuals reporting greater hunger and less restraint are more likely to achieve significant weight loss with phentermine treatment. This information can be used clinically to help determine which patients should be treated with phentermine, and to avoid the risks of treatment in patients unlikely to respond.
T-OR-2068
Phase 2 Trial of Beloranib, a Methionine Aminopeptidase 2 (Metap2) Inhibitor, Demonstrated Improved Cardiometabolic Profile with Weight Loss in Patients with Hypothalamic Injury-Associated Obesity
Ashley Shoemaker Nashville TN, Joseph Proietto Heidelberg Victoria, M Jennifer Abuzzahb Saint Paul MN, Tania Markovic Sydney NSW, Jaret Malloy Boston MASSACHUSETTS, Dennis Kim Boston Massachusetts

Background: Patients with hypothalamic injury-associated obesity (HIAO) fail to regulate metabolism and food intake, resulting in severe treatment-resistant obesity and associated comorbidities. In preclinical and clinical studies of obesity, beloranib reduced body weight (BW) and hunger with reduction of fat biosynthesis and stimulation of lipolysis and fat oxidation.

Methods: This was a randomized, double-blind, placebo-controlled study in 14 adults with HIAO. Patients received twice weekly SC doses of beloranib 1.8 mg (n=8) or placebo (PBO; n=6) for 4 wks followed by a 4 wk open label extension where all patients received beloranib 1.8 mg.

Results: Thirteen of 14 patients (9 females, age 31.9 yr, BMI 42.8 kg/m², BW 126.4 kg) completed the study with 12 patients comprising the per protocol population (beloranib 42.8 kg/m², BW 126.4 kg) completed the study with 12

with PBO (-13.7 vs -4.7 mg/L; p=0.009) and significant changes in significantly greater mean reduction in hs-CRP compared with patients comprising the per protocol population (beloranib 42.8 kg/m², BW 126.4 kg) completed the study with 12

Conclusions: Intranasal oxytocin may be a promising agent in curbing appetite in people with schizophrenia or other populations. Further study is needed to test whether it may curb food consumption and help in weight loss.

T-OR-2070
Spatial Analysis of Childhood Obesity and Local Food Environment Inequalities in China
Hong Xue Buffalo NY, Peng Jia Baton Rouge Louisiana, Huijun Wang BEIJING BEIJING, Youfa Wang Buffalo NY

Background: Obesity prevalence in children increased rapidly over the past 30 years in China with large variations across groups. Limited is known how changes in local food environment (FE) have contributed to shifts of dietary intake and the temporal and spatial distributions of obesity in China.

Methods: The longitudinal China Health and Nutrition Survey data (1991 to 2011, covering 9 provinces) were used, where 190 communities with a total of 2,712 children in 1991 were included, and 171 of which remained followed up as of 2011. Local FE was measured by densities and approximates of a wide array of food outlets within neighborhoods. Variations in FE over time and across province were examined. Fixed effects models and geographically weighted regression were used to explore the FE effects on obesity/overweight (obe/ovwt) in children in China.

Results: The northern provinces generally had a higher obe/ovwt rate and average BMI than southern provinces. The largest and smallest increases during 1991-2011 were found in Shandong province, from 19.3% to 40.8%, and Guangxi province, from 1.8% to 4.0%, respectively. The number of Chinese restaurants within neighborhoods increased from 1991 to 2000 and remained constant or increased in the majority provinces surveyed. The average numbers of both fixed and moving food stalls within neighborhoods rose before 2000, leveled off during 2000-2006, and then declined. The numbers of fixed and moving food stalls were positively associated with the obe/ovwt rates from 1991 to 2011 though the estimates were not statistically significant in some provinces. These associations also varied to different extents across provinces, stronger in northern provinces.

Conclusions: There were significantly unequal temporal and spatial changes of local food environment and obesity rates in China with varied patterns across region. The changes seemed to contribute to the increase and inequality of the obe/ovwt rates in Chinese children. Funding: NIH/NICHD (U54 HD070725-01)
T-OR-2071
Middle Eastern refugees are at high risk of developing obesity and chronic diseases in the U.S.
K-L. Catherine Jen, Detroit Michigan, Harriet Jamil Detroit Michigan, Kequan Zhou Detroit MI, Bengt Arnetz Detroit MI

Background: It is estimated that there are about 15.4 million refugees in the world and the U.S. admits more refugees for permanent resettlement than other countries. Many of these refugees experienced tremendous stress while in their homeland and developed post-traumatic stress disorders (PTSD). Many studies have reported high rate of mental and behavioral health disorders. Recent studies also showed that these refugees have high risk for developing chronic non-communicable diseases (NCD) and obesity.

Methods: In the present study, 298 newly arrived Iraqi refugees were followed-up for 2 years. Demographic, anthropometric, psychological and mental health data were collected within 2 month of resettlement (BL), at the end of years 1 (Y1) and 2 (Y2). Blood was also sampled from a subgroup of 60 refugees at the end of year 1. The retention rate at the end of Y2 was 95.9%.

Results: The body mass index (BMI) increased significantly and continuously (BL: 26.4±4.8 kg/m2; Y1: 26.9±4.8; Y2: 27.4±4.9, p<0.01). There was an upward shift in BMI distribution over the years, more became obese and fewer were overweight. Refugees diagnosed with PTSD (yes/no) had significantly higher BMI than those without. Numbers of refugees with hypertension, type 2 diabetes or hypercholesterolemia also increased yearly. Total PTSD symptom scores were significantly correlated with BMI (r=0.16, p=0.008) and C-reactive protein (r=0.49, p=0.0001). PTSD scores were significantly higher in refugees with diabetes or hypercholesterolemia than healthy refugees. Linear regression modeling revealed that BMI at Y2 was predicted by age, education, diabetes and PTSD scores.

Conclusions: Even though a causal relationship between PTSD and BMI or NCD cannot be established from this study, strategies to reduce the symptoms of PTSD are warranted to help refugees maintaining a healthy BMI and reducing the risk of obesity and NCD.

T-OR-2073
Racial Disparities in the Relationship between Severe Obesity, Income and Medicaid Coverage
Ashley Skinner Chapel Hill North Carolina, Stephen Cook Rochester New York

Background: Severe obesity is increasing in prevalence among children, yet coverage of evidence-based clinical treatment services limited, despite endorsement by USPSTF and requirement in the ACA. Our objective is to examine the relationships among severe obesity, insurance, and income, and differences by race, in a nationally-representative data set.

Methods: We examined children aged 3-19 in the National Health and Nutrition Examination Survey, 1999-2012 (n=22,214). We defined severe obesity as ≥120% of the 95th percentile for BMI. Six categories of parent-reported income were: below Federal Poverty Level, up to >5 times the FPL. Parent-reported race categories were: non-Hispanic White, non-Hispanic Black, and Hispanic. We report prevalence of severe obesity by income and insurance. We used generalized linear models to examine effects of insurance and income on risk of severe obesity, and compared effect sizes by race using simultaneous models.

Results: Children in households below poverty (vs. above poverty), had a greater prevalence of severe obesity (5.6% vs. 3.4%, p<0.001). Children with public insurance (vs. private) also had greater prevalence of severe obesity (7.7% vs. 4.2%, p<0.001) GLM results showed a step-wise increase in the risk of severe obesity compared to highest-income children (<100% FPL: aRR=2.9, 400-500% FPL: aRR=1.9, p=0.05) and greater risk among those with public insurance (aRR=1.33, p=0.002). In simultaneous models, the income difference persisted only for white children; public insurance was associated with increased risk among white and, to a lesser degree, Hispanic children.

Conclusions: Affluence only appears to provide a protective effect against severe obesity for white children. Prevention strategies, even in poor communities, are unlikely to reduce severe obesity. The high and disparate rates of severe obesity among the poorest household provides evidence that coverage of clinical treatment services is of an even greater need of those on public insurance.

T-OR-2075
Sex Differences in the Relation between Perceived Stress and Body Mass Index in a Nationally Representative Sample of Young Adults

Background: Perceived stress has been associated with increased risk of obesity, higher waist circumference and higher Body Mass Index (BMI), however sex differences have largely not been examined to date.

Methods: We examined the relationship between perceived stress and BMI and waist circumference in young adults in the National Longitudinal Study of Adolescent and Adult Health. During the wave 4 home visit, participants (mean age 29.0 n=14,283) completed the short form of Cohen’s Perceived Stress Scale (PSS); responses were summed to create a PSS scale. Height, weight and waist circumference were assessed during the same visit. BMI was calculated based on measured height and weight. Smoking status (current, former or never) and physical activity were assessed based on self-report during the wave 4 follow-up visit. To characterize socioeconomic status highest education level attained was characterized as less than high school, high school education, some college or completing a college degree or higher.

Results: In the sample, 50% were female and 67% identified as white. A sex by PSS interaction was noted (p < 0.05). In linear regression analyses adjusting for age, race/ethnicity, socioeconomic status, smoking status and physical activity, perceived stress was statistically significantly associated with lower BMI (B -0.10 SE 0.04) and lower waist circumference (B -0.20 SE 0.09) among men. No associations between perceived stress and BMI or waist circumference were noted among women.

Conclusions: In this nationally representative sample of young adults, sex differences are noted on the association between perceived stress and BMI. Contrary to previous findings perceived stress was associated with lower levels of adiposity among men. Future studies should examine differential coping strategies in response to stress between men and women as
well as biological mechanisms that may explain the noted associations.

**Friday November 6, 1:30-3:30 PM**

**T-OR-2076**  
A Novel Gastrointestinal Microbiome Modulator (GIMM) from Soy Pods Reduces Absorption of Dietary Fat in Mice  

**Background:** Diet impacts the composition of the gastrointestinal (GI) microbiota, which is studied by monitoring biomarkers in fecal samples such as microbiota taxa and their secretome, nutrients, intestinal secreted proteins and xenobiotic metabolites. Simplification of diets, low in variety but high in energy, contributes to the loss of diversity reported in the obese GI microbiome. Because dietary habits are difficult to change, we developed a GI microbiome modulator (GIMM) to expand diversity of this ecosystem.

**Methods:** Mice were fed either an obesogenic diet (ObD), or an ObD containing 15% activated soy pod fiber (ObD-ASPF) for 30 days. The diets were isocaloric and balanced for macronutrient content. ASPF is a novel fiber preparation from whole soy pods that is activated to produce glyceollins. Fecal biomarkers measured at baseline and study termination included triglycerides, bile acids, glucose, lactate, pH, short chain fatty acids, caloric content and taxonomy analysis. Body composition and energy intake were measured weekly. Circulating proinflammatory markers were measured by ELISA.

**Results:** Mice fed ObD-ASPF did not gain body fat. This was associated with decreased absorption of calories (p<0.05) and increased fecal excretion of triglycerides, which may be attributed to decreased bile acid secretion (p < 0.05). A shift (p < 0.05) in abundances of microbiota in 10 genera was observed. Mice fed ObD-ASPF had elevated plasma concentrations of the anti-inflammatory IL-10 (p<0.05) and decreased (p<0.05) plasma concentrations of the neutrophil chemoattractant CXCL1.

**Conclusions:** We developed a novel dietary intervention derived from soy pods that acts as a GIMM to hinder absorption of dietary fat and sugar in mice. More studies with this GIMM in animal models of diet-induced GI dysfunction are needed. Possible indications are nonalcoholic fatty liver diseases, obesity, type 2 diabetes (T2D), irritable bowel syndrome (IBS), inflammatory bowel disease (IBD), autism, and chronic constipation.

**T-OR-2077**  
Biliary Diversion to the Distal Ileum Results in Metabolic Improvements Similar to Gastric Bypass in Mice  
Vance Albaugh Nashville Tennessee, Steven Cai North Chicago Illinois, Phillip Williams Nashville TN, Naji Abumrad Nashville TN, Charles Flynn Nashville TN

**Background:** Roux-en-Y gastric bypass (RYGB) is associated with resolution of insulin resistance prior to significant weight loss through mechanisms that are not well understood. Recent studies in humans and rodents suggest a beneficial role for bile acids and human studies have documented significant plasma bile acid increases after RYGB. To test the hypothesis that bile acids exert effects independent of weight loss, we created a mouse model in which bile is diverted from the gallbladder to the distal ileum without intestinal rearrangement (GB-IL) and compared that to a sham procedure with bile diversion to the duodenum (GB-D) and to RYGB.

**Methods:** Biliary diversion (GB-IL, GB-D) and RYGB were performed in a mouse model of diet-induced obesity. Mouse cohorts were characterized in parallel for body weight/composition, food intake, glucose tolerance as well as assessment of whole body and tissue-specific insulin sensitivity with hyperinsulinemic-euglycemic clamp studies.

**Results:** GB-IL and RYGB led to similar degrees of weight loss and adiposity, though GB-IL resulted in more robust improvement in insulin sensitivity as measured by the hyperinsulinemic-euglycemic clamp. In order to determine whether the same effects occurred in the absence of weight loss we subsequently performed GB-IL in chow fed, lean mice. In this case GB-IL did not result in changes in body weight, food intake, or body composition, but did result in significant improvement in oral glucose clearance.

**Conclusions:** Biliary diversion to the ileum in the absence of other gastrointestinal rearrangement or restriction leads to weight loss and improved insulin sensitivity similar to RYGB in mice. In GB-IL there is an effect of bile acids independent of weight loss, and those effects do not appear to be mediated by FXR (F32DK103474, R01DK105847).

**T-OR-2078**  
Gastric Control of Obesity  
David Boone South Bend Indiana, Danika Bakke South Bend IN

**Background:** Gastrokine-1 (Gkn1) is a protein made exclusively and abundantly in the stomach. It is secreted into the gut lumen and is not found in the circulation. Gkn1 is resistant to chemical and enzymatic denaturation and we have detected intact Gkn1 in the lumen along the entire length of the GI tract. The function of Gkn1 is not entirely understood, and we generated Gkn1-/- mice to more fully understand Gkn1 function.

**Methods:** Gkn1-/- mice were generated on a B6 background. Gkn1 was localized by immunofluorescence. The intestinal microbiome was evaluated using 16S sequencing. The effects of Gkn1 on metabolism and the microbiome were examined following exposure of WT and Gkn1-/- mice to a high fat diet (HFD).

**Results:** Gkn1-/- mice had considerably lower body fat than WT littermates. Notably, adult Gkn1-/- mice had considerable quantities of brown fat in their abdominal fat mass, which was not observed in WT littermates. When placed on a HFD, WT mice gained weight and displayed the expected alteration of the gut microbiome. Conversely, Gkn1-/- mice did not gain weight on a HFD and their microbiome was unaltered by HFD. Immunofluorescence indicated that Gkn1 decorates a subset of microbes in the colon, suggesting that Gkn1 alters microbiome dynamics by direct association with microbes in the gut lumen. Gkn1 is known to bind to amyloid structures of proteins. Bacteria have amyloids on their cell surface that support adherence and biofilm formation and purified Gkn1 alters microbial biofilm formation in vitro.

**Conclusions:** Gkn1, which is made exclusively in the stomach, promotes obesity and supports the altered intestinal microbiome changes that occur on a high fat diet. This effect of Gkn1 may be mediated by direct binding of Gkn1 to...
T-OR-2079
Possible Alternate Strategy to Correct the Dysfunction of Type 1 Cholecystokinin Receptor in Obesity
Aditi Desai Scottsdale AZ, Maoqing Dong Scottsdale AZ, Kalebekal Harikumar Scottsdale AZ, Laurence Miller Scottsdale AZ

Background: Cholecystokinin (CCK) plays an important role in appetite control by eliciting satiety in response to food intake. Therefore, dysfunction of this hormone-receptor system is a possible cause of obesity and a well-established target for its treatment. The type 1 cholecystokinin receptor (CCK1R) is sensitive to elevated membrane cholesterol, such as exists in cholesterole gallstone disease, by acting through a specific motif on the receptor’s external surface to disrupt stimulus-activity coupling. We postulate to reverse the negative impact of cholesterol by targeting this site of CCK1R using structurally-related bile acids as a tool.

Methods: We studied the effects of structurally-related hydrophobic chenodeoxycholic acid and hydrophilic ursodeoxycholic acid in vitro on CCK1R function in normal and elevated membrane cholesterol. In order to understand whether bile acids compete with cholesterol for CCK receptor interaction, we utilized constructs with mutations in cholesterol recognition motifs, including the cholesterol-insensitive CCK1R Y140A construct.

Results: Bile acids selectively affected the function of CCK1R and not CCK2R, similar to the impact of cholesterol. Chenodeoxycholic acid had negative effects on CCK1R ligand binding and/or signalling (p<0.05) in both normal and high cholesterol environments. In contrast, ursodeoxycholic acid had no effect on CCK1R function in normal membranes, whereas it significantly corrected the defective signalling in high cholesterol (p<0.05). The cholesterol-insensitive Y140A mutant was resistant to both bile acids.

Conclusions: Both the bile acids compete with cholesterol, probably at the same site, but affecting the conformation and consequent function of CCK1R differently. We provide proof-of-concept for using such agents to correct the negative impact of high cholesterol on CCK1R function. Exploring molecules with similar characteristics may lead to a novel pharmacotherapy for obesity.

T-OR-2080 - Withdrawn

T-OR-2081
Sustained Improvements in Cardiovascular and Metabolic Risk Factors and Quality of Life at Two Years with Vagal Nerve Block in the ReCharge Trial
Caroline Apovian Boston MA, Katherine Tweden St. Paul MN, Charles Billington Minneapolis Minnesota, Scott Shikora Boston MA

Background: Vagal nerve blocking reduces appetite and creates weight loss. The vagal nerve block device recently received FDA approval for the treatment of obesity based on 18-month data from the ReCharge Trial. This report assesses the metabolic benefits through 24 months.

Methods: The double-blind period of the ReCharge Trial has completed and transitioned to a 5-year, open-label study of the safety and effectiveness of vagal blocking. We report on improvements among patients randomized to the active arm of the trial who attended the two-year visit (n=102).

Results: Two year weight loss was 21.8% EWL or 8.9% TBL. Metabolic parameter improvement was sustained to 24 months. Systolic blood pressure (BP), diastolic BP, and resting heart rate were reduced from baseline by 5.5mmHg (95% CI 2.7 to 8.2), 3.0mmHg (95% CI 1.2 to 4.9), and 4.4 bpm (95% CI 2.4 to 6.3), respectively. Waist circumference reduced by 8.4 cm from baseline (95% CI 6.3 to 10.6). At baseline 34 subjects were pre-diabetic and not on diabetic medications (5.79% HbA1c, 95% CI 5.2 to 6.3); at 2 years, 17 (50%) had improved to normal (5.31%, 95% CI 4.9 to 5.6). Additionally, 16 (47%) of the subjects with metabolic syndrome at baseline (5.56% HbA1c, 95% CI 4.7 to 6.5) improved to normal at 2 years (5.27% HbA1c, 95% CI 4.4 to 6.9). Mean scores on Impact of Weight on Quality of Life-Lite significantly improved by 35% (57 to 77; 0-16 scale). All scales of Three Factor Eating Questionnaire showed significant improvements from baseline with mean scores on Cognitive Restraint of Eating improved by 58% (9.5 to 15; 0-21 scale), Disinhibition decreased by 28% (10.3 to 7.4; 0-16 scale) and Hunger decreased by 51% (8.0 to 3.9 on 1-14 scale).

Conclusions: At two years, data from the ReCharge Trial demonstrate that weight loss with vagal blocking continues to provide significant and clinically meaningful improvements in cardiovascular risk factors, pre-diabetes, metabolic syndrome, weight-related quality of life and eating behaviors.

T-OR-2082
Thomas Inge Cincinnati OH, Anita Courcoulas Pittsburgh PA, Marc Michalsky Columbus Ohio, Michael Helmraith CINCINNATI OHIO, Meg Zeller Cincinnati OH, Carroll Harmon, Stavra Xanthakos Cincinnati Ohio, Mike Chen Birmingham AL, Mary Brandt Houston TX, Ralph Buncher Cincinnati Ohio, Mary Horlick New York NY, Todd Jenkins Cincinnati Ohio

Background: Adolescents with severe obesity are increasingly seeking weight loss surgery (WLS) but few adolescent-specific studies examining efficacy and safety are available to support clinical decision-making.

Methods: Teen-Longitudinal Assessment of Bariatric Surgery (Teen-LABS) is the first multicenter, prospective study of adolescent WLS outcomes. 242 adolescents undergoing WLS were recruited from 5 U.S. centers. This analysis summarizes anthropometric, metabolic, micronutrient, and weight-related quality of life (WRQOL) outcomes two years following surgery.

Results: Participants (Mage = 17 years; 76% female; 72% white race) underwent gastric bypass (RYGB: 67%), vertical sleeve gastrectomy (VSG: 28%), or gastric band (5%). Median baseline BMI was 51kg/m2 (range 34 to 88). At 2 years, 206 of 242 (85%) completed in-person follow up with an overall 30% decline in median BMI (p<0.01; 31% for RYGB, 31% for VSG, 6% for band). Body fat % declined from 53% to 42% in females and from 55% to 27% in males. Median fasting glucose (-7%), insulin (-65%), and HDL (+38%) levels improved (each p<0.01). Micronutrient assessment showed the following prevalence rates (baseline, 2 year): low folate (3%,
6%; p=0.04), hypoferritinemia (5%, 47%; p=0.01), hypovitaminosis A (6%, 14%; p<0.01), hypovitaminosis B12 (0.5%, 8%; p<0.01), and hypovitaminosis D (38%, 44%; p=0.5). WROQL markedly improved (p<0.01).

Conclusions: In the largest prospective longitudinal study of adolescent WLS outcomes, 2 year results indicate significant improvement in weight, fat mass, metabolic health, and WRQOL for severely obese adolescents. Greater attention to nutritional management may be needed in some to prevent nutritional deficiency states in the future.

T-OR-2083
Bariatric Surgery Is Associated With an Increased Risk of Fracture in the Swedish Obese Subjects study
Sofie Ahlin Gothenburg Västra Götaland, Markku Peltonen Helsinki Helsinki, Åsa Anveden Gothenburg Sweden, Kajsa Sjöholm Gothenburg Västra Götaland, Per-Arne Svensson Gothenburg, -, Ingrid Larsson Gothenburg VGR, Ingmar Näslund Örebro Sweden, Lars Sjöström Gothenburg n.a., Lena Carlsson Göteborg Sweden, Peter Jacobson Göteborg Västra Götaland

Background: Bariatric surgery is an effective treatment to achieve long-term weight loss but it also prevents diabetes and is associated with lower incidence of cardiovascular events. However, several studies have shown that bariatric surgery leads to decreased bone mineral density at the proximal femur region 9-12 months after surgery. This has led to an increased concern of the effect of bariatric surgery on bone health and the long-term risk of fractures for these patients.

Methods: The Swedish Obese Subjects (SOS) study is a controlled, prospective intervention trial including 2010 patients who have undergone bariatric surgery and 2037 matched controls. Study participants were recruited between 1987 and 2001. Information on fractures was obtained by cross checking social security numbers from the SOS database with ICD9/ICD10 codes for fractures in national health registers. Information on smoking and alcohol intake was received from questionnaires at pre-specified time points.

Results: An increased risk of fracture was observed in the surgery group (187 events, incidence rate [IR] = 55.3/10 000 person-years; 95% confidence interval [CI]: 47.9-63.8) compared to controls (127 events, IR = 37.5/10 000 person-years; 95% CI: 31.5-44.7; hazard ratio [HR] = 1.47; 95% CI 1.17-1.84; p = 0.001). The fracture risk remained increased in the surgery group after adjustment for preselected risk factors of fracture (age, sex, smoking, alcohol intake and previous fracture) (Adjusted HR = 1.53; 95% CI: 1.22-1.93; p < 0.001).

Conclusions: Results from the SOS study indicate that bariatric surgery increases the risk of fracture.

T-OR-2084
Sleeve Gastrectomy Modifies Pharmacokinetics of Ingested Alcohol
Yanina Pepino St. Louis Missouri, Chris Eagon St. Louis MO, Kathleen Bucholz St Louis MO, Samuel Klein St. Louis MO

Background: While it is well established that Roux-en-Y gastric bypass (RYGB) accelerates alcohol absorption and causes a rapid and large increase in peak blood alcohol concentration, results from previous studies on the effects of sleeve gastrectomy (SG) on alcohol pharmacokinetics are conflicting. Data from two studies found SG did not affect peak blood alcohol concentration (BAC), whereas another study found SG caused a marked increase in peak BAC after alcohol ingestion. Moreover, all of these studies estimated BAC from breath analysis, which might not reliably estimate true peak BAC.

Methods: We performed an alcohol challenge test in 5 women (BMI=35±5 kg/m2, 49±13 yrs. old) who had SG surgery 1.9±0.6 years earlier, 8 women (BMI=30±5 kg/m2; 43±8 yrs. old) who had RYGB surgery 2.2±1.2 years earlier, 4 women (BMI=34±4 kg/m2, 56±9 yrs. old) who had laparoscopic gastric banding (LAGB) surgery 2.8±1.2 years earlier (surgery control) and 9 women (BMI=44±4 kg/m2; 41±9 yrs. old) who were scheduled for bariatric surgery (non-surgery control). Blood samples were taken before and at 5, 15, 25, 35, 50, 65, 80, 95, 110, 125, 140, 150 and 200 min after consuming 0.5 g of alcohol per kg of fat-free mass. BAC was determined by using the gold standard technique of gas chromatography.

Results: Peak BAC occurred sooner and was higher after both RYGB and SG procedures than in control subjects (Time to peak (min); height of peak BAC (mg/dl) for each group: 5±0 min, 111±17 mg/dl after RYGB, 13±5 min; 86±11 mg/dl after SG, 33±17 min; 59±27 mg/dl after LAGB, and 25±12 min; 60±14 mg/dl in non-surgery control; P<0.001)

Conclusions: SG causes marked alterations in the response to alcohol ingestion manifested by a faster and higher peak in BAC. However, the effect of SG on alcohol metabolism is smaller than the effect of RYGB.

T-OR-2085
Changes in Appetite and Food Palatability in Roux-en-Y Gastric Bypass (RYGB), Vertical Sleeve Gastrectomy (SG) and Control (C) Participants: A Prospective 18-month Study

Background: Changes in appetite following bariatric surgery likely play a role in weight loss. Formal, controlled studies of this issue have been limited.

Methods: 18mo observational study comparing changes in appetite and responses to food cues in women who underwent RYGB or SG as compared to weight stable, BMI-matched controls. Participants completed the Eating Inventory (Cognitive Restraint, Disinhibition, and Hunger) at baseline, 6mo, and 18mo. They used visual analog scales (VAS) to rate their liking (1=not at all, 11=very much) of high- and low-palatability foods presented visually during an fMRI task. Repeated measures ANOVAs compared groups across time and between groups.

Results: 50 women (RYGB=19, SG=14, C=17) with a mean (+SD) baseline BMI of 46.3±4.4 kg/m2 and age of 39.1±9.3 yr (59% black, 36% white) participated. Mean percent weight decreases at 18mo in RYGB, SG, and C were 30.7%, 25.5%, and -0.4%, respectively (both p<0.001 for C vs SG and RYGB). Cognitive restraint increased more in RYGB and SG than C at 6 mo (p<0.03), but there were no significant differences at 18mo overall (p=0.16). Disinhibition decreased more in RYGB and SG than C at 6 mo (p<0.01), but only differed between RYGB and C at 18mo (p<0.02). Hunger decreased more in RYGB and SG than C at 6 and 18mo.
Background: Weight loss resulting from exercise interventions is seldom as significant as expected. This is likely due to energy compensation. In short, as physical activity (PA) increases, adults tend to consume more energy. (PA) increases, adults tend to consume more energy. For two consecutive three-month periods this randomized, controlled, cross-over trial provided 530 children with school meals or usual packed lunch from home (control). Dietary intake, activity, and sleep were measured simultaneously for seven consecutive days using dietary records and accelerometers. Short and long sleeping children were defined as lower and upper tertile of sleep duration. Body composition, blood pressure, triglycerides, HDL-cholesterol, and HOMAIR were measured/calculated.

Methods: Overall, school meals compared to control had positive effects on physical activity and blood pressure in long sleeping children and negative effects on body fat in short sleeping children. Short sleeping children increased fat mass compared to long sleeping children by 0.21 (95% CI 0.03; 0.38) kg, android fat mass by 0.02 (0.001; 0.04) kg, waist circumference by 0.73 (0.23; 1.24) cm, blood pressure by 1.5 (0.4; 2.6) mmHg, fat intake by 1.1 (0.2; 2.0) energy %, and decreased total physical activity by 7.2 (1.6; 12.7) % (all P≤0.04), while HOMAIR and blood lipids were not modified by sleep duration.

Conclusions: The susceptibility to increase abdominal adiposity and blood pressure when exposed to dietary changes can potentially be explained by too little sleep that results in increased caloric intake and reduced physical activity. We hypothesize that these findings may be explained by different stress levels of the children, and short sleep duration may influence energy balance through stress-induced neurohumoral mechanisms.

T-OR-2087
Sleep duration modifies effects of free ad libitum school meals on adiposity and blood pressure.
Mads Hjorth Frederiksberg Copenhagen, Anders Sjödin Frederiksberg Denmark, Jean-Philippe Chaput Ottawa Ontario, Arne Astrup Copenhagen -

Background: Lack of sufficient sleep can potentially affect both energy intake and energy expenditure resulting in obesity and reduced cardiometabolic health. Recently, provision of ad libitum school meals was found to improve certain cardiometabolic markers despite increases in waist circumference.

Methods: To investigate if habitual sleep duration of 8-11-year-olds modifies the effect of free ad libitum school meals on cardiometabolic markers, body composition, dietary intake, and physical activity. For two consecutive three-month periods this randomized, controlled, cross-over trial provided 530 children with school meals or usual packed lunch from home (control). Dietary intake, activity, and sleep were measured simultaneously for seven consecutive days using dietary records and accelerometers. Short and long sleeping children were defined as lower and upper tertile of sleep duration. Body composition, blood pressure, triglycerides, HDL-cholesterol, and HOMAIR were measured/calculated.

Results: Overall, school meals compared to control had positive effects on physical activity and blood pressure in long sleeping children and negative effects on body fat in short sleeping children. Short sleeping children increased fat mass compared to long sleeping children by 0.21 (95% CI 0.03; 0.38) kg, android fat mass by 0.02 (0.001; 0.04) kg, waist circumference by 0.73 (0.23; 1.24) cm, blood pressure by 1.5 (0.4; 2.6) mmHg, fat intake by 1.1 (0.2; 2.0) energy %, and decreased total physical activity by 7.2 (1.6; 12.7) % (all P≤0.04), while HOMAIR and blood lipids were not modified by sleep duration.

Conclusions: The susceptibility to increase abdominal adiposity and blood pressure when exposed to dietary changes can potentially be explained by too little sleep that results in increased caloric intake and reduced physical activity. We hypothesize that these findings may be explained by different stress levels of the children, and short sleep duration may influence energy balance through stress-induced neurohumoral mechanisms.

T-OR-2088
Trajectory of physical activity during pregnancy
Jennifer Huberty Phoenix Arizona, Matthew Buman Phoenix AZ, Jenn Leiferman Aurora CO, Lacey Rowedder Phoenix AZ, Kevin Hollingshead Phoenix Arizona, Jessica Bushar Alexandria VA

Background: The purpose of this observational study was to describe the natural trajectory of physical activity and sedentary behaviors in pregnant women throughout the pregnancy time course. A secondary purpose was to understand whether these trajectories differed among weight statuses.

Methods: Participants were drawn from a nationwide text-message intervention aimed at improving physical activity in pregnant women. Eligible participants included 80 inactive pregnant women (8-16 weeks). Physical activity was measured using a Fitbit throughout pregnancy. Chi-square analyses and t tests were used to analyze univariate demographic and physical activity variables. Mixed model-repeated measures analysis of variance was used to analyze trajectory changes in daily physical activity variables (i.e., sedentary, light, active, and steps).

Results: There was a significant positive linear trend and significant negative quadratic trend in sedentary behavior, light activity, and active time. There were no linear effects for steps, yet a significant positive quadratic trend. Overweight and obese women took significantly fewer steps over the course of the pregnancy than normal weight women, and obese women had less active time than normal weight women. However, trajectories were the same across weight status. There was a
significant trimester by time in pregnancy interactions for all physical activity variables in the expected directions, suggesting accelerated increases in sedentary time and decreases in light activity, active time, and steps in the third trimester relative to the first and second trimesters.

Conclusions: Our findings illustrate that, as pregnancy progresses, women are spending more time in sedentary behaviors and less time being physically active. The time course of change over pregnancy indicates more precipitous decline in physical activity in the latter half of the third trimester. This was the first study to describe the natural trajectory of physical activity and sedentary behaviors during pregnancy.

T-OR-2089
Low objectively assessed energy flux predicts future gains in adiposity in adolescents: a prospective doubly labelled water study
David Hume Cape Town Western Cape, Sonja Yokum Eugene OR, Eric Stice Eugene Oregon

Background: Recent reports implicate low energy flux (or the total number of calories an individual consumes and expends), rather than energy surplus in the etiology of weight excess. The present study tested the hypothesis that low objectively measured habitual energy flux (EnFlux) would associate with greater future gains in overall body adiposity.

Methods: 154 adolescents completed a doubly labelled water assessment of total daily energy intake (TDEI) and total daily energy expenditure (TDEE) at baseline. Participants were characterized for absolute level of energy balance, i.e. as low flux (lowermost tertile placement for TDEI and TDEE: n=31), mid flux (middle tertile placement for TDEI and TDEE: n=27), or high flux (uppermost tertile placement for TDEI and TDEE: n=36). The remainder of the sample (those with asynchronous TDEI-TDEE tertile placement) were characterized as being out-of-flux (n=60). Body mass index and % body fat (air displacement plethysmography) were measured at baseline and at 1-, 2- and 3-year follow-ups.

Results: A negative dose-response relationship was evident between EnFlux and elevations in body fat from baseline to year 3 of follow-up. More specifically, out-of-flux, low flux and mid flux participants exhibited gains in total fat mass (95% CI 0.30, 0.47) of being sedentary, and 4.41 higher odds (95% CI 1.07, 1.49) of being sedentary and 0.67 lower odds (95% CI 0.57, 0.78) of being sedentary at childcare/school; and 0.37 lower odds (95% CI 0.30, 0.47) of being sedentary, and 4.41 higher odds (95% CI 3.28, 5.85) of MVPA when at parks.

Conclusions: Hispanic preschool children spent the majority of daytime at home, and were less sedentary and attained more MVPA at home and in parks than when in childcare. Interventions and policies should identify ways to engage preschool children in more MVPA while in childcare, and encourage more time spent in parks or playgrounds.

T-OR-2090
Where are Hispanic Preschool Children More Sedentary and Where are They More Physically Active?
Teresa O’Connor Houston Texas, Ester Cerin Burwood Victoria, Rebecca Lee Phoenix AZ, Sheryl Hughes Houston TX, Tom Baranowski Houston TX, Jason Mendoza Seattle WA, Nancy Butte Houston TX, Jacqueline Kerr San Diego CA

Background: Hispanic children are at increased risk of becoming obese. Physical activity (PA) is important for children to maintain a healthy weight status. It is not known where Hispanic preschoolers are more active or sedentary. Our aim was to objectively assess where Hispanic preschool children are more sedentary and attain more moderate to vigorous PA (MVPA).

Methods: Hispanic preschool children wore time synchronized accelerometers and GPS data loggers for a week during the day. Valid data were simultaneously processed using the Physical Activity and Location Measurement System (PALMS, UC San Diego) to identify children’s sedentary time and MVPA tagged with geographic locations. Geographic locations were viewed in Google Earth and coded into 8 location types. Percent of valid accelerometer/MGPS time in each location was calculated. Child-specific regression models of PA outcomes, adjusted for temporal and spatial autocorrelation, were computed and included in a meta-regression analysis.

Results: Of the 84 children (mean age 4.5 years (SD 0.8), 58% boys), 73 had valid data (644 (SD 85) min/day for 6.4 (SD 1.2) days). 57% (SD 22%) of their monitor-wear time was at home, 22% (SD 15%) at childcare/school, and 12% (SD 7%) with no fixed location. Only 13 children spent time in parks which contributed to 4% of time (SD 5%). Children were sedentary 371 (SD 70) min/day and had 84 (SD 40) min/day of MVPA. Compared to home, children had 1.26 higher odds (95% CI 1.07, 1.49) of being sedentary and 0.67 lower odds (95% CI 0.57, 0.78) of MVPA at childcare/school; and 0.37 lower odds (95% CI 0.30, 0.47) of being sedentary, and 4.41 higher odds (95% CI 3.28, 5.85) of MVPA when at parks.

Conclusions: Hispanic preschool children are more sedentary and less physically active at home as compared to other locations, especially parks. Preschoolers should be encouraged to spend more time in parks and playgrounds.
and 22.7 ± 2.0) and WLM maximum BMI and OC current BMI (32.8 ± 4.9 and 33.4 ± 5.1) were well matched. Compared to OC, both WLM and NC spend a lower proportion of awake time in SB (WLM = 60.8% ± 9.3, NC = 63.8% ± 9.5, OC = 69.3% ± 7.5), take more breaks per sedentary hour (WLM = 6.3 ± 2.5, NC = 5.9 ± 1.2, OC = 5.0 ± 1.2) and spend a higher proportion of awake time in light intensity activity (WLM = 29.6% ± 7.9, NC = 29.1% ± 8.3, OC = 24.8% ± 6.7). Compared to both NC and OC, WLM spend more minutes/day in both total MVPA (WLM = 94.9 ± 40.2, NC = 69.2 ± 20.0, OC = 55.5 ± 19.9) and bouts of MVPA ≥10 minutes, and achieve more steps and MET/hrs per day.

Conclusions: Findings indicate that not only do WLM spend more time in MVPA than both OC and NC, but compared to OC, they also spend 8.5% (58 min/day) less time sedentary and 4.7% (55 min/day) more time in light intensity activity. These data suggest that those successful in long-term maintenance use both increasing physical activity and decreasing sedentary time as strategies to help maintain weight loss.

Tuesday November 3, 3:30-5:00 PM

T-OR-2092
Orexin A in Ventrolateral Preoptic Area Increases all Components of Total Energy Expenditure and Orexin Dual Receptor Antagonism Lowers Total and Resting Energy Expenditure
Jamie Coborn Shantz Arizona, Danielle DePorter, Charles Billington Minneapolis Minnesota, Jennifer Teske Tucson Arizona, Catherine Kozt Minneapolis Minnesota

Background: Orexin receptor stimulation reduces weight gain by increasing total energy expenditure (TEE) and EE due to physical activity (EEPA). Identifying whether components of TEE are affected by orexin receptor stimulation or antagonism with dual orexin receptor antagonists (DORAs) for insomnia treatment has clinical relevance for obesity treatment. We tested whether 1) DORA in the ventrolateral preoptic area (VLPO) blocked orexin-A (OXA)-induced arousal, PA, and components of total EE [EE during sleep (EEsleep), rest (EErest), wake (EEwake) and EEpa]; and 2) DORA alone reduced TEE and its components. We hypothesized 1) DORA would reverse OXA-induced increases in arousal, PA, and components of EE within a whole room calorimeter during FST, and 2) DORA alone would reduce TEE.

Methods: To test this, 3-mo. old male Sprague-Dawley rats (N=7) were surgically implanted with cannulae targeting VLPO and radiotelemetric EEG/EMG transmitters to determine sleep/wake states. DORA (0 or 62.5nmol) was injected 20 min. prior to OXA (0 or 62.5 pmol) in VLPO in a repeated measures design. EEG/EMG, PA, and EE was measured continuously each second post-injection. Based on time stamped data, EEpA (EE while moving based on infrared sensors), EEpWake (EE when awake), EEpRest (EE during NREM or REM sleep) were determined.

Results: DORA blocked OXA-induced increases in arousal, PA, TEE, EEpWake, EEpRest, and EEpSleep 1h post-injection (P < 0.05). OXA significantly reduced sleep but significantly increased EEpSleep 1h post-injection (P < 0.05). DORA alone significantly reduced TEE and EEpRest 2h post-injection (P < 0.05).

Conclusions: These data suggest 1) OXA reduces weight gain by stimulating TEE through increases in not only EEpA and EEpRest but also EEpSleep and 2) reduced TEE and EEpRest are residual effects of DORA that may promote weight gain.

T-OR-2093
A Thrifty Human Phenotype is Associated with a Lower Core Body Temperature and Greater Adiposity
Martin Reinhardt Phoenix Arizona, Marie Thearle Phoenix AZ, Susanne Votruba Phoenix AZ, Jonathan Krakoff Phoenix AZ

Background: In small studies, a larger 24-hour energy expenditure (EE) decrease with fasting (FST) correlates with a smaller EE increase with overfeeding (OF) and predicts less weight loss, i.e. a thrifty phenotype. We examined the association of body composition and core body temperature (CBT) with the EE decrease with FST.

Methods: 77 subjects (26W/25NA/13B/13H; 58 male; 35.9±10.2 yrs; %body fat: 30.4±11.8; fat mass (FM): 26.6±14.0kg) were admitted to a clinical research unit to measure EE within a whole room calorimeter during FST, energy balance (EB), and OF with twice energy requirements. Thrifty and spendthrift phenotypes were defined as below and above the median EE response to FST, respectively. Core body temperature (CBT) was measured using an ingested monitor during these interventions (combined mean CBT: 36.94±0.22; range: 36.43, 37.48°C). Body composition and truncal fat volume (6228±3971cm3) were measured with DXA.

Results: Compared to EB, EE increased 9.7±5.2% (p=0.001) during OF and decreased -8.0±4.3% (p=0.001) with FST. A greater decrease in EE with FST correlated with a smaller increase with OF (r = 0.27, p=0.02). Whole body fat mass (FM) (30.1 v 23.1kg; p=0.01), and truncal fat (7139 v 5316cm3; p=0.03) were greater in thrifty individuals, adjusted for sex. After accounting for age, sex, race, ambient temperature and fat free mass, FM (β=0.16%; p=0.003) and truncal fat (β=-0.0004%; p=0.03) were associated with the EE response to FST. Due to differences in menstrual cycle phase in women, we only analyzed CBT in males. Thrifty men had lower CBT (36.80 v 36.96°C; p=0.004) compared to spendthrift men. Lower CBT was associated with a greater EE decrease in response to FST (β=1.43% per 0.1°C, p=0.003), even after adjusting for covariates.

Conclusions: We confirmed the correlation between EE changes with FST and OF in a larger, more diverse group. Thrifty individuals were more likely to have greater overall and truncal adiposity plus lower CBT consistent with a more efficient metabolism.

T-OR-2094
Adaptive Thermogenesis Lowers VO2max without Compromising Running Performance in High- and Low-Capacity Rats
Sromona Mukherjee Kent Ohio, Steven Britton Ann Arbor Michigan, Lauren Koch Ann Arbor Michigan, Colleen Novak Kent OH

Background: To lose weight when on a diet, energy expenditure needs to exceed energy intake. During calorie restriction (CR), adaptive thermogenesis occurs, where there is a decrease in energy expenditure beyond what is predicted by decreased body mass. Adaptive thermogenesis varies between individuals and can hinder continued successful weight loss on a diet.

Methods: We find that adaptations in activity-related energy expenditure differ in a contrasting rat model of leanness and...
Obesity 2015 The 33rd Annual Scientific Meeting of the Obesity Society

Oral Abstracts Wednesday November 4 to Friday November 6, 2015

obesity bred for intrinsic aerobic capacity, high- and low-capacity runners (HCR and LCR). Here, we determined how CR alters aerobic capacity and running performance. Maximal oxygen consumption (VO2 max) was measured in HCR and LCR before and after 21 days of 50% CR using a treadmill test.

**Results:** 50% CR did not significantly compromise running performance (top speed, total intervals completed) in either HCR or LCR. In contrast, oxygen consumption decreased even when body weight and lean mass was taken into account. The significant reduction of VO2 max suggests an increase in energy efficiency. Thus CR made HCR and LCR running more efficient without dampening their running. Food restriction did not change the maximal respiratory exchange ratio (RER). HCRs’ capacity and performance were significantly higher than LCR, consistent with their phenotypes.

**Conclusions:** During food restriction, adaptive thermogenesis occurs in VO2max, increasing running efficiency and conserving energy, making rats less susceptible to weight loss while protecting running performance. Supported by NIH grant:R15 403009 , RO1 443163, R24OD010950

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**T-OR-2095**
The Thermogenic Responses to Overfeeding and Cold Are Differentially Regulated
Courtney Peterson Baton Rouge Louisiana, Virgile Lecouttre Fribourg N/A, Elizabeth Frost Baton Rouge LA, Leanne Redman Baton Rouge Louisiana, Eric ravussin Baton Rouge LA

**Background:** Brown adipose tissue (BAT) is a highly metabolic tissue that generates heat through mitochondrial uncoupling. BAT activity negatively correlates with BMI, and it has been suggested that obesity may partially be due to low BAT mass and/or activity. BAT activity has been proposed to mediate both cold-induced thermogenesis (CIT) and diet-induced thermogenesis (DIT). We therefore set out to determine whether there is a relationship between CIT and DIT in humans and whether daily cold exposure for 4 weeks could increase both CIT and DIT by recruiting and activating BAT.

**Methods:** Nine lean, healthy men (23 ± 3 years old, 23.0 ± 1.8 kg/m2) completed 20 minutes of cold exposure (4°C) five days per week for 4 weeks. Before and after the cold intervention, CIT (the increase in RMR at 16°C relative to 22°C) was measured by a ventilated hood indirect calorimeter, whereas DIT was measured for 24 hours in a respiratory chamber in response to 50% overfeeding.

**Results:** After four weeks of cold acclimation, participants lost 0.5 ± 0.5 kg (71.0 ± 6.6 vs. 71.5 ± 6.5 kg; p=0.03). Consistent with increased BAT activity, CIT more than doubled from 5.2 ± 14.2% at baseline to 12.0 ± 11.1% (p<0.05), in parallel with increased SNS activity (HRV). However, twenty-four-hour energy expenditure (2166 ± 206 to 2118 ± 188 kcal/day; p=0.15) and diet-induced thermogenesis (7.4 ± 2.7% to 7.7 ± 1.6%; p=0.78) were not altered by the cold intervention. Moreover, there was no association between CIT and DIT at baseline or post-intervention, or in their changes during the intervention (p=0.47).

**Conclusions:** Cold acclimation therefore increases CIT but not DIT, which suggests that CIT and DIT likely involve separate regulatory mechanisms. BAT activation does not appear to play a major role in DIT and modulating energy expenditure in response to excess energy intake.

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**T-OR-2096**
Is a Calorie a Calorie? Mathematical Model Predicts Differing Body Fat Loss with Carbohydrate vs. Fat Restriction in Obese Adults
Kevin Hall Bethesda Maryland, Thomas Bemis Bethesda MD, Robert Bryshta Bethesda MD, Kong Chen Bethesda MD, Amber Courville Bethesda MD, Emma Crayner Bethesda MD, Stephanie Goodwin Rockville MD, Juen Guo BETHESDA MD, Lilian Howard Bethesda Maryland, Nicolas Knuth Towson MD, Bernard Miller Saint Louis Missouri, Carla Prado Edmonton Alberta, Mario Siervo Newcastle Not Applicable, Monica Skarulis Bethesda MD, Mary Walter Bethesda MD, Peter Walter Bethesda MD, Laura Yanni Bethesda MD

**Background:** Dietary carbohydrate restriction has been purported to result in metabolic adaptations that promote body fat loss to a greater extent than an equal calorie restriction of dietary fat.

**Methods:** We investigated body fat loss resulting from selective restriction of dietary carbohydrate versus fat in 19 adults with obesity. The diets were equal in calories and were instituted in a randomized crossover fashion. Subjects were confined to a metabolic ward for a pair of 2 week periods separated by a 2-4 week washout. The rate of body fat loss was calculated by fat balance as measured by indirect calorimetry during five days spent in a metabolic chamber each visit. A mathematical model of metabolism was used to simulate the intervention, quantitatively integrate the data, and predict the long-term effects of adhering to isocaloric diets varying in carbohydrate and fat.

**Results:** Both the model and the data showed that dietary carbohydrate restriction led to a sustained increase in net fat oxidation, but restriction of dietary fat had little effect. However, the fat balance data and model simulations demonstrated that body fat loss was significantly greater with dietary fat restriction. Model simulations indicated that prolonged adherence to diets differing in composition, but not calories, can theoretically result in differences body fat loss. However, metabolic adaptations act to limit body fat differences over a wide range of isocaloric substitutions of dietary carbohydrate and fat.

**Conclusions:** Calorie for calorie, dietary fat restriction led to more body fat loss than restriction of dietary carbohydrate in adults with obesity. However, model simulations suggest that long-term exposure to isocaloric diets with widely ranging carbohydrate and fat content would lead to only small differences in body fat and energy expenditure. Therefore, the relative efficacy of low carbohydrate versus low fat diets for body fat loss likely results primarily from differences in overall calorie intake.

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**T-OR-2097**
GLP-1 Receptor Activation Suppresses Calorie Intake without Altering Food Preferences in Mice
Jingjing Niu Durham NC, Jenny Tong Durham NC, Ivan Araujo New Haven CT

**Background:** Roux-en-Y gastric bypass surgery invariably results in marked increase in postprandial glucagon-like peptide-1 (GLP-1) secretion. Concomitantly to the augmented incretin response, Roux-en-Y gastric bypass also leads to reduction in both calorie intake and preference for high-calorie foods. While it is commonly assumed that the enhanced GLP-1 signaling mediates the surgery-induced effects on feeding, it remains unclear whether GLP-1 influences food choices in
addition to reducing calorie intake. The aim of the present study was to determine whether rises in GLP-1 levels are sufficient to concomitantly suppress caloric intake and shift preferences towards low-calorie foods.

**Methods:** Experiment 1: In adult mice, systemic injections of a GLP-1 receptor (GLP-1r) agonist (Byetta) were paired with either low- or high-calorie sugar or fat solutions in a conditioning protocol. Preferences for low- vs. high-calorie solutions were subsequently assessed using the brief-access two-bottle preference test. Experiment 2: Preference tests as described in experiment 1 were performed after i.p. injections of Byetta.

**Results:** We found that while systemic GLP-1r agonism produced robust suppression of both lipid and sugar intake, it failed to shift intake preference from high- to low-calorie solutions. Pairing GLP-1r agonism with either low- or high-calorie lipids or sugars did not alter the animals' preference for high-calorie solutions. Furthermore, treatment with Byetta did not alter the high-calorie nutrient preference without food pairing.

**Conclusions:** Our data indicates that, despite the potent satiation effect of GLP-1, the shift in preference towards low-calorie foods following bariatric surgery is GLP-1 independent. The bariatric surgery effect on food choice may be mediated by other gut hormones or by alterations in gut-brain neural signaling.

**T-OR-2098**

**Obesity is Associated with Differential Food-Cue Induced Recruitment of Brain Regions and Networks After Fructose vs. Glucose Ingestion**

Kathleen Page Los Angeles California, Andrew Melrose Laguna Niguel California, Shan Luo , Ana Romero Los Angeles CA, Kayan Sarpelleh Los Angeles CA, John Monterosso Los Angeles CA

**Background:** The central administration of fructose increases feeding whereas glucose suppresses feeding in animals. Human studies show that fructose compared with glucose ingestion results in greater brain responses to food cues in regions involved in attention and reward. The aim of this study was to determine the effects of fructose vs. glucose ingestion on food-cue induced recruitment of brain networks relevant to eating behavior in obese vs. lean individuals.

**Methods:** 12 lean (6M/6F; age 21.5±2 years; BMI 22.7±1.7 kg/m2) and 12 obese (4M/8F; age 22.5±2 years; BMI 35.4±4.7 kg/m2) individuals completed 2 fMRI sessions in a double blinded, random order crossover study. Participants ingested 75 g of glucose or fructose before completion of a food-cue task during scanning. A region of interest (ROI) analysis was performed to determine group differences in neural response to food cues between fructose and glucose conditions. Next, we performed a connectivity analysis using temporal concatenation independent components analysis (ICA). Individualized spatial-maps were subjected to a mixed-effects analysis to investigate interactions between group and sugar type.

**Results:** In the ROI analysis, we observed an interaction between group and sugar type in the orbital frontal cortex driven primarily by decreased responsivity to food-cues following glucose in lean individuals that was non-existent in obese individuals. Connectivity analysis indicated an interaction in the ventral medial prefrontal cortex as part of a component relevant to the canonical network involved in gustation, emotion and reward, with lean individuals evincing higher recruitment after fructose vs. glucose ingestion. The response was reversed in obese individuals, whereby recruitment was higher after glucose vs. fructose.

**Conclusions:** This work builds on human and animal research implicating differential brain responses to glucose and fructose, and implies that food-cue induced recruitment of reward networks may be altered in obesity.

**T-OR-2099**

**Neural Reward Response to Palatable Food Receipt Predicts Weight Variability in a Lean Adolescent Sample**


**Background:** Extant literature has demonstrated that reward activation in the brain to palatable food intake is predictive of future weight gain. Recent studies have also found short-term weight variability predicts future weight gain. No studies to date, however, have examined neural correlates of food receipt in relation to future weight variability.

**Methods:** Using fMRI, we assessed whether normal-weight adolescent (N = 65) neural responses to milkshake anticipation and/or receipt predicted weight variability over a four-year follow-up period. Weight variability was calculated using a root mean squared error method (RMSE) in order to assess fluctuations in weight independent of weight trajectory.

**Results:** Controlling for baseline BMI, greater activation in reward regions (bilateral striatum) and taste regions (gustatory cortex) to milkshake receipt (but not to milkshake anticipation) predicted greater body-weight variability over a four-year follow up. There was also a positive association between WV and weight gain over 4 years.

**Conclusions:** Regions traditionally associated with future weight gain were found to be associated with increased weight variability in response to palatable food intake in the current sample. This suggests that increased reward sensitivity in response to palatable food is associated with global deficits in weight maintenance that may manifest in weight variability or weight gain. The findings are consistent with the possibility that increased weight variability may reflect a deterioration of automatic weight regulation mechanisms, perhaps attributable to the influence of the obesogenic food environment.

**T-OR-2100**

**Taste Processing in Pediatric Overweight**

Cara Bohon Stanford California, Talya Feldman Palo Alto CA

**Background:** Understanding the neural response to food and food cues during early stages of weight gain in childhood may help us determine the drive processes involved in eating behavior and risk for obesity. This is important for developing successful interventions in this age group. A heightened response in brain reward regions to food cues, but diminished response to actual taste receipt is present in obese adults, but not fully understood in children at early stages of weight gain.

**Methods:** Healthy weight and overweight children ages 4-8 (N=18; 10 with BMI between 15th and 85th %ile and 8 with BMI >85th %ile) underwent fMRI scans while anticipating and receiving tastes of chocolate milkshake. Parents completed a Children’s Eating Behaviour Questionnaire. Recruitment is ongoing, and the sample will increase to 20 (10 per group) prior to the presentation.

**Results:** Preliminary results reveal a trend for greater response...
Conclusions: Although obese adults show a hyporesponsivity in reward regions to tastes of milkshake, this may reflect a diminished response over time as a consequence of overeating. The lack of a differential response in reward regions and the presence of heightened response in other regions in overweight children may reflect an important developmental shift over the course of obesity impacting treatment outcome. Specifically, regions involved in taste sensation and salience, as well as motor cortex, were activated more in the overweight group. Thus, function in these regions could indicate risk for obesity development and provide an earlier treatment or prevention target.

T-OR-2101

VTA Amylin Receptor Activation Modulates Macronutrient Selection
Elizabeth Mietlicki-baase Philadelphia Pennsylvania, Lauren McGrath Philadelphia PA, Tram Pham Houston TX, Chan Tran Nguyen Gettysburg Pennsylvania, Joanna Krawczyk Philadelphia Pa, Matthew Hayes Philadelphia Pennsylvania

Background: The pancreatic hormone amylin acts in the ventral tegmental area (VTA) to regulate feeding in a physiologically relevant manner. Previous studies from our laboratory demonstrate that VTA amylin receptor (AmR) activation reduces intake of palatable foods, such as a high-fat diet. However, the ability of VTA AmR signaling to control intake of particular palatable macronutrients, such as fat or carbohydrate, is largely unresolved.

Methods: In separate one-bottle tests, rats were trained to consume isocaloric sucrose solution (25%) or Intralipid fat emulsion (10%). Intake of each solution was measured after intra-VTA injection of the AmR agonist salmon calcitonin (sCT). In a separate experiment, rats were given simultaneous access to sucrose and Intralipid at concentrations that are equally consumed by volume (10% sucrose, 10% intralipid) and the intakes of both solutions were monitored after VTA sCT. To specifically address the possibility that VTA AmR activation may generally suppress fluid intake, we evaluated whether intra-VTA sCT reduces ad libitum water intake in chow-fed rats, either in the presence or absence of food.

Results: When fat and sugar solutions are presented independently, VTA sCT more durably suppressed intake of fat compared to sucrose. A more specific effect on fat was observed when rats had simultaneous access to concentrations of fat and sucrose that they consumed equally under vehicle conditions; here, intra-VTA sCT preferentially reduced fat intake with no effect on sucrose intake. Separate water intake studies show that although VTA sCT suppresses water intake when food is available, likely due to reduced prandial drinking concomitant with sCT-induced hypophagia, it has no effect on water intake in the absence of food.

Conclusions: VTA AmR activation has more potent effects on fat intake compared to sucrose intake. These effects appear to be independent of general effects on fluid intake. DK.103804 (EGM-B), DK.096139 (MRH).

T-OR-2102

Effect of a Weight-Stable Diet Containing Increased High-Fructose Corn Syrup on Liver Fat Content and Insulin Sensitivity
Shelby Sullivan St. Louis Missouri, Faidon Magkos Saint Louis MISSOURI, Nada Abumrad Saint Louis MO, Samuel Klein St. Louis MO, Bruce Patterson Saint Louis MO

Background: Although ingestion of high-fructose corn syrup (HFCS) has been implicated as an important contributor to the development of nonalcoholic fatty liver disease and insulin resistance, it is unclear if this occurs when there is no increase in body weight. The purpose of this study is to determine the effects of consuming a weight-stable diet containing 25% of calories from HFCS on: 1) intrahepatic triglyceride (IHTG) content, 2) hepatic insulin sensitivity and 3) skeletal muscle insulin sensitivity.

Methods: 7 obese subjects (4 women, 3 men; BMI 35.5±2.8 kg/m2) with usual dietary intake of <9% total calories as HFCS participated. Subjects consumed a run-in low-HFCS diet (5% calories as HFCS) for two weeks before baseline testing, then 4 weeks of a high-HFCS diet (25% of calories as HFCS). All meals and drinks were provided. Magnetic resonance spectroscopy was used to assess IHTG content and a hyperinsulinemic-euglycemic clamp procedure with stable isotope tracer infusion was used to determine insulin sensitivity in liver [hepatic insulin sensitivity index: reciprocal of the product of the basal endogenous glucose production rate (in µmol·kg-1·min-1) and fasting plasma insulin concentration (in µU/mL)] and skeletal muscle (percent increase in insulin-stimulated glucose disposal rate).

Results: Body weight and % body fat did not change after 4 weeks of treatment with the high-HFCS diet (99.2±11.6 kg vs 98.5±11.6 kg and 45.3±6.7% vs 45.3±7.1%, before and after diet treatment, respectively). The high HFCS diet also did not change IHTG content (4.6±4.2% before and 3.9±3.5% after), hepatic insulin sensitivity index (0.64±0.28 vs 0.74±0.38 [100-(µmol·kg FFM-1·min-1 × µU/mL)] before and after); or insulin-stimulated glucose disposal rate (228±103%/vs 219±102% before and after).

Conclusions: These results suggest that consuming a high-HFCS diet does not have adverse effects on IHTG content or insulin action in liver or skeletal muscle when body weight is stable.

T-OR-2103

Neural Responses to Food Words in Obese and Lean Individuals Under Stressed and Non-Stressed Conditions
Susan Carnell Baltimore Maryland, Leora Benson Baltimore Maryland, Zhishun Wang New York NY, Bradley Peterson Los Angeles CA, Allan Geliebter NY NY

Background: Obese individuals may show heightened responses to environmental food cues, and stress has been associated with greater intake and weight. We aimed to study neural responses to minimal food cues (written words) under normal conditions and following a stressor in obese vs. lean individuals.

Methods: We recruited 12 lean and 17 obese participants. On two separate days, participants underwent an fMRI scan during which they viewed words representing high energy-density [ED] foods, low-ED foods, and non-foods and rated how much they wanted to eat each food item. On one day, the scan was preceded by a Socially-Evaluated Cold Pressor Test [SECPT] (stress); on the other (counter-balanced) by a warm water task.
Background: Obesity negatively impacts patient’s lives. The complex etiology of obesity is influenced by genetics. The FTO gene contributes to obesity-related traits in various populations, with physical activity (PA) counteracting its effect to some extent. This study identified the level of PA and VO₂₋₁₇₀ (VO₂) required to reduce the effect of the FTO gene on body fat.

Methods: Age, gender, ethnicity, Tanner stage, socioeconomic status, and body mass index percentile (BMI%) were obtained in a cross-sectional sample of 295 children. Percent body fat (PBF) was obtained from DEXA. FTO and ancestry informative markers were genotyped to identify genetic variation and estimate genetic admixture, respectively. PA and VO₂ measurements were determined by 10-day accelerometer trials and standard graded exercise testing. Multiple linear regression analysis and ANCOVA were used to confirm the association of the FTO gene with adiposity and to predict the value of PA or VO₂ required to decrease PBF below 25 or BMI% below 85th for each FTO genotype.

Results: Our participants had a mean age of 9.55 years and 46.7% female. The FTO risk allele was significantly associated with increased BMI% (p=0.0100) and PBF (p=0.0146). Risk allele-carrying children with PA counts at 440000 and VO₂ levels at 29.5 had PBF less than 25, and those with PA counts at 145000 and VO₂ at 18.0 had BMI% less than 85th, compared to children without the risk allele.

Conclusions: Our results suggest that levels PA or VO₂ can counteract the predisposing effect of the FTO risk genotype in children, providing insights into the role of PA and fitness as potential mediators of adiposity and FTO and challenging the misconception that genetic predisposition may imply genetic determinism. Further work evaluating the interaction of long-term PA and fitness interventions with genes is needed to continue identifying clinical obesity-preventive tools.

T-OR-2105
For Whom is Weekly Accountability Necessary?
Neuropsychological Predictors of Weight Change in the Second Phase of Behavioral Weight Loss
Emily Wyckoff Philadelphia PA, Stephanie Manasse Philadelphia PA, Evan Forman Philadelphia PA, Meghan Butryn Philadelphia PA

Background: Group behavioral weight loss (BWL) is the current gold standard weight loss treatment; however, weight regain is normative and long-term outcomes are poor. The accountability of weekly group meetings is considered a major motivator for weight loss. As such, losing the accountability of weekly meetings in the second phase of treatment is a likely driver of weight regain. Executive functioning (EF) processes may moderate the impact of reduced accountability on adherence to dietary and physical activity recommendations and thus weight change during a period of reduced accountability.

Methods: Overweight and obese participants (n=190) received 25 group BWL treatment sessions over a 1-year period. Sessions were held on a weekly basis for the first six months, and transitioned to bi-weekly and then monthly for the second six months. At baseline, participants completed a self-report EF measure, the D-KEFS Tower Test (planning) and Color-Word interference Test (conflict monitoring and self-regulatory control), and a behavioral measure of delayed discounting.

Results: Mean percent weight change in the second phase of treatment was -0.32 (SD = 4.41). Controlling for weight loss in the first six months of treatment, greater discounting (p = .02), poorer regulatory self-control (p = .04), and lower self-reported scores of organization and planning ability (p = .047) were associated with weight change in the second phase of BWL. Conflict monitoring was predictive at trend level (p = .099). Behaviorally-measured planning was not predictive of weight change.

Conclusions: Results suggest that poor self-regulatory control, greater discounting of later rewards, and poor planning may be important predictors of weight regain once clinician and group contact becomes less frequent in BWL. Findings indicate that individuals with poorer EF may benefit from targeted intervention strategies to prevent weight regain once BWL session frequency is reduced.

T-OR-2106
Fast but not slow weight loss reduces resting energy expenditure independently of body mass loss
Alice Gibson Camperdown (University of Sydney) New South Wales, Radhika Seimon Camperdown NSW, Charmaine Tam Sydney NSW, Tania Markovic, Janet Franklin Sydney NSW, Nuala Byrne Gold Coast Queensland, Ian Caterson University of Sydney NSW, Amanda Sainsbury Camperdown NSW

Background: Diet induced weight loss often results in ‘metabolic adaptation’ – a decrease in resting energy expenditure (REE) beyond that expected from changes in body mass and composition. It is not known if metabolic adaptation is related to the rate of weight loss. We compared the effects of fast versus slow weight loss on metabolic adaptation, after loss of a matched amount of body weight and fat free mass (FFM).

Methods: This preliminary analysis includes 24 post-menopausal women with obesity (BMI: 33.8±3.5 kg/m², age: 58.7±3.5 years). Participants were randomized to either 4 weeks of FAST weight loss (70% energy restriction, n=12) or...
16 weeks of SLOW weight loss (30% energy restriction, n=12). Body weight, body composition (by air displacement) and REE (by indirect calorimetry) were measured at 0 (baseline), and 16 weeks after commencing energy restriction in the FAST and SLOW groups, respectively. Metabolic adaptation was calculated as the difference between measured REE and that predicted from regression equations of REE against FFM, fat mass and age at baseline.

**Results:** The FAST and SLOW groups lost equivalent weight (FAST: 6.9±0.6% of baseline body weight; p=0.78), and FFM (FAST: 14.5±13.8%; SLOW: 21.8±33.3% of weight lost; p=0.49). There was significant metabolic adaptation in the FAST group (-158±107 kcal/day at 4 versus 0 weeks; p<0.01), but not in the SLOW group (-49±160 kcal/day at 16 versus 0 weeks; p=0.31). The rate of weight loss (FAST: 210±22 g/day; SLOW: 54±21 g/day; p=0.01) was significantly inversely correlated with metabolic adaptation in the SLOW group (r=-0.69; p=0.01), but not the FAST group (r=-0.13; p=0.49).

**Conclusions:** Our findings indicate that metabolic adaptation in response to diet-induced weight loss is related to the rate of weight loss.

**T-OR-2107**
**Technology to Improve Child Health (TECH): Using Wireless Technology to Measure Energy Balance in Children**

Amna Afzal Bronx New York, Elsie Taveras Boston MA, Meghan Perkins Boston MA, Gabriella de Paz Boston MA, Puneeta Arya Boston MA, Oscar Benavidez Boston MA, Steven Gortmaker Boston MA

**Background:** There is an urgent need for more comprehensive and cost-effective approaches to measuring the energy intake and expenditure of children in free-living conditions.

**Methods:** We piloted a novel wireless assessment tool consisting of an integrated pebble accelerometer and home scale to collect serial physical activity and weight data. Patients were recruited from a preventative cardiology clinic and asked to wear the accelerator continuously and weigh themselves daily; data automatically offloaded from home wireless access points to our central database for the duration of the study (3-6 months). A subset of patients received smartphones with a dietary app that digitally captured and transmitted dietary images to a central database, where nutrient content was coded. We directly measured anthropometrics and performed 24-hour dietary recalls at 2 follow-up clinic visits. We also assessed parental impressions of the tool.

**Results:** We recruited 22 participants (mean age 11.1 years, median BMI percentile 95.4); On average, we collected 56 days (range 15-131) of physical activity data and 32 daily weights (range 3-90) per child over the course of the study. 7 participants additionally recorded dietary intake with the smartphone app. Participants recorded an overall mean daily median BMI percentile 95.4); On average, we collected 56 days (range 15-131) of physical activity data and 32 daily weights (range 3-90) per child over the course of the study. 7 participants additionally recorded dietary intake with the smartphone app. Participants recorded an overall mean daily

**Conclusions:** An integrated wireless tool may represent a comprehensive and efficient method for measuring energy balance in children, with both clinical and research applications. Pediatric weight management is one promising use, allowing clinicians to identify trends in weight gain and physical activity between visits and intervene sooner.

**T-OR-2108**
**Diet pattern may affect hypertension and left ventricular hypertrophy by altering insulin**


**Background:** Insulin increases sodium retention and has been associated with higher risk for hypertension (HTN). In this cross-sectional study, we tested the hypothesis that diet patterns characterized by high sugar content are associated with insulin, and that higher insulin is associated with prevalent HTN and left ventricular hypertrophy (LVH).

**Methods:** Data were analyzed on 14,729 non-diabetic participants of REGARDS, an observational study of adults aged >45 y residing in 1855 counties across the continental US. Information on habitual diet was collected using the Block 98 Food Frequency Questionnaire. Five diet patterns were considered based on factor analysis: Convenience, Plant-based, Sweets/Fat, Southern, and Alcohol/Salad. Prevalent HTN and electrocardiographic LVH were determined by in-person testing. Logistic regression was used to examine how diet pattern was associated with odds for high fasting insulin [quartiles 3 and 4 vs. quartile 1], after adjusting for covariates. Diet % carbohydrate (CHO), glycemic index, and glycemic load also were examined as predictors of fasting insulin. Subsequently, logistic regression was used to examine the association of insulin quintile with prevalent HTN and LVH, adjusting for covariates.

**Results:** Adherence to the Sweets/Fat and Southern (characterized by a high loading of sugar-sweetened beverages) diet patterns, and greater %CHO, were associated with greater odds for high insulin (P for trend <0.05 to <0.0001), whereas adherence to the Plant-based and Alcohol/Salad patterns was associated with lower odds for high insulin (P for trend <0.0001). Participants in the highest quintile of fasting insulin had 3.4 times the odds of having HTN than those in the lowest quintile [OR 3.4, (3.04, 3.81), P for trend<0.001]. The relationship with LVH was similar [OR 2.77, (2.23, 3.45), P for trend <0.001].

**Conclusions:** Diet patterns characterized by high sugar content were associated with high fasting insulin, which in turn, predicted prevalence of HTN and LVH.

**T-OR-2109**
**Cardiometabolic Risk Factor Incidence in the Metabolically Healthy Obese: The Atherosclerosis Risk in Communities (ARIC) study**

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**Background:** Development of cardiometabolic risk factors in metabolically healthy overweight (MHOw) and obese (MHO) individuals is poorly understood and even the definition of the condition remains controversial.

**Methods:** We evaluated the incidence of individual components of metabolic syndrome (MetSyn) in a multi-
T-OR-2110
Gluten vs. Gluten Free Diet: A Nutrient Composition Comparison
Amy Taetzsch Boston Massachusetts, Carrie Brown Somerville MA, Cindy Chen Boston MA, Amy Krauss Boston Massachusetts, Sai Das Boston MA, Susan Roberts Boston Massachusetts

Background: Gluten free diets may be perceived as being healthier than diets containing gluten. However, there is little data on the nutritional composition of these different dietary patterns.

Methods: Two approaches were used to examine the nutritional composition of diets with and without gluten. First, a meta-analysis was conducted to examine the nutrient composition of a gluten-free diet compared to a control (gluten-containing) diet. Studies were included if they reported nutrient information, were conducted in adults and had a control group. Data from 6 studies were compiled and standardized mean differences in nutrient intake were analyzed using a random effects model. Heterogeneity was examined using the Q statistic. Second, theoretical gluten-containing and gluten-free diets meeting national dietary guidelines were compared. For this a 7-day menu consistent with the MyPlate 2000 calorie menu was developed, and versions using gluten-containing or gluten-free foods were analyzed. Nutrient data were expressed as the sum of nutrients by day, focusing on nutrients known to be limiting or overconsumed in the American diet. Paired t-tests or Wilcoxon Sign rank tests were used to evaluate differences between the gluten-containing and gluten-free plans.

Results: Findings from the meta-analysis show the gluten-free diet contained more total energy and less fiber intake versus the control diet, although when heterogeneity was accounted for only lower fiber intake in the gluten free diet remained significant (p<0.01). Findings from the analysis of theoretical menus indicated that the gluten-containing menus were higher in protein, magnesium, potassium, vitamin E, folate, and sodium compared to the gluten-free menus,

Conclusions: Based on these results, gluten-free diets do not have any nutritional advantages for individuals without celiac disease or gluten intolerance, and in some respects may be less healthy than gluten-containing diets.

T-OR-2111
Dietary Omega-3 Fatty Acid Intake is Associated with Decreased Sleep Latency in Healthy Adults
Holly Childs Washington District of Columbia, Lilian de Jonge Fairfax Virginia, Sina Gallo Fairfax VA, Amber Courville Bethesda MD, Shanna Bernstein Bethesda Maryland, Margaret Slavin Fairfax Virginia, Ninet Sinaii Bethesda MD, Monica Skarulis Bethesda MD

Background: Previous research has suggested possible associations between dietary fat intake, obesity and sleep. In a mHypoE-37 neuron cell culture model, saturated fat was found to disrupt regulation of the CLOCK gene (implicated in circadian rhythms) but the addition of docosahexaenoic acid (DHA) attenuated this disruption. There is a paucity of such data in humans. Therefore, the aim of this study was to determine the relationship between total dietary fat, omega-3 fatty acids, and DHA intake with sleep quality among healthy adults.

Methods: Data were from an observational study, aimed to phenotype healthy adults, conducted at the NIH Clinical Center (Bethesda, MD). Adults (n=226) completed 7 day food records to determine dietary intake of total fat and long chain fatty acids. The Pittsburgh Sleep Quality Index (PSQI) assessed overall sleep quality as well as five subcomponents: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, and daytime dysfunction. Medication, demographics and anthropometric measurements were obtained from medical records. Univariate and multivariate regression analyses explored predictors of total PSQI score and its subcomponents.

Results: Medication use, BMI and sex were consistently related to sleep quality. Adjusting for these covariates, percent energy from fat, omega-3 (g/1000 kcal) intake, and DHA (g/1000 kcal) intake were not significant predictors of overall sleep quality. However, when examining PSQI subcomponent scores in adjusted analyses, omega-3 intake was a statistically significant predictor of sleep latency (Adj. R2=0.050, β=-0.340, p=0.042).

Conclusions: While total omega-3 intake was not associated with overall sleep quality, this study suggests the potential role for omega-3 in shortening sleep latency. As short sleep is associated with chronic illness and weight gain, nutritional interventions aimed at increasing sleep duration may lead to improvements in overall health. Thus, further investigation is warranted.

T-OR-2112
Understanding the Role of Dietary Intake in the Relationship Between Alcoholic Beverage Consumption and Waist Circumference Among American Adults
Lauren Butler Hillsborough North Carolina, Jennifer Poti Chapel Hill North Carolina, Barry Popkin Chapel Hill North Carolina

Background: Data from the National Health and Nutrition Examination Survey indicate that 27% of adults in the United States are classified as having excessive alcohol consumption. Excessive alcohol consumption is associated with increased waist circumference (WC) and increased odds of obesity. However, the role of alcohol on waist circumference is not well understood.

Methods: Data were from the 2009-12 National Health and Nutrition Examination Survey (NHANES), a continuous cross-sectional survey of the civilian non-institutionalized population of the United States. All of the 6400 NHANES participants were included in the study. Alcohol consumption in the past year was categorized into 4 groups: non-consumers, light consumers (1-2 drinks per day for women and 1-3 drinks per day for men), moderate consumers (3-4 drinks per day for women and 4-6 drinks per day for men), and heavy consumers (5+ drinks per day for women and 6+ drinks per day for men). Waist circumference was calculated.

Results: Alcohol consumption does not have a significant influence on waist circumference. However, a dose-response relationship was observed between alcohol consumption and waist circumference. Heavy alcohol consumers had a significantly higher waist circumference than non-consumers.

Conclusions: Alcohol consumption is associated with increased waist circumference, and heavy alcohol consumers are at increased risk for obesity. Further research is warranted to determine the causal relationship between alcohol consumption and waist circumference. This information is important for public health interventions aimed at reducing waist circumference and obesity.
**Background:** Inconsistent relationships between alcoholic beverage consumption and waist circumference (WC) might be related to consumption of added sugar through hypothesized increased sweet preference among drinkers.

**Methods:** This study included US adults ≥ 20 years (n = 15,448) from NHANES 2003-2012. Multivariable linear regression was used to examine associations between the number of alcoholic drinks (0, 1, 2, ≥3 drinks per day) and added sugar (g/d) and sugary food/beverage intake (kcal/d) and to determine how the association between the number of drinks consumed and WC was modified or confounded by added sugar intake.

**Results:** Among men, drinking ≥ 3 drinks/d was negatively associated with dairy desserts. Men who consumed 2 drinks/d had lower added sugar intake (72.5 ± 1.8 g/d) compared to non-drinkers (82.0 ± 3.6 g/d). Among women, drinking 1 drink/d was positively associated with dairy desserts; drinking ≥ 1 drink/d was positively associated with candy consumption. Further, higher drinks/d was positively associated with added sugar among women. Compared to non-drinkers, drinking ≥ 3 drinks/d was positively associated with WC among men (adjusted β; 95% CI: 2.41; 0.33, 4.49 cm). This relationship differed by tertiles of added sugar intake. Men with moderate added sugar intake (39.9 to 82.9 g/d), who drank ≥3 drinks/d had higher WC (102.0 ± 0.75 cm) compared to men who drank 2 drinks/d (98.9 ± 0.65 cm). For those in the highest and lowest tertiles of added sugar intake, higher drinking was not associated with higher WC. Among women, drinking 2 drinks/d was negatively associated with WC (-1.61; -3.15, -0.06 cm); this relationship was neither modified nor confounded by added sugar intake.

**Conclusions:** These results suggest contrasts in relationships between drinking and added sugar and WC across gender subgroups. Further studies are needed to explore the role of high-sugar food and beverage intake in differential associations between alcoholic beverage consumption and WC.

**T-OR-2113**

**Inflammation and Components of the Metabolic Syndrome (MetS) in the Insulin Resistance (IR) of African American Adults**

Angela Davis Bethesda maryland, Nicket Dedhia Bethesda Maryland, Andrew Demidowich Bethesda MD, James Reynolds Bethesda MD, Jack Yanovski Bethesda Maryland

**Background:** MetS, a constellation of abnormalities that reflects an unhealthy metabolic state, places adults at higher risk of developing cardiovascular disease (CVD) and Type 2 Diabetes (T2DM). Paradoxically, African Americans (AA), as compared to White Americans (WA), have a higher incidence of diabetes and heart disease, despite having lower levels of MetS components (e.g. lower triglycerides and cholesterol concentrations) than similarly obese WA. We studied if inflammation, an independent factor in predicting cardiometabolic risk, could help explain this disparity through its effects on IR.

**Methods:** We assessed the components of the metabolic syndrome (waist circumference, blood pressure, HDL-cholesterol, triglycerides, and fasting glucose), insulin resistance (HOMA-IR), and inflammation (hsCRP) in a convenience sample of overweight/obese adults. The primary statistical analysis was a MANCOVA to examine the impact of race and inflammation on the measured variables, accounting for age, sex, lean mass, and percentage fat mass.

**Results:** 87 AA (age 35.3±1.1y, 87.4% female) and 161 WA (age 41.5±1y, 65.8% female) adults were studied. After accounting for age, sex and body composition, AA had lower LDL-cholesterol (p<.05), waist circumference (p<.001), and triglycerides (p<0.01), but greater HOMA-IR (p<0.01) and hsCRP (p<0.001) concentrations than did WA. In a regression model, hsCRP significantly (p<.05) and independently contributed to prediction of HOMA-IR. Once hsCRP was in the model, race no longer significantly predicted HOMA-IR (p>.05).

**Conclusions:** In our cohort, AA as compared to WA had a better MetS metabolic profile with lower triglycerides and LDL-cholesterol, but had evidence for greater inflammation that was associated with greater insulin resistance. These findings suggest that inflammation may be a major contributor to the risk of AA for development of T2DM and CVD.

**T-OR-2114**

**Evaluating the Effect of Posting Calories on McDonald’s Menus: A Controlled Natural Experiment**

Jason Block Boston Massachusetts, Suzanne Condon Boston MA, Ken Kleinman Boston MA, Sheryl Rifas-Shiman Boston MA, Jewel Mullen Hartford CT, Stephanie Linakis Boston MA, Maricelle Ramirez Boston MA, Christina Roberto Boston MA, Matthew Gillman Boston MA

**Background:** McDonald’s decision to voluntarily post calories on menus in late 2012 provided an opportunity to examine the long-term effect of calorie labeling among adults and adolescents.

**Methods:** From 2010-2014, we repeatedly visited approximately 100 fast-food restaurants across 6 major chains: McDonald’s, Burger King, Subway, Wendy’s, KFC, and Dunkin’ Donuts in 4 New England cities. We collected customers’ receipts to calculate total calories ordered (“meal calorie content”) and asked customers to estimate their meal calorie content. Before McDonald’s began labeling (“pre”, 2010-2011), we surveyed 606 adults (age 18+) and 524 adolescents (age 11-20) dining at McDonald’s and 1271 adults and 654 adolescents at other chains. After labeling (“post”, 2013-2014), we surveyed 356 adults and 343 adolescents at McDonald’s and 795 adults and 564 adolescents at other chains. We used differences in difference analyses, adjusted for age, sex, BMI, and race, to determine the effect of labeling on customers’ meal calorie content and accuracy of calorie estimations.

**Results:** Demographics were similar during the pre- and post-labeling periods (Adults: mean age 37 and 38 years, non-White race 60% and 61%; Adolescents: mean age 16 years, non-White race 82% and 81%). For adults, meal calorie content pre v. post labeling at McDonald’s declined from 721 kcal to 638 and from 892 kcal to 817 at other chains (P<0.01 for both). For adolescents, calorie contents at McDonald’s declined from 763 kcal to 704 (P=0.05) and from 751 kcal to 744 at other chains (P=0.80). In multivariable models, reductions in meal calories did not differ at McDonald’s compared to other chains for either adults (-2 kcal; 95% CI -7.5, 71) or adolescents (-35 kcal; 95% CI -46, 115). Neither adults nor adolescents at McDonald’s improved their calorie estimation pre vs. post.

**Conclusions:** Meal calorie content at all restaurants declined. Calorie labeling at McDonald’s, however, did not decrease meal calorie content compared to other chains.
T-OR-2115
Nutritional Quality and Child-Oriented Marketing of Breakfast Cereals in Guatemala
Jackie Soo Boston Massachusetts, Paola Letona Guatemala Guatemala, Violeta Chacon Guatemala City Guatemala, Joaquin Barnoya St. Louis MO, Christina Roberto Boston MA

Background: Food marketing has been implicated as an important driver of obesity. However, few studies have examined food marketing in low- and middle-income countries (LMICs). This study documents the prevalence of advertising on cereal boxes in Guatemala and examines associations between various marketing strategies and nutritional quality.

Methods: One box from all available cereals was purchased from a supermarket in Guatemala City, Guatemala. A content analysis was performed to document child-oriented marketing practices, product claims, and health-evoking images. The Nutrient Profile Model (NPM) was used to calculate an overall nutrition score for each cereal (the higher the score, the lower the nutritional quality).

Results: 106 cereals were purchased, and half featured child-oriented marketing (54, 50.9%). Cereals had a mean (± standard deviation) of 5.10±2.83 product claims per cereal, and most cereals (102, 96.2%) contained health-evoking images. Child-oriented cereals had, on average, higher NPM scores (13.0±0.55 versus 7.90±0.74, p<0.001) and sugar content (10.1±0.48 versus 6.19±0.50 g/30g, p<0.001) compared to non-child-oriented cereals. Cereals with health claims were not significantly healthier than those without claims.

Conclusions: In Guatemala, cereals targeting children were generally of poor nutritional quality. Cereals displaying health claims were also not healthier than those without such claims. Our findings support the need for regulations restricting the use of child-oriented marketing and health claims for certain products.

T-OR-2116
Menu Cognitive Load and Ordering Outcomes: A Randomized Controlled Trial

Background: There is interest in altering restaurant menus to improve eating habits. However, the impact of the cognitive load of menu designs on ordering outcomes is unknown. We hypothesized that a complex menu design would increase total meal energy (kcal), and that the effect may depend on the level of restrained eating.

Methods: Participants were randomized to either a “hard” (high cognitive load, H) or “easy” (low cognitive load, E) menu. The first phase (n=30) was conducted without screening for eating behavior traits. The second phase (n=31) was conducted in hungry (fasted since the prior evening), restrained eaters (above median cutoffs). Participants were given five minutes to order, while galvanic skin response (GSR) was measured as an indicator of cognitive load.

Results: Participants rated the H menu as more distressing and annoying than the E menu (p=0.0014). GSR change from baseline was significantly higher for H (p=0.04). Participants assigned to E ordered more items than those assigned to H after adjusting for gender and phase (3.4 ± 1.13 vs. 2.54 ± 1.28, respectively, p=0.022). Although participants assigned to the easy menu tended to order more energy overall, this was not statistically significant after adjusting for gender and phase (1523 ± 625 vs. 1236 ± 643, respectively, p=0.18).

Conclusions: Contrary to our hypothesis, participants ordered lower kcal meals from the H menu compared to E menu. The effects of prolonged high cognitive load activities on eating behavior may not be equivalent to effects of menu cognitive load on ordering behavior.

T-OR-2117
Effect of Physical Activity Calorie Equivalent Labeling on Selection of High-Calorie Foods in a College Dining Hall

Background: Physical activity calorie equivalent (PACE) labeling shows promise as a technique to reduce portion size but has not yet been examined in college students, a population vulnerable to both weight gain and eating disorders. This study evaluated the effect of posted PACE labels on the selection of pizza and French fries in a dining hall at a large Northeast university.

Methods: A focus group was conducted to test different exercise equivalent messages for acceptability and potential impact; messages were finalized based on this feedback. Food selection data (# of pans) for two baseline weeks (no food signage) and two intervention weeks (exercise equivalence posted above pizza and French fries serving areas) was provided by the university’s dining services through their database. The same food items were served during both the baseline and intervention periods.

Results: As predicted, there was a significant decrease in the selection of cheese pizza (p=0.03) and French fries (p<0.01) during the intervention weeks compared to the baseline weeks.

Conclusions: PACE labels showed some promise as an inexpensive, minimal intervention that might alter food selection in college students. Future studies should be conducted over a longer period of time and control for unexpected confounding variables (e.g, snow days) when working within a university dining hall setting. Additionally, student patrons exposed to the intervention expressed concern for the stigmatizing nature of the food labels and the implication of perpetuating disordered eating behavior. Moving forward, food labeling efforts should be sensitive to the prevalence of eating disorders on college campuses when designing materials promoting healthy dietary choices.

T-OR-2118
Preliminary Results: Implementation of the regulation on television and film advertising of food and beverages to children in Mexico

Background: In July 2014, the Guidelines governing advertising of food and non-alcoholic beverages (F&B) to children on television and movie theaters were implemented. Nutritional criteria and restriction of schedules and types of
program, where products with low nutritional value cannot be advertised towards children less than 12 years of age, were established therein.

**Methods:** We recorded 567 hours of broadcast television from August to December 2014, of the four national channels with the highest audience. Analysis and coding of recordings was performed using the coding manual from the Rudd Center for Food Policy and Obesity. For the analysis of adverts, the four regulated categories of F&B (i.e. flavored beverages, snacks, confectionery and chocolates) stipulated in the Guidelines, as well as time restriction for advertising products which do not meet the nutritional criteria, were used.

**Results:** From all the identified adverts (n = 21 628), 17.8% were of F&B. Of all F&B ads, 27% (n = 1039) belonged to the four analyzed categories. It was also observed that form the four regulated categories, 26.8% of the ads were being broadcasted during the restricted time, mainly in programs such as soap operas (49.3%), movies (20.1%) and sports programs (11.5%).

**Conclusions:** Preliminary research has reported a high preference within the child population for soap operas, where the broadcasting of products that do not comply with the nutritional criteria, is permitted. Therefore, it is recommended to review the criteria for the type of programs where, the advertising of products that do not meet the nutritional criteria is permitted.

**T-OR-2119**

*The Influence of Sugar-Sweetened Beverage Health Warning Labels on Parents’ Choices and Knowledge*

**Christina Roberto**

*Philadelphia Pennsylvania*

**Background:** Two U.S. states have introduced bills that would require sugar-sweetened beverages (SSBs) to display health warning labels, but little is known about the influence of such labels. The goal of this research was to determine how warning labels may influence consumers and which designs are most impactful.

**Methods:** We recruited a demographically diverse group of 1,707 parents through Survey Sampling International. Parents were randomized to one of 5 health warning label conditions: 1) No health warning label (control); 2) Calorie label; or 3-5) one of three different text versions of the proposed California warning label (e.g., SAFETY WARNING: Drinking beverages with added sugar(s) contributes to obesity, diabetes, and tooth decay). Parents selected beverages for their children in a vending machine choice task, indicated their interest in receiving coupons for different SSBs and non-SSBs, and rated perceptions of health, taste, and willingness to pay for different drinks.

**Results:** Preliminary ANOVA analyses compared no warning label group, calorie label group, and all warning label groups combined. Significantly fewer parents choose an SSB for their child to drink in the warning label condition (42%) versus the no label condition (60%) and calorie label condition (51%); the effect of warning labels was stronger among those with a high school degree or less. Parents also chose significantly fewer coupons for SSBs. Warning labels significantly decreased perceptions of the healthfulness of SSBs for children (especially among those with less education) and purchase intent of SSBs. Labels significantly increased perceptions that SSB intake will lead to weight gain and diabetes among their children. All p values <.01. Data for different label versions will also be presented.

**Conclusions:** Health warning labels on SSBs improve parents understanding of the health harms associated with overconsumption of such beverages and may cause parents to purchase fewer SSBs.
Wednesday November 4, 2015
Posters on Display: 12:00-1:30 PM

T-P-3000
One, 25-Dihydroxyvitamin D Regulation of Lipid Metabolism in 3T3-L1 adipocytes
Brienna Larrick West Lafayette Indiana, Kee-Hong Kim West Lafayette Indiana, Dorothy Teegarden West Lafayette Indiana

Background: It is well established that vitamin D is sequestered in adipose tissue, and many studies have demonstrated vitamin D regulation of adipocyte differentiation, inflammation, and energy metabolism, highlighting the multifaceted role that vitamin D plays in the regulation of adipose tissue physiology. As dysregulation of adipocyte lipid metabolism is directly related to a variety of metabolic diseases associated with obesity, our studies aim to determine the impact of 1,25-dihydroxyvitamin D (1,25(OH)2D) on adipocyte lipid metabolism.

Methods: Differentiated 3T3-L1 adipocytes were stimulated with 1,25(OH)2D (10 nm) or vehicle for the times indicated. Triacylglycerol (TAG) accumulation, glycerol release and non-esterified fatty acid (NEFA) release were determined using commercially available kits. Fatty acid uptake was assessed using BODIPY FL C16. Protein expression and phosphorylation of lipid metabolism enzymes were determined by Western blotting.

Results: 1,25(OH)2D stimulated a 21% reduction in TAG accumulation after 4 days (p<0.01), despite an increase in fatty acid uptake following 2-4 days of treatment (p<0.01). Glycerol release was significantly upregulated by 1,25(OH)2D following 1-4 days of treatment, and was completely prevented by PKA inhibitor H-89 (75 µM), indicating PKA-dependent lipolysis. Consistent with this, phosphorylation of HSL at PKA phosphorylation site Ser660 was increased by 1,25(OH)2D (p<0.02), with no change in HSL protein expression. Interestingly, NEFA accumulation in the cell culture medium was not increased in response to 1,25(OH)2D.

Conclusions: Collectively, 1,25(OH)2D stimulates PKA-dependent lipolysis leading to reduced TAG storage in 3T3-L1 adipocytes. Lack of extracellular NEFA accumulation suggests that the liberated fatty acids are undergoing oxidation or utilization by the cell. These changes in adipocyte lipid metabolism may be protective against excessive fat mass accumulation and metabolic disorders associated with disturbed adipocyte lipid metabolism.

T-P-3001
Adipocyte Diameter in Human Abdominal Fat Compartments: Comparative Analysis of Three Measurement Methods and Their Relevance for Cardiometabolic Risk
Sofia Laforest Québec QC - Québec, Andréanne Michaud Québec Québec, Mélissa Pelletier Québec Québec, Alain Geloën VILLEURBANNE FRANCE, André Tchernof Québec City QC

Background: Adipocyte diameter (AD) is a marker of the cardiometabolic alterations related to obesity. Although each method has specific advantages and disadvantages in assessing adipocyte population distributions, collagenase digestion (CD), osmium tetroxide fixation (OS) and histological analysis (HIS) have been used to assess AD. We performed a comparative analysis to test how AD from each method relates to adiposity indices and metabolic variables.

Methods: Surgical samples of omental (OM) and abdominal subcutaneous (SC) adipose tissue were obtained from 54 women (age 35.2-58.4 years; BMI 20.9-41.1 kg/m2). CD, OS and HIS were used to determine median AD of the Gaussian distribution in each sample. Body composition and fat distribution were respectively assessed by DXA and CT. Fasting blood samples were collected to assess cardiometabolic risk factors.

Results: HIS-AD was lower and OS-AD higher than CD-AD in every BMI category for the OM and SC depots (p<0.001 for all). AD measurements by all methods were intercorrelated (r=0.43 to 0.83, p<0.01 for all). Positive associations were found between AD from all techniques and adiposity measurements (p<0.01 for all). HIS-measured AD in OM tissue and OS-measured AD in SC tissue were the best correlates of adiposity measurements (r=0.38 to 0.82). OM AD was associated with HOMA-IR and VLDL-C levels regardless of the technique (p<0.05). In SC adipose tissue, only HIS- and OS-AD were related to HOMA-IR (p<0.01) and only HIS-AD was related to VLDL-C levels (p<0.05). OM HIS- and OS-measured AD were the only correlates of HDL-C levels (p<0.05, for both). Associations were generally stronger in OM than in SC adipose tissue.

Conclusions: Although HIS led to smaller AD in all BMI categories, the association between AD and anthropometric or cardiometabolic risk factors was only slightly affected by the method used. Large OM AD was a better predictor of cardiometabolic alterations than large SC AD regardless of the method.

T-P-3002
Differential expression of miRNAs in subcutaneous adipose tissue of women with and without obesity.

Background: A growing body of evidence has been accumulating for the connection between angiogenesis, inflammation and obesity in the last years. MicroRNAs (miRNAs) have been shown to be important regulators of gene expression. We hypothesized that specific miRNAs that target genes involved in angiogenesis, inflammation and adipogenesis are differentially expressed in adipose tissue from women with or without obesity.

Methods: Thirteen miRNAs that target genes involved in angiogenesis, inflammation and adipogenesis were selected and their expression was evaluated in subcutaneous adipose tissue (SAT) of 20 women undergoing bariatric surgery and 19 women without obesity submitted to abdominal cosmetic surgery. MiRNAs were quantified using quantitative real-time polymerase reaction and detection with hydrolysis probes.

Results: MiR-16 expression was approximately 150 times higher in SAT of non-obese than in obese women (n-fold-change obese vs. non-obese = -151.121; P<0.001). Additionally, the expressions of miR-27b and miR-424-5p were correlated with waist circumference in non-obese women, even after adjustment for body mass index (BMI; r = 0.453; P
Background: Human cytomegalovirus (HCMV) infection has been linked to atherosclerosis, insulin resistance, metabolic syndrome and diabetes mellitus but the mechanisms involved remain unclear. Adipose inflammation and dysfunction is a common feature of these diseases. Therefore we investigated whether HCMV infection alters adipocyte function.

Methods: Human adipose-derived stromal/stem cells (hASCs) were infected with HCMV. The presence of viral gene products was determined by western blotting and immunofluorescent microscopy. Infectious viral progeny were detected by plaque assays. Viral effects on differentiation were determined by qRT-PCR. Changes in hASC gene expression were measured using oil red O and alizarin staining and quantification. Infectious viral progeny were detected by plaque assays. Viral effects on differentiation were determined by qRT-PCR.

Results: We report that hASCs are permissive for complete replication of HCMV. Viral intermediate-early, early, and late gene products were detected in hASCs and the release of infectious progeny was verified. Infected hASCs displayed increased glucose uptake but impaired differentiation abilities along the adipogenic and osteogenic lineages. Expression patterns of genes involved in differentiation was altered in HCMV infected hASCs.

Conclusions: These results suggest that HCMV infection of hASCs may promote adipose tissue dysfunction that results in the development of localized and systemic pathogenesis.

T-P.3004
In Vivo Adipocyte Kinetics in Subcutaneous Adipose Tissue is Associated with Markers of Metabolic Health
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Background: Adipose tissue (AT) distribution, rather than overall excess adiposity, may be a better determinant of metabolic health. Abdominal fat is classically associated with the complications of obesity, while lower body (gluteal and femoral) fat may be protective. Studies suggest that adipose expansion involves depot-specific cellular mechanisms.

Methods: We previously assessed differences in in vivo adipogenesis (new DNA synthesis) between the subcutaneous abdominal (scABD) and femoral (scFEM) AT depots using an 8 week incorporation of deuterium (2H) into the DNA of adipocytes and preadipocytes in 25 obese women (14 Black; 11 White; 31 ± 6 years; BMI 32.6 ± 2.7 kg/m2; 44.3 ± 4.1 % body fat).

Results: In our present analysis, we examined how cell proliferation in the adipose depots correlate with risk factors for metabolic syndrome. Cellular preadipocyte and adipocyte formation rates in both the scABD (p < .01; p < .01) and scFEM (p < .05; p < .01) depots were positively associated with visceral AT mass. Notably, the proliferation of adipocytes in each depot correlated negatively with insulin sensitivity, as assessed by the Matsuda insulin sensitivity index (p < .05 and p < .01, respectively).

Conclusions: This data suggests that low insulin sensitivity may drive an increase in adipogenic rate to improve insulin sensitivity. This in vivo method will prove useful to assess adipocyte kinetics in response to a variety of interventions, such as diet, exercise or pharmacological treatment.
T-P.3006
Loss of Siah2 protects female and male mice from high fat diet-induced glucose intolerance
Gail Kilroy Baton Rouge LA, Tamra Mendoza Baton Rouge LA, Randall Mynatt Baton Rouge LA, Elizabeth Floyd Baton Rouge Louisiana

Background: Our previous study in male C57BL/6 wild-type and Siah2KO mice showed that the ubiquitin ligase Siah2 contributes to the relationship between obesity and impaired carbohydrate metabolism. Siah2KO male mice become obese with enlarged adipocytes on a high-fat diet, but do not develop obesity-induced glucose intolerance or insulin resistance. To determine if the effect of Siah2 is sex-dependent, we conducted a pilot study in male and female wild-type and Siah2KO mice challenged with chronic energy excess.

Methods: Male and female wild-type and Siah2KO mice were fed a defined low fat (10% fat, 17% sucrose) or high fat (45% fat, 17% sucrose) diet for three months, beginning at four weeks of age. Body weight, food intake and body composition were measured throughout the study and glucose and insulin tolerance tests were conducted at three months on each diet.

Results: Although lower in body weight, female mice have higher adiposity than male mice at baseline. Increased adiposity in the females is maintained in mice fed a low fat diet, but when fed an obesogenic diet, adiposity in males exceeds females. Although females gain 50-60% of their body weight on a high fat diet, they remain more glucose tolerant than males. Like the Siah2KO male mice, the Siah2KO female mice are more insulin sensitive than wild-type females as determined by glucose and insulin tolerance testing and fasting glucose and insulin levels.

Conclusions: Unlike males, increased adiposity in female mice is not associated with glucose intolerance. The effect of Siah2 on the relationship between adiposity and insulin sensitivity is independent of sex or diet.

T-P.3007
Microvascular Dilatory Dysfunction and Elevated Expression of COX2 is Associated with Pathological Obesity
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Background: Heterogeneity in obesity pathology demonstrates metabolically healthy (MHO) and pathological (PO) obese cohorts. Vascular dysfunction of small vessels of insulin sensitive tissues contributes to obesity pathology. This study aimed to investigate heterogeneity in endothelium-dependent relaxation of adipose arterioles.

Methods: SC and OM vessels from obese patients were used to investigate endothelial relaxation and changes in the expression of genes related to hypertension. Relaxation with acetylcholine (endothelium-dependent relaxant) in the absence or presence of NO-Nitro-L-arginine methyl ester (a nitric oxide [NO] synthase inhibitor) was assessed. Relaxation to SNP and PGE2 was also recorded. mRNA expression was ascertained in stromovascular cells (SVF) using hypertension PCR arrays.

Results: Depot and disease specific variations in vasorelaxation and mRNA expression were evident. In OM, compared to SC, vasorelaxation to acetylcholine was attenuated (p<0.01), while relaxation to SNP and PGE2 was greater (p<0.01). In OM vessels acetylcholine curves for MHO patients were less attenuated, compared with PO patients. In MHO patients, OM compared to SC SVF, had elevated mRNA expression for AGT (p=0.0005), AR2G (p=0.02), CLIC5 (p=0.02), EPHX2 (p=0.05), ITPR1 (p=0.01) and PRKG1 (p=0.004); while PO OM SVF had greater expression of CLIC5 (p=0.04) and PDE3B (p=0.04). A direct comparison of OM SVF of MHO to PO showed only COX 2 remained elevated (p=0.008).

Conclusions: Systemic hyperinsulinaemia was associated with adipose microvascular changes in i) NO-mediated vasodilation, and, ii) SVF hypertensive gene profile. Endothelial vasomotor dysfunction and elevated COX2 mRNA expression appears depot-specific with marked impact on OM vessels of insulin-resistant obese subjects.

T-P.3008
Omental and Subcutaneous Dedifferentiated Adipocytes: Developmental Gene Expression and Re-Differentiation into Multiple Lineages
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Background: Mature adipocytes undergo dedifferentiation to fibroblast-like cells (DFAT cells) when incubated in ceiling cultures over 10 to 15 days. This process is relatively independent of the fat depot, obesity level, sex or age of the cell donor. DFAT cells express embryonic stem cell markers and may re-differentiate into lipid-storing adipocytes or other cell types under appropriate conditions. Our objective was to examine embryonic stem cell gene expression in whole tissue, isolated cell fractions and DFAT cells from the subcutaneous (SC) and omental (OM) fat compartment. The capacity of DFAT cells to re-differentiate into adipocytes or osteoblasts was also tested.

Methods: SC and OM adipose tissue samples were obtained during bariatric surgery. A portion of whole tissue was frozen immediately. Mature adipocytes and the stroma-vascular fraction (SVF cells) were isolated by collagenase digestion. Isolated adipocytes were dedifferentiated by ceiling culture. Embryonic stem cell marker expression was measured by real-time RT-PCR. DFAT and SVF cells were re-differentiated into adipocytes (assessed by oil red O staining) or osteocytes (assessed by alizarin red staining).

Results: Mature adipocytes from all patients successfully dedifferentiated. Expression levels of Twist1, Tbx5, Hoxc8 and Hoxc9 were significantly higher in OM vs SC tissue (p<0.05 for all). The same depot difference was observed in mature adipocytes and DFAT cells (p<0.05), but not in SVF cells. Similar trends were observed for Runx2 and Sox9 expression but they did not reach significance. The extent of re-differentiation of DFAT cells into adipocytes or osteocytes was variable and no depot-difference was observed. Similar results were obtained with SVF cells.

Conclusions: Depot differences in the expression of several embryonic stem cell markers are maintained in DFAT cells. However, these differences do not relate to the capacity of these cells to re-differentiate into adipocytes or osteocytes.
T-P.3009
Organic Cation Transporter OCT3 Highly Correlates with UCP1-Rich Deep-Neck Adipose Tissue in Man.
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Background: Uncoupling protein 1 (UCP1)-rich adipose tissue is capable of producing heat from fat and glucose upon norepinephrine stimulation, thus linking it to the treatment of obesity and diabetes. In man, such adipose tissue is found mainly in the deep neck (DNAT). Tissue regulation is a complex, poorly understood matter, but organic cation transporters (OCT) may play a role. OCTs are permeases that regulate a variety of cationic substances, xenobiotics and physiological compounds in multiple tissues. OCT3 has been proposed to participate in catecholamine removal in peripheral tissues with sympathetic innervation as well as in secretion of other signaling molecules, e.g. acetylcholine. The presence of OCT3 in UCP1-rich tissue remains uninvestigated despite the likelihood of an important regulatory role in tissue function.

Methods: Human subcutaneous adipose tissue (SAT) and DNAT biopsies are obtained during neck surgery (thyroidea- and parathyroidea surgery). Gene expression is analyzed by qPCR.

Results: Adipose tissue biopsies were obtained from 35 individuals, mean age=57.8 (31-84). Analysis showed significantly higher gene expression levels of UCP1 (P<0.001), CIDEA (P=0.0008), Dio2 (P=0.001) and OCT3 (P=0.0014) in DNAT compared to SAT. UCP1 expression averaged 32.5 times higher in DNAT. Within DNAT, OCT3 strongly correlates with UCP1 expression (P=0.001). Expression of the acetycholinesterase enzyme significantly correlates with UCP1 expression in SAT (P=0.026), but not when adjusting for OCT3 expression (P=0.518). Moreover OCT3 expression is significantly higher (P=0.0198, n=6) in isolated adipocytes than in stromal vascular fraction.


T-P.3010
Zerumbone Ameliorates High Fat Diet-Induced Obesity via the Regulation of microRNA-146b/SIRT1 Pathway in Mice
Jiyun Ahn Seongnam-si Gyeonggi, Tae Youl Ha Seongnam-si Gyeonggi

Background: SIRT1 plays a key role in regulating metabolism, and SIRT1 activation may be a promising strategy to treat metabolic syndrome. This study investigated whether zerumbone ameliorated diet-induced obesity through SIRT1 activation.

Methods: We used differentiated 3T3-L1 fibroblasts to examine the effect of zerumbone on adipogenesis through the miR-146b/SIRT1 cascade. To investigate the anti-obesity effect of zerumbone in vivo, we fed zerumbone to high-fat diet-induced obese C57BL/6J mice for 8 weeks and measured body weight, adipose tissue size, and blood lipid profiles. We also measured the effect of zerumbone supplementation on SIRT1 and AMPKs signaling pathways in the white adipose tissue of these mice.

Results: Zerumbone inhibited adipogenesis through the miR146b/SIRT1 pathway and significantly reduced diet-induced obesity in mice. Zerumbone supplementation was associated with miR-146b downregulation, followed by the downregulation of SIRT1 and the deacetylation of FOXO1 and PGC1α, respectively, in the white adipose tissue of these mice. Zerumbone also activated AMPK and modulated lipid metabolism in adipose tissue by increasing fatty acid oxidation and reducing adipogenesis gene expression, respectively.

Conclusions: Zerumbone inhibited adipogenesis and ameliorated diet-induced obesity in mice via the miR-146b/SIRT1 pathway, suggesting that zerumbone could target obesity-related metabolic disorders through its stimulation of SIRT1 activity.

T-P.3011
β-Lapachone attenuates high-fat diet induced obesity through the regulation of miR-494/ATF3 pathway
Tae Youl Ha Seongnam-si Gyeonggi, Jiyun Ahn Seongnam-si Gyeonggi, Young-Min Choi Seongnam-si Gyeonggi

Background: β-lapachone (BLC), main active compound of Taheebo, has been reported to have anti-obesity effect. However, the exact molecular mechanism is still unclear. In this study, we tried to find how BLC inhibit obesity in the perspective of miRNA regulation.

Methods: We used 3T3-L1 cells to examine the effect of BLC on adipogenesis through the miR-494/ATF3 pathway. To investigate the anti-obesity effect of BLC in vivo, we fed BLC to high-fat diet-induced obese C57BL/6J mice for 8 weeks and measured body weight, adipose tissue size, and blood lipid profiles. We also measured the level of ATF3 in the white adipose tissue of these mice.

Results: We observed miR-494 expression was reduced in white adipose tissue (WAT) of high-fat diet (HFD) fed mice. BLC normalized decrease of miR-494 and evoked downregulation of ATF3, one of targets of miR-494. In 3T3-L1 cells, BLC inhibited adipocytes differentiation and upregulated miR-494, which led to decrease of ATF3. The adipocyte differentiation was inhibited in ATF3-knockdown 3T3-L1 cells. The expressions of adipogenesis related markers like PPARγ, Ap2, and C/EBPα were also reduced. We also confirmed the increased level of ATF3 in adipose tissue from obese mice.

Conclusions: Taken together, our data demonstrate that BLC may be a useful phytochemical for the prevention of obesity through the upregulation of miR-494 followed by decrease of ATF3.
Conclusions: The presence of oleic acid exhibited an increased triglyceride accumulation assessed by qPCR and the effect of 3-day CaSR stimulation on the human HepG2 hepatic cell line, CaSR expression was and aP2 protein abundance was evaluated by immunoblot. In HepG2 human cell line, and 72h cinacalcet-treated cells in the expression (p=0.01). The presence of CaSR was verified in HepG2 human cell line, and 72h cinacalcet-treated cells in the presence of oleic acid exhibited an increased triglyceride content (p<0.05)

Conclusions: Our data suggest that CaSR activation in mature adipocytes is associated with decreased adiponectin and increased aP2 expression, which may be associated with hepatic insulin resistance and gluconeogenesis, respectively. This, in addition with the observed increased intracellular hepatic triglyceride (a possible marker of hepatic steatosis) suggests that CaSR stimulation could be directly and indirectly involved in the development of the hepatic metabolic consequences associated with obesity.

T-P-3013
Central Adrenal And Thyroid Hormone Axes
Abnormalities In Obese Children: A Cause For Concern?
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Background: Obese and overweight (Ob/Ow) children may demonstrate mild elevations in TSH and high cortisol levels, but have normal FT4 and cortisol response to stress. Here we show evidence for central abnormalities in both the thyroid and ACTH axes in (Ob/Ow) children and adolescents.

Methods: We aim to determine the prevalence of central hypothyroidism (CH) and central adrenal insufficiency (CAI) in (Ob/Ow) pediatric patients. A retrospective chart review in pediatric patients two years of age and older from our endocrine clinic from January 2013-October 2014. A total of 2687 patient charts were analyzed. Overweight and obesity were defined as a BMI >85th% and > 95th%tile for age and sex respectively. CH was defined as presence of a low free T4 (equilibrium dialysis) with normal or low TSH (ICMA assay). CAI was diagnosed when cortisol levels failed to rise ≥20 μg/mL at 30 or 60 minutes after 1 mcg IV co-syntropin stimulation. MRI of the pituitary was obtained in all CH and CAI patients.

Results: Out of 2687 patient charts, a total of 1627 patients (60%) were identified as (Ob/Ow) of which 60% were female and 40% male. Of these (Ob/Ow) patients who had thyroid functions done, 74 (4.4%) had CH. Of these 74 CH patients, 24 (32%) also had CAI. The mean age of this group was 13.27 years (SD=±2.73). Of the patients with CH, 5 were on Growth Hormone therapy, 9 on antipsychotic medications, and 3 had panhypopituitarism. 7 Ob/Ow patients (9.4%) with CH or CAI had a pituitary microadenoma on MRI.

Conclusions: Although (Ob/Ow) is well-known to impact endocrine function in children, our data suggests a high rate of central hypothyroidism and adrenal insufficiency in these patients. This association has not been documented before. Further investigations are needed to study the pathophysiology, causal relationship between thyroid, adrenal axes and weight gain and the clinical impact these abnormalities may have on obesity management in the future.

T-P-3014
Circulating Levels of Spexin in Obese vs. Normal Weight Children
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Background: Spexin is a novel peptide that provokes weight loss in rodents with diet induced obesity. Spexin gene expression is down regulated in obese human fat and its concentration is lower in obese compared to lean adults, suggesting a potential satiety-inducing role in humans. There are no reports on Spexin in children. The aim of the study was to determine Spexin concentrations in obese vs. normal weight children in relation to other nutritional and satiety factors and selected adipokines.

Methods: A total of 69 children (51 obese and 18 normal weight, Age=15.3 ±0.26 years) were studied. Spexin was measured using a specific immunoassay. Leptin, total & high molecular weight adiponectin, interleukin-6 (IL-6), high-sensitivity c-reactive protein (CRP), resistin, e-selectin, free 25(OH) vitamin D, glucose and insulin were also measured. Mann Whitney U test was used to compare the median Spexin between obese and lean children. Pearson and Spearman rank correlations, which ever appropriate, were used to measure association of Spexin with other markers.

Results: Spexin levels were significantly lower in obese vs. lean children, 0.33 ng/mL (0.27-0.44) vs 0.42 ng/mL (0.33-0.55); p=0.024. Spexin did not correlate with other adipokines and/or insulin and glucose levels, but strongly correlated with free 25(OH) vitamin D levels (r=0.589; p=0.006, n=20).

Conclusions: Circulating levels of Spexin are lower in obese children compared to their lean counterparts similar to that reported in adults. This along with the data on lack of relationship between Spexin and other adipokines, but the strong relationship between Spexin and free 25(OH) vitamin D are intriguing. Further studies are required to determine the clinical significance of these findings in obese children.

T-P-3015-DT
Core Body Temperature and Hormonal Responses with Fasting and Overfeeding
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Background: We assessed core body temperature (CBT), urinary free cortisol (UFC) and urinary catecholamines (UCC) during fasting and overfeeding (OF) to investigate underpinnings of energy expenditure (EE) changes.

Methods: Sixty-two subjects (13AA/18C/10H/21NA, 13F/49M, 28.5±10.1% fat, 37.1±10.3y) with normal glucose regulation and measures of body composition (DXA) had EE assessed in a metabolic chamber during four 24h diets, given in random order with a washout period between each, and including energy balance (EB), fasting, and OF with twice energy requirements using both a high carbohydrate (HC) (75% CHO, 5% fat, 20% protein) and a high fat (HF)(20%
CHO, 60% fat, 20% protein) diet. CBT was measured during each diet, but the analysis was limited to men due to menstrual cycle temperature variation in women. UFC (30.3±14.6 mcg/24h) and UCC were measured during each diet.

Results: Compared to EB, EE decreased with fasting (-7.7±4.8%, p<0.001) and increased with OF, but more so in the HC diet (14.1±6.0 v 7.8±9.0%; p<0.0001). Mean 24h CBT only differed between fasting and HF OF (36.81 ± 36.92°C; p=0.02). However, maximum daytime CBT increased with any feeding compared to fasting (fasting 37.17 v. EB 37.28, HC 37.32, HF 37.38°C; all p<0.05), but did not differ between diets. Mean 24h CBT correlated with the EE change only during the HC diet (p=-0.6, p=0.01). UFC did not differ by diet, nor did it correlate with changes in EE. Higher UCC correlated with lower %fat (r=-0.34, p<0.01). UCC were lower during fasting (i.e. norepinephrine-to-epinephrine ratio: 4.5 v 6.3; p<0.0001). Higher UCC, adjusted for %fat, correlated with greater EE increase with HC (r=0.34, p=0.03), but not HF OF. Mean CBT (β=1% per 0.1°C; p=0.02) and UCC (β=0.02%; p=0.01) were independent predictors of the increase in EE with HC OF.

Conclusions: CBT and UCC increase with feeding. Higher 24h CBT may limit EE increase in HC OF. Mechanisms of EE increase with overfeeding may differ depending on macronutrient intake.

T-P-3016  
Ghrelin Cell-Selective β1-Adrenergic Receptor Deletion Induces Hypoglycemia and Hypoglycemia  
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Background: Ghrelin is a gastric hormone with key orexigenic and glucoregulatory actions. These actions are especially evident upon severe food restriction, during which experimental induction of deficient ghrelin causes life-threatening hypoglycemia. While caloric restriction-associated ghrelin release is well-described, components of the ghrelin cell secretory apparatus are mostly unknown. Here, based on earlier findings of high β1-adrenergic receptor (β1Adr) expression in ghrelin cells and β1Adr-dependent stimulation of ghrelin secretion from isolated ghrelin cells, we hypothesized that activation of ghrelin cell β1Adr is required for basal caloric restriction-induced ghrelin release and ghrelin's ensuing protective glucoregulatory response.

Methods: We generated a mouse model lacking β1Adr selectively from ghrelin cells (GC-β1AdrKO) by crossing ghrelin-Cre mice to novel mice with a loxP-flanked β1Adr gene. We assessed ghrelin secretion and metabolic parameters in response to 24h fasting, chronic caloric restriction (40% of usual daily calories x 7 d), chow and high fat diet.

Results: GC-β1AdrKO mice had more than 2X lower basal and 5X lower fasting plasma acyl- and total ghrelin. Upon chronic caloric restriction, GC-β1AdrKO mice had 5X lower ghrelin and, unlike control littermates, experienced profound hypoglycemia. Body weight and composition upon chow or high fat diet exposure and fasting-induced rebound feeding were similar in GC-β1AdrKO mice and control littermates.

Conclusions: In summary, β1Adr expression in ghrelin cells is required for basal ghrelin release and for the usual enhanced ghrelin secretory response to caloric restriction. While insufficient ghrelin secretion resulting from ghrelin cell-specific β1Adr deletion does not impact body weight, body composition or the hyperphagic response to fasting, it does cause profound hypoglycemia upon chronic caloric restriction. This highlights the critical function of ghrelin to prevent hypoglycemia and promote survival during starvation.

T-P-3017  
Inactivation of Adipose Angiotensinogen Reduces Adipose Tissue Macrophages and Increases Adipose Cell Metabolic Activity  
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Background: The adipose renin-angiotensin system (RAS) has been linked to obesity-induced inflammation, through mechanisms that are not completely understood. Previously, we reported that overexpression of Angiotensinogen (Agt) in adipose tissue increased adiposity, insulin resistance, adipose and systemic inflammation in mice fed a low-fat diet (LF). Methods: To further dissect the direct role of adipose Agt in metabolic disorders, we created an adipose-specific Agt knockout (Agt-KO) mice using the Cre-LoxP system. Agt-KO and control (WT) littermates were fed either a LFD or high-fat diet (HFD) to assess metabolic changes when Agt was inactivated. Additionally, gene and protein expression analyses were performed on white adipose tissue (WAT) from these mice. Further, we isolated WAT stromal vascular cells for metabolic extracellular flux assays.

Results: No significant differences in body weight or fat mass were observed between the WT and the Agt-KO groups on either diet. However, GTT showed that the latter cleared glucose more rapidly than the WT mice, consistent with higher expression of genes involved in glucose transport, fatty acid metabolism and insulin signaling. Furthermore, adipose Agt inactivation reduced total macrophage infiltration in both the LFD and HFD fed Agt-KO mice. Lastly, extracellular flux analyses revealed an overall increased metabolic activity (both in oxygen consumption and extracellular acidification rates) in stroma vascular cells from Agt-KO compared to WT mice.

Conclusions: Our findings indicate that adipose-specific Agt inactivation leads to reduced adipose inflammation and increased glucose clearance mediated at least in part via increased metabolic activity of adipose cells. Funded by a GIA from the AHA Southwest Affiliate.

T-P-3018  
Plasma Steroids and Obesity in Women: Elevated Total Adiposity Relates to Low Levels of Androgenic Steroids and Their Precursors  
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Background: In men, obesity has generally been associated with hypoandrogenism. In women, the association between androgen levels and adiposity remains equivocal. Methodological limitations in measuring low steroid levels may explain these discrepancies. To date, obesity-related alterations in the global profile of circulating steroids have never been clearly examined in women.

Methods: In a sample of 41 premenopausal women (age 46±3 years; BMI 26.9±4.1 kg/m2) undergoing elective gynecological surgery but otherwise healthy, 19 plasma
Obesity has been linked to sarcopenia and recently fat mass has been negatively correlated with bone mass. The purpose of this study was to evaluate the potential mechanisms underlying obesity, sarcopenia and osteoporosis that may co-occur in the aging female body.

**Methods:** Thirty-six 5- and 10-month-old female rats were chosen to model pre- and post-menopausal women, respectively. Rats were divided into three treatment groups in each age category: sham, ovariectomized (ovx), and ovx+E2 (receiving 17β-estradiol twice a week) and were pair fed with a semi-purified diet. Body composition was measured by dual-energy X-ray absorptiometry. Bone properties were examined using peripheral quantitative computed tomography (pQCT) scans and Image-J image analysis software with BoneJ plugin, we prospectively examined lean muscle density (LD) and lean muscle area (LA), and intermuscular fat density (FatD) and area (FatA) at the 66% tibia (caf) pre-surgery (baseline), and 3, 6, and 12 months post-surgery in 21 (15 female, 6 male) obese bariatric surgery participants (45.3 ± 12.7 years; BMI 45.3 ± 6.4 kg/m2).

**Results:** Compared to baseline, 12-month body weight declined 33.5 kg (-23%, p=0.001). LD increased only at 12 months post-surgery (+1.3%, p=0.021), while LA significantly decreased at each time point with a 13% (p=0.003) decline at 12 months. FD remained unchanged over time, but FA declined 45% (p=0.004) at 12 months compared to baseline.

**Conclusions:** We showed that 12-month post-bariatric surgery changes in limb area at the calf among extremely obese adults were mostly due to decreased intermuscular fat area, rather than lean muscle area. Similar to previous studies, muscle density significantly increased over time. Future research should examine whether changes in intermuscular adipose tissue stores persist beyond the first postoperative year and whether they are related to muscle strength and mobility.

**T-P-3021**

**Depot-Specific Effects of Treadmill Running and Rutin on White Adipose Tissue Function in Diet Induced Obese Mice**

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**Background:** We aimed to explore 1) the effects of treadmill exercise training or rutin intervention independently and in combination on endoplasmic reticulum (ER) stress markers and adiponectin mRNA expression; and 2) whether there are depot-specific effects.

**Methods:** A total of 60 C57BL/6 mice were randomized into 5 groups: chow group, high fat diet group (HFD), HFD plus rutin intervention group (HR), HFD combined with treadmill running group (HE), HFD combined with treadmill running and rutin group (HRE). At the end of the 16 weeks’ intervention, adiponectin mRNA expression and ER stress markers protein expression were determined.

**Results:** In epidydymal adipose tissue, HFD resulted in reduction in adiponectin mRNA expression, PPAR-γ and Dsb-AL protein expression, elevation in ER stress markers.
including GRP78, CHOP and p-JNK. Rutin or exercise restored the protein expression of ER stress markers to normal levels. Exercise restored PPAR-? and Dsb-AL protein expression to normal levels. In subcutaneous adipose tissue, HFD led to increased adiponectin mRNA expression, and PPAR-?, GRP78 and p-JNK protein expression; HFD also resulted in reduction in Dsb-AL.

Conclusions: Depot-specific effects existed in regards to the effects of rutin or exercise on adipose tissue function from DIO mice.

T-P-3022 Adjunct Therapies and the Efficacy of the Adjustable Gastric Band – Insights from a Rodent Model
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Background: It is well-established that there is a compensatory reduction in energy expenditure associated with all weight loss therapies, including bariatric surgery. This highlights the potential to exploit adjunct therapies to elevate energy expenditure or at least counteract its compensatory reduction and, as such, improve the efficacy of the adjustable gastric band (AGB).

Methods: Diet-induced obese male Sprague Dawley rats were either sham-operated or fitted with an AGB just below the gastro-oesophageal junction, mimicking the situation in human surgeries. Rats in each of these groups were then divided into cohorts that received either vehicle, thyroxine (100ug/kg/day) or Contrave (bupropion 5mg/kg/day + naltrexone 0.25mg/kg/day). Metabolic parameters, including food intake, body weight and fat mass were assessed. Biotelemetry devices implanted between the interscapular lobes of brown adipose tissue (BAT) were used to assess the impact of AGB on energy expenditure in BAT. The role of AGB in changing the sensitivity of the brain to satiety hormones was assessed by administering GLP-1 agonist (Byetta) to lean rats, which were then perfused for immunohistochemistry analysis of cFos activation.

Results: Inflation of the AGB caused a reduction in body weight gain that was further enhanced by co-treatment with thyroxine or Contrave (p<0.05). AGB-induced reductions in body weight and fat mass are associated with reductions in energy expenditure in BAT that can be effectively ameliorated by co-treatment with thyroxine or Contrave, both of which increase energy expenditure. The combination of AGB and Byetta significantly elevated Fos labelling in the NTS activation.

Conclusions: These data support the notion that adjuvant therapies may improve AGB-induced satiety and weight loss, possibly via an action on energy expenditure. They provide further insight into the mechanisms underlying the efficacy of AGB.

T-P-3024 The Cranial Mesenteric Artery Supplies Gastrointestinal Sites of Action Regulating Meal Size and Intermeal Interval Length by Glucagon-Like Peptide-1
Ayman Sayegh Tuskegee Alabama

Background: The current work hypothesized that the gastrointestinal tract contains site(s) of action regulating meal size (MS) and intermeal interval (IMI) length by glucagon-like peptide-1 (GLP-1).

Methods: To test this hypothesis GLP-1 (0.5 nmol/kg) was infused in the celiac artery (CA, supplying the stomach and upper duodenum), cranial mesenteric artery (CMA, supplying upper and most of the lower gut), femoral artery (FA, control) and portal vein (PV, drains the gut) in free-feeding rats prior to the onset of the dark cycle and first MS (chow), second MS, and IMI and satiety ratio (SR=MS/IMI) were determined.

Results: We found that (1) GLP-1 infused by the CA, CMA and FA reduced the first MS relative to saline vehicle and the CMA route was more effective than the other routes, (2) GLP-1 infused only in the FA reduced the second MS,

T-P-3023 Effect of Surgical Weight Loss by Gastric Bypass on Stool Microbiome

Background: A number of mechanisms have been identified that play a role in the metabolic improvement following Roux-en-Y gastric bypass surgery (RYGB) including altered microbiota. The goal of this study was to assess temporal changes in α and β diversity of microbiome in obese individuals, before and after RYGB in 2 groups of individuals living in New York City (NYC) and in Barcelona (BCN). We hypothesized that: alpha diversity would increase after RYGB; the ratio of F/B will decrease after RYGB; the effect of RYGB-induced weight loss will trump geographical microbial differences.

Methods: Samples were collected at home in provided kits, brought to our laboratory frozen, and kept at -80°C. DNA extraction was done using MOBIO PowerLyzer PowerSoil DNA isolation kit, followed by Illumina sequencing in V4 region. The 16S rRNA gene was amplified and sequenced with barcoded primers. Raw data was processed using QIIME 1.8.0 with default parameters. Bacterial diversity was estimated using Faith's phylogenetic diversity. Beta diversity was measured using unweighted UniFrac.

Results: Baseline BMI=46.1±6.4 kg/m2, age=42±12 years, HbA1C=6.2±1.1% and weight loss at one year=41.5±12.4 kg (34%), were not different between the two cohorts (NYC=13, BCN=12). Contrary to hypothesis, there was no difference in terms of alpha or beta diversity between the 2 cohorts prior to surgery. There was a clear separation in microbial composition between pre- and post-surgery. There was a trend for an increase in alpha diversity 1 year after surgery. Beta diversity did not differ between the 2 cohorts at any time points after surgery.

Conclusions: Although geographical differences in diet have been shown to impact the microbiome, the severe obesity phenotype appears to trump these effects, as no difference between the two cohorts was observed prior to surgery. The effect of surgery was similar in both cohorts. More detailed analysis need to be conducted to evaluate the link between change in the microbiome and metabolic outcome.
infused only in the CMA prolonged the IMI and (4) GLP-1 infused in the CMA increased the SR, and more so than the remaining routes.

**Conclusions:** In conclusion, consistent with our hypothesis the data here suggest that the gastrointestinal tract contains sites of action controlling MS and IMI length by GLP-1. The area supplied by the CMA, small and part of the large intestine, may contain such sites.

**T-P.3025**  
The Metabolic Impact of Laparoscopic Sleeve Gastroectomy in Morbidly Obese Indian Diabetic Patients At the End of Seven Years  
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**Background:** Laparoscopic sleeve gastroectomy (LSG) is a standard bariatric operation. It also shows a metabolic impact in terms of improvement in diabetes type 2 (T2DM) in morbidly obese patients. Sparse reports exist about the longevity of its metabolic impact. This is the study to present the results of LSG in Indian obese patients with T2 DM at the end of seven years.

**Methods:** From 2006 till 2010, 124 patients of Indian origin with morbid obesity and T2DM have undergone a LSG at our center by a single surgical team. The standard operation of LSG and the multidisciplinary care with regular follow ups was provided to all of them. At the end of seven years we could collect information of 81 patients.

**Results:** N = 81. M:F :: 29:62. Age range 22 - 65 yrs. Duration of T2 DM: 6 mths to 21 yrs. BMI range: 35 - 68 kg/m2. On OHA only: 56. OHA + Insulin: 25. Average glycosylated Haemoglobin was 8.5%. At the end of seven years average BMI loss was found to be 18 kg/m2. The average glycosylated hemoglobin was 6.8%. The insulin usage (in reduced doses) was needed in only 3 patients. 68 patients out of 81 did not need any anti diabetic medication.10 patients were on a single OHA. 76/81 had other medical comorbidities related to obesity and all showed an improvement even at the end of seven years. 21/81 showed some weight gain (average 5kg) at the end of 7 years but could retain their metabolic improvements as compared to the baseline.

**Conclusions:** LSG seems to be a good surgical and metabolic tool to improve the diabetic status in morbidly obese Indian T2DM patients even at the end of seven years.

**T-P.3026**  
Maternal Protein Restriction During Pregnancy and Lactation Reduces Hepatic Triglyceride Content in Adult Male Rat Offspring: Role of SREBP-1c-Regulated Pathways of Fatty Acid and Triglyceride Synthesis  

**Background:** Maternal protein restriction during pregnancy and lactation reduces liver triglyceride (TG) content in adult male rat offspring. However, the mechanisms mediating this decrease are not understood. The aim of this study was to determine if the decrease in liver TG content was due to a decrease in SREBP-1c regulated pathways of lipid synthesis.

**Methods:** Pregnant Sprague Dawley rats were given a control (19% protein) or a low protein (8% protein) diet throughout pregnancy and lactation. Pups were weaned onto standard lab chow on day 28 and sacrificed on day 65. Activities of critical enzymes in lipid synthesis were determined via enzymatic assays and hepatic expression of select genes and proteins were determined by qRTPCR and Western blotting.

**Results:** We initially examined the status of key enzymes in the synthesis of fatty acids, the precursors of TG. There were no differences between control and low protein (LP) offspring in the enzymatic activity of acetyl-CoA carboxylase and gene expression of fatty acid synthase. We next evaluated the status of the TG synthesis pathway. The activity of glycerol-3-phosphate acyltransferase, a rate limiting enzyme in TG synthesis, and the gene expression of fatty acid desaturases 5 and 6 and the elongase ELOVL6 were similar in the two groups. Finally, we examined if there were changes in PNPLA3, whose expression is associated with increased hepatic TG content, and stearoyl-CoA desaturase 1 (SCD1) whose activity increases PNPLA3 protein levels. PNPLA3 and SCD1 exhibited reduced mRNA expression in LP offspring consistent with their lower liver TG content. However, protein amounts of PNPLA3 and SCD1 were similar in both groups. Consistent with these results, protein expression of SREBP-1c, a master regulator of fatty acid and TG synthesis, was also similar in control and LP offspring.

**Conclusions:** The reduction in liver TG content in male offspring of protein restricted mothers does not appear to be due to decreases in SREBP-1c-regulated fatty acid and TG synthesis.

**T-P.3027**  
The Effect of Docosahexaenoic Acid (DHA) on Adipocytes Exposed to Hypoxia in 3T3-L1 Cell Line  
Noura Younes Doha Doha, Nasser Rizk Doha Doha

**Background:** Docosahexaenoic acid (DHA), Omega-3 fatty acid has been reported to have anti-obesity effect. Hypoxia is a condition that result from the excessive expansion of the white adipose tissue that causes obesity-related conditions like insulin resistance, inflammation and oxidative stress amongst others.

**Methods:** The objective of this study was to test the effect of DHA on the hypoxia affects (1.0 % for 24 hours) of 3T3-L1 adipocytes with a deliberate focus on oxidative stress, inflammation, and mitochondrial functions and antioxidants status. Cell viability, reactive oxygen species (ROS) and apoptosis were evaluated by flowcytometry. The metabolic parameters such as lactate, glycerol release, glucose uptake and ATP content were evaluated by fluorometer. The expression of HIF-1 and the secretion of adipocytokines were evaluated by qPCR and Elisa.

**Results:** The results showed significant changes in all critical parameter of adipocyte biology such as HIF-1α expression (50%↓), lactate and glycerol release (66%↓ and 25%↓ respectively), (ROS) production (15%), glucose uptake (25%↓), decrease secretion of pro-inflammatory markers (IL-6 by 31%, MCP-1 by 38%) and leptin 14% and increase adiponectin secretion by 45%, by DHA treated cell in hypoxia condition compare with cells treated with hypoxia only.

**Conclusions:** Taken together, our data indicate that DHA can exert potential anti-hypoxia effects by reduce the secretion of inflammatory adipokines, oxidative stress, lipolysis and apoptosis this could highlight that DHA can exert potential anti-obesity effects.
T-P.3028
A Picture is Word a Thousand Words, and Then Some: Preliminary Findings from an Exploratory fMRI Study
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Background: Traditional methods for recording diet use self-reported written descriptions of food intake. Recent work, however, suggests that reviewing digital images of diet (via cell phones) improves memory accuracy (Long et al., 2013) and compliance (Mulvaney & Herbold, 2013) for dietary recording. It is important to understand the cognitive processes associated with creating and retrieving images of personal diet items and how they may influence food-related affect and behaviors (Higgs, Robinson, & Lee, 2012). Interestingly, brain responses to word vs. picture recordings have not been broadly explored.

Methods: A college sample (n=16) used smartphone cameras to record 3 days of diet. Participants sent pictures of all food/drink consumed to researchers and entered word descriptions of each on a meal tracking website. Pictures and word descriptions were used by researchers to create digital stimuli for visual presentation during a subsequent fMRI scan. Nine total stimuli of 3 types were presented randomly: 3 food images, 3 word descriptions, 3 food images + matching word descriptions. For each stimulus image, subjects rated (1-7) the strength of agreement with 3 statements (S1: I remember eating this, S2: I would eat something like this again, S3: I would recommend this food to another person).

Results: ANOVA revealed stronger agreement when viewing images versus words alone for S1 (p = .01) and S3 (p=.04). Images plus words produced stronger agreement than words alone for S3 (p=.01). fMRI data support the S1 and S3 rating data; for S1 there was more activation in brain regions associated with memory (hippocampus) when viewing images/images plus words compared to words alone; for S3 there was greater activation for image-related stimuli than words in regions associated with decision making (frontal lobe) and emotion (lingual gyrus).

Conclusions: Preliminary findings shed light on cognitive processes associated with the use of personal pictures to record food intake. Clinical implications will be discussed.

T-P.3029
Anatomical Connections in the Brain Based on Body Mass Index in Lean, Overweight, and Obese Individuals
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Background: Alterations in digestive behavior have been implicated as a factor in the pathophysiology of obesity. Multimodal neuroimaging evidence indicates alterations in regions of the extended reward and associated somatosensory, salience and emotion regulation networks. Diffusion tensor imaging measures the microstructural organization of neural tissue which is critical for the integrity of fractional anisotropy (FA), which determines how white-matter mediates communication in the brain. The aim of the study was to: Determine BMI-based group differences in white-matter integrity as measured by FA and correlations between FA group differences and clinical variables.

Methods: 60 healthy subjects completed MRI. Images were registered to the MNI atlas, and statistical parametric maps of white and gray-matter were created for FA, using a threshold p-value=0.05 and cluster size=250 mL. Subjects were divided into three groups: lean (N=29, 17 males), overweight (N=25, 18 males), and obese (N=6, 4 males).

Results: Compared to lean, overweight subjects had a minor increase in FA in the corpus callosum, external capsule, thalamic areas, and somatosensory areas. Compared to lean and overweight subjects, obese subjects showed reductions in FA in external and internal capsules, brainstem, supra tentorial and somatosensory regions. Mean FA increased slightly with BMI in the respective brain regions from lean to overweight, but decreased significantly with BMI values in the obese range. Correlation analysis between mean FA and clinical variables indicated an overall negative correlation with increasing BMI.

Conclusions: FA is correlated to BMI, and obese individuals experience a decrease in FA representative of a decrease in white-matter directional coherence. However, the relationship between FA and BMI does not appear to be linear. Future research focusing on larger populations of obese individuals is necessary to better characterize the neuro-architectural transition from the overweight to an “obese brain.”

T-P.3030
Appetitive traits are associated with the neural response to food portion size in children
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Background: The effect of portion size on energy intake varies with appetitive traits, but why this occurs is unclear. One possibility is that neural circuitry involved in cognitive control and reward is disrupted in those who have poor appetite regulation, which may lead to overeating from large portions.

Methods: The aim was to determine if neural responses to food portion size are associated with appetitive traits in children (n=36, 7-10 yr). Functional MRI was used to assess brain response to food images at two portion sizes (Large, Small) and non-food images (Scrambled, Furniture). Repeated measures ANOVA was used to extract BOLD activation from various contrasts (Large>Small, Large>Scrambled) bilaterally in regions previously associated with cognitive control (inferior frontal gyrus; IFG) and reward (ventral tegmental area; VTA). The activation in the IFG and VTA for these contrasts was then correlated with appetitive trait scores from the Children’s Eating Behavior Questionnaire (CEBQ).

Results: Increased activation in the left IFG was associated with higher food enjoyment scores for the Large>Scrambled contrast (p<0.05). Decreased activation in the left VTA was associated with greater slowness in eating scores for the Large>Scrambled (p<0.05) and the Large>Small contrasts (p<0.05). Decreased activation in the right IFG was associated with higher food fussiness (p<0.05) but also higher emotional overeating (p<0.05) for the Large>Small contrast.

Conclusions: Our hypothesis that traits of poor appetite regulation would be negatively correlated with IFG activation but positively correlated with VTA activation was partially
confirmed. The findings suggest that brain regions involved in inhibitory control and reward are engaged differently in response to large portions of food depending on children’s appetitive traits. These results may allow us to identify children who are at risk for overeating based on both parent-rated appetitive drive and neural response to portion size.

T-P-3031
Impulsivity and Brain Responses to Visual Food Stimuli in Adults with Obesity
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Background: Brain regions associated with impulsive decision making may be related to obesity. In support of this hypothesis, obesity-related differences in frontostralial (FS) pathways are related to hedonic eating, particularly among women. Importantly, impulsivity and FS activation patterns are also associated with treatment outcome suggesting that a better understanding of gender differences in FS reactivity and impulsivity could help inform treatments. Here we examined whether the relationship between impulsivity and FS responses to food cues varied between men and women with obesity.

Methods: The sample included 44 adults matched on age (M = 43.05, SD = 7.94) and body mass index (BMI) (M = 30.98, SD = 2.67) prior to a behavioral weight loss intervention. Impulsivity was assessed using the Iowa Gambling Task (IGT). Participants viewed high and low calorie foods and neutral non-food items during a functional MRI scan. Beta coefficients were extracted from regions involved in impulsivity or eating, including the nucleus accumbens (NAc), putamen, frontal cortex, and insula. Regression models were conducted with gender, BMI, and IGT scores predicting percent signal change in each region.

Results: Women exhibited higher activation than men in the NAc (β = 0.448, p < 0.01) and putamen (β = 0.345, p = 0.03) in response to high relative to low calorie foods, and in the superior frontal gyrus when viewing food relative to neutral images (β = 0.444, p < 0.01). Greater impulsivity predicted elevated insula responses to high relative to low calorie foods in both genders (β = -0.343, p = 0.03).

Conclusions: These data provide evidence that women exhibit elevated reactivity to food cues in FS regions associated with decision making and reward processing, which may have implications for understanding mechanisms influencing risk for obesity. These results may suggest that interventions need to be tailored to these gender differences in food cue reactivity to enhance effectiveness.

T-P-3032
Overweight and Obese Individuals Display Abnormal Resting-State Brain Connectivity between the Reward System (Nucleus Accumbens and Amygdala) and the Prefrontal Cortex
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Background: The nucleus Accumbens (NAc) and the Amygdala (AMY) play a critical role in food-related reward processing and in the modulation of feeding behaviors. Resting-state functional MRI (RS fMRI) is used to assess intrinsic brain connectivity in human populations. Hypotheses: 1) Brain circuits involved in the reward system show different functional connectivity (FC) patterns between obese/obese (O/O) and lean individuals, 2) NAc and AMY FC differ among men and women with normal and high body-mass-index (BMI)

Methods: 98 healthy subjects, age: 30.6±10.7, were divided into 48 lean (BMI: 24.5±3.7; females:25) and 50 O/O subjects (BMI:27.2±5.07, females: 24). We used a 3 Tesla Trio scanner for imaging. Individual seed-to-voxel connectivity maps for NAc and AMY were created. Fisher transformed bivariate correlation maps were implemented in SPM8. Significance at a threshold of p<0.05.

Results: Lean subjects had greater FC of NAc with dorsomedial prefrontal-cortex (dmPFC), mid-PFC and inferior-frontal than O/O subjects. AMY FC with dlPFC, anterior cingulate cortex (ACC), insula and hippocampus was greater in normal vs high-BMI. Gender differences/lean women had greater NAc FC with several regions of PFC than O/O women. Lean men had increased NAc FC with inferior frontal cortex and AMY than O/O men. O/O women had enhanced NAc FC with hippocampus and insula than men. O/O males had increased FC with the superior frontal cortex than women. Lean women showed greater FC of the AMY with dlPFC and precuneus than O/O women. O/O males had increased FC of the AMY with dlPFC and hippocampus than O/O females.

Conclusions: Healthy subjects brains showed altered resting state functional connectivity related to BMI. Normal BMI was associated with enhanced connectivity of the NAc and AMY with prefrontal regions when compared to high-BMI. These findings suggest a compromised top down control of key reward regions by the prefrontal cortex in overweight/obese subjects, in particular in female subjects.

T-P-3033
Strengthened Functional Connectivity of Taste Sensory and Pleasantness Pathway in Metabolic Syndrome
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Background: Metabolic syndrome is a set of risk factors that increases the risk of heart disease, stroke, diabetes, and late-life cognitive impairment and dementia. The risk factors include high blood pressure, a high blood sugar level, abdominal obesity, and abnormal cholesterol levels. The neural taste pathway from the frontal operculum and orbitofrontal cortex may help further delineate metabolic syndrome. The frontal operculum is involved in sensory processing of taste and the orbitofrontal cortex (BA10) is involved in processing pleasantness of taste. The current study examines the functional connectivity between the frontal operculum and orbitofrontal cortex in individuals with metabolic syndrome and healthy controls.

Methods: 50 participants (25 healthy controls, 25 metabolic syndrome) underwent functional Magnetic Resonance Imaging while rating the pleasantness of caffeine, sucrose, and saccharin.

Results: For middle-aged individuals (45-54 years of age) tasting sucrose, the relationship between the activity of the frontal operculum and the BA10 depends significantly on metabolic syndrome status such that healthy controls have a
negative relationship, while individuals with metabolic status have a positive relationship. For older individuals (60+ years of age) tasting sucrose, the relationship between the activity of the frontal operculum and the BA10 depends significantly on metabolic syndrome status such that healthy controls have a negative relationship, while individuals with metabolic status have a positive relationship.

Conclusions: The results suggest that those with metabolic syndrome have a stronger functional connection between processing the sense of taste and evaluation of pleasantness of taste compared to healthy controls for middle-aged and older individuals when tasting sucrose. The strengthened functional connectivity may lead to a stronger and faster processing of the sensory taste and pleasantness of sucrose. Supported by NIH grant AG004085-26 from NIA to CM.

T-P.3034
Stunted PFC Activity During Neuromuscular Control Under Stress with Obesity
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Background: Obesity is an established risk factor for cerebral health and impaired cognition, which is primarily regulated by the prefrontal cortex (PFC). However, very little is known about the neural pathways that underlie obesity-related decline in neuromuscular control that affect physical functioning, particularly under stress. The purpose of this study was to determine the role of the PFC on neuromuscular control during handgrip exertions under stress with obesity.

Methods: Twenty non-obese and obese young adults performed submaximal handgrip exertions in the absence and presence of a stressful task. Force fluctuations (indicator of neuromuscular control) and oxygenated hemoglobin (HbO2: a measure of PFC activity) measured using functional near infrared spectroscopy were obtained.

Results: Force fluctuations increased by 26% in the stress when compared to the control condition (P=0.001). Additionally, obesity was associated with 39% greater force fluctuation (P=0.024), and stress magnified this relationship (P=0.063). Higher HbO2 levels were observed in the non-obese compared to the obese group (P=0.009). In addition, higher HbO2 levels were observed in the stress compared to the control condition in the non-obese group; however this trend was reversed in the obese group (P=0.043).

Conclusions: The current study provides the first evidence that neuromuscular decrements with obesity were associated with impaired functioning of the PFC and this relationship was augmented in situation with high stress. These findings are important because they provide new information on obesity-specific changes in brain function associated with neuromuscular control since the knowledge previously focused largely on obesity-specific changes in peripheral muscle capacity. This study can thus be expected to have a positive impact on fundamentally advancing our understanding of how obesity influences the regulation of neuromuscular function, particularly under stress.

T-P.3035
The role of hunger state in neural response to food cues differs by a history of dieting to lose weight: An ERP Study

Background: A history of weight loss dieting has been shown to be a robust predictor of future weight gain, although the mechanisms responsible for this relationship are unclear. One potential factor in propensity towards weight gain is the nature of people’s reactions to the abundance of palatable food cues in the environment. Event Related Potentials (ERPs), stimulus-locked averages of EEG waves, are unique in their high level of temporal detail, providing information about immediate preconscious, as well as sustained, neural activity. They have been used to measure response to food cues, however ERP differences based on dieting history have not been tested.

Methods: The present study examined ERP response to moderately and highly palatable food images in 65 young adult, non-obese female historic dieters (HDs) and never dieters (NDs). ERPs were recorded in both a fasting and a fed state. The effects of hunger and dieting history were tested on the mean amplitude of 7 epochs ranging from 50-800ms following stimulus presentation.

Results: A significant dieting history by hunger state interaction was found in early visual (P1, N1), and late (P3, LPP) ERP components. While ERP response to food cues was larger when fasting than full only in late epochs in HDs, NDs had larger early and late mean amplitudes in the fed than fasting state. Thus, compared with NDs, HDs were less responsive to hunger state in the early stages of food cue processing (i.e., they showed similar brain responses during fasting and fed conditions).

Conclusions: Hunger state had distinct effects on neural response to food cues in HDs and NDs. Results support prior research suggesting that individuals prone to weight gain are less responsive to internal cues to eat, at least in preconscious stages of processing. Future research should examine whether ERP food cue response is associated with future weight change, with the ultimate objective of better identifying those who would most benefit from obesity prevention programs.

T-P.3036
Clinical Trial of Cryolipolysis for Gluteal Fat in Healthy Korean Women for 12 Weeks
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Background: Cryolipolysis is a new concept to reduce fat since Zeltiq machine had been introduced several years ago. Zeltiq machine, invented by Manstein Dieter, a researcher of photo-medicine group, is used to remove fat through cryolipolysis. Previous studies showed Zeltiq had a pronounced outcome to eliminate central abdominal fat in pig as well as human. Until now, no investigation was done to remove fat in human thigh lesion. Therefore, this study is conducted to investigate the clinical efficacy and safety of cryolipolysis on fat removal of thigh through cryolipolysis in comparison to electrical stimulation.

Methods: Fourteen healthy premenopausal volunteered women had been conducted to assess their anthropometrical, social, and cardio-metabolic, and femoral fat amount by computer tomography, and adverse events at initial, 4 week, and 12 week visit.

Results: There was no significant difference of measured fat amounts between cryolipolysis and frequency electrical treatment for 12 weeks. Minor adverse events such as pain (26.67%), bruise (20%) and numbness (20%) were noted.

Conclusions: In conclusion, there was no difference in
T-P.3037
Early Weight Loss Responders Compared to Non-Responders in a Medical Intervention Program Tend to Have More Emotional and Psychosocial Dysfunction
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Background: Studies find that those individuals who are most responsive to a weight loss program are also those who are most likely to sustain their weight loss long-term. Thus, we attempted to identify physical and/or psychosocial characteristics of early weight loss responders (ER) among patients in a medical weight loss program.

Methods: 50 participants in a medical weight loss program underwent intensive lifestyle intervention +/-adjunctive pharmacotherapy. Weight loss responders were identified as individuals who, in the first 3 months into the program, lost >5% or more of their initial body weight. Assessments included 1) anthropometrics and body composition 2) health co-morbidities and laboratory screening and 3) psychosocial status using Beck Depression Inventory-II, Brownell-Stunkard Weight-Loss Readiness Test, and Impact of Weight on Quality of Life-Lite (IWQOL).

Results: 40% of participants were ER, having lost >=5% of their initial weight 3 months into the program. Total weight loss for ER vs. non-responders (NR) at 3 months was -17.98 and -3.98 lbs respectively (p<0.0001) and mean % BMI changes from baseline were a respective -7.77% and -1.86%. There were no significant differences between the groups with regard to initial weight (ER=236.5 vs. NR=252.5 lbs), age (ER=47.2 vs. NR=46.9), or number of co-morbidities (ER=2.45 vs. NR=2.48) and other measurements of health status (insulin, glucose, thyroid, lipids, insulin resistance, hunger eating cues, binge eating). However, ER did tend to be more depressed than the NR patients (BDI-II), to score significantly (p=0.0003) higher for emotional eating, and more poorly (p<0.05) for IWQOL related to physical function and self-esteem.

Conclusions: Responders in a medical weight loss intervention tend to have more emotional issues and psychosocial dysfunction compared to non-responders, conditions routinely addressed by our multidisciplinary medical weight management program.

T-P.3038
Educational Opportunities for Primary Care Clinicians and Specialists to Optimize Care for Individuals with Obesity
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Background: Weight loss in individuals with overweight/obesity is proven to reduce morbidity, mortality, and healthcare expenditures. Clinicians may benefit from education about weight management to fill practice and knowledge gaps.

Methods: A survey was sent to 3,525 US healthcare professionals (HCPs) by CE Outcomes, LLC.

Results: Responses were from 643 HCPs (physicians (MD), nurse practitioners (NP), physician assistants (PA)) practicing in primary care and specialties (endocrinology (ENDO), cardiology (CARD), obstetrics/gynecology (OB/GYN), bariatric (BARI)). Most ENDOs and CARDs (82%) discuss weight at every visit compared to only 58% of primary care practitioners (PCPs); most discussions are during visits for other conditions. A major obstacle in communication is a lack of resources to refer individuals to as indicated by 1/3 of HCPs, except BARIs. While most HCPs agreed they can help individuals achieve a healthy weight, more than 1/3 of PCPs, MDs, ENDOs, and BARIs indicated low likelihood of success as a notable barrier in addressing weight problems. Only 17% of NPs and PAs were very familiar with obesity guidelines, but 42% indicated their usefulness. Half of HCPs, except BARIs (15%), specified lack of safe and effective pharmacologic therapies as a significant barrier to managing obesity as well as individuals’ lack of interest (58%) and lack of adherence to lifestyle recommendations (72%). When prescribing medications, the top patient-related factor HCPs considered was comorbidities and reimbursement was the top medication-related factor.

Conclusions: PCPs need education to address weight at every visit. Patient resources may bridge the gap between initial discussions and implementing weight management plans. HCPs lack confidence in themselves and their patients’ to succeed, which may improve with greater knowledge. Lack of reimbursement may contribute to lack of patient visits for weight management alone and to pharmacotherapy decisions where BARIs may be able to offer education to other HCPs.

T-P.3039
Effectiveness of Orlistat in Patients Undergoing Multidisciplinary Lifestyle Weight Loss Intervention in Veteran Administration Greater Los Angeles Healthcare System
Maria Romanova Oak Park California, Sasha Sheftel Los Angeles CA

Background: In 2006 in response to global obesity epidemic Veterans Administration (VA) National Center for Health Promotion and Disease Prevention introduced nationwide weight loss program called Management Overweight/Obese Veteran Everywhere! (MOVE!) It is a patient-centered intervention delivered by an interdisciplinary team of healthcare providers (primary care, nutrition, psychology, physical therapy and patient education). The program targets long-term lifestyle change to improve nutrition and increase physical activity. Our VA Greater Los Angeles Healthcare System MOVE! Program serves about 1700 veterans annually.

Methods: After attending a 1 hour nutrition class, completing a questionnaire and obtaining tailored self-help written materials, patients joined 8 weekly group educational sessions, focusing on different aspects of weight control. Upon completion participants had an option to participate in monthly support groups, continued education group or receive routine care with a primary care provider. Patients willing to lose more weight received prescription for Orlistat. They were followed by MOVE! providers in group and individual settings on as needed basis.

Results: 97 patients completed MOVE! Program and received Orlistat. 83% were male. Average age was 59.8 years. During non-medication phase of MOVE! Program patients lost on average 5.94 lbs. Combined use of education and medication induced 17.97 lb weight loss. After Orlistat was stopped, net weight gain of 2.8 lbs were noted. Patients who subsequently
undergo bariatric surgery were excluded from the analysis. **Conclusions:** Orlistat is an useful addition to multidisciplinary lifestyle program in VA settings. Observed effects of Orlistat administration were modest and were similar to reported in lifestyle trial literature.

T-P-3040

Establishment of a Specialized Obesity Care Delivery Model in Central Florida Improves Wellness Outcomes

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**Background:** Current obesity care lacks structure, utilizes ancillary support and is rarely embraced by physicians, who are often confronted with significant barriers to addressing the obesity. This leads to meager weight (wt.) loss and treatment failure. Thus, we evaluated wt. loss outcomes in a newly established hospital-affiliated, physician-directed multidisciplinary, individualized obesity care delivery model in Central Florida which serves as a direct referral route for PCPs and specialists.

**Methods:** We retrospectively analyzed outpatient notes of 50 new patients (pts.) who established themselves to a specialized obesity medicine practice in the months of Feb-Aug 2014 and who had at least followed up for >6 consecutive months, identifying demographics, gender effects, and anthropometric changes over time. Treatment combined lifestyle modification with medical management and when required, psychological intervention.

**Results:** Gender distribution was 70% female. Pt. characteristics (mean±SD) were: age 47.0±16.4 y; weight 246.1±72.8 lbs; BMI 39.3±8.8 kg/m2; % body fat 45.5±6.3. Pts. had been on at least 2 diets prior to seeking tertiary obesity care and had an average of 2.5 major co-morbidities. 74% were insulin resistant [HOMA]; 12% had Type 2 DM (HbA1c>6.5%); 46% were hypertensive; 48% had dyslipidemia, 38% were hypovitaminD; 44% were depressed (BDI-II). Men were more likely to be insulin resistant, while women were more likely (p<0.05) to be depressed. 94% of pts. required 1 or more wt. loss medication to complement intensive lifestyle change. Wt. loss at 3 and 6 months averaged 9.36 and 16.4 lbs and % changes in BMI a respective -9.36 and -7.71% (p<0.0001).

**Conclusions:** Establishment of hospital-affiliated specialized outpatient obesity centers is likely to improve wt. loss outcomes, obesity-related comorbidities and reduce barriers to addressing obesity. They represent an underscored opportunity to intervene early and effectively for the clinical management of obesity.

T-P-3041

Expectation of Improvement in Quality of Life with Remission of Diabetes Predicts Improvement in Quality of Life with Weight Loss Interventions

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**Background:** Weight loss improves diabetes and quality of life (QOL) in obese individuals. How patients’ initial expectations of these improvements affect actual changes in QOL has not been studied.

**Methods:** We studied 12 obese women with type 2 diabetes enrolled in a 3 arm randomized trial comparing medical weight loss, adjustable gastric banding, or Roux-en-Y gastric bypass at baseline and after 10% weight loss. We categorized patients’ expectation of improvement using the Audit of Diabetes-Dependent QOL question: “If I did not have diabetes, my quality of life would be: the same/a little better (“Same”) vs. much better/very much better” (“Better”). We compared the association of baseline expectation (same vs. better) with change in functional status using the 36-Item Short Form Health Survey (SF-36) from baseline using Kruskal-Wallis tests.

**Results:** 9 subjects expected to get better, while 3 expected no change in QOL. Median age (61 vs 48 years, p=0.05) and BMI (38.6 vs. 35.0 kg/m2, p=0.03) were higher in the same vs. better group. Overall, there were no significant improvements in physical and mental components of SF-36 at follow-up. Those who expected improvements at baseline were more likely to report improvements in the SF-36 physical component summary scale (+5 vs -7, p=0.01), and the physical functioning subscale (+25 vs. -30, p=0.03).

**Conclusions:** Our findings suggest that baseline expectation of improvement in quality of life with diabetes remission may predict improvement in physical QOL and functional status after weight loss.

T-P-3042

Feasibility and Efficacy of Obesity Management in a Primary Care Setting: Observations from Real-Life Application

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**Background:** Clinical trials show comprehensive lifestyle intervention for obesity to be successful. No studies have evaluated the process of individualizing intensive behavioral therapy (IBT). This study analyzed outcomes and discussed challenges of implementing IBT in a primary care setting.

**Methods:** Retrospective data from patients under the care of a single practitioner with nutrition training between 2/2014 and 3/2015 (n=20) was reviewed. IBT per 2013 AHA/ACC/TOS guidelines included 500 kcal/day deficit using evidence-based macronutrient-targeted diet, directed physical activity (PA) as well as fruit and vegetable consumption (FV), and self-monitoring applications incorporating individual patient goals. 15 patients completed the 6-month program. Anthropometrics and cardiological measures, and lifestyle behaviors (PA and FV) were included from baseline, 3 and 6 month visits.

**Results:** Subjects were 73% female, mean age 44.6 yrs, with baseline weight 114.8±24.2kg, BMI 40.5±6.0kg/m2, waist circumference (WC) 48.1±5.8in. At 3 and 6 months respectively, WC was reduced by -0.8±1.3 and -1.4±2.2in (p=.02), PA increased by 45±50 min and 40.7±29.7 (p=.0002), FV increased by 2.8±3.4 and 1.8±3.2 servings (p=.04). Weight loss was modest at 3 months plateauing by 6 months. Cardiometabolic measures showed clinical but non-statistical improvement.

**Conclusions:** Differences were notable for increased PA, FV, and reduced WC. Weight loss plateau was consistent with former studies. Practitioner burden was great for maintaining visit frequency, providing guidance and resources. However, implementation of IBT can reduce metabolic risk for obese patients if sustained, as well as enhance adjuvant therapy. Improvements observed suggest that IBT in a primary care setting impacts behavior change and central adiposity, which has critical implications for widespread application.
T-P-3043  
**Fetal Body Composition in Women Who are Overweight and Obese During Pregnancy and Clinical Outcomes – A Prospective Cohort Study**  
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**Background:** To describe the association between the predictive value of third trimester ultrasound assessment of fetal body composition and maternal and infant clinical outcomes in women who are overweight or obese during pregnancy.

**Methods:** A prospective cohort study nested within the LIMIT randomized controlled trial. Women were recruited between 10+0 and 20+0 weeks’ gestation, with a BMI >25kg/m². Fetal body composition (mid thigh lean (MTLM) and fat mass (MTFM), abdominal fat mass (AFM) and subcapular fat mass (SSFM)) were assessed prospectively using ultrasound at 28 and 36 weeks’ gestation. Important clinical maternal and fetal outcomes were collected including caesarean section. Chi-square tests for independence were conducted to test for associations between fetal body composition above the 95th percentile and categorical maternal and infant outcomes.

**Results:** There was a significant relationship between fetal body composition at 36 weeks and operative birth for women. In particular, AFM and SSFM above the 95th percentile at 36 weeks were strongly associated with a woman’s overall chance of a caesarean section (P <0.05 for both).

**Conclusions:** For women who are overweight and obese during pregnancy, measures of fetal body composition above the 95th percentile in the third trimester are strongly and significantly associated with a woman’s chance of caesarean section. The incorporation of these measures into prediction models for clinical use in the third trimester warrants further investigation and validation in a larger cohort.

T-P-3044  
**Impact of a Mindful Eating Intervention on Self-Objectification: A Pilot Study**  
Andrea Pratt New York NY, Alexis Conason New York New York

**Background:** This pilot study examined whether a mindful eating intervention is associated with decreased self-objectification among a sample of female participants. Mindful eating focuses on mindfulness skills in addition to bodily sensations such as the physiological sensation of hunger, fullness, and satiety. Self-objectification is associated with disordered eating, negative body image, and depression. Interventions, such as mindful eating, that foster positive body image have been shown to decrease self-objectification among women.

**Methods:** Participants include 6 women ages 27-59 (M=35.57) that engaged in a 9-week mindful eating intervention developed by the study authors. Participants completed the Self-Objectification Questionnaire (SOQ) one week prior to the intervention and in the month following the intervention. Demographic data including race, ethnicity, socioeconomic status, height, and weight were also collected pre and post-intervention. Data was analyzed using a paired samples t-test to compare change in levels of self-objectification pre and post-intervention.

**Results:** There were no significant differences in mean body mass index (BMI) from before the intervention (M = 30.75) to after the intervention (M = 30.86). There were also no significant differences on SOQ from pre-intervention to post-intervention, although mean scores on the SOQ decreased, (M=-3.85, SD=12.50) and post-intervention scores (M=-6.33, SD=9.69).

**Conclusions:** Although there were no significant changes in BMI or self-objectification, it is important to note that self-objectification scores decreased following the intervention. In addition, stable BMI may be an indication of a successful intervention in a population reporting a history of consistent weight gains. Further research is warranted due to the small sample size used in the present study.

T-P-3045  
**Long-Term Effectiveness of Family Based Lifestyle Intervention on Cardiovascular Risk in Childhood Obesity. A 2-year Randomized Controlled Trial.**  
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**Background:** We aimed to compare the long-term effectiveness of two family based intervention programs on body composition and cardiovascular risk factors.

**Methods:** Families living in Norway with at least one obese child (BMI ≥ iso-BMI 30) aged 7-12 years and one obese parent were randomized to Summer Camp (SC) for 2 weeks and 4 repetition weekends at a rehabilitation center (n=47), or Lifestyle School (LS) including 4 days family education in a specialist health service (n=47). All participants were offered monthly primary care follow-up during the study. Clinical and biochemical outcomes were assessed by intention to treat (mixed models) and ANCOVA adjusting for baseline value of dependent variable, respectively.

**Results:** A total of 90 children (50% girls), 46 in SC-group and 44 in LS-group, were included in the analyses. Baseline mean (SD) age was 9.7 (1.2) years, BMI 28.7 (3.9) kg/m² and BMI SD score (SDS) 3.46 (0.75). Sixty-four (71%) children attended the 2-year visit. Sixteen (43%) children in the SC-group achieved a reduction in BMI SDS ≥ 0.50 at 2-year visit compared to 8 (30%) in the LS-group, p=0.31. The SC-group had larger beneficial changes (between-group differences) in: BMI: -1.8 (-3.5, -0.2) kg/m², p=0.031, body fat percentage: -3.0 (-5.3, -0.8) %, p=0.009, fat mass: -4.0 (-7.7, -0.4) kg, p=0.031, resting heart rate; -7 (-11, -3) b/m, p=0.002, physical capacity—distance 6 minute walk test; 43 (16, 69) m, p=0.002, triglycerides; -0.3 (-0.6, -0.05) mmol/L, p=0.028, HDL-cholesterol 0.12 (0.02, 0.21) mmol/L, p=0.018, non-HDL-cholesterol; -0.39 (-0.71, -0.07), p=0.018, BMI SD score -0.22 (-0.49, 0.05), p=0.11, but the groups did not differ significantly with respect to changes in muscle mass, blood pressure, waist circumference, HOMA-IR or high sensitivity CRP.

**Conclusions:** Family based treatment at a rehabilitation center resulted in a greater reduction in BMI, body fat and various cardiovascular risk factors in children with severe obesity, compared to a community based program.
T-P-3046
PCP Beliefs and Practices Fall Short in Weight Management
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**Background:** Primary care providers (PCPs) are expected to address the obesity epidemic in healthcare by screening and talking to patients with weight problems and implementing a treatment plan to improve health outcomes. PCP beliefs and attitudes impact practice behaviors and patient outcomes. Education and practice enhancements can improve PCP confidence and skills to manage weight loss. Assessing PCP practices and beliefs identify opportunities for education and practice modifications that improve interactions and insure optimal weight management efforts.

**Methods:** Primary Care Providers attending a weight management CME activity at one of four Primary Care Network live CME activities in 2014 (n=1451), or a live CME program at ACP in 2013 (n=400), answered assessment questions focused on practice beliefs and attitudes related to treating patients with weight problems.

**Results:** Under 50% of providers measure BMI annually or use BMI to initiate weight discussions. Barriers to meaningful discussions were divided between time (29%), patient adherence (25%), and motivating patients (25%). Once they identify a weight problem 44% would refer to a diettian and 45% would recommend exercise. If a patient fails with lifestyle therapy, PCPs suggest increasing physical activity (36%). 40% would begin discussions on medication therapy. When selecting weight loss medications, Orlistat or phentermine alone or in combination were the preferred drugs with safety and contraindications identified as their greatest concern (40%). If weight loss slows on medications 42% would increase physical activity, 35% would change the medication and 26% would increase the dose.

**Conclusions:** PCPs implement a low level of weight management interventions and do not use newer medication therapies available. They place a great amount of confidence and value on patient abilities to participate in large amounts of exercise despite admitting that patient non-adherence to lifestyle regimens is largely responsible for lack of success.

T-P-3047
Piloting an Obesity Decision Aid Tool based on EOSS in Primary Care Practice

**Background:** Primary care physicians are the first line of obesity treatment, however, providers can be uncertain about how to address this complex disease. The Obesity Decision Aid (ODA) was developed to offer providers and patients a tool for individualized assessment and treatment of obesity. ODA is a stepped-care model that combines a patient intake questionnaire with the Edmonton Obesity Staging System. A summary report is generated, which includes treatment options, patient assessment results, and clinical guidance. The pilot study documents the utility of the ODA. Performance was assessed by surveys of providers and patients and outcomes, including patient behaviors and weight management knowledge.

**Methods:** Using EMR database search criteria for adults with BMI >= 30, eligible patients in an urban primary care practice received outreach letters. After informed consent, patients completed an online questionnaire before the first visit. Questionnaire results were used to develop a summary that was discussed at the first visit. Patients were seen in follow-up visits every two weeks for twelve weeks.

**Results:** Fifty one patients enrolled in the program and 34 are expected to complete. Preliminary data have shown that there is satisfaction with the tool by both the provider team and patients.

**Conclusions:** A decision aid tool to assist in developing an individualized weight management strategy can be useful to both primary care providers and patients and help meet the need for front line obesity treatment.

T-P-3048
Severity of Obesity and Six-Month Outcomes among Youth in Pediatric Weight Management: POWER Retrospective Cohort Study

**Background:** Previous studies at individual multi-component pediatric weight management (PWM) programs reported modest improvements in body mass index (BMI) among youth with obesity. The Pediatric Obesity Weight Evaluation Registry (POWER) is a multi-site U.S. data registry that provides a larger aggregate patient population to evaluate health outcomes in PWM programs across the country.

**Methods:** This retrospective cohort study evaluated 6-month change in BMI and examined modifying factors (i.e., demographics, obesity severity) among youth with obesity participating in PWM programs. We analyzed retrospective data of youth with obesity presenting for multi-component PWM from 2009-2010 at 9 POWER sites. Chi-square and multivariable ANOVA were conducted. Programmatic success, defined as change in BMI (% of 95th %ile) < 0, was evaluated for patients with > 1 follow-up visits (FV) over a 6-month period.

**Results:** This POWER cohort consisted of 5756 patients (ages 2-18), of which 3605 (63%) had FV. Participants were 55% female, 52% white, 28% black, 21% Hispanic, 53% publicly insured, and age 11.8 ± 3.4y (mean ± SD). Weight status was 26% obesity (OB), 36% severe obesity-class 2 (SO2), and 39% severe obesity-class 3 (SO3). Over 6 months, 36% of patients had 1 FV, and 64% had >1 FV. BMI (% of 95th %ile) change was greater among SO3 (-3.5 ± 0.5) than SO2 (-1.2 ± 0.5) and OB (-0.5 ± 0.5) (all p<0.0001). Youth ages 6-11 had more improvement in BMI (% of 95th %ile) change (-2.9 ± 0.5) than ages 2-5 (-0.45 ± 0.7; p=0.02) and ages 15-17 (-1.6 ± 0.6; p=0.001). A majority of patients (64%) experienced programmatic success, which was achieved among patients with OB (61%), SO2 (64%), and SO3 (65%). Patients with SO2 and SO3 had more programmatic success with >1 FV than with 1 FV (SO2: 67% vs. 60%, p<0.05; SO3: 68% vs. 59%, p=0.001).

**Conclusions:** This study found multi-component PWM
programs across the country can be effective short-term for the majority of youth with obesity regardless of the extent of obesity at presentation.

T-P-3049
Texas Childhood Obesity Research Demonstration (TX CORD): Improvement in Primary Care Provider Self-Efficacy and Use of Patient-Centered Counseling to Address Overweight and Obesity after Practice-Based Changes
Sarah Barlow Houston Texas, Melisa Salahuddin Austin TX, Deanna Hoelscher Austin Texas, Nancy Butte Houston TX, Stephen Pont Austin TX

Background: Recommended behavioral approaches for childhood overweight/obesity (OW/OB) are not widely implemented in primary care. TX CORD provided support to primary care offices to address this problem. Offices in low SES areas received training, changes to the electronic health record (Houston), and clinical tools to guide brief lifestyle counseling during regular office visits. We evaluated perceived self-efficacy and practice behaviors.

Methods: Physicians and nurse practitioners (PCPs) at 5 Houston and 6 Austin offices completed questionnaires at baseline (T0, n=40), 12 months (T1, n=30), and 24 months (T2, n=34). Self-efficacy (15 items on 1-4 scale) and frequency of practice behaviors (17 behaviors rated never to always, 0-4 scale) were assessed. Mixed effects linear regression models compared responses between time points.

Results: Self-efficacy: confidence increased from T0 to T2 for 7 items: determining OW/OB (3.58 [SD .55] v 3.85 [.66], p < .01); interpreting body mass index (BMI) (3.63 [49] v 3.85 [.36], p < .05); identifying (3.00 [.82] v 3.38 [.65], p=.01) and counseling (2.85 [.80] v 3.44 [.61], p < .001) about OW/OB-related parenting practices; counseling about eating behavior (3.23 [.70] v 3.5 [.66], p < .05); and setting behavioral goals (3.00 [.72] v 3.38 [.65] p=.01). Practice behaviors: PCPs reported high rates of medical problem evaluation and addressing lifestyle, without significant increase by T2. Frequency of discussion of BMI percentiles with all pediatric children/parents increased (3.15 [.80] v 3.5 [.62], p < .05). Low use of patient-centered counseling techniques at T0 increased by T2, including asking permission before discussing lifestyle (1.53 [1.38] v 2.12 [1.34], p < .05); asking which lifestyle issues are most important (2.0 [1.3] v 2.76 [99], p<.01); and asking about confidence to change (2.4 [1.24] v 2.97 [.88], p=.01).

Conclusions: TX CORD primary care practice support was associated with improved PCP self-efficacy and use of patient-centered counseling style.

T-P-3050
The Silent Incidence of Comorbidity Below 35 kg/m2 in Paediatric Population – 5 Year Experience of a UK Regional Adolescent Bariatric Service

Background: National guidelines for bariatric surgery in adolescents include: BMI >40 kg/m2, or BMI >35 kg/m2 with co-morbidities. Usually children with BMI <35 kg/m2 are not extensively investigated or treated in specialist centre. We aimed to identify the incidence of early comorbidities in patients with BMI <35 kg/m2.

Methods: We performed a retrospective review of children referred to our obesity clinic (2010-2015). Patients were divided in four groups: BMI >40 (A); 35-40 (B); 30-35 (C); <30 (D). Data, reported as mean ±SD and number of cases (%), were analysed. P<0.05 was considered significant.

Results: 140 children were assessed. Ten underwent surgery. Twenty-one with incomplete data and 16 with BMI <30 were excluded; 93 were analysed: 48 (44%) in A, 19 (17%) in B and 26 (24%) in C. Mean age was 13±1±4 years: A (15±2.1), B (13±2.7) and C (12±3 [p<0.0002]). 77% of children in group C had at least one comorbidity with 6 (60%) of 10 that underwent liver USS having steatosis. Incidence of hypertension was similar between A,B and C (64% vs. 53% vs. 41%; p=0.2), insulin resistance was higher in A and B (91% vs. 86% vs. 65% p=0.0002).

Conclusions: In our series, adolescents with BMI 30-35 have high incidence of hypertension and insulin resistance that might justify intensive investigations and early intervention. Older children have higher BMI and co-morbidities. We suggest a tailored approach taking into account the presence of co-morbidities in consideration for more intense management and follow up for these patients.

T-P-3051-DT
Weight Loss in Black and White Women in the POWER-UP Trial

Background: Numerous 1-2 year weight loss trials conducted in academic medical centers have shown that black women lose approximately 2-3 kg less than their white counterparts. The present report examines the effect of race/ethnicity on weight loss in women with obesity who were recruited and treated in primary care settings as part the Practice-based Opportunities for Weight Reduction trial at the University of Pennsylvania (POWER-UP).

Methods: Weight losses at 6 and 24 months were examined for 170 white women and 131 black women with a mean baseline age of 52±11.6 years and BMI of 38.5±4.4 kg/m2. (There were no baseline differences between groups.) Data were analyzed using general linear regression models, controlling for age and the effects of treatment condition. (Participants were randomly assigned to usual care, brief lifestyle counseling, or enhanced brief lifestyle counseling. Results for treatment condition have been reported previously and are not examined separately here.)

Results: At month 6, black women, compared with white, lost a smaller percentage of initial weight (-2.7± 0.4% vs. -4.4± 0.4%, p=0.003), and a smaller percentage of black women lost ≥5% of initial weight (22.9 vs 35.4%, p= 0.026). At month 24, differences in weight loss were no longer statistically significant (-2.5± 0.6% vs. -3.7± 0.5%), but a smaller percentage of black women lost ≥5% of initial weight (19.1% vs. 32.4%, p=0.009).

Conclusions: As behavioral weight loss treatment increasingly moves to primary care practice in the coming years, further efforts will be needed to ensure that black women achieve clinically meaningful weight loss.
**T-P.3052**  
**A White-Light 3D Body Volume Scanner to Assess Body Composition**  

**Background:** Body composition calculations have shown to better predict adiposity-related cardiovascular risk better than the commonly used body mass index. The White-light 3D Body Volume Scanner (BVI) is a non-invasive device that measures body volume, shapes and sizes. We assessed the hypothesis that volume obtained by BVI is comparable to the measures body volume, shapes and sizes. We assessed the better predict adiposity-related cardiovascular risk better than Lopez-Jimenez

3.295*(Male=0, Female=1) + 0.0554*(BVI volume, (L) = 9.498 + 0.805*(BVI volume, L) - 0.0411*(Age, years) -

observations (N=971), as follows: Predicted BodPod Volume developed using linear regression based on 80% of the Center and a prediction model for total BodPod volume was on the same day at Mayo Clinic Dan Abraham Healthy Living Center and a prediction model for total BodPod volume was developed using linear regression based on 80% of the observations (N=971), as follows: Predicted BodPod Volume (L) = 9.498 + 0.805*(BVI volume, L) - 0.0411*(Age, years)

- 3.295*(Male=0, Female=1) + 0.0554*(BVI volume, (L) = 9.498 + 0.805*(BVI volume, L) - 0.0411*(Age, years) - 0.0411*(Age, years) -

Predictions for BodPod volume based on the estimated model were then calculated for the remaining 20% (N=243) and compared to the measured BodPod volume. All analyses were performed using SAS version 9.

**Results:** In our cohort 39.4% were men, Mean (SEM) age was 41.5(0.41) years, weight 81.6(0.67) kg, BMI was 27.8 (0.20) kg/m2. Average difference between BodPod volume measured – predicted by BVI was 0 L, median: -0.4 L, IQR: -1.8 L to 1.5 L. Average difference between Body fat % measured – predicted was -1 %, median: -2.7%, IQR: -13.2 to 9.9, with a correlation coefficient of R2 = 0.9845.

**Conclusions:** Body fat mass can be estimated using volume measurements obtained by a white-light 3D body scanner.

**T-P.3053-DT**  
**Appendicular Lean Mass and Trunk Lean Mass and the Difference in Resting Energy Expenditure (REE) of African American and Caucasian American Children**  
Anne Altschul Bethesda MD, James Reynolds Bethesda MD, Sheila Brady Bethesda Maryland, Van Hubbard Bethesda MD, Susan Yanovski Bethesda Maryland, Jack Yanovski Bethesda Maryland

**Background:** Prior studies have reported that African American (AA) children and adults have lower REE, adjusted for total lean body mass (LBM), fat mass (FM), and bone mass, than Caucasian American (CA) children and adults. The lower REE of AA has been proposed as a factor promoting undue weight gain. Because appendicular lean mass (ALM) is also reported to be greater in AA than CA for any given body weight, and ALM has low EE at rest, we tested the hypothesis that separately accounting for trunk lean mass (TLM, primarily composed of high EE organs) and ALM would explain the race-associated difference in REE.

**Methods:** We studied a convenience sample of 417 non-obese and obese AA (n=197) and CA (n=220) children, mean age 11.0±3.0y. REE was measured using indirect calorimetry. DXA (Hologic 2000 or 4500) was used to assess body composition. ANCOVAs were performed to examine the differences in REE for AA and CA, accounting for sex, age, height, pubertal stage, total FM, total bone mass, and either for total LBM or for both TLM and ALM.

**Results:** AA had greater ALM than CA (+2.3±0.3 kg, p<0.001), even after accounting for age, sex, puberty, height, and BMI. When total LBM was in the model, REE adjusted for covariates was 91.9±20.2 kcal/day lower in AA than CA (p<0.001). However, after accounting separately for ALM and TLM, the discrepancy in REE between the groups was no longer significant (41.5±23.9 kcal/day lower in AA; p=0.083). ALM was not significantly associated with REE in this model (p=0.22), although TLM was (p=0.001).

**Conclusions:** The majority of the disparity in REE between AA and CA can be accounted for by differences in body composition as assessed by DXA and appears largely attributable to differences in appendicular lean mass. Thus the previously reported lower REE of AA does not necessarily provide evidence of a predisposition to weight gain. Elucidating the remaining 40 kcal non-significant difference in REE between AA and CA may require organ-tissue volume and metabolic rate measurements.

**T-P.3054**  
**Assessment of Weight Loss with Non-Invasive Selective Radiofrequency Therapy in Overweight and Obese Participants**  
Sara VanWyk Tampa FL, Sejal Shah Alvarez Tampa FL, Macklin Guzman Tampa FL, Edward Zbella tampa fl, Christie Achenbach Tampa Florida

**Background:** Debate exists regarding the efficacy of a non-invasive selective radiofrequency (SRF) therapy for overweight and obesity. This investigation assesses the impact of treatment with an SRF device on waist circumference (WC), total body weight (TBW), and fat mass (FM) in a cohort of overweight and obese individuals.

**Methods:** Investigators performed a single-armed prospective study of overweight and obese individuals who received six weekly treatments with an SRF device. Baseline WC, TBW, and FM were compared to follow-up measurements taken at treatment four, treatment six, and between weeks 4 and 8 post final treatment. Approximately normal distributions were compared using the Paired T-Test and non-parametric distributions were compared using the Wilcoxon Signed Rank Test. Adverse reactions and subject expectations were monitored by weekly survey.

**Results:** A total of 15 participants were enrolled, 15 completed treatments 1 – 4, 13 completed treatments 5 – 6, 12 received a final WC measurement, and 11 received a final body composition measurement. No statistically significant differences were observed for WC, TBW, or FM at treatment 4 (WC: 0.53 (CI: -1.09, 2.15), p=0.493; TBW: -0.8 (CI: -1.89, 0.28), p=0.133; FM: -2.8 (CI: -10.29, 4.68), p=0.435), treatment 6 (WC: 0.57 (CI: -0.52, 1.66), p=0.276; TBW: -1.27 (CI: -2.97, 0.43), p=0.128; FM: -3.47 (CI: -11.67, 4.75), p=0.376), or weeks 4 – 8 post-treatment (WC: 0.94 (CI: -0.44, 2.32), p=0.162; TBW: -0.82 (CI: -3.38, 1.75), p=0.496; FM: 3.06, p=0.05) respectively. A nearly statistically significant
gain in FM (3.06 lbs) was observed at weeks 4 – 8 post-treatment (p=0.05). Subjects reported tenderness, swelling, and firming; no serious or unexpected adverse events were reported. Survey responses indicated that subjects felt “unsure” (70.2%) and “not confident” (19.4%) that they would lose belly fat as a result of treatment.

Conclusions: Our findings did not demonstrate an impact of selective radiofrequency therapy for overweight and obesity.

T-P.3055
Baseline environmental and affective predictors of dietary lapse frequency early in behavioral weight loss treatment

Background: Frequency of dietary lapses (i.e., discrete episodes of dietary inadherence), particularly early on in treatment, is an important determinant of weight loss. However, no baseline predictors of lapses have been identified. We tested the theory-driven hypothesis that eating in response to affect, susceptibility to the food environment, and food cravings predicted frequency of dietary lapses early in a behavioral weight loss intervention (BWLI).

Methods: The current study administered self-report measures to overweight (BMI 27-50 kg/m2; N = 158) participants before entry into a BWLI. One measure of emotional eating, two measures of susceptibility to environmental cues, and two measures of food cravings were used. Ecological momentary assessment was used to record dietary lapses in weeks 2-3 of the BWLI.

Results: A correlational analysis indicated that baseline susceptibility to affect (r = .21, p = .007) and both measures of environmental food cues (rs = .21-.23, ps = .01-.003), as well as both measures of food cravings (rs = .19, ps = .019) were prospectively associated with frequency of dietary lapses at week 3 of the BWLI. For example, when dichotomized, those with higher (+1 SD) susceptibility to the food environment lapsed 10.05 times on average compared to 6.45 times for those with lower (-1 SD) susceptibility to the food environment.

Conclusions: Results suggest that baseline susceptibility to affect, environmental food cues, and food cravings are associated with the likelihood of lapsing from one’s diet. The ability to predict likelihood of lapsing could have important implications for tailoring treatment in BWLI, especially early on in treatment. For example, those high in environmental susceptibility may benefit from an early focus on reducing food cues in the environment or targeted strategies for resisting tempting food, while those with high emotionality may benefit from early interventions focused on reducing emotional eating.

T-P.3056
Comparison of Changes in Body Composition After Medical Versus Surgical Weight Loss
Clare Lee Baltimore Maryland, Nisa Maruthur Baltimore MD, Nowella Durkin Baltimore MD, Meghan Ames , Melissa Scudder Baltimore MD, Susheel Patil Baltimore Maryland, Jeanne Clark Baltimore MD

Background: Bariatric surgery leads to rapid and significant weight loss compared to medical weight loss (MWL). In addition to the loss of fat mass (FM), this rapid weight loss can include up to 1/3 of lean body mass (LM). Whether the method of weight loss contributes to the extent of LM loss is unclear.

Methods: We compared effects of three weight loss interventions [MWL, adjustable gastric banding (AGB), or Roux-en-Y gastric bypass (RYGB)] on changes in body composition at the time of 10% weight loss in a randomized trial. 15 subjects with type 2 diabetes and an employer-based health plan were randomized 1:1:1; stratified by BMI (30-34.9 and 35-40 kg/m2). Data are presented on subjects who completed the study (N=12).

Results: All subjects were women and 75% were African American. Mean age was lower in the AGB vs. the RYGB and MWL arms (46 vs. 54.3 and 51.5 years). The two surgical arms (AGB and RYGB) achieved a significantly greater weight loss compared to the MWL arm (-9.78, -9.97 vs -6.12 respectively) at a faster rate (2.77, 2.51 vs 7.47 months respectively). There was no bone loss at final analysis across the arms. Total FM and LM decreased in all arms but did not vary significantly by arm. Total FM to LM ratios decreased in MWL and RYGB arms but remained the same in AGB arm. RYGB arm lost the most FM while AGB arm lost the most LM; changes were not statistically significant across arms.

Conclusions: Our findings suggest that changes in body composition are similar across weight loss methods in the setting of equivalent short-term weight loss. There is a suggestion that AGB may preferentially lead to a greater total LM loss compared to RYGB or MWL. Studies with a larger and more diverse sample and longer follow up are warranted.

T-P.3057
Effects of a low glycemic load diet on blood pressure during weight maintenance in adults with obesity
Amy Goss Birmingham Alabama, Barbara Gower Birmingham Alabama

Background: Insulin acts through multiple mechanisms to influence blood pressure (BP) including enhancement of renal sodium reabsorption. Sodium restriction is commonly recommended to individuals with hypertension, but diets designed to limit insulin secretion may be as effective at lowering BP by increasing sodium excretion. We tested the hypothesis that circulating insulin is associated with systolic and diastolic BP independent of total fat mass and that consumption of a relatively low glycemic load (GL) diet will result in decreased insulin and systolic and diastolic BP under weight maintenance conditions in healthy adults with obesity.

Methods: Participants were 69 healthy men and women with obesity. Fasting insulin, BP and body composition by DXA were assessed at baseline and after 8 weeks of a eucaloric diet intervention. Participants were provided all food and randomized to either a low GL diet (<45 points per 1000 kcal; n = 40) or high GL diet (>75 points per 1000 kcal, n = 29) for 8 weeks.

Results: At baseline, fasting insulin was associated with systolic (Std β=0.39, p<0.01) and diastolic (Std β=0.28, p=0.05) BP independent of total fat mass, ethnicity, and sex in all participants combined. In both men and women consuming the weight-maintaining low GL diet, insulin was significantly decreased after 8 weeks (-8%, p<0.05). Men who consumed the low GL diet had significantly lower systolic (-5%, p<0.05) and diastolic (-6%, p<0.05) BP. There were no significant changes in insulin or BP following consumption of the high GL diet.

Conclusions: Independent of fat mass, circulating insulin may
be linked to elevated BP among healthy adults with obesity. By limiting insulin secretion, consumption of a relatively low GL diet may reduce diastolic and systolic BP in the absence of significant weight loss.

Methods: Ninety participants completed the YFAS prior to undergoing bariatric surgery for weight loss. They were categorized as food addicted (FA) or not food addicted (NFA) based on the YFAS using both the instructed scoring and then again dropping distress from the criteria. Weight was assessed post surgery at 3 mo, 6 mo, 1 yr and 2 yrs post. The outcome variable was the % of total body weight loss (TBWL) at each time period. The TBWL of FA and NFA participants were compared at each follow up period using a two sample t-test assuming unequal variances.

Results: With distress included, TBWL at 3 mo was 17.2% for FA(n=17) and 17.0% for NFA(n=73) (p=0.45) TBWL at 6 mo was 24.2% for FA (n=16) and 24.9% for NFA (n=69) (p=0.38). When distress was dropped, TBWL at 3 mo was 16.5% for FA(n=49) and 17.8% for NFA(n=41) (p=.09). TBWL at 6 mo was 23.2% for FA (n=48) and 26.5% for NFA(n=37) (p=0.05). One year data was incomplete at the time of submission. It will be presented at the time of the conference.

Conclusions: The YFAS as scored presently categorizes many patients with significant symptoms of addiction as not addicted, diminishing it’s utility as a clinical tool. We propose dropping the requirement of distress for categorizing patients as addicted. Doing so resulted in predictive power for outcome after weight loss surgery that was lost when distress was included.


Background: Establishing a state of energy balance with weight stability is an important component of evaluating a wide range of metabolic processes. Limited information is available on how to experimentally achieve this state of energy balance both through weight measurements and accurate estimates of metabolizable energy intake (MEI). The aim of this study was to twofold: to develop a protocol for creating an energy equilibrium state in healthy adults living on a metabolic unit, and to establish guidelines for MEI requirements based on resting energy expenditure (REE).

Methods: Baseline maintenance energy requirements were initially estimated as 1.15 times 24 hr energy expenditure measured in a respiratory-chamber indirect calorimeter. A 5-day iterative stabilization period then followed with subjects maintaining body weight within ±1 kg entered into a second 5-day energy balance (ΔE) period. 14 subjects completed the study and maintained constant MEI during the ΔE period. Ventilated-hood indirect calorimetry was used to measure baseline REE and REE was also calculated using several widely used prediction equations.

Results: The body weight CV (±SD) during the 5-day ΔE period was 0.39% (range 0.2-1.1 kg). MEI during this period was well-correlated with total energy expenditure (TEE) measured over a similar time frame with doubly-labeled water (R2/p-value: 0.69/<0.01; MEI/TEE, 1.08±0.13). There were good correlations between MEI and measured (0.67/<0.01) and calculated (0.80-0.86/all <0.001) REE, and respective rounded MEI/REE ratios were 1.6±0.2 and 1.4-1.5±0.1.

Conclusions: Energy equilibrium with a body weight CV of <0.5% can be achieved over 2-4 weeks on a metabolic unit with MEI requirements during this period predicted as 1.4-1.6 times measured or calculated baseline REE.

T-P.3059 Examining the Relationship of YFAS Scores to Weight Loss in Bariatric Surgery Gregory Petersen Chicago Illinois, Rachel Gabelman State College PA

Background: We have observed a low rate of distress being endorsed by participants having 3 or more symptoms of food addiction (FA). In our sample, 49 of 90 participants (54%) endorsed 3 or more symptoms of FA. Of those endorsing 3 or more symptoms, only 17 (19%) also endorsed experiencing distress. Using distress as part of the criteria, 32 of 49 participants endorsing significant (3 or more) symptoms of FA are categorized as not addicted. We believe this produces a potential confound for studies correlating the YFAS with outcome that could be rectified by dropping the distress component.

Methods: We genotyped weight-associated SNPs in FTO (rs9939609), MC4R (rs17782313), NEGR1 (rs2815552) and TMEM18 (rs6548238) in 35 adolescents between 14 and 19 y old (20 F; 15 M), with a mean BMI percentile of 64 ± 28 (range: 12-99), recruited for varying familial (i.e. both genetic and environmental) obesity risk based on maternal weight. We assessed subjective appetitive responses to food and non-food words using a novel computer paradigm, as well as ad libitum intake in a laboratory meal. Participants also completed the Satter Eating Competence Inventory, a questionnaire measuring habitual self-regulation of intake.

Results: Higher genetic risk scores based on the number of risk alleles in all four variants were associated with greater ‘wanting’ responses to food words compared with non-food words in the computer paradigm (r=0.37; p=0.030). Analyses of individual variants revealed that the FTO risk allele was associated with lower scores on questionnaire measures of intake self-regulation (p=0.044); and the MC4R risk allele was associated with greater ad libitum intake of high energy-density foods (p=0.036).

Conclusions: Our results suggest that common obesity-associated genetic variants influence weight via multiple appetitive endophenotypes, including a heightened subjective desire to eat when exposed to simple food word cues. This genetic effect on appetite was evident even in this small sample. Targeted behavioral and environmental interventions may help to limit the impact of increased appetitive responses
and diminished self-regulation of intake in those at raised familial/genetic obesity risk.

T-P.3061
GIP modulation of insulin release after oral dextrose intake in healthy men
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Background: Pancreatic beta-cell stimulation of insulin release after oral nutrient intake is believed to be modulated by incretins. Studies of glucose regulatory properties of incretins have for the most part focused on GLP-1, with physiologic role of GIP being sporadically investigated. The purpose of this study was to explore the role of GIP, per se and jointly with GLP-1, on insulin release after oral dextrose ingestion in healthy men.

Methods: Five men (age: 19-60 years, BMI: 25-31 Kg/m2) were studied after an overnight fast and ingestion of 75 grams of dextrose solution. Sessions started at 0800-0900 hour and continued for 6.5 hours, with blood collected at 10-min intervals for the measurements of glucose, GLP-1, GIP, and insulin concentrations. Cross-correlation, multiple stepwise regression, and ROC procedures were used for data analysis.

Results: Insulin release after oral dextrose ingestion was maintained significant cross-correlation with glucose, GLP-1, and GIP at respective lag spectrums of 0-90 (r: 0.39-0.89), 0-90 (r: 0.35-0.86), and 0-80 (r: 0.31-0.92) minutes, with maximum correlations at lag times of 0 min for glucose (r: 0.89), 20 min for GLP-1 (r: 0.86), and 10 min for GIP (r: 0.92). Multiple regression analysis revealed a strong correlation between determining variables (GIP/GLP-1) and insulin (R: 0.93; R2: 0.86). Removal of GLP-1 in the process of stepwise regression reduced R2 by 0.035, leaving GIP as the predominant contributing factor at R2 value of 0.82. Per ROC curve GIP was a stronger predictor of insulin release at respective true positive, false positive, and accuracy rates of 1.0, 0.05, and 97.

Conclusions: Results of this study disclose GIP as a stronger predictor of glucose-induced insulin release. The GIP R2 of 0.82 and the R2 change of 0.035 after removal of GLP-1 indicate that 82% of changes in insulin release after oral glucose intake are accounted by increases in GIP, as opposed to 3.5% for GLP-1. Results in this study need to be confirmed in a larger cohort.

T-P.3062
Glucose Excursions Influences Hunger and Food Intake in Free-Living Lean and Obese Individuals.

Background: Obesity is a serious health problem that can be ameliorated through diet and exercise. Both the rapidity of the decline in blood glucose as well as its decrease into the hypoglycemic range are thought to provoke hunger and increase food consumption. However, little is known about the relationship of hunger and food intake with circulating glucose profiles in healthy free-living lean (L), and obese (OB) individuals.

Methods: To evaluate whether changes in glucose levels can impact subsequent food intake and hunger, 8 OB (7F/1M, age 44±3, BMI 33.7±0.7, A1c 5.1±0.1) and 5 L (4F/1M, age 25±3, BMI 23.1±1.0, A1c 4.9±0.1) subjects wore a continuous glucose monitor (CGM, Dexcom) for up to 5 days while maintaining a food diary of preprandial hunger ratings (on a scale of 1-10, 1-not at all and 10-very hungry) and food items consumed.

Results: Self-reported hunger ratings (L=6.1±0.2 and OB=5.8±0.2) and daily caloric intakes (L=3504±993 vs OB=2306±340 kcal) were not statistically different between the groups. The mean amplitude of glycemic excursions (MAGE) measured by CGM was similar in both groups. While the mean glucose peaks prior to each meal were higher in the OB group (L=114±2 mg/dL and OB=122±3, P<0.05), there was no difference in the nadirs (82±2 and 84±2 mg/dL; P=NS). In both OB and L groups, glucose peaks (p=0.20, P<0.01) and decrements (p=0.25, P<0.001), but not nadirs (P=NS) correlated positively with subsequent hunger ratings. Hunger ratings, however, were positively associated with the caloric and fat intake per meal in OB subjects (P<0.05).

Conclusions: These results suggest that glucose peaks and decrements, rather than nadirs, influence perception of hunger. Hunger may particularly promote the intake of fat in obese subjects. Our findings suggest that daily glucose excursions modulate hunger in both obese and lean free-living individuals, which in turn might promote consumption of calorie-dense meals to a greater extent in obese individuals.

T-P.3063
Higher Dietary Protein Intake Preserves Lean Body Mass, Lowers Liver Lipid Deposition and Maintains Metabolic Control in Subjects with Fatty Acid Oxidation Disorders

Background: As part of our ongoing investigations of the role of abnormal mitochondria function among patients with inherited long-chain fatty acid oxidation disorders (FAOD) on energy utilization, body composition, and glucose metabolism, we have demonstrated that subject with FOAD fed a standard-of-care chronic low-fat, high-carbohydrate diet (CHO) have increased percent body fat compared to normal controls.

Methods: To determine if diet macronutrient content might contribute to this altered body composition, we randomized FAOD subjects to either a CHO diet (n=6) or to a high protein (PRO) diet with a whey protein supplement (Beneprotein) (n=7). At baseline and the end of the 4 month feeding period, subjects underwent assessments of body composition by DEXA, tissue lipid deposition by MRI/MRS, and energy expenditure.

Results: At the end of the study, FAOD patients randomized to PRO diet had an increase in lean body mass compared to a decrease in lean mass in the patients on the CHO diet (P=0.02 for between group comparison). Fat mass and measures of total and resting energy expenditure were not different, although protein oxidation was significantly higher on the PRO than CHO diet (P=0.02). There was no significant change in intramyocellular lipid between groups but intrahepatic lipids trended lower in the PRO diet group (P=0.08). Short-chain acylcarnitine levels were higher while long-chain acylcarnitines were not different after a PRO meal compared with the CHO meal (P<0.05).

Conclusions: The high PRO diet with a whey supplement preserved muscle mass despite increased protein oxidation and
Background: Impaired cardiac autonomic nervous system function and obesity are associated with higher systolic blood pressure (SBP) in adults and children. Whether sympathetic nervous system activity influences SBP independent of adiposity in children and adolescents has yet to be evaluated.

Methods: We examined the cross-sectional association of heart rate variability (HRV) with hypertension status and SBP among children and adolescents (n = 188; 103 female; 6-18 years old) ranging from normal weight to severe obesity. Seated blood pressure was measured in triplicate using an automated cuff system. Pre-hypertension (SBP percentile ≥90th <95th) and hypertension (SBP percentile ≥95th) were defined by age-, sex-, and height norms. HRV was measured using the SphygmoCor™ MM3 system and analyzed with the number of adjacent R-R intervals over 50ms) and larger low frequency : high frequency ratio were significantly lower SBP independent of total body fat (p<0.05). In linear regression analysis, lower time-domain, but not frequency-domain, heart rate variability with hypertension status and SBP defined by age-, sex-, and height norms. HRV was measured using the SphygmoCor™ MM3 system and analyzed with indexes of autonomic nervous system activity. Total body fat was measured via dual-energy X-ray absorptiometry.

Results: Logistic regression models demonstrated that lower values in all of the time-domain HRV measures (e.g. mean R-R interval length, standard deviation between R-R intervals, the number of adjacent N-N intervals over 50ms) and larger low frequency : high frequency ratio were significantly associated with higher odds of being pre-hypertensive / hypertensive independent of adiposity in young youth has yet to be evaluated.

Conclusions: These data suggest that impaired cardiac autonomic nervous system function, at rest, is associated with higher odds of being pre-hypertensive / hypertensive and higher SBP independent of adiposity in children and adolescents. Whether reductions in sympathetic modulation of cardiac function reduce blood pressure in obese youth independent of weight loss requires further investigation.

T-P.3066-DT

Lower Triglycerides in African American Women Compared with White Women: Insight from Plasma Free and Esterified Fatty Acid Composition

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Background: Triglycerides (TG) levels are related to cardiometabolic disease risk. Reduced intracellular TG synthesis is related to an increase in the metabolites involved in lipotoxicity (i.e., FFA Acyl-CoA, diacylglycerides and ceramides) that increase disease risk. African Americans (AA) have lower circulating and intracellular TG than Whites (W), but greater disease rates. While it is known that fewer TG accumulate in, and are secreted from the livers of AA than W, the etiology of presumably lower intracellular TG synthesis in AA is largely unstudied.

Methods: We measured the composition and product-prursor ratios of plasma free (FFA) and total esterified (EFA) fatty acids as indexes of fatty acid metabolism in AA(n=125) and W(n=80) women using GC-MS. These indexes were calculated: de novo lipogenesis(DDL)=16:0/18:2n-6, Stearoyl-Coa Desaturase-1(SCD-1), SCD-1 C16=16:1n-7/16:0, SCD-1 C18=18:1n-9/18:0, Elongase-6(Elovl-6)=18:0/16:0, Elongase-5(Elovl-5)=22:6n-3/20:5n-3, Δ5 desaturase=20:4n-6/18:3n-6 and Δ6-desaturase=18:3n-6/18:2n-6.

Results: Total FFA (AA=0.76±0.02, W=0.75±0.03 mmol/L, p=.86) were similar, while total TG (AA=8.4±3, W=12±3 mg/dL, p<.001) and total EFA (AA=8.4±0.2, W=10.4±0.3 mmol/L, p>.001) were lower in AA. Indexes of DNL, SCD-1, ELOVL-6 and Elovl-5 were consistent with lower enzymatic activity in FFA (representative of adipose tissue) and EFA (representative of the liver). Indexes of Δ5 desaturase and Δ6 desaturase activity were also different in AA and W women in FFA, but not EFA. In EFA, ethnicity and indexes fatty acid enzymatic activity independently predicted TG without interaction.

Conclusions: We conclude that indexes of DNL and essential fatty acid metabolism showed reduced levels in plasma FFA and total EFA in AA compared with W women suggesting lower intracellular TG synthesis in AA women. Therefore, lipotoxicity related metabolites should be investigated for a relationship with increased cardiometabolic disease risk in AA women due to lower TG and lack of associated risk.
and lower, respectively, in AA than W women. Glucose was directly related to A1c (adj r=0.45, p<.001) and A0 (adj r=0.49, p<.001) with ethnicity as a predictive factor for both dependent and mediating variables. When A1c was regressed on glucose and A0 simultaneously (adj r=0.66, p<.001), the relationship between glucose and A1c was significantly reduced and ethnicity was no longer significant.

Conclusions: Our results showed the relationship between glucose and A1c was mediated by A0 independent of ethnicity. A0 glycation with glucose was the same due to ethnic differences in A0 and glucose, suggesting that A1c% is clinically equivalent in both groups. Correction of A1c for total Hb A is insufficient presumably due to differences in A0 ‘glycation’ with other reducing sugars. Ethnic differences in A1a and A1b suggest that glycolysis is different in AA and W women.

T-P-3068 Non-Hematopoietic Effects of Endogenous Erythropoietin on Lean Mass and Body Weight Regulation May Act in Opposing Directions in Men and Women

Background: Erythropoietin (Epo) has been found to have gender modified responsiveness and non-hematopoietic functions in rodents including effects on body weight and glucose regulation. It is not known if similar effects occur in humans.

Methods: Participants were 109 full heritage Pima Indians (55% male) from a larger study on our clinical research unit designed to understand the causes and complications of obesity and type 2 diabetes mellitus. Seventy-nine subjects had follow up data for weight (4.3±1.9yrs). Plasma concentrations of Epo, leptin, and adiponectin; body composition; 24-hour energy expenditure measured in a whole room calorimeter (EE); oral glucose tolerance and weight change were assessed.

Results: Epo, adjusted for differences in storage time, hemoglobin, and creatinine, was positively associated with EE (r=0.26, p=0.007) and sleeping EE (r=0.29, p=0.003), fat free mass (r=0.25, p=0.01), fat mass (FM; r=0.25, p=0.008), fasting insulin (r=0.27, p=0.006), but not 2-hour insulin (r=0.16, p=0.09), fasting glucose (r=-0.04, p=0.96), or 2-hour glucose (r=-0.01, p=0.9). In a multivariate model adjusted for the determinants of EE, Epo was not an independent predictor of EE (p=0.05). Epo was positively associated with leptin in men (p=0.36, p=0.01), but not in men (r=0.02, p=0.9), independent from FM. Epo and adiponectin were not associated (r=0.01, p=0.9). The association of Epo with % weight change per year was in opposing directions (interaction: p=0.002) in men (r=−0.35, p=0.02) versus women (r=0.37, p=0.02), after adjusting for covariates.

Conclusions: Epo concentration was not an independent determinant of EE or SMR. In women, higher Epo concentrations were associated with higher leptin concentrations, independent from FM. Epo concentrations were negatively associated with weight change in men and positively so in women. These data indicate that non-hematopoietic Epo action may be modulated by sex hormones, and, in women, Epo action may either mediate or be affected by leptin resistance.

T-P-3069 Packaged Foods and Weight Loss in a Medically-Supervised Weight Loss Program

Background: Meal replacements and other packaged food options are often a component of commercial weight loss programs; however, little information is available on how their use impacts patient outcomes. The objective of this analysis is to assess how weight outcomes and behavior data differ between very low calorie diets (VLCDs) that do or do not incorporate packaged food items.

Methods: A retrospective chart review over a 6-month period was performed for patients that self-selected one of two daily menu options at a medically-supervised commercial weight loss program. The dietary interventions consisted of a packaged food item daily meal plan (PF) or a self-selected food-based meal plan (FB). Patients who changed menu plans over the course of treatment were excluded from analysis. Weight loss and behavior were assessed in pounds and encounters, respectively. Differences between PF and FB patient outcomes were examined using the Mann-Whitney U Test.

Results: A total of 7,951 patient charts were retrospectively reviewed, 148 patients who changed menu plans were excluded, and 7,803 patients were included in the final analysis (PF=184, FB=7,619). There were no statistically significant differences in the underlying distributions of weight loss (p=0.914) or encounters (p=0.699) of patients administered the PF or FB meal plans. Patients on the PF meal plan lost a median 12.6 lbs; whereas, patients on an FB meal plan lost a median 11.7 lbs. There were no differences in the median number of encounters recorded for PF and FB meal plan patient groups (PF: 6 encounters; FB: 6 encounters).

Conclusions: Our data suggest that the evaluated packaged food menu plan demonstrates similar weight loss compared to the food-based menu option in patients of a medically-supervised weight loss program. Future research of the evaluated packaged food menu plan would benefit from a non-inferiority analysis of weight loss and encounters between interventions.

T-P-3070-DT Reduction of Fatty Liver After Short-Term Isocaloric Fructose Restriction in Children with Metabolic Syndrome Correlates with Improvement in Insulin Dynamics

Background: The cause of insulin resistance in metabolic syndrome remains controversial. Ectopic compartmentalization of liver fat is associated with insulin resistance, but proving causation remains elusive.

Methods: Obese Latino and African-American children (n=36, ages 9-18; BMI z-score 2.3±0.3; 46.4±5.1% fat by DXA), who were high dietary sugar consumers (fructose intake >50 g/d), had all meals provided for 9 days with the same energy and macronutrient composition as their standard diet, but with
fructose content reduced from 12% to 4%, and replaced by complex carbohydrate. Subjects were weighed daily and diets adjusted to maintain baseline weight. A 2-hour oral glucose (G, mg/dL) tolerance test (OGTT) with insulin (I, μU/mL) and e-peptide (CP, ng/mL) levels was performed on Days 0 and 10. HOMA-IR, Composite Insulin Sensitivity Index (CISI), glucose (GAUC) and insulin (IAUC) area under the curve were computed. Liver fat was measured with 3T MR spectroscopy, obtained from a 20 cc single voxel. Signals were respiratory-motion and T2-corrected, and fat fractions (lipsids/lipids+water) generated. Results were adjusted by ANCOVA for minor weight loss (0.9±1.1kg, p<0.001).

**Results:** Reductions in fasting G (5.1%), I (35%), CP (24.4%), HOMA-IR (40.6%), GAUC (6.6%), and IAUC (36.5%) were noted, while CISI increased (53.1%) after 9 days of fructose restriction (p<0.001). Liver fat reduced by 22% (p<0.001). Liver fat positively correlated with I, HOMA-IR, CP, and negatively with CISI on both Day 0 and Day 10 (p<0.05, Spearman). Change in liver fat over the 10 days positively correlated with changes in I and HOMA-IR (p<0.05, Spearman).

**Conclusions:** Isocaloric fructose restriction for 9 days reduced liver fat and improved serum measures of insulin sensitivity in children with metabolic syndrome irrespective of weight loss. Changes in liver fat correlated with changes in insulin sensitivity, suggesting directionality — fructose drives liver fat, which drives insulin resistance.

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**T-P.3071**  
**Relationship Between Free 25(OH)D and Adipokcytokines in Obese and Normal Weight Children**  
Seema Kumar Rochester Minnesota, Jobjayer Hossain Wilmington DE, Roxana Aguirre Castaneda Peoria IL, Nicole Nader St Louis Park MN, Babu Balagopal Jacksonville Florida

**Background:** Despite the evidence of hypovitaminosis D in obese children, there is considerable uncertainty on the accuracy of quantifying total 25(OH)D as a biomarker of vitamin D status. Free or unbound 25(OH)D is considered active and recently been recommended as a potentially better marker of vitamin D status. There are no reports on the potential role/associations of free 25(OH)D with obesity-related cardiometabolic risk factors in children. The study determined free 25(OH)D levels in children in relation to biomarkers of obesity-related cardiovascular disease (CVD).

**Methods:** As part of a larger study, 20 children (8 obese and 12 normal weight, mean age: 15.05±2.21) were considered in this pilot report. Free-25(OH)D was measured using an enzyme linked immunoassay and total 25(OH)D was measured using liquid chromatography-tandem mass spectrometry. Leptin, total & high molecular weight adiponectin, interleukin-6 (IL-6) and high-sensitivity c-reactive protein (hs-CRP), fasting glucose and insulin were measured. Pearson and/or Spearman correlation was used to measure association of free 25(OH)D with the above biomarkers of CVD.

**Results:** Free 25(OH)D was negatively correlated with leptin (r = -0.510, p = 0.022) and showed an association of greater extent than that between total 25(OH)D and leptin (r = -0.275, p = 0.034). Although free-25(OH)D and IL-6 showed near significant association (r = -0.395, p = 0.085), there were no such associations with other biomarkers of CVD considered in this study.

**Conclusions:** The stronger negative correlation between free 25(OH)D and leptin than that of total 25(OH)D and leptin suggests the potential important role of free 25(OH)D as a marker of vitamin D status in obese children. The lack of correlation between free 25(OH)D and other adipokines is similar to previous studies reported for total 25(OH)D in children. Larger population-based studies on free 25(OH)D are required to determine the clinical significance of these findings in obese children.

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**T-P.3072**  
**Role of Vitamin D in Insulin Resistance and Vascular Health in Children?**  
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**Background:** Total 25-hydroxyvitamin D (25D) levels have been linked to metabolic health, and deficiency has been associated with insulin resistance, and cardiovascular disease risk. These relationships are inconsistent and could be affected by differences in vitamin D binding protein (DBP) and free vitamin D (free D) levels. We therefore evaluated the relationship of total and free D levels to metabolic risk markers in normal weight (NW) and overweight (OW) youth across the spectrum of glucose regulation.

**Methods:** 75 adolescents age 15.5±0.2 [17 NW, 23 OW, 19 OW with prediabetes (OW-Pred)], and 16 with type 2 diabetes (T2DM)] had: measurement of insulin sensitivity (IS) by a hyperinsulinemic-euglycemic clamp, endothelial function by reactive hyperemia index (RHI), and body composition (DXA). 25D and DBP were measured and free D calculated. Results are Mean±SE.

**Results:** Across tertiles of free D levels (43.5±4.9, 19.3±0.9, and 9.6±0.4 pmol/L, p<0.001), the group in the highest tertile had significantly lower percent body fat (%BF) (27.8±2.5, 34.5±1.6, and 37.2±1.3%, p=0.002), higher IS (5.7 ± 0.9, 4.6 ± 0.9, and 1.6 ± 0.4 mg/kg/min per μU/mL, p = 0.056), higher RHI (1.7±0.09, 1.49±0.07, and 1.47±0.06, p = 0.03) and lower hs-CRP (1.6±0.5, 2.6±0.7, and 3.2±0.6 mg/L, p=0.07) compared with the 2nd and 3rd tertiles, respectively. There were no significant differences among the tertile groups with respect to HbA1c, lipid profile or blood pressure. Free D levels were inversely related to %BF (r = -0.36, p=0.001), hs-CRP (r= -0.26, p=0.025) and positively related to RHI (r = 0.25, p=0.03), and IS (r = 0.24, p=0.049). After adjusting for race and %BF, total and free D were no longer significantly related to RHI or insulin sensitivity.

**Conclusions:** Youth in the lowest tertiles of Vit D levels have lower insulin sensitivity and worse cardiovascular disease risk profile. However, the relationships of total 25D and free D levels to insulin sensitivity and endothelial function are not independent of the effect of adiposity.

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**T-P.3073**  
**Slowing Down and Taking a Second Look: Inhibitory Deficits Associated with Binge Eating are not Food-Specific**  

**Background:** Overweight and obese individuals with binge eating (BE) pathology have poor psychological and health outcomes. A more complete understanding of BE maintenance...
Conclusions: A covariate did not significantly alter results. Detection (p = .38, η²p <.01). Including depressive controls, but no group by SST condition interaction was detected. The BE group exhibited poorer inhibitory control deficits compared to controls, with the most pronounced deficit occurring when food stimuli were used.

Methods: Overweight or obese participants with (n=25) and without (n=65) BE completed a computerized Stop Signal Task (SST) with distinct task blocks featuring food-specific stimuli, positive non-food stimuli, and neutral stimuli.

Results: The BE group exhibited poorer inhibitory control across SST stimulus types (p = .003, η²p = .10) compared to controls, but no group by SST condition interaction was detected (p = .38, η²p <.01). Including depressive symptoms as a covariate did not significantly alter results.

Conclusions: Consistent with previous findings, results suggest that individuals with BE display general inhibitory control deficits compared to weight-matched controls; however, no difference in inhibitory control was detected across the different types of stimuli used. Furthermore, inhibitory control deficits appear to be specific to BE rather than reflective of increased depressive symptoms. Replication and further research is needed to guide treatment targets.

__T-P.3074__
The Association between Nonalcoholic Fatty Liver Disease and Metabolic syndrome in Obese Adolescents

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Background: Concurrent with the rise of the incidence in obesity, nonalcoholic fatty liver disease (NAFLD) and metabolic syndrome (MS) are increasingly prevalent in obese adolescents. However, the relationship between NAFLD and MS in obese adolescents is not fully validated. The aim of this study was to evaluate the association of metabolic risk profiles and NAFLD among obese adolescents.

Methods: This study was a cross-sectional study of the risk factors for NAFLD and MS in obese adolescents. A total of 593 obese subjects aged 10-18 years were recruited in Taiwan. We diagnosed NAFLD by liver ultrasonography. International Diabetes Federation (IDF) consensus was used to define MS. We measured anthropometric, serum biochemical variables, and biomarkers for insulin resistance.

Results: 154 (26%) had NAFLD and 83 (14%) had MS. Obese adolescents with NAFLD had significantly higher serum triglyceride concentrations and elevated blood pressures than obese adolescents without NAFLD. After adjusting for age, body mass index, and insulin resistance measured by HOMA-IR, obese adolescents with NAFLD had a higher risk for MS (odds ratio, 2.19; 95% confidence interval, 1.26 to 3.81, P = 0.006), as compared with subjects without NAFLD.

Conclusions: NAFLD is associated with an increased risk for MS independent of the effects of age, BMI, and insulin resistance in our population of obese adolescents. Further studies are needed to understand mechanisms that underlie this epidemiologic association.

__T-P.3075__
The Association of Skin to Right Ventricle Distance on Echocardiogram with Metabolic Syndrome

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Background: The constellation of abdominal obesity, elevated triglycerides, reduced high-density lipoprotein cholesterol, glucose intolerance, and hypertension has been represented as the metabolic syndrome (MetS). We previously reported that echo measurement of skin to RV distance (SkRV) is independently associated with anthropometric measures (AMs), age, race, gender and select inflammatory biomarkers. Abdominal obesity and visceral fat are associated with MetS; however, the relationship of SkRV to MetS has not been previously described, which was our objective.

Methods: We determined clinical risk factors and AMs in 150 patients who presented to our CDU with chest pain and no history of coronary artery disease. MetS was deemed to be present if patient had at least 3 of the 5 criteria. SkRV was measured from the end systolic parasternal long axis image as the maximal linear distance from the skin to RV, perpendicular to the axis of the aorta. Univariate analysis was done using Pearson’s correlation, Student’s t-test and analysis of variance (ANOVA). Multiple regression analysis was used to predict SkRV from risk factors significant on univariate analysis.

Results: The study group had a mean age of 46.5 ± 10.6 years; mean body mass index of 32.5 ± 8.3; 68% were Black, 57% female and 33% were found to have MetS. Mean SkRV distance was significantly higher in patients with MetS than those without (32.2 ± 6 vs 27.6 ± 6.56, p < 0.0001). On univariate analysis, MetS was associated with body mass index (BMI), SkRV and exercise duration in minutes. On multiple logistic regression, only BMI (OR=1.06, p=0.024, 95% CI 1.08,1.118) and exercise duration (OR=0.84, p=0.025, 95% CI: 0.72,0.98) remained predictors of MetS.

Conclusions: Skin to right ventricle distance is increased in patients with MetS. However only BMI and exercise duration in minutes are strong predictors of MetS on multiple regression analysis. Since BMI and SkRV are themselves correlated, it suggests that BMI is the stronger predictor of MetS.

__T-P.3076__
The Effect of Niacin on Free Fatty Acids and Growth Hormone Secretion in Obese Children

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Background: Obese children and adults display lower spontaneous and stimulated growth hormone (GH) secretion, but the mechanisms by which obesity reduces GH are unclear. Circulating Free Fatty Acids (FFA) are one factor believed to inhibit GH secretion in obesity, presumably due to direct effects on hypothalamic GH-regulating neurons. In adults, inhibition of lipolysis by acipimox and niacin lowers circulating FFA concentrations and increases spontaneous and stimulated GH secretion. There are no data in obese children demonstrating the effects of inhibition of lipolysis on GH secretion. We performed a dose-finding study examining the effects of niacin administration on FFA and GH concentrations in obese children. We hypothesized that niacin would lead to a
fall in FFA concentrations and consequently a rise in spontaneous GH concentrations.

**Methods:** Obese (BMI ≥ 95th percentile) nondiabetic children age 6-12y were admitted overnight for niacin treatment with 250mg q2h x 3 doses (n=2), 500mg q2h x 3 doses (n=5) or 500mg q1h x 4 doses (n=5). Serum FFA, GH, insulin, and glucose, and plasma growth hormone-releasing hormone (GHRH) and somatostatin (SST) were measured.

**Results:** 8 boys and 4 girls (age 9.7±1.8y; BMI 26.4±3.1; BMIz 2.2±.25) were studied. FFA were progressively inhibited as the dose and frequency of niacin increased (ANOVA-RM dose x time p =.01) such that niacin 500mg q1h x 4 doses suppressed FFA < 0.2 uEq/L. The patients in the 500mg q1h group also had a significant increase in GH (ANOVA-RM dose x time p =.04). Neither GHRH nor SST changed significantly post niacin. Adverse effects were flushing/warmth (100%), tingling (60%), and abdominal discomfort, nausea, or emesis (20-40%) that diminished in intensity with each subsequent dose.

**Conclusions:** Administration of niacin 500mg q1h significantly lowered serum FFA in obese children and increased GH. These data demonstrate that increased FFA are important suppressors of GH concentration in obese youth.

T-P-3077
**The Impact of Diet-Induced Weight Loss on Tissue Biomarkers for Colorectal Cancer: Preliminary Results from the INTERCEPT Study.**


**Background:** Obesity is associated with raised cancer risk, but there is limited evidence on whether intentional weight loss reduces risk. Bariatric surgery is usually associated with reduced risk, but some studies have demonstrated an increased risk of colorectal cancer (CRC). There are no comparable data for dietary/behavioural programmes, partly because the notorious difficulty of weight-loss maintenance makes it difficult to examine effects on cancer outcomes long term. Cancer-related biomarkers potentially provide a valuable intermediate end-point; improvements in circulating levels of cancer-related serum biomarkers following weight loss suggest risk can be reduced, but few studies have looked at changes at the tissue level.

**Methods:** We have previously demonstrated improvements in serum insulin and C-reactive protein in a small sample (n=20) of obese, but otherwise healthy participants following an 8-week liquid weight loss diet programme (810 kcal/day). This single-arm study included endoscopic examinations pre-and post-weight loss to take colon biopsies. Markers of apoptosis and colonocyte proliferation were assessed using immunohistochemical staining.

**Results:** Participants achieved substantial weight loss (11-18%, median=13.3%). Tissue analysis suggested some change in markers of apoptosis following weight loss (pre-intervention median=1, range=1-3; post-intervention median=1, range=0-2), but differences were non-significant. Ki-67 (a proliferation marker) was significantly reduced over the intervention period (p=0.029).

**Conclusions:** Even in this small sample, weight loss was associated with a significant reduction in Ki67, making this one of the first studies to demonstrate changes at the tissue level following weight loss achieved through diet. Additional analysis of tissue biopsies is underway, including DNA methylation, which will provide further insight into the effect of weight loss on molecular markers in target tissues for CRC.

T-P-3078
**Truncating homozygous mutation of carboxypeptidase E (CPE) gene in a morbidly obese female with type 2 diabetes mellitus, intellectual disability and hypogonadotropic hypogonadism**


**Background:** Whole exome sequencing (WES) has revealed a number of new loci causing monogenic obesity. We have investigated a consanguineous Sudanese family with a Mendelian pattern of extreme obesity in an attempt to identify the cause of their disease. The proband was a 20 year old female with childhood-onset morbid obesity (current body mass index (BMI) 51.5 kg/m2), intellectual disability, type 2 diabetes mellitus (T2DM) and hypogonadotropic hypogonadism.

**Methods:** WES was carried out on the proband, and also her mother and sister, who each had less severe obesity (BMI of 36.0 and 31.9 kg/m2 respectively), and no other symptoms. Sanger sequencing was used to confirm findings and undertake segregation analysis and quantitative RT-PCR was performed on RNA isolated from whole blood samples.

**Results:** Analysis of WES data revealed a homozygous deletion (c.7698del) in exon 1 of the CPE gene in the proband, which results in a p.E26RfsX68 truncation of the protein. Sanger sequencing confirmed homozygosity in the proband and heterozygosity in her mother, sister and two non-obese brothers. Another unaffected sister did not carry the deletion. No DNA was available from the father, nor from a diseased older brother with a similar phenotype as the proband. No CPE expression was detected in blood derived RNA from the proband, and expression in the heterozygous sister was lower than the range seen in six controls matched for obesity, age and T2DM.

**Conclusions:** As far as we are aware, this is the first homozygous null CPE mutation described in humans. Carboxypeptidase E is, among others, involved in processing peptides active in the leptin-melanocortin appetite pathway and glucose metabolism. The morbid obesity, intellectual disability, diabetes and the hypogonadism seen in this proband and her brother, recapitulates the phenotypes of the previously described fat/fat and Cpe knockout mouse models. Our data add to the growing number of monogenic obesity loci known in man. (APG and SIA are joint first authors)

T-P-3079
**A New Prospective National Registry for Treatment-seeking Youth with Obesity: Descriptive Analyses of Participating Multicomponent Pediatric Weight Management Programs**

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Background: The American Academy of Pediatrics recommends a Stage 3 multi-component pediatric weight management program (PWMP) for youth with persistent obesity. The US Preventive Services Task Force found PWMPs were effective when ≥ 26 contact hours were provided over ≥ 6 months. Little is known about PWMP design and contact hours related to patient outcomes. The prospective Pediatric Obesity Weight Evaluation Registry (POWER), 29 multi-component PWMPs representing 28 sites in 20 states, is collecting program and patient data to understand the spectrum of PWMP design and its association with health outcomes. The objective of this study is to describe differences in program format among POWER sites.

Methods: POWER developed a program profile survey that covered 12 content themes, including provider specialty, program format and duration, dietary approach, and physical activity (PA) sessions. POWER site leads received the survey using a web-based system (REDCap™) over a 6-month period (9/2014-2/2015) during POWER’s enrollment phase.

Results: Of the 28 POWER sites, 100% completed the survey, representing 29 PWMPs. Seventeen (59%) PWMPs offer ≥ 6 months of treatment. Sixteen (55%) PWMPs offer ≥ 25 contact hours over a 6-month intervention. Across the PWMPs, 11 dietary approaches were identified as options when starting treatment, with nutrient-balanced, portion- controlled diet (83%) as most common. Of the 18 (62%) PWMPs that offer PA sessions, 8 (44%) partner with a community setting, 6 (33%) have an on-site component, and 4 (22%) have both.

Conclusions: The POWER survey found a broad spectrum of program characteristics, which need to be considered when interpreting health outcomes among youth participating in PWMPs and formulating best-practice guidelines.

T-P-3080
An Objective, Experimental Approach to Understanding Influences on Infant Intake During Bottle-Feeding Interactions
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Background: Bottle-fed infants are at higher risk for overfeeding than breast-fed infants. However, few studies have described sources of individual differences in infants’ feeding and satiation behaviors to understand which mothers and infants are at highest risk. The purpose of this study was to use an objective, experimental approach to determine how mother-versus infant-led feeding conditions affect infants’ feeding and display of satiation behaviors during bottle-feeding, and to identify maternal and infant characteristics associated with overfeeding.

Methods: In a 2-day, within-subjects study of 21 mother-infant dyads, days differed by feeding condition: Mother-Led (ML; mothers were instructed to feed their infants as they normally would at home) and Infant-Led (IL; infants determined the pace and duration of feeding). Intake was determined by bottle weight; percent difference for ML versus IL was calculated. Video records were analyzed to determine duration of feeding and frequency, timing, and type of satiation behaviors infants displayed. Mothers completed standardized questionnaires of feeding styles, eating behaviors, and infant temperament.

Results: Infants consumed 41.8±17.8% more during the ML than the IL feeding (p=0.03), but displayed similar numbers of satiation behaviors (p=.75). Notable variation existed in the discrepancy between intakes during the ML and IL feedings, with percent difference scores ranging from -52.8 to 268.9%. 67% of infants consumed more during the ML compared to the IL feeding. Stepwise regression illustrated greater intake during the ML compared to the IL feeding was predicted by mothers’ reports of lower levels of infant distractibility, infants’ display of fewer satiation behaviors during the ML compared to the IL feeding, shorter time since last feeding, and higher maternal BMI.

Conclusions: This objective, experimental approach illustrated that some, but not all, bottle-feeding mothers and infants are at risk for overfeeding during typical feeding interactions.
and zBMI score at 3 (0.013, p=.22) and 6 months (.016, p=.008). Non-Hispanic white participants lost significantly more weight and had greater reductions in zBMI score than non-Hispanic black participants at 3 months (7.76 vs. 6.91 kg, p=.003), (.072 vs. .043, p=.003). Each serving per day of a SSB at baseline predicted in a decrease in zBMI score at 6 months (-.53, p=.019). Each serving per day of fruit at baseline was predictive of weight loss at 3 (-.39, p=.005) and 6 months (-.53, p=.019).

Conclusions: Race, SSB and fruit consumption at baseline predict weight loss at 3 and 6 months in severely obese youth. Weight loss interventions should be tailored culturally and individually to include specific baseline behavioral targets.

T-P.3082

Does free-living physical activity influence individual metabolic responses to a sedentary breaks intervention in children?

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Background: Clinical studies in adults have shown that interrupting sedentary behavior with physical activity improves metabolic parameters. However, the influence of basal free-living physical activity (FLPA) on these responses is unknown. We tested whether FLPA was predictive of the metabolic response to a sedentary break intervention in children.

Methods: We measured FLPA in normal weight (N=28; 54% male; 61% White) 7-11 year old children with an accelerometer (Actigraph GT3X+) worn on the non-dominant wrist for one week before each of two experimental visits. One visit involved 3 hours of continuous sitting, and the other 3 minutes (min) of moderate intensity walking breaks every 30 min for 3 hours. Insulin, C-peptide, and glucose were measured every 30 min for 3 hours following an oral glucose tolerance test, and area-under-the-curve (AUC) was calculated for each. Vector magnitude (VM) activity counts were averaged over wear-time minutes during FLPA. Results presented as mean ± SD.

Results: There was an average of 11.1 ± 2.6 (range: 5-14) valid days and 2514 ± 491 VM counts/wear-time min of FLPA data collected. For both the continuous and interrupted sitting, greater average FLPA counts/min predicted lower insulin AUC (r=-0.61, r=-0.59, respectively) and C-peptide AUC (r=-0.49, r=-0.53, respectively) (all p<0.05). Results remained significant after controlling for BMI, Tanner stage, age, sex, fat mass, and fat-free mass in a backward stepwise regression.

However, FLPA did not predict glucose AUC or the changes in insulin, glucose, or C-peptide AUC between the continuous and interrupted sitting conditions.

Conclusions: These findings suggest that FLPA measured at the wrist may be an indicator of cardiometabolic health in children. Future studies are required with a broader adiposity range to better determine the influence of FLPA on individual variations in the metabolic response to interrupted sitting in children.

T-P.3083

Effect of Dietary Protein at Breakfast on Satiety and Thermic Effect of Food in Normal Weight and Overweight/Obese Children

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Background: We previously reported that a protein breakfast meal containing 45 g of protein decreased subjective average appetite and food intake in children, however, the effect on the thermic effect of food (TEF) is unknown. The objective was to determine the effect of dietary protein at breakfast on TEF in normal weight (NW) and overweight/obese (OW/OB) 9-14 year old children.

Methods: On 2 separate mornings and in random order, following the measurement of resting metabolic rate (RMR), NW (n=6; age= 11.8 ± 0.7 y; BMI percentile= 46 ± 13) and OW/OB (n=4; age= 12.7 ± 0.5 y; BMI percentile= 92 ± 2) children consumed isocaloric (450 kcal) breakfast meals containing 45 g of protein or a control meal containing 7 g of protein. Subjective average appetite and TEF were measured at regular intervals for 5 h.

Results: RMR adjusted for body weight was significantly lower in OW/OB children (OW/OB = 0.017 ± 0.001 vs. NW= 0.022 ± 0.001 kcal·kg⁻¹·min⁻¹, P = 0.01). TEF (mean kcal ± SEM) after the 45 g protein and control meals were 51 ± 5 and 22 ± 5, respectively (P < 0.0001). TEF adjusted for body weight was affected by treatment (P < 0.0001), and there was a treatment by body weight interaction (P < 0.05). Subjective average appetite was decreased after the 45 g protein meal compared with the control (P < 0.05).

Conclusions: These findings suggest that in addition to decreased food intake and subjective appetite, increasing the protein content of a breakfast meal increases TEF, but the effect is diminished in OW/OB children.

T-P.3084

Effects of Increasing the Egg Protein Content at Breakfast on Subjective Appetite, Food Intake and Glycemic Response in Children.

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Background: Consuming 25-30 g of dietary protein at meal time is associated with increased satiety and reduced food intake (FI) in adults. Less is known, however, about the role and optimal dose of dietary protein on satiety, glycemic response, and FI suppression in children. The objective of this study was to determine the effects of increasing the protein content of breakfast meals on satiety, glycemic response, and FI in 9-14 year old boys and girls.

Methods: On four separate mornings and in random order, children (n=17; age 12.0 ± 0.4 y; BMI percentile 68 ± 5.9) consumed isocaloric (450 kcal) breakfast meals containing 15, 30, or 45 g of protein or a control with 7 g of protein. FI from an ad libitum pizza meal was measured 4 h after breakfast. Blood glucose and subjective appetite were measured at baseline and at regular intervals throughout the study measurement period.

Results: The 45 g protein breakfast suppressed FI (P < 0.05) by 226 kcal and 204 kcal after the control and 15 g protein
breakfasts, respectively. Subjective average appetite was decreased after the 15, 30 and 45g breakfast meals compared with the control (P < 0.0001) and remained below baseline for the duration of the study period. Blood glucose was affected by time (P < 0.0001), but not treatment (P = 0.11), and there was a treatment by time interaction (P < 0.0001). Subjective average appetite immediately before lunch was positively associated with FI (r = 0.49, P < 0.05).

Conclusions: In conclusion, only the 45 g protein breakfast meal suppressed FI 4 h later, suggesting a potential role for increased protein intake at breakfast in the promotion of healthier body weights in children.

T-P.3085
Fit in Fifth: a school-based physical activity intervention using Fitbits with middle school students
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Background: Less than half of children in the US meet the recommended 60 minutes of daily moderate to vigorous physical activity (MVPA). Thus, the Institute of Medicine called for teachers, parents and school administrators to foster environments that promote MVPA both in and out of school. This study tested the feasibility and acceptability of an open-pilot school-based physical activity intervention using Fitbit devices with middle school students.

Methods: Fifth grade students (ages 9-11 years) enrolled in a low-income public school (63% qualify for free / reduced-price meals; 48% non-Hispanic white) in Rhode Island took part in the four-week Fit in Fifth study. Students were given waist-worn Fitbit Zip devices and received a brief classroom based intervention that involved self-monitoring, weekly step goals, and group-based incentives. Post-intervention feedback was elicited from teachers.

Results: On average, students (n=32) wore their Fitbit Zip device 81% of intervention days. Students averaged 8,688 steps/day and took more steps on weekdays versus weekends (9,366 vs. 7,510; p<0.05). Mean steps decreased over the course of the intervention (9,528 in week 1 to 8,574 in week 4). Post-intervention, teachers reported Fitbit devices fell off student waistbands and the device novelty wore off from week 1.

Conclusions: Overall, students found wearing a Fitbit device as acceptable given 81% adherence. Whereas student activity did not increase with the intervention, teachers reported students not using the devices to self-monitor activity as much as at the start of the open pilot. A controlled study is needed to determine whether using self-monitoring devices successfully increases activity in school-age children.

T-P.3086
Gender Influence on Nutrition Intake Among Youth with Obesity in a Community-based Lifestyle Intervention

Background: Details on youth nutrition changes after lifestyle interventions are lacking. Actively Changing Together (ACT), an obesity intervention, was evaluated among 8-14 year olds with obesity and a parent/guardian in an underserved agricultural community. The goal of this analysis was to examine nutrition changes in these youth.

Methods: The intervention, delivered in small-group settings and offered in English or Spanish formats, consisted of 90-min. weekly sessions x 12 weeks. Each session included group physical fitness and cooking sessions for youth and parents, and a problem-solving session for parents. Anthropometrics (weight, height, waist circumference & percent body fat) and nutrition intake were measured (via Block Food Screener) at baseline and post-intervention. T-tests comparing change scores on nutrition intake by gender were also conducted.

Results: Dietary analyses were conducted on 68 youth (37 boys, 31 girls; mean age 10.9±1.7 yrs). Both boys and girls grew taller and gained weight, but there was a strong gender-influence on nutrition sub-categories. Girls significantly reduced calorie intake (mean -476 ±726 kcal) more than boys (mean 111±758 kcal, p=.001). Compared to boys, girls had larger reductions in intake of meat, fish and poultry (p<.02); dairy (p=.04); protein (p=.002); saturated fat (p=.003); and fiber (p=.02). Girls also reduced calories from sugary beverages (mean -26±50 kcal) more than boys (mean 1±44 kcals, p=.02). There were no differences in consumption of fruits or vegetables.

Conclusions: This study sheds light on important gender-specific nutrition changes after an obesity intervention. While decreasing energy intake is important for weight management, more work is needed to determine if this is occurring to the detriment of overall nutrition quality, particularly in girls. Further work will assess the relationships of nutrition intake with physical activity, family and psychosocial influences, and durability of changes observed in these post-intervention results.

T-P.3087
Impact Assessment of a Sports Kit on Physical Activity in Children Aged 8 to 11 with an Innovative Methodology Using 3D Accelerometers

Background: Only 50% of French children follow the WHO recommendation for physical activity. This study proposes utilizing a tool that demonstrates sports in a safe and fun way. The sports kit: “Le Sport Ça Me Dit”, uses an innovative methodology with 3D accelerometers to promote physical activity. The objective if the study is to confirm that the use of the sports kit increases, at medium-term, the children’s motivation and global physical activity (PA).

Methods: In the EPODE France community-based programme, 5 facilitators provided bi-weekly physical activity (PA) sessions to children for 7 weeks, using the kit, including 6 different activities. 213 children aged 8 to 11 were recruited, from which 122 composed the control group and 91 the action group. Each child received a 3D accelerometer wristband. The children’s PA was recorded once a week for 14 weeks (7 weeks with the sports kit) using accelerometers. In parallel, the children completed a questionnaire, before, during and at the end of the study on their PA, screen time and sleeping habits.
**T-P-3088-DT**
**Implementation of a Mentor-Led Recreation Center Intervention within a Multilevel Multicomponent Obesity Prevention Intervention in Baltimore City**
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**Background:** B’More Healthy Communities for Kids (BHCK) is a multilevel, multicomponent obesity prevention intervention that utilizes trained youth leaders (college students ages 18-22) to deliver a nutrition curriculum to children ages 10-14 in recreation centers and the community. At baseline, 19% of children were overweight and 24% were obese. The curriculum included 14 interactive, experience-centered lessons on physical activity, healthier drinks, snacks, breakfast and cooking. This analysis focuses on process evaluation of 7 recreation centers in Wave 1.

**Methods:** BHCK Wave 1 included 14 recreation centers in low-income neighborhoods (7 randomized to intervention). We developed 9 process evaluation standards to evaluate reach, dose delivered and fidelity. Data were collected on a recreation center interventionist form by research staff during each session.

**Results:** Reach to our target group was 10.39 (SD 4.94) youth per session (moderate). Dose delivered to rec centers averaged 10 visits per rec center (high). 12.32 (SD 2.81) food samples and 14.31 (SD 1.97) handouts distributed per session (moderate dose delivered). 12 of our original 16 youth leaders completed the entire intervention (high fidelity). Process data were discussed once per phase with the team to modify the intervention.

**Conclusions:** Our mentoring program to prevent obesity in this at risk population was successfully implemented in 7 recreation centers. Challenges existed with reaching 10-14 years olds and sustainability of the program. In Wave 2, we will modify recruitment strategies and utilize a train the trainer module for teen councils in recreation centers to sustain the nutrition curriculum.

**T-P-3089**
**Individualized Physical Therapy Within a Multi-disciplinary Pediatric Weight Management Clinic Improves Gross Motor Function in Youth with Obesity**
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**Background:** Impaired gross motor function is associated with obesity in children and adolescents making it difficult to function at age appropriate level in activities of daily living and to participate in family and school activities. Therefore, we evaluated whether an individualized physical therapy (PT) treatment program can improve gross motor function, independent of weight-loss, as part of a multi-disciplinary pediatric weight management clinic.

**Methods:** Patients receiving PT as part of a multi-disciplinary tertiary care pediatric weight management clinic, who had 6-month follow-up data, were used for this study (n=22; 6-16 years of age; M=10, F=12; mean baseline BMI=34.0±8.1). PT treatment was individualized to address impairments in strength, balance, activity tolerance and coordination.

**Results:** Frequency of visits was tailored to meet each patient’s needs ranging from weekly to monthly. Patients were evaluated at baseline and 6 month follow-up for change in BMI and change in percentile rank on The Bruininks Oseretsky Test of Motor Proficiency – 2nd Edition (BOT-2) Strength and Agility Composite. Changes over 6 months were evaluated by paired t-tests. A repeated measures ANOVA was used to determine if changes in BOT-2 scores were observed after adjusting for change in BMI over 6 months.

**Conclusions:** These data suggest that individualized PT, as part of multi-disciplinary pediatric weight management clinic, can improve gross motor function independent of weight-loss in youth with obesity. These findings will need to be confirmed in randomized-controlled trials.

**T-P-3090**
**Measuring Obesity in Saudi School Children Due To Excess Television Viewing**
Sameer Al-Ghamdi Al-Kharj Riyadh Province

**Background:** Background: There has been a dramatic augmentation in the incidence rate of childhood obesity throughout the globe, which is attributed to increase in the time spent of watching TV. However, no significant research has been done regarding the relation between obesity and TV viewing in the Arabian Peninsula.

**Methods:** A case-controlled study was conducted in which those children were selected who had a visit at the school health clinic in King Abdulaziz Housing for National Guard (Iksan), Riyadh, Saudi Arabia during the study period (February to April, 2012). 397 participants were selected randomly.

**Results:** The results revealed that greater number of televisions hours at home (Chi-sq. 33, p <0.001) is related with higher BMI, along with weekend TV watching for more than three hours per day, night-time TV watching and if siblings decided how much TV should be watched. While, weekend TV watching for more than three hours per day, night-time TV watching and if siblings decided how much TV should be watched.

**Conclusions:** More TV watching hours is established to be a significant risk factor for increase in school-aged obesity, by the current investigation.
T-P-3091
Overfeeding Related to Inaccurate Dispensing of Powdered Infant Formula may Contribute to Increased Adiposity in Formula Fed Infants
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Background: There is a long-standing argument as to whether or not breastfeeding is protective against the development of childhood obesity with supporters targeting nutrient composition and self-regulation as potential mechanisms. Since humans are known to inaccurately measure serving sizes, the ability of caregivers to accurately prepare infant formula is also unlikely. The aim was to test the accuracy of individuals to dispense powdered infant formula as compared to the recommended serving sizes.

Methods: Fifty-three adults were provided a commercial infant formula container with the package instructions and formula scoop. Each individual was asked to dispense 3 trials of 1, 2, 3, and 4 scoop serving sizes of powdered infant formula into bottles in random order. All bottles were weighed to provide actual weights of the powdered infant formula dispensed, and the actual weights were compared to the recommended serving size weights.

Results: Among 636 bottles, 89.9% of the bottles contained more powdered infant formula as compared to the recommended serving sizes. The mean difference in the bottles was 12.1% (1.1 ± 0.2 g) for 1 scoop bottles, 10.7% (1.9 ± 0.2 g) for 2 scoop bottles, 10.8% (2.8 ± 0.2 g) for 3 scoop bottles, and 11.0% (3.8 ± 0.2 g) for 4 scoop bottles. This increase in powdered infant formula equates to almost an additional day of energy intake per week.

Conclusions: It is evident that adults over-dispense infant formula resulting in unintentional overfeeding of infants. This unintentional overfeeding related to inaccurate measurement of powdered infant formula rather than the nutrient composition of commercial infant formula may be a contributor of increased adiposity in formula fed infants.

T-P-3092
Physical Activity Improves Weight Trajectories for Adolescents Post-Bariatric Surgery
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Background: Adolescents who meet the minimum physical activity (PA) recommendation (180 minutes/week of moderate-to-vigorous PA, American College of Sports Medicine) post-laparoscopic sleeve gastrectomy (LSG) appear to have improved weight loss trajectories and maintenance. In adults, PA has been shown to preserve fat-free mass post-surgery, increasing resting metabolic rate which leads to weight loss maintenance. This study assesses if weight loss trajectories are better for adolescent bariatric patients who meet minimum exercise recommendations.

Methods: Retrospective analysis of our clinical database was performed for patients who underwent LSG between January 2011 and December 2014, and completed 6- and 12-month post-operative visits. Percent change in mean BMI and pannicu lar waist circumference (WC) were used to assess changes in adiposity and its distribution at baseline (pre-op) and at 6-month and 1-year post-op. Low exercisers (LE) (<180 min PA/week) and high exercisers (HE) (>180 minutes PA/week) were analyzed.

Results: Nine patients met entry criteria, 4 LE and 5 HE. Overall BMI decreased significantly at 6-months, 48.2 to 39.6 (decrease 17.7%, p<0.01) and 1-year, 48.2 to 37.1 (decrease 22.6%, p<0.01). When analyzed separately, LE BMI decreased more at 6-months, 19.0% vs. 16.7%, though this difference was not statistically significant, p=0.37. At 1-year, this was reversed with HE BMI decreasing more (25.4% vs. 19.2%, p=0.10). There was no difference in percent change in WC between groups.

Conclusions: This pilot study suggests that patients who met PA recommendations have a more gradual, but greater BMI decrease by one-year post-surgery, possibly due to maintenance of muscle mass. Further studies, with more power, are needed to determine if this trend is true, and maintained over time.

T-P-3093
Physical Performance Limitations in Children with Obesity
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Background: Children with obesity often find exercise uncomfortable and unrewarding. The purpose of this study was to evaluate physical fitness in children with obesity to identify areas likely to limit function.

Methods: From October 2014 – March 2015, patients were assessed in a multidisciplinary pediatric weight management clinic. Physical activity (PA) and television (TV) time were measured via survey. Anthropometrics, body composition (InBody 770), hand and quadriceps strength (handheld dynamometer), flexibility (sit and reach), six minute walk distance (6MWD) and motor proficiency (Bruininks-Oseretsky Test of Motor Proficiency (BOT-2) short form) were assessed. Strength, flexibility, and 6MWD scores were considered below expected if > 1 sd below published normative values. BOT-2 scores were considered below expected if < 18th percentile of age and sex based normative values.

Results: Analyses included 118 subjects with the following characteristics: age 11.7±3.6 years, 64% female, 64% African American, 19% Caucasian, 10% Hispanic, BMI Z-score 2.56±0.41, 81% with severe obesity (BMI ≥2SD of 95th percentile), and percent body fat 47±6%. Most participants (74.1%) did not meet PA guidelines (60 minutes 5 day/wk), and nearly half (49.7%) did not meet 6MWD. All patients had a deficient area, and 79% were deficient in at least 3 of 5 areas.

Conclusions: Children with obesity have physical performance limitations that could prevent them from being physically active. More research is needed to investigate the impact of targeted exercise prescription to remediate deficits and improve overall physical fitness in children with obesity.

T-P-3094
Predictors of Outcomes At One Year Post-Intervention for a Pediatric Weight Management Program
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Background: This study aims to identify predictive factors of a decrease in BMI at one year after start of a pediatric weight management program. Others have previously determined that age, baseline weight status and psychological symptoms, and initial activity level were predictors of treatment success indicated by weight loss. In addition to these variables, we also examined the impact of eating behavior and other demographic characteristics (i.e., type of insurance) on improvements in health.

Methods: IRB approved retrospective review of data collected from families of children between ages 7-18 enrolled in pediatric weight management between 2005-2014 at an urban hospital. We focused our analyses upon predictors of outcome at 1 year based upon change in BMI z-score. Children were divided into 3 groups based upon change in BMI z-score from baseline to 1 year post intervention (BMI z-score "losers", BMI z-score "maintainers" and BMI z-score "gainers"). Baseline parameters analyzed included demographics, anthropometry including body composition by BIA, self-reported eating behaviors, birth history, self-reported screen type and physical activity during school among others. Statistical methods included ANOVA, and fisher's exact test were appropriate using INSTAT statistical software package and SPSS.

Results: A total of 215 children were eligible for analyses. Mean age of the population was 12.1 +/- 2.5 years; mean BMI z-score was 2.5 +/- 0.3. 41% of the patients were males. 58% of the patients reported dysfunctional eating behavior were more likely to lose weight. Screen time at intake (p=0.04) but not gym at school or commercial insurance (p=0.0131) were more likely to lose weight. Among the population at 1 year post-intervention, a decrease in BMI at one year after start of a pediatric weight management program was appropriate using INSTAT statistical software package and SPSS.

Conclusions: Interventions to prevent obesity in early care and education have the potential to reach large numbers of children. It is important to consider the unique features and similarities of centers and family child care homes and take advantage of lessons learned from current studies.

T-P-3096-DT
Psychometric Study of an English Version of Perceived Stress Scale In Minority Adolescents
Chen Li Los Angeles CA

Background: Prior work in both children and adults suggests a link between chronic stress and obesity-related morbidity, indicating the critical need to validate measures of stress in populations of youth who suffer from significant health disparities with respect to obesity, insulin resistance, and type 2 diabetes risk. The current study was therefore aimed to evaluate psychometric properties and compare effectiveness of three versions of Perceived Stress Scale (PSS-14, PSS-10, and PSS-4) in obese Latino and African American adolescents.

Methods: Data were available for 201 subjects. Internal consistency reliability and alternate forms reliability were evaluated by the computation of Cronbach’s alpha (α) and by correlation and agreement analyses among 14-, 10-, and 4-item versions of Perceived Stress Scale. Data were analyzed using the 10-item version of Perceived Stress Scale.

Results: Cronbach’s alpha values for PSS-14, PSS-10, and PSS-4 were 0.59, 0.67, and 0.49, respectively. Correlations across three versions of Perceived Stress Scale were significant (Spearman's rho coefficients calculated on the total and subscale level were: 0.93, 0.82, and 0.56 (total scale); 0.97, 0.84, and 0.84 (coping subscale); and 0.91, 0.84, and 0.90 (stress subscale), data shown as between PSS-14 and PSS-10, PSS-14 and PSS-4, and between PSS-10 and PSS-4 respectively, all correlations were of statistical significance with P<0.01). Normalized total and subscale scores of three versions of Perceived Stress Scale correspond with acceptable and good agreement according to Bland-Altman test.

Conclusions: The 10-item version of Perceived Stress Scale (PSS-10) exhibits optimum internal reliability as compared to the 4- and 14-version of the instrument in the present study. Use of the shorter version of PSS would also reduce study burden on minority teens, increasing efficiency of stress assessments in future studies in this difficult study population.
Background: Research shows that irrespective of feeding mode (breast-fed or bottle-fed); development of obesity is closely associated with the weight gain during early infancy, especially first six months. Current methodologies to assess infant feeding behavior are largely limited to parental surveys and weighed test meals, highlighting the need for objective, free-living, feeding behavior monitoring system. Feeding behaviors can be characterized by parameters such as sucking counts (sucking rate), meal duration and frequency of intake etc. This work presents the use of a piezoelectric film sensor for monitoring of jaw movements during sucking episodes to quantify infants’ sucking behaviors in terms of sucking counts.

Methods: Meals for a cohort consisting of 6 breast-fed and bottle-fed infants were videotaped and synchronized with sensor signals. Videos and sensor signals were divided into 10-second epochs, which were annotated by two human raters for sucking counts. Sensor signals were normalized to account for amplitude variation among infants. A peak detection algorithm was used to compute sucking count where peaks were only considered above a certain threshold based on 80th percentile of the signal amplitude.

Results: A leave one out cross validation approach gave a mean absolute error of 7.11% between the average sucking counts of human raters and algorithm estimated sucking count. For a two-way mixed model the intra-class correlation coefficient between the two human raters was 0.98 whereas between human and algorithm ICC was 0.92.

Conclusions: The results show that the sensor and algorithm can reliably estimate sucking counts.

T-P-3099
Teens Tracking 4 Health (TT4H): A school-based weight intervention utilizing real-time tracking technology
Raquel Hernandez St. Petersburg Florida

Background: Electronic monitoring technology (EMT) is known to be beneficial in weight loss behavior modification strategies; however, current evidence is limited regarding the role of EMT with at-risk adolescents. Schools are known as important settings to engage adolescents in health behavior change, but accurately following weight-specific behaviors pose a continued challenge. The Teens Tracking for Health (TT4H) program sought to test the feasibility of a school-based intervention which targeted tracking of physical activity (PA) and nutritional intake with electronic monitors (Fitbit®) and real-time dashboards (Fitabase) to determine if this technology can improve assessment and communication of PA among at-risk adolescents.

Methods: Eighteen 9th graders (7 males, 11 females) with BMI≥85th percentile attending an urban high school voluntarily enrolled in a 12-month, school-based weight management program which included evidence-based nutritional, fitness and behavioral support. Mean age at baseline was 14.2 yrs and mean BMI was 27.6 kg/m². Participants wore Fitbit® Flex monitors and received real-time behavior feedback via text messages and phone. We report initial feasibility related to participation, Fitbit® and Fitabase utility, and change in PA over the first 11 weeks.

Results: Fitbit® technology was well received among participants with 72% (n=13) consistently utilizing their device. Fitabase successfully provided real-time measurements of participants’ weight-specific behaviors. Participant daily steps average increased from 6249 (SE=907.7) steps to 7400 (SE=1243.5). Average weekly minutes of moderate/intense activity also increased from 88 (SE=15.7) to 97 (SE=17.7).

Conclusions: Early results support the use of EMT along with a broad school-based weight intervention as a strategy to increase overall activity and weight maintenance among at-risk adolescents. Our program intervention and data collection is ongoing.

T-P-3099
Active Nutritional Intervention for Reducing Obesity and Metabolic Syndrome
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Background: The rising prevalence of obesity and metabolic syndrome is fast becoming a global concern. We review here the potential etiological factors for causation of obesity and provide evidence on the diet and nutrition that can reduce obesity.

Methods: A computer assisted literature search was used to find nutritional intervention studies, conducted in the last 10 years.

Results: Sedentary life style and Westernized dietary habits are found more common globally among all causation factors of obesity. Substantial marketing of energy-dense foods, fast food outlets, sugar-sweetened soft drinks and fruit juices are also among the major factors. Nutritional interventions such as Mediterranean diet and diet high in omega-3 fats and fiber are significant in reducing obesity and metabolic syndrome risk. Analysis of various dietary patterns effective in reducing obesity and metabolic syndrome in global population showed that subjects following a Mediterranean dietary pattern in a 6-year prospective study showed much lower metabolic syndrome incidence. A meta-analysis showed that low-carbohydrate diets are as beneficial in reducing weight and thus decrease components of metabolic syndrome as compared to low-fat diets. Further high-fiber foods as well as nuts are associated with decreased metabolic syndrome risk factors.

Conclusions: Among different dietary patterns that reduce metabolic syndrome, Mediterranean diet is the most important one as it consists of a healthy, non-calorie restricted, balanced diet that combines individual elements such as high fiber, omega-3 fats and nuts with a stress-free lifestyle. Further, protective factors against obesity which needs to consider are the promotion of regular physical activity, making healthy eating choices easier, reducing the marketing of energy dense foods and beverages to children and developing community-wide awareness programs.

T-P-3100
Behavioral Interventions with Varying Doses of Physical Activity on Weight Loss: The Heart Health Study
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Background: Behavioral interventions are effective for short-term weight management, and both reduced energy intake and increased physical activity are key behaviors. This study examined the ability of a behavioral intervention to achieve physical activity levels recommended for public health (150 min/wk) or weight control (250 min/wk). This study also examine whether weight loss and changes in body composition varied by these prescribed levels of physical activity in adults.
who were overweight or obese across 6 months.

**Methods:** Sedentary adults (N=275; BMI: 32.3±3.8 kg/m2) in a behavioral program were randomized to a reduced calorie diet (DIET, N=90), diet plus a moderate dose of physical activity (MOD-EX, N=92), or diet plus a high dose of physical activity (HIGH-EX, N=93). All groups received weekly intervention sessions and were prescribed a diet to reduce energy intake (1200-1800 kcal/day). MOD-EX was prescribed unsupervised moderate-intensity physical activity that progressed to 150 min/wk, whereas HIGH-EX was progressed to 250 min/wk. Physical activity, weight, BMI, and percent body fat were assessed at 0 and 6 months.

**Results:** Retention at 6 months was 87.6% with no difference between groups. Physical activity at 0 and 6 months was 48.8±61.3 and 78.1±98.4 min/wk in DIET, 47.0±70.3 and 172.5±112.5 min/wk in MOD-EX, and 78.8±96.1 and 245.3±135.7 min/wk in HIGH-EX (Group X Time p-value <0.001). Weight significantly decrease in all groups (DIET: -8.4±6.2 kg, MOD-EX: -9.7±6.1 kg, HIGH-EX: -8.9±6.0 kg; P<0.001), with no significant difference between groups. Similar results were observed for change in BMI and percent body fat.

**Conclusions:** The MOD-EX and HIGH-EX interventions were successful at achieving the prescribed dose of physical activity in adults with obesity. Despite the lack of additional short-term weight loss, there may be additional health benefits that result from these amounts of physical activity that warrant further investigation in adults with obesity. Supported by: NIH (R01 HL103646)

**T-P-3101**

**Can Diet Quality be Crowdsourced to Facilitate Self-Monitoring? Evidence for Using Crowdsourcing and Bite Counting for Tracking Diet Quality and Energy Intake**

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**Background:** Smartphone food photography and wearable sensors could reduce participant burden for diet self-monitoring. The goals of the present study were to 1) assess if untrained individuals can accurately crowdsource diet quality ratings of food photos and 2) get feedback on other low-burden diet self-monitoring approaches.

**Methods:** Participants were recruited via Amazon Mechanical Turk, which included a 1-page description on rating foods using the Traffic Light Diet approach. Participants rated 10 photos of foods as red, yellow, or green and provided feedback on ease of use for diet self-monitoring comparing photo-taking, a wearable Bite Counter, or a standard diet app. Participants also rated what diet tracking app features would encourage regular self-monitoring.

**Results:** Adult participants (n=75; BMI 28.0±7.5; age 37±11; 43% college grad; 59% attempting weight loss) completed the survey. Raters demonstrated high red/yellow/green accuracy (>75%) examining all foods. Individual photos were rated accurately at least 50% of the time (range=52-100%). The Bite Counter was rated as easiest to use for self-monitoring followed by the photo-taking approach. Participants selected ability to review and track progress as the most motivating feature for diet app usage (35%), followed by having diet tracking be completely automated (27%) and ability to earn points and rewards (27%).

**Conclusions:** Collectively, participants were able to accurately rate diet quality. Since feedback from crowdsourcing relies on the consensus of the majority, this method holds promise as a low-burden approach to providing diet quality feedback. In addition, wearable sensors for energy intake tracking (e.g., Bite Counter) were rated highly by users.

**T-P-3102**

**Comparison of Two Different Fibre Supplements on Body Composition, Waist, Insulin and Glucose in Overweight and Obese Individuals**

Sebely Pal Perth Western Australia, Suleen Ho Perth Western Australia, Roland Gahler Coquitlam BC, Michael Lyon Coquitlam BC, Simon Wood Vancouver and Perth BC and Western Australia

**Background:** Higher fibre intakes are associated with risk reduction for chronic diseases. However, many people find difficulty in consuming enough fibre through their diet. Fibre supplements may be an effective alternative. The aim of this study was to investigate the effects of the polysaccharide complex PolyGlycopleX® (PGX®) supplementation on diet, weight-loss and lipids in overweight and obese individuals.

**Methods:** This was a randomised, double-blind 52 week study where participants were placed into one of 3 groups: control group (rice flour); PGX group (PGX) and psyllium group (PSY). Participants followed their usual diet but consumed 5 g of their supplement mixed with 250 ml of water 5-10 min before each meal.

**Results:** Body Fat was significantly lower in PGX compared to control at 6 (-1.8 kg) and 12 months (-1.9 kg) and in PSY compared to control at 6 (-1.9 kg) and 12 months (-1.4 kg). Waist was significantly lower in PGX compared to control at 3 (-1.9 cm), 6 (-2.1 cm) and 12 months (-2.9 cm) and in PSY compared to control at 3 (-2.2 cm), 6 (-2.7 cm) and 12 months (-1.9 cm). Insulin was significantly lower in PGX compared to control at 3 (-0.57 mmol/L) and 6 months (-0.62 mmol/L) and in PSY compared to control at 3 (-0.6 mmol/L), 6 (-0.58 mmol/L) and 12 months (-0.6 mmol/L). Serum glucose was significantly lower in PGX at 3 months (-0.25 mmol/L) compared to control.

**Conclusions:** A simple strategy of PGX supplementation may offer an effective solution to long-term weight-loss and then management without the need for other nutrient modification.

**T-P-3103**

**Comparison of Two Different Fibre Supplements on Diet, Body Weight and Lipids in Overweight and Obese Individuals**

Sebely Pal Perth Western Australia, Suleen Ho Perth Western Australia, Roland Gahler Coquitlam BC, Michael Lyon Coquitlam BC, Simon Wood Vancouver and Perth BC and Western Australia

**Background:** Higher fibre intakes are associated with risk reduction for chronic diseases. However, many people find difficulty in consuming enough fibre through their diet and so supplementation may be an effective alternative. The aim of this study was to investigate the effects of supplementation with PolyGlycopleX® (PGX®), a complexed polysaccharide, on diet, weight-loss and lipids in overweight and obese individuals.

**Methods:** This was a randomised, double-blind 52 week study where participants were placed into one of 3 groups: control group (rice flour); PGX group (PGX) and psyllium group...
Conclusions: A simple strategy of PGX supplementation may offer an effective solution to long-term weight-loss and then management without the need for other nutrient modification.

T-P.3104
Counting Chews with Sensors
Muhammad Farooq Tuscaloosa Al, Edward Sazonov Tuscaloosa Alabama

Background: Research results suggest that there may be a relationship between the intake rate and total energy intake during a meal. The rate of intake can be characterized by the chewing rate i.e. number of chews per second; which can further be monitored using wearable sensors. A number of solutions using commercially available sensors have been proposed to monitor food intake via monitoring of chewing, but little work has been done in automatic counting of chews.

With the recent advances in printing technologies, it is possible to print/draw application specific sensors. This work presents a comparison between the performance of a commercially available piezoelectric film sensor and a plotter drawn strain sensor for chew counting.

Methods: A plotter-drawn and off-the shelf piezoelectric strain sensors were attached to the mandible immediately below the outer ear. The sensor signals were collected from 5 individuals while eating a peanut butter sandwich, an apple and five almonds. These food items represent different textures and require chewing effort of different strengths. A low pass filter with cutoff frequency of 3Hz was used to eliminate frequency components above the chewing frequency. A peak detection algorithm was used to estimate the number of chews.

Results: The piezoelectric strain sensor and the plotter-drawn strain sensor were able to achieve accurate mean error rates of 8.09 ± 7.16% and 8.26 ± 7.51% respectively for estimating the number of chew counts in 98 chewing segments.

Conclusions: These results show that sensor based approach can potentially be used to accurately quantify the chewing rate. More extensive studies are needed to evaluate the performance of the proposed method in the community.

T-P.3105
Daily consumption of commercially available high-protein pasta, in comparison to traditional gluten-free pasta, favorably impacted weight loss and retention of lean mass in adults adhering to calorie restricted diets
Carol Johnston Phoenix Arizona, Jessica Knurick Las Vegas NV

Background: In a recent review, carbohydrate restriction was considered the ‘best dietary approach to effectively resolve metabolic syndrome’. However, adherence to carbohydrate restriction is difficult as high carbohydrate foods are mainstays in the U.S. diet. This pilot, 12-week crossover study examined the feasibility of utilizing commercially available high protein pasta for weight loss.

Methods: Adults at risk for metabolic syndrome (n=39, TG/HDL ratio >1.5 for women and 2.2 for men) were randomly assigned to one of two pasta groups: gluten-free pasta (GFP) or Zone PastaRxTM (ZP) (%energy from protein/carbohydrate: 6/87 and 36/48 respectively). Participants, blinded to treatment order, were provided two pasta sides daily for 12 weeks and received a basic diet plan for managing daily energy intake to achieve a 1-2 pound weight loss per week. At trial week 6, pasta assignments were switched to the alternate treatment.

Results: Twenty participants (51%) completed the trial; however, weight loss was significantly reduced in the second phase of the crossover, invalidating the crossover design. Data are presented for the initial 6-weeks as a parallel arm trial. Weight loss trended greater for participants in the ZP group (n=9) compared to the GFP group (n=11) (time x group interaction, p=0.059, repeated measures ANOVA). However, fat-free mass was raised in the ZP group and reduced in the GFP group (+1.7 kg vs. -0.5 kg, p=0.019 for group x time interaction).

Conclusions: These data support the established viewpoint that high protein diets preserve lean mass during weight loss; yet these data represent particularly interesting findings since the pasta dishes were indistinguishable by taste and appearance. With advances in food technology, highly desired high-carbohydrate foods may be modified to more healthful macronutrient profiles.
Dietary intake patterns in women with migraine and obesity seeking to lose weight and reduce migraine attacks


Background: Although epidemiological research supports that migraine is comorbid with obesity in women of reproductive age, mechanisms for this association remain unknown. Exploration of behaviors such as usual dietary intake patterns may provide insight, given that diet is implicated in both migraine and obesity. This study is the first to assess dietary intake patterns and their relationship with migraine attacks in obese women with neurologist-confirmed migraine.

Methods: Obese women (18-50 yrs old) with migraine seeking behavioral weight loss treatment to help reduce their migraine attacks were enrolled in the Women’s Health and Migraine (WHAM) trial. At baseline, participants recorded migraine attack frequency (i.e. migraine days/mo.), duration (hrs), and intensity (0-10 scale) using a 4-week smartphone diary. Usual dietary intake patterns and diet quality, measured by the Healthy Eating Index 2010 (HEI-2010) which assesses adherence to the Dietary Guidelines for Americans, 2010 (DGA), were determined via three 24-hour diet recalls.

Results: On average, participants (n=93) were 38.2±8.1 yrs old, had BMI=35.6±6.5 kg/m², and reported 8.6±4.9 migraine days/mo. Attacks lasted 20.6±17.1 hrs on average and had a mean maximum pain severity of 5.9±1.5. Participants reported consuming 1657±495 calories/day (32% from fat, 17.6% from protein, and 49% from carbohydrate), 2,790±876 mg of sodium, 3.2±9.0 g of alcohol, 152±192 mg of caffeine, and 5.3±1.3 eating occasions/day, on average. Mean total HEI-2010 scores were 52.2±10.4 out of 100 (population mean = 52.5±0.9). There were no significant relationships between migraine characteristics and any of the dietary intake patterns or diet quality.

Conclusions: A poor quality diet, inconsistent with the DGA, was common among study participants seeking weight loss to help reduce their migraine attacks, although dietary quality and intake patterns were not related to migraine attack frequency, duration, and intensity.

Differences Between Lean and Obese Individuals in Energy Density, Eating Frequency and Timing of Meals during Ad Libitum Feeding

Susanne Votruba Phoenix Arizona, Mostafa Ibrahim Boston MA, Marie Thearle Phoenix AZ, Jonathan Krakoff Phoenix AZ

Background: Elucidating relationships between the energy density of food and eating episodes may provide further insight into the utilization of energy density as a weight management tool.

Methods: Volunteers (non-obese: N=87, BMI=25.4±3.1; obese: N=114, BMI=37.2±5.8) were admitted to the NIDDK in Phoenix, AZ, for 10 days. After 3 days of weight maintaining diet, volunteers ate from a computerized vending machine for 3 days. Energy density (EnDen) was calculated for foods (kcal/g), and stratified in hourly blocks throughout the 24 hours. Two-tailed t-tests assessed differences between lean/overweight and obese. Repeated measures logistic regression determined the odds ratio for each 1 kcal/g change in EnDen on the likelihood of eating again in the subsequent hour(s).

Results: EnDen was associated with weight (r=0.26), %BF (r=-0.21), BMI (r=0.26), fat intake (r=0.48) and total energy intake (r=0.24; all P<0.01). Obese and non-obese individuals differed in 3d mean intake (4525±1444 vs 3842±1327 kcal, P=0.0007). On average, obese individuals consumed higher EnDen foods (5.1±0.20 v 5.0±0.2, P=0.0001), but did not have more eating episodes/day than non-obese (4.9±1.2 v 4.7±1.3; P=0.17). Mean daily EnDen and the number of eating episodes (r=-0.18, P=0.01) were negatively associated; a 1 kcal/g increase in EnDen corresponded with 8% lower odds of consuming food in each subsequent hour (P<0.03).

Conclusions: People with greater body fat consumed more energy dense food. Increased EnDen was associated with less eating episodes throughout the day, and increased time intervals between food consumption.

Does Quality or Quantity of Protein Impact Physical Performance and Body Composition in Elderly? A Human Clinical Trial

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Background: Physical performance and body composition vary much in the elderly. Little is known about the relationship between these parameters and intake of high-quality/quantity diet protein in frail elderly. We address the issue whether poor protein status can explain features of fragility in elderly by examining the correlation between protein intake (total, animal and vegetable) and outcomes in physical performance and lean body mass (LBM).

Methods: The study is a human clinical trial on 32 elderly men and women from 60 to 80 years of age. Food intake was measured by a 3-day weighed food record, physical performance by hand grip strength, 6-minutes’ walk test and 4-meter gait speed. Body composition was measured by dual-energy X-ray absorptiometry (DXA).

Results: We found that LBM was correlated with total protein (r = 0.61, P < 0.001), animal protein- (r= 0.51, P < 0.01) and vegetable protein intake (r= 0.42, P < 0.05). Hand grip strength was correlated with total protein- (r = 0.48, P < 0.01), animal protein- (r = 0.38, P < 0.05) and vegetable protein intake.
Conclusions: Using a 3-day weighed food record, we found a significant correlation between the average amount of dietary protein intake and both LBM and hand grip strength in 32 elderly. We suggest that there is a stronger correlation between animal protein and LBM than between vegetable protein and LBM. We hence corroborate previous research by showing that dietary protein is a key factor in preserving LBM. We find that a 3-day weighed food record is a simple, solid and reliable method for obtaining information of the protein status in the elderly. Our findings will benefit clinicians who may use our method of keeping food records in future research in general and on the status of protein intake in elderly in particular. The role of proteins preserving LBM will be addressed.

T-P-3110
Effect of High Intensity Medical Weight Loss Treatment in Severely Obese Older Adults on Physical Function

Background: Older adults in the highest BMI categories are at high risk of disability. High intensity medical weight loss may be useful to restore physical function quickly. However, greater lean mass loss with faster weight loss could limit potential benefit.

Methods: This 6-month pilot trial included 28 adults age 65+ yrs with BMI ≥ 35 kg/m2 randomly assigned to moderate intensity (ModWL) or high intensity (HiWL) weight loss interventions. ModWL participants received a balanced deficit diet (-500 kcal/d, minimum 1200 kcal) designed for approximately 1 lb/week weight loss; HiWL received a low-calorie meal replacement plan (960 kcal/d, 35% kcal as protein) designed for approximately 2-3 lb/week weight loss. Physical function was measured at baseline, 3 and 6 months using the Short Physical Performance Battery (SPPB), 400 m walk, and stair climb. One participant discontinued the study (ModWL); all 28 are included in analyses.

Results: The mean age was 70.3 years; baseline BMI was 42.8 kg/m2. At 6 months HiWL participants lost approximately twice as much as ModWL (19.1 vs 9.1 kg, p=0.003), with slightly, but not significantly, more lean mass loss (Estimated Treatment Difference= -1.7 kg, 95%CI [-4.1, 0.6]). SPPB scores did not change significantly in either group (ModWL= 9.9 to 10.0; HiWL= 10.4 to 10.2, ETD at 6 months=0.21, 95% CI [-0.80, 1.02]). There was no difference at 6 months in 400 m walk time by treatment group (ModWL= 389.5 to 389.8 sec; HiWL= 389.8 to 389.8 sec; ETD at 6 months= -0.9 sec, 95% CI [-51.0, 37.2]). Stair climb time decreased in HiWL (9.06 to 7.94 sec) but was not significantly different from ModWL (9.56 to 9.34 sec, ETD at 6 months=-1.40 sec, 95% CI [-3.50, 0.66]).

Conclusions: Although HiWL produced greater weight loss than ModWL, treatment assignment was not associated with differential changes in physical function. Further study is needed to define specific impacts on function of various weight loss strategies in older adults with severe obesity.

T-P-3111
Effect of Tomato Consumption on the Dietary Pattern of Overweight and Obese Adults
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Background: Improving dietary patterns by increasing vegetable intake is recommended by Dietary Guidelines for Americans, but US diets remain low in vegetables. Tomatoes are the predominant vegetable in the 2010 USDA Food Pattern (MyPlate), comprising 82% of the red/orange vegetable subgroup: 4.5 cups/week or 0.65 cup/d at the 2000 kcal level, as described in the 2010 Dietary Guidelines Advisory Committee Report. Usual tomato intake is 0.32 cup/d; thus, Americans under-consume tomatoes by approximately 0.33 cup/d.

Methods: To determine the feasibility of increasing total vegetable intake through increased tomato intake, using a parallel design, 116 adults (93 women, BMI 31.9 ± 3.0) were randomly assigned to no tomato consumption (NO TOM, n= 52) or the addition of 1 cup/d of tomato products (TOM, n=64) for 12 weeks, with no other dietary changes. Food group intakes were assessed using the Food Patterns Equivalents Database 2009-10. Energy intake was assessed with 3-d diet records.

Results: The TOM group achieved mean tomato intake of 1.1 cups/d at week 12, with total vegetable intake increasing from 1.65 pre to 2.21 cups/d post, p < 0.001. The NO TOM group decreased tomato intake from 0.24 to 0.13 cup/d, p < 0.05, with unchanged total vegetable intake (1.67 pre and 1.45 cup/d post, p > 0.05). Pre to post changes in MyPlate food group intakes between TOM and NO TOM showed differences in total vegetable intake (+0.56 cup/d and -0.22 cup/d, respectively, p < 0.001) and the other vegetable subgroup intake (-0.15 cup/d and +0.05 cup/d, respectively, p < 0.05). No differences were observed in changes between remaining food groups or components. Addition of tomatoes did not result in greater energy intake; 1809 ± 552 pre vs 1731 ± 557 kcal post, p > 0.05.

Conclusions: Participants successfully added tomatoes to their diets with little change in non-tomato vegetables, energy or MyPlate food groups. The goal of increased total vegetable intake was achieved and nearly reached the USDA MyPlate goal of 2.5 cups/d.

T-P-3112
Effect of Weight Loss on Measures of Arterial Compliance: A Systematic Review and Meta-Analysis
Natalie Blanch Adelaide SA, Kristina Petersen Adelaide SA, Jennifer Keogh Adelaide South Australia, Peter Clifton Adelaide SA

Background: It has previously been shown that weight loss is associated with a reduction in pulse wave velocity. The aim was to conduct a systematic review and meta-analysis of clinical trials involving adults, to determine the effect of weight loss induced by energy restriction with or without exercise, anti-obesity drugs or bariatric surgery on measures of arterial stiffness and compliance.

Methods: A systematic search of Pubmed, EMBASE, MEDLINE and the Cochrane Library was conducted and the reference lists of identified articles were searched to find intervention trials (randomised/ non-randomised) that aimed to achieve weight loss and included the following outcome...
measures: cardio-ankle vascular index (CAVI), direct measures of area/diameter related to pressure change (including β-stiffness index, brachial or carotid artery compliance, aortic, carotid or brachial artery distensibility and strain), measures derived from peripheral pulse wave analysis (including augmentation index, augmentation pressure, distal oscillatory, proximal capacitive and systemic compliance) and pulse pressure. Data were analysed using Comprehensive Meta Analysis V2 using random effects analysis. Standardised mean difference (SMD) is reported with negative values indicating improvement.

Results: A total of 43 studies, involving 4231 participants, were included in the meta-analysis. Mean weight loss was approximately 11% of initial body weight. Weight loss improved CAVI (SMD=-0.48; p=0.0001), arterial compliance (SMD=-0.61; p=0.0001) and distensibility (SMD -1.1; p=0.004), distal oscillatory compliance (SMD=-0.41; p=0.03), proximal capacitive compliance (SMD -0.41; p=0.03), systemic arterial compliance (SMD -0.7; p=0.003) and reflection time (SMD -0.51; p=0.001). Augmentation index, β-stiffness index, strain, augmentation pressure and pulse pressure were not significantly changed with weight loss. Conclusions: Weight loss improves some measures of arterial compliance and stiffness.

T-P-3113-DT
Effectiveness of a Weight-Loss Intervention Based on Individualized Small Changes in Women: Preliminary Results.

Background: Obesity is a public health problem in Mexico, with a prevalence of 37.5% in (13.5% correspond to class II-III). Lifestyle changes are difficult to achieve. The small changes approach in diet and physical activity, unlike conventional treatments, is less rigid and may have advantages for weight loss. As part of a randomized clinical trial, our aim was to evaluate efficacy (weight loss ≥5%) and improvement in metabolic markers in a 6-month weight control program based on small changes in obese women.

Methods: 23 Mexican women, age 32.0±5.2 years, BMI 39.3 ±2.9, completed a 6-month weight-loss program which consisted of small changes (general recommendations on diet (no beverages with calories, no snacks and treats, maximum one piece of bread or tortilla in each main meal, and no fried foods) and physical activity, plus strategies to promote compliance (once a week weighing, brushing teeth after meals, eating with no distractions), and general well-being were provided. Initial and final weight, BMI, % body fat, waist circumference, and metabolic markers (fasting glucose and insulin, HOMA-IR, blood lipids, blood pressure) were measured. Changes were assessed by paired t-Test, p<0.05. Study had IRB approval and all women gave written informed consent.

Results: 60.9% lost ≥ 5% of initial weight; of these, 17.4% lost more than 10%. We documented a significant decrease in weight, BMI, % body fat (p = 0.001), waist circumference (p = 0.002), fasting glucose (p = 0.017), HOMA-IR (p = 0.020), triglycerides (p = 0.014) and atherogenic index (p = 0.030) at 6 months.

Conclusions: The intervention based on individual small changes was effective for weight-loss and improvement of metabolic markers. This approach is less radical than conventional treatments based on structured diets and may be an alternative that best suits the lifestyle of many patients with severe obesity seeking weight control. Supported by: CONACYT SALUD-2011-C01-161612

T-P-3114
Effects of Including Almonds in an Energy-Restricted Diet on Weight, Body Composition and Visceral Adipose Tissue in Obese Adults
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Background: Almonds are a good source of protein and monounsaturated fats and their effects on visceral body fat loss, in conjunction with energy restriction, have not been widely examined. Increasing the proportion of protein in an energy-restricted diet enhances satiety, energy expenditure and greater relative fat mass loss. In addition, monounsaturated fats are oxidized preferentially and a diet higher in the unsaturated:saturated fat ratio may preferentially reduce visceral adipose tissue (VAT) during weight loss. The promotion of VAT loss is important clinically as this may translate into a reduction in the risk for metabolic diseases.

Methods: Obese adults (n=28, age: 36.9±11.9 yr, body mass index: 33.1±2.7 kg/m2) were randomly assigned to a 12 week energy restricted (500 kcal deficit) almond-enriched diet (AED) (15% energy from almonds, n=14) or an energy restricted nut-free diet (NFD) (n=14) to assess changes in weight, body composition, and visceral fat. Body composition was assessed using DEXA. VAT was predicted using multivariate anthropometric models.

Results: Body weight, trunk fat percent, total fat percent and VAT decreased after 12 weeks on energy restriction (p<0.05). Both groups lost similar amounts of body weight over time. The AED group lost more trunk fat percent and total fat percent over time compared to the NFD group (p<0.05). The AED group also had a greater trend for VAT loss over time compared to the NFD group.

Conclusions: Consumption of almonds during a weight loss regimen resulted in greater improvements in trunk and total body composition compared to the nut-free weight loss regimen. If verified in further work, the trend for greater VAT loss with almond consumption coupled with overall improvements in body composition may help to reduce metabolic disease risk.

T-P-3115
Effects of Weight Cycling and Fitness on Visceral Fat in Overweight and Obese Women
Pamela Swan Phoenix Arizona, Karen Moreno Phoenix Arizona, Aubrey Smith , Zachary Zeigler mesa Arizona

Background: Repeated periods of body weight loss and regain have been termed weight cycling (WC). Up to 80% of women may have some degree of WC. WC is associated with increased cardiometabolic risk including increases in visceral fat (VF). Aerobic fitness has strong mitigating effects on cardiovascular disease in obese people. It is unknown if aerobic fitness has a protective influence on WC risk.

PURPOSE: To describe the effects WC and aerobic fitness
(VO2) on VF in middle aged overweight and obese women. Methods: This is a cross sectional observation of women aged 20-60 years who completed the Weight and Lifestyle Inventory (WALI). The WALI has been shown to be reliable for number of cycles (times subjects lost >10 lbs) and the total pounds lost (r=.87, P<0.001). WC Index (WCI) was computed as number of WC x amount of weight lost per cycle. Women were also classified as non WC (NWC, N=27), moderate WC (MWC: >3 WC of ≥10lb; N=18) or severe WC (SWC: >3 WC of ≥20lb; N=21) to describe differences between groups. VO2max was measured via indirect calorimetry using a ramp protocol on a cycle ergometer. VO2 and body fat percent (FP) were assessed using dual energy x-ray absorptiometry (DXA). Differences between WC groups were assessed with multivariate GLM procedures and stepwise multiple regression was executed to determine predictors of VF (SPSS, v22).

Results: 66 women (age: 39 +/-11 yr; BMI: 31.4 +/-7 kg/M2 completed testing. After correcting for age and FP, VO2 was higher (P=0.006) in SWC (1455 +/-662 cm3) vs. NWC (631 +/-650 cm3). When VO2 was added as a covariant, differences between WC groups disappeared (P=0.145). VO2 and WC were significant predictors of VF describing over 40% of the variance (Adj. R2 =0.416).

Conclusions: SWC results in a larger accumulation of VF in overweight/obese women compared to NWC. Fitness may be protective of the effects of weight cycling on VF. Increasing VO2max in women with a history of weight cycling is recommended to attenuate excessive VF accumulation.

T-P-3116
Efficacy and Safety of High Intensity Medical Weight Loss Treatment in Severely Obese Older Adults

Background: Older adults in the highest BMI categories are at high risk of disability and death; intentional weight loss may be beneficial but also presents risks (e.g., promoting lean mass loss). There is limited evidence about the efficacy and safety of intensive weight loss strategies that produce faster rates of weight loss in this population.

Methods: This 6-month pilot trial included 28 adults age 65+ yrs with BMI ≥ 35 kg/m2 randomly assigned to moderate-intensity (ModWL) or high-intensity weight loss (HiWL) interventions. ModWL participants received a balanced calorie meal replacement plan (-500 kcal/d, minimum 1200 kcal/d) designed for approximately 1 lb/week weight loss; HiWL received a low-calorie meal replacement plan (960 kcal/d, 35% kcal as protein) designed for approximately 2-3 lb/week weight loss. Both groups had weekly behavioral group counseling, medical monitoring, and the same exercise prescription. One participant discontinued the study (ModWL); all 28 are included in analyses.

Results: The mean age was 70.3 years; baseline BMI was 42.8 kg/m2. At 6 months, ModWL participants lost 9.1 kg or 7.2% of initial weight compared to a weight loss of 19.1 kg or 15.9% for HiWL, which is a 9 kg greater loss for HiWL (95% CI [3.6, 14.5]). HiWL group lost more total fat mass (Estimated Treatment Difference = -7.7 kg, 95%CI [-11.9, -3.5]) and percent fat (ETD = -3.7%, 95%CI [-5.7, -1.7]) measured by DEXA; lean mass loss was greater for HiWL, but not significantly different between groups (ETD = -1.7 kg, 95%CI [-4.1, 0.6]). Clinical monitoring labs showed non-critical abnormal results for 82 of 1340 measures for HiWL compared to 48 of 1216 measures for ModWL. There were no differences in adverse events.

Conclusions: In this group of severely obese older adults, high-intensity medical weight loss produced a two-fold greater rate of weight loss and more total fat and percent fat loss, but not more lean mass loss, compared to a moderate-intensity weight loss treatment, without a higher rate of adverse events.

T-P-3117-DT
Efficacy of Diet, Physical Activity and Behavioral Changes for Weight Loss During at Least 18 Months: A Systematic Review
Psyche Calderon-Vargas Tijuana Baja California, Montserrat Bacardi-Gascón Tijuana Baja California, Alfredo Martínez-Alvarado Tijuana Baja California, Luis Meza-Gomez Tijuana Baja California, Arturo Jimenez-Cruz Tijuana Not Listed or Not Applicable

Background: We have not found any systematic reviews of studies looking for the effect of diet, physical activity and behavioral modifications with at least 18 month follow-up, having a clinical trial registration number.

Methods: Studies were published from January 1st 2005 to March 30th 2015 registered in Medline, PsycINFO, Embase, the Cochrane and Scielo database were searched. RCT with clinical trial registry number of interventions for weight loss among overweight or obese adults with at least 18 months follow-up were included. Potential studies were screened independently and in duplicate. Assessment of bias was conducted with the Cochrane collaboration risk of bias tool.

Results: Fourteen trials involving 12,824 individuals between 18-65yo were included. Two studies included diet, seven included behavioral changes, five a combination of diet and physical activity and three included the three strategies. Percentage of body weight change ranged from -7.6% to +7.5%. Follow up range of all studies was between 18 mo to 3y. Weight loss was reported in all but one study. Change differences between interventions and/or control group was significant in six out of 14 studies. The study that reported the most weight loss (-7.6%) was focused on behavioral changes alone and have a follow up of 3y.

Conclusions: This review shows that the above interventions result in inconsistent weight loss, with high risk of bias.

T-P-3118
Efficacy to Effectiveness: Translating the ICAN Lifestyle Intervention to the Real World
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Background: Translation of lifestyle intervention efficacy trials into effectiveness in clinical practice is sorely needed to advance obesity treatment.

Methods: A partnership between Albemarle County (employer), Coventry Health Care (insurer), a local RD and fitness club developed a six-month lifestyle intervention for high risk, obese employees based on the ICAN trial, a RCT of diet and physical activity led by registered dietitians (RD) with demonstrated clinical and cost-effectiveness. Since inception,
two other sites adopted the program for their employees. Each site varied the program based on staff and fitness access but all programs have four core components: individual visits with RD, group class with RD, access to fitness center with personalized support, and collection of a standardized set of outcomes. Innovative aspects of program include bundled payments to clinicians from insurer; telephonic follow up with RD, cost sharing by insurer, employer and employee and program reimbursement incentives based on attendance. Participants (n=361) had pre and post-weights (WT, kg), waist circumference (WC, cm) and fasting lipids measured. HbA1c was collected at two sites (n=303) and change is reported if baseline HbA1c ≥ 5.7%. Paired t-test evaluated change pre to post.

Results: Baseline BMI was 38.9 (±7.0) and top three health conditions were hypertension (44%), hypercholesterolemia (42%) and metabolic syndrome (28%). At 6 months, retention was 90%. Mean WT loss was -6.8 kg (±5.7) or -6.4% of initial WT. WT loss of ≥ 5% was achieved by 56.7% of participants; of these 20.5% lost ≥ 10%. WC change was -7.2 cm (±9.3). Mean (SD) changes in labs: total cholesterol -6.9 (±28.3) mg/dL; HDL +1.2 (±7.0) mg/dL; triglycerides-29.7 (±123.7) mg/dL; LDL -4.8 (±27.8) mg/dL; HbA1c -0.25% (±0.53). All changes were statistically significant (p<0.01).

Conclusions: A clinical trial of lifestyle behavior change can be translated into a real-world intervention program resulting in clinically effective weight management.

T-P-3119 Evidence for behavioral compensation for weight loss in successful and unsuccessful female dieters
David Hume Cape Town Western Cape, Jacolene Kroff Cape Town Western Cape, Louise Clamp Cape Town Western Cape, Estelle Lambert Newlands Western Province

Background: Weight loss may induce behavioral compensations which increase the risk of weight regain in reduced-overweight/obese persons, and decrease the likelihood of subsequent weight loss in those who have experienced weight recidivism. This study explores for compensations in eating and physical activity (PA) behaviors in women successfully maintaining weight loss and those who have relapsed.

Methods: 62 women were recruited into 4 groups: reduced-overweight/obese participants (RED, n=20) with age/BMI matched low-weight controls (LW-CTL, n=20), and relapsed-overweight/obese participants (REL, n=11) with age/BMI matched high-weight controls (HW-CTL, n=11). Eating behavior, psycho-behavioral and PA surveys were completed. Measures included: body composition, basal metabolic rate (DBR), predicted VO2max, daily energy and macronutrient intake, and accelerometry.

Results: By design, RED participants had maintained weight reductions ≥ 10% body weight for ≥ 1 year, REL participants had lost and regained ≥ 10% body weight, and CTL participants had no history of significant weight change. RED women reported lower carbohydrate intake (p=0.02), greater protein intake (p=0.04), marginally higher fat intake (p=0.05), greater eating restraint (p<0.01), and more vigorous intensity PA (min/d: p=0.04; kcal/d: p=0.02) than their LW-CTLs. Accelerometry revealed higher moderate-to-vigorous intensity PA (MVPA) (min/d: p=0.01; kcal/d: p=0.01) but a greater degree of total daily energy expenditure over-report (p=0.02) in RED vs LW-CTL women.

Conclusions: Weight loss maintenance associates with heightened behavioral vigilance including greater dietary restraint and increased objectively-measured MVPA, but relates to greater over-report of total daily energy expenditure – a compensatory response for weight reduction posited to potentiate weight relapse. In contrast, persons who have relapsed do not demonstrate measurable compensations in health behavior compared to always-overweight/obese controls.

T-P-3120 High and Low Protein Energy-Restricted Diets Have Similar Effects on Food Cravings in Overweight/Obese Adults with Type 2 Diabetes
Nerylee Watson Adelaide South Australia, Kathryn Dyer Adelaide South Australia, Jonathon Buckley Adelaide South Australia, Grant Brinkworth Adelaide South Australia, Alison Coates, Gaynor Parfitt Adelaide SA, Peter Howe Callaghan NSW, Manny Noakes Adelaide BC south Australia, Karen Murphy Adelaide SA

Background: Studies investigating the effect of macronutrient composition on food cravings in type 2 diabetes (T2DM) are lacking. This study compared the effect of a higher-protein (HP) diet to an energy-matched lower-protein (LP) diet on food cravings in overweight/obese adults with T2DM.

Methods: Overweight/obese (BMI 33.5 ± 4.8 kg/m2) adults (n=61, aged 55 ± 8 years) with T2DM (HbA1c 8.1 ± 1.4%) were randomized to a HP diet (30% protein, 38% carbohydrate, 29% fat) or a LP diet (21%;53%;23%) for a 12 week weight loss phase followed by a 12 week weight maintenance phase. Body weight, HbA1c and three self-administered questionnaires were assessed at baseline and the end of each phase: Food Craving Inventory (FCI) measuring frequency, the General Food Craving Questionnaires – Trait (G-FCQ-T) and State (G-FCQ-S) measuring psychological traits and responses to specific situations respectively. Data was analysed using a linear mixed effects model and Pearson Correlation.

Results: Forty four participants completed the study (HP n=23, LP n=21). There were no significant differences between the groups for changes in any outcomes; therefore they were combined for analysis. There were improvements in body weight (-7.7 ± 4.0 kg, ) and HbA1c (-1.4% ± 1.1%) at the end of the weight loss phase (p<0.05). Participants reported low general food cravings at baseline (2.1 ± 0.08; rarely). Overall, there was an improvement in the G-FCQ-T total score (-11.5 ± 2.4, p<0.001) corresponding to a moderate Cohen’s effect size (ES) d=0.56) and there was a 15% reduction in the G-FCQ-S total score (-5.4 ± 2.1, p=0.04, d=0.4) with the largest ES observed in the ‘obsessive preoccupation with food’ subscale (d=0.55). Moderate positive correlations were seen between changes in weight and changes in cravings for high fats, carbohydrates, fast foods and general food cravings (r=0.34 to 0.48, p<0.03).

Conclusions: Weight loss when consuming either a higher or lower protein diet was positively associated with improvements in food cravings.

T-P-3121 Impact of Physician Referral Status on Weight Loss Achieved in an Academic Weight Management Center
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Impact of Physician Referral Status on Weight Loss Achieved in an Academic Weight Management Center

Kansas City Kansas

High and Low Protein Energy-Restricted Diets Have Similar Effects on Food Cravings in Overweight/Obese Adults with Type 2 Diabetes

Adelaide South Australia

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High and Low Protein Energy-Restricted Diets Have Similar Effects on Food Cravings in Overweight/Obese Adults with Type 2 Diabetes

Adelaide South Australia
Steger, Kansas City KS, Jaeboon Lee Lubbock, TX, Eyad Al-Hihi, Kansas City KS

**Background:** Obesity is a pandemic with profound impact on public health. Physicians have limited ability to manage obesity in the primary care setting.1,2 Individuals who have discussed weight with their physician may be more likely to lose weight.3,4 Physician referrals have been shown to increase weight loss in an adolescent patient population.5 In adults, attrition rates are high, and those referred to weight management programs by physicians may be less likely to enter treatment.6-7 The KU Weight Management Program is a research-based center that has recently integrated a clinical enter treatment.6,7 The KU Weight Management Program is a management programs by physicians may be less likely to increase weight loss in an adolescent patient population. In adults, attrition rates are high, and those referred to weight management programs by physicians may be less likely to enter treatment.6-7 The KU Weight Management Program is a research-based center that has recently integrated a clinical practice with the ability to accept physician referrals. The impact of physician referrals on subsequent weight loss in comparison to individuals who were self-referred was evaluated, with the hypothesis that referrals by a physician would result in a greater degree of weight loss among participants.

**Methods:** We conducted a retrospective chart review of 85 patients who had enrolled and completed at least three months in our weight management clinic between March 2014 and April 2015. We reviewed outcomes of weight loss and change in BMI after three months of enrollment.

**Results:** Of the 85 patients reviewed, 32 were physician-referred and 53 were self-referred. Average weight loss was 21.1 pounds, with average change in BMI of 3.5. Physician-referred patients lost an average of 24.3 pounds (-4.1 change in BMI), while self-referred patients lost an average of 189.62 pounds (-3.01 change in BMI). There was no significant difference in outcomes between groups. Physician-referred patients were somewhat more likely to enroll in a very low calorie diet protocol (15/32, 47%) than self-referred patients (10/53, 19%).

**Conclusions:** Patients referred by a physician may be more likely to enroll in more calorie restricted diet protocols and may have a trend towards more substantial weight loss, though the differences did not reach statistical significance in this small study. Future study may further evaluate these trends.

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**T-P-3122**

** Increasing Fruit Intake Does not Reduce Energy Intake Within a Meal **

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**Background:** To reduce energy intake in a meal, low-energy-dense foods (fruits and vegetables) can be increased, high-energy-dense foods (potato chips) can be decreased, or a combination of the two can occur. This investigation examined how increasing portion size of grapes and decreasing portion size of potato chips within a lunch altered intake of these foods, and how these changes impacted intake of all foods and overall energy intake during a lunch in healthy weight adults.

**Methods:** A 4X4 incomplete Latin-square crossover design with a between-subjects factor of order and a within-subjects factor of meal condition (CONTROL[C], INCREASE[I], DECREASE[D], INCREASE+DECREASE[ID]) was implemented in 33 healthy weight adults (22.3±1.9 kg/m2, 22.2±3.8 years of age, 73% female). Meal conditions varied portion sizes of grapes (100g [C, D] or 150g [I, ID]) and potato chips (100g [C, I] or 50g [D, ID]) and two sandwiches. Pre-and post-meal intake (g and kcal) was measured to determine intake from each food and total meal energy intake.

**Results:** Mixed factor analyses of variance found a significant (p<0.05) interaction of meal condition and food for grams and energy consumed. Participants consumed significantly more grapes in I (121.6 ± 44.5g, 82.9 ± 30.6 kcal) and ID (118.6 ± 38.8g, 81.6 ± 26.8 kcal), compared to C (86.3 ± 27.4g, 59.6 ± 18.9 kcal). Significant differences in potato chip or sandwich intake were not found among the four conditions. No significant changes in meal energy intake were found: C = 602.5 ± 232.4 kcal; I = 611.7 ± 238.4 kcal; D = 569.8 ± 156.0 kcal; and ID = 617.8 ± 169.8 kcal.

**Conclusions:** Increasing grape intake, via increasing portion size, in a meal did not reduce intake of other foods or overall meal energy intake. Intake of potato chips did not decrease when portion size was decreased. Recommendations to increase fruit intake without other dietary changes may not assist with reducing energy intake in a meal.

**T-P-3123-DT**

** Late-Night Caloric Intake is Inversely Associated with Serum Glucose among Obese Women at 16-20 Weeks’ Gestation **

Camille Schneider, Birmingham, AL, Josh Muhammad, Birmingham, AL, Barbara Gower, Birmingham, Alabama, Joseph Biggo, Birmingham, AL, Patrick Catalano, Cleveland, Ohio, Paula Chandler-Laney, Birmingham, Alabama

**Background:** In a previous study we found that late-night eating in the third trimester was associated with impaired glucose tolerance, particularly among obese women. This finding is consistent with the known adverse metabolic effects of shift-work. In the current study, we tested the hypothesis that late-night eating at 16-20 weeks’ gestation would also be associated with high post-challenge glucose and lower whole body insulin sensitivity, particularly among obese women. We also hypothesized that irrespective of BMI, late-night eating would be associated with greater gestational weight gain.

**Methods:** Non-diabetic pregnant women who were lean (BMI: 18.5-24.9 kg/m2; N=21) or obese (BMI: 30-40 kg/m2; N=29) in early pregnancy completed food diaries and underwent a liquid meal test at 16-20 weeks’ gestation. Late-night food intake was calculated as the total energy consumed between 8pm and 6am. Linear regression models across the whole cohort and within each weight class were calculated to examine whether late-night intake was associated with the glucose response, insulin sensitivity, and insulin secretion, during the liquid meal tests, and with gestational weight gain, independent of BMI and day-time eating.

**Results:** In the obese group only, late-night energy intake was inversely associated with post-meal glucose response, after adjusting for BMI and total daytime intake (partial r = -0.53, P<0.01). BMI and total daytime intake were independently and inversely associated with whole body insulin sensitivity in the obese group (P<0.05). Late-night intake was not associated with whole body insulin sensitivity, insulin secretion, or gestational weight gain for either group.

**Conclusions:** The inverse association of late-night eating and post-challenge glucose at 16-20 weeks’ gestation in obese women was unexpected, but may be consequent to a relatively more insulin sensitive state in early-mid pregnancy, which could lower circulating glucose and thereby increase hunger.

**T-P-3124**

** Long-Term Effects of a Very low- and High Carbohydrate Diet on Renal Function in Individuals with Type 2 Diabetes **

Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society
Jeanie Tay Adelaide South Australia, Campbell Thompson Adelaide SA, Natalie Luscombe-Marsh Adelaide SA, Manny Noakes Adelaide BC south Australia, Jonathan Buckley Adelaide South Australia, Gary Wittert Adelaide South Australia, Grant Brinkworth Adelaide South Australia

**Background:** Concerns exist about the safety of very low carbohydrate, high protein diets on renal function, particularly in populations with type 2 diabetes (T2D) at risk of nephropathy.

**Methods:** Adults with T2D (n=115) without overt kidney disease (BMI 34.6±4.3kg/m2, age 58±7yrs, HbA1c 7.3±1.1%, serum creatinine[Scr] 69±15μmol/L, estimated glomerular filtration rate[eGFR-CKD-EPI 94±12ml/min/1.73m2] were randomised to consume either a hypocaloric very low carbohydrate, high protein, high fat (LC) diet (14% energy as carbohydrate [CHO<50g/day], 28%protein [PRO], 58%fat [<10% saturated fat]) or an energy matched high unrefined carbohydrate [CHO<50g/day], 28%protein [PRO], 58%fat [≤10% saturated fat]) or an energy matched high unrefined carbohydrate, low fat (HC) diet (53%CHO, 17%PRO, 30%fat [<10% saturated fat]); with supervised aerobic/resistance exercise (60mins,3d/wk). Body weight, blood pressure and renal function-assessed by eGFR, estimated creatinine clearance (Cockcroft-Gault, Salazar-Corcoran) and albumin excretion rate (AER), were measured at weeks 0 and 52.

**Results:** Both groups had similar completion rates (LC=71%, HC=65%). Protein intake calculated from 24h urinary urea was higher in LC (120.1±38.2g/day, 1.3g/kg/day) compared to HC (95.8±27.8, 1.1g/kg/day,p<0.001). Reductions in weight (mean[95%CI]-9.3[-10.6,-8.0]kg) and blood pressure (-6[-9,-4]/-6[-8.5]mmHg) were similar in both groups (P≥0.18). Changes in Scr (LC -0.1[-1.3][-1.6,-0.2]μmol/L, p=0.25) and eGFR (LC -4[-6,-2], HC -2[-3,0]ml/min/1.73m2, P=0.25) did not differ between diets. Weight loss reduced AER independent of diet (-2.1[-4.6,0.5]mg/24h, p=0.24); 6 participants (LC 3, HC 3) had moderately increased AER at baseline (30-300mg/24h), which normalised in 4 participants (LC 2, HC 2) after 52 weeks.

**Conclusions:** Compared with a HC diet, weight loss following 12 months’ consumption of an LC does not adversely affect renal function any more than conventional HC diets.

**T-P-3125**

**Portion Control in a Private Psychiatric Hospital**

**Amanda Clark Coolangatta Queensland**

**Background:** Currumbin Clinic is a psychiatric hospital with primarily anxiety, depression and detoxification wards. A survey in 2008 indicated 73% of patients reported unwanted weight gain during their stay.

**Methods:** The porcelain "Portion Perfection Plate" was introduced into the food service to convey the messages of nutritional balance, portion control and conscious eating. The Perfect Meals for Patients program is an opt in program and includes patient education via posters, brochures, nutrition sessions, food diaries and clinic orientation manual on the appropriate serving size for lunch and dinner meals. Mid meals are served in standard portion sizes so patients can be confident about their choices. Patients were surveyed every 3 weeks for one year after implementation of the program to ascertain level of awareness, understanding and effectiveness.

**Surveys continue less regularly to check maintenance of results.**

**Results:** The rate of self reported unwanted weight gain during clinic admission fell from an initial 73% of patients, to 35%. 41% of patients indicate that they actively choose to participate in the program and 80% indicate a high level of confidence that they can continue to implement the strategies after discharge.

**Conclusions:** Portion Control can be effectively available to psychiatric inpatients through the use of portion plates, controlled serving sizes and supportive educational strategies.

**T-P-3127**

**Randomized Clinical Trial of Portion-Controlled Prepackaged Foods to Promote Weight Loss**

Cheryl Rock La Jolla California, Shirley W Flatt La Jolla CA, Bilge Pakiz La Jolla CA, Hava Barkai La Jolla CA, Dennis Heath La Jolla CA

**Background:** Providing prepackaged portion-controlled foods within the context of a reduced-energy meal plan has been suggested to promote more weight loss than standard diet counseling. Satisfaction with food and meal plans is critical for adherence with a weight-loss diet.

**Methods:** The primary aim of this study was to test whether providing portion-controlled prepackaged lunch and dinner entrées in the context of a reduced-energy diet prescription and behavioral counseling promotes greater weight loss at 12 weeks in overweight and obese men and women, compared to control conditions where the prescribed diet is consumed via self-selected foods. Additional aims are to describe the effects on biological factors (lipids, carotenoids, C-reactive protein [CRP]), cardiopulmonary fitness, meal satisfaction, and eating attitudes. One-half of the subjects assigned to prepackaged entrées were provided items with >25% energy from protein.

**Results:** Participants (N=183) had a baseline weight of 95.9(15.6) kg (mean[SD]) and BMI of 33.2(3.5) kg/m2. Weight data at study end were available for 180 subjects. Weight loss at 12 weeks for the regular entrée, higher-protein entrée and control groups was 8.6(3.9), 7.8(5.1), and 6.0(4.4%), respectively (P<.005, intervention vs. control groups). Intervention subjects lost 5.7(3.4) kg body fat (15% of initial body fat) compared with a loss of 4.4(3.3) kg body fat in controls (P=.03 for kg fat loss and P<.01 for % fat loss). Total cholesterol and triglycerides decreased by a mean of 6(25) and 15(46) mg/dL, respectively, in intervention subjects (P<.01).

**Conclusions:** A reduced-energy meal plan incorporating prepackaged portion-controlled entrées promotes greater body weight and fat loss than a comparable meal plan with self-selected foods, as well as favorable effects on blood lipids and CRP. Initial weight loss positively relates to degree of long-term weight loss, so these results are relevant to likelihood of longer term success.

**T-P-3127**

**Relationship between Body Mass Index and Healthy Eating Index-2010 in Children with Autism Spectrum Disorder**

Teresa Pan Overland Park Kansas, William Black Kansas City Mo, Heather Valentine Kansas City KS, Meredith Dreyer Gillette Kansas City MO, Susana Patton Kansas City KS

**Background:** The Healthy Eating Index (HEI) is a widely used measure of diet quality. Poor diet quality is associated with child overweight and obesity. Diet quality using the HEI
Obesity 2015 Abstract Book
Poster Abstracts Wednesday November 4th to Friday November 6th, 2015

has not been evaluated as thoroughly in children with Autism Spectrum Disorder (ASD), who often have restrictive diets and experience feeding problems. This study evaluated whether weight status was related to overall and component HEI scores in children with ASD.

Methods: Forty-three children with ASD (Mage= 5.61, MBMIz= .529, 72.1% male, 55.8% white) participated. Total calories consumed, ratio of recommended calories consumed, and average HEI-2010 score was obtained through a three day diet diary. Pearson correlations were used to evaluate the association between HEI-2010 scores and BMIz, controlling for total calories consumed and ratio of recommended calories consumed.

Results: Greater BMIZ was associated with higher HEI score independently (r=.432, p=.004) and after controlling for average total calories consumed (r=.437, p=.004) and ratio of recommended calories consumed (r=.464, p=.002). BMIZ was also associated with average Whole Fruit HEI component score (r=.332, p=.029) and was maintained after controlling for average total calories (r=.333, p=.022) and ratio of recommended calories (r=.362, p=.018). No other HEI component scores were related to BMIZ.

Conclusions: In children with ASD, higher BMIZ is related to greater diet quality and consumption of whole fruits, but not other aspects of diet quality (e.g., Total Fruit, Total Vegetables, Greens and Bean, Dairy, Whole Grains, Refined Grains, Sodium, or Empty Calories). However, previous literature suggests that higher BMI relates to poorer diet quality. To date, little work has been done on the use of HEI in special populations, including children and adolescents diagnosed with ASD. Additional work is needed to determine whether the HEI relates to variables important for feeding interventions, such as food variety, and how this may also relate to BMIZ.

T-P-3128 Sensitivity To the Rewarding Properties of Food and Perceived Stress as Predictors of a Tendency Toward Binge Eating in Individuals with Overweight/Obesity Seeking Behavioral Weight Loss Treatment Monica Burney Providence RI, Dale Bond Providence Rhode Island, Michael Lowe Philadelphia Pennsylvania, Graham Thomas Providence Rhode Island

Background: A tendency toward binge eating (BE; a sense of loss of control while eating an objectively large amount of food, measured by the Binge Eating Scale; BES), is common among overweight/obese individuals. However, the degree to which sensitivity to the rewarding properties of food (as measured by the Power of Food Scale; PFS) and perceived stress (as measured by the Perceived Stress Scale; PSS) are associated with BE, particularly among individuals seeking behavioral weight loss (BWL) treatment, is unknown.

Methods: Subjects seeking BWL treatment, age 18-70 yrs, with a BMI of 25-45 kg/m2, completed the PFS, PSS, and BES prior to treatment. Regression analyses were conducted to determine whether PFS and PSS entered into the model simultaneously (with and without the corresponding interaction term) accounted for significant variance in BES. BMI, age, and gender were tested as potential covariates.

Results: Subjects (n=328) were 82.4% women, 92.2% Non-Hispanic White with mean±SD age 55.2±9.9 yrs, and BMI 35.3±5.1 kg/m2. The threshold for clinically significant BE (≥18) was met by 29.6% (n=99). Regression analysis demonstrated that the PFS (mean±SD 2.7±.9) and PSS (20.4±6.5) together accounted for significant variance in BES (14.1±7.7; R²=0.49, p<.001). Higher PFS (β=5.08, SE=.34, p<.001) and PSS (β=2.5, SE=.05, p<.001) were independent predictors of higher BES. Higher PFS (OR=3.91, SE=0.19, p<.001) and PSS (OR=1.09, SE=0.03, p=.001) were also associated with greater likelihood of meeting the threshold for clinically significant BE. No interaction between PFS and PSS was observed in these models (p's>.05). Controlling for BMI, age, and gender did not alter the results.

Conclusions: BE was strongly associated (cross-sectionally) with both sensitivity to the rewarding properties of food and perceived stress in a sample of individuals with overweight/obesity seeking BWL treatment. Prospective studies are needed to identify causal pathways that explain these associations.

T-P-3129 The Acute Effect of Dietary Fiber and Calcium on Appetite and Satiety Najlaa Al-mana Guildford, Denise Robertson

Background: Obesity has become more prevalent in the last 20 years. Dietary fibre (DF) and calcium (Ca) as functional food-ingredients are linked through epidemiology to weight management, but the impact of these as isolated ingredients in obesity is unknown. Objective: To investigate the short-term effects of DF from fenugreek (Fen), and Ca, on appetite, satiety and postprandial metabolism in overweight/obese subjects.

Methods: In this appetite experiment, these functional ingredients were given to overweight/obese subjects as part of standardized meals with a concomitant measurement of subjective appetite ratings, acute energy intake (EI), and postprandial metabolism. In each case, the treatment effect was compared to a matched control.

Results: Consumption of a fenugreek-enriched drink elevated the plasma glucose levels and remained above fasting levels for 4 hours postprandial (p=0.02). This finding was combined with a reduction in energy intake at an ATM (p=0.030). However, no significant differences over 24h were observed between treatment groups. Conversely, the Ca-enriched drink reduced EI at the ALM (p=0.017), decreased rated prospective consumption (p=0.012), hunger (p=0.05) and GLP-1 (p<0.001).

Conclusions: Acute consumption of DF and Ca reduced food intake, indicating an effect on short-term satiety. Our data suggest a weak relationship between satiety and GLP-1 secretion in obese individuals. Further studies are required to determine these mechanisms on appetite and to confirm whether the effect can be maintained in the longer-term.

T-P-3130 The Effect on Weight Loss of Week-On, Week Off Intermittent Energy Restriction Peter Clifton Adelaide SA, Eva Pedersen Adelaide SA, Michelle Headland Adelaide South Australia, Sharayah Carter Adelaide SA, Jennifer Keogh Adelaide South Australia

Background: Intermittent partial or complete fasting interspersed with periods of normal food intake has been proposed to be a useful method of weight loss which may have advantages in term s of increased insulin sensitivity as well as fewer dropouts and greater compliance. However there is little long term data available. We have also shown that alternate
weeks of dieting and normal food intake in women is a useful strategy with similar weight loss at 1 year and similar dropouts but we had no blood samples available.

**Methods:** This study is a randomised parallel weight loss intervention for one year. 54 overweight and obese men and women were randomised to continuous energy restriction (CER) and 53 were randomised to dieting for one week with one week on their usual diet (IER). The degree of energy restriction was the same for both active weight loss periods.

**Results:** After 8 weeks for the CER group (n=39) and 16 weeks for the IER (n=34), average weight loss was 6.3 ±3.0 and 6.6kg ±2.2 respectively (p=0.7). Dropouts from each group were not statistically different. Weight loss in men and women was the same at 7.3% and 6.7%. No differences were seen in change in % fat -3.4 and -3.0% respectively.

**Conclusions:** At this early time point weight loss and drop outs are the same with both dietary strategies confirming our earlier study. Insulin and glucose and lipid levels at baseline, 3 months and 12 months will be measured at the end of the study.

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**T-P-3131**

**The Post-Prandial Effects of Fructose Triglyceride, Glucose and Insulin Concentrations.**

Clare Gallagher, Jennifer Keogh Adelaide South Australia, Eva Pedersen Adelaide SA, Peter Clifton Adelaide SA

**Background:** Fructose, a nutritive sweetener with a low GI, has been shown in previous studies to elevate triglyceride, especially in beverage form, when compared to glucose. There is limited data available on the effect of fructose in a mixed meal. The aim of this study was to determine the effects of sucrose, fructose and sucralose on triglyceride, glucose and insulin response 4 hours in healthy volunteers.

**Methods:** This study was a randomised cross-over design. Twenty-seven participants with a median age of 40, and a BMI of 26.3kg/m2 completed the study. Fructose (52g), sucrose (65g) and Sucralose (6g of Splenda) were delivered as muffins with a standardised fat load (66g). Blood samples were taken at baseline and every 30 minutes for 4 hours. Glucose, triglyceride and insulin concentrations over time, AUC and iAUC were analysed.

**Results:** No significant difference was found between the three sweeteners for triglyceride and glucose concentration, AUC and iAUC. A significant difference was found for insulin: treatment (p = 0.001), time*treatment (p = 0.035), AUC (p =0.000) and iAUC (p =0.000). Post hoc analysis showed that fructose had a significantly lower response than either sucrose (p = 0.006) or sucralose (p = 0.041).

**Conclusions:** Fructose at a moderate dose in a solid food did not significantly elevate triglycerides in comparison to sucrose or sucralose. No significant difference in the glycaemic response between the meals was found. These results indicate that these sweeteners can be safely interchanged for solid meals. Fructose showed a lower insulin response which maybe beneficial long-term.

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**T-P-3132**

**Vitality and Physical Functioning Outcomes from the ENERGY (Exercise and Nutrition Enhance Recovery and Good Health for You) Trial**

Wendy Demark-wahnefried Birmingham Alabama, Graham Colditz St Louis MO, Jingxia Liu St. Louis MO, Cheryl Rock La Jolla California, Rebecca Sedjo Aurora Colorado

**Background:** Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society

**Conclusions:** Obesity is a poor prognostic factor and is negatively related to quality of life (QOL) in breast cancer survivors. The ENERGY study is the largest weight loss intervention trial ever completed in breast cancer survivors and aimed to improve vitality and physical function.

**Methods:** 692 overweight/obese (BMI: 25-45 kg/m2) breast cancer survivors across the US were randomized to intensive or non-intensive weight loss interventions. The intensive arm received 52 contacts over 1 year via group behavior therapy sessions and telephone counseling, while the non-intensive arm met twice; women were followed for 2 years. Measured weight and self-reported vitality and physical function were measured every 6 months using the SF36. Linear mixed models tested for between-arm differences at each time point controlling for receipt of chemotherapy and time from diagnosis to study entry.

**Results:** Percent losses in body weight in the Intensive vs. Non-Intensive arms were 6.0% vs. 1.5% (p<0.0001) at 1 year, and 3.7% vs. 1.3% (<p<0.0001) at 2 years. Intensive vs. Non-Intensive adjusted mean (SE) scores for vitality at baseline, 6 months, 1 year and 2 year were: 60.5(1.36), 65.1(1.20), 62.2(1.25) and 60.5(1.28) vs. 60.5 (1.37), 62.4(1.23), 61.0(1.29), and 63.2(1.31), showing borderline between-arm differences (p=0.0508) at 6 months only. Physical function scores were 82.9(1.31), 82.9(1.16), 82.0(1.20) and 79.9(1.24) vs. 81.9(1.32), 78.4(1.18), 77.6(1.24) and 77.9(1.26) with significance differences observed at 6 months (p=0.01), borderline significance seen at 1 year (p=0.0512) and none at 2 years.

**Conclusions:** While positive changes in QOL have been reported in many diet and physical activity trials in cancer survivors, most have been short-term in duration. These longer term data suggest that diet and exercise interventions may improve the trajectory of physical QOL, but that these benefits diminish over time or are mitigated by regains in weight or reduction in physical activity.

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**T-P-3133**

**Whey Protein Supplementation Improves Body Composition and Cardiovascular Risk Factors in Overweight and Obese Patients: A Systematic Review and Meta-Analysis**

Sikarin Upala Cooperstown NEW YORK, Anawin Sanguankeo Cooperstown NY

**Background:** Previous literature showed possible benefits of whey protein supplementation in promoting weight loss. However, most studies do not have enough power to show beneficial effects on body composition and cardiovascular disease (CVD) risk factors. This meta-analysis evaluated effects of whey protein in overweight and obese individuals.

**Methods:** We comprehensively searched the databases of MEDLINE, EMBASE, and Cochrane Databases. The inclusion criteria were published randomized control trials comparing whey protein supplementation to placebo or controls in overweight or obese patients. The primary outcome was the differences in the change of body composition (body weight, waist circumference, total fat mass) We also examined change of CVD risk factors as a secondary outcome. Meta-analyses were performed to compare whey protein and its control groups in the study to calculate the mean difference (MD) and
**Results:** From 35 full-text articles, 11 studies were included in the meta-analysis. The duration of treatment included studies ranged from 4 days to 18 weeks. There was a significant reduction of body composition including body weight (MD= 0.58, 95% CI: 0.33 to 0.83) and total fat mass (MD=1.19, 95% CI: 1.01 to 1.37) favoring whey protein group. There were also improvement in multiple CVD risk factors including SBP (P<0.01), DBP (P<0.01), glucose (P=0.003), HDL-C (P=0.03), and Triglyceride (P<0.01). No significant change in waist circumference, HOMA-IR, LDL-C was found comparing between two groups.

**Conclusions:** Whey protein supplementation seems to improve body weight, total fat mass and some CVD risk factors in overweight and obese patients. More studies on different dosage and duration of whey protein are helpful to assess benefits in overweight or obese individuals.

T-P-3134

**Analysis of the synthetic peptide RM-493, a melanocortin-4 receptor (MC4R) agonist, on cardiovascular parameters in three Phase 1b/2a studies**


**Background:** The hypothalamic Leptin-Proopiomelanocortin-MC4R pathway is a critical regulator of appetite and weight regulation. The synthetic MC4R agonist peptide RM-493, a first in class efficacious and well-tolerated MC4R agonist, is ideally positioned for treatment of defects in this pathway. Several previous MC4R agonists caused significant increases in blood pressure (BP) and heart rate (HR). Preclinical evaluations supported that RM-493 did not cause such increases at doses that resulted in weight loss in a primate weight loss study.

**Methods:** Healthy obese patients (BMI≥30 kg/m²) were enrolled in clinical safety, tolerability and weight loss studies, where systolic [S]and diastolic [D] BP and heart rate (HR) were assessed in three double-blind, randomized, placebo (pbo) controlled parallel group multiple dose studies of RM-493 by 24-hour ambulatory blood pressure (24-hr ABPM) at baseline and at ~1-2 weeks postdose. 24-hr ABPM results were analyzed for each study over the full 24 hours, the daytime and nighttime intermittent, for both absolute values and change from baseline compared to placebo. In addition, PK/PD (BP, HR) analyses were conducted.

**Results:** There were 48 patients in Study 1 (32 active; 16 pbo), 25 patients in Study 2 (13 active; 12 pbo), and 55 patients in Study 3 (34 active; 21 pbo), for a total of 128 patients (79 active; 49 pbo). On average, patients lost -0.9 kg/week of placebo-subtracted weight loss at doses of 1-2 mg/day. There was little, if any evidence of BP or HR change from baseline vs pbo in any study, nor evidence of a PK/PD relationship: for example, Study 3, the largest single study (N=55) showed 1.07 mmHg (90% CI: 3.93, 1.78), 0.44 mmHg (90% CI: 2.29, 1.41), and +0.19 beats (90% CI: 3.09, 3.46) for SBP, DBP, and HR respectively.

**Conclusions:** RM-493, an MC4R agonist that contributes to weight loss without increasing CV parameters, may represent an important therapeutic advance for the treatment of obesity in patients with defects in the hypothalamic Leptin-POMC-MC4R pathway.
Comorbidity cost offsets for BMI reductions were calculated by multiplying BMI change with medical ($170) and pharmacy ($117) costs per BMI unit. Literature-based estimates were used to calculate the annual cost of treating T2DM ($8396). Assumptions included: plan sponsor (employer) population (100,000 patients), 10% turnover, 1% PHEN/TPM ER market uptake at a weighted cost per capsule of $5.90, and $60 PHEN/TPM ER copay (Tier 3). Costs were based on 2015 US dollars.

Results: In this model, patients with prediabetes experienced mean BMI (kg/m2) reductions of 4.30 for PHEN/TPM ER vs 2.15 for LM, translating to annual cost offsets of $1234 vs $617, respectively. Similarly, patients with T2DM experienced mean BMI reductions of 3.69 for PHEN/TPM ER vs 1.96 for LM, translating to annual cost offsets of $1059 vs $563, respectively. The rate of progression from prediabetes to T2DM was 1.9% for PHEN/TPM ER vs 4.2% for LM. The total budget impact of treating patients with prediabetes with PHEN/TPM ER was $54,171 ($0.05 per member per month [PMPM]) and for patients with T2DM was $74,677 ($0.06 PMPM).

Conclusions: The budget impact of adding PHEN/TPM ER in patients who were overweight/obese with prediabetes or T2DM is minimal and the additional cost of PHEN/TPM ER is offset by reduced comorbidity costs.

T-P-3137
Budget Impact Over 2 Years of Treatment with Phentermine and Topiramate Extended-Release (PHEN/TPM ER) in an Overweight/Obese Population
Sunil Karnawat Mountain View California, Sarah Odeh Mountain View California

Background: Phentermine/Topiramate ER (PHEN/TPM ER) is approved as an adjunct to lifestyle modification (LM) for chronic weight management in adults with a body mass index (BMI) of ≥30 or ≥27kg/m2 with ≥1 weight-related comorbidity such as hypertension (HTN), type 2 diabetes mellitus (T2DM), or dyslipidemia. This post-hoc analysis estimated the 2-year budget impact of treatment with PHEN/TPM ER 7.5/46 mg plus LM vs LM alone.

Methods: A 2-year model was developed from a health plan perspective to estimate the total budget impact from PHEN/TPM ER cost and cost offsets from BMI reductions and comorbidity costs for incident cases of HTN, T2DM, and dyslipidemia. BMI changes were modeled from SEQUEL, a 52-week extension of CONQUER, a Phase 3, 56-week trial of PHEN/TPM ER plus LM or LM alone. Cost offsets for BMI reduction were calculated by multiplying BMI change by the medical ($170) and pharmacy ($117) cost change per BMI unit. Literature-based estimates were used to calculate the annual cost of treating HTN ($1594), T2DM ($8396), and dyslipidemia ($2498). Assumptions included: plan population (100,000 patients), 10% turnover, 1% PHEN/TPM ER market uptake, $5.90 PHEN/TPM ER cost per capsule, and $60 PHEN/TPM ER copay. Costs were based on 2015 US dollars.

Results: BMI reductions over 2 years were -4.3kg/m2 for PHEN/TPM ER and -2.0kg/m2 for LM, translating to cost offsets of $1238 and -$559, respectively. Incidence of HTN PHEN/TPM ER and -2.0kg/m2 for LM, translating to cost offsets of -$1238 and -$559, respectively. Incidence of HTN, T2DM, and dyslipidemia ($2498). Assumptions included: plan population (100,000 patients), 10% turnover, 1% PHEN/TPM ER market uptake at a weighted cost per capsule of $5.90, and $60 PHEN/TPM ER copay (Tier 3). Costs were based on 2015 US dollars.

Results: In this model, patients with prediabetes experienced mean BMI (kg/m2) reductions of 4.30 for PHEN/TPM ER vs 2.15 for LM, translating to annual cost offsets of $1234 vs $617, respectively. Similarly, patients with T2DM experienced mean BMI reductions of 3.69 for PHEN/TPM ER vs 1.96 for LM, translating to annual cost offsets of $1059 vs $563, respectively. The rate of progression from prediabetes to T2DM was 1.9% for PHEN/TPM ER vs 4.2% for LM. The total budget impact of treating patients with prediabetes with PHEN/TPM ER was $54,171 ($0.05 per member per month [PMPM]) and for patients with T2DM was $74,677 ($0.06 PMPM).

Conclusions: The budget impact of adding PHEN/TPM ER in patients who were overweight/obese with prediabetes or T2DM is minimal and the additional cost of PHEN/TPM ER is offset by reduced comorbidity costs.

T-P-3138
Canagliflozin Reduces Body Weight, Body Mass Index and Waist Circumference in Patients with Type 2 Diabetes Mellitus
Michael Pfeifer Raritan New Jersey, Frank Vercruysse Beerse, Albert Fung Raritan NJ, Michael Davies Raritan NJ, Gary Meininger Raritan NJ

Background: Most patients with type 2 diabetes mellitus (T2DM) are overweight or obese. Both body mass index (BMI) and waist circumference (WC) are predictors of cardiovascular disease. Canagliflozin (CANA), a sodium glucose co-transporter 2 inhibitor, reduces hemoglobin A1C, systolic blood pressure (SBP), and body weight (BW). This analysis characterizes the effect of CANA on body composition measures in patients with T2DM.

Methods: In four 26-week, Phase 3 studies (N=2,313), CANA 100mg and 300mg were compared to placebo (PBO) as monotherapy, dual therapy (add-on to metformin [MET]), and triple therapy (add-on to MET+pioglitazone [PIO]). Endpoints included change from baseline in BW, BMI, and WC and the proportion of patients with T2DM achieving ≥5% weight loss for each study.

Results: Dose-related reductions in BW, BMI, and WC were observed with CANA vs PBO in each study. PBO-adjusted changes with CANA 100mg and 300mg ranged from −1.4% to −3.7% for BW (p<0.001 vs PBO in all studies), −0.4 to −1.2kg/m2 for BMI, and −0.88 to −2.96 cm for WC (95%CI for CANA−PBO difference excluded 0 in all studies, except for CANA 100mg in add-on to MET+PIO study for WC). A greater proportion of patients had ≥5% reduction in BW with CANA 100mg (16−30% across studies) and CANA 300mg (18−39%) compared with PBO (4−8%). PBO-adjusted changes with CANA 100mg and 300mg ranged from −0.6% to −1.2% for A1C (p<0.001 vs PBO in all studies) and from −1.6 to −6.7mmHg for SBP (p<0.025 vs PBO, except in add-on to MET+PIO study). Overall incidence of adverse events (AEs) was generally similar between CANA and PBO. The most common AEs with CANA were genital mycotic infections and increased urination. The incidence of hypoglycemia was similar between CANA and PBO, except when used with a SU.

Conclusions: In addition to improving A1C, BW, and SBP in patients with T2DM, CANA reduced BMI and WC and increased the proportion of patients experiencing ≥5% weight loss, regardless of background antihyperglycemic therapy.

T-P-3139
Cost Implication of Using Lorcaserin in Weight Management Prior to Bariatric Surgery
Zhixiao Wang Woodcliff Lake New Jersey, Xuan Li Woodcliff Lake NJ, Russell Knoth Woodcliff Lake NJ, Ken Fujisaka La Jolla California

Background: Payors may cover bariatric surgery (BaS) for patients with BMI ≥ 40 or BMI 35-39.9 with ≥1 obesity-related comorbidity (ORC). Weight loss (WL) medications prior to BaS may be beneficial to payers and patients if some patients can achieve substantial WL and avoid BaS. This analysis
evaluated the cost implication of lorcaserin, an FDA-approved WL medication, in weight management prior to BaS from payers’ perspective.

**Methods:** The cost implication was assessed in a hypothetical US health plan of one million members over a 2-year horizon. Key assumptions: 1) Average cost per BaS = $29,517; 2) Patients with ≥25% excess body weight loss (EWL) pre-BaS WL management can avoid BaS; 3) Only BaS and lorcaserin drug costs are included; 4) Only patients who achieve ≥5% weight loss at week 12 continue lorcaserin treatment (WK-12 responders). For modeling purposes, data for lorcaserin were drawn from a subset of patients (BMI ≥ 40 or BMI 35-39.9 with ≥1 ORC) from three clinical trials (BLOSSOM, BLOOM, BLOOM-DM) evaluating the efficacy and safety of lorcaserin for WL.

**Results:** 42.5% of patients with baseline BMI≥40 (average BMI 42.3) were WK-12 responders. Among responders, average WL was 10.6% (STD: 6.6%), average EWL was 26.0% (STD: 16.4%), and 47.4% of responders had ≥25% EWL at one year. 49.3% of patients with baseline BMI 35-39.9 and ≥1 ORC (average BMI 37.2) were WK-12 responders. Among them, average WL was 10.5% (STD: 6.4%), average EWL was 32.5% (STD: 19.8%), and 58.2% had ≥25% EWL. The cost analysis estimated cumulative savings of $3.996 million over 2 years if patients with ≥25% EWL avoid BaS.

**Conclusions:** From a payer’s perspective, using lorcaserin for WL prior to BaS may lead to significant cost savings over a 2-year horizon. Real world, long-term evidence is needed, however, to further evaluate the role of lorcaserin for weight management in patients considering BaS.

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**T-P-3140**

**Distribution of Body Weight Changes With Canagliflozin in Patients With Type 2 Diabetes Mellitus**

Lawrence Blonde New Orleans LA, Kaj Stenlof Gothenburg ~, Albert Fung Raritan NJ, John Xie Raritan NJ, William Canovatchel Raritan NJ, Gary Meininger Raritan NJ

**Background:** Canagliflozin (CANA), an SGLT2 inhibitor, lowers plasma glucose in patients with type 2 diabetes mellitus (T2DM) by increasing urinary glucose excretion, which leads to a mild osmotic diuresis and net caloric loss. CANA has been associated with body weight (BW) reductions in patients with T2DM on various background antihyperglycemic agents (AHAs). This analysis examined the distribution of BW changes in two Phase 3 studies of CANA.

**Methods:** In Study 1, patients (N=1450; mean age, 56 y; HbA1c, 7.8%; BMI, 31 kg/m²) received CANA 100 or 300 mg or glimepiride (GLIM) as add-on to metformin for 52 weeks. In Study 2, patients aged 55-80 y (N=714; mean age, 64 y; HbA1c, 7.7%; BMI, 32 kg/m²) received CANA 100 or 300 mg or placebo (PBO) added to stable background AHAs for 26 weeks. Changes in BW were assessed in the overall population and by quartiles of weight loss in each study.

**Results:** In Study 1, BW reductions were seen with CANA 100 and 300 mg compared with GLIM at Week 52 (~3.7, ~4.0, and 0.7 kg). In Study 2, BW reductions were seen with CANA 100 and 300 mg compared with PBO at Week 26 (~2.2, ~2.8, and ~0.1 kg). Approximately 85% of patients treated with CANA 100 and 300 mg in both studies had a BW reduction ≥0 kg versus 32% with GLIM (Study 1) and 54% with PBO (Study 2). Decreases in BW were seen with both CANA doses versus GLIM or PBO across quartiles of weight loss. In Study 1, BW changes with CANA 100 and 300 mg and GLIM were ~8.2, ~8.5, and ~3.5 kg in Q1; ~4.1, ~4.6, and 0.2 kg in Q2; ~2.0, ~2.5, and 2.0 kg in Q3; and 0.5, 0.5, and 5.1 kg in Q4. In Study 2, BW reductions with CANA 100 and 300 mg and PBO were ~6.2, ~7.1, and ~3.3 kg in Q1; ~3.1, ~3.8, and ~0.9 kg in Q2; ~1.4, ~2.2, and 0.2 kg in Q3; and 0.9, 0.3, and 2.2 kg in Q4.

**Conclusions:** In both studies, patients with T2DM treated with CANA 100 and 300 mg experienced BW reductions compared with GLIM or PBO across weight loss quartiles, with some variability in the amount of weight loss among patients.

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**T-P-3141**

**Effectiveness of Weight Loss Medication Following Bariatric Surgery**


**Background:** Although bariatric surgery can induce significant weight loss in obese patients, persistence of overweight/obesity and weight loss recidivism are commonly observed following weight loss surgery. There is limited data regarding the use/effectiveness of pharmacotherapy in this clinical setting.

**Methods:** In a retrospective study, 69 consecutive patients with overweight/obesity seen at the Comprehensive Weight Control Center, Weill Cornell Medical College, and prescribed one or more weight loss medications after bariatric surgery were identified through an EPIC search. Details of demographics, medical history and weight changes after initiation of pharmacotherapy were recorded by reviewing their electronic medical records.

**Results:** Mean age of patients was 52 years (SD= 12.0 years, range 23 to 71 years). 17.4% of patients were male and 82.6% were female. 13.0% of patients had gastric banding, 23.2% had sleeve gastrectomy, 46.4% had Roux-en-Y gastric bypass, and 17.4% had more than one bariatric surgical procedure. 23.9% of patients were treated at weight plateau following bariatric surgery and 76.1% were treated after weight regain. An average of 2(SD= 1) medications were prescribed over a mean treatment period of 26.2 months (SD= 25.4 months). Several drug combinations were used including the two most common: metformin (73.9% of patients) and topamax (49.3% of patients) alone or in combination with phentermine. Mean weight loss over the treatment period was 5.4% (SD= 10.4%); 24.6% of patients lost ≥ 10% of total body weight. Mean weight loss in patients treated at plateau and after weight regain was similar.

**Conclusions:** Pharmacotherapy can be a useful adjunct to maximize weight loss following bariatric surgery. The optimal time to introduce weight loss medication may be at weight plateau. Prospective studies are needed to elucidate the effectiveness of pharmacotherapy on maximizing weight loss and countering weight loss recidivism in this post-bariatric surgery population.

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**T-P-3142**

**Effects of Chronic Treatment with Extended-Release Naltrexone/Bupropion (NB) on Markers of Cardiometabolic Risk (CMR) in Overweight/Obese Subjects Achieving ≥5% Weight Loss by Week 16: A Pooled Analysis of Three Phase 3, Double-Blind, Placebo-Controlled Studies**

Joyce Riffer Deerfield IL, Keely Gilroy Deerfield IL, Hung Lam Deerfield Illinois, Claire Dybala Deerfield IL

**Background:** Cardiometabolic risk (CMR) is defined as a constellation of risk factors for cardiovascular disease (CVD) and type 2 diabetes mellitus (T2DM). Obesity is a significant contributor to CMR, and weight loss is a key component of CMR management. The purpose of this study was to evaluate the effects of chronic treatment with extended-release naltrexone/bupropion (NB) on markers of CMR in overweight/obese subjects achieving ≥5% weight loss by week 16 of a 52-week, randomized, double-blind, placebo-controlled trial (BLOOM-DM) evaluating the efficacy and safety of NB in overweight/obese patients. The study included three phase 3 trials: BLOOM-DM, Naltrexone/Bupropion (NB) on Markers of Cardiometabolic Risk (CMR) in Overweight/Obese Subjects Achieving >5% Weight Loss by Week 16: A Pooled Analysis of Three Phase 3, Double-Blind, Placebo-Controlled Studies.

**Methods:** In this study, the BLOOM-DM trial was conducted in overweight/obese patients with T2DM. The primary objectives were to evaluate the efficacy and safety of NB in achieving ≥5% weight loss. The secondary objectives included evaluating the effect of NB on markers of CMR. The study included three phase 3 trials: BLOOM-DM, Naltrexone/Bupropion (NB) on Markers of Cardiometabolic Risk (CMR) in Overweight/Obese Subjects Achieving >5% Weight Loss by Week 16: A Pooled Analysis of Three Phase 3, Double-Blind, Placebo-Controlled Studies.

**Results:** The study showed that chronic treatment with extended-release naltrexone/bupropion (NB) significantly reduced markers of CMR, including triglycerides, low-density lipoprotein cholesterol, and systolic blood pressure. The treatment also improved glycated hemoglobin (HbA1c) levels and reduced the risk of cardiovascular events. The results were consistent across all three phase 3 trials.

**Conclusions:** The use of extended-release naltrexone/bupropion (NB) in overweight/obese patients with T2DM who achieve ≥5% weight loss by week 16 of treatment is associated with improvements in markers of CMR. These findings support the use of NB as a treatment option for weight loss and improvement in CMR in overweight/obese patients with T2DM.
**Background:** Modest, sustained weight loss can be associated with clinically meaningful health benefits, including improvements in CMR markers. NB is approved for chronic weight management in overweight and obese patients who lose >5% of baseline (BL) body weight after 16 weeks of treatment (12 weeks at full dose). It is important for physicians, patients, and payers to understand the anticipated health benefits for those who are eligible and adherent to long-term NB therapy.

**Methods:** Data were pooled from three, Phase 3, 56-week studies in overweight/obese, non-diabetic patients. Changes in CMR markers from BL at 56 weeks were assessed in completers NB subjects losing >5% BL body weight at Week 16 (NB responders; N=781) vs. all completer placebo subjects (PBO; N=663) using analysis of covariance and Wilcoxon rank-sum test. BL characteristics were similar between NB responders and PBO in terms of weight (99 vs. 99 kg), BMI (36 vs. 36 kg/m²), sex (85 vs. 84% female) and age (46 vs. 46 y).

**Results:** NB responders completing 56 weeks of treatment experienced significantly greater weight loss vs. PBO (-12.4% vs. -2.7%, p<0.001). Multiple CMR markers also improved significantly (p<0.001), including waist circumference (-10.4 cm vs. -3.3 cm), triglycerides (-17.8% vs. +1.4%), HDL (+5.9 mg/dL vs. 0 mg/dL), LDL (-3.5mg/dL vs. +0.1mg/dL), and hsCRP (-42.0% vs. -16.7%). Blood pressure decreased slightly in both treatment arms and did not differ between groups. Heart rate decreased less for NB responders vs. PBO, consistent with the known safety profile (-0.3 bpm vs. -0.8 bpm, p=0.016). The most common adverse events with NB completers were constipation (29.1%), nausea (26.4%), headache (16.6%), and dry mouth (11.8%).

**Conclusions:** In addition to significant weight loss, NB produced meaningful improvements in multiple CMR markers in Week 16 responders who completed 56 weeks of treatment.

**T-P.3143**  
**Effects of Phentermine and Topiramate Extended-Release (PHEN/TPM ER) on Weight Loss (WL) in Patients with a Baseline Body Mass Index (BMI) ≥45 kg/m²**  
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**Background:** It is generally believed that patients with extreme obesity (BMI ≥45 kg/m²) do not respond to non-surgical WL interventions. Most randomized-controlled trials of WL medications set an upper BMI limit of 40 or 45 kg/m², thereby excluding an important population. This post-hoc analysis evaluated WL in subjects with baseline BMI ≥45 kg/m² in EQUIP, which had no BMI upper limit.

**Methods:** Subjects (n=1267) from a double-blind, placebo-controlled, 56-week Phase 3 clinical study, EQUIP, were randomized to placebo, PHEN 3.75 mg/TPM ER 23 mg (3.75/23), or PHEN 15 mg/TPM ER 92 mg (15/92). Changes in weight and several cardiometabolic parameters (eg, SBP, DBP, HDL-C, triglycerides, and fasting glucose [FG]) were evaluated at Week 56.

**Results:** At baseline, 125 subjects receiving placebo, 63 receiving 3.75/23, and 117 receiving 15/92 had a BMI ≥45 kg/m², and 58, 39, and 71 subjects, respectively, completed the study. At baseline, mean weight was 141 kg and mean BMI was 51 kg/m². At Week 56, mean percent WL among completers was -2%, -8%, and -15%, respectively (P<.005 vs placebo). SBP, DBP, and HDL-C were improved but not significant. Similar trends were observed in those with BMI <45 kg/m².

**Conclusions:** These data demonstrate that among patients with extreme obesity, treatment with PHEN/TPM ER, in conjunction with lifestyle modifications, achieved significant WL and cardiometabolic improvements. These outcomes were similar to observations in patients with less severe obesity.

**T-P.3144**  
**Efficacy and Safety of the Sufentanil Sublingual Tablet System (SSTS) in Class I and II Obese Patients: The Effect of BMI on Analgesic Response**  
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**Background:** An increasing number of patients undergo surgery for obesity-related conditions, such as knee and hip arthroplasty. The physiological differences between obese and normal-weight patients may modify not only procedural analgesic requirements, but also post-operative pain management, which is critical for prevention of complications. The sufentanil sublingual tablet system (SSTS) is a handheld, non-invasive PCA product currently under FDA review for management of moderate-to-severe acute pain. SSTS allows patients to self-administer sufentanil 15 mcg tablets with a 20-minute lockout period and may be well-suited for the obese given patients’ ability to self-titrate based on body weight and need.

**Methods:** Data from the Phase 3 development program using SSTS to treat postoperative pain including two randomized, placebo-controlled trials and one open-label, active comparator study vs. IV PCA morphine in major joint replacement or abdominal surgery were integrated for purposes of subpopulation analysis. Analgesic efficacy was assessed using the pain intensity difference to baseline as well as global assessment measures over 48 hours. Safety assessments incorporated adverse events (AEs), vital signs and the use of concomitant medications.

**Results:** 606 patients were randomized to SSTS; 341 non-obese (56%), 141 Class I obese (23%; BMI ≥30 to <35kg/m²) and 123 Class II obese (21%; BMI ≥35kg/m²). Primary efficacy endpoints were met across all studies with obese and non-obese demonstrating roughly equivalent analgesic responses. There was no difference in number of SSTS doses needed to gain control over pain in the first hour and mean interdosing intervals over 48 hours (96, 80 and 66 min for non-obese, Class I and II, respectively) suggested appropriate self-titration based on weight. AE profiles were similar across BMI sub-groups.

**Conclusions:** In these studies SSTS provided a patient self-administered analgesia modality that was equally effective and well tolerated by patients across all BMI subgroups.
T-P-3145

Extended-Release Naltrexone/Bupropion-Assisted Weight Loss Results in Greater Improvements in Cardiometabolic Risk Factors in Subjects with Higher Risk at Baseline

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Background: Cardiometabolic (CM) risk varies widely in equally obese individuals and benefits of weight loss (WL) are accentuated in those at most risk. It would be clinically useful to identify obese individuals at greatest CM risk who stand to gain the most from naltrexone/bupropion (NB)-assisted WL.

Methods: Obese non-diabetic subjects were classified using harmonized criteria as metabolic syndrome (MS) positive (MS+) or negative (MS-) then divided into 3 body mass index classes (BMI-kg/m²): Class I (30-34.9; n=432); Class II (35-39.9; n=393); Class III (>40; n=275). CM risk factors (CMRFs) and weight were measured at baseline and after 56 weeks of NB treatment. Those changes were compared between MS+ and MS- groups within each BMI class.

Results: MS prevalence varied from 25-34% in BMI classes. WL was comparable (8.3-10.4 kg) irrespective of MS across all 3 classes. As expected, the CMRF profile was more adverse in the MS+ group. In all 3 BMI classes, greater decreases in mean glucose and median triglycerides (TGs) were seen in the MS+ vs MS- group and differences between the groups were statistically significant (range of between-group differences: glucose -5 to -6.5 mg/dL, TGs -23 to -35 mg/dL). Insulin, HOMA-IR, HDL-C, and LDL/HDL also improved to a greater degree in MS+ vs MS- groups in all BMI classes and the differences between MS+ and MS- groups were statistically significant in the following BMI classes: insulin and HOMA-IR (II, III), HDL-C (I, III), and LDL/HDL (III). As BMI class increased, more CMRFs improved to a greater degree in MS+ vs MS- groups; the following between-group differences were statistically significant in BMI Class III: median insulin -4uIU/mL, median HOMA-IR -1.2, mean HDL-C 4.6 mg/dL, mean LDL/HDL -0.23, median TGs -23 mg/dL, mean glucose -6.3 mg/dL. Changes in blood pressure were comparable in the 2 groups.

Conclusions: Not all obese subjects are at the same CM risk. NB-assisted WL resulted in greater CMRF reduction in subjects with MS irrespective of BMI class and despite comparable WL.

T-P-3146

Liraglutide 3.0 mg Efficacy and Safety are Similar Across Baseline Edmonton Obesity Staging System (EOSS)

Categories: Post Hoc Analysis


Background: Obesity is associated with increased mortality. The SCALE Obesity and Prediabetes (NCT01272219) and SCALE Diabetes (NCT01272232) trials evaluated the efficacy and safety of liraglutide 3.0 mg, as adjunct to diet and exercise, for weight management. This post hoc analysis evaluated weight loss (WL; primary endpoint), secondary endpoints and overall safety from the 2 trials in EOSS subgroups. The EOSS classifies obesity based on comorbidities and functional status and out-performs BMI in predicting mortality (CMAJ 2011;183:e1059).

Methods: Adults (BMI ≥27 kg/m² with ≥1 comorbidity or ≥30 kg/m²) randomized to liraglutide 3.0 mg or placebo were assigned an EOSS score using available data. Week 56 data are for exposed individuals with ≥1 post-baseline assessment with LOCF.

Results: By definition, more individuals with T2D had a baseline EOSS score of 2 or 3, indicating greater risk. Mean age, body weight, BMI and SBP increased with baseline score. Consistently across EOSS stages, greater WL and improvements in cardiometabolic risk factors (A1C, SBP, lipids) and physical function were seen at week 56 with liraglutide 3.0 mg vs. placebo. With liraglutide 3.0 mg WL was 7.4−8.1% in individuals without T2D and 5.8−6.5% in those with T2D. In the placebo group WL was 2.3−3.1% in individuals without T2D and 1.8−3.2% in those with T2D. Treatment effects were generally independent of baseline EOSS score (interaction p-value>0.05). Overall adverse events and serious events were similar across EOSS subgroups. Pulse increased with liraglutide 3.0 mg (1.9−2.6 bpm) vs. placebo (-3.9−0.9 bpm; treatment difference 2.0−6.5 bpm, p<0.05) across EOSS scores.

Conclusions: Effects of liraglutide 3.0 mg, as adjunct to diet and exercise, on weight loss, associated metabolic effects, physical function and clinical safety profile were generally consistent across baseline EOSS scores.

T-P-3147

Liraglutide 3.0 MG in Obese/Overweight Adults with or without Prediabetes with Baseline BMI <35 vs ≥35 KG/M2 in the SCALE Obesity and Prediabetes 56-Week Randomized, Double-Blind, Placebo-Controlled Trial

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Background: SCALE Obesity and Prediabetes (NCT01272219) randomized 3731 subjects (mean age 45 years, male 22%, mean BMI 38 kg/m², 61% with prediabetes) 2:1 to liraglutide 3.0 mg or placebo (PBO) as adjunct to diet and exercise (D&E) for 56 weeks.

Methods: This post hoc analysis compared efficacy and safety results for subjects with BMI < vs ≥35 kg/m² at baseline. The treatment effect of liraglutide across baseline BMI subgroups was evaluated by statistical testing of interaction between treatment and baseline BMI subgroup.

Results: Baseline characteristics were similar between liraglutide and PBO subgroups (BMI< vs ≥35 kg/m²) except for body weight (90.1 and 89.9 kg; 115.1 and 115.0 kg) and prevalence of prediabetes (54.0% and 51.1%; 65.3 and 66.1%); both were higher with BMI ≥35 kg/m². At 56 weeks, greater mean and categorical weight loss were seen with liraglutide vs PBO in both subgroups (mean: −8.2 and −7.9%; −2.7 and −2.6%) as well as greater improvements in systolic BP, FPG, and IWQoL-Lite total score. These treatment effects of liraglutide were all independent of baseline BMI (< vs ≥35 kg/m²; p<0.05), except for the IWQoL-Lite physical function sub-score, which improved more with BMI ≥35 kg/m² (p=0.04). Adverse events (AEs) and serious AEs were generally comparable across BMI subgroups. In both liraglutide subgroups (BMI< or ≥35 kg/m²), more subjects reported nausea (40 vs 40%) than PBO (15 vs 15%). Gallbladder disorders were similar in liraglutide subgroups (18
[2.1%] vs 37 [2.3%] subjects) but higher than PBO (3 [0.7%] vs 7 [0.9%] subjects). Similar results were seen for adjudicated events of acute pancreatitis (liraglutide: 2 [0.2%] vs 5 [0.3%] subjects; PBO: 0 vs 1 [0.1%] subject).

**Conclusions:** The effects of liraglutide 3.0 mg, as adjunct to D&E, on body weight, metabolic control and safety were similar in subjects with baseline BMI < and ≥35 kg/m².

**T-P-3148**

**Long-Term Efficacy of Naltrexone/Bupropion, Administered as Recommended in Clinical Practice**

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**Background:** Extended-release naltrexone 32 mg/bupropion 360 mg (NB) is approved in the US and EU for chronic weight management as an adjunct to diet and physical activity. Phase 3 studies demonstrated significantly greater weight loss with NB vs placebo in the setting of both standard and intensive lifestyle modification counseling. This study examined the effects of NB combined with a commercially-available telephone/web-based lifestyle intervention program (Group 1), compared with usual care (Group 2; periodic diet and exercise advice), in overweight/obese subjects over 26 weeks, followed by a 1-year extension during which all subjects received NB and lifestyle intervention.

**Methods:** Consistent with NB prescribing information, subjects were required to exhibit ≥5% weight loss after 16 weeks, with no sustained increase in blood pressure (BP), to continue NB treatment. The primary endpoint was weight change at Week 26 (reported previously). This analysis focuses on Week 78 data (total NB treatment duration was 78 weeks for Group 1 and 52 weeks for Group 2). Data from Group 1 and 2 subjects are pooled for the Week 78 analysis.

**Results:** The randomized population (Group 1 N=153, Group 2 N=89) was 84% female, 78% white, with mean age of 47 y and BMI of 36 kg/m². The Week 78 per protocol (PP) population (n=83) was 81% female, 87% white, 48 y, with BMI of 36 kg/m². Major reasons for NB discontinuation were <5% weight loss after 16 weeks of treatment (24%) and adverse events (21%). At 78 weeks, least squares mean change in weight (SE) was similar between PP Group 1 and Group 2 subjects (-9.4[1.1]% and -10.7[1.5]%). In Group 1 and Group 2 pooled, 72%, 46%, and 25% of subjects achieved ≥5%, 10%, and 15% weight loss at Week 78. Mean systolic / diastolic BP was reduced 1-2 mmHg at Week 78. The AE profile was similar to Phase 3 trials.

**Conclusions:** NB, when combined with lifestyle modification and used in a manner consistent with prescribing information, resulted in approximately 10% mean weight loss for up to 78 weeks.

**T-P-3149**

**Long-Term Outcomes Using Phentermine following a Very-Low Calorie Diet**

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**Background:** Subjects following a very-low calorie diet (VLCD) show significant weight loss but studies are needed to examine long-term maintenance of the weight loss using different methods. The purpose of this study was to show the results of VLCD, pharmacotherapy, and lifestyle change in long-term maintenance.

**Methods:** 444 subjects, 370 females and 74 males, were enrolled in the protocol. Subjects either used OPTIFAST TM (800 calories) or a food-based VLCD for a minimum of eight weeks. Following the use of the VLCD, subjects had their diets increased to a low calorie diet (LCD) and were prescribed phentermine HCL (18.75-37.5 mg/day) for the duration of the study. Patients followed up 2-4 times per month, and were seen by a physician and registered dietitian. The counseling included medical monitoring and lifestyle intervention.

**Results:** Mean BMI at baseline was 39.2, age - 47.5 years, and mean body weight - 242.8 pounds. Mean body weight (including dropouts) at the end of the VLCD was 207.3 pounds, at the end of one year-191.8, two years-194.8, three years-196.2, four years- 189.3, and 5 years- 200.1. Subjects tolerated the phentermine well, and the major complaints were elevated blood pressure, heart racing, agitation, sleep disturbances, and dry mouth. The drop-out rate was 75% at year two. In examining the subjects who completed each year, 153 completed year one, and had a weight loss of 15%, 70 year 2 and had a 13.1% weight loss, 44 year 3 and showed a 10% decrease in weight, 29 year 4 and had a 8.1% decrease, and 20 completed year 5 and had a 5.6% decrease in body weight. Not all subjects had the ability to complete 5 years, and are still in active treatment.

**Conclusions:** Although drop out rates were high, those subjects who completed the study showed clinically meaningful weight loss even at 5 years. The 15% weight loss at one year is higher than with anti-obesity medications alone. More research is needed to improve retention in the program, and thus increase the positive results.

**T-P-3150**

**Lorcaserin Improves Dietary Adherence: New Insights From an Energy Balance Analysis**

Diana Thomas Montclair NJ, Corby Martin Baton Rouge LA, Leanne Redman Baton Rouge Louisiana

**Background:** Weight-loss medications are prescribed in the context of lifestyle modification, including energy-restricted (weight-loss) diets and exercise. Effective weight-loss medications promote greater weight loss than placebo, yet it is unclear how much of this effect is due to improved adherence to dietary recommendations. Quantifying dietary adherence with self-reported food intake is inaccurate, though validated mathematical energy-balance models offer a novel method to quantify the effect of medications on dietary adherence.²

**Methods:** Energy expenditure in a metabolic chamber, body composition by Dual Energy X-ray Absorptiometry, and weight-change measurements were collected on 52 subjects (lorcaserin, N=27; placebo, N=25) at baseline and after 1 and 8 weeks of treatment in the TULIP study. All participants were prescribed a 600-kcal/day energy deficit. These data were used to calculate the actual energy deficit through a validated thermodynamic model that predicts energy intake during weight loss. Actual versus prescribed energy deficits were compared. Also, participants were classified as responding to treatment or not via a newly developed validated algorithm.²

**Results:** The actual energy deficit achieved by the lorcaserin-treated group was -487.6 ±647.6 kcal/d. The placebo-treated group achieved a deficit of -286.1±733.8 kcal/d. The percentage of subjects classified as nonresponders in the placebo and lorcaserin groups was 68% and 55%, respectively.

**Conclusions:** Lorcaserin improved dietary adherence, which will likely contribute to long-term weight loss success over...
T-P-3151
Network Meta-Analysis of Treatments for Patients with Type 2 Diabetes Mellitus and Obesity
Lisa Neff Chicago IL, Michael Broder Beverly Hills CA, David Beenhouwer, Eunice Chang Beverly Hills CA, Zhixiao Wang Woodcliff Lake NJ

Background: When lifestyle changes and metformin fail to produce glycemic control in type 2 diabetes mellitus (T2DM), other anti-diabetic medications (ADM) are used. ADMs reduce glycated hemoglobin (HbA1c), but effect on weight varies. Lorcaserin (LOR) is indicated as an adjunct for weight reduction in adults with BMI ≥30 or BMI ≥27 with ≥1 weight-related comorbidity. In addition to weight loss, RCTs showed improvement in glycemic control. We did a network meta-analysis (NMA) to compare the impact of adding LOR or other ADM to metformin (MET) on weight and glycemic control.

Methods: Systematic review of RCTs (Medline, EMBASE, ISI Web of Science, Cochrane, key abstracts) and NMA. Included studies (published 1990-2014) were of LOR or ADM in T2DM with prior or concurrent MET or sulfonylurea [SU], no basal insulin, parallel group design, compared active treatment to placebo or different active treatment, and reported ≥1 key outcome (change in weight or HbA1c, % HbA1c <7, hypoglycemia). Direct MA was done using DerSimonian and Laird random effect models. NMA was done with Bayesian Markov-chain Monte Carlo random effects models.

Results: We screened 6552 articles and included 42 (1 LOR). In 37/42 studies baseline BMI in all study arms was ≥27; in 26 it was ≥30. NMA showed LOR was non-inferior to other agents on HbA1c reduction and % achieving HbA1c of <7%. LOR reduced weight (in kg) significantly more than thiazolidinediones [5.79 (3.39, 7.50)], glinides [5.54 (3.58, 7.69)], SU [5.38 (3.73, 7.10)] and dipeptidyl peptidase-4 (DPP-4) inhibitors [3.20 (1.46, 4.66)]. Its impact on BMI was not statistically different from ADM, though sample sizes for this comparison were small. LOR had significantly lower risk of hypoglycemia than SU and no greater risk than other ADMs. Additional improvements were observed in other parameters, including decreases in apolipoprotein B of 39%, C-reactive protein of 43%, and LDL particle concentration of 37%, with a desirable OM3 index of 10%.

Conclusions: Thus, in this statin-treated obese patient with persistent high TG, switching from OM3EE containing both EPA and DHA to IPE containing high-purity EPA resulted in beneficial and substantial changes in the lipid profile with a notable reduction of TG along with additional reductions in LDL-C.

T-P-3153
The Impact of Weight Loss Therapy on Control of Eating: An Exploratory Analysis From a 12-Week Pilot Safety Study
Frank Greenway Baton Rouge Louisiana, Robert Pilson Woodcliff Lake New Jersey, Tony Ma Woodcliff Lake New Jersey, Tiffany Kung Woodcliff Lake New Jersey

Background: Weight loss (WL) is often associated with increases in hunger and cravings, which may prevent additional WL and/or promote weight regain. The Control of Eating Questionnaire (COEQ) has 20 visual analog scales (VAS) and includes assessments of eating behavior and cravings. COEQ was used to evaluate patients’ ability to manage hunger & cravings during WL with lorcaserin (LOR) alone or with 2 doses of immediate-release phentermine (PHEN).

Methods: This was a 12-week, double-blind, randomized, parallel-group, pilot safety study in overweight & obese adults. Assessments from the COEQ were included; however, this study was not powered for efficacy. 238 patients (pts) were randomized to receive diet & exercise counseling with LOR 10mg BID alone (LOR BID) or combined with PHEN at either 15mg QD (LOR BID+PHEN QD) or 15mg BID (LOR BID+PHEN BID). COEQ change from baseline (CFB) is reported for the modified intent-to-treat population with observed cases.

Results: The COEQ was evaluated for each question individually. In general, responses were similar in all arms, although the magnitude of COEQ CFB tended to be greater in the LOR BID+PHEN arms than LOR BID. Pts in all groups reported an increased control of eating at Week 12, “How difficult has it been to control your eating during the last 7 days?” (CFB, least-squares mean [95% confidence interval], of -16.86 [-21.86, -11.86], -24.83 [-29.64, -20.03] and -32.99 [-38.19, -27.78] mm on VAS for LOR BID, LOR BID+PHEN QD and LOR BID+PHEN BID respectively). Pts also reported...
a reduction in the incidence and strength of food cravings.

**Conclusions:** Pts receiving LOR BID alone or in combination with PHEN QD or PHEN BID reported improvements in the COEQ questionnaire at Week 12. Future studies are needed to evaluate the effect of these improvements on chronic weight management.1*Drugs* 2011; 71:2247-55.2*ISRNObes* 2013; 2013:210524 3*Lancet* 2010; 376:595-605Support: Eisai Inc.

**T-P.3154**
**The Impact of Weight Loss Therapy on Food Cravings: An Exploratory Analysis From a 12-Week Pilot Safety Study With Lorcaserin and Phentermine**

Frank Greenway Baton Rouge Louisiana, Robert Pinol Woodcliff Lake New Jersey, Tony Ma Woodcliff Lake New Jersey, Tiffany Kung Woodcliff Lake New Jersey

**Background:** Weight loss and maintenance in patients (pts) with overweight and obesity are often compromised by subsequent increases in cravings.1 The Food Craving Inventory (FCI) is a psychometrically valid 28-item questionnaire consisting of 4 subscales that measure the frequency of specific food cravings. This analysis evaluated the impact of weight loss with lorcaserin (LOR) alone or in combination with 2 doses of immediate-release phentermine (PHEN) on general and specific cravings from the FCI.

**Methods:** This was a 12-week, multicenter, double-blind, randomized, parallel-group, pilot safety study in pts with overweight and obesity. Pts received LOR alone or in combination with PHEN at either 15mg QD (LOR BID + PHEN QD) or 15mg BID (LOR BID + PHEN BID). All pts received diet and exercise counseling. FCI change from baseline to Week 12 is reported for the modified intent-to-treat population with observed cases.

**Results:** Pts in all groups reported reductions in cravings from baseline to Week 12, with total FCI decreases, Least-squares mean (± SEM) of -9.9±2.2, -9.0±2.8, and -9.3±2.3 in LOR alone, LOR BID + PHEN QD, and LOR BID + PHEN BID, respectively. Pts in all groups also showed improvements in specific cravings for high fats, sweets, carbohydrates/starches, and fast-food fats.

**Conclusions:** Pts receiving LOR BID alone or with PHEN reported reductions in food cravings after 12 weeks of treatment. Additional studies are warranted to determine the impact of reduced cravings on chronic weight management with combination pharmacotherapy.


**T-P.3155**
**The Nicotinic Acid Analog, Acipimox, Increases Exercise Capacity in Overweight or Obese Subjects with Type 2 Diabetes**

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**Background:** Obesity and type 2 diabetes (T2D) are associated with insulin resistance, elevated free fatty acid (FFA) levels, mitochondrial dysfunction, and decreased exercise capacity (peak VO2). Acipimox, a nicotinic acid analog and NAD+ precursor, has been shown to decrease FFA levels, acutely improve insulin sensitivity and, recently, to improve mitochondrial function. We hypothesized that acipimox would improve exercise capacity in T2D.

**Methods:** Overweight or obese subjects with T2D (n=6, age 54.9±7.8 years, BMI 31.2±5.4 kg/m2) were enrolled in a double-blind, random-order, placebo-controlled, crossover study of 7-9 days of treatment with acipimox/placebo.

**Results:** Acipimox treatment reduced fasting baseline VO2 (3.08±0.58 vs 3.49±0.48 ml/kg/min, p=0.034), increased peak VO2 during maximal exercise testing (19.7±3.1 vs 18.2±2.6 ml/kg/min, p=0.006), and increased work load capacity at anaerobic threshold (75.8±22.9 vs 65.7±23.6 watts, p=0.034).

There was no significant difference in steady state VO2 during exercise at 85% of baseline anaerobic threshold (11.2±2.1 vs 11.4±1.9 ml/kg/min, p=0.237). As the tachyphylaxis to FFA-lowering occurred earlier than previously reported, acipimox did not consistently reduce FFA levels (74.6±250.2 vs 605.8±113.2 uEq/L, p=0.448) or improve insulin sensitivity by hyperinsulinemic euglycemic clamp (M-value: 6.00±1.52 vs 6.04±0.69 mg glucose/kg lean body mass/min/ul/mL insulin x 100, p=0.940).

Triglyceride levels were reduced by acipimox (99±33 vs 134±43 mg/dl, p=0.02).

**Conclusions:** These results suggest that acipimox improves exercise capacity, and that the improvement is not acutely dependent on FFA levels or insulin sensitivity. Increased peak VO2 may occur through improved mitochondrial function independent of FFA levels and may therefore be unaffected by tachyphylaxis to FFA suppression and potentially clinically significant.

**T-P.3156**
**Urinary Catecholamines as a Marker of Lorcaserin Action on Vital Signs**

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**Background:** Blood pressure (BP) & heart rate (HR) reductions occur with weight loss (WL) & have been associated with changes in autonomic nervous system activity (NSA).1,2 Despite promoting WL, obesity medications, particularly those with intrinsic sympathomimetic activity, do not consistently reduce BP & HR.3 Lorcaserin (LOR) is a serotonin 2C receptor agonist for chronic weight management in adults. Phase 3 trials with LOR show decreases in BP & HR.4,5 To determine if LOR’s effects on BP & HR could be associated with a reduction in sympathetic NSA (SNSA), we evaluated urinary catecholamines measured in the Phase 2b TULIP trial in LOR-treated patients (pts).

**Methods:** TULIP was a double-blind, randomized, placebo (PBO)-controlled, parallel-group study in overweight & obese pts (N=57) randomized to LOR 10mg BID or PBO in combination with diet & exercise (DE) for 56 days (D); weight maintenance (no changes to DE) was imposed during D1-7.6 Changes from baseline (BL) in 24hr urine epinephrine (E) & norepinephrine (NE) were assessed at D7 & D56.

**Results:** Mean WL (kg) at D56 was significantly greater with LOR than PBO (-2.3 vs -2.2; p=0.01).6 BP (mmHg) & HR (bpm) were reduced from BL with LOR on D7/D56 (systolic BP: -4.6/-4.1; diastolic BP: -6.6/-2.7; HR: -4.1/-6.3), with significant differences vs. PBO seen only in D7 systolic & diastolic BP.6 A significant decrease vs. PBO was observed in 24hr NE excretion (nmol/24hr) on D7 (LOR -122.3, PBO -15.7; p=0.001) & D56 (LOR -131.8, PBO -63.0; p=0.009).

Urine E was below the limit of quantitation in most samples.

**Conclusions:** LOR use was associated with significant...
Background: Little is known about economic consequences of bariatric surgery in the elderly. We aimed to assess change in prescription drug costs over up to 5 years in this patient group.

Methods: In the Scandinavian Obesity Surgery Register (SÖReg), we identified 1243 patients 60 years or older who had gastric bypass between 2007 and 2012 (64% women, mean age 62 years, mean BMI 41.0, 43% with drug-treated diabetes). For each surgery case, 10 comparators from the general population were identified and matched by age, sex, and place of residence. Drug costs were retrieved from the nationwide Swedish Prescribed Drug Register from January 1, 2006, until October 31, 2014.

Results: During the year before surgery, the mean annual drug cost was $1743 (SD 2446; median 1068). Diabetes drugs made up 27% ($475/$1743) and cardiovascular drugs 18% ($307/$1743). The mean annual 1-, 3- and 5-year drug costs were $1351 (median 818), $1087 (median 525) and $1124 (median 560), corresponding to reductions of $395 (95%CI 399-930) at 5 years. The greatest contribution to drug cost reductions compared to baseline were from diabetes drugs at 1 (94%), 3 (55%) and 5 years (48%). In matched general population comparators, drug costs were $689, $694, $664 (95%CI 399-930) at 5 years. The mean annual 1-, 3- and 5-year drug costs in matched general population comparators were stable during follow-up.

Conclusions: Elderly patients show substantial prescription drug cost savings compared to baseline over up to 5 years after gastric bypass, while costs in matched general population comparators were stable during follow-up.

T-P-3158 Assessment and Treatment of Child Overweight (OW) and Obesity (OB) and Related Comorbidities Are Associated With Subsequent Weight-Status Improvement in Children in Pediatric Primary Care

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Background: The 2007 Expert Committee Recommendations Regarding the Prevention, Assessment, and Treatment of Child and Adolescent OW and OB recommend that pediatricians conduct BMI screening, address weight-related comorbidities, and reassess weight at follow-up visits. We hypothesized these clinical practices would be associated with weight-status improvement. To our knowledge, these data are the first to suggest that certain Expert Committee recommendations to assess and treat OW/OB and related comorbidities are associated with modest weight-status improvement; greater adoption of these recommendations has the potential to improve the weight status of school-age children.

T-P-3159 Changes in use of antidiabetic, antihypertensive, and hypolipidemic drugs within 36 months after Roux-en-Y gastric bypass surgery in the treatment of obesity: A nationwide population-based study

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Background: After Roux-en-Y Gastric Bypass (RYGB) surgery, obesity-related complications such as diabetes, dyslipidemia and hypertension may improve or remit with concomitant reduction or discontinuation of associated drugs. While relapse of complications may occur, studies with long-term follow-up are sparse. We investigated long-term changes in use of antidiabetic, antihypertensive, and hypolipidemic drugs among RYGB patients in comparison with drug use in a matched non-RYGB cohort.

Methods: From population-based medical databases we obtained complete data on prescription drug use for all 9,908 patients undergoing RYGB in Denmark 2006-10 and for an age, gender and RYGB-date matched (1:1) general population comparison cohort (99,080 persons). We calculated prevalence ratios (PRs), of drug use comparing periods 6 months before and 36 months after the RYGB/index date in both cohorts.

Results: The mean age in both cohorts was 40.6 years; 21.7% were male. Use of antidiabetic drugs decreased substantially in the RYGB cohort (16.5% before surgery; 4.6% after 36 months, PR=0.28 (95% confidence interval(CI); 0.25, 0.31)) while use increased slightly in the comparison cohort (1.9% before index date, 2.5% after 36 months, PR=1.31 (95%CI; 1.23, 1.39)). For antihypertensive drugs use also decreased in the RYGB cohort (43.2% before vs. 26.6% after, PR=0.61 (95%CI; 0.59-0.64)) and increased in the comparison cohort (10.1% before vs. 12.5% after, PR=1.24 (95%CI; 1.21 -1.27)). Use of hypolipidemic drugs decreased in the RYGB cohort (14.4% before vs. 7.3% after, PR=0.50 (95%CI; 0.46, 0.55)), and increased in the comparison cohort (3.8% before vs. 5.7%
after, PR=1.48 (95% CI: 1.42, 1.54)).

Conclusions: We observed large reductions in the use of antidiabetic, antihypertensive and hypolipidemic drugs 36 months after RYGB, with little indication of relapse during this time period. Nonetheless, overall use of these drugs remained higher among RYGB patients than among age-matched population comparisons.

T-P-3160
Childhood Characteristics of Adults Undergoing Bariatric Surgery
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Background: To determine whether or not patients undergoing bariatric surgery had weight related issues during childhood that predisposed them to morbidity obesity as adults.

Methods: Single centre prospective study between July and December 2014. Patients undergoing bariatric surgery during this period were asked six questions relating to their childhood (0-18 years). 1. Were yo overweight? Did you experience weight related bullying? 3. Did you have eating disorder? 4. Did you suffer from weight related depression. 5. Did you have overweight parents? 6. Did you have overweight siblings? The same questions were put to a control group of volunteers not undergoing bariatric surgery. Demographic data were calculated on both groups; sex, age, and BMI. Statistical analyses were performed using an unpaired t-test and a Fisher's exact test.

Results: There were 51 individuals in the bariatric surgery group and 47 in the control group. The groups did not differ in the proportion of women 40/51 vs 38/47, p = 0.807, nor mean age 43 vs 46 years, p = 0.1325. The mean BMI in the surgery group was significantly higher than in the control group 47.5 vs 26.6, p < 0.0001. The proportion of patients who were overweight in childhood was significantly greater in the surgery group than in the control group 27/51 vs 9/47, p = 0.0007, odds ratio 4.75. Weight related bullying was more common in the surgery group than in the control group 17/51 vs 5/47, p = 0.008. Patients undergoing bariatric surgery as adults were no more likely to have had overweight parents, overweight siblings nor a history of childhood eating disorders compared to controls. The incidence of weight related bullying in overweight children was 54%.

Conclusions: Overweight children are five times more likely to become morbidly obese adults, but this is independent of obesity in their close family members and was not associated with a higher prevalence of childhood eating disorders. 54% of overweight children are subject to bullying because of their weight.

T-P-3161-DT
Does Obesity Status Affect Length of Hospital Stay for Asthma or Appendicitis?

Background: Pediatric obesity has been associated with poorer lung function in patients with asthma and increased perioperative complications and length of stay [LOS] in patients with appendicitis. Therefore, the purpose of this study was to assess whether BMI-z correlated with inpatient LOS for children with asthma or appendicitis in a large, free standing, urban children’s hospital.

Methods: Electronic medical records were reviewed for African American [AA] or Non-Hispanic Caucasian [NHC] patients, ages 2-18y, with admitting diagnosis of asthma (ICD-9 code: 493.92) or appendicitis (ICD-9 codes: 540, 540.1, 540.9, 541, 542) in the emergency room, inpatient ward, or ambulatory surgery unit during January-December 2013. Lengths, heights, and weights were considered valid if biologically plausible (within ±5 SD). BMI-z was calculated using CDC growth charts. Spearman rank correlation coefficients and Wilcoxon rank sum tests were performed using SAS 9.3.

Results: Out of 62,767 total encounters, 34,153 were initial patient visits with valid height, weight, and sex. There were 1,582 unique patients with asthma diagnoses (mean age 7.5 ± 4y; 38% female; 92% AA and 8% NHC). There were 223 initial patient visits with appendicitis diagnoses (mean age 11.5 ± 4y; 38% female; 34% AA and 66% NHC). There was no association between BMI-z and LOS for appendicitis or for asthma diagnoses within the whole cohort as well as subcohorts stratified by race and sex.

Conclusions: Our data showed no association between BMI-z scores and LOS for asthma or appendicitis. Limitations in the study include human error in measuring and reporting heights and weights and inability to assess LOS in appendicitis with regards to type of appendectomy performed (laparoscopic versus open). Patient severity of illness was not assessed in the study. Further analyses investigating the relationship between obesity and LOS in other common acute and chronic childhood conditions are ongoing.

T-P-3162
Efficacy of FemiScan Pelvic Floor Therapy System for the Treatment of Urinary Incontinence in Women with Elevated Body Mass Index

Background: Elevated Body Mass Index (BMI) may cause strain on the pelvic floor muscles and in time muscle weakness and urinary incontinence (UI). Pelvic floor Muscle training can be effective; however, women need instruction, motivation and feedback to gain optimal benefit from pelvic rehabilitation. The FDA-approved FemiScan Pelvic Floor Therapy System (PFTS) uses computer software to measure EMG and an in-home programable device to provide training, motivation and feedback. The study was undertaken to document whether the outcomes with the PFTS are related to BMI.

Methods: Women with de novo, post-partum, or post-surgical UI (stress, urge or mixed type), who completed a MD-EMG and subjective outcomes of women divided into two cohorts; Women with BMI <25 and BMI ≥25

Results: 237 women initiated PFTS, and 141 (60%) completed the 8 visit protocol. The analysis is based on the patients who completed their course of therapy. Mean age was 53.4 years & 54.7 years, and parity was 2.4 & 2.7 for women with BMI < 25 and BMI ≥ 25 respectively (p.< NS). In this cohort, there was a
statistically significant increase in peak EMG measurements between the first and final visit, a mean of 12.0 +/- 14.2 µV (p<.001). Furthermore, there was no statistically significant difference in the increase in peak EMG measurements in high and low BMI groups (10.9 +/- 15.3 µV, vs. 13.0 +/- 13.0µV, p = 0.39) and between subjective improvement and BMI.

**Conclusions:** PTSD is a safe and effective treatment for UI in women with elevated BMI. There was no difference in response to treatment as measured by EMG activity in women with higher or lower body mass index. Additionally, there was no correlation between subjective improvements and BMI.

**T-P-3163**

**Factors Associated with Women Achieving Clinically Significant Weight Loss in a National, Nonprofit Weight Loss Program for Up to Five Years**

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**Background:** Clinically significant weight loss (CSWL) is defined as ≥5% loss of initial weight because it is associated with improvements in weight-related comorbidities. Take Off Pounds Sensibly (TOPS) is a national, nonprofit, peer-led weight loss program where the average weight loss is significant for up to five years, but up to half of participants do not achieve CSWL. The purpose of this study is to examine factors associated with CSWL amongst female TOPS participants in the first five years of participation.

**Methods:** Participants were females who joined TOPS from 2005 to 2011, had a birth date recorded in the database, and renewed their annual membership for up to 5 years. The initial dataset contained 52,322 women at year 1 and 8,218 women at year 5. A multivariable log-binomial regression model was used for years 1 to 5 to determine the adjusted relative risk for CSWL for categories in each of the following variables: participant age, initial weight, and number of members per chapter.

**Results:** Over 5 years, age, initial weight, and number of chapter participants were significantly associated with achieving CSWL. Women aged ≥70 years were 29 to 44% more likely to achieve CSWL than those aged 18 to 44 years. Participants in chapters with ≥25 members were 5 to 9% more likely to achieve CSWL than those in chapters with <25 members. Women who weighed 113 to 136 kg were 7 to 22% more likely to achieve CSWL than women who weighed <80kg.

**Conclusions:** TOPS participants were more likely to achieve CSWL if they were older, heavier, and participating in chapters that had ≥25 members. Older women may be more successful because they have less competing demands and may be biologically predisposed to lose weight compared to younger women. Chapters with more participants might be more motivating and engaging than those with less. Heavier women may be more successful because the suggested lifestyle changes may be a greater departure from their initial habits than their lighter counterparts.

**T-P-3164**

**High Prescription Rates of Drugs that Cause Weight Gain in Overweight School-Age Children in Pediatric Primary Care**

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**Background:** Many drugs cause weight gain (DWG) as a recognized side effect. The extent of their use and association with particular conditions and subsequent weight gain in overweight school-age children is unknown.

**Methods:** This case-control study examined factors associated with DWG use. A 2015 Endocrine Society clinical practice guideline was used to identify DWG (e.g., oral steroids, antipsychotics, beta blockers, etc.). Using electronic medical record (EMR) data from 60 pediatric practices, the prevalence of DWG use was determined in a sample of 6-12 year-old children with BMIs ≥85th percentile, ≥1 visit, and ≥2 BMIs measured ≥30 days apart. Cases were those 1) who received ≥1 DWG (vs. 0) and 2) whose BMI increased (vs. decreased/no change). Multivariable analyses identified conditions (determined by ICD9 codes) associated with use of ≥1 DWG and whether use of ≥1 DWG was associated with BMI increase from first to last visit, adjusting for age, gender, BMIz, race/ethnicity, health insurance, clinic site (academic/community/private), and duration of EMR data.

**Results:** Of 8,642 overweight children, 29.7% had ≥1 prescription for a DWG. Conditions associated with greater adjusted odds of DWG use included asthma (AOR, 3.8; 95% CI, 3.4-4.3), prediabetes/type 2 diabetes (2.7; 95% CI, 1.3-5.6), epilepsy (2.3; 95% CI, 1.7-3.1), and psychiatric diagnoses (1.7; 95% CI, 1.3-2.0); whereas hypertension (0.6; 95% CI, 0.4-0.9) was associated with lower adjusted odds of DWG.

**Conclusions:** About one-third of overweight children are prescribed DWG, and DWG are associated with a significantly higher risk of subsequent weight gain. The findings suggest that it may be useful for pediatricians to identify drugs that are weight neutral or cause weight loss for overweight children with asthma, prediabetes/type 2 diabetes, epilepsy, and psychiatric diagnoses.
of MOVE! use included: Hispanic ethnicity (OR: 0.81 [0.79, 0.84]), hypertension (OR: 0.94 [0.92-0.95]), dyslipidemia (OR: 0.92 [0.94-0.97]), ischemic heart disease (OR: 0.95 [0.94-0.97]), heart failure (OR: 0.86 [0.83-0.88]), and psychotic disorders (OR: 0.93 [0.87-0.99]). Many results were similar among women, but heart failure and psychotic disorders were not associated with women’s MOVE! use. Drug use disorders were associated with increased odds of MOVE! use in men (OR: 1.29 [1.25, 1.33]), but decreased odds of MOVE! use in women (OR: 0.88 [0.80-0.98]).

Conclusions: Patients most likely to benefit from MOVE! are least likely to use it. In addition, some predictors of MOVE! use differ across gender. Efforts to increase MOVE! use should focus on patients with hypertension, dyslipidemia, and/or heart disease, with particular attention to Hispanic patients, men with psychotic disorders, and women with drug use disorders.

T-P.3166
Willingness to Take Weight Loss Medications among Obese Primary Care Patients
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Background: Weight loss medications are effective adjunctive therapies in helping patients lose up to 10% of their body weight on average when combined with diet and exercise. Little is known about patients’ perception of these medications and how willing they are to take a daily weight loss medication.

Methods: We interviewed obese patients (BMI > 35 kg/m²) from 4 diverse primary care practices in Boston, MA to assess if they would be willing to take a daily weight loss pill at the recommendation of their doctor. We conducted sequential logistic regression models to identify demographic, clinical, and quality of life (QOL) factors associated with this willingness.

Results: Of 331 subjects, 69% were women, 35% were white, 35% were black and 25% were Hispanic; 249 (75%) were willing to take a daily weight loss pill if recommended by their doctor. After adjustment, men were significantly more willing than women [1.18 (95% CI 1.03-1.36)] to take a daily weight loss pill. Diabetes was the only comorbidity associated with willingness to take weight loss med [1.17 (1.03-1.32)] but only modestly improving model performance (C-statistic increased to 0.60 from 0.59 in the preceding model). In contrast, lower QOL was a stronger significant correlate (C-statistic of 0.65 from 0.60) with scores on the self-esteem and sex-life subscales being the strongest correlates (C-statistic rose from 0.60 to 0.72). The median weight loss required by patients to take a weight loss pill was greater than 10% across all demographic groups and ranged from 14.8 to 24.4% of body weight; only 15% of patients overall were willing to take a weight loss med for a weight loss of 10% or less.

Conclusions: A majority of obese primary care patients were willing to take a daily weight loss pill; however, most required more than 10% weight loss in order to consider it worthwhile. Poor QOL, especially low self-esteem and poor sex-life, were the strongest correlates of willingness among the sociodemographic, clinical, and QOL factors examined.
Methods: At Western Diabetes Institute, Pomona, CA patients were surveyed to identify the differences in nutrition knowledge between SRD vs. SRND. Participants completed a survey assessing knowledge of food groups, portion size, and carbohydrate sources. Descriptive statistics was used to describe patient characteristics. Comparisons of test scores between patients were analyzed using the Student’s t-test (significance equals p<0.05).

Results: Between June to August 2014, 103 patients (66% female, mean age 49±15 years old, BMI 31±7kg/m², 50% Hispanic) completed the survey. Of 103 patients, 56 reported being SRND, and 47 reported being SRD. Of the patients in the SRND group and SRD group, 84%, and 55% of patients completed a high school education or higher, respectively. Patients in the SRND group scored higher than those in the SRD (64% vs 53%, p<0.05) when evaluating food groups, portion size, and carbohydrate sources. There were no statistically significant differences between the two groups when exclusively comparing carbohydrate knowledge (SRND vs. SRD, 54%, of 47%, p>0.05).

Conclusions: Results suggest that patients with DM may have a poor understanding of nutritional factors influencing blood glucose compared to patients without DM. This lack of knowledge may be contributing to obesity and therefore the development of DM in certain groups. Food Groups (including carbohydrate sources) and portion size are important aspects of MNT and DM care.

T-P.3169
Association of Obesity Gene Variants with Adiposity and Dietary Traits in 1,953 Adolescents
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Background: Specific target for most obesity candidate genes discovered by genome-wide association studies remains unclear. They are often highly expressed in hypothalamus indicating their role in energy homeostasis. We aimed to evaluate an association of selected gene variants with adiposity and dietary traits.

Methods: Dietary intake was calculated from self-reported 3-day dietary records. Anthropometric parameters (height, weight, waist circumference and their z-scores), total body and trunk fat by bioimpedance, daily dietary intake (total energy, fat, protein, carbohydrate, fiber, calcium) and ten gene variants (TMEM18, SH2B1, KCTD15, PCSK1, BDNF, SEC16B, MC4R, FTO) were analyzed in 1,953 Czech individuals aged 10.0-18.0 years (1,035 normal weight (NW) and 918 overweight/obese (OW/OB)).

Results: OW/OB adolescents exhibited a lower energy intake (p<0.001) but a higher percentage intake of fat (p=0.009) and protein (p<0.001) than NW. A lower calcium intake in OW/OB group was further observed (p<0.001). Obesity risk alleles of TMEM18 rs7561317, SEC16B rs10913469 and FTO rs9939609 were related to an increased body weight, BMI and waist circumference (p<0.05). The latter two genes also showed a positive association with fat mass (p<0.010; p<0.001). An association with at least one component of dietary intake was found in 3 of the 10 studied gene variants. The MC4R rs17782313 was negatively associated with protein (p=0.012) and positively with fiber (p=0.032) intake. Risk alleles of BDNF rs29546 and FTO rs9939609 were related to a lower calcium intake (p=0.001 and 0.037). The effect of FTO variant, however, disappeared after the adjustment for BMI (p=0.164).

Conclusions: OW/OB adolescents consumed less total energy than their NW counterparts. SEC16B rs10913469 and FTO rs9939609 showed a relation to fat mass content. Finally, our results suggest that common variants in MC4R and BDNF may influence intake of several nutrients.

T-P.3170
Associations between Empirically-Derived Dietary Patterns and Anthropometric and Biomarker Outcomes among University Students
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Background: Dietary patterns have been linked with health measures, but most studies have evaluated older adults; few have included young adults attending four-year universities.

Methods: Dietary data were collected from undergraduates participating in the Tufts Longitudinal Health Study (1998-2007) via Block Food Frequency Questionnaire (n=1323). Dietary patterns were derived using principle components analysis and orthogonal rotation. Scree plots, eigenvalues, factor loadings, and previous studies were used to determine and name the dietary patterns retained. Multivariable regression models were used to examine cross-sectional relationships between dietary pattern scores (DPS) and Body Mass Index (BMI) (n=1323) and lipid biomarkers (n=379). Models were adjusted for age, gender, race, year in school, physical activity (min/d), and total energy intake. Gender was evaluated as an effect modifier, and P values <0.05 were considered significant. Main effects were reported when no significant interaction was present.

Results: Three dietary patterns were identified and labeled as Prudent, Western, and Alcohol. No significant associations between Prudent or Western DPS and anthropometric measures were found. The Alcohol DPS was positively associated with BMI (β=2.32). Alcohol and Prudent DPS were positively associated with HDL (β=1.89 and β=1.67, respectively). Among women, the Western DPS was associated with lower total cholesterol (β=−2.99) and LDL (β=1.32) cholesterol; and positively associated with triglycerides (β=2.19). Among men, the Western DPS was positively associated with total cholesterol (β=7.51), LDL (β=7.52) and triglycerides (β=1.10).

Conclusions: In these college age students, dietary patterns were not consistently associated with anthropometric measures of adiposity. Among men, greater adherence to a Western pattern was associated with unfavorable lipid biomarkers, suggesting possible increased cardiovascular disease risk.

T-P.3171
Barriers to Participation in the National School Lunch Program: Perceptions of School Nutrition Staff Students and Parents
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Background: The Healthy, Hunger-Free Kids Act of 2010 aims to reduce obesity prevalence through prevention-based
Obesity 2015 Abstract Book
Poster Abstracts Wednesday November 4th to Friday November 6th, 2015


terventions implemented through the National School Lunch Program (NSLP), yet participation in NSLP declined by 1.2 million students within two years after the act’s introduction. This study sought to identify NSLP participation barriers from the perspectives of school lunch program employees, students and parents.

**Methods:** Data were collected in September-October 2014 through 8 focus group discussions of 5-7 participants with school nutrition managers and staff, students and parents. Nutrition employees were recruited through emails from school directors with whom researchers had existing collaborations. Students and parents were contacted through phone calls to households and a screener used to select participants based on qualifying variables. All participants were of schools in primarily middle income communities in the Atlanta area. Each received a small stipend for participating. Transcripts were reviewed for themes and a conceptual framework developed to explain influences of NSLP participation.

**Results:** Each participant group reported different NSLP participation barriers. Students’ reported barriers are based on food taste and appearance. Parents reported concerns for participation barriers. Students and parents were contacted through phone calls to households and a screener used to select participants based on qualifying variables. All participants were of schools in primarily middle income communities in the Atlanta area. Each received a small stipend for participating. Transcripts were reviewed for themes and a conceptual framework developed to explain influences of NSLP participation.

**Conclusions:** Food dissatisfaction is the single most important NSLP participation barrier. While many nutrition managers perceive new policies as barriers to improving satisfaction, others have identified creative solutions. Efforts to replicate successful strategies among school nutrition programs could increase NSLP participation.

**T-P-3172**
**Behaviors and Motivations for Weight Loss in Children and Adolescents**
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**Background:** The risk of disordered eating behaviors is higher in children who are overweight or obese, but little is known about motivations for weight loss in children or adolescents. Our objectives were to assess in a nationally representative sample: the weight loss behaviors of children and adolescents, their motivations for weight loss, and the association of weight status with their behaviors and motivations.

**Methods:** We examined data from the National Health and Nutrition Examination Survey (NHANES), focusing on children in the United States aged 8-15, in repeated cross-sections from 2005 to 2011.

**Results:** More than half of participants (N=6117) reported attempting to lose weight at least sometimes, and children who were overweight or obese attempted to lose weight more frequently than children who were a healthy weight. Children used both healthy (exercising, eating less sweets or fatty foods) and unhealthy (skipping meals, dieting, starving) methods for losing weight. The motivation to be healthier was associated with healthy weight loss behaviors. Children motivated by other people or by teasing were more likely to engage in unhealthy weight loss behaviors. The motivations for losing weight differ by weight status.

**Conclusions:** Many children and adolescents attempt to lose weight, using both healthy and unhealthy behaviors. Children’s weight loss behaviors differ based on their motivations for weight loss. Future research must examine whether physicians, parents, and teachers can encourage children to have positive motivations for healthy eating and physical activity behaviors, rather than focusing on weight loss itself.

**T-P-3173-DT**
**Breakfast Food Choices are Associated with Location Among Urban School-Aged Youth**

**Background:** Breakfat is thought to have beneficial effects on child academic outcomes. Much less is known about the location and quality of children’s breakfast choices. This research evaluated whether breakfast location influences the likelihood of consuming fruits and vegetables (FV) vs. foods high solid fats and added sugars (SOFAS) among urban school-aged youth.

**Methods:** Participants were 4th-6th grade children (n=1371; 51.3% female; 66.5% Black; 78.9% eligible for free/reduced meals) attending urban public schools (n=16) in Pennsylvania. Children self-reported breakfast food choices (16 food categories) at four different locations (home, corner store, school cafeteria, and other). Intake of FV (i.e. fruits, 100% fruit juice, and vegetables) and high SOFAS foods (i.e. chips, candy, and sugar-sweetened beverages) were assessed. Height and weight were measured. Statistical models controlled for race, gender, and grade.

**Results:** Approximately one fifth (17.5%) of children did not eat breakfast (n=240). Of those children who ate breakfast (n=1131), 46.1% ate at home only, 13.2% ate at school only, and 40.7% ate at a combination of locations, including 21.6% who reported eating foods from a corner store. 41.7% of children ate 1 or more FV, and 21.2% ate 1 or more SOFAS foods for breakfast. Compared to students who ate breakfast at home, those who ate at school were more likely to eat FV (OR=1.94 [95%CI 1.29-2.90]), and less likely to eat SOFAS (OR=0.45 [95%CI 0.22-0.93]). Children who reported eating breakfast foods from corner stores (n=244) were 19 times more likely to consume SOFAS (OR=19.43 [95%CI 14.42-26.16]) than those who did not. Neither breakfast location nor food choices were associated with weight.

**Conclusions:** Children who eat school breakfast are more likely to make healthier food choices than those who eat at home. Eating breakfast at the corner store dramatically increases the odds of SOFAS consumption at breakfast. Interventions should focus on encouraging school breakfast.

**T-P-3174 - Withdrawn**

**T-P-3175**
**Child Overweight : Can it Tell Us What's Packed for Lunch?**
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Child-Parent Food Decision Disagreement in Obese and Lean Children
Amanda Bruce Kansas City Kansas, T. Ryan Smith Kansas City KS, Megan Haghnehgar Shavnee Kansas, Dominic Burkart Kansas City Missouri, J. Bradley Cherry Kansas City Kansas, Oh-Ryeng Ha Kansas City MO, Jared Bruce Kansas City MO, Alex Francisco Kansas City Missouri, Seung-Lark Lim Kansas City MO

Background: Many factors influence food choices, and these decisions remain critical to obesity and its comorbidities. We compare food choice concordance in healthy and obese children and parents.

Methods: Thirty-two children (ages 8-14) and their moms were recruited from the Kansas City area. After measuring height and weight, children and moms underwent a series of behavioral food decision tasks where they reported subjective overall preference ratings as well as separate ratings of tastiness and healthiness for 60 food images (half unhealthy). We compared child-parent agreement (Fisher’s z transformed correlation coefficients) of ratings between obese (BMI > 85th; N=9) and lean children (BMI < 85th; N=22).

Results: Child BMI% was positively correlated with moms’ BMI, r(30) = .49, p < .01. All three ratings showed positive correlations between children and moms (overall mean r = .14, tastiness mean r = .15, healthiness mean r = .15). Independent sample t tests showed that the obese child-mom group had lower agreement on overall preference ratings, t(30) = 2.62, p < .05, and tastiness ratings, t(30) = 2.05, p < .05, compared to the lean child-mom group. There was no significant difference on healthiness ratings, t(30) = .81, p = .42.

Conclusions: Food ratings diverge amongst obese children and mothers. Mothers of obese youth may understand healthy food choices but face significant obstacles in promoting healthy choices in their children. Further studies should examine the process of food decisions to optimize pediatric obesity intervention outcomes.

T-P-3177
Children’s Consumption of Foods from Quick Service Restaurants Determined Using Plate Waste Methodology

Background: It is currently unknown how much food children consume when dining out at quick-service restaurants (QSRs), or if it is feasible to collect this consumption data in restaurants/food courts.

Methods: Parents/guardians (n=50) who were dining with a child between the ages of 5-10 years in a quick-service restaurant or mall food court at lunch/dinner were recruited to participate in the study. Parents/guardians reported the foods ordered for the child, and the child’s leftovers were weighed at the end of the meal using standard plate waste methodology. Two untean samples of every food were also ordered and weighed to determine stable baseline estimates. Analyses were performed using t-tests.

Results: On average the ordered meals had 707 calories, 27.0 g total fat, 7.3 g saturated fat, 1212 mg sodium, and 37.7 g of sugar. Children consumed 83.6% of their entrées, 67.7% of their beverages, 64.6% of their side dishes, and 88.7% of their desserts. Thus, children consumed 521 kcal on average, 20.2 g total fat, 5.7 g saturated fat, 947 mg sodium, and 23.3 g of sugar from their overall meals. Only 36% of children had meals ordered from the children’s menu, which averaged 20% fewer calories and total fat, 37% less sodium, and similar amounts of saturated fats and sugar compared with meals from the adult menu. This translated to children consuming significantly fewer calories (412 vs. 531 kcal; p=0.04) and less sodium (680 vs. 1064 mg; p=0.009) when they ate foods from the children’s menu compared with the adult menu.

Conclusions: It is feasible to collect QSR consumption data among children dining out using plate waste methodology. Children consumed a substantial amount of calories, saturated fat, sodium, and sugar from QSR foods, particularly when meals were ordered from the adult menu.

T-P-3178
Children’s Perspectives on Healthier Side Dish and Beverage Options in Restaurants
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Background: Children frequently consume food and beverages from restaurants, which tend to be more energy-dense than those prepared at home. Previously (2010 data), we provided evidence that children would accept fruit/vegetable
(FV) side dishes at restaurants. The aim of this study was to provide more extensive, updated information regarding children's perspectives on healthier options in restaurants.

**Methods:** Participants were 711 8- to 12-year-old children who completed an online survey in 2014. Data were weighted to be nationally representative. Survey questions asked how happy or unhappy children would be to receive a kids’ meal that came with (1) a FV but not fries and (2) milk, water, or flavored water but not soda/pop. Children who indicated that they would be happy or unhappy about these substitutions were asked why; open-ended responses were dummy-coded into categories.

**Results:** Sixty-eight percent of children reported that they would be happy (40.5%) or neutral (27.9%) to receive a FV but not fries, and 81.3% would be happy (51.6%) or neutral (40.5%) to receive milk, water, or flavored water but not soda/pop. Acceptance of these substitutions did not significantly differ by child sex, age, or socioeconomic status. Liking/taste was the most common reason for both happy and unhappy children’s responses. Other common reasons were: health (25.1% of those happy about FV substitution), habit (28.5% of those happy about beverage substitution), and wanting a treat (13.2% and 32.5% of those unhappy about FV and beverage substitutions respectively).

**Conclusions:** Children continue to report willingness to accept healthier sides at restaurants; the current results suggest that even more children would accept healthier beverages. Additional demographic differences will be explored and can provide further insights into the views of children at disproportionate risk of obesity. Overall findings support efforts to increase the availability of palatable, healthy kids’ menu offerings.

**T-P-3179**

**Chronic Insufficient Sleep and Diet Quality: Contributors to Childhood Obesity**

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**Background:** Many studies support an association of shorter sleep duration with risk of childhood obesity, yet underlying mechanisms remain unclear.

**Methods:** In Project Viva, 1,046 parents reported children’s sleep duration at 6m and annually until mid-childhood (7y). The main exposure was a sleep curtailment score (6m-7y) ranging from 0 (maximal curtailment) to 13 (adequate sleep). In mid-childhood, parents reported children’s diet; researchers measured height/weight. Multivariable linear regression assessed associations of sleep with diet (Youth Healthy Eating Index [YHEI]); sleep with BMI z-score adjusting for YHEI; and, secondarily, joint associations of sleep and YHEI with BMI.

**Results:** Mean (SD) sleep and YHEI scores were 10.21 (2.71) and 58.76 (10.37). Longer sleep duration was associated with higher YHEI in mid-childhood (0.59 points/unit sleep score; 95%CI: 0.32, 0.86). Though higher YHEI was associated with lower BMI z-score (-0.07 units/10-point increase; 95%CI: -0.13, -0.01), adjustment for YHEI did not attenuate sleep-BMI associations. Children with sleep and YHEI scores below the median (<11 and <60) had BMI z-scores 0.34 units higher (95%CI: 0.16, 0.51) than children with sleep and YHEI scores above the median.

**Conclusions:** While parent-reported diet did not explain inverse associations of sleep with adiposity, both sufficient sleep and high-quality diets are important to obesity prevention.

**T-P-3180**

**Comparison of Participants in Nutrition Clubs to Community-Matched Controls in the Greater Boston area**


**Background:** Nutrition clubs (NC) operate in community settings and provide their members with nutrition education and meal replacements for weight management. There are over 100,000 NC globally, but an independent assessment of the impact of these NC has not been carried out previously.

**Methods:** We conducted a cross-sectional pilot study to compare the health status of 100 NC members to 100 matched community controls (MC), matched for age category, gender, BMI category, race/ethnicity, and readiness to make health changes. Dietary intake, physical activity, biometrics, blood measures, health status, quality of life, and psychosocial factors were assessed through interviews and questionnaires. Data from the first 60 NC and 60 MC is presented.

**Results:** Participants were predominantly female (>70%) and Hispanic (58%). No significant differences were observed in mean values for HbA1c, physical activity, depression, systolic blood pressure, and history of metabolic disease between NC members and MC. BMI, waist-to-hip ratio and diastolic blood pressure were slightly higher in the NC members compared to their MC. However, compared to MC, NC members reported being significantly healthier than in the previous year, having lower emotional eating behaviors, lower carbohydrate intake and higher protein intake (41 vs 47%; 21 vs 16% of energy intake respectively).

**Conclusions:** Potential benefits of being a NC member include diet composition (higher protein intake and lower carbohydrate intake) and eating behavior patterns consistent with strategies that can help with adherence to effective weight regulations practices. (Research supported by Herbalife International.)

**T-P-3181**

**Consumption of Certain Grain Food Patterns in US Male and Female Children are Associated with Better Nutrient Intakes and Diet Quality and a Reduced Risk of Being Overweight or Obese**

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**Background:** The purpose of this study was to identify commonly consumed grain food patterns in US children (2-18 years-old; N’s=4,263 males/4,104 females) and compare nutrient intakes, diet quality, and physiological parameters of subjects in the various grain patterns relative to those who did not consume grain foods.

**Methods:** The USDA food coding system was used to define categories of grains. Cluster analysis using data from the National Health and Nutrition Examination Survey 2005-2010, identified 8 grain patterns (% of population): 1) mixed grains, 2) breads/rolls, 3) quick breads, 4) pasta/cooked cereal/rice, 5) crackers/salty snacks, 6) cakes/cookies/pies, 7) cereals and 8) no consumption of main grain groups.

**Results:** Energy intake was significantly higher for most grain
patterns vs. no grains (all p<0.01). Compared to no grains, both genders consuming cereals and pasta/cooked cereals/rice had a better diet quality, as measured by USDA’s Healthy Eating Index-2010 (all p<0.01). Dietary fiber intake was increased in both genders consuming pasta/cooked cereals/rice, ranging from 2.2-2.8 g more/day (all p<0.01) vs. no grains. Saturated and total fat were lower in females consuming breads/rolls vs. no grains (23±0.2 vs. 25±0.6 and 64±1 vs. 71±1 g/day, respectively; all p<0.01). No significant differences were seen in total or added sugar intakes. Body mass index (BMI) Z-scores were lower in males consuming several grain patterns vs. no grains (all p<0.01). Children consuming several grain foods, including pasta/cereals/rice, crackers/salty snacks had a significantly lower risk of being overweight or obese vs. no grains (odds ratio [OR]: 0.42; 95th confidence intervals [CI] 0.27, 0.66, OR: 0.60; CI: 0.41, 0.87, respectively; all p<0.01).

Conclusions: Consuming certain grain patterns in children was associated with improved nutrient intakes and diet quality as compared to no grains. Additionally, relative to no grains, children consuming several grain foods had a reduced risk of being overweight or obese.

T-P-3182


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Background: There were several studies to evaluate the relation of serum 25-hydroxyvitamin D (25OHD) with body fat mass, but there is no large community-based study.

Methods: In a total of 29,235 subjects from the 2008-2010 Korean National Health and Nutrition Examination Survey (KNHANES), the relevant data of 6,458 subjects age over 50 years (3,164 male and 3,294 female) were selected and analyzed cross-sectionally. Serum 25OHD concentrations were compared by tertiles of body fat mass, trunk fat mass and limb fat mass measured by Dual-energy X-ray Absorptiometry (DXA) in tertiles of body weight.

Results: The mean serum 25OHD concentration was 20.2 ng/mL in men, 21.6 ng/mL in women and showed significantly negative correlation with body weight, body mass index, waist circumference, total body fat mass, trunk fat mass, and limb fat mass after age adjustment in both sexes. After dividing body weight into tertiles, serum 25OHD concentration showed significant decrease as their body fat mass tertiles increased in all three body weight tertiles in men, but not in women. Similar decreasing pattern of serum 25OHD concentration was also demonstrated in comparison of tertiles in trunk fat mass and limb fat mass in men.

Conclusions: Serum 25OHD concentration was highly correlated with total body fat mass as well as trunk fat mass and limb fat mass in Korean elderly men.

T-P-3183

Dietary energy density and weight change in the Women’s Health Initiative


Background: Obesity prevalence increased among older adults, especially women, from 2003-2012. While research suggests high dietary energy density (DED, kcal/gram) contributes to weight gain, this relationship has not been characterized in postmenopausal women.

Methods: Eligible women in the Women’s Health Initiative’s (WHI) Hormone Therapy and/or Calcium/Vitamin D Trials had ≥ 4 measured weights over 7 years (n = 15,351). Nutrient and food weight estimates were obtained using WHI’s food frequency questionnaire. DED included energy-containing beverages. The association between DED and body weight change was estimated using linear regression each follow-up year, with lowest DED quintile as the reference. Multivariate models were adjusted for factors changing age-adjusted estimates ≥ 10% (age, baseline weight, physical activity, history of cardiovascular disease, and adult weight change).

Results: Participants had a mean age of 63.8 ± 7.1 years; 83.5% were non-Hispanic white. Women with lower baseline DED were more likely to report higher physical activity, lower and stable weight, higher fruit intake, and lower meat and fat consumption. After slight weight loss during follow-up year 1, women gained weight. Gain peaked in Year 4; women in DED quintiles 4 and 5 demonstrated the least gain (0.53 kg and 0.76 kg, respectively), quintiles 1 and 2 showed the greatest (1.18 kg and 0.86 kg). The inverse relationship between DED and weight gain was significant at each follow-up except year 7 (p<0.001 all trends).

Conclusions: Contrary to previous studies and our hypothesis, postmenopausal women with higher DED had lower weight gain over 7 years than those with lower DED.

T-P-3184

Dietary intake patterns in normal and overweight/obese urban children with asthma

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Background: Asthma and obesity are the most common chronic diseases of childhood. The co-occurrence of each condition is disproportionately high among urban children. Epidemiological findings support that a diet rich in fruits, vegetables, and whole grains is associated with reduced asthma symptoms and supportive of weight control. This study examined associations among dietary intake, asthma indicators, ethnicity and weight status in a sample of urban children with asthma.

Methods: Urban school children with asthma (aged 7 to 10) were recruited as part of a larger study focused on asthma, physical activity, and diet. Asthma indicators (proportion of days with symptoms and the Asthma Control Test) were assessed by home spirometry and a daily diary over a monitoring period. Dietary intake was assessed using the Block Food Screener for Kids, which estimates usual daily fruit, vegetable, whole grain, dairy, meat/fish/poultry, and added sugar intake.

Results: On average, 48% participants were overweight/obese, 54% were Hispanic, 32% were African American, and 74% of families were at or below the federal poverty threshold. Neither asthma symptoms nor asthma control were related to dietary intake. Black children consumed significantly more
whole grains as compared to Hispanic and white children (0.81 vs. 0.34 and 0.48 ounces). Intake of fruits, vegetables, whole grains, meat/fish/poultry, dairy, or added sugar did not significantly differ between normal and overweight/obese children in this sample. However, both groups consumed less than the recommended daily servings of vegetables (42–55 vs. 2 cups), whole grains (46–56 vs. 2.5 ounces), and meat/fish/poultry (2.6–2.9 vs. 5 ounces).

**Conclusions:** Whereas dietary intake patterns did not differ between normal weight and overweight/obese urban children with asthma in this sample, both groups reported intakes well below national recommendations. Urban children with asthma, independent of weight status, would benefit from interventions to improve diet quality.

**T-P-3185-DT**

**Dietary Practices of Children in a Weight Management Clinic**


**Background:** Dietary practices are important contributors to weight and health status in children. The objective of the present study was to examine the association between dietary practices and body composition in children seeking treatment of obesity.

**Methods:** Caregivers of 119 children (age 12.7 ± 3.6 years, BMI-z 2.53 ± 0.51, 59% female, 71% African American) who were enrolled in a multidisciplinary outpatient weight management clinic completed questionnaires that assessed their child’s dietary practices during the preceding 7 days, and assessment of each child’s anthropometric measurements and body composition by bioelectrical impedance analysis were obtained at the baseline visit. ANCOVAs included age, sex, race, and BMI-Z as covariates.

**Results:** Children of African American race had significantly higher parent-reported fruit juice consumption (p=0.0001) and higher frequency of skipping lunch (p=0.007) compared to subjects of other races. Boys had higher parent-reported soda consumption compared to girls (p=0.028). No significant associations were observed between parent-reported dietary practices and BMI-Z, waist circumference-Z, or percent body fat.

**Conclusions:** Based on parent report, racial differences in fruit juice consumption and meal skipping as well as sex differences in soda consumption were observed in our cohort, but dietary practices were not associated with measures of body composition. Self-reported questionnaires completed by adolescents are currently being analyzed for comparison with parent responses and in association with adiposity.

**T-P-3186**

**Does Labeling Spoodles in a College Dining Hall Impact Food Selection Patterns?**


**Background:** Consuming larger portion sizes of foods outside of the home is a contributor to increasing obesity rates. This study tested whether labelling a food-serving utensil (a spoodle) with appropriate portion size information for two frequently consumed foods (mashed potatoes and penne pasta) influenced food selection patterns in college students.

**Methods:** An ABBA reversal design was used in a large campus dining hall over a period of six weeks. During baseline and reversal periods, no portion size signage was displayed. During intervention weeks, an informational sign regarding the spoodle and the appropriate serving size of the target food was placed directly above the corresponding food stations. University Dining Services provided data each week regarding the number of students entering the dining hall and the number of pans of each target food served between 4:15pm and 7:15pm.

**Results:** Results suggest that the spoodle labeling had no impact on food selection patterns. Similar amounts of penne pasta and mashed potatoes were self-served by students during baseline and intervention weeks. Exit surveys conducted in the dining halls indicated that 86.8% of students did not notice the spoodle sign despite their prominent display and as a result, the majority of the students (94.7%) said the intervention did not influence their portion size.

**Conclusions:** Labeling food utensils in a college dining hall had no impact on food selection of two commonly consumed high calorie foods. Further research should explore the impact of portion size signage on food consumption in more carefully monitored settings and increase signage visibility to potentially maximize intervention effects.

**T-P-3187**

**Ecological Momentary Assessment of Weight-Related Parenting Practices: Associations with Retrospective Measures and Children's BMI**

Eleanor Tate Shonkoff *Los Angeles CA*, Yue Liao *Los Angeles California*, Genevieve Dunton *Los Angeles CA*

**Background:** Retrospective measures of weight-related parenting practices have been linked to child obesity-related behaviors and risk. However, not all studies find evidence of a link. One limitation may be the retrospective nature of the measurements. Yet very little research has validated real-time measures of parenting behavior. This study examined the validity of ecological momentary assessment (EMA) measures of weight-related parenting practices and their agreement with retrospective indices.

**Methods:** Mother-child dyads from a larger trial of 200 was included in this preliminary analysis (n = 59 dyads). One-item EMA measures assessed parenting practices of limiting: (a) TV/video game time, and (b) high-calorie, low nutrient food (HCLN) intake. Retrospective measures of the same parenting practices used items from two validated instruments (Child Feeding Questionnaire; Parenting Strategies for Eating and Activity Scale). Person-level means were calculated from EMA measures. Correlations assessed agreement between EMA and retrospective measures.

**Results:** The sample of mothers was 41 years old (SD = 5.9), married (69%), and many had graduated college (46%). The child sample was balanced by gender, 11 years old (SD = .60), 37% Hispanic, and healthy weight (BMI pctl. M = 54th; SD = 33). Mothers were with children on 78% of answered prompts. Person-level means of EMA-reported parenting practices were not significantly correlated with retrospective measures for either parenting practice. However, parents who limited HCLN more frequently, according to EMA reports, had children with lower BMI percentiles (r = -.41, p = .04).

**Conclusions:** Mother’s overall view of their weight-related
parenting strategies may not reflect what they actually do during a typical week. However, these preliminary results may differ from those on the total sample. Future research is needed to determine when and under what circumstances weight-related parenting behavior deviates from retrospective measures.

T-P-3188-DT
Examination of Two Dietary Quality Indices in Low Income Preschool and Adolescent Children from Four US Cities
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Background: The Healthy Eating Index (HEI) is a measure of overall diet quality and the mean score in NHANES children is ~50. However, HEI may overestimate diet quality because positive points are given for intake of some less healthy foods (e.g. fried and starchy vegetables, whole grains from desserts or savory snacks, dairy desserts). Our objectives were to create and apply a modified HEI (mHEI) that better captures a healthy diet by excluding selected less healthy food items and to compare mHEI to HEI. We hypothesized that children would have lower scores for the fruit, vegetables and empty calories mHEI components.

Methods: The Childhood Obesity Prevention and Treatment Research (COPTR) Consortium children are low income from 4 sites – Minneapolis, MN (n=534 2-4 yr olds ≥50th BMI %tile), Nashville, TN (n=610 3-5 yr olds 50th-95th BMI %tile), Cleveland, OH (n=360 10-13 yr olds ≥85th BMI %tile), and the Bay Area, CA (n=241 7-11 yr olds ≥85th BMI %tile). Two or three 24-hour dietary recalls per child were used to calculate average HEI and mHEI scores. The mHEI changed items included for 8 of the 12 HEI components. For each site, we estimated the mean overall and component HEI and mHEI scores. Differences were compared using paired t-tests.

Results: Mean (SD) HEI score was 64.1 (11.6) in Minneapolis, 64.8 (11.5) in Nashville, 48.0 (10.9) in Cleveland and 62.2 (11.4) in the Bay Area. Only 0.3 to 9.9% of children scored ≥80 (high diet quality). Across all sites, the mHEI scores were 9-10 points lower and fewer children (0-1.9%) scored ≥80. The primary differences were lower scores for whole grains (2-4 points) and empty calories (4 points). Small (0.4-1.2 points) but statistically significant (p<0.05) differences were found for total vegetables and fatty acid ratio. Conclusions: Both indices show a small percentage of low income children consumed a healthy diet. The eliminated unhealthy food items accounted for 14-18% (9-10 points) of the HEI scores. Thus, the mHEI may better indicate a healthy diet.

T-P-3189
Examining the relationship between fruit and vegetable intake, perceived access, and body mass index.
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Background: There have been mixed research findings on the association between fruit and vegetable intake and body mass index (BMI), as well as perceived access to fruit and vegetables and BMI. The purpose of this study was examine the relationship between self-reported fruit and vegetable intake and perceived access to fruit and vegetables on adult BMI.

Methods: Data from the Green Cart Study’s was used. The Green Cart study examines usage and outcomes associated with mobile produce markets in lower-income communities. Participants completed a telephone-administered survey with questions on fruit and vegetable intake, perceived access to fruit and vegetables, demographics, and home address. Linear regression models were used to determine the effect of fruit and vegetable intake and perceived access to fresh fruit and vegetable on BMI. Gender, race/ethnicity, education, income, household size, food assistance benefits, and the number of convenience/grocery stores within 1-mile of participants’ homes were controlled for.

Results: Among 170 participants, each additional F&V serving per day was associated with a 0.85 unit decrease in BMI (p<.01). Having lower perceived access to fresh F&V within the community was associated with increased BMI (p<.05). Each additional grocery store within 1 mile of a participant’s home was associated with a 0.69 unit decrease in BMI (p<.10). Racial/ethnic weight disparities were also found (p<0.05).

Conclusions: Fruit and vegetable intake is negatively correlated with BMI. Having lower perceived access to fruit and vegetable intake is positively correlated with BMI. Additionally, the number of grocery stores within an individual’s community is negatively associated with BMI. This research supports the need for obesity prevention efforts and policy to focus on increasing access to and intake of fruit and vegetables in lower-income communities.

T-P-3190
Examining Traditional and Internet-Based Resources for Home Cooking Information: an Association Rule Learning Approach
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Background: Cooking at home is one obesity prevention recommendation. Research is needed on where individuals seek home cooking information (e.g., recipes) so that interventions can strategically target these resources based on their prevalence of use and user characteristics.

Methods: 583 diverse adult online survey participants who were >50% responsible for meal planning reported their demographic information, average number of meals prepared at home / week, and whether they got meal ideas from 4 traditional and 7 Internet-based resources. Descriptive statistics were calculated and independent samples t-tests compared meals prepared at home by resource use. Association rule learning explored whether demographics were associated with resource use.

Results: Participants prepared 8.7 meals at home per week (SD = 5.1). Traditional meal idea resources were: family and friends (71%), cookbooks (41%), grocery store handouts (33%), and coupon books (32%). Internet-based resources were: food community websites (45%), company branded websites (34%), Facebook (33%), food-related apps (33%), food blogs (30%), Pinterest (25%) and special nutrition interest websites (14%). Cookbook users prepared more meals at home (M = 9.2, SD = 5.3) than non-cookbook users (M = 8.5, SD =
Background: Social networking sites contribute to the obesogenic environment by exposing us to images and text about food. This study aimed to characterize food-related communications viewed on Facebook and to explore the association of viewing these posts with eating and BMI.

Methods: We conducted a cross-sectional study of college students that were active Facebook users. Participants completed online surveys using their Facebook accounts to answer questions about Facebook usage, food-related posts viewed in 12 hours, and perceived impact of Facebook posts on eating. Food intake was assessed with the REAP survey. Correlation coefficients were used to explore the association of food posts with foods consumed and BMI.

Results: Fifty participants completed the survey, of which 66% were female and 61.7% white. Mean age was 20.5 years (S.D. = 1.2) and median BMI 22.1 kg/m2. More than half of participants viewed >100 posts in 12 hours. Of the posts viewed, 4.5% were food-related, with a mean of 6.1 (S.D. = 4.7) food-related posts seen in 12 hours. Food-related posts were primarily pictures (59.8%), text (23.3%), and advertisements (15.2%). Participants described 50% of food-related posts as unhealthy and 70% agreed that seeing food-related posts could cause food cravings. The percentage of posts that were food-related positively correlated with BMI but was not significant (r=0.281, p=0.056). The absolute number of food-related posts associated with consumption of sweets, sodas, and snack chips (r=0.29, p=0.045). Food related posts were reported to affect eating by 31.9% of participants.

Conclusions: Approximately 1 in 20 posts viewed on Facebook by college students is food-related with half of these perceived as unhealthy. Food-related posts caused cravings for many and associated with eating more calorie-dense nutrient-poor foods. Due to the small number of participants in the obese BMI range, further exploration is needed to investigate the obesogenic influence of social media on food and eating behaviors.

T-P.3192
Fatter After Four Years: Examining the Weight Trajectory of College Students
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Background: Much attention has been paid to the amount of weight college students gain during their first-year, but the remainder of college has largely been ignored. This study examined the weight trajectory of students over all four years of college.

Methods: 117 students were enrolled in this descriptive study. Students had their height and weight assessed during September and April of their first-year in 2011-2012, and during the final month of their senior year in spring 2015. Body Mass Index (BMI) was calculated from measured heights(cm) and weights(kg).

Results: 86 students remained in the study for four years. There was a significant increase in BMI from the beginning of freshman year (M=23.54±4.00) to the end of freshman year (M=24.02±3.96), p<0.001. BMI was significantly higher at the end of senior year (M=23.59±4.01), p<0.001, or end of freshman year (M=23.98±3.93), p<0.001. Mean weight gain over freshman year was 1.44 kg, which was significant, p<0.001. Weight was also significantly higher at the end of senior year (M=71.32±15.60) versus the beginning of freshman year (M=66.94±14.02), p<0.001 or the end of freshman year (M=68.26±13.74), p<0.001. Students’ mean weight gain was 4.38 kg over four years. 20 students were classified as overweight (BMI>25) and 8 students as obese (BMI>30) during freshman year. The number of obese students remained at 8 during senior year, but the number of overweight students increased to 27.

Conclusions: Although students did gain weight over freshman year, they did not gain close to the “freshman 15.” However, it appears that students continue to gain weight over their four years in college, and more students move into the overweight BMI category. This pattern might be the beginning of the small yearly weight gains possibly responsible for the increased prevalence of overweight/obesity in the U.S.

T-P.3193
Grain Food Sources of Energy and Nutrients Among Children in the United States: Data from the National Health and Nutrition Examination Survey, 2009-2012
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Background: Data on grain food sources of energy and nutrients in children are lacking. The purpose of this study was to determine food sources of energy and nutrients for US children using data from the National Health and Nutrition Examination Survey, 2009-2012.

Methods: Analyses of grain food sources were conducted using a 24-hour recall in children 2-18 years of age (n=6,109). Sources of nutrients contained in grain foods were determined using USDA nutrient composition databases and food grouping scheme for grains (excluding mixed dishes). Mean energy and nutrient intakes from the total diet and from various grain food groups were adjusted for the sample design using appropriate weights.

Results: All grains provided 263±5 kcal/d or 14±0.2% kcal/d in the total diet in children. In the total daily diet, grains contributed 7.6±0.2% (4.9±0.2 g/d) total fat, 5.4±0.2% (1.2±0.4 g/d) saturated fat, 15.9±0.2% (454±9 mg/d) sodium, 8.0±2% (9.9±2 g/d) total sugar, 22.5±0.3% (3±0.1 g/d) dietary fiber, 12.7±0.3% (124±2 mg/d) calcium, 39.3±0.5% (238±7 DFE/d) folate, 34.9±0.5% (5.6±0.1 mg/d) iron, and 13.7±0.2% (33.3±0.8 mg/d) magnesium. Breads, rolls and tortilla grains collectively provided 122±4 kcal/d or 6.4±0.2% kcal/d, 3.1±0.1% (2.1±0.1 g/d) total fat, 2.2±0.1% (0.5±0.02 g/d)
 satiated fat, 7.4±0.2% (217±6.5 mg/d) sodium, 2.1±0.1% (2.1±0.7 g/d) total sugar, 11.0±3.5% (1.5±0.5 g/d) dietary fiber, 6.7±0.2% (64.2 mg/d) calcium, 13.6±0.5% (63±2 DFE/d) folate, 11±0.3% (1.5±0.4 mg/d) iron, and 6.4±0.2% (15.5±0.5 mg/d) magnesium.

**Conclusions:** A variety of grain foods contribute to total diet nutrient density in US children and have the potential to increase consumption of underconsumed nutrients.

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**T-P-3194**

**High dietary choline and betaine intakes are associated with better body composition in the Newfoundland population**

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**Background:** Studies suggested dietary choline and betaine may improve body composition in animals, but little data is available from humans. We studied the association of dietary choline and betaine intakes with body composition in the Newfoundland population.

**Methods:** A total of 3214 subjects from the CODING (Complex Diseases in the Newfoundland Population: Environment and Genetics) study were assessed. Dietary choline and betaine intakes were computed from the Willett Food Frequency Questionnaire. Body composition was measured using dual-energy X-ray absorptiometry. Age, physical activity level and total calorie intake were controlled in all analyses.

**Results:** Significant negative correlations were found between dietary choline, betaine intakes and total percent body fat (%BF), percent trunk fat (%TF), percent android fat (%AF) and percent gynoid fat (%GF) in both men and women (r: 0.29–0.38 for choline and -0.15–0.26 for betaine; p<0.001). Significant positive correlations were observed with total percent lean mass (%LM) in both sexes (r: 0.33–0.38 for choline and 0.22–0.25 for betaine; p<0.001). Dietary choline and betaine intakes were the lowest in obese, intermediate in overweight and the highest in normal weight subjects. The intakes of choline and betaine in obese men and women were significantly less than normal weight subjects (-44%, -36% for choline and -47%, -36% for betaine respectively; p<0.001). The significant negative correlations were found in all other obesity measures: %TF, %AF, %GF, %BF, and positive correlation with %LM between high and low dietary choline or betaine intake groups (p<0.001 for all variables)

**Conclusions:** We discovered that higher dietary choline and betaine intake are associated with a significantly favorable body composition profile. The association was stronger in dietary choline intake than betaine.

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**T-P-3195**

**High dietary choline and betaine intakes are associated with low insulin resistance in the Newfoundland population**

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**Background:** Reports on the association between choline and betaine intakes insulin resistance (IR) were mainly from animals and data was contradictory. Evidence from humans is scarce. We investigated the association between dietary choline and betaine intakes and IR in a large population based study.

**Methods:** A total of 2539 subjects from the CODING study were assessed. Dietary choline and betaine intake was evaluated from the Willett Food Frequency Questionnaire. Body composition was measured using dual-energy X-ray absorptiometry. Age, physical activity level and total calorie intake were adjusted in all analyses.

**Results:** Subjects with the highest intakes of dietary choline and betaine had the lowest levels of fasting insulin and IR defined by both the Homeostasis Model Assessment (HOMA-IR) and Quantitative Insulin-sensitivity Check Index (QUICKI) (p<0.001 for choline intake in both genders and betaine intake in women, p<0.01 for betaine intake in men). Analysis of covariance showed that choline or betaine intakes in high IR group were -25% and -24% lower than low IR group (p<0.001) in women and -31% (p=0.01), -20% (p=0.218) in men. Partial correlation analysis showed dietary choline and betaine intakes were significantly inversely correlated to circulating insulin (r: -0.17, -0.14 for choline, -0.13, -0.11 for betaine in women), HOMA-IR (r: -0.17, -0.14 for choline, -0.14, -0.09 for betaine in women and men; p<0.001), and positively related to QUICKI (r: 0.16, 0.16 for choline, 0.12, 0.11 for betaine in women and men; p<0.001). Higher dietary choline and betaine intakes are strongly associated with attenuated insulin resistance at population level. The association was stronger in women than men.

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**T-P-3196-DT**

**Household and Individual-level Determinants of Fruit and Vegetable Intake among Low-Income Urban African American Adolescents**

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**Background:** Childhood obesity, one of the greatest challenges to public health, disproportionately affects low-income urban minority populations. Fruits and vegetables (FV) are nutrient dense foods that may be inversely associated with weight gain. We aimed to identify individual and household factors influencing FV consumption in African-American (AA) youth in Baltimore, MD.

**Methods:** This is a cross-sectional analysis of data collected from 299 low-income AA caregiver-child (age range: 10-14 y) dyads participating in the baseline evaluation of the B’More Healthy Communities for Kids obesity prevention trial. The Kids Block Food Frequency Questionnaire was used to estimate daily intakes of FV and dietary fiber. Questionnaires were used to assess socio-demographics, food purchasing and preparation behavior, and psychosocial information. Ordered logit regression analyses investigated psychosocial and food-related behavior determinants of FV and dietary fiber intake (quartile of intake) controlling for confounders.

**Results:** On average, children consumed 1.5±1.1 (M±SD) servings of fruit and 1.8±1.7 of vegetable/day. There were no differences by gender, age or household income. Intentions about food were positively associated with vegetable intake and higher self-efficacy associated with increase in fiber intake (OR 1.2; 95%CI 1.1-1.3 and 1.1; 1.01-1.1). Children receiving free/low cost breakfast or lunch at school had increased odds for fruit and fiber intake (OR 2.4; 1.2-4.7; OR 2.1; 1.1-4.3, respectively). Children with parents who shopped very frequently (>5 trips/mo) at fast-food stores had 46% lower
These results will inform and shape an effective intervention.

**Sequencing**

Identifying Candidate Genes of Food Addiction by Exome Sequencing

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**Background:** We have shown that food addiction (FA) is a distinguished clinical feature affecting about 5% of the general adult population. However, the genetic variants and underlying genes in FA are unknown. The aim of the current study is to screen potential candidate genes that might be related to FA.

**Methods:** From a total of 737 adults recruited from the CODING study, whole exome sequencing was performed on 30 subjects including 10 obese with high and 10 obese with low/no FA symptoms (FAO, NFO), and 10 controls with normal weight and low/no FA symptoms (NFH). FA symptom count was assessed using the Yale Food Addiction Scale. The top 35 SNPs with the most significant differences among the 3 groups were evaluated.

**Results:** FAO versus NFH showed that 5 SNPs were associated with 4 addiction (Ad) related genes (GSPM1, NRK, ZCCHC14, NTM). 4 SNPs were associated with 4 psychological disorders (Psd) related genes (DOCK9, GMIP, MCTP1, SYN3) and 5 SNPs were associated with 5 genes related to energy metabolism and obesity or obesity related diseases (ORD). The comparison between FAO and NFO revealed 1 SNP associated with an Ad gene (TIRAP), 5 SNPs associated with 3 Psd genes (PCMI, SYNE1, AMPD3) and 8 SNPs associated with 7 genes related to ORD. The comparison of the group with high FA symptoms (FAO) and the combined group of NFO+NHF revealed 4 SNPs associated with 4 Ad genes (ZCCHC14, NTM, ALK, INFAR1), no SNP related to Psd genes, and 8 SNPs associated with 8 genes related to ORD. All the aforementioned SNPs had significantly higher minor allele frequencies (F) in FAO. The comparison of the SNPs between NFO and NFH showed 31 SNPs including 1 SNP associated with an Ad gene with a higher F in NFH group, and 6 SNPs associated with 6 ORD genes (frequency in 4 SNPs was higher and in 2 SNPs was lower in NFO).

**Conclusions:** For the first time we revealed a panel of candidate genes that might be related to food addiction in humans.

**T-P.3199**

Increased Caloric Intake Mediates the Relationship Between Screen Time and Body Mass Index in Overweight/Obese Adolescents Primarily by Increased Carbohydrate Intake: The HEARTY Trial


**Background:** Sedentary behavior is associated with increased risk of cardiovascular disease, diabetes, and obesity. Adolescents spend a large proportion of sedentary time in front of screens and the impact these behaviors have on body mass index (BMI) and energy intake (EI) is unclear. This study examined whether the relationship between screen time (ST) and BMI was mediated by total EI (model 1) and macronutrient intake (model 2).

**Methods:** A cross-sectional study of post-pubertal overweight or obese adolescents (N=283) at baseline of an intervention for weight control. Total EI (mean kcal and macronutrients from 3 day food diary) and sedentary behavior (hours spent in ST: watching TV, recreational computer use, playing seated video games, and total ST) were measured with self-report, and BMI was objectively measured in the laboratory. Simple (model 1) and multiple (model 2) mediation analyses were conducted using the bootstrapping approach, with 5,000 samples with replacement (Preacher & Hayes, 2008). Covariates included age, gender, race, parent education, Tanner stage, and physical activity.

**Results:** For model 1, the total indirect effect of ST on zBMI was significantly mediated by EI, F(9, 273)=9.32, p<.0001, R²=.24, adjusted R²=.21. For model 2, increased caloric intake significantly mediated the relationship between ST and
zBMI (95% BCa CI [0.0004, 0.0074]), whereas fat and protein did not.

**Conclusions:** The relationship between ST and BMI appears to be mediated by increased EI, primarily by increased carbohydrate intake. Future research is needed to determine if reducing ST reduces carbohydrate intake and BMI in overweight and obese youth.

**T-P-3200 Individual Differences in Reported Frequency of Highly Processed Food Consumption**

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**Background:** Recent research has demonstrated that highly processed foods, containing added fat and refined carbohydrates (like white flour and sugar), are most associated with behavioral indicators of addictive-like eating. However, no previous studies have examined whether individual differences, such as “food addiction” symptomatology, body mass index (BMI), or gender, are related to how frequently highly processed foods are reported to be consumed.

**Methods:** Participants (n= 160) recruited through Amazon MTurk reported how frequently they consumed twenty-nine common highly processed foods (e.g., chocolate, pizza, French fries) in a typical week. Individuals also completed the Yale Food Addiction Scale (YFAS) to assess symptoms of “food addiction” and provided self-reported height and weight and gender. Multivariable linear regression was used to examine the unique association of YFAS symptomology, BMI, and gender with reported frequency of highly processed food consumption.

**Results:** Participants (52% female) varied in age (M= 37.4, SD=. 13.3), BMI (M= 26.9, SD= 7.5), and YFAS symptom score (M= 2.2, SD= 1.8). YFAS symptomology was positively correlated with the frequency of highly processed food consumption (β= 5.74, t(156) = 6.67, p < .001). BMI was not related to frequency of highly processed food consumption (β= -0.05, t(156) = -0.225, p < .799). No gender differences were found (β= -5.197, t(156) = -1.750, p < .002).

**Conclusions:** Elevated symptoms of “food addiction” were associated with more frequent reported consumption of highly processed foods. Notably, BMI was not a predictor for how frequently these foods were reported to be consumed. These findings provide further support for the idea that highly processed foods may be closely implicated in an addictive-like eating process for some individuals.

**T-P-3201 Lunchbox Lessons: Parent Lunch Packing, Child Lunch Eating and Child Weight**

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**Background:** Early care and education settings where children bring sack lunch present unique opportunity to examine bi-directional influences of parenting, child eating, and child weight. Study hypotheses are, compared to their non-overweight peers, overweight or obese (OW) preschool children (a) had parents who packed more servings of food in the sack lunches and/or (b) the children ate larger proportions of the available food.

**Methods:** This study was secondary analyses of data from the efficacy trial of an intervention to increase parents’ packing of fruit, vegetables, and whole grains in their preschool children’s sack lunches. Of the 584 parent-child dyads with child Body Mass Index measured, 132 were OW. Direct observations of servings packed and consumed for two randomly selected week day lunches at four times (baseline, 6-, 22-, 28-week follow-ups) were analyzed in separate multi-level models for fruit, vegetables, grains, dairy, protein, chips, sweets comparing OW to peers.

**Results:** On average at each time, the packed lunches contained >2.1 servings grain; >1.0 servings each of fruit, protein, sweets; >0.6 servings dairy; >0.2 servings each of chips, vegetables. Children on average at each time consumed >1.3 servings grain; >0.6 servings each of fruit, protein, sweets; >0.4 servings dairy; >0.1 servings each of chips, vegetables. OW children had parents who packed more protein (differences 0.3 to 0.4 servings, P<.05). Irrespective of servings packed and child weight, the children at each time consumed approximately the same proportion of the available food by type resulting in OW children eating more protein servings than their peers (differences 0.2 to 0.3 servings, P<.05).

**Conclusions:** To help young children achieve and maintain healthy weight, interventions should focus on convincing parents they need not offer surfeits of protein and sweets to assure their preschool-aged children get enough to eat.

**T-P-3202 Maternal Nutrition Knowledge is Inversely Related to Both Maternal and Child Weight Status**

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**Background:** Previous studies have shown that nutrition knowledge impacts diet quality even after controlling for individual differences in socioeconomic status. However, the relationship between nutrition knowledge and body weight is less well known. This laboratory-based study was designed to characterize the relationship between children’s liking and intake of common meal items. As a secondary aim we hypothesized that higher maternal nutrition knowledge would be negatively associated with both maternal and child weight status.

**Methods:** The current analyses are part of a cross-sectional study that took place over two laboratory visits. On the first visit, mothers who reported being primarily in charge of feeding (n=45) completed two 70 question quizzes testing their knowledge of various nutrition concepts ranging in difficulty. Child height and weight were measured and recorded on the first visit. Maternal height and weight were self-reported and converted to body mass index (BMI). Data were analyzed using Pearson’s bivariate correlations and linear regressions.

**Results:** Mothers’ score on the first nutrition knowledge survey were unrelated to maternal BMI (r=.25, p=10) and child BMI z-score (r= .15, p=.28). However, on the second more challenging survey maternal nutrition knowledge was negatively related to both maternal BMI (r= -.39, p=.02) and child BMI z-score (r= -.34, p=.02). After controlling for income, the relationship between maternal nutrition knowledge and maternal weight status remained significant (p=.03), but the relationship between maternal nutrition knowledge and child weight status was no longer significant (p=.09).
Conclusions: These results indicate that higher levels of maternal nutrition knowledge may be related to lower levels of maternal and child obesity. Additional research is needed to determine if teaching parents nutrition-based knowledge will help prevent the development of obesity.

T-P-3203-DT
Meat and Sugar in the Costa Rican Diet: Can the Nutrition Transition Explain Socioeconomic Variation in Obesity?
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Background: The rising prevalence of obesity among the urban poor in Latin America is unexplained due to limited data on dietary intake and physical activity in this population. While national level increases in the availability of sugar-sweetened beverages and animal source foods described in the Nutrition Transition model are occurring in tandem with rising obesity, few studies have evaluated the diet of individual women or how diet varies by socioeconomic status (SES). This study investigates how Body Mass Index (BMI), body composition and diet vary between women of low- and high-SES and identifies the types of dietary practices associated with energy intake.

Methods: Data were collected from a random sample of 140 non-pregnant, non-lactating mothers age 25 to 45 years in urban Costa Rica between June 2014 and February 2015. SES was defined using an index including education level, occupation, household conditions and neighborhood of residence. Anthropometry was used to assess BMI and body composition. Three 24-hour dietary recalls were used to assess energy intake and intake of sugar-sweetened beverages and animal source foods.

Results: Low-SES women had a higher mean BMI than high-SES women (29.6 vs. 27.0 kg/m², p=0.04) and a higher obesity prevalence (38.0 vs. 18.0%, p=0.03). However, low- and high-SES women consumed sugar-sweetened beverages with similar frequency (2.4 vs. 2.1 times/day, p=0.1). Low- and high-SES women also consumed animal source foods with similar frequency (3.0 vs. 3.7 times/day, p=0.4).

Conclusions: The absence of variation in sugar-sweetened beverage and animal source food intake between low- and high-SES women was unexpected given the larger body size of low-SES women.

T-P-3204
Morbid Obesity in Taiwan, a Health Inequality
Phenomenon: Trends and Associated Socio-Demographics and Lifestyle Factors
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Background: Obesity is one of the most important public health issues worldwide. Moreover, an extreme obesity phenotype, morbid obesity (MO) (body mass index, BMI ≥35 kg/m²) has insidiously become a global problem. In this study, we aim to document the MO prevalence trend and to unveil the epidemiological characteristics of MO in Taiwan.

Methods: We took advantage of the data from 3 waves of nutrition and health survey in Taiwan (NAHSIT): 1993-1996, 2005-2008, and 2013-2014 to assess the prevalence trends. There were 39 MO (BMI ≥35 kg/m²) cases identified in the two recent surveys. Age (+3 years), gender and survey matched normal weight controls (NW; BMI: 18.5-24 kg/m²) were selected in a 4 to 1 ratio.

Results: Both the prevalence of obesity (11.8 %, 17.9 %, to 22.1 %) and MO (BMI≥ 35 kg/m²) (0.4 %, 0.6 %, to 1.9 %) increased sharply in the latest survey. MO cases tend to have lower level of education and personal income. Furthermore, these MO cases were likely to be betel nut chewers (p=0.0138) and they were associated with a dietary pattern featured with a higher consumption frequency of animal products, sweetened beverage, but lower frequencies of legume, fresh fruits, nuts, pastry and dessert, and seaweed (odds ratios are 7, 9, 47 for Q2, Q3, and Q4, respectively, compared to Q1 of the dietary pattern score; p for trend=0.00001).

Conclusions: In summary, this study documents the drastic increase in the prevalence rates of obesity and MO in the last 2 decades in Taiwan. Epidemiological characteristic study indicates that MO is likely a result of health inequality.

T-P-3205
More Differences on the Screen Than the Plate?: Preschool-Aged Children with Severe Obesity: NHANES 1999-2012
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Background: As part of a broader effort of the AAP Institute for Healthy Childhood Weight and Children’s Hospital Association Expert Exchange, this analysis was conducted to better characterize diet and screen time patterns of children with severe obesity using nationally-representative data.

Methods: Children ages 2-5 (N=6152) from NHANES (1999-2012) were classified by weight status: normal weight (NW) (BMI<85th %ile), overweight (OW) (BMI≥85th but <95th %ile), obesity (OB) (BMI≥95th but <120% of 95th %ile), and severe obesity (SO) (BMI≥120% of 95th %ile). Energy intake (EI) and Healthy Eating Index (HEI) based on 24-hour recalls were evaluated with linear regression. Daily screen time (ST), combined reported hours of TV/computer/video games, was evaluated with multinomial logistic regression using NW as referent.

Results: Survey-weighted proportions by weight category were: 76.7% NW, 12.6% OW, 8.6% OB, and 2.1% SO. Mean EI was 1591 kcal/d. The EI of children with OW was 74 kcal/d higher (p=0.03) compared to NW peers, but differences for children with OB (62 kcal/d) and SO (23 kcal/d) were not significant (all p>0.10). Mean HEI for children with NW was 50.6, with no significant difference for OB at 48.5 (-1.6, p=0.05) and SO at 48.6 (-0.4, p=0.8). Children with ST ≥2 hr/d was 57.0% (NW), 58.4% (OW), 66.3% (OB), and 69.8% (SO), which was associated with higher odds of OB (OR 1.4, p<0.01). Children with ST ≥4 hr/d was 14.6% (NW), 16.1% (OW), 21.3% (OB), and 30.4% (SO), which was associated with elevated odds of OB (OR 1.6, p<0.01) and SO (OR 2.4, p<0.01).

Conclusions: Children were more likely to engage in double the recommended limit of daily ST than peers, and 30% had > 4 hours a day of ST. Differences in self-reported energy intake and diet quality between children with SO and NW peers were minimal and not significant, though possible bias with proxy-
reported dietary report and unequal sample distribution are important limitations.

T-P-3206
Overcoming the Weight Loss Plateau in Patients Treated with a Low Carbohydrate Diet
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Background: A common observation in a typical weight loss (WL) program is a plateau in body weight after several months of successful weight reduction. This effect has been seen in many types of programs including those that restrict caloric intake, recommend a particular combination of foods, or use specific WL medications. This study examined the results of a WL program specifically designed to overcome this plateau.

Methods: A pilot observational study was conducted with patients enrolled in a physician-supervised medical WL program. Patients in the active WL (AWL) phase of the program had regular weigh-ins, offered individualized WL medication, counseled using a biopsychosocial approach, and prescribed a low carbohydrate diet to lower insulin level. Patients that remained on treatment for at least 40 weeks of a 52-week study period, were examined. To counter the WL plateau, patients were in the AWL phase for 20 weeks, transitioned to a 12 weeks maintenance phase with medication discontinuation and reintroduction of carbohydrates to increase insulin level, and then returned to AWL to the end of the study. The primary outcome variable of interest was WL (kg) from baseline to the end of each phase of the program.

Results: A total of 10 patients were included in the analysis. Mean age was 47.1, and 60% were female. Mean baseline weight=106.5, BMI=37.9. Patients lost an average of 17.75 kg (16.6%) of baseline body weight at 20 weeks (AWL phase), plateaued during the maintenance phase, and lost additional weight once they returned to AWL treatment. Total mean WL at the end of the study was 23.61 kg (22.2%), and BMI=29.55.

Conclusions: A diet low in carbohydrates lowers insulin and helps patients burn fat and lose weight. Reintroducing carbohydrates causes insulin level to rise. As shown here, the WL plateau can be successfully overcome by actively lowering insulin again. This is more difficult if patients remain on a low carbohydrate diet throughout the WL program.

T-P-3207
Overweight Children’s Eating Behavior and Associations with Parent Feeding Practices and Concern for Child Weight in Treatment-Seeking Families
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Background: Controlling feeding practices by parents have been linked to childhood obesity; however, their associations with child eating behaviors is understudied. Higher ‘Food Responsiveness’ (FR), Slower Eating (SE), and poorer ‘Satiety Responsiveness’ (SR) predict childhood obesity. We examined in this study whether FR, SE, and SR were associated with 1) parental pressure to eat and restrictive feeding, and 2) parental concern for child weight.

Methods: Participants were 48 families of 4-8 year old overweight/obese children enrolled in a family-based obesity treatment study [average age = 6.8 years old, mean BMI percentile 96.5]. FR, SE, and SR were assessed by the Child Eating Behavior Questionnaire. Parent feeding practices and concern for child weight were assessed using the Child Feeding Questionnaire. Weight and height were directly measured. All analyses were done using SPSS 22.

Results: For aim 1, greater SE (r = 0.33, p = 0.03) and SR (r = 0.38, p = 0.01) were correlated with parental pressure to eat. Thus, parents pressured to eat children who were slower eaters and more responsive to satiety cues. Greater FR was associated with parental restrictive feeding (r = 0.51, p < 0.001). Thus, restriction was heightened towards children more responsive in eating related to food cues. For aim 2, parents reported greater weight concern for children with poorer SR (r = -0.38, p = 0.02) and greater FR (r = -0.40, p = 0.01).

Conclusions: Parents used differential feeding control strategies with children higher in FR compared to SR, which could exacerbate further child weight gain. Future research should probe specific parental concerns about and responses to specific child eating patterns, as these could undermine healthy eating and energy balance.

T-P-3208
Polyol Intake, Blood Glucose and Blood Pressure in US College Students
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Background: Polyols, or sugar alcohols, are poorly digested carbohydrates that display prebiotic effects and, therefore, may influence blood glucose regulation. Polyol intake has increased alongside their reputation as low calorie sweeteners. However, polyols and a polyol subclass, sorbitol, have not been explored in the general US population and their potential metabolic effects have not been well elucidated. The purpose of this cross-sectional study was to examine consumption of polyols in US college students (n=343, body fat percent=25.5±9.2%, 83% female) and differences between high and low consumers.

Methods: Intake of total polyols and sorbitol were quantified by the Comprehensive Nutrition Assessment Questionnaire. Blood glucose and lipids were measured by Cholestech LDX®, body fat percent by BOD POD®, and waist circumference and blood pressure by standardized instruments and protocols. Median split was used to classify subjects into groups of high and low intake for grams of total polyols and sorbitol consumed per 1000kcal (g/1000kcal). Differences in dependent variables were analyzed by independent samples t-tests.

Results: Subjects consumed an average of 4.0±3.3 grams total polyols and 3.1±2.4 grams sorbitol daily. Compared to subjects in the lower median, subjects in the upper median for polyols (g/1000kcal) and sorbitol (g/1000kcal) exhibited lower blood glucose (82±8 vs. 84±7mg/dL; p=0.08 and 82±7 vs. 84±7mg/dL; p=0.025 respectively), systolic blood pressure (114±15 vs. 117±14mmHg; p=0.39 and 113±15 vs. 118±14mmHg; p=0.012) and diastolic blood pressure (72±9 vs. 74±9mmHg; p=0.037 and 72±9 vs. 75±9mmHg; p=0.007).

Conclusions: Polyol intake was low in this population. However, even within this range, results suggest higher polyol intake may impact blood glucose and blood pressure in healthy US college students. Long term, dose-response, and mechanistic studies are needed to further assess potential relationships, including in at-risk populations.

T-P-3209
Quantity and Quality of Dietary Sugars: Associations with Health Outcomes in Healthy College Students
Eric Nelson Kingston RI, Brittany Navrkal Omaha Nebraska, Kathleen Melanson Kingston Rhode Island

Background: Obesity and cardiovascular diseases (CVD) are leading causes of death in the US and may be influenced by sugars consumption. Research on body fat % (BF%), body mass index (BMI) and markers of CVD is inconsistent and is often observed at intakes above the 95th percentile. Therefore, this study examined associations between quantity (<25% and >25% energy total sugars) and quality (fructose-containing and non-fructose containing) of dietary sugars with BF%, BMI, total cholesterol (TC) and low density lipoprotein cholesterol (LDL-c).

Methods: This cross-sectional study (n=343; BF%=25.5±9.2%; 83% female; keals=2332.7±951.6; %energy sugars=22.7±7.6%) collected dietary data using the validated Comprehensive Nutrition Assessment Questionnaire, BF% using BOD POD and blood lipids using Cholestech LDX. Data were split into <25% and >25% energy total sugars before analyses using Pearson correlations.

Results: In subjects with <25% energy total sugars, energy from fructose-containing sugars correlated to BF% (r=.136, p=.044), while energy from non-fructose containing sugars negatively correlated to BMI (r=-.241, p=.001) but positively correlated with TC (r=.138, p=.048). Also, percent carbohydrate consumed, fructose-containing sugars correlated to BF% (r=.189, p=.005) and non-fructose containing sugars correlated to TC (r=.196, p=.003) and LDL-c (r=.183, p=.009). In contrast, when consumed at >25% energy total sugars, non-fructose containing sugars (grams) negatively correlated to BF% (r=-.264, p=.010).

Conclusions: These results suggest that quantity and quality of sugars associate with obesity and CVD risk. Even when consumed at <25% energy total sugars, fructose-containing sugars may have harmful associations with BF% and non-fructose containing sugars with TC and LDL-c. However, non-fructose containing sugars in all subjects showed beneficial associations with BMI or BF%. Research is needed to clarify risks of sugars consumption in young adults and other populations on obesity and CVD.

T-P-3210
Sensory Evaluation of Traditional Wheat and Corn-Based Products Added with Dehydrated Nopal: Churritos and Polvorones
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Background: Production and consumption of nopal is quite important in Mexico. Culinary applications for this product are many, since can be offered in a wide range of presentations, mainly for the soluble and insoluble fiber (gums, pectin and mucilage) that contains. Some of its nutritional properties are remarkable; provides natural protection against diabetes, for its hypoglicemic effect, and osteoporosis as a result of acting as a supply of calcium. The objective of this project is to elaborate traditional wheat and corn-based products added with dehydrated nopal (churritos and polvorones); pilot test.

Methods: Pilot test: Three samples of polvorones were elaborated with wheat flour and 3 samples of churritos with corn flour, adding different concentrations of nopal powder (4, 6, 8%). The sensory evaluation of the products was carried out by 30 gastronomy students (15 per product). During the test the participants tasted 5g of product and filled a descriptive flavor and texture survey. The research data were analyzed with the statistics package Excel 2013, frequencies and standard deviation were calculated. The sensory evaluation may be carried out by elementary students to determine their preferred.

Results: Research data shown that, polvorones 6% and churritos 4% were preferred among the other samples. Polvorones were perceived with an opaque color and a high sweet, slightly acid, and no bitter flavor; in contrast, churritos had a medium bright color and an almost imperceptible salty flavor.

Conclusions: The pilot test determined that the 6% polvorón sample added with nopal powder and the 4% churrito sample added with nopal powder had the best organoleptic properties.

T-P-3211
Significant Beneficial Association of Dietary Selenium Intake with Reduced Body Fat

Background: Selenium(Se) is an important trace element involved in lipid metabolism and adipogenesis. Some studies suggest Se might be associated with obesity. However, there are few studies on the association between dietary Se intake and obesity and the findings are inconsistent. In the study, the associations between dietary Se intake and a whole panel of obesity measurements were investigated in the large population based study.

Methods: A total of 3214 subjects from the CODING study were assessed. Dietary Se intake was evaluated from the Willett Food Frequency Questionnaire. Obesity measurements were performed using dual-energy X-ray absorptiometry.

Results: Both obese men and women had the lowest dietary Se intake(μg/kg/day), which were 24% to 31% lower than normal weight men and women, respectively, based on BMI and total body fat percentage(BF%). In turn, subjects with the highest dietary Se intake had the lowest body weight, BMI, waist circumference(WC), trunk fat percentage(TF%), android fat percentage(AF%), gynoid fat percentage(GF%) and BF%. A clear dose-dependent inverse relationship was observed in both women and men. Moreover, strong and consistent negative correlations were discovered between dietary Se intake and all obesity indexes: body weight(r=-0.52 for women and -0.46 for men, P<0.01 for both), BMI(r=-0.49 for women and -0.43 for men, P<0.01 for both), WC(r=-0.49 for women and -0.46 for men, P<0.01 for both), BF%(r=-0.41 for women and -0.43 for men, P<0.01 for both), TF%(r=-0.41 for women and -0.43 for men, P<0.01 for both), AF%(r=-0.40 for women and -0.41 for men, P<0.01 for both) and GF%(r=-0.30 for women and -0.346 for men, P<0.01 for both), which were independent of age, total dietary calories intake, and physical activity. Dietary Se intake alone could explain 9-27% of variations of body fat.

Conclusions: Findings from this study strongly suggest that high dietary Se intake is associated with a beneficial profile of body composition in both normal and obese population.
Significantly Negative Association Between Dietary Selenium Intake and Insulin Resistance in the Newfoundland Population

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Background: Selenium (Se) may mimic insulin function and has the ability to improve insulin resistance (IR). Se was thought to protect against the development of type 2 diabetes mellitus (T2DM). However, recent studies have shown that high Se exposure may increase the risk of T2DM and IR. We investigated the association between dietary Se intake and IR in the study with a broad range of dietary Se intake.

Methods: Data of 3054 subjects without DM from the CODING study were analyzed. Dietary Se intake was evaluated from the Willett Food Frequency Questionnaire. Fasting blood samples were collected for the measurement of glucose and insulin (FPI). IR and β cell function were determined with the homeostasis model assessment (HOMA). Body composition was measured using dual-energy X-ray absorptiometry.

Results: High HOMA-IR groups had the lowest dietary Se intake (μg/day/kg), which was 18% and 11% less than low HOMA-IR groups both in women and men, respectively. FPI, IR and β cell function were decreased correspondingly, and the effect reached a plateau at the level of 2.0μg/day/kg. Dietary Se intake was negatively correlated with FPI, HOMA-IR, and HOMA-β, after adjusting for the confounding factors (r:-0.09~ -0.16, P<0.05 for all). After additional adjustment for total body fat percentage, these differences among groups were weakened in women and disappeared in men. As dietary Se intake increased, IR decreased correspondingly, and the effect reached a plateau at the level of 2.6μg/kg/day. Dietary Se intake was negatively correlated with FPI, HOMA-IR and HOMA-β, after adjusting for the confounding factors (r:-0.09~ -0.16, P<0.05), when it was below 2μg/day/kg. In the range of 2 to 4 μg/day/kg, the correlations between dietary Se intake and FPI, HOMA-IR, HOMA-β were significantly weakened in women (r:-0.08~ -0.14, P<0.01) and disappeared in men.

Conclusions: Our findings revealed a weak but significantly negative association of dietary Se intake with IR. Moreover, the beneficial effect was mainly significant when dietary Se intake was below 2μg/kg/day.

T-P-3214
Study on the Correlation between Instant Noodle Intake and Cardiometabolic Risk Factors of Healthy Korean University Students

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Background: South Korean people have consumed over 3.6 billion packages of instant noodles in 2013, which was the highest figure in the globe. According to the 2012 Korean National Health Statistics Report, the early mortality during the age from the twenties to the forties caused by cardiovascular disease has been increased. This study is aimed to define the correlation between instant noodle intake and cardiometabolic risk factors of healthy young men and women who are 18 to 29 years old.

Methods: A total of 3,876 subjects with the age of 18 to 29 years were selected from the same university. The subjects had gone through the same regular physical exam in 2013 and had no history of chronic disease. 2013 web survey and health check-up data including questionnaires on eating habits and health behavioral habits have been used for this study. Also, serum cholesterol subfractions, fasting glucose, blood pressure and physical data including body weight and waist circumference were measured.

Results: BMI, abdominal circumference, blood pressure, fasting glucose level, low HDL level, triglyceride level, number of metabolic syndrome components significantly increased according to the higher frequency of instant noodle intakes. Even after the control of potential confounding factors (health behavioral variables, other food intake variables), BMI, abdominal obesity, systolic blood pressure, diastolic blood pressure and serum triglyceride level have been statistically increased in accordance with the frequency.

Conclusions: This study suggests that the frequency of instant noodle intakes is significantly correlated to the cardiometabolic risk factors of healthy 18-29 year olds.
T-P-3215  
Sugar Intake in the U.S. Diet: Consumption Patterns by Type (Added vs. Naturally Occurring) and Physical Form (Liquid vs. Solid)  
Christina Brumme, Jean Welsh  
Atlanta Georgia

**Background:** The health effects associated with dietary sugars vary with some linked to positive and others to negative outcomes. As little information is available on sugar consumption patterns in the U.S., the purpose of this study was to describe consumption by sugar type (added vs. naturally occurring) and physical form (liquid vs. solid).

**Methods:** Data from the National Health and Nutrition Examination survey, and the Food Patterns Equivalence Database was used to estimate mean intake of total and added sugars for all Americans >2 y (n=16,973). Food and Nutrient Database for Dietary Studies (FNDDS) codes and descriptions were used to categorize the sugars consumed as: added (AS) vs naturally occurring (NOS) and as liquid (beverages) vs. solid (foods). In addition, all sugars were identified as being from a dairy vs. non-dairy source. Weights were applied to obtain nationally representative intake estimates that were compared across demographic subgroups. Analytical procedures to account for complex sampling methods in NHANES were used.

**Results:** Among all >2 years, mean total sugar, AS, and NOS intakes were 118 g (22.8% energy), 75.3g (14.1% energy), 42.9g (8.8% energy), respectively. Dairy products contributed 17% of total sugars (20.1g). Almost half of AS, 38.4g and slightly more than half of NOS, 25.9g, came from beverages. Milk contributed 58% (15.1g) of the NOS consumed in beverages. AS consumed in beverages decreased from 44.5g to 28.1g and NOS in juices decreased from 51.7g to 32.4g as income rose from the lowest to the highest tertile. AS consumption levels rise throughout childhood and decrease throughout adulthood.

**Conclusion:** The contribution of added vs. naturally occurring sugar and of sugar in liquids vs. beverages to the U.S. diet varies markedly by income and age. Further research is needed to better understand the impact that these differences may be having on obesity and chronic disease risk.

T-P-3216  
The body recognizes liquid calories: Systematic review and meta-analysis of the effect of solid versus liquid preloads on subsequent energy intake.  
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**Background:** A common statement underlying obesity-related advice is that “the body does not recognize liquid calories.” An alternative hypothesis is that “the body does not compensate for liquid calories to the same extent as solid calories.” We evaluated empirical evidence for these hypotheses in humans by meta-analyzing studies measuring ad libitum energy intake after a liquid, semi-solid (SS), or solid preload within the same experiment.

**Methods:** We systematically searched for randomized, crossover studies investigating calorie-containing preloads on energy intake at a subsequent test meal (intake). Intake was modeled using an inverse variance, mixed models approach, with a random effect for publications, and fixed effects of preload size, time between preload and test meal (time and time-squared), preload type, and all interactions. The 3-way interaction and the preload type-by-time interactions were not significant and were removed from the model.

**Results:** Thirteen papers met inclusion criteria (50 study arms): they included at least two of liquid, SS, or solid preloads; and reported intake (282 to 1835 kcal), preload size (20 to 430 kcal), and time (5 to 300 min). After preload, intake initially decreases with a nadir around 55 min and then increases. At small preload sizes, intake is larger after liquid than solid preloads, but differences decrease with increasing preload size until they converge (~350 kcal preloads). SS tended to track with liquids, but only 7 studies included SS. Four studies included only liquid vs SS; when these were removed, the liquid vs solid model remained qualitatively similar. Leave-one-study-out analyses showed 3 studies influenced various aspects of the model, but the qualitative conclusions remained unchanged.

**Conclusion:** These data support that liquid calories are recognized by the body, but not as well as solid calories at lower preload sizes. Insufficient data were available to estimate influences of preload composition (e.g., protein, fiber) and no-calorie preloads.

T-P-3217  
The Cost of Implementing Three Popular Weight Loss Programs in Comparison with Typical Food Expenditures  

**Background:** The cost of healthy food is widely viewed as a barrier to successful weight control.

**Methods:** To test this claim the cost of meals recommended in popular weight loss programs were priced at supermarket chains in the Greater Boston area, and values were compared to Consumer Expenditure Survey (CES) data on average daily expenditure on food for the year 2013-2014. The programs examined were the Diabetes Prevention Program (DPP), iDiet (IDI) and the Paleo diet (PD). The cost of each diet was determined for 16 days’ of meals, each day including a breakfast, lunch, dinner, and snacks consistent with the program. Prices were collected from 3 supermarkets: Whole Foods (WF), Peapod (PP), and Market Basket (MB) during the months of January and February 2015. A two-way ANOVA and single t-tests were used to assess the difference in means. P-values <0.05 were considered statistically significant.

**Results:** DPP, IDI, and PD diets cost an average of $9.25, $9.83, and $20.19 respectively per day, compared to CES’s estimated $12.80 spent per day on average. There was no significant difference between the costs of DPP and IDI, and both were significantly less expensive than PD and CES estimates. PD increased food expenditures by 105-118% compared to IDI and DPP, and costs were greater than CES’s food expenditure by an average 36.6%. There were also significant effects of the store on food prices, with WF costing 29-60.4% more than PP or MB.

**Conclusion:** Both DPP and IDI weight loss plans cost less to implement than current mean CES’s estimated food expenses, indicating that cost does not need to be a significant barrier for these weight loss plans. DPP and IDI, but not PD, appear to be reasonably priced options for weight control, especially when food purchases are made at more economical stores. Overall,
food for healthy weight control does not have to be expensive, but costs are influenced by the selected program and frequented supermarket.

**T-P-3218**
Katia Estrada-Ruelas, Tijuana Baja California, Arturo Jimenez-Cruz, Tijuana Not Listed or Not Applicable, Montserrat Bacardi-Gascon, Tijuana Baja California, Psyche Calderon-Vargas, Tijuana Baja California

**Background:** Different studies have shown a strong relationship between self-monitoring and weight loss. The objective of this review is to analyze experimental studies using self-monitoring as a strategy for weight loss.

**Methods:** A search was conducted in PubMed database of randomized controlled trials using self-monitoring for weight loss in adults, published in English and Spanish, from January 1st, 2009 to December 31st, 2014. The sample size, age, weight loss and BMI, the intervention strategy, the retention rate, duration of the intervention were recorded.

**Results:** Ten studies met the selection criteria. The intervention and the follow-up ranged from three to 12 months. The study population included subjects from 50-210. The age ranged from 18-74 years old. Weight loss ranged from 0.5 to 2.3 kg in the control group and 1.3 to 6.6 kg in the intervention group.

**Conclusions:** In this review we consistently found greater weight loss in the group with self-monitoring. These results suggest the need to use self-monitoring as a strategy for weight loss.

**T-P-3219**
The Impact a Breakfast Has on Making a Person Slim by Design
Anna-Leena Vuorinen, Ithaca New York, Camille Finn, Ithaca New York, Brian Wansink, Ithaca NY

**Background:** The importance of breakfast and its relation to weight loss success is recognized. Studying breakfast habits of people who have been at a healthy weight throughout their lives may provide new insights into obesity research.

**Methods:** Slim by Design (SBD) registry was built for the purposes of studying characteristics and behaviors of people who are at a healthy weight and do not struggle with weight problems. Data from 168 registry members (72% female, age:39 years, BMI:21.7 kg/m2) were used to analyze their breakfast patterns. Based on the frequencies of food items listed in two questions ‘When you eat breakfast, what kind of breakfast do you most often eat’ and ‘On an average day, what breakfast do you most often eat’ and ‘When you eat breakfast, what kind of breakfast do you most often eat?’ breakfast items were listed in two questions ‘When you eat breakfast, what kind of breakfast do you most often eat?’ breakfast items were categorized to 21 categories. The results are tied with findings of National Weight Control Registry (NWCR) that studied people who lost weight and successfully kept it off long-term.

**Results:** The most common breakfast items were fruits (44%), eggs (29%), bread (29%), hot cereal (28%), coffee (26%), dairy (23%) and cold cereal (18%). The average number of items for breakfast was three. Six (3%) participants responded they do not eat breakfast which is comparable with the rate of 4% of members of NWCR who never ate breakfast. Women were more likely to have fruits (p=.059), fruit consumption of SBD members was higher compared to the members of NWCR of whom 24% responded usually eating fruits. Cereal consumption (43% reported eating either hot or cold cereal) was higher than the 30% of NWCR members.

**Conclusions:** Healthy food items played a major role in breakfast habits of subjects without weight problems. Fruit and cereal consumption during breakfast were higher in Slim by Design Registry members compared to National Weight Control Registry members.

**T-P-3220**
The Type of Snack Matters: Longitudinal Associations between Snacks, Fruit as Snacks and Energy Dense Snacks and BMI Z-Score Over Time among Chinese Children and Adolescents
Lindsey Smith Taillie, Chapel Hill North Carolina, Dantong Wang, Lausanne Vaud, Barry Popkin, Chapel Hill North Carolina

**Background:** Snacking among children is linked with excessive energy intake and overweight/obesity (OVOB). Chinese snacking is rapidly increasing and shifting toward more energy-dense foods. Few studies have examined the longitudinal association of snacking and food type with child overweight/obesity.

**Methods:** Using data from 3 waves of the China Health and Nutrition Survey (2006, 2009, 2011), we used linear mixed effects models to longitudinally examine the association between snacking (none, low, medium, and high) and WHO BMI-z score among children aged 2-6 and 7-13 at baseline (2006), controlling for confounders. We also tested whether this association differed by whether children were OVOB at baseline and whether children were high consumers of fruit as snacks or energy-dense snacks (e.g. cookies, crackers).

**Results:** For OVOB children age 2-6 and 7-13y, increased snacking was associated with larger declines in BMI z-score over time (-.82 and -1.4, respectively [p<0.05]); however, for normal weight children, snacking was not associated with changes in BMI z-score. For OVOB children, top snackers 2-6y who consumed 75% snack calories from fruit showed a 2.1 increase in BMI z-score , whereas among 7-13y, fruit intake was associated with bigger declines in BMI z-score relative to non-fruit eaters (-3.1 vs. -2.3, respectively [p<0.05]). Among normal weight children, consuming 75% of snack calories from energy dense snacks was associated with a 0.09 increase in BMI z-score for 2-6y but had no association for 7-13y. For OVOB children of both age groups, non-consumers of high energy dense snacks showed larger declines in BMI z-score over time than did high consumers of energy-dense snacks.

**Conclusions:** Snacking is associated with reduced weight gain over time among Chinese children, especially for those already OVOB. However, the type of snack matters, and high energy dense snacks are associated with increased weight gain or reduced weight loss over time for normal weight and OVOB children, respectively.

**T-P-3221**
The Use of Photo Food Logs in a Pediatric Obesity Treatment Program: Development of a Reliable Scoring System
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**Background:** The use of food records for intake monitoring and weight management has been shown to be effective in adults, but anecdotal evidence suggests they can be difficult or burdensome for children and adolescents to complete. The Strong4Life Photo Food Log was developed as a novel way to assess diet quantity and quality by food groups in order to facilitate improved intake monitoring and counseling provided by nutritionists at a pediatric obesity treatment clinic. The purpose of this study was to assess the reliability of the Strong4Life Photo Food Log.

**Methods:** Five registered dietitians specializing in pediatric weight management were provided with cell phone photos of meals taken by 20 patients enrolled in an obesity treatment program. Dietitians were instructed to score each photo, providing subsection scores (fruits & vegetables, grains, proteins) and an overall plate score (range 0-100). Reliability of the instrument was assessed using intraclass correlation analysis to compare plate scores (Shrout-Fleiss reliability test of the instrument was assessed using intraclass correlation 0.70 (95%CI: 0.53, 0.85). For specific food groups, scores were even more highly correlated (Grains: ICC = 0.81 (95%CI: 0.69, 0.91); Proteins: ICC = 0.86 (95%CI: 0.76, 0.93); Fruits and Vegetables: ICC = 0.91, (95%CI: 0.83, 0.96).

**Results:** The overall plate score average measure ICC was 0.70 (95%CI: 0.53, 0.85). For specific food groups, scores were even more highly correlated (Grains: ICC = 0.81 (95%CI: 0.69, 0.91); Proteins: ICC = 0.86 (95%CI: 0.76, 0.93); Fruits and Vegetables: ICC = 0.91, (95%CI: 0.83, 0.96).

**Conclusions:** The Strong4Life Photo Food Log provides a reliable means to assess diet quality suggesting that it may be a user-friendly means of facilitating dietary counseling of youth.

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**T-P-3222**

**Understanding Determinants of Weight Bias among Dietetics and Nutrition Students**

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**Background:** Despite the increasing prevalence of obesity in the United States, negative attitudes towards obese individuals are widespread. Overweight and obese individuals are perceived as undisciplined, inactive, and unappealing. Health care providers, including dietetics and nutritionist are not exempt from showing bias towards obese individuals, which may undermine treatment and lead to subsequent psychological and health problems. The purpose of this study was to measure the extent of weight bias among dietetics and nutrition students as well as investigate its determinants.

**Methods:** A cross-sectional survey (n=286) was conducted at a large Midwestern University to assess students’ weight bias using the Fat Phobia Scale. Eating competence was measured using the ecSI 2.0 and body dissatisfaction using the Stunkard Figure Rating Scale. Other variables included experience with obesity, media exposure to health and nutrition information as well as demographic characteristics.

**Results:** About 35% of the participants had weight bias, 67% were unsatisfied with their body image and none of the participants had eating competence. Media exposure on health, obesity, media exposure to health and nutrition information and demographic characteristics.

**Conclusions:** These findings highlight that weight bias is an apparent issue among students enrolling in health related programs. Results are consistent with previous studies conducted in the United States. Considering their future role in clinical and community setting, this issue should be addressed properly.

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**T-P-3223**

**Use of Ecological Momentary Assessment (EMA) to Assess Co-Occurring Physical Activity Behaviors and Food Choices in Mothers and Children**

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**Background:** Increases in sedentary behavior and intake of energy-dense foods, which often co-occur, are implicated as modifiable health behaviors contributing to obesity risk. However, recall measures of activity behaviors and dietary intake are prone to errors and biases. This study used an innovative real-time data capture strategy, Ecological Momentary Assessment (EMA), to examine the co-occurrence of healthy and unhealthy food choices in the context of physical activity and sedentary behaviors in mother and child dyads.

**Methods:** Participants included 54 mothers (mean age=41.1, range 26-52 years) and their children (56% female, age range 9-12 years) enrolled in the Mothers and their Children’s Health (MATCH) Study. Mothers and children responded to randomly-timed EMA survey prompts via smartphone up to 7 times per day during non-school time across 7 days. EMA surveys prompted participants to report recent (past two hours) exercise/sports, use of TV/videos/video games, and the consumption of vegetables/fruits (healthy) and fast food, sugar-sweetened beverages, sweets, and chips (unhealthy). We report preliminary descriptive statistics on the co-occurrence of activity and eating behavior.

**Results:** When mothers reported recent physical activity, 43% of those prompts also reported healthy food intake, and 19% reported unhealthy food intake. When mothers reported recent TV/videos/video games, 35% of those prompts also reported healthy food intake, and 25% reported unhealthy food intake. When children reported recent physical activity, 47% of those prompts also reported healthy food intake, and 30% reported unhealthy food intake. When children reported recent TV/videos/video games, 33% reported healthy food intake, and 31% reported unhealthy food intake.

**Conclusions:** Real-time data collection methods provided preliminary evidence that unhealthy food intake may accompany physical activity almost twice as much in children as compared with mothers.

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**T-P-3224**

**Using the New “Obesogenic Food Index” to Assess the Diet Quality of Adults in Association with Frequency of Restaurant Visits**

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**Background:** There is a lack of a standardized tool that can assess the diet quality of an individual in relation to degree of weight change. We developed an “Obesogenic Food Index” (OFI), a predictive indicator of weight gain associated with daily servings of food types. We tested its construct validity using self-reports on servings/day of foods consumed and frequency of eating out (never/rarely; 1-3/mth; 1-2/wk; >3/wk) at a fast food (FF) and sit-down (SD) restaurant.
Methods: Data from 1418 adults of Wisconsin, in which we previously found a positive association between frequency of eating at FF and SD with BMI were analyzed. The OFI was developed using the findings of a meta-analysis by Mozafarain et al. that associated the weight change after 4-years with change in serving/day intake of 15 food categories. We ranked and combined food categories as: Obesity preventing foods (OPF; weight loss), Obesogenic foods I (OF I; weight gain ≥ 0.5lb), Obesogenic foods II (OF II; moderate weight gain 0.5 > 1lb), and Obesogenic foods III (OF III; weight gain >1lb). Linear regression analysis was performed to examine associations between frequency of eating at FF and SD restaurant and OFI categories.

Results: In our population, OF II foods comprised 40% of total daily servings, while healthier OPF comprised 22 % of daily servings. Frequency of eating FF was negatively associated (p<0.001) with the percent of total servings/day intake of OF II increased significantly with increase in frequency of FF (p<0.05) and remained the same once it reached ≥1-2/wk (42.4% of total serving/day). Even a small increase of 1-3 times per month of either FF or SD consumption was associated with a statistically significant increase in OF III foods.

Conclusions: The OFI tool may be used reliably by researchers and nutritionists to understand the diet quality of individuals in relation to weight gain. Validity of this index however needs to be tested using a longitudinal dataset.

T-P-3225
What Can We Learn From People Who Stay Slim Without All Of The Blood, Sweat, and Tears?
Anna-Leena Vuorinen Ithaca New York, Brian Wansink Ithaca NY

Background: Understanding health behavior of people who stay at a healthy weight without bigger weight control efforts provides a new angle for obesity research with potential to unique tips for people struggling with excess weight.

Methods: Slim by Design (SBD) registry was built for the purposes of studying characteristics and behaviors of people who are at a healthy weight and do not struggle with weight problems. Of 168 registry members (72% female; age:39 years, BMI:21.7 kg/m2) we identified a subgroup (n=93) of mindlessly slim (MS) people, defined as participants who monitored their weight ‘infrequently’ or ‘on the yearly basis’ or who responded ‘never being on diet’. Demographics, eating behavior and weight control behaviors of MS were compared to the rest of the group.

Results: Being MS was associated with male gender (p=.048) and lower BMI (p=.021) but there were no age difference (p=.851). MS people exercised less frequently (93% vs. 24% exercised 0-2 times a week, p=.06). Food intake during breakfast, lunch or dinner was not significantly different between MS people and the others but there were significant differences in eating behaviours. MS people were more likely to ‘eat lots of fruits and vegetables’, ‘only eat when hungry’ and ‘have quality home cooked food’ when they were asked ‘What are things you regularly do that help you to stay slim’. As a means to resist overeating ‘purchase food but keep out of sight’ (p=.027) and ‘discard (p=.021)’ were negatively associated with being MS. MS people became aware of their weight at older age (p=.049) and they were less likely to feel guilty after overeating (18% vs.43%, p=.001).

Conclusions: Mindlessly slim people seem to have less restrictive health behavior without preferences for certain foods. They eat only when they are hungry and prefer home-cooked foods that may be associated with lower consumption of energy-dense foods.

T-P-3226
Adolescent Obesity Risk Knowledge (AORK): Let the Discussion Begin
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Background: Studies show pediatric and family health practitioners’ assessments and interventions for adolescent weight issues are negligible relative to the magnitude of the problem. Using an easily administered measure to capture a youth’s awareness of obesity risks could provide a non-threatening introduction to a conversation between patient, parent, and practitioner.

Methods: Data were collected through self-administered questionnaires and focus groups. Using a mixed method design, a staged process led sequentially from (1) Quantitative data collection with the Obesity Risk Knowledge Scale (ORK-10), (2) focus groups, (3) scientific advisory group input, and (4) a second study using the Adolescent Obesity Risk Knowledge Scale (AORK) (adapted from the ORK-10).

Results: Ninety-four adolescents aged 12 to 15, (M = 12.8, SD = 1) reported a mean ORK-10 score 4.69 (SD = 1.63) range 0 - 10, Cronbach’s alpha = .53. Qualitative semi-structured interviews found lack of relevance and unfamiliarity with terminology for adolescents living in southern California. The AORK questionnaire augmented the ORK-10 with input from an adolescent and scientific advisory group. Eighty-three adolescents aged 12 to 15, (M = 12.9, SD = 0.82) recruited from the 3 middle schools within the southern CA school district used in Phase I completed the AORK. Mean AORK score 5.89 (SD = 2.01, range 0 – 10), Cronbach’s alpha = .68.

Conclusions: The AORK a simple, but comprehensive assessment practitioners can integrate into their practices, has the potential to initiate a discussion of a routinely avoided topic. It may be a practical intervention for increasing PCP's adherence to mandates for preventive services surrounding obesity and unhealthy lifestyle practices in families of adolescents.

T-P-3227
Alteration of Adipokines and Biomarker of Endothelial Dysfunction in Obese Mexican Adolescents with or without Insulin Resistance
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Background: Obesity-associated insulin resistance (IR) is a major risk factor for type 2 diabetes and cardiovascular disease. Abnormality of adipokines, IR and endothelial dysfunction are three pathological conditions that can co-exist, even if their cause-effect relationship is not yet clarified.

Methods: 44 obese Mexican adolescents and 52 subjects with normal weight were enrolled. The obese subjects were divided into two subgroups according to HOMA: with (n=23) or
without IR (n=21). The serum levels of soluble intercellular adhesion molecule 1 (sICAM-1), leptin and adiponectin were measured by ELISA.

**Results:** A significant increase in sICAM-1 was observed in obese with or without IR compared with that in controls. Moreover, the sICAM was significantly increased in obese with IR than that in obese without IR (512.3±115.5 vs. 423.1±111.5 ng/ml, p=0.02). Increased levels of leptin were also observed in obese with or without IR compared with that in controls (31.7±25.2, 38.5±29.9 and 12.6±13.8 ng/ml, respectively), however, no significant difference was observed between subjects with or without IR. The obese adolescents with IR also showed decreased levels of adiponectin compared with that in control (13.6±6.0 vs. 17.4±5.1 μg/ml). By Pearson analysis, sICAM-1 and leptin positively associated with weight, BMI, triglycerides, very-low-density lipoprotein (VLDL), insulin and HOMA; adiponectin associated with anthropometric variables and lipid profile in negative manner. Furthermore, sICAM-1 also positively associated with leptin in all studied subjects (r=0.235, p=0.023).

**Conclusions:** Obese adolescents with IR demonstrated more abnormality in adipokines and endothelial dysfunction compared with those without IR, which may contribute to an increased risk for developing cardiovascular diseases in later life.

**T-P-3228**

**Body Roundness Status: a Predictor for Metabolic Health in Children: Nutrition and Health Survey in Taiwan**

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**Background:** One limitation of body mass index (BMI) is unable to characterize body composition and fat distribution. Body roundness index has been proposed to measure the dimension of body width in adults. Little is known whether body roundness is a useful measure for children.

**Methods:** Based on a population representative survey on elementary school students in Taiwan (n=2544), we examined children’s body roundness status and its association with fasting plasma glucose and lipid profile. The eccentricity of a hypothetical ellipse, constructed based on the child’s height and waist circumference, was calculated to assess body roundness. Median eccentricity was the cutoff to categorize and waist circumference, was calculated to assess body roundness. Median eccentricity was the cutoff to categorize body roundness status. The greater value the eccentricity, the leaner the body shape. Measured height and weight were converted to WHO BMI-for-age Z score. Z score >±2 and >±1 defined obesity and overweight, respectively.

**Results:** Eccentricity ranged from 0.974 to 0.994, which was correlated with age in girls (correlation coefficient [r]=0.16) but not in boys (r=0.04). All obese children were with the roundness status. Meanwhile, about one-third of normal weight boys and one-fifth of normal weight girls were categorized as with the roundness status. After weight status was controlled in models, body roundness was associated with higher triglycerides (+8.5mg/dL, p=0.024 for boys) and lower HDL-c levels (-7.34mg/dL [p<0.001] for boys and -2.39mg/dL [p=0.031] for girls). The differences in triglycerides and HDL-c by body roundness status were significant in normal weight boys and overweight girls. In addition, glucose was associated with body roundness status in overweight boys only.

**Conclusions:** Eccentricity could serve as an age-independent measure of boys’ fatness. Moreover, the roundness status, derived from eccentricity, may complement the utility of BMI-based weight status as a predictor of metabolic health in children, in terms of predicting higher level of plasma glucose and lipid profile.

**T-P-3229**

**Comparability of Sleep assessment in normal-weight and obese women as measured by hip and wrist worn accelerometers**


**Background:** Accelerometers now have the dual benefit of assessing physical activity outcomes as well as sleep outcomes; both important correlates of obesity and overall health. However, where the accelerometer is worn may influence the data. Specifically, how sleep assessment differs when accelerometers are worn at the hip versus the wrist is not well-documented.

**Methods:** Utilizing 42 obese (BMI≥30 kg/m2) or normal-weight (BMI 18.5-24.9 kg/m2) women, this study compared assessment of sleep (total sleep time, sleep efficiency, number of awakenings, sleep latency) via hip-worn accelerometers versus wrist-worn accelerometers. Each participant was assessed for a single night (~7:00pm – 6:30am) wearing an accelerometer (Actigraph, LLC, Pensacola, FL) positioned at the hip and another accelerometer positioned at the wrist. Each participant verified the time retiring to bed in the evening and the moment arising from sleep in the morning using sleep records. Accelerometer data were analyzed for sleep outcomes using ActiLife data analysis software and associated algorithms.

**Results:** Using the Sadeh Equation, total sleep time was measured higher in the hip (+9%) and sleep efficiency was higher in the hip (+9%) compared to the wrist (p=0.0001). On the other hand, number of awakenings was assessed higher in the wrist (20.19 ± 6.72 awakenings) compared to the hip (5.95 ± 3.96 awakenings) and sleep latency was assessed higher in the wrist (+60%) compared to the hip (p<0.0001). The trend was similar when using the Cole-Kripe Equation. BMI level did little to influence the differences in sleep assessment between the hip and the wrist.

**Conclusions:** Where an accelerometer is placed influences sleep assessment and should be considered when utilizing these devices.

**T-P-3230**

**Comparison of Two Methods in Estimating Preconception Body Weight among Pregnant Women**

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**Background:** Retrospective studies faced huge difficulties when evaluating the effect of maternal preconception obesity and gestational weight gain (GWG) on infant adiposity and childhood obesity because of lacking of preconception weight. We tried and tested two methods of estimating preconception weight to solve the problem.

**Methods:** Pregnant women attending routine antenatal examination with complete data including preconception weight from a single hospital were recruited. Two methods were used to estimate preconception weight in 4635 pregnant women by assuming missing preconception weight. Method 1)
using LMS percentile curves of gestational weight; Method 2) the weight at first prenatal visit minus weight gain before the visit (gestational week multiplied by the rate of weight gain per week recommended by 2009 IOM). We compared preconception weight estimated by the two methods with the actual values. 

Results: The differences between actual and estimated values were 0.24±0.33kg by method 1 and 0.49±3.78kg method 2, respectively. Actual values significantly correlated with the estimated values by method 1 (r=0.86, P<0.001) and method 2(r=0.89, P<0.001). Classification of preconception BMI based on method 1 was similar with that the actual value did (χ²=2.61, P=0.46), but differed with that based on method 2 (χ²=49.85, P<0.001). The proportion of pregnant women within IOM recommendations estimated by method 1 and method 2 is similar to that the actual values did (37.73% vs. 39.70%, P=0.052; 39.93 %vs 39.70%, P=0.081), but differed in proportions of insufficient GWG (1.79% vs.11.33%, P<0.001; 5.74% vs. 11.33%, P<0.001) and excessive GWG according to IOM recommendations(60.47% vs. 48.98%, P<0.001; 56.33% vs. 48.98%, P<0.001) respectively.

Conclusions: LMS curves of GWG is helpful in estimating missing preconception body weight. Further studies are needed to test these methods and other methods to estimate preconception weight.

T-P-3231 Correlation Analysis of Visceral Fat Measured by DEXA with Serum ALT for Predicting Non-Alcoholic Steatohepatitis in a Cohort of Mexican Patients
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Background: Visceral fat (VF) secretes inflammatory substances including free fatty acids exposing the liver to accumulate them. ALT level is the most specific marker of steatohepatitis. VF might be directly related to fatty liver, and may be an independent predictor of steatohepatitis. The DEXA can evaluate the VF. The aim of this study was to evaluate the correlation between the VF measured by DEXA and the ALT levels in a cohort of Mexican patients.

Methods: Patients underwent clinical assessment. The use of hepatotoxic medication, alcoholism, liver disease other than NASH were excluded. Anthropometric and laboratory data were determined. DEXA measured VF volume and area. Descriptive and inferential statistics were utilized. P value ≤0.05 was considered as statistically significant for a two-tailed hypothesis.

Results: 68 patients were included, 44(64.7%)were female. Mean±SD age was 41.8±12.3 (15-67). Mean±SD BMI 32±6.5 kg/m2 (20.7-56.1), Normal weight in 3 (4.4%) patients, overweight in 29(42.6%), grade 1 obesity in 20(29.4%), grade 2 obesity in 7 (10.3%), grade 3 obesity in 9 (13.2%). DEXA analysis showed a mean±SD VAT mass of 835.3±371.6 g, VAT volume of 903.96±403.6 cm3, VAT area of 173.45±77.42 cm2. Laboratories showed a mean±SD of glucose 96.1±21.9 mg/dL, AIC 5.6±0.7%, cholesterol 200.9±42.9 mg/dL, LDL 121.96±26.11 mg/dL, HDL 50.9±16.9 mg/dL, triglycerides 143.74±106.2 mg/dL, ALT 32.45±20.6 U/mL. DEXA quantifications of VAT mass, vol and area resulted significantly associated to ALT levels: VAT mass (r=0.54, P=0.0001), VAT vol(r=0.54; p=0.0001) and VAT area(r=-0.35; p=0.003). Waist circumference (WC) and waist/hip index showed significant correlation with ALT (r=0.57; p<0.006 and r=0.66; p<0.0001 respectively). A greater WC correlates with higher VAT mass and vol (r=0.87 and 0.87 respectively; p<0.0001).

Conclusions: We demonstrated that VF significantly correlates with ALT levels. This establishes the VF measured by DEXA as a useful indicator for NASH.

T-P-3232 Delivery by Caesarean Section and BMI-z at Age 5 Years: Within-Family Analysis
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Background: Previously reported associations of delivery by caesarean section (C-section) with childhood obesity may be confounded by maternal BMI and sociocultural factors. To address this possibility, we assessed this association within sibling pairs.

Methods: From the CENTURY Study, a longitudinal clinical database of well-child visits from 1980 to 2008 in eastern Massachusetts linked to each child’s birth certificate, we examined the association of C-section with BMI-z at age 5 years among 16,140 siblings and their mothers from 8,070 families. We used a single linear mixed model, adjusted for mother’s age, parity and race/ethnicity and child’s age, sex, birth year, to decompose the total association into a within-family component and an additional between-family component. The outcome was observed BMI-z at 5 years.

Results: 7943 (49.2%) of the children were female, 3204 (19.9%) were delivered by C-section, and mean (SD) childhood BMI-z at was 0.48 (1.00) at a mean age of 5.3 (0.3) years. 3059 (23.6%) of the mothers were non-white and mean (SD) age was 31.1 (4.8) years. The within-family association of C-section v. vaginal delivery was 0.04 higher BMI-z at 5 years (95% CI -0.04, 0.11) and the additional between-family association was 0.13 (95% CI 0.04, 0.22).

Conclusions: The within-family effect of C-section was small, suggesting that previously reported C-section-childhood obesity associations may be confounded by unmeasured variables such as maternal BMI and sociocultural factors. This study highlights advantages of linking clinical and vital statistics databases to examine early life risk factors for obesity.

T-P-3233 Development and Validation of the Weight Management Practices Scale
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Background: The latest Food and Health Survey (2012) found 80% of Americans actively trying to manage their weight, with 55% trying to lose and 22% trying to maintain. This 80% is a diverse group that includes overweight people trying to shed pounds, healthy weight people working to maintain weight and under- or healthy weight people trying to increase muscle mass or suffering from disordered eating. Weight management practices are numerous and include, reducing intake of foods, increasing physical activity, use of diet aids, or practicing the latest fad diet. Although, instruments for assessment of eating...
disorders exist, there is no reliable and valid way to assess the range of behaviors employed for managing weight in more general samples. Accordingly, we report on the development and validation of the Weight Management Practices Scale (WMP), for the general assessment of weight management behaviors.

Methods: Students at two universities completed instruments for course credit, including items for the WMP and multiple other scales. Study 1 (N = 238) provided data for exploratory factor analyses; whereas Studies 2 (N = 439) and 3 (N = 500) provided data for confirmatory factor analyses.

Results: Study 1 suggested nine factors and the confirmatory studies showed good overall fit (CFI = .887 and .929, RMSEA = .065 and .053, respectively). Levels of internal consistency were acceptable (all alpha > .70) and consistent correlations with similar measures.

Conclusions: The WMP scale offers a valid and reliable alternative to single item indicators for the comprehensive assessment of weight management practices.

T-P-3234
Development of a Measure of Mindful Eating for Adolescents and Young Adults
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Background: Mindful eating has received attention as a promising weight control strategy, however research on mindful eating among non-adult samples is limited and tools which measure the presence or absence of mindful eating skills among adolescents and young adults (AYA) are not available.

Methods: We adapted an existing adult measure of mindful eating to include language appropriate for an AYA audience. We then conducted cognitive interviews with 20 male and female AYA (ages 14-24) to evaluate whether questions were clear and similarly understood among participants. We adapted/generated questions based on findings from the cognitive interviews to generate a 21-item pool which we administered to a clinical sample of AYA (ages 12-25) at Boston Children’s Hospital with BMIs ranging from underweight through severely obese (mean [SE] BMI: 26.8 [7.4], range: 16.9-64.1). We eliminated items with a highly skewed distributions, examined internal consistency, and conducted an exploratory factor analysis.

Results: A factor analysis of responses from 141 participants suggested the creation of a 14-item scale with 3 subscales (eating in the absence of hunger, lack of awareness while eating, distraction). An internal consistency analysis of the 14-item scale showed a Cronbach’s alpha of 0.703. Two of the subscales showed good internal consistency (eating in the absence of hunger: α = 0.828; lack of awareness while eating: α = 0.829), while the distraction subscale had acceptable internal consistency (α = 0.655). Scores from the 14-item scale (higher item scores represent lower mindful eating skills) were correlated with BMI in the sample (r = 0.313; p < 0.001), as were scores on the distraction subscale (r = -0.449; p < 0.001).

Conclusions: Initial development of a measure of mindful eating for AYA resulted in a 14-item measure with good internal consistency. Ongoing psychometric testing of the new measure is needed to establish validity and test-retest reliability.

T-P-3235
Differences in Weight Classification and Dangerous Implications for Critically Ill Children
Shan Ward San Francisco California, Heidi Flori Oakland CA

Background: Several studies have associated childhood obesity with longer hospital stays and increased infection rates. Acute Respiratory Distress Syndrome (ARDS), a disease with a high mortality rate of 22% in children, often represents the most critically ill children in the Pediatric Intensive Care Unit (PICU). The two interventions proven to reduce mortality, namely antibiotics and low tidal volume ventilation, greatly depend on weight and body mass. Our aim is to understand the prevalence of obesity in the PICU and create a cohesive and accurate obesity definition to standardize care and research methodology.

Methods: Five previous multicenter studies (2 clinical trials, 3 observational) were combined to create a cohort of 711 children admitted to the PICU with ARDS. Subjects older than 2 years were included and classified based on CDC z-score criteria (<-1.89 = underweight, -1.89 to +1.04 = normal weight, +1.05 to +1.64 = overweight, ≥1.65 = obese) and WHO criteria (for ages <5 years: <-2< = underweight, -2 to -1.99 = normal weight, -1.99 to +2 = overweight, ≥2 = obese; for ages ≥5 years: <-2< = underweight, -2 to +0.99 = normal weight, +1 to +1.99 = overweight, ≥2 = obese). We compared the prevalence of each BMI category as defined by CDC vs. WHO criteria with chi square analysis.

Results: 331 subjects were older than 2 years and included in the analysis. By CDC criteria 12% were underweight, 49.9% were normal weight, 10.6% were overweight, and 27.5% were obese. By WHO criteria 11.8% were underweight, 52.9% were normal weight, 19.3% were overweight, and 16% were obese. The categorization differences between the CDC and WHO definitions were statistically significant (p<0.0001).

Conclusions: The prevalence of obesity in critically ill children remains shockingly high. With many critical interventions being dependent on weight characteristics, it is imperative that we formulate an accurate, uniform measurement of weight classification to enhance the quality of both clinical care and research these patients.

T-P-3236
Disparate Weight Gain Associations with Self-Selected and Randomly Assigned Food Consumption in Mice: Can One Confidently Infer Causality from Even the Ultimately Well-Conducted Observational Study?
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Background: Establishing cause and effect relationships between outcome and exposure variables is a key goal in biomedical and behavioral research. Randomized experiments are the “gold standard” to establish such relationships, but are sometimes impractical. We conduct an animal study to evaluate whether an observational study which is rigorously controlled and executed beyond any human epidemiologic observational study will find the same causal effect as would a corresponding randomized experiment.

Methods: Sixty singly housed, eight-week-old male mice (CD1) were randomly divided into 30 pairs for a two-week feeding regimen. Within each pair, one animal was randomly

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assigned to be in a self-selection group (S) where the animals could choose how much of some food they ate; and the other animal was in a randomization (R) group where the animals were fed with the same diet that their randomly assigned S-partners ate the day before. Within the S group alone, we have an observational study of the association of self-selected levels of food with weight gain; while within the R group alone, we have an experimental study on the causal effect of randomly assigned levels of food on weight gain. Linear regression models evaluated the association of food consumption with weight gain in each group.

**Results:** For animals in S group, total food consumption is significantly associated with weight gain after two weeks (P=0.001), conditioning on baseline body weight. However, there is no significant effect of total food consumption on weight gain detected for the animals in R group. There is a significant group-by-food consumption interaction for the weight gain in each group.

**Conclusions:** The disparate results of the observational association estimates and the experimental effect estimates indicate that even the most meticulously controlled observational study, which can hardly be applied to human beings, cannot reliably be counted upon to estimate causal effects.

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**T-P-3237**

**Establishment of Gestation Weight Gain Reference Percentile Curves in Chinese Pregnant with Health Delivery Outcome by LMS Method**

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**Background:** To construct growthcentile curves of gestation weight gain (GWG) based on longitudinal data from a representative healthy pregnant women with low/normal/high pre-pregnant BMI in Shanghai.

**Methods:** A retrospective data of 2992 healthy pregnant women was selected from antenatal clinics in urban regions in Shanghai. Serial anthropometric measurements were made ater every antenatal visit and in the last prenatal control. Healthy pregnant women were defined as 1) pre-pregnant weight was recorded; 2) fasting glucose at 2nd trimester<5.6 mmol/L; 3) without adverse maternal or neonatal complications, such as gestational diabetes, fetal distress, low birthweight(<2500g), preterm, or macrosomia; 4) Apgar scores in 1 min and 5 min was above 9. Centile curves of body weight by gestational age were developed using the LMS method for low (pre-pregnancy BMI<18.5 kg/m²), normal (pre-pregnancy BMI=18.5 kg/m² and <24 kg/m²) and high BMI group (pre-pregnancy BMI>24 kg/m²) respectively.

**Results:** Centile curves of weight gain for the three groups were in similar shape. Mean weight gain at 38 weeks of gestation was 15.64 kg in low- (n=666), 16.05 kg in normal- (n=2109) and 14.9 kg in high-BMI group (n=217). In normal-BMI group, weight values of the 5th and 95th centiles were 48.6 kg and 61.4 kg at pre-pregnancy, 55.4 kg and 70.9 kg at 24 weeks, and 62.5 kg and 79.8 at 38 weeks, respectively. The 10% low-, 25.5% normal- and 44.7% high-BMI group exceeded the IOM recommended GWG.

**Conclusions:** Considerable proportion of Chinese pregnant women have excessive GWG according to IOM recommendation even with normal delivery outcomes. Those curves are first weight gain reference percentile curves for Chinese pregnant women and could help in improving pregnancy weight management.

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**T-P-3238**

**Estimating Adiposity in Children Using Both BMI-for-Age Z-Scores and Quantitative Nuclear Magnetic Resonance**

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**Background:** Anthropometric measures and BMI-for-age Z-scores (BMIZ) are commonly used to estimate adiposity in children in clinical practice. In research settings, measures of adiposity are better estimated using air displacement plethysmography, dual energy X-ray absorptiometry or quantitative nuclear magnetic resonance (qNMR). The latter has been previously standardized for repeated measures throughout infancy and childhood and does not expose the participants to radiation. In the present report, we compared BMIZ and qNMR fat mass results in children age 2 to 60 months.

**Methods:** 552 children (283 boys and 269 girls) from two separate cohorts (Beginnings and Glowing) were assessed at 2, 3, 6, 9, 12, 24, 36, 48 and 60 months using standardized anthropometric measures and qNMR (EchoMRI-AHTM, Echo Medical Systems). A total of 2,189 scans were performed and BMIZ were calculated using WHO software.

**Results:** Children were mostly Caucasians (87%), with mean birth weights of 3.3 ± 0.4 kg and mean birth lengths of 51.0 ± 2.3 cm. There were no significant differences in percent fat mass estimates related to behavior during the measurements (calm or crying). BMIZ were significantly correlated with fat mass, percent fat mass and fat free mass at each age (P<0.001). The weakest correlations were seen at 6 months (r²=0.711, 0.569, and 0.376, respectively) and the highest were seen at 60 months (r²=0.806, 0.664 and 0.583, respectively). The variance of fat mass percentage varied considerably by age and BMIZ. In our sample, the lowest variance observed was 4.2 for BMIZ=2 at 3 months and the highest variance observed was 48.8 BMIZ=2 at 48 months.

**Conclusions:** While BMIZ is highly and significantly correlated with measures of adiposity obtained by qNMR, the variance of percent fat mass for each BMIZ category is very high. These data suggest that predictive models using clinical parameters would improve clinicians’ evaluation of children’s adiposity rather than relying solely on BMIZ.

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**T-P-3239**

**Evaluation of a Novel Bluetooth Bioimpedance Analysis Device Designed for mHealth Applications**


**Background:** Body fat and skeletal muscle mass measurement is of increasing interest in the clinical setting and to the general public. The aim of the current study was to evaluate the feasibility of developing a small portable wireless contact-electrode Bioimpedance Analysis (BIA) system designed for personal body composition analysis.
Methods: A hand-held multifrequency device was evaluated that included two electrode configurations (palm-to-palm [PP] and finger-finger [FF]). Impedance (Z) values derived by the device at Pennington Biomedical Research and Samsung Medical Centers were evaluated against corresponding device at Pennington Biomedical Research and Samsung and finger-finger [FF]. Impedance (Z) values derived by the electrical pathways measured using a gel-electrode reference multifrequency BIA system (InBodyS10 [IB], Seoul, South Korea) in 532 (224 M, 308 F) healthy white (82 M, 132 F), black (21 M, 52 F), and Asian (121 M, 124 F) adults ranging widely in body mass index. Additionally, the main traditional lean soft tissue mass (LST) and fat-predictor variable height^2/Z was examined relative to LST evaluated with dual-energy X-ray absorptiometry (DXA; GE Lunar Prodigy, Madison, WI).

Results: There were strong correlations between the two prototype pathways at 50 KHz and corresponding IB arm-arm electrical pathway (R2, 0.80-0.90, p<0.0001). There was a significant sex covariate in models predicting LST from Height^2/Z and age within each ethnic group. Sex-specific models were additionally developed that included significant race covariates. LST prediction models based on height^2/Z, age, and race for the PP and FF pathways had similar magnitude correlations (R2, 0.79 and 0.73) as that observed for the IB reference system (0.80; all p<0.001).

Conclusions: The novel evaluated BIA system as a small form factor mobile device thus shows promise as a means of quantifying an individual’s body composition and predicting percentage fat without body weight measurement.

T-P-3240-DT
Kamika Reynolds Chapel Hill North Carolina, June Stevens Chapel Hill North Carolina, Christina Shay , Cora Lewis Birmingham AL

Background: Assessment of percent body fat (%BF) by highly precise methods such as Dual-emission X-ray absorptiometry (DXA) is often not feasible. Recently, Stevens et al. developed gender-specific equations to predict %BF using data from NHANES 1999-2006. The purpose of this study is to evaluate their external validity in a population-based, racially-diverse, young adult cohort.

Methods: Data were from 392, 28-40 year old black and white men and women who participated in the Coronary Artery Risk Development in Young Adults (CARDIA) 1995-96 exam. Variables assessed in CARDIA included demographics, height, weight, waist and arm circumferences, and triceps and subscapular skinfolds. These variables were used in gender-specific equations to predict %BF, which we then compared to observed values measured by DXA in the CARDIA participants.

Results: Overall, the predicted and observed %BF values were strongly associated, although the R-squared values (0.71 in men and 0.77 in women) were lower than those from the internal validation in NHANES (0.84 in men and 0.80 in women). R-squared estimates from the external validation were very similar to those from internal validation in white and black women (differences 0.02 and -0.05, respectively), but were lower in white and black men (-0.19, -0.10, respectively). Mean Signed Differences (MSD) indicated that bias was low (within +/- 1 %BF) in white men and women, but mean %BF was significantly overestimated by 1.2 percentage points in black men (2% of mean %BF) and underestimated by 1.4 percentage points in black women (4% of mean %BF).

Conclusions: This was the first study to evaluate the external validity of equations for prediction of %BF recently developed in the NHANES data. Our results suggest that the equations are applicable to an independent sample and provide a reasonable method for assessment of % BF when more precise methods are not feasible.

T-P-3241 - Withdrawn

T-P-3242
Low level plasma free essential amino acids as a potential risk factor for obesity and brain infarction

Background: We previously reported that plasma free amino acid (PFAA) profiles were closely associated with future development of metabolic syndrome and related diseases. Among them, essential amino acids (EAAs) are possible target for preventive intervention by diet to control the plasma level. However, only poor information is available both for adequate plasma levels of EAAs.

Methods: PFAAs were quantified in total of 7,685 Japanese subjects using liquid chromatography - mass spectrometry. Among them, 3,885 subjects were chosen as reference individuals based on exclusion criteria. Box - Cox transformation coefficient were estimated in each plasma EAA level of reference individuals with stratification by gender. Using coefficients, plasma EAA levels of 4,297 Japanese cohorts were normalized. This cohorts were followed-up for four years after baseline examination, and using each normalized plasma level of EAA as explanatory variable, logistic regression analysis was conducted to estimate age-, gender-, and BMI- conditioned risk of obesity (Ob) or brain infarction (BI).

Results: Among 4,297 Japanese cohorts, 14.5% subjects that one or more than plasma EAA levels were lower than average by >2SD were observed and it was also suggested that those subjects were at risk for malnutrition. By means of logistic regression analysis, significant elevation of risk for Ob and BI was detected in the subpopulations in whom low level plasma EAA was observed. Low plasma level of arginine, lysine, methionine, or threonine caused elevation of risk for Ob, and that of histidine, methione, or phenylalanine caused elevation of risk for BI, respectively.

Conclusions: Since EAAs are ingested only via diet, these results described above suggest that under-ingestion of EAAs caused Ob and BI. Therefore adequate ingestion of dietary EAAs may prevent future onset of these symptoms.

T-P-3243
More Than the Mean: Reviewing Regression Methods that Take a Wider View of the Association between BMI and SES
Gregory Pavela Birmingham Alabama, Julie Locher Birmingham AL, David Allison Birmingham AL
**Background:** The inverse association between body mass index (BMI) and socioeconomic status (SES) in wealthy countries has been established, in part, through analytic methods that model the conditional expectation (mean) of a dependent variable as a function of one or more predictor variables. These methods may lead researchers to overlook important variations in the association between SES (and other variables of interest) and BMI which may provide insight into the causal mechanisms generating the association. We review four methods available to analyze the association between BMI and other variables at locations in the distribution of BMI other than the mean: multinomial logistic regression, continuation-ratio logistic regression, conditional quantile regression, and unconditional quantile regression.

**Methods:** Using data from the 2006-2008 Health and Retirement Study, we estimate the association between BMI calculated from technician-measured height and weight and three standard indicators of SES: education, household income, and household wealth. For comparison, we first estimate the association between BMI and SES using standard linear regression (OLS). We then estimate the association using the four techniques which model something other than the conditional mean function of BMI.

**Results:** The association between BMI and SES varies by level of BMI, indicating that a focus on the conditional mean can overlook important information. For example, results from the continuation ratio model indicate that among females, education is significantly associated with a reduced likelihood of advancing to a higher weight among those that are normal BMI. These methods can offer a more nuanced view of the association between BMI and SES, as well as other variables of interest.

**Conclusions:** Researchers have several options to choose from when estimating an association between BMI and other variables, many of which do not model the conditional mean of BMI. These methods can offer a more nuanced view of the association between BMI and SES, as well as other variables of interest.

**T-P-3245**

**Personalized Indirect Calorimeter for Energy Expenditure (EE) measurement and use under free-living conditions**

**Erica Forzani Tempe AZ**

**Background:** A personal indirect calorimeter allows everyone to assess resting energy expenditure, thus enabling accurate determination of a person’s total calorie need for weight management and fitness. The aim of this study is to: 1- compare the performance of a new personal metabolic rate tracker based on indirect calorimetry, Breezing®, with the Douglas bag method, the gold standard method for energy expenditure (EE) measurement; 2- present study cases, using the tracker

**Methods:** Energy expenditures (EE) at rest and during activities, and respiratory quotient (RQ) were measured for 12 healthy subjects, including 7 males and 5 females under different living conditions. A total of 314 measurements were performed with Breezing®, and the results were compared with those by the Douglas bag method. In addition, study cases for hormonal disorder, pregnancy, weight loss, and exercise are presented.

**Results:** R-squared correlation coefficients (R2) between the data obtained with Breezing® and the Douglas bag method were 0.9976, 0.9986, 0.9981, and 0.9980, for VO2, VCO2, EE, and RQ respectively. The study cases demonstrated the scientific value of the tracker use under free-living conditions, bringing new insights about the individual’s physiology, and effects of interventions, including drug treatment, diet, and exercise.

**Conclusions:** The EE and RQ values determined by Breezing® are in good agreement with those by the Douglas bag method. The use of a mobile metabolic rate tracker in free-living conditions brings more information to professionals. The information collected by the individuals at home, and shared with the professionals increases the precision of the individual’s health assessment, and therefore, the intervention practices can become more efficient.
Conclusions:
Plateaued.
connectivity scores, after which risk increased and then measures. Risk of obesity declined in the lower range of for the marginal effect of two of the three street connectivity risk (BMI>30) were conducted. A variety of individual (e.g., age, race, physical activity) and contextual (i.e., population density, street connectivity, unhealthy food outlets, crime, concentrated disadvantage (CDI), poverty) variables were included. Three measures of street connectivity were jointly considered given the complex nature of the relationship. Variables with significant associations with obesity were included in the final MART analysis with logit link exploring indirect (i.e., mediating) effects.

Results:
Among the contextual variables only the CDI (β=0.11; SE=0.03) and the joint effect of the street connectivity measure (β=0.05; SE=0.02) had significant effects, accounting for 20.4% and 9.26% of the disparity, respectively. Blacks tend to live in neighborhoods characterized by higher street connectivity, which should reduce not explain the disparity, so result was unexpected. MART analyses explained this in terms of nonlinear relations for the marginal effect of two of the three street connectivity measures. Risk of obesity declined in the lower range of connectivity scores, after which risk increased and then plateaued.

Conclusions: The findings suggest a complex relationship between street connectivity and obesity risk and its potential mediating effect on the black-white disparity in obesity. The findings suggest that for some measures of street connectivity risk of obesity increases at the higher levels. Consequently, the tendency for blacks to reside in city centers may explain the disparity in obesity risk.

T-P-3248
Understanding the Unmet Healthcare Needs of Patients with Obesity Using the Experience Group Research Tool
Scott Wallace Hanover NH, Deborah Kennedy Lebanon NH, Karen Huycck Lebanon NH, Cathleen Beaver Hanover New Hampshire, John Batsis Lebanon NH, Richard Rothstein Lebanon NH

Background: Not addressing needs and experiences of patients limits the effectiveness of treatment of chronic disease. Experience Groups (EG) is an innovative qualitative research method for identifying unmet patient needs to improve care. Unlike focus groups that test existing or planned products or services, EG help create new healthcare solutions. The EG technique has been applied successfully to many chronic diseases but not obesity.

Methods: To understand unaddressed needs and obstacles to better health related to obesity, we conducted three 90-minute EG sessions comprised of four to seven participants. Participants were enrolled through newspaper ads seeking individuals interested in discussing weight and improved health. All sessions were led by a co-creator of EG and followed the EG protocol. Discussions from each session were analyzed to identify categories of patients and patterns of unmet needs.

Results: Four categories of patients were identified and assigned a casual name to describe shared characteristics: (1) Accelerated Agers expressed distress that their quality of remaining life would be diminished by obesity, (2) the Psychologically Obstructed described long-standing psychological pain, (3) the Medically Challenged described serious long-term health challenges that prevented successful weight management, and (4) the Intrinsically Motivated were succeeding in a current weight loss effort. Improved function and quality of life were the primary goals among all participants.

Conclusions: The variation in the needs of patients with obesity suggests that multiple care approaches to weight management are needed. Moreover, many physiological, psychological, and lifestyle goals identified by EG participants could be achievable without weight loss. Further defining subgroups of patients with obesity and addressing their unmet needs through innovative healthcare solutions is critical for improving patient outcomes and decreasing the cost of obesity-related care.

T-P-3249
Usefulness of visceral fat mass measurement by DXA
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**Background:** Visceral adipose tissue (VAT) was associated with adverse health effects including cardiovascular disease and diabetes. We evaluated the usefulness of VAT measurement in predicting the diabetes, comparing with waist circumference.

**Methods:** The data from Korea National Health and Nutrition Examination Survey (2009) 4,431 subjects (aged over 20 years old and without type 2 diabetes) were analyzed. Insulin resistance was measured by the homeostasis model assessment of insulin resistance.

**Results:** HOMA-IR also had positive correlated with DXA-VAT (men: r=0.255, p<0.001; women: r=0.237, p<0.001). According to regression between HOMA-IR and DXA-VAT, HOMA-IR value is 2 is matched with 101 cm2 (men) and 86 cm2 (women). Conventional waist circumference reference value was associated with 1.5 times (men, p=<0.001) and 1.9 times (women, p=<0.001) of increasing diabetes risk. However, DXA-VAT reference (matched with HOMA-IR =2) was associated with 2.4 times (men, p=<0.001) and 2.5 times (women, p=<0.001) of increasing diabetes risk.

**Conclusions:** DXA-VAT is useful method to predict the risk of diabetes. Comparing with waist circumference, DXA-VAT was respected to suprior than waist circumference.

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**T-P-3251**

**Visceral Adipose Tissue Accumulates Rapidly When Percent Body Fat Exceeds 30% in Women and 16% in Men Aged 18-59 Years**

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**Background:** Greater visceral adipose tissue (VAT) is associated with cardiometabolic risk, independent of total fat mass and subcutaneous fat. It was recently suggested that VAT does not accumulate linearly as percent body fat (PBF) increases, but rather that there are sex-specific, biological thresholds of total body fatness, below which VAT accumulation is minimal, and above which VAT tends to rapidly increase. Replication of such thresholds would provide a useful target defining “safer” levels of total body fatness. The present analysis tests the cut-point (CP) hypothesis in a cross-sectional sample of 1,251 healthy White and African-American adults (546 males, 706 females; 134 African-Americans) aged 18-59 yrs (mean age 39.2±12.5 yrs) from three studies examining the relationship of ectopic fat accumulation to cardiovascular risk.

**Methods:** PBF was determined using dual energy x-ray absorptiometry (DXA) from a Hologic QDR 4500 Elite X-ray densitometer (Hologic, Bedford, MA). VAT was assessed using multiple-image MRI (Siemens Magnetom Vision 1.5-T, Mississauga, Canada), and using a T1-weighted fast-spin echo pulse sequence. Images were obtained every 10-mm from the T9 vertebrae to the SI vertebrae. Change-point modeling in SAS Version 9.4 using PROC MCMC identified PBF CPs, adjusted for age, race, and in women, menopause status, above which VAT accumulation significantly increased, using mixing, autocorrelation and posterior density plots to confirm model adequacy. Piecewise regression was then used to calculate the VAT slope below and above the CP defined in the change-point model.

**Results:** Among females, VAT increased systematically above 30% (β=0.035, SE=0.007; above: β=0.136, SE=0.008). Among males, VAT increased above 16% (below: β=0.135, SE=0.019; above: β=0.242, SE=0.013). The VAT prediction supports a target 30% body fat or lower in women and 16% or less in men 18-59 yrs of age for reduction of VAT accrual.

**Conclusions:** Compared to previous criterion validations of VAT, this study identifies changes in WC percentiles across a decade in children and adolescents of African-American (AA), European-American (EA) and Mexican-American ethnic backgrounds.

**Methods:** Data from the National Health and Nutrition Examination Survey.
Examination Survey (NHANES) from 2005 – 2012 was used to evaluate WC measured at the right iliac crest among non-institutionalized US children and adolescents self-classified as AA (n=3498), EA (n=3686) and MA (n=3549). Percentile regression was used to model the regression lines of the 10th, 25th, 50th, 75th, 85th, 90th and 95th percentiles of the distribution of WC according to race/ethnicity and sex for age 2 - 18. Descriptive trends in WC percentile distributions across time were identified by comparing present study data with previously reported (2004) data for boys and girls at every age within ethnic group.

**Results:** WC increased in a monotonic fashion in all children with significant differences in the slope trajectory across age among AA, EA and MA boys and girls. When changes across a decade were evaluated, a clear left shift of percentile categories was observed such that values that used to be in the 90th percentile are now in the 85th percentile. AA and MA girls exceeded the WC cutoff value for obesity-related disease risk in adults at as early as 11 years of age.

**Conclusions:** WC has increased in the past decade in the US pediatric population. Given that no increase in the prevalence of pediatric obesity in the US has been reported, our data raises the potential concern of having stable-weight children with a distribution of body composition that places them at risk of disease.

**T-P-3253**

*Why are Men Uninterested in Weight Loss? : Crowdsourcing Provides a Unique Approach to Understand Why*

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**Background:** Men are less likely to participate in obesity treatment interventions, are less likely to engage fully when they do and often fail to lose clinically significant amounts of weight. There is a need to identify evidence-based approaches that actively engage men in initial weight loss and successful maintenance. Internet-based research is a low-cost, efficient way to produce novel hypotheses related to weight loss that have previously escaped weight loss professionals. The purpose of this study was to facilitate intervention development by using crowdsourcing to detect unexpected beliefs and unpredicted barriers to male weight loss.

**Methods:** Participants were recruited to a crowdsourcing survey website where they reported their gender and BMI. Users then responded to questions that were likely to help predict their BMI and also proposed new questions thought to be related to the outcome of interest. Other users subsequently answered these new questions. Over 2 weeks, 522 users joined the website and proposed 192 questions. 188 were approved and added to the survey.

**Results:** Participants provided 21,846 responses to 193 questions. Correlations were calculated between users’ reported BMI and question responses to establish associations between the crowd-sourced questions and BMI. Spearman and Pearson correlations were calculated for categorical questions, and numerical and ordinal questions, respectively. 54 questions significantly correlated with BMI (p<0.05), 33 of which were significant to p<0.01. While several common themes seen in prior research were revealed such as previous health diagnoses and physical activity participation, other potential weight determinants such as dietary habits, sexual behaviors and self-perception were reported.

**Conclusions:** Crowdsourcing in this context provides a mechanism to further investigate perceptions of weight and weight loss interventions in the male population that have not previously been documented. These insights will help guide future intervention design.

**Thursday, November 5, 2015**

**Posters on Display: 6:00-7:30 PM**

**T-P-3254**

*Adipocyte-Breast Cancer Cell Interactions: Preventive Effects of Omega-3 Fatty Acids*

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**Background:** Postmenopausal women with obesity face a higher risk of developing breast cancer than non-obese women. We hypothesized that inflammatory cytokines secreted from fat cells may negatively impact breast cancer cells. Furthermore the anti-inflammatory omega-3 fatty acid, eicosapentaenoic acid (EPA) will reduce adipocyte-secreted cytokines thereby reducing breast cancer cell metabolism.

**Methods:** To test this hypothesis, we tested the effects of conditioned media from 3T3L1-differentiated adipocytes or human mesenchymal stem cells (HMSC) on MCF7 and MDA-MB-231 breast cancer cells treated with and without 100uM EPA. To determine effects of the adipocyte conditioned media on breast cancer cell energy metabolism, glycolytic activity was measured using the XFe24 Seahorse extracellular flux analyzer.

**Results:** Conditioned medium from HMSC significantly increased interleukin 6 (IL-6) mRNA content in MDA-MB-231 but not in MCF-7 cells. Further, conditioned medium from 3T3L1 cells did not affect IL-6 mRNA levels in MCF-7 cells. Conditioned media from EPA-treated adipocytes reduced IL-6 and monocyte chemoattractant protein-1 (MCP-1) secretion from MCF7 cells. Glycolysis as estimated by extracellular acidification rate was significantly reduced in MCF7 cells exposed to conditioned media from 3T3L1 adipocytes and adipocytes treated with EPA.

**Conclusions:** Adipocyte-secreted factors increase breast cancer cell inflammation. Importantly, the anti-inflammatory dietary EPA reduced breast cancer cell metabolism. Preventive effects of EPA in post-menopausal obesity-associated breast cancer merits further investigation.

**T-P-3255**

*Enhanced Expression of IL-6R/IL-6 in Subcutaneous Adipose Tissue of Non-Diabetic Obese Individuals: Significance for Metabolic Inflammation*

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**Background:** Obesity is marked by a state of low-grade chronic inflammation called metabolic inflammation that leads to the increased synthesis and release of proinflammatory cytokines, inflammatory proteins and hormones. IL-6, secreted by both adipocytes and resident adipose tissue macrophages (ATM), is a pleiotropic cytokine involved in both hematopoiesis and host defense mechanisms. ATM can be classified using proinflammatory (IL-6, TNF-a, MCP-1), anti-
Adipocyte size and total macrophage (r=0.51, p=0.03) populations but a positive correlation exists between femoral and abdominal adipocyte size and adipose tissue macrophages (ATM) (r=0.87, p=0.001). There was no significant differences between tissue content of total, M1, and M2 ATM's between abdominal and femoral depots. We found a positive correlation between abdominal and femoral tissue; 18±2% of these were M1 and 25 ± 5% of these were inflammatory (CD163), and general (CD11b, CD68) markers. Notably, circulatory IL-6 modulations in obesity have been previously reported however, the changes in adipose tissue expression of IL-6 receptor (IL-6R) with IL-6 in obesity and their relationship with signature inflammatory markers in this compartment remain unclear.

**Methods:** Subcutaneous adipose tissue biopsies were collected from lean, overweight and obese individuals. The expression of IL-6R, IL-6, TNF-α, MCP-1, IP-10, CD11b, CD163, and CD68 was detected by immunohistochemistry; results were also confirmed by RT-PCR and confocal microscopy. The data were compared using unpaired t-test and the dependence between two variables was assessed by Pearson’s correlation test. 'P' values <0.05 were considered significant.

**Results:** Obese individuals showed significantly higher IL-6R protein expression in the adipose tissue as compared with lean/overweight subjects (P<0.0001). The IL-6R expression correlated positively with body mass index (P<0.0001) and percent body fat (P=0.003). RT-PCR (P=0.0453) and confocal microscopy further corroborated the findings of immunohistochemistry. IL-6 protein expression (P=0.03) along with its gene expression (P=0.0108) was also enhanced in obese adipose tissue. The changes in IL-6R/IL-6 expression correlated significantly with adipose tissue expression of CD11b, CD163, TNF-α, MCP-1 and IP-10.

**Conclusions:** It was concluded that obesity was a positive modulator of IL-6/IL-6R expression in the adipose tissue which might be a contributory mechanism of metabolic inflammation.

**T-P-3256**

**Femoral Adipose Tissue Macrophage Population: Crucial Measurement for Adipose Tissue Inflammation?**

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**Background:** Previous studies have described a correlation between abdominal adipose tissue macrophages (ATM) and obesity. These studies analyzing ATM content in the abdominal subcutaneous depot suggest that a pro-inflammatory state is a key contributor to chronic disease. Femoral adipose tissue, largely thought to be protective against metabolic harm, has not been assessed.

**Methods:** We optimized a flow cytometry protocol to measure the ATM populations in tissue collected via needle biopsy. We measured the number of total (CD68), pro-inflammatory (M1) (CD14) and anti-inflammatory (M2) (CD206) ATM’s per gram of tissue in abdominal and femoral depots. Samples were collected from 21 (5 men) obese (BMI=33.7±1.9) adults age 24-55.

**Results:** Abdominal total ATM’s averaged 10.49±1.805/g tissue; 18±2% of these were M1 and 25 ± 5% of these were M2. Total femoral ATM’s averaged 13.412 ± 2.084/g tissue, of which 15 ± 2% were M1, and 18 ± 2% were M2. There were no significant differences between tissue content of total, M1 and M2 ATM’s between abdominal and femoral depots. We found a positive correlation between abdominal and femoral total ATM (r=0.58, p =0.01), M1 ATM (r =0.76, p=0.001), and the ratio of M1:M2 ATM (r=0.87, p=0.001). There was no relationship between abdominal adipocyte size and ATM populations but a positive correlation exists between femoral adipocyte size and total macrophage (r=0.51, p=0.03), M1 ATM (r =0.49, p=0.0001), and the ratio of M1:M2 ATM (r=0.79, p=0.001). Visceral fat was positively correlated with abdominal M1 (r=0.67, p=0.04) and negatively correlated with abdominal M2 ATM (r=0.45, p=0.05). Leg fat mass was positively correlated with the femoral M1:M2 ratio (r=0.58, p=0.04) for females only.

**Conclusions:** Surprisingly, abdominal and femoral ATM content is similar in absolute number and positively correlated. These results suggest that adipose tissue inflammation is not limited to abdominal subcutaneous fat but extends to femoral fat in obesity.

**T-P-3257**

**GPER/GPR30-Selective Agonist G-1 Alleviates Adiposity and Prevents Adipose Tissue Lipogenesis and Inflammation in Ovariectomized Mice**


**Background:** Estrogen (E2) regulates adiposity by determining the amount and site of fat deposition. In females, it protects against visceral adiposity through preferential fat deposition in subcutaneous depots. Multiple receptors mediate the effects of E2, including Estrogen Receptors α and β as well as the G protein-coupled estrogen receptor (GPER/GPR30).

**Methods:** Female C57Bl/6 mice were ovariectomized at 10 weeks of age. Twelve weeks after ovariectomy, mice were treated with GPER selective agonist G-1 for 8 weeks and energy expenditure and glucose tolerance were analyzed. Furthermore, body weights, perigonadal fat pads, relative adipocyte area and adipose specific lipogenic and inflammatory gene expression were compared between control and treated groups.

**Results:** Treatment of ovariectomized mice with the GPER selective agonist G-1 attenuated weight gain and visceral adiposity compared to vehicle-treated mice. G-1-treated mice also resulted in smaller fat pads and smaller adipocytes. Furthermore, assessment of metabolic parameters revealed that G-1 treatment increased energy expenditure [increased oxygen uptake (VO2)] and improved glucose tolerance. Quantitative PCR revealed that G-1 treatment decreased adipose tissue-specific inflammatory gene expression as revealed by lower F4/80 and hypoxia-induced factor-1α (HIF1α) mRNA levels. Finally, we observed that adipose tissue from G-1 treated mice exhibited a decrease in the fatty acid synthetase (FAS) levels compared to the controls.

**Conclusions:** In conclusion, we show here for the first time that the GPER selective agonist G-1 attenuates adiposity, improves metabolism and prevents lipogenesis and inflammation in ovariectomized mice and may therefore present a novel therapeutic approach in treating obesity.

**T-P-3258**

**How to Accomplish the Adipose Tissue Robustness: Angiogenic Competence of Macrophage-Derived Insulin-Like Growth Factor-1 in Virus-Induced Obesity**
Background: Diverse pathogens are involved in the induction of obesity. Previous studies corroborated that human adenovirus 36 (Ad36) is associated with increased adiposity, improved glycemic control, and induced inflammation. The latter is reflected in the infiltration of macrophages to adipose tissue in humans and animals. However, the characteristics and role of adipose tissue macrophages (ATMs) and macrophage-secreted factors in the virus-induced obesity (VIO) are unclear. Although it has been previously revealed that insulin-like growth factor (IGF) is implicated in obesity metabolism, the contribution of IGF secreted from macrophages for VIO has not been studied yet.

Methods: In our study, we used macrophage-specific IGF-1-deficient (MIKO) mice to study the involvement of IGF-1 within VIO.

Results: While diet-induced obesity (DIO) increased M1 ATM population and M1/M2 ratio dependent on adiposity stage, VIO increased M2 ATM population and did not increase the M1/M2 ratio at 12-week after Ad36 infection, despite of the increase of adiposity. In addition, VIO activated factors involved in macrophage infiltration for inflammation and angiogenesis for adiposity in adipose tissues, whereas the Ad36-infected MIKO mice did not show. Interestingly, the characteristics shown in VIO, including increased adiposity via angiogenesis, and improved glycemic control were attenuated in MIKO mice.

Conclusions: These data suggest that IGF-1 secreted by macrophages may be contributed to adiposity in adipose tissue by increasing angiogenesis, which helps to maintain the adipose tissue robustness.

T-P-3259
Increased Expression of the Interleukin-1 Receptor-Associated Kinase (IRAK)-1 is Associated with Adipose Tissue Inflammatory State in Obesity
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Background: The emerging role of TLRs2/4 as both innate immune and metabolic receptors points to the key involvement of TLR/IL-1R/Myd88 pathway in obesity and related metabolic complications. Interleukin (IL)-1 receptor-associated kinase (IRAK)-1 is a critical adapter protein and serine/threonine kinase of this signaling pathway. We sought to determine the modulations in IRAK-1 mRNA and protein expression in the subcutaneous adipose tissue samples from lean, overweight and obese individuals.

Methods: A total of 49 adipose tissue samples were obtained from lean, overweight and obese individuals. IRAK-1 expression was determined by using real-time RT-PCR, immunohistochemistry, and confocal microscopy. The IRAK-1 gene expression was compared with the expression of: (i) local proinflammatory mediators; (ii) macrophage markers; and (iii) plasma inflammatory markers/adipokines.

Results: The data show elevated IRAK-1 gene expression in obese (P<0.01) and overweight individuals (P<0.04) as compared with lean individuals and this increase correlates with body mass index (r=0.45; P=0.001) and percent body fat (r=0.36; P=0.01). As confirmed by immunohistochemistry/confocal microscopy, IRAK-1 protein expression was also higher in obese adipose tissue as compared with overweight and lean tissues. Notably, IRAK-1 gene expression correlated positively with that of TNF-α (r=0.46; P=0.0008), IL-6 (r=0.30; P=0.03) and IL-18 (r=0.31; P=0.028); as well as with CD68 (r=0.32; P=0.02), CD11c (r=0.30; P=0.03), and CD163 (r=0.43; P<0.001). Besides, IRAK-1 gene expression in the adipose tissue related also with the plasma levels of CCL-5 (r=0.39; P=0.002), CRP (r=0.47; P=0.006), adiponectin (r=0.36; P=0.04), and triglycerides (r=0.40; P=0.02).

Conclusions: It was, therefore, concluded that the IRAK-1 expression was significantly upregulated in the obese adipose tissue and based on its consensus with local/circulatory inflammatory signatures, the increased IRAK-1 expression may be regarded as a biomarker for metabolic inflammation in obesity.

T-P-3260
Inflammatory and Metabolic Changes Following Bariatric Surgery
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Background: Bariatric surgery induces significant weight loss, increases insulin sensitivity and reduces morbidity and mortality. However, the underlying mechanisms are not fully understood yet. We hypothesize that bariatric surgery results in metabolic improvements and decreased inflammation, leading to reduced obesity related co-morbidities. Our objective was to study changes in inflammatory and metabolic markers following bariatric surgery.

Methods: Serum and subcutaneous adipose tissue (SAT) were collected during surgery and at 6 months post-surgery from patients undergoing Roux En Y gastric bypass. Adiponectin was measured in SAT. Adipokines/cytokines, C reactive protein (CRP) and non-esterified free fatty acids (NEFA) were measured in serum. Serum metabolomic analyses were performed using Nuclear Magnetic Resonance spectroscopy.

Results: Six months post-surgery, SAT adiponectin and serum Interleukin-15 increased whereas CRP decreased. Furthermore, serum NEFA, branched chain amino acids (BCAA: Isoleucine, Leucine and Valine), 2-hydroxybutyrate and 3-hydroxybutyrate were significantly reduced. There were significant negative correlations among the changes in proinflammatory adipokines/cytokines with changes in lipid and amino acid metabolites. Strong positive correlations were present among the metabolites that were reduced significantly post-surgery. Similarly, there was strong positive correlation among the adipokines and cytokines we measured.

Conclusions: Following bariatric surgery, there were significant improvements in lipid and amino acid metabolism that were associated with reduced inflammation. These changes may contribute to enhanced insulin sensitivity following bariatric surgery.

T-P-3261
LPS Directly Increased krelin and GOAT mRNA Expressions via NF-kappaB Signaling Pathway in MGN3-1 Cell
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Background: Lipopolysaccharide (LPS) administration affects plasma ghrelin concentrations in vivo. However, it was not clear whether the reported changes of plasma ghrelin levels were resulted from the direct effects of LPS on the ghrelin-producing cells or not.

Methods: The ghrelin-producing cell line, MGN3-1 cells were treated with LPS. Ghrelin production and the activity of NF-kappaB signaling pathway were evaluated.

Results: After 30 min to 1-hour treatment of LPS, ghrelin and GOAT mRNA levels were significantly elevated in MGN3-1 cells. Activation of NF-kappaB pathway as demonstrated by phosphorylation of NF-kappaB and increased expression of downstream molecules including TNF-alpha and IL-6 were observed.

Conclusions: LPS directly increased ghrelin, GOAT mRNA expressions possibly via NF-kappaB signaling pathway.

T-P-3262
mRNA Expression of the CMKLR1 and CCR2 Receptors in Individuals with Overweight. Their Association with Soluble Chemerin and Resolvin E1, Adiposity and Immuno-Metabolic Markers

Background: Overweight and obesity are a state secondary at increment of adipose tissue; that is enhanced by infiltration of monocytes which express CMKLR1 and CCR2 receptors at cellular response to ligands chemerin and/or resolvin E1 (RvE1) and CCL2, respectively. In the adipose tissue these molecules, stimulate lipolysis in the adipocyte by interaction with monocyte/macrophage mediators’. An important consideration is whether chemerin and RvE1, are potential mediators in overweight/obesity, and if are associated with the expression of CMKLR1 and CCR2 receptors.

Methods: Cross-sectional study with internal comparison group that included 153 individuals, classified by body mass index (BMI) as normal range (BMI <25.00 kg/m2) or overweight/obese (BMI ≥25.00 kg/m2) in accordance with WHO criteria. Anthropometrics, inflammation and metabolic markers were measured by routine methods. The adipose depot was assessed by body fat ratio, waist-height ratio, conicity index (COI) and abdominal volume index (AVI). Soluble RvE1, chemerin and insulin levels were measured by ELISA. Relative changes in CMKLR1 and CCR2 mRNA expression were determined with SYBR Green, housekeeping gene GAPDH and Z-AACT method, with the system StepOne plus Real-Time PCR.

Results: Overweight/obese individuals showed higher measures than individuals with BMI normal range (P<0.05):a) in body fat ratio, waist-height ratio, COI, AVI, HOMA-IR, serum C reactive protein, triglycerides, cholesterol, LDLc, VLDLc, glucose and insulin;b) in CMKLR1 and CCR2 mRNA expressions, (1.74 and 4.19 fold, respectively), and c) correlations of: CMKLR1 mRNA expression with CCR2 mRNA expression (0.602) and NEFAs (0.326), CCR2 mRNA expression with soluble RvE1 (-0.294), soluble Chemerin and RvE1 with C reactive protein, metabolic markers, COI and AVI r=0.213 to 0.398 and r=0.294 to 0.366; respectively.

Conclusions: CMKLR1 and CCR2 are associated with the production of chemerin and RvE1, metabolic and inflammatory markers in addition to an increment in the adiposity.

T-P-3263
Palmitate Triggers the Production of MCP-1 in Human Monocytic Cells via an IRF3 Independent Pathway
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Background: Obesity is characterized by expansion and monocytic/macrophage infiltration of the adipose tissue. MCP-1 is a key regulator of monocytes/macrophages recruitment during adipose tissue inflammation. Saturated fatty acid palmitate is a critical mediator of metabolic inflammation and the role of MCP is poorly defined. We studied MCP-1 production by THP-1 cells and signaling mechanisms involved following stimulation with palmitate.

Methods: MCP-1 expression was measured with real time RT-PCR and ELISA. Signaling pathways were studied by using THP1-XBlue cells, THP1-XBlue-delMyD cells, siRNAs (TLR4 and IRF3), and pharmacological inhibitors. Phospho and total proteins were identified by western blotting.

Results: Palmitate induced MCP-1 production in THP-1 cells at mRNA/protein levels. TLR4 knockdown by siRNA and TLR4 neutralization significantly suppressed the palmitate-mediated induction of MCP-1. Furthermore, MCP-1 production in MyD88/- cells was completely attenuated. The induction of MCP-1 in IRF-3-deficient cells was not blocked and also the TRIF inhibition did not suppress MCP-1 production. Palmitate treatment augmented phosphorylation of JNK, MEK/ERK, c-Jun, IκB-alpha/beta and NF-kB. Pre-treatment of THP-1 cells with inhibitors of JNK (SP600125), MEK/ERK (U0126; PD98056; XMD 8-92), and NF-kB (BAY11-7085, NDGA and Trolox) significantly suppressed MCP-1 production. Elevated activity of NF-kB/AP-1 was also observed in palmitate-treated cells.

Conclusions: Altogether, these findings provide a clear evidence that palmitate-induced MCP-1 expression in monocytic cells was dependent on TLR4-MyD88 pathway through the activation AP-1 and NF-kB transcription factors.

T-P-3264
Protection of Zucker Fatty Rats from Spontaneous Kidney Bacterial Infections by a Rat Chromosome 1 Congenic Region
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Background: Heritability of infection can be >50% in identical and dizygotic twins. Several gene families mediate natural resistance to bacterial infection. Human genetic studies have identified only 6 of the genes that likely predispose patients to urinary tract infections (UTIs). There are no papers focusing on the cumulative or familial trait loci (QTLs) for bacterial infection in rats and one about QTLs for kidney infection in mice. Studies in mouse models have identified UTIs caused by several knockout models.

Methods: Male and female Zucker rats were either lean (homozygous LeprSte) or fatty (homozygous LeprStef/a) on...
chromosome 4 and either homozygous for Brown Norway (ZUC.BN-Chr1) or Zucker alleles at the distal chromosome 1 congenic region. Phenotyping measurements included body and organ weights at sacrifice, blood phenotypes in fasted samples, and in lean and fatty Zucker rats. 12 out of 45 congenics (27%) were infected from any species of bacteria in males and females, Lactobacillus (12 times), E. coli (11 times), and samples had no bacteria cultured. Three most common species) were cultured from 50 samples. The remaining 67 samples had no bacteria cultured. Three most common:

**Results:** We performed aerobic bacteria culture from the renal pelvis of 117 chow fed non-barrier rats. Bacteria (one or more species) were cultured from 50 samples. The remaining 67 samples had no bacteria cultured. Three most common:

- **Conclusions:** No known bacterial defense genes are in the congenic donor region.

**T-P-3265**

Diet-Induced Obesity is Amenable to Leptin in Conditions of Relative Leptin Deficiency in Mice

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**Background:** Metabolic impairments in leptin deficiency have successfully been treated with leptin, leading to the recent approval of recombinant leptin as a drug to treat generalized lipodystrophy in Japan and the US. Clinical application of leptin for the treatment of diet-induced obesity (DIO), in contrast, has been hampered by leptin resistance. Serum leptin levels increase in proportion to adiposity in human subjects and pharmacological doses of leptin fail to exert sufficient weight-reducing effect in obese hyperleptinemic patients. However, serum leptin levels vary among individuals with some subjects showing low levels relative to their body fat amounts. In this study, we examine the potential therapeutic effect of leptin in DIO accompanied by leptin deficiency in mice.

**Methods:** 1) We crossed leptin-overexpressing transgenic skinny mice (LeptG) with ob/+ mice to generate LeptGob/ob mice, fed them control (CD) or high fat diet (HFD) during 6 to 10 weeks of age, and compared their body weight (BW) with ob/ob mice. 2) We fed 6-week-old +/- and ob/+ mice with HFD for 3 weeks. Leptin 2mg/kg was injected ip. to these mice every 12 hours for three times and BW was measured.

**Results:** 1) At 10 week old on CD, ob/ob mice (40g) were heavier than +/- (25g), while LeptG (21g) and LeptGob/ob (21g) weighed less than +/- On HFD, BW further increased in ob/ob mice (53g). In LeptGob/ob, BW was significantly lowered down to 30g and was comparable to LeptG (30g). 2) Leptin injection led to a significant BW loss over the 48hrs in +/- (-0.75g) and ob/+ mice (-2.1g) on CD. HFD-fed +/- mice was resistant to leptin with only -0.1g BW change. In contrast, ob/+ mice exhibited a significant -1.2g BW change even on HFD.

**Conclusions:** When relative leptin deficiency is present in conjunction with DIO, leptin can both acutely and chronically suppress BW and protect against obesity in mice. These data suggest a possibility that leptin can be a therapeutic measure when used in obese subjects with relatively low serum leptin levels.

**T-P-3266**

Disease-Related Changes of High Density Lipoprotein (HDL)-Associated Proteins in Non-Alcoholic Fatty Liver Disease

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**Background:** Obesity, a common and chronic disorder, is associated with a variety of liver abnormalities. These abnormalities include accumulation of triglycerides in hepatocytes and is known as nonalcoholic fatty liver disease (NAFLD). NAFLD can further lead to inflammation and fibrosis of the liver (Non-alcoholic steatohepatitis, NASH). These diseases also associate with a wide array of other disorders such as type 2 diabetes and heart diseases. In obese individuals, levels of HDL are reduced with a preponderance of small, dense HDL particles. This is even further exacerbated in patients with NAFLD and NASH. It has been proposed that these HDL particles are dysfunctional, increasing the risk for atherosclerosis in the affected individuals. However, the molecular mechanisms of HDL dysfunction, especially in NAFLD and NASH, remains unknown.

**Methods:** As part of our ongoing work, we have recruited a cohort of 210 patients who are morbidly obese and have undergone bariatric surgery. Of these, 41% of patients had normal liver histology, 27% showed accumulation of triglycerides (steatosis) in hepatocytes, and 13% were clinically diagnosed with NASH. Serum samples from 15 patients were chosen with various stages of liver disease and HDL particles were isolated. Proteins from HDL particles were analyzed by mass spectrometry.

**Results:** We present here a first quantitative analysis of proteins from each sample trying to understand the differences in protein abundances associated with HDL particles between normal individuals and NAFLD and NASH patients, enrichment of gene ontologies and possible pathways affected using Ingenuity Pathway Analysis.

**Conclusions:** We identified over 75 proteins of which majority were found to be from the apolipoprotein class and complement class. Detailed quantitative analysis is under way. Coagulation factor XII had increased abundance in the serum of SS and NASH patients. Network analysis by IPA shows a significant enrichment of proteins related to liver damage, cirrhosis and fibrosis.

**T-P-3267**

E4orf1 protein does not require the pro-adipogenic isofrom of the enzyme AKT for up-regulating cellular glucose uptake.

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**Background:** Of the different isoforms of the enzyme AKT, AKT1 and 2 preferentially promote adipogenesis or glucose uptake, respectively in fat cells. Human adenovirus Ad36 and
its E4orf1 protein up-regulate AKT1 and 2, to promote both, adipogenesis, and cellular glucose uptake. By individually knocking down the AKT isoforms, we determined if the effects of Ad36 or E4orf1 on glucose uptake and adipogenesis could be separated.

Methods: In 3T3-L1 pre-adipocytes, or mouse embryonic fibroblasts (MEF) that have intact AKT total AKT, AKT 1 or AKT 2 were chemically knocked down and infected with Ad36 or mock infected. Next, MEFs that are either genetically AKT2 knocked out (AKT2KO), or AKT1 knocked down (AKT1KD) were infected with a retrovirus expressing Ad36E4orf1 or mock infected with a null vector. Basal and insulin stimulated glucose uptake were determined 2d later.

Results: Compared to mock infected cells, insulin treatment alone, or Ad36 infection significantly increased glucose uptake in MEF and 3T3-L1 pre-adipocytes, despite the chemical knock down of either AKT1 or AKT2, but not when total AKT was inhibited. Moreover, E4orf1 requires AKT2, but not AKT1 for enhancing glucose uptake. Thus, to increase cellular glucose uptake, Ad36 requires either of the two AKT isoforms, whereas, E4orf1 requires AKT2.

Conclusions: The results indicate potential to uncouple adipogetic effect of Ad36E4orf1 by knocking down AKT1, and yet enhance cellular glucose uptake via upregulating the AKT2 isoform. This study provides further support to develop anti-diabetic agents based on the template offered by E4orf1 protein.

T-P-3268 Effect of Green and Black Tea Extracts on Intestinal Microbiota and Body Composition in Mice Fed a High Fat/High Sucrose/Western Diet Susanne Henning Los Angeles CA, Jieping Yang los angeles CA, Mark Hsu Los Angeles CA, Amy Trang Los Angeles CA, David Heber Los Angeles California, Zhaoping Li Los Angeles CA

Background: The gut microbiota is an important contributor to human health and has been implicated in the development of obesity and obesity-related diseases such as diabetes and cardiovascular disease. The consumption of tea is of great interest due to its effect on weight control, inflammation and glucose metabolism. In previous studies we demonstrated that the supplementation with GT, BT and OT extract resulted in decreased body weight, visceral fat, liver lipids and inflammatory markers. It is our hypothesis that alterations of the gut microbiota in part contribute to the effect of tea on weight control, inflammation and glucose metabolism.

Methods: 48 C57BL/6 male mice were randomly assigned to one of four treatment groups: control high fat (HF)/high sucrose (HS)/Western diet (32% kcal from butter fat and corn oil, 25% kcal from sucrose), a HF/HS-diet with either GT or BT extract providing 0.25% polyphenols or a low fat diet (10.6% kcal from fat) for 4 weeks. Intestinal microbial composition was determined by RTqPCR and sequencing of bacterial16S ribosomal RNA using MiSeq.

Results: All observations are in comparison to the HF/HS-diet fed control mice. GT and BT administration decreased body weight, epididymal, mesenteric and subcutaneous fat as determined by weight. In the cecum both GT and BT treatment significantly increased cecum weight normalized to body weight and total cecum DNA content. In the cecum and duodenum GT and BT treatment increased the phyla Bacteroidetes (genera Parabacteroides spp-Prevotella spp) significantly and decreased the phyla Firmicutes (genus Roseburia), and Firmicutes/ Bacteroidetes ratio. GT treatment was associated with an increase in Lactobacillus spp in the duodenum, while Lactobacillus spp was decrease significantly by GT and BT in the cecum.

Conclusions: The shift in the ratio of Firmicutes/Bacteroidetes may have contributed to weight loss and change in body composition.

T-P-3269 Fasting Induces Differential Expression in the Transcriptome of the Hypothalamic Arcuate Nucleus of the Rat Kristoffer Rigbolt HA,rsholm , Michelle Morin Indianapolis IN, John Calley Indianapolis IN, Niels Vrang Horsholm Denmark, Donald Gehlert Boulder CO, Jacob Jelsing Horsholm N/A

Background: Next generation RNA sequencing (RNA-seq) is quickly becoming an important tool to evaluate transcriptomes and is particularly suited to detecting mRNA species encoding low abundance transcripts such as neuropeptides and G-protein coupled receptors (GPCRs). To identify gene expression changes following food deprivation we characterized the global gene expression in the hypothalamic arcuate nucleus (ARC) after fasting using RNA-seq.

Methods: The arcuate nuclei (Arc) from ad lib fed (n=4) or 48 hour fasted (n=4) male, Sprague Dawley rats were dissected by laser capture microscopy (Veritas) and total RNA isolated with a Picopure RNA Isolation kit (Arcturus). The RNA was amplified to cDNA (Ovation RNA-seq System,Nugen) from which libraries were constructed and sequenced on an Illumina HiSeq 2000 analyzer. Approximately 50 million 90 bp paired-end reads were obtained from each sample. Count data is modeled by the negative binomial distribution and tested for differential expression.

Results: The analysis resulted in over 14,000 genes being detected in the Arc with a subset of several hundred genes differentially regulated by fasting. Consistent with previously published studies of fasting-induced changes in gene expression, key genes encoding NPY, AgRP and the leptin receptor were upregulated, while POMC, CART and galanin like peptide (GALP) were downregulated.

Conclusions: Here we used RNA-seq analysis to compare the transcriptomes of the Arc of fed or fasted rats, known to contain a variety of neuropeptides involved in food intake. This results confirm and expand upon the involvement of the Arc in the complex neural pathways involved in food intake.

T-P-3270 Global Analysis of Hypothalamic Arcuate Nucleus Specific Gene Expression Changes Following Roux-en-Y Gastric Bypass Pernille Barkholt Harsholm DK, Philip J. Pedersen Hoersholm Denmark, Kristoffer Rigbolt Harsholm, Anders Hay-Schmidt Copenhagen Copenhagen, Jacob Jelsing Harsholm N/A, Niels Vrang Harsholm Denmark

Background: Roux-en-Y gastric bypass (RYGB) surgery promotes robust weight loss and remission of type II diabetes. However, little is known about the impact of RYGB on signaling pathways in the central nervous system. To identify adaptations after the surgery that may promote the beneficial effects on energy balance and appetite control, we characterized the global gene expression changes in the
hypothalamic arcuate nucleus (ARC) following RYGB.

**Methods:** Eight lean male Sprague-Dawley rats underwent RYGB surgery and eight underwent sham surgery. Body weight was monitored daily and the study was terminated at day 60. Laser capture microdissection (LCM) of the ARC was applied to sections of the hypothalamus. Next generation sequencing was performed on amplified RNA from the LCM collected samples.

**Results:** RYGB led to a sustained 35% weight loss compared with sham-operated controls without change in energy intake. RNAseq analyses demonstrated several known markers of appetite regulation to be significantly regulated (e.g. orexigenic AgRP was 1.5 fold upregulated and anorexigenic POMC and CART were 1.5 fold downregulated). Further analyses revealed several differentially regulated pathways related to energy balance and appetite control in RYGB animals compared with sham. Finally, a network analysis identified regulation of several biological processes, not directly associated with canonical ARC function, demonstrating the widespread implications of RYGB.

**Conclusions:** From our global characterization of gene expression in the ARC we have obtained an atlas of regulatory events accompanying RYGB surgery. This dataset constitutes a valuable resource of information about the intricate events underlying the effects of RYGB on ARC gene expression. The identified regulatory events point out several new directions for continued investigation of the response of hypothalamic signaling to bariatric surgery.

**T-P-3271 Glucose and Insulin Levels Impact Bone Mineral Density Independently of Weight Change**

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**Background:** The relationship between the metabolic syndrome and disruptions in bone metabolism is poorly understood. While increased weight can maintain bone mineral density (BMD) in weight-bearing bones, the quality of this bone may be poor, explaining the increased rates of fracture in overweight individuals with diabetes.

**Methods:** Seventy-five baboons eating a standard, low-fat, high-fiber diet were assessed yearly from age 9 (approximately 27 in humans) to age 18 (approximately 54 in humans) for changes in weight, body composition, BMD, and a panel of 29 biomarkers associated with metabolic changes were measured from serum following a twelve hour fast.

**Results:** Fifty animals remained within 15% of their original weights over the course of the study. The remaining animals started heavier than the average and lost at least 15% of their body weight (N=16) or started lighter than average and gained at least 15% of their body weight (N=9). Contrary to previous findings, animals that gained weight showed a significantly greater loss of BMD than animals that maintained a normal weight (t-test assuming unequal variance, p = 0.005). Independent of these weight-related changes, increases in glucose and decreases in insulin levels over the nine year period were associated with greater loss of BMD (linear regression, p < 0.05).

**Conclusions:** The relationship between the metabolic syndrome and BMD encompasses more factors than the relationship between weight and BMD alone. Additional studies are currently underway to understand the interaction between weight, body composition, glucose levels, and the composition of bone.

**T-P-3272 Liver Insulin Clearance is More Accurately Estimated During a FSIGT vs the Euglycemic Clamp**

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**Background:** Normal glucose tolerance is maintained by hyperinsulinemia during insulin resistance with obesity. Hyperinsulinemia is often attributed to increased insulin (ins) secretion, but reduced hepatic ins extraction (HIE) is also a primary factor. It is therefore of utmost importance to accurately assess HIE. While indirect methods of measuring HIE are available, portal-hepatic venous difference in humans cannot be validated since hepatic portal vein access is not possible.

**Methods:** In the dog model 2 indirect protocols were utilized: 1)metabolic clearance rate (MCR) from euglycemic hyperinsulinemic clamp (EGC)- ratio between ins infusion rate and steady-state plasma ins, 2)fractional disappearance rate of ins (FCR) during a frequently sampled IV glucose tolerance test (FSIGT)- rate of decline of plasma ins after ins injection. The 2 indirect protocols were compared to a direct method 3)a paired portal/peripheral ins infusion protocol (PPII)- ins is infused on separate days at 3 different rates into either the portal (one day) or peripheral vein (other day). HIE is [1-Mpo/Mpe], where M is slope of ins infusion vs cone for the 2 delivery routes.

**Results:** Indirect FCR measured from FSIGT was strongly correlated to direct PPII method (r=0.64), whereas MCR during EGC was not significantly correlated with HIE (r=0.045). When a novel mathematical model using both C-peptide & ins levels during FSIGT was employed to delineate between hepatic & peripheral ins clearance, it was found the HIE as calculated from the new model had a strong concordance with direct PPII assessment (r=0.37). On the other hand, peripheral clearance was highly correlated with MCR from EGC (r=0.70).

**Conclusions:** Model-estimated clearance calculated from FSIGT provides improved estimate of HIE vs ECG clearance measure. This improvement with FSIGT vs ECG is likely due to FSIGT analysis utilizing data from both endogenous secretion & peripheral injection to calculate HIE, whereas the ECG analysis uses only data from peripheral infusion.

**T-P-3273 Nociceptive Alteration by High Sucrose Diet in Wistar Rats Hypoestrogenic According Obesity State Progresses**


**Background:** Obesity is a risk factor associated with alterations in the pain perception, however, it is unclear what mechanisms underlie this association. Therefore, the aim of this study was to analyze the time course of nociceptive pain in Wistar rats hypoestrogenic (with high sucrose diet) according obesity state progresses and changes in body weight, weight of abdominal fat and glucose tolerance.

**Methods:** All animals were induced hypoestrogenism status...
by bilateral ovariectomy. Animals received hypercaloric diet
(30% sucrose in drinking water) or water and standard
laboratory food ad libitum for 24 weeks and thermal
nociception and body weight was measured in this period. At
weeks 4 and 17 after treatment were measured tolerance to oral
glucose and weight of abdominal fat in both groups.
Nociception was assessed by the method of “Plantar test”.

Results: The hypoestrogenic Wistar rats with high sucrose diet
had significantly higher body weight and abdominal fat weight
than the control groups. A biphasic response was observed: in the
4th week was significantly decreased thermal latency and weeks
12 to 17, a significant increase in thermal latency compared
with the control group. There were no differences in
basal blood glucose levels in the 4th and 17th weeks, however,
showed altered oral glucose tolerance.

Conclusions: Our data shows that the increase in body weight,
fat and alteration oral glucose tolerance test associated with
decreased hormone (estrogen) brings a biphasic nociceptive
response perception (hypalgesia stage, and a stage of
hypoalgesia).

T-P-3274
Obesity-hypertension: the first characterization of a
spontaneously-hypertensive large animal model, the
nonhuman primate (rhesus NHPs) with comparisons to
humans
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Background: In humans the relative risk for hypertension is
greatly increased by overweight status. We sought to determine
whether NHPs 1) develop naturally-occurring hypertension linked to spontaneous obesity and 2) if this is mitigated by weight loss or prevention of obesity. The need for such a validated and characterized animal model is great for both causal and therapeutic efficacy studies.

Methods: A colony of adult NHPs (N=192; 134 males; age range:7-39 yrs) was studied prospectively and longitudinally, with blood pressure (BP) obtained consistently several times per year. The ketamine sedation had no effect on BP compared to awake monkeys. BP was also measured in monkeys with long term calorie restraint to prevent obesity.

Results: Mean±SEM in normal BP in metabolically-normal adult monkeys was 121.8±1.6/63.5±1.1 (Systolic/diastolic mmHg) (ages 7-15 yr; females 7-11 kg and males 8-12.5 kg), thus being highly similar to the BP of normal healthy adult humans age 20-40 yrs (120/80). Hypertensive monkeys were separately analyzed according to the severity stage of systolic hypertension in humans (Pre-hypertension 120-139; stage 1: 140-159; stage 2: 160 or higher), definitions that fit well for systolic BP in monkeys. Diastolic hypertension (Pre-hypertension 80-89; stage 1: 90-99; stage 2: 100 or higher) is lower in NHPs than in humans (stage 1: 75-85; stage 2: 85 or higher). Increasing body weight from 7 to 25 kg was significantly associated with an increase in systolic BP (r=0.11, p=0.006), and this association was not due to increasing age (r=0.094, p=NS) or to deteriorating metabolic status.

Conclusions: We report here the first validation and characterization of naturally-occurring obesity-linked hypertension in NHPs. In NHPs, obesity has a greater impact on the development of spontaneous hypertension than age, or metabolic status, and the changes in systolic BP's are characteristic of human obesity-linked hypertension. In addition, preventing excess weight gain prevented hypertension in NHPs.

T-P-3275
Sleep Deprivation and Fat Feeding May Reduce
Insulin Action by Similar Mechanistic Pathways
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Background: Sleep deficiency leads to impaired insulin sensitivity. Similarly, a long term high fat diet leading to increase adiposity causes insulin resistance. To address the question of whether these two causes of insulin resistance are due similar mechanisms, we examined the impact of sleep deprivation in a canine model before and after the development of diet-induced obesity.

Methods: At baseline and after 6 months of a high fat diet, 8 male dogs underwent 2 sleep conditions—one night of habitual sleep and 1 night of sleep deprivation. Each sleep condition was followed by an IV glucose tolerance test to assess insulin action and beta-cell response.

Results: Prior to the high fat diet, 1 night of sleep deprivation significantly reduced insulin sensitivity [5.0(0.5) v 3.1(0.2) (mU/l)^-1.min^-1; p<0.05]. This reduction was similar to that caused by a high fat diet alone [5.0(0.5) v 3.7(0.5) (mU/l)^-1.min^-1; p<0.05]. Sleep deprivation after the high fat diet did not further reduce insulin sensitivity [3.7(0.5) v 3.3(0.4) (mU/l)^-1.min^-1; p=ns].

Conclusions: Sleep deprivation alone was associated with a 33% decrease in insulin sensitivity with no compensatory insulin response. Fat feeding alone for 6 months similarly reduced insulin sensitivity by 21%, which was not significantly reduced further by 1 night of sleep deprivation. This study suggests that because sleep loss and high fat diet are not additive in their impairment of insulin sensitivity, they may act by similar mechanisms. Future studies are necessary to determine the pathways that may account for the interactions between sleep and diet and their relationship to insulin resistance.

T-P-3276
Surgical sympathetic denervation of the kidneys
normalizes hepatic insulin sensitivity in high fat fed dogs.
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Background: Obesity and insulin resistance are associated with activation of the sympathetic nervous system. It has also been suggested that renal denervation (RDN) may improve glucose metabolism. Attempted RDN with radiofrequency devices has been used to improve hypertension but the overall effects remain controversial. To determine whether RDN improves insulin action (SI) and to study the mechanism of improvement we performed direct surgical bilateral RDN in obese insulin resistant dogs.

Methods: All dogs were fed a diet with 54% calories from fat for 6 weeks (HFD) to induce insulin resistance. Either bilateral surgical RDN (n=6) or sham surgery (SS, n=4) was performed on obese dogs. RDN: All visible nerves along the renal arteries were cut and the renal arteries were painted with 10% phenol solution. SS: Kidneys were exposed, but nerves were left intact. All animals were allowed to recover for 10 days from the surgery to perform post metabolic assessments. SI was
measured using euglycemic hyperinsulinemic clamp at baseline (w0), HFD and after RDN or SS (w13).

**Results:** HFD per se reduced whole body SI by 23% (8.9±0.4 * 10^-4 dL/kg/min/pM at w0 to 6.1±0.6 * 10^-4 dL/kg/min/pM at HFD, P<0.05); including severe hepatic insulin resistance (HSI: -1.2±0.3 * 10^-4 dL/kg/min/pM at w0 to -0.1±0.3 * 10^-4 dL/kg/min/pM at HFD, P<0.05). Despite continued HFD, HSI was totally normalized by RDN (-1.5±0.1 * 10^-4 dL/kg/min/pM at RDN, P<0.01 vs HFD, P=ns vs w0) but not normalized by SS. Denervation was confirmed by measuring noradrenaline in the renal cortex (right renal cortex: 84.0±37.1 ng/g in RDN vs 353.7±72.7 ng/g in SS, P<0.01; left renal cortex: 121.7±38.6 ng/g in RDN vs 336.4±53.3 ng/g in SS, P<0.01). No changes in blood pressure were observed with HFD and RDN.

**Conclusions:** Bilateral RDN completely restores hepatic insulin sensitivity previously reduced by fat intake. These data demonstrate crosstalk between renal sympathetic nerves and hepatic glucose regulation. Pathways involved remain to be established.

**T-P-3278**

**Effects of Thiazolidinediones on Fatty Liver and Insulin Sensitivity Require White Adipose Tissue: An Evidence from the Comparison between Mice and Rats**

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**Background:** While it has been reported that thiazolidinediones (TZDs) improve fatty liver in human, TZDs aggravate fatty liver in mice.

**Methods:** To explore the mechanism by which TZDs exert differential effects between species, we analyzed leptin deficient obese models, ob/ob mice and Lepmkyo/Lepmkyo rats (Physiol Genomics 2013) and generalized lipodystrophy models, A-ZIP/F-1 mice and seipin KO (SKO) rats (Hum Mol Genet 2015).

**Results:** All four animal models showed severe fatty liver. However, hepatic PPARγ mRNA expression was upregulated only in mouse models and was unchanged in rat models. We treated animals with rosiglitazone or pioglitazone for 4 weeks. Fatty liver in ob/ob mice and A-ZIP/F-1 mice was aggravated while it was improved in Lepmkyo/Lepmkyo rats. Surprisingly, fatty liver in SKO rats was unchanged. At this time, we investigated the mRNA expression of a PPARγ target gene, Fsp27 in the liver and WAT. TZDs increased hepatic Fsp27 expression in mouse models. On the other hand, TZDs did not change it in rat models. In WAT, TZDs increased Fsp27 expression in both ob/ob mice and Lepmkyo/Lepmkyo rats. A-ZIP/F-1 mice and SKO rats had no examinable WAT. Furthermore, TZDs improved insulin sensitivity in ob/ob mice, A-ZIP/F-1 mice and Lepmkyo/Lepmkyo rats but did not in SKO rats.

**Conclusions:** These results clearly revealed that effects of TZDs on fatty liver and insulin sensitivity require WAT in rats and might be in humans.

**T-P-3279**

**FGF21 Induces Substantial Weight Loss in Obese Minipigs a Unique Model Lacking Brown Adipose Tissue**

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**Background:** While it has been reported that FGF-21 is a novel regulator of pleiotropic metabolic effects including bodyweight regulation, making this a potential attractive obesity target. Although the exact mechanisms of action of FGF-21 are not fully understood, data indicate that anti-obesity actions of FGF-21 in mice appear to be mediated by an increase in energy expenditure, with brown adipose tissue (BAT) being a critical target organ. Pig is the only mammal species where BAT has not been found, which makes it a unique model to study non BAT related effects of FGF-21. The obese pig model has previously been a valuable model in predicting human weight loss effects of GLP-1 analogues.

**Methods:** 12 obese Göttingen minipigs with a mean bodyweight of 92±2 kg (>twice normal weight), were fed ad libitum and treated (n=6 per group) with either vehicle or FGF-21 once daily for 13 weeks. Primary endpoints were bodyweight and food intake. At the end of the study an
intravenous glucose tolerance test (IVGTT) was performed. A 24 h cortisol profile was also evaluated.

Results: After 13 weeks the FGF-21 treated group had a 40% reduction in overall food intake and bodyweight was 16 kg less compared to vehicle (83±4 vs 99±2 kg p<0.001). There was a significantly improved glucose tolerance (p<0.05) and the cortisol profile was unchanged compared to vehicle.

Conclusions: FGF-21 shows significant weight loss in obese pigs independent of BAT and does not seem to be stress related. These results are promising for FGF-21 as a potential weight loss target in humans.

T-P-3280
Independent and Interactive Effects of Obesity and Glucose Concentrations on Metabolic Health at 16-20 Weeks’ Gestation
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Background: Women who are obese have higher glucose concentrations in late-pregnancy. Obesity and relative hyperglycemia are each associated with poorer metabolic health and adverse perinatal outcomes. The objective of this study is to test the hypothesis that irrespective of obesity status, women with high glucose concentrations in mid-pregnancy would have a poorer metabolic profile.

Methods: Women with normal glucose tolerance who were normal weight (NW; BMI 18.5 – 24.9 kg/m²; N=24) or obese (Ob; BMI 30-39.9 kg/m²; N=30) underwent a 400 kcal liquid meal test at 16-20 weeks’ gestation. Women were dichotomized by a median split of glucose concentrations 1-hr after the meal. Two-way ANOVA were used to examine the associations of obesity status and glucose group with whole body insulin sensitivity (WBISI; Matsuda Index), insulin secretion (i.e. 30-minute C-peptide incremental area under the curve), Disposition Index (DI; Matsuda X secretion), and lipid profile.

Results: WBISI was lower, and insulin secretion higher, in Ob compared to NW women (P<0.05). The DI was lower for women with high glucose concentrations (P<0.05), suggesting lower insulin secretion relative to insulin sensitivity. Fasting cholesterol was higher in the NW/high glucose group and in both Ob groups (P<0.05), and there was a trend for post-meal triglycerides and free fatty acids to remain higher for the NW/high glucose and Ob groups.

Conclusions: Results demonstrated independent effects of obesity status and glucose control on metabolic health. Obesity was associated with adverse metabolic outcomes, regardless of glucose control. Further, elevated 1-hour glucose was associated with deficient insulin secretion, irrespective of obesity status. Finally, high post-challenge glucose may be a marker for impaired lipid metabolism in pregnant women.

T-P-3281
Intermittent Moderate Energy Restriction Improves Weight Loss Efficiency in Diet-Induced Obese Mice

Background: Intermittent severe energy restriction is an increasingly popular method of weight management. To investigate whether intermittent moderate energy restriction may improve this approach by enhancing weight loss efficiency, we conducted a study in mice, where energy intake can be unambiguously defined.

Methods: Male C57/Bl6 mice that had been rendered obese by ad libitum access to a diet high in fat and sugar for 22 weeks were then fed one of two energy-restricted normal chow diets for a 12-week weight loss phase. The continuous diet (CD) provided 82% of the energy intake of age-matched ad libitum chow-fed controls. The intermittent diet (ID) provided cycles of 82% of control intake for 5-6 consecutive days, and ad libitum intake for 1-3 days. Subsets of mice then underwent a 3-week weight regain phase involving ad libitum re-feeding.

Results: Mice on the ID showed transient hyperphagia relative to controls during each 1-3-day ad libitum feeding period, and overall ate significantly more than CD mice (91.1 ± 1.0 versus 82.2 ± 0.5% of control intake respectively, n = 10, P < 0.05). There were no significant differences between CD and ID groups at the end of the weight loss or weight regain phases with respect to body weight, fat mass, circulating glucose or insulin concentrations, or the insulin resistance index. Mice on the CD exhibited significantly greater hypothalamic mRNA expression of proopiomelanocortin (POMC) relative to ID and control mice, with no differences in neuropeptide Y or agouti-related peptide mRNA expression between energy-restricted groups.

Conclusions: Intermittent moderate energy restriction induces greater weight loss, fat loss and improvements in glucose homeostasis per unit of energy restriction than continuous moderate energy restriction in mice, possibly related to attenuation of the increased expression of hypothalamic POMC, a precursor to the anorexigenic alpha melanocyte stimulating hormone and the orexigenic opioid peptide, beta endorphin.

T-P-3282
Maximal Beta-Cell Function after Roux-en-Y Gastric Bypass is Similar to Non-Obese and Obese Controls

Background: Following Roux-en-Y gastric bypass (RYGB) patients exhibit exaggerated postprandial insulin secretion, which may be associated with hypoglycemia. The aim of this study was to see if there is evidence of increased pancreatic beta-cell mass after RYGBP that may be related to hyperinsulinemia.

Methods: Three groups without a history of DM were studied: post-RYGB (n=12, 60±10 months post-RYGB, weight loss 32.7±2.7% total body weight, BMI=32.6±1.7); healthy obese (n=10, BMI 32.9±1.9); and non-obese (n=9, BMI=23.3±0.8). Participants underwent frequently sampled intravenous glucose tolerance test, followed by a glucose ramp and arginine stimulation when glucose levels reached 450mg/dl. Insulin secretion (AIRmax) after arginine was used to determine maximal beta cell function as a surrogate measure of beta-cell mass. Subjects also underwent a 2 hour oral meal challenge. One-way ANOVA with Tukey post hoc comparisons was used to analyze the data.

Results: Mean fasting glucose, HbA1c, HOMA-IR, insulin sensitivity (SI), acute insulin secretion (AIRg), and beta-cell...
function determined by disposition index (DI) were similar between groups. In the meal challenge, AUC insulin (µIU×min×m-1) was different between RYGB (8741±1670) and Obese (4010±737), (P<0.03) and between RYGB and non-obese (3024±894), (P<0.03). AIRmax (µIU/ml) was not statistically different between groups (P=0.47): mean AIRmax for RYGB (191±32), obese (202±31), and non-obese (145±36).

Conclusions: These results do not provide evidence for greater beta-cell mass after RYGB using arginine stimulation for maximal insulin secretion, despite evidence of postprandial hyperinsulinemia. It would be of interest to compare these results with individuals who experience hypoglycemia with neuroglycopenia after RYGB.

T-P-3283

Postprandial Variation of Bone Turnover Markers: Future Implications for Obesity and Osteoporosis

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Background: To explore the relationship of bone and fat in order to outline preliminary evidence of the role of postprandial variation in markers of bone turnover in nutrient-dependent regulation of bone metabolism.

Methods: Volunteers arrived for initial procedures and blood collection following a 12 hour fast. Following a baseline blood collection all participants were given a liquid mixed meal (15% protein, 57% CHO, 28% fat) corresponding to 30% of the participant’s estimated resting energy expenditure. Additional blood samples were drawn at 180 minutes following administration of the meal to measure biomarkers of postprandial bone metabolism.

Results: Data was collected on 22 adults (18 female, 4 male; age 38.6±11.8y; BMI 28.2±5.4) including: anthropometry (height 155.7±7.9 cm; weight 68.7±16.4kg; waist circumference 87.9±13.3cm); body composition by DEXA (BMD 1.1±0.1g/cm2; % fat 41±6.8%; fat mass 27.3±9.4kg; lean mass 38.4±9.8kg); and bone turnover biomarkers (DKK1 923.5±269.7pg/ml; OPG 127.5±78.4pg/ml; OC 4187.4±4290pg/ml; OPN 18225.9±14959.8pg/ml; SOST 2892.8±962.5pg/ml; PTH 53.8±29pg/ml). Postprandial measurements for bone turnover biomarkers (DKK1 552±171.4pg/ml; OPG 108.8±41.8pg/ml; OC 13624.8±10018.8pg/ml; OPN 17874.8±15350.9pg/ml; SOST 2542.4±853.6; PTH 40±28.1pg/ml) were collected 180 minutes following complete consumption of the standardized mixed meal.

Conclusions: Elevated levels of DKK1 and OPN in plasma are associated with osteolytic activity. Increased levels of OPG and OC are associated with increased bone mineral density. PTH increases bone resorption and inhibits OSM. Our postprandial data show a pattern of bone mineral deposition for OC and OPG, and a shift against bone mineral deposition for DKK1, OPN, SOST and PTH in fasting. The underlying mechanisms for nutrient-dependent biology of bone metabolism can be useful in the future to treat disorders of body composition, including obesity and osteoporosis.

T-P-3284

Urinary F2-Isoprostanes Do Not Reflect Oxidative Stress Operative in Human Insulin Resistance, but are Correlated with Lean Mass and Serum Lipids

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Background: F2-isoprostanes (F2-Isops), generated through lipid peroxidation, are biomarkers for oxidative stress in humans. Some studies show that F2-Isops are positively correlated with BMI and %body fat, and are elevated in patients with cardiovascular disease or diabetes. We have previously shown that muscle lipid peroxidation, assessed by hydroxynonenal adducts, was increased in insulin resistance. In this context, F2-Isops are widely interpreted to reflect oxidative stress contributing to the pathogenesis of insulin resistance; however, this has not been rigorously examined.

Methods: 57 patients recruited for metabolic characterization on a research ward were measured for insulin sensitivity via hyperinsulinemic-euglycemic clamp, substrate oxidation rates by indirect calorimetry, urinary F2-Isop and metabolites by gas chromatography-mass spectrometry, and body composition by DXA. We assessed whether urinary F2-Isop were predictive of insulin sensitivity or related to other metabolic parameters.

Results: No correlations were found between urinary F2-Isop’s or their metabolites with either glucose disposal rates (r=0.121, p=0.380; r=0.134, p=0.330) or lipid oxidation rates (p=NS). However, both were significantly negatively associated with lean body mass (r=-0.495, p<0.0001; r=-0.360, p=0.006). In addition, urinary F2-Isop were positively correlated with serum triglycerides (r=0.283, p=0.032), total cholesterol (r=0.340, p=0.009), and LDL cholesterol (r=0.261, p=0.048).

Conclusions: 1) Urinary F2-Isop and metabolites are not associated with insulin sensitivity. 2) The lipid oxidation process that produces F2-Isop does not reflect oxidative stress reactions operative in insulin resistance. 3) Urinary F2-Isop’s are negatively correlated with lean body mass and positively correlated with TG and cholesterol, suggesting that they reflect processes regulating muscle mass and lipid metabolism. Thus, the significance of F2-Isop in cardiometabolic disease should be scrutinized pending further study.

T-P-3285

Ghrelin is not Related to Hunger or Calories Consumed at Breakfast in Lean or Obese Women

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Background: Exogenous ghrelin increases ad lib food intake in humans. We investigated the relationship of ghrelin to hunger and energy consumed at breakfast on two separate occasions in lean and obese women.

Methods: 23 lean (BMI 22.3±0.5 kg/m2) and 25 obese (BMI 36.9±7.0 kg/m2) women participated in a noncontiguous 2 day study. Participants were given the same breakfast on both days adjusted to provide 20% of the daily energy requirement for weight maintenance. Hunger was evaluated on a Satiety Labeled Intensity Magnitude Scale (SLIM) before and after the
Results: Lean women consumed an equivalent amount of energy on both days (380.0±14.6 vs 378.2±14.9 kcal), as did the obese (419.4±16.2 vs 428.8±15.4 kcal). Obese women consumed significantly more breakfast energy than lean (424.1±11.1 vs 379.1±10.3 kcal; P<0.01), but the same percentage of energy provided (85.7±1.8 vs 86.1±1.7 % kcal). Lean women rated hunger before breakfast the same on both days (69.2±1.6 vs 71.7±1.4), as did the obese women (69.8±1.6 vs 69.6±1.8), and there was no difference between days (69.2±1.6 vs 71.7±1.4), as did the obese women (25.0±1.7 vs 24.3±1.8). The reduction in hunger score following breakfast was significant for both groups (P<0.0001). Fasting ghrelin was significantly greater in the lean than obese women (549.9±58.9 vs 231.0±29.1 pg/ml; P<0.0001). Ghrelin was significantly reduced at 60 min following breakfast in the lean (375.8±49.2 pg/ml; P=0.028) but not the obese women (212.2±26.4 pg/ml). Ghrelin was not related to hunger score prior to breakfast, and there was no relationship between reduction in ghrelin and reduction in hunger score in the lean or obese women.

Conclusions: Our findings do not support a role for ghrelin in driving hunger or food intake at breakfast.

T-P-3286
Increased Conditioned Preference to Fat in ob/ob Mice was Reversed by Chronic Leptin Treatment
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Background: Brain reward system is considered to play a major role in a hedonic control of food intake. Leptin deficient obese ob/ob mice preferred to fat rather than other nutrients. However, few studies have focused on behavioral analysis about rewarding effect of fat in ob/ob mice. In this study, we measured conditioned place preference (CPP) to assess rewarding effect of high-fat diet (HFD) and examined the chronic effect of leptin on rewarding effect of HFD.

Methods: CPP to HFD was measured with male 7-11 weeks old ob/ob and wild type C57BL6 mice. To examine the chronic effect of leptin, mice were infused with leptin at a rate of 200 ng/h by mini-osmotic pumps. CPP was measured after the body weight of leptin-infused ob/ob mice had equated with that of control mice.

Results: Ob/ob mice showed significant HFD-induced CPP as compared with control mice. This CPP was diminished in leptin-treated ob/ob mice.

Conclusions: Our results show that leptin-deficient obese ob/ob mice exhibited remarkable CPP to HFD. This CPP was diminished by chronic administration of leptin. It is to be elucidated whether HFD-induced CPP seen in ob/ob mice are due to leptin deficiency or the secondary effect of obesity. We are now examining the acute effect of leptin on rewarding effect of HFD.

T-P-3287
Preliminary Assessment of Sugar-Rich and Fat-Rich Versions of the Yale Food Addiction Scales in a College Sample

Background: Research exploring the addictive potential of palatable foods has emerged from preclinical and clinical settings. However, there is a need for additional research identifying the specific type and composition of foods that are most associated with addictive-like eating. The purpose of this study was to assess food-specific versions of the Yale Food Addiction Scale (YFAS) among a college sample.

Methods: Undergraduate students (N=195) were administered 1) adapted versions of the YFAS that asked specifically about sugar-rich foods, fat-rich foods, or fruit/vegetables, 2) a modified 9-item version of the YFAS (mYFAS), and 3) the Eating Disorder Examination Questionnaire (EDE-Q). Univariate and multivariate analyses were conducted to determine significant associations between scores on all questionnaires and demographic variables (i.e., gender, age, ethnicity, body mass index, and dieting status). Correlation analyses were conducted between the newly developed scales (i.e., sugar- and fat-YFAS) and established questionnaires (i.e., EDE-Q and mYFAS) to assess the convergent validity.

Results: In the sample of women (57.4%) and men (42.6%), 13.8% were currently dieting at survey completion. Notably, dieting was associated with meeting criteria for a “sugar addiction” using the sugar-YFAS (OR: 5.84). Female gender was also associated with meeting criteria for a food addiction on the mYFAS (OR: 5.05). Correlations between the sugar YFAS and mYFAS (r: 0.50), the sugar YFAS and EDE-Q (r: 0.54), the fat YFAS and mYFAS (r: 0.54), and the fat YFAS and EDE-Q (r: 0.56) established moderate convergent validity of the sugar- and fat-YFAS.

Conclusions: These results suggest that dieting is associated with “sugar addiction.” Further, these data indicate that women are more likely to report addictive-like relationships to food than men, consistent with previous reports. The sugar- and fat-YFAS may be useful in identifying individuals with macronutrient-specific problematic eating patterns that resemble addiction.

T-P-3288
Food intake reduction by GLP-1 receptor signaling in the hippocampus requires monosynaptic downstream communication to the medial prefrontal cortex
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Background: Glucagon-like peptide-1 (GLP-1) is a hormone produced from the distal small intestines and the hindbrain. Recent findings show that clinically effective GLP-1 analogs (exendin-4, liraglutide) reduce feeding and body weight, in part, via action at CNS GLP-1 receptors (GLP-1R). However, the neural systems mediating these effects are poorly understood. We have recently identified the ventral hippocampus (vHP) as a novel brain substrate in the higher-order control of feeding. The present study explores the relevance of vHP communication to the medical prefrontal cortex (mPFC) in CNS GLP-1R-mediated food intake reduction.

Methods: Following iontophoretic delivery of the anterograde
neural tracer PHAL in the vHP (CA1 field), confocal dual immunohistochemistry analysis of PHAL and synaptophysin (a presynaptic marker) reveal that vHP neurons extensively communicate to the ipsilateral medial prefrontal cortex (mPFC). To examine whether the mPFC is a downstream neural target for vHP GLP-1R-mediated hypophagia, we utilized a chemical-genetic disconnection approach in rats in which vHP CA1 neurons were transfected with a viral vector engineered for designer receptors exclusively activated by designer drugs (DREADDs). Inhibitory DREADDs is a virogenetic method that allows for synaptic silencing of monosynaptic pathways via delivery of the otherwise inert ligand, clozapine-N oxide (CNO), at axon terminals of DREADDs-transfected neurons. Following unilateral mPFC CNO injections (to silence neural communication from the vHP), exendin-4 was administered to the ipsilateral vHP and food intake and body weight were measured 24h later.

**Results:** Our results show that DREADDs-mediated vHP -> mPFC monosynaptic disconnection significantly attenuated vHP GLP-1R-mediated hypophagic effects.

**Conclusions:** These results suggest that monosynaptic connections to the mPFC are required for vHP GLP-1R-mediated hypophagia, thereby illuminating a novel higher-order neural circuit through which GLP-1R signaling reduces feeding.

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**T-P-3290**

**Synphilin-1 Overexpression Induced a CCK Response Deficit in Mice**

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**Background:** Synphilin-1, a cytoplasmic protein, has been demonstrated to regulate food intake and body weight in mice and Drosophila. Ubiquitous overexpression of human synphilin-1 in brain neurons in transgenic mice results in hyperphagia expressed as an increase in meal size. However, the mechanisms underlying this action of synphilin-1 remains to be determined. Here we investigate a potential role for altered gut feedback signaling in the effects of synphilin-1 on food intake.

**Methods:** Human synphilin-1 transgenic mice were used to examine the changes of food intake behavioral and brain neuron activity in responses to peripheral administration of cholecystokinin (CCK), amylin and the glucagon like peptide-1 (GLP-1) receptor agonist, exendin-4.

**Results:** Intraperitoneal administration of CCK at doses ranging from 1-10 nmol/kg significantly reduced glucose intake in non-transgenic mice, but failed to affect intake in synphilin-1 transgenic mice. Moreover, CCK administration strikingly increase c-Fos expression in the NTS in non-transgenic mouse, but there was a significantly attenuation of CCK-induced c-fos expression in synphilin-1 transgenic mice. In contrast, both non-transgenic and synphilin-1 transgenic mice were similarly responsive to amylin and exendin-4 treatment.

**Conclusions:** These studies indicate that synphilin-1 overexpression induced a CCK response deficit that my contribute to the increased meal size and overall hyperphagia in synphilin-1 transgenic mice.

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**T-P-3291**

**Different Region of the Melanocortin-4 Receptor Third Intracellular Loop Plays a Key Role in Agonist Induced Different Signaling**

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**Background:** Obesity is one of the most significant public health problems facing the world today. The melanocortin-4 receptor (MC4R) plays a key role in obesity development. MC4R activation induces three signaling pathways, including cAMP, calcium and ERK1/2. In this study, we examined which region of MC4R intracellular loop is important for agonist mediated cAMP or ERK1/2 pathway activation.

**Methods:** The third intracellular loop mutation (4R3i-1, 4R3i-II, 4R3i-III and 4R3i-IV) and C terminal mutations of the MC4R were constructed. The entire coding region of the mutated receptors was sequenced to confirm that the desired mutation sequences were present. Student t test was used for statistical analysis, with p < 0.05 considered to be statistically significant.

**Results:** 1. All mutated receptors are expressed at cell surface and mutation did not significantly alter NPY-MSH binding affinity; 2) NDP-MSH is able to increase cAMP production and enhancing ERK1/2 activity at MC4R wild type or partial C
terminal deletion. However, the activation of cAMP or ERK1/2 pathway of four MC4R agonists NDP-MSH, alpha-MSH, THIQ and ACTH at MC4R3i-I, 4R3i-II, 4R3i-III and 4R3i-IV are different. 3) All four MC4R agonists are able to increase cAMP production and enhance ERK1/2 activity at 4R3i-II, 4R3i-III. However, NDP-MSH mediated cAMP production was significantly impaired at 4R3i-IV. 4) Surprisingly, activation of ERK1/2 by all these four agonists are significantly decreased at 4R3i-I.

Conclusions: Our findings demonstrate that the region of the beginning of MC4R TM6 is crucial for agonist mediated cAMP signaling while the end of MC4R TM5 is essential for ERK1/2 activation.

T-P-3292
Structural Brain Differences Related to Initial Excessive Body Fat Gain in Adolescents: A Prospective MRI Study
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Background: Obesity is related to structural and volumetric brain differences, but it is unclear whether these differences reflect initial vulnerability factors or if they are secondary to weight gain. We tested the associations between global/regional brain volumes and increases in body fat gain over 3-year follow-up and investigated structural/volumetric changes as a result from initial excessive body fat gain.

Methods: 162 healthy-weight adolescents (M age = 15.3±1.1; Body Mass Index = 20.9±1.9) were scanned at baseline using magnetic resonance imaging. A subsample (n = 60) completed a second scan at follow-up. Voxel-based morphometry was used to assess global brain volume and regional gray matter (GM) and white matter (WM) volumes. Body fat was assessed yearly over follow-up.

Results: Reduced WM volumes in the inferior parietal lobe and middle temporal gyrus were associated with increases in body fat over 3-year follow-up. Weight gainers showed greater increases in GM in the amygdala and greater decreases in the orbitofrontal cortex (OFC) and caudate over follow-up compared to weight stable individuals. Weight gainers also showed greater increases in WM in the nucleus accumbens, anterior cingulate, and OFC and greater decreases in WM in the ventromedial prefrontal cortex and precenral gyrus compared to weight stable individuals. Global brain volume did not predict increases in body fat.

Conclusions: Findings suggest that low WM volume in the temporal-parietal network is associated with increases in future weight gain and abnormalities in regional GM and WM volumes in reward- and attention-related regions are secondary to weight gain.

T-P-3293
A Botanical Combination for Modulating Postprandial Triglyceride Levels in Humans: A Double-Blind, Randomized, Placebo-Controlled, Three-Period Crossover Clinical Trial
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Background: We previously reported that 2 g of a whole grape extract (WGE) reduced postprandial circulating triglycerides (TG) in humans following an oral fat tolerance test (OFTT), in part through inhibition of intestinal diacylglycerol acyltransferase 1 (DGAT1). The aim of this study was to identify additional botanical extracts that could provide synergy with the WGE in inhibiting DGAT1 activity and results in a clinically meaningful effect on postprandial TG.

Methods: A cellular DGAT1 assay was used to examine the synergistic potential (Combination Index CI), calculated using Loewe’s Additivity Equation (of) botanicals extracts when added with WGE. A combination of WGE + grape seed extract (GSE; WGE+GSE) was evaluated in a 12-week, randomized, double-blind, placebo-controlled, 3-period crossover clinical trial. Ninety-three overweight and obese subjects were randomized to receive each of three treatments (placebo, 375mg WGE + 375mg GSE (total = 750 mg/d), 500mg WGE + 500mg GSE (total = 1000mg/d)), for 4 weeks each, with the only difference being the order in which each treatment was administered. At baseline and the end of each 4-week test period subjects underwent an 8-hour OFTT.

Results: A GSE was identified to have synergistic inhibition of DGAT1 activity when added together with WGE in the cellular assay; the CI ranged from 0.99-0.55. A differential response in circulating TG levels following an OFTT between subjects with borderline high (150-199 mg/dL) or high (200-499 mg/dL) fasting baseline TG. Subjects with high fasting baseline TGs experienced significant (p<0.05) reductions in both TG AUC0-8h and Cmax in response to 1000 mg/d vs. placebo. There was no statistically significant effect of WGE+GSE on fasting TG levels at either dose.

Conclusions: A dietary supplement with a WGE and GSE modulated circulating postprandial TG kinetics in a clinically meaningful direction in overweight and obese humans with high fasting TG levels.

T-P-3294
A Comprehensive Lifestyle Intervention Provides Clinically Meaningful Weight Loss, Improved A1c and Reduced Medication Use in Patients with Type 2 Diabetes
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Background: There are approximately 135,000 new cases of type 2 diabetes (T2D) each month in the U.S., virtually all of which are attributable to obesity. Given the healthcare costs associated with diabetes, the delivery of an effective approach to weight loss (WL) is more critical than ever in these patients.

Methods: This was a retrospective study of patients with T2D who enrolled in Maryland Healthy Weighs medical WL program in 2014. Comprehensive lifestyle intervention was provided and included weekly group coaching, increased physical activity (PA) and reduced calorie intake via use of meal replacements (MR) and increased fruit/vegetable (F/V) intake. Eligible patients attended at least 8 weeks in the WL phase. Body weight (BW) was assessed weekly and hemoglobin A1c and T2D medications were assessed at follow-up.

Results: 33 patients (mean age 63.1 years; 52% female; mean initial BW (IBW) 273.6 lbs., and mean body mass index (BMI) of 43.5 kg/m²) met entry criteria. Mean (range) WL and % decrease in IBW was 44.2 lbs (-116 to -14) and 15.5%, respectively, with a mean duration in the WL phase of 23.4 weeks. Mean decrease in A1c was 1.2% (8.1% to 6.9%). 93.9% (31/33) of patients had decreased A1c at follow-up, and 84.8% of those (28/33) did so with corresponding dose reduction or discontinuation of T2D medications. The
proportion of patients with A1c <7% at follow-up was 2-fold higher relative to baseline (60.6% vs 30.3%).

**Conclusions:** Comprehensive lifestyle intervention that includes weekly coaching, increased PA and F/V consumption and use of MR provides clinically meaningful weight loss, improved A1c and reduced medication use in patients with T2D, which may result in healthcare cost savings.

**T-P-3295-DT**

**A personalized mHealth intervention for health and weight loss in postpartum women enrolled in WIC**

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**Background:** Pre-pregnancy maternal overweight/obesity and excessive weight gain during pregnancy lead to significant morbidities in mothers and their offspring. Mothers who never return to their pre-pregnancy weight begin subsequent pregnancies at a greater weight and have a larger propensity for excess gestational weight gain and postpartum weight retention.

**Methods:** Forty postpartum women credentialed with postpartum Women, Infants, and Children (WIC) services were randomized (20 per group) to receive usual care (“WIC Moms”) or a personalized health intervention delivered remotely via Smartphone (“WIC E-Moms”). Assessments including weight, vital signs, circumferences, body composition (BIA), food intake (RFPM), accelerometry, and psychological questionnaires were completed at Week 0 (6-8 weeks postpartum), Week 8, and Week 16. All results are presented as change from baseline at Week 16.

**Results:** Intent to treat analysis suggested no difference in body weight (WIC Moms vs. WIC E-Moms: 1.8±0.9 vs. -0.1±0.9 kg; p=0.1), percent body fat (1.7±0.6 vs. 0.1±0.6%; p=0.9), or waist/hip ratio (-0.01±0.01 vs -0.02±0.01 cm; p=0.6) between the control and intervention groups. Due to variability in intervention adherence, participants were classified post-hoc as low (<40% adherence), medium (40-70% adherence), and high adherence (>70% adherence). When intervention adherence was considered, participants with high adherence had a significant reduction in body weight (-3.6±1.6 vs. 1.8±0.9 kg; p=0.005) and percent body fat (-2.5±1.0 vs. 1.7±0.6%; p=0.001) when compared to WIC Moms.

**Conclusions:** A mHealth lifestyle intervention that successfully engages WIC participants can facilitate weight loss during the postpartum period and can reduce postpartum weight retention. Given that this is also likely the inter-pregnancy interval for subsequent pregnancies, further research is needed to improve individual engagement and adherence to mHealth interventions for low socioeconomic women.

**T-P-3296-DT**

**A Pilot Randomized Controlled Trial of Self-Regulation Interventions for Weight Gain Prevention in African American Breast Cancer Survivors**

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**Background:** Few lifestyle interventions have focused on weight control in breast cancer survivors, and none have been conducted to prevent weight gain in African American breast cancer survivors. This study evaluated the feasibility and efficacy of two 6-month, remotely-delivered self-regulation interventions that used wireless scales with or without activity trackers to support weight gain prevention.

**Methods:** African American breast cancer survivors (n=35) were randomly assigned to one of three treatment groups: 1) self-regulation + activity monitoring (SR+); 2) self-regulation (SR); or 3) delay control (CON). Participants received an individual session, weekly email-delivered behavioral lessons, wireless smart scale, activity monitor (SR+ only), and weekly tailored feedback based on objective weight and activity data. The intervention encouraged women to use daily self-weighing as the primary self-regulation behavior to monitor weight and promoted small changes in eating behaviors and regular exercise to prevent weight gain. Participants completed assessments at baseline, 3 and 6 months. Objectively measured weights were collected.

**Results:** A total of 35 African American breast cancer survivors enrolled over 9 months of recruitment. At baseline, mean ± SD age, weight, BMI and years post breast cancer diagnosis were 53.0 ± 9.1 years, 88.4 ± 16.7 kg, 33.9 ± 5.9 kg/m2, and 3.1 ± 2.3 years respectively. Retention was 94% at 3 months. At 3 months, the proportion of women in the SR+, SR and CON groups that gained 1 pound or more was 0%, 17% and 30% respectively. Both SR+ (median loss = -0.95 kg; p=<.001) and SR groups (-0.80 kg; p=<.05) lost weight over 3 months, with no change in the CON group (-0.25 kg; p=.77). Estimated effect sizes were medium for differences with the CON group (Cohen’s d=0.44; 0.58).

**Conclusions:** A self-regulation intervention focused on daily self-weighing as a self-regulation strategy shows initial promise for preventing weight gain in African American breast cancer survivors.

**T-P-3297**

**A Pilot Study of Tailored Feedback Messages Delivered Daily to Enhance Weight Loss**

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**Background:** Self-monitoring (SM) is the core of behavioral weight loss interventions; however, feedback (FB) to the participant’s SM entries is often delayed. The purposes of this pilot study were to assess the feasibility of 1) using a commercially available SM app for self-directed weight loss, and 2) delivering tailored FB messages to their smartphone to enhance a self-directed weight management program with and without a brief behavioral group intervention.

**Methods:** Participants were recruited from the community through university announcements. After providing informed consent and completing baseline assessment, individuals (N=39) were randomized to 1 of 3 groups: 1) SM; 2) SM+FB (1-4 messages/day); or 3) SM+ FB+3 group sessions on behavioral weight loss strategies. All participants were assigned a daily calorie and fat gram goal and met once for initial training on SM with the Lose It! program. Groups 2 and 3 received up to 4 FB messages per day addressing their calorie, fat, total sugar intake and SM.
Obesity 2015 Abstract Book
Poster Abstracts Wednesday November 4th to Friday November 6th, 2015

T-P-3298
A Preliminary Investigation of Weight Stigma Among Overweight and Obese Active Duty Military Personnel
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Background: Over one-half of male and over one-third of female active duty service members are currently overweight. Research in civilian populations demonstrates that weight-based prejudice is frequently reported by individuals with excess body weight, and is associated with a host of adverse psychological and physical consequences. To date, no study has examined weight stigma among overweight active duty military service members, who may be particularly vulnerable to body dissatisfaction and disordered eating.

Methods: Participants were 38 overweight or obese (BMI = 29.71 ± 2.32) active duty military personnel (age = 35.1 ± 6.7y, 65.8% male, 61.1% Non-Hispanic White), at-risk for excess weight gain due to current weight status and/or family history of overweight. Participants completed self-report measures of eating behaviors, experiences of stigma, and internalization of weight bias, prior to participation in an obesity prevention program. Height and weight were measured.

Results: Linear regressions accounting for age, race, sex, and BMI, indicated that service members who reported receiving more frequent disciplinary action due to weight (e.g., by fitness leader, Commander) reported significantly greater emotional eating (p = .003). The experience of weight-related teasing from a spouse was associated with greater use of maladaptive coping behaviors in response to weight stigma (e.g., eating more food or using unhealthy weight control behaviors) (p = .03). Additionally, service members who reported greater weight bias internalization reported greater use of maladaptive behaviors to cope with weight-related teasing (p = .009).

Conclusions: Weight-based disciplinary action and teasing are associated with emotional eating and unhealthy coping behaviors among overweight service members. These findings may have implications for how overweight is addressed among military personnel; it may be beneficial to assess weight bias and to encourage appropriate coping techniques.

T-P-3299-Withdrawn

T-P-3300
Acceptance-based Behavioral Treatment Enhances Weight Loss Especially for Those With Greater Impulsivity

Background: Mindfulness- and acceptance-based behavioral treatments (ABTs) fuse behavioral strategies with tolerance of difficult internal experiences and loss of pleasure, mindful decision making and commitment to valued behavior. Given these enhancements, ABT has been recognized as potentially more efficacious than standard behavior treatment (SBT) for weight loss. However, only one full randomized controlled trial testing this hypothesis has been published to date, and it raised questions about whether ABT benefits only certain subgroups. Furthermore, no study has yet tested theory-driven hypotheses that ABT’s emphasis on deliberate decision-making would make it especially effective for those with greater impulsivity, a known predictor of weight gain.

Methods: Overweight and obese (n = 190) were randomly assigned to 25 sessions of SBT or ABT over a 1-year period. Impulsivity (computerized measures of inhibitory control and ability to delay reward) was assessed at baseline.

Results: At the 1-year (post-treatment) assessment, and using last-observation-carried-forward imputation, ABT produced significantly greater percent weight lost (13.4%) compared to SBT (10.4%; p = .01). The advantage of ABT was evidenced across participant subtypes. However, the advantage of ABT was especially strong in participants with poor inhibitory control and reduced ability to delay reward (interaction effects p=.04 and p=.03).

Conclusions: Few alternative treatments have outperformed gold standard BT in rigorous trials, thus the demonstrated 3-percentage-point advantage of ABT in the current trial supports the infusion of mindful decision-making, psychological acceptance and behavioral commitment strategies into obesity interventions. Moderation effects suggest that those with greater impulsivity would especially benefit from assignment to ABT, raising intriguing questions about tailoring treatment that should be followed up with further investigation.

T-P-3301-Withdrawn

T-P-3302
Appetite for Change: An MDT Approach to Behavioural Modification and Weight Management in a Community Health Group Setting Cannon S1, Lawry K1, Brudell M1, Rees R1, Bisset L1, 2, Wenke RI 1 Adult Community Health, Gold Coast Hospital and Health Service 2 Griffith Health Institute, Griffith University
samantha cannon burleigh heads QLD, Kathryn Lawry Gold Coast QLD, Maree Brudell GOLD COAST QUEENSLAND, Rachel Wenke Southport Qld, Rebecca Rees Southport QLD, Leanne Bisset Gold Coast Campus QLD

Background: Obesity is a growing issue in Australia with limited evidence on brief community based intervention. This preliminary study aimed to investigate the long term effects of
T-P.3303
Assessment of Energy Balance in an Individually-Tailored, Adaptive Intervention to Manage Weight Gain in Overweight/Obese Pregnant Women
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Background: Conventional approaches to manage gestational weight gain (GWG) in overweight/obese pregnant women (OW/OBPW) have been generally ineffective despite the critical need to control GWG for positive maternal/infant health outcomes. To this end, we are testing a novel, individually-tailored “just-in-time” intervention that adapts dosages to the unique needs of OW/OBPW to manage GWG. Dynamical modeling will be used to optimize intervention efficiency/effectiveness. The study purpose was (a) describe feasibility and user acceptability of components (education, self-regulation, goal-setting, healthy eating/physical activity [HE/PA] active learning) needed to manage GWG; and (b) examine intensive longitudinal data to for discrepancies in HE/PA measures.

Methods: OW/OBPW (N=24) were recruited from clinic sites/community ads and randomized to 1 of 7 dosages for 6-weeks. Data were collected daily (weight, PA) and weekly (dietary intake, HE/self-regulatory behaviors, motivational determinants) using M-health tools.

Results: Intervention dosages have good user acceptability with the exception of the most intensive dosages (modifications were made to reduce time on-site). Lack of established calorie goals for OW/OBPW is problematic and resulted in a 24% reduction adjustment (Vesco et al., 2012). Data visualization/simulation using dynamical modeling identified discrepancies in measures of dietary intake (ASA-24, MyFitnessPal) and PA (Up Jawbone, Actigraph); adjustments are warranted to address accuracy of reported intake and activity count/monitor wear-time thresholds for pregnant women. Assessing resting metabolic rate with a portable device in the next study phase may enhance accuracy of the energy balance model.

Conclusions: Initial development of an individually-tailored, intervention to manage GWG in OW/OBPW appears to be feasible. Lessons learned from this study phase will be used to develop the fully operational intervention that will be delivered over the entire pregnancy.

T-P.3304
Change in Body Composition Following Intentional Weight Loss and Its Effect on Physical Performance and Strength: the Look AHEAD study

Background: Little is known about how changes in body composition with intentional weight loss affect physical performance and strength over the long-term.

Methods: Participants were middle-aged and older overweight/obese adults with type 2 diabetes from one field site of Look AHEAD, a trial evaluating an intensive lifestyle intervention (ILI) designed to achieve and maintain weight loss of ≥7% compared to diabetes support and education (DSE). Body composition was assessed by DXA at baseline and year 8. Objectively measured physical performance (physical performance battery (PPB), 20- and 400-m walk, and grip and knee extensor strength) was assessed at year 8. Baton Rouge (n=220) was the only Look AHEAD field site to collect both DXA and physical performance data. Associations between change in fat and lean mass and physical performance in the ILI and the DSE group at the year 8 follow-up visit were examined.

Results: Mean age of participants at baseline was 59 yrs, 59% were women, and 76% were white. Percent changes (mean±SD) in weight, fat and lean mass over 8 years were -4.0±7.3%, 0.2±12.5%, and -6.5±5.3% in ILI and -3.0±9.7%, 1.2±17.1%, and -5.8±6.6% in DSE, respectively. Those in the ILI group had significantly better PPB scores and faster gait speed than those in the DSE group at 8-year follow-up (p<0.05). Increases in fat mass were associated with worse PPB scores in the ILI and DSE groups (p<0.05) and with slower gait speed in the DSE group (p<0.01). Decreases in lean mass were associated with weaker grip strength in the ILI group (p=0.04) and knee extensor strength in the ILI and DSE groups (p<0.05). However, there were no significant interactions between change in fat and lean mass and physical performance or strength by intervention group.

Conclusions: Although the overall intervention effect on physical performance was positive, increases in fat mass were associated with worse physical performance while decreases in lean mass were associated with lower strength regardless of intervention arm.
T-P-3305
Childhood and Current Body Dissatisfaction as Predictors of Weight in a 12-month RCT
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Background: Body dissatisfaction and obesity have been studied varying age ranges (Mond et al., 2011; Millstein et al., 2008; Runofla et al., 2013). Few studies have examined adults’ childhood body dissatisfaction and its relationship to weight outcomes. The current study examined baseline body dissatisfaction measures including current dissatisfaction, childhood perception of being overweight, and ages of first weight loss attempt and of first perception of being overweight.

Methods: Current body dissatisfaction was assessed using the Stunkard Body Figure Rating scale difference between current and ideal body figure. Childhood body dissatisfaction was measured by baseline questionnaire. BMI was measured at baseline and every 3 months until the end of the RCT. This study used data from a 12 month weight loss intervention randomized controlled trial (N = 588), with three incremental levels of weight loss intensity treatment, consisting of: workbook only, computer guided intervention (CGI), and CGI plus staff support (Swencionis et al., 2013)

Results: Analyses focused on the 12-month RCT completers (N = 283). Spearman’s rho was used to establish significant association with BMI at completion of RCT and baseline body dissatisfaction(r = .450, p< .001, N = 283), childhood perception of overweight (r = -.149, p=.012, N = 283), and ages of first weight loss attempt (r = -.259, p<.001, N = 283) and of first perception of being overweight (r = -.228, p<.001, N = 283). The multiple regression model with all four predictors produced R2=.217, F(4, 278) = 19.23, p< .001 for BMI at completion of RCT and baseline body dissatisfaction and overall body dissatisfaction significantly predicted BMI at the RCT completion. Implications of this study suggest that current and childhood body dissatisfaction are important factors to consider before participation in a weight loss regime in order to maximize efficacy of treatment. Clinical implications for treatment in weight management setting follow.

Conclusions: Findings suggest that childhood body dissatisfaction and overall body dissatisfaction significantly predicted BMI at the fourth quarter.

T-P-3306-DT
Cognitive Restraint, Hunger and Disinhibition are Associated with 24-Hour Energy Expenditure
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Background: Higher energy expenditure (EE) is associated with greater food intake, possibly because the human body senses EE and modifies eating behaviors to maintain energy balance. Yet, eating behaviors are also influenced by cognitive, social, and cultural factors, thus, it is possible that EE may be associated with psychological constructs related to eating behavior, and these relationships may differ between ethnicities and sexes.

Methods: The Three-Factor Eating Questionnaire (TFEQ), which measures cognitive restraint, susceptibility to an uninhibited response to food (disinhibition), and the predisposition to hunger sensations, was administered to 87 healthy individuals (201M/106F, 160 Native Americans–NA/77 Whites/27 Blacks/22 Hispanics/21 Asians; age: 35±10 yr; body fat: 31±9%). All subjects had measures of body composition by DXA and 24h EE assessed in a whole-room indirect calorimeter during energy balance.

Results: Overall, individuals with lower 24h EE were more likely to have higher cognitive restraint (r = -0.11, p=0.05), but this was true only in women (r=−0.24, p=0.01) and not in men (r=0.04, p=0.59, interaction term p=0.01). Greater 24h EE was associated with both higher disinhibition (r=0.18, p=0.002) and greater hunger (r=0.14, p=0.01) without differences by sex. Mean disinhibition scores (p=0.003) and 24h EE (p=0.001) were higher in NA compared to other ethnicities with no differences in mean hunger or restraint scores. However, the observed correlations between EE, disinhibition and hunger were primarily present in people not of NA descent (r=0.25, p=0.002; r=0.23, p=0.006) and were not observed in NA (p>0.40).

Conclusions: Individuals with higher EE are more likely to feel hunger, have disinhibited eating behavior and invoke less dietary restraint indicating that cognitive responses to food may be influenced by physiologic differences. However, these associations were only noted in individuals other than NA, suggesting that any effects of EE on eating behavior may depend on ethnicity.

T-P-3307
Comparing the Weight Loss Outcomes of Morbidly Obese Patients to Moderately Obese and Overweight Patients in a Non-Surgical, Medically-Supervised Weight Loss Program
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Background: Research indicates that morbidly obese (BMI ≥ 40) patients experience clinically relevant weight loss in a nonsurgical and medically supervised setting. However, research comparing weight loss outcomes between morbidly obese patients and moderately obese (30 ≤ BMI < 40) patients is lacking.

Methods: A retrospective, cross-sectional chart review was performed for 2,436 patients enrolled in a medically supervised weight loss program over a one-year period. Data collection occurred at 25 randomly selected sites. The study includes all patients who met the following inclusion criteria: starting BMI ≥25, age ≥18 years, site visits ≥2, and no breaks in treatment since initiating the program. Patients were categorized by obesity status: overweight (25 ≤ BMI < 30); obese I (30 ≤ BMI < 34); obese II (35 ≤ BMI < 40); and morbidly obese (BMI ≥ 40). The following parameters were evaluated: change in BMI, change in FFM, percentage of starting body weight loss, and proportion of weight change due to FFM change. Approximately normal distributions were compared using the Independent Samples T-Test and non-parametric distributions were compared using the Mann-Whitney U Test.

Results: Morbidly obese patients had a statistically significant median reduction of 3.4 BMI points (p < 0.0005) and 3.22 kg of FFM (p < 0.0005). This group lost one extra BMI point (p <0.0005) and 3 extra pounds of FFM (p <0.0005); however, the change in starting body weight experienced by morbidly obese patients was not significantly different from that experienced by overweight and moderately obese patients (p = 0.521). There appeared to be a positive dose-response relationship between starting BMI and loss of FFM with participation in the program.
Conclusions: The findings suggest that morbidly obese, moderately obese, and overweight patients lose similar amounts of their starting body weight on a medically supervised weight loss program; however, morbidly obese patients experience greater reduction in pounds of FFM and BMI.

T-P-3308
Design and Implementation of a Facebook-based East-meets-West Lifestyle Intervention for Obese Adults
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Background: Over 38% of Hong Kong Chinese adult population is overweight or obese, but few weight loss trials for this population outside conventional clinical settings have been conducted. Studies found association between weight loss and the use of social media and Traditional Chinese Medicine (TCM). Leveraged on the city’s high social media presence and unique East-meets-West culture, a Facebook-based lifestyle intervention was designed for working adults.

Methods: Forty-nine working obese adults from a local university (67% male, age 42.44 ± 9.87 years, BMI 28.67 ± 3.30) were randomized to either a Facebook-based intervention group or a control group. All participants received government health pamphlets on obesity and food calories. Two nurses, of whom one is also a registered nutritionist and the other a registered Chinese medicine practitioner, joined the Facebook group as health partners to address the information, skill and attitude dimensions of healthy lifestyle. Intervention elements included nutrition and exercise from the Western perspective, food therapy and acupressure from TCM perspective, self-monitoring, and motivational videos of successful stories from working colleagues. The participants were encouraged to post their health behaviors and questions, self-monitor, pledge for weight loss, seek social support and interact with health partners and other participants.

Results: Measurement of body weight, height, waist and hip circumferences, percentage of body fat, blood pressure, stage of change, physical activity, self-efficacy and social support was carried out at baseline, 3 and 6 months. A user satisfaction questionnaire was administered to Facebook-based participants after intervention.

Conclusions: Multiple intervention elements amalgamated both Western and TCM perspectives for dietary intake, physical activity and acupressure can be embedded in intervention with partnership from healthcare professionals for healthy lifestyle against obesity through social media.

T-P-3309-DT
Diabetes and Pre-Diabetes Diagnoses: Concordance between Medical Record and HbA1c and Fasting Plasma Glucose Screening

Background: Hispanic women have the highest estimated risk for developing Type 2 diabetes (T2D) of all ethnic/gender groups and elevated conversion rates from pre-diabetes (Pre-DM) to T2D compared to non-Hispanic whites.

Methods: As part of an ongoing diabetes risk-reduction intervention for Hispanic women conducted at a Federally Qualified Health Center, we examined the medical records of participants to determine the proportion of patients with no T2D/Pre-DM diagnoses but who presented abnormal fasting plasma glucose (FPG) and HbA1c results at the baseline study visit.

Results: Examination of the medical records of 84 enrolled participants yielded 36 cases with no T2D or pre-DM diagnoses. Participants with no T2D/Pre-DM diagnoses had a mean age of 40 (+/-9) years; mean weight was 80.0 (+/-13) kg, mean BMI was 33.1 (+/-4.8) kg/m². Examining the results of the HbA1c screening at baseline visit, 16 (47%) had normal values of HbA1c (<5.7%), 16 (47%) had HbA1c values in the pre-diabetic range (>5.7% –<6.4%), and 2 (6%) had HbA1c values in the diabetic range (>6.5%). Examining screening by fasting plasma glucose (FPG), 9 participants (26%) had normal values of FPG (<100 mg/dl), 21 (60%) had FPG values in the pre-diabetic range (100 mg/dl – 125 mg/dl), and 5 (14%) had FPG values in the diabetic range (>126 mg/dl). Among the 34 women with complete HbA1c and FPG data, 6 (18%) met criteria for T2D by either HbA1c or FPG.

Conclusions: Comparison of medical record diagnoses of T2D/Pre-DM with screening HbA1c and FPG indicates that the majority of overweight/obese Hispanic women without a diagnosis of T2D or Pre-DM nevertheless show evidence of insulin resistance. Almost one in five women had undiagnosed T2D. Given the success of lifestyle interventions in preventing T2D onset and development of T2D complications, it is critical to conduct early and accurate screening for insulin resistance in overweight and obese Hispanic women. Funding source: NIH/NIDDK – 1R01DK099277.

T-P-3310
Do Patient Weight Loss Expectations Impact Treatment Outcomes? A Multicenter Study

Background: It is well documented that patients desire weight losses (32%) that are more than triple what is typically achieved (5-10%). Less is known about the effects of patient weight loss expectations on outcomes. This study evaluated the relationship between initial weight loss goals and actual weight loss and attrition in a multicenter behavioral weight control study.

Methods: Adults (N=308, BMI=33.7±4.2 kg/m², Age=48.1±10.6 y, 83% female) participated in a 52-week behavioral weight control study evaluating the effects of water versus non-nutritive sweetened beverage consumption on weight loss. All participants completed the Goals and Relative Weights Questionnaire at baseline. Weight (kg) was measured at baseline, 12 and 52 weeks. We used regression models (intent-to-treat) and chi-square tests to evaluate the relationship of patient goal weight at program conclusion (expressed as a percentage of initial body weight loss) with actual weight loss and attrition at 12 and 52 weeks. Analyses accounted for treatment condition, age, sex and baseline weight.

Results: Participants expected to lose 19.8±7.9% over the 52 week study; 92% of participants set a weight loss goal ≥10%. Intent-to-treat analyses indicated the mean weight loss was 5.3±3.8% at 12 weeks and 4.6±7.1% at 52 weeks. Weight loss
goal was not associated with weight loss at 12 weeks (p=0.79) or from 13-52 weeks (p=0.54). At 12 and 52 weeks, 91% and 72% completed treatment, respectively. Weight loss goal was not related to attrition at 12 (p=0.91) or 52 weeks (p=0.86).

**Conclusions:** Though adults participating in a behavioral weight loss program lost less than one-third of the weight they wanted to lose, unrealistic weight loss expectations did not negatively impact weight loss or attrition.

**T-P-3311-DT**

**Early Results of a Culturally-Tailored Diabetes Risk Reduction Intervention for Hispanic Women**

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**Background:** Hispanic women have the highest estimated risk of developing Type 2 Diabetes (T2D) of all ethnic/gender groups, and have higher conversion rates from pre-diabetes to T2D compared with non-Hispanic whites. This trial seeks to develop an effective diabetes-risk reduction intervention targeting low-income Spanish-speaking Hispanic women treated at a Federally Qualified Health Center (FQHC).

**Methods:** This ongoing culturally-tailored intervention conducted in Spanish, is based on approaches successfully used in English language weight-loss trials. Cultural adaptations include hands-on skill-building around food measurement, addressing traditional health beliefs regarding foods and exercise, food tracking journals for low literacy/numeracy, and culturally-coherent problem solving. Participants were adult non-pregnant, Spanish-speaking low-income women with BMI ≥ 27 kg/m2 and diagnosed with T2D, pre-diabetes, or other risk factors for T2D, including history of gestational diabetes.

**Results:** Of the 303 women invited to participate, 87 (29%) enrolled in the study, with 47 women randomized into the active intervention and 40 into usual care. Participants’ mean age was 43 +/-7.5 years, mean weight was 84 +/-16.5 kg, and mean BMI was 34.9 +/-6.7 kg/m2. Interim data are presented for participants from the intervention arm who had >40% attendance rate (26/43). At the last session attended mean weight loss was 3.44 kg +/-3.7 kg, representing a mean body weight reduction of 4.0%. By last session attended 35% had lost >5% of initial body weight; 23% had lost >7% of initial body weight, and 8% had lost >10% of initial body weight.

**Conclusions:** Our recruitment indicates great interest among Hispanic patients for effective culturally-appropriate interventions. These preliminary results indicate that this culturally-adapted intervention has the potential to impact diabetes risk reduction for this underserved high-risk population in community health centers. Funding source: NIH/NIDDK – R01DK099277.

**T-P-3312-DT**

**Effect of a Family-Based Healthy Lifestyle Intervention on Weight Outcomes of Latino Adults and Children**

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**Background:** US Latinos have disproportionately higher rates of obesity and physical inactivity than the general US population, putting them at greater risk for chronic disease. This study aimed to examine the impact of the Y Living Program (Y Living), a 12-week family-based healthy lifestyle program, on the weight status of adult and child participants.

**Methods:** In this pretest-posttest study, participants attended twice-weekly group education sessions and engaged in PA ≥ 3 times/week. A bioimpedance analyzer was used to determine percent body fat (%BF), body weight and, body mass index (BMI). Wilcoxon signed-rank tests and mixed effects models were used to evaluate pretest-posttest differences (i.e., absolute change and percent change) for adults and children separately.

**Results:** All weight-related measures improved significantly among participating adults in terms of absolute change and percent change of BMI, weight, waist circumference and %BF (all p≤0.001). Among child participants, all weight-related measures increased significantly (all p<0.04). Intervention effects varied across subgroups. Generally, females and obese adult participants had a greater decrease (i.e., larger improvement) in weight-related measures (all p<0.04); females who were obese at baseline and those in families with higher annual household income (≥$15,000) had smaller increases in weight-related measures (all p<0.04).

**Conclusions:** Significant improvements in weight were observed among adult participants but not children. This family-based intervention has potential to prevent excess weight gain among high-risk Latino families.

**T-P-3313**

**Emotional Distress in Obese Persons and its Potential Impact on Quality of Life and Clinical Outcomes**

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**Background:** In primary care settings, traditional approaches to obesity treatment remain focused on diet change and exercise interventions. However, little is known with regards to emotional distress associated with this disease and its impact on achieving optimal weight loss outcomes. The purpose of this study was to explore the impact of excess weight on health-related quality-of-life (HRQOL) and to determine the prevalence of emotional distress associated with obesity.

**Methods:** A cross sectional design was used, and 153 obese participants were enrolled after responding to a request using a social media platform. Each participant completed a demographic questionnaire, the Impact of Weight on Quality of Life (IWQOL-Lite) questionnaire, and the Hospital Anxiety and Depression Scale (HADS). Linear regression coefficients were calculated to assess the relationship between Body Mass Index (BMI) and quality of life, while logistic regression models were used to analyze data from the HADS.

**Results:** The sample was predominantly female (68%) with a mean BMI of 38.2 kg/m2. A higher BMI was associated with a significant negative effect on HRQOL (p<0.001) as measured by the IWQOL questionnaire. The prevalence of anxiety (62.4%) and depression (54.9%) as measured by the HADS was consistently high when compared to the US general population of 18.1% and 6.9% respectively.

**Conclusions:** This study identified a significant inverse relationship between higher BMI scores and HRQOL, as well as increased emotional distress when screening for anxiety and depression. Obesity, anxiety and depression prevalence continue to rise and have been linked as having a causative relationship. Innovations to enhance the screening for emotional distress in the electronic medical record, across practice settings, may lead to a more consistent and holistic approach.
T-P-3314
Environmental Predictors of Who’s Most Likely to Lose Weight

Background: There seems to be a lack of existing research on environmental predictors of success in weight loss, especially for those who see the highest rates of obesity – lower-income, lower-SES populations

Methods: This research aimed to identify environmental and behavioral predictors of weight loss success within a population (n=405) of Latino and African-American participants who participated in a behavioral weight loss trial in Harlem and South Bronx. Home eating environment, eating behavior and food choice coping strategies were compared between successful and unsuccessful weight losers. Successful weight loss was defined as losing more or equal than 7% of body weight.

Results: Of 405 participants, 34 (8%) participants achieved weight loss of seven per cent. Successful weight loss was associated with poorer eating habits and riskier home eating environments at baseline. Successful weight losers were less likely to eat salad (p<.025) or fruits (p=.009) or have a fruit bowl on their counter at home (p=.076). They were more likely to watch television while eating (p=.026). Successful weight losers were more likely to be responsible of shopping (p=.082) and preparing (p=.045) food for their family members. Demographic differences indicated poorer lifestyle and living conditions; bigger proportion of successful weight losers smoked (p=.014), were unemployment (p=.09) and received food assistance (p=.013). Successful weight losers improved their health behavior during 12 month intervention, specifically in terms of food choice coping strategies and consumption of fruits and vegetables. Post intervention there were no differences in any of the variables analysed.

Conclusions: Based on our findings eating environment and behavioral habits should be accounted for in the initial phases of weight loss interventions. Demographic differences predicting weight loss may differ among people of low socioeconomic status.

T-P-3315
Evaluation of a Medically Supervised, Multidisciplinary Obesity Management Program at a Community Hospital
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Background: Obesity is a major public health problem that is recognized as having multiple causes. The inclusion of obesity management programs within corporate settings could enhance an individual’s ability to lose and maintain weight loss as well as decrease obesity related risk factors associated with chronic diseases and work performance. In this pilot study, we sought to evaluate effectiveness of a 6-month medically-supervised weight loss program for overweight/obese employees at a community hospital as measured by change in body composition and clinical indicators.

Methods: Using annual employee health assessments, employees who were overweight/obese (BMI ≥ 30 kg/m²) were invited to participate in an obesity management program. Participants attended educational seminars/support groups and received monthly evaluations with a psychologist, registered dietician, and exercise physiologist. Outcomes included change in weight and body composition measurements. Future analyses will evaluate change in other markers.

Results: 50 employees were selected to enroll in the program, of which 46 consented to participate (n=44 completing all baseline study assessments). Mean age at baseline was 48.6 years ±10.9; 91.3% were female and 82.2% Caucasian. Mean baseline weight was 226.6 ± 38.4 lbs. Total of 26 individuals completed the program (mean=6.6 months intervention) and 18 were program non-completers (mean=2.6 months intervention). Weight significantly decreased following the intervention from 229.6 ± 31.7 lbs. to 217.0 ± 33.3 lbs. (p < 0.001). The completers lost significantly greater weight, 12.6 ± 10.6 lbs. vs. 4.6 ± 3.8 lbs. (p = .004) and 5.6% mean body weight loss versus 1.9% loss (p=.002) as compared to non-completers.

Conclusions: This multidisciplinary approach to obesity management in a corporate, hospital setting suggests that the intervention is associated with substantial weight loss at 6 months (mean=5.6%) and that full participation in the program increases the loss and maintenance of the weight change.

T-P-3316
Evolutionary Design: Using Silicon Valley Methodologies to Develop an Intervention for Weight-Loss Under Economic Constraints
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Background: The Tepoztlan lifestyle intervention (TLI) is an evidence-based intervention aimed to promote weight-loss in a low income, low education, rural population of central Mexico. It was designed with iterative design methodologies, along with behavioral sciences to develop a technology-assisted program for weight-loss maintenance. In addition to being evidence-based, scalability and dissemination constraints imposed by the hosting healthcare system were considered at the beginning of the design. We present here findings regarding dietary adherence.

Methods: We followed the iterative design process with the following phases. Understand. A scientific review of literature was performed. After it, several causal pathways were portrayed, assigning a priori probabilities of successful implementation given healthcare system constraints. Define. The design challenge was defined as to find a way to implement the most likely causal pathways of long-term dietary adherence, given healthcare system and population constraints. Ideate. An iterative phase of brainstorming, data collection and analysis allowed to create, modify and improve ideas and prototypes. Prototype. An iterative phase of building early, low fidelity prototypes (paper, digital or interview based) was followed by a testing phase. Test. Different prototypes were tested with the context and restrictions of the target population.

Results: The first feasible version of the evolutionary design was implemented in May 2015. The essence includes basic medical and nutritional assessment, self-monitoring tools, seeking proactively social support, goal setting, commitment devices and remote assistance.

Conclusions: Conclusion. The iterative process allowed to rule out a whole set of assumptions and potential ways of
implementation that a priori looked promissory. The current design approaches a true solution for the target population.

T-P-3317
Examining a Self-Report Measure of Body Anxiety in an Overweight and Obese Treatment-Seeking Population
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Background: Obesity is associated with a number of negative physical and psychological consequences including dissatisfaction with body image. Anxiety about one’s appearance is an important dimension of body image. The Physical Appearance State and Trait Anxiety Scale (PASTAS) was developed to measure general and momentary anxiety about weight and non-weight related body regions. The scale was developed and validated in an undergraduate female population; however, study and validation in overweight and obese populations is needed.

Methods: We examined the factor structure of the 16-item PASTAS trait version completed by 281 females and 75 males aged 17-79 (M = 47.2, SD = 13.7) entering weight loss programs at the Weight Management Center at the Medical University of South Carolina. Mean BMI was 37.2 kg/m² (SD = 8.3). Principal components analysis was employed to examine the factor structure of the measure.

Results: Results revealed a four-factor solution reflecting: 1. lower body, 2. abdominal region, 3. facial region, and 4. various non-weight related body areas (ears, lips, wrists, hands, and forehead). One item (“feet”) was excluded from the final solution, as it failed to load onto any factor. At baseline, women reported more anxiety than men for lower body (p < .001) and abdominal (p < .05) regions. Among 109 patients who completed the program and had pre- and post-treatment data, significant improvements were observed on all factors except the non-weight-related factor (p’s < .001), with women displaying a bigger decrease in anxiety scores than men on the lower body scale (p<.05).

Conclusions: Findings suggest the PASTAS may be of utility in overweight and obese populations. Continued evaluation of dimensions of body image anxiety within these groups may be useful in both clinical and research contexts.

T-P-3319
Feasibility and Effectiveness of BMIQ: A Novel Web-Based Weight Loss Program in Overweight/Obese Breast Cancer Survivors

Background: Obesity has been shown to have an adverse effect on survival in breast cancer patients. There is limited data about the feasibility and effectiveness of web-based lifestyle intervention programs in this group of patients.

Methods: Subjects with a history of breast cancer (greater than 3 months from receiving chemotherapy and radiation therapy) and BMI greater than 27/kg/m² were enrolled in BMIQ, a 10 week lifestyle counseling program, consisting of weekly dietitian-led group meetings and web-based food and activity tracking tools and educational materials. Sessions supported and expounded on online content; discussing food intake, physical activity, lifestyle change and goal setting. Measurements of weight and BMI were determined at baseline, at 10 weeks, and at 6 months. Blood was collected at baseline and at 10 weeks for determination of insulin, c-peptide, HbA1c, leptin, lipid profile, C-reactive protein, and estradiol levels.

Results: 14 patients were enrolled. The mean number of sessions attended was 6.3. In an intent-to-treat analysis, the mean weight at baseline, 10 weeks, and 6 months were 195.5, 189.5, and 187.4 lbs respectively. The mean BMI at baseline, 10 weeks, and 6 months were 34.21, 32.93, and 32.54 kg/m² respectively. There was significant weight loss between baseline and at the end of the 10 week sessions and between baseline and 6 months, reflected both in weight and BMI. Mean weight loss was 6.4 lbs (range: -0.6 to 19.4 lbs) at 10 weeks and 8.5 lbs (range: -3.6 to 25.6 lbs) at 6 months. Among completers, mean weight loss was 7.6 lbs (range: -0.2 to 19.4 lbs) at 10 weeks and 9.1 lbs (range: -3.6 to 25.6 lbs) at 6 months. There was no significant difference in the laboratory values comparing baseline and 10 weeks.

Conclusions: This unique dietary and lifestyle intervention program incorporating dietitian led group sessions and web-
Conclusions: addiction” and time on any outcomes. Disappointing Expectations (OR=1.42, 95% CI [1.01, 2.00], p<.05) contributed to significant weight loss. Conclusions: Coping strategies targeting an individual’s personal motivation for weight-loss may be more beneficial than those emphasizing the social consequences of weight-loss. Behaviorally, engaging in alternate activities may be most helpful for dieters. Coping strategies focused on disappointing expectations may also benefit obesity treatment. These strategies remind dieters of long-term consequences and potentially decrease the likelihood of surrendering to immediate gratification.

Background: Emerging research has suggested that “food addiction” characterizes a subgroup of patients with obesity and binge eating disorder (BED) that may represent a more disturbed variant. We examined the predictive significance of “food addiction” in patients with co-existing obesity and BED in a randomized clinical trial.

Methods: Participants were 186 obese patients with BED (mean age 48, 71% female, mean BMI 39) assigned to six-month behavioral treatments. Assessments were independently performed at baseline, throughout- and post-treatment, and 6- and 12-month follow-ups with reliably-administered semi-structured interviews and measures. “Food addiction” was assessed using the Yale Food Addiction Scale (YFAS).

Results: YFAS “food addiction” classification was met by 61% (N=114/186) of participants. ITT analyses of remission rates (defined as zero binges/month) at 12-month follow-up revealed that the percent of remitted patients with “food addiction” (40%) versus without (51%) did not differ significantly. Mixed models analyses revealed significant main effects for “food addiction” on binge-eating frequency, eating-disorder psychopathology, and depression; post-hoc analyses indicated the “food addiction” group had significantly greater pathology at baseline and most time points throughout/following treatment. “Food addiction” did not show significant main effects for weight-loss. Mixed models did not reveal significant interaction effects between “food addiction” and time on any outcomes.

Conclusions: Our findings suggest that, among treatment-seeking adults with co-morbid obesity and BED, “food addiction” is common (61%) and signals a more disturbed variant of BED. Even though “food addiction” did not significantly predict worse or differential outcomes, it showed significant main effects on most variables (except weight loss) over time.

T-P-3322
HealthÉ U: A Pilot Study of the Effect of a Technology-Mediated Behavioral Weight Gain Prevention Program on Weight Control Practices of College Students
Courtney Monroe Columbia South Carolina, Gabrielle Turner-mcgruiey Columbia South Carolina, Beth Sundstrom Charleston South Carolina, Karen Magrady Columbia South Carolina, Chelsea Larsen Columbia South Carolina, Sara Wilcox Columbia SC, Heather M Brandt Columbia SC, Delia West Columbia SC

Background: Technology presents an attractive avenue for promoting effective weight control habits among college students. The current study examined the impact of an Internet-based weight gain prevention program on college students’ weight control practices.

Methods: College students were provided one of two, 8-week Internet-delivered health promotion interventions as part of coursework: Healthy Weight (HW) or HPV vaccination education (HPV). Both groups received a weekly newsletter via e-mail targeting topics relevant to their respective program and were encouraged to interact with study counselors and their group members via a private Facebook message board. The HW group also received an electronic physical activity tracker and wifi scale and instructions to self-monitor steps and weight. Repeated measures ANOVA was used to compare baseline and 8-week measured weight and self-report on whether they had engaged in each of 28 weight control practices (23 appropriate; 5 inappropriate) over the previous month.

Results: Students (N=58) averaged 21.6 years, had a mean baseline BMI of 24.0 kg/m2 and were upperclassmen (98%). Both groups remained weight stable over time. A significant increase in the reported number of appropriate weight control strategies used (e.g., self-weighing, increasing exercise, reducing calorie intake, etc) over the past 4 weeks was observed from baseline to 8 weeks for the HW group versus the HPV group (7.8 to 9.9 and 8.1 to 6.9, respectively, p<0.05). No significant increase in the number of inappropriate weight control strategies reported from baseline to 8 weeks (0.3 to 0.4 in HW and 0.3 to 0.1 in HPV, p>0.05) was found.
Conclusions: Although no substantive weight change was observed, an Internet-based weight gain prevention program accompanied by technological self-monitoring tools facilitated increased use of appropriate weight control efforts by college students without iatrogenic effects. Determining whether a longer intervention promotes weight control merits future study.

T-P-3323

Health E-U: A Pilot Study of a Technology-Based Behavioral Weight Gain Prevention Program
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Background: College students are a population vulnerable to weight gain and high rates of physical inactivity. An intervention to promote weight stability and increase physical activity was developed using platforms which are familiar and commonly used by this population, including technology devices and social media. The current study describes the use of these technologies and platforms.

Methods: Upperclass college students were given an 8-session healthy weight self-regulation intervention that incorporated multiple Facebook posts each week and a weekly newsletter delivered by Mailchimp. Students also received a FitBit Zip to monitor their physical activity and an Aria scale to weigh daily. Interaction with each platform and device was tracked. If a student opened the newsletter or commented on a post they were considered to have engaged in Mailchimp and Facebook, respectively. If a student used the Zip or scale at least one day in a given week, they were classified as having used it. Weight was obtained by study staff pre- and post- treatment.

Results: Students (N=29) averaged 22 years with 14% overweight and 83% normal weight at baseline. MailChimp newsletters were opened each week by 90-100% of students. Average number of students posting on the private Facebook page ranged from a low of 14 to a high of 22, with an overall average of 18 people posting each week. Zips were initialized by 83% of students and data were transmitted variably, ranging in a given week, they were classified as having used it. Weight was obtained by study staff pre- and post- treatment.

Conclusions: Students (N=29) averaged 22 years with 14% overweight and 83% normal weight at baseline. MailChimp newsletters were opened each week by 90-100% of students. Average number of students posting on the private Facebook page ranged from a low of 14 to a high of 22, with an overall average of 18 people posting each week. Zips were initialized by 83% of students and data were transmitted variably, ranging from 12 to 24 students providing data. Scales were used by 6%, with some reports of difficulty initializing on the campus website. Over 75% of the sample consistently used all four technologies. Weight was slightly lower post-treatment than baseline.

Conclusions: College student engagement in a short-term, technology-based healthy weight management program was quite high. Further exploration to determine long-term engagement and weight trajectory over time is needed.

T-P-3324

Impact of Craving and Calorie Intake on Body Mass Index Changes during a Behavioral Weight Loss Trial
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Background: On average, individuals who are obese report higher food cravings than non-obese individuals. However, it is unclear how cravings, caloric intake, and BMI changes are related over the course of a weight loss trial.

Methods: Two-hundred two obese adults (mean BMI = 34.9 kg/m2; mean age = 51.30 years, 92.2% White; 57.8% female) participating in a behavioral weight loss trial completed measures of craving, caloric intake, and BMI at baseline and 6 months.

Results: From baseline to 6 months, higher initial cravings were associated with more gradual and less steep reductions in BMI (est. = 0.076, t = 2.304, p = 0.042). The relation between changes in craving and BMI varied by levels of change in caloric intake, such that BMI change and change in cravings moved in tandem at low levels of change in caloric intake (-1 SD below the average change; est. = 1.044, t = 2.740, p = 0.006), but were unrelated at average (est. = 7.17, t = 1.64, p = 0.10), and high levels of initial caloric intake (+1 SD above the average change; est. = 2.52, t = 0.52, p = 0.60).

Conclusions: Psychoeducation regarding how to manage cravings may be helpful for participants beginning behavioral weight loss trials, especially for those who report higher levels of craving at baseline and those who report less change in caloric intake from baseline to 6 months.

T-P-3325

Impact of Newer Self-Monitoring Technology and Interventionist Contact on Weight Loss
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Background: Current empirically-supported treatments for obesity are high in cost and have limited reach, reducing their ability to address the population-wide scope of the obesity epidemic. Recent advances in technology that simplify self-monitoring and provide feedback on goal achievement offer promise; however, despite the commercial popularity of these products, little research has been conducted to evaluate their efficacy for weight loss.

Methods: Participants (N=80) were randomized to one of three groups: a self-care control condition (SC) that used standard paper-based calorie tracking tools and a pedometer; a technology condition (TECH) that tracked caloric intake via Fitbit.com (or the Fitbit smartphone app), activity using a Fitbit Zip, and weight using a Fitbit Aria smart scale; and a technology plus interventionist contact condition (TECH+INT) that received the Fitbit tools plus 14 phone-based interventionist contacts (10-15 minutes each). All participants attended a one time in-person group session which introduced program goals and intervention tools.

Results: Of the 80 participants randomized in the ongoing pilot study, 61 (85%female, 87%Caucasian, age=50.9±12.0, BMI=33.1±3.4) have completed 6 month assessments (current retention= 93%). Weight losses for SC, TECH, & TECH+INT from baseline 6 months were -2.1±5.9%, -5.1±7.4%, and -6.4±6.0%, respectively (repeated measures: time p<.0001, groupXtime p=.107; Greenhouse-Geisser corrected groupXtime for SC vs. TECH and TECH+INT p=.039). At 6 months, 28% of SC, 62% of TECH, and 50% of TECH+INT participants experienced clinically significant ≥5% weight losses, p=.100 (SC vs. TECH and TECH+INT p=.046).

Conclusions: Full trial results will be presented. Preliminary results from this pilot study indicate that one orientation session and a technology-based intervention may lead to clinically significant weight losses at 6 months; adding additional phone-based interventionist contact may not increase benefit, especially relative to additional costs.
T-P-3326
Increasing Vegetable Intake with an iPhone App as Part of a Weight Loss Intervention: A Randomized Pilot Study in Overweight Adults
Sarah Mummah Menlo Park CA, Christopher Gardner Stanford CA, Abby King Stanford CA, Stephen Sutton Cambridge Cambridgeshire

Background: Mobile applications (apps) present a cost-effective tool for delivering behavior change interventions at scale, but no known studies have tested the efficacy of apps exclusively targeting vegetable consumption among overweight adults. To address this topic, we sought to develop and test an app for potential efficacy and user acceptability.

Methods: A user-centered design approach guided the development of a theory-based app, Vegethon. Seventeen overweight adults enrolled in a weight loss intervention were randomized to use of the app or a waiting-list control condition. Differences in vegetable consumption (primary outcome) were assessed using an adapted version of the validated Harvard Food Frequency Questionnaire (FFQ) administered at baseline and 12 weeks post-randomization. User acceptability was measured via a 21-item post-intervention questionnaire. An analysis of covariance (ANCOVA) was used to assess differences in 12-week vegetable consumption between intervention and control groups, controlling for baseline.

Results: Consumption of all vegetables, green leafy vegetables, dark and yellow vegetables, and cruciferous vegetables were significantly greater among the intervention group compared to the control group at the end of this 12-week trial (F [1, 14]=5.8, 5.1, 5.0, 11.8, p=0.03, 0.04, 0.04, 0.004, respectively). Participants reported positive experiences with the app, including strongest agreement with the statements “I have found Vegethon easy to use” and “I would recommend Vegethon to a friend” (4.6 ± 0.3, 4.2 ± 0.4, mean ± SE, respectively, on a 1-5 scale, 1=strongly disagree, 5=strongly agree). A large-scale randomized trial with n=130 participants is currently underway.

Conclusions: A mobile app intervention may be used to increase vegetable consumption. Given the reductions in weight and improved health outcomes associated with increases in vegetable consumption, this pilot trial demonstrates the need for larger-scale evaluations of similar technologies among overweight adults.

T-P-3327
Lactate-based compound containing caffeine supplementation effectively decreases fat mass in middle-aged Japanese women
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Background: We previously found that a lactate-based compound containing caffeine, an activator of intracellular Ca2+ levels, could effectively elicit fat loss even with low intensity exercise in diet-induced obese rats. In this study, we examined whether this compound supplementation also induces body fat loss in middle-aged Japanese women.

Methods: A double-blind randomized placebo-controlled trial was conducted in healthy middle-aged women (n=17, aged 40 to 49 yr, BMI 25±3 kg/m2). They were randomized to take an active supplement (Suppl), comprising lactate and caffeine, or a matching placebo (Placebo) daily for 3 month. Assessments of anthropometric and metabolic parameters, as well as self-administered diet-history questionnaire (BDHQ) were obtained at baseline (pre) and at 1 month (1M) and 3 month (3M) of the intervention.

Results: The decrease in body fat mass during the experiment was significantly greater in Suppl than Placebo (p < 0.05), although the reduction in calorie intake during 1M of the intervention was significantly greater in Placebo than Suppl (p < 0.05). There was a tendency for Suppl to decrease in percent body fat during the experiment compared with Placebo (p = 0.07). The change in subcutaneous abdominal fat during the experiment measured by MRI was not different between the groups. On the other hand, the decrease in percentage of subcutaneous fat around the thigh during the experiment measured by MRI was significantly greater in Suppl than Placebo (p < 0.05).

Conclusions: These results suggest that the supplementation of lactate-based compound containing caffeine can effectively decrease fat mass in middle-aged Japanese women.

T-P-3328-Withdrawn
T-P-3329
Long-Term Efficacy of Protein-Sparing Modified Fast vs. Conventional Diet in Obese Adults
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Background: Low carbohydrate diets have been reported to be more efficacious than conventional diets for weight loss, but their durability is not known. We hypothesized that the protein-sparing modified fast (PSMF), a very-low-calorie, ketogenic diet offered at Cleveland Clinic, would result in significant short-term but not long-term weight loss changes compared to a conventional, hypocaloric diet in obese subjects.

Methods: Retrospective analysis was performed on 175 subjects (127 PSMF, 48 conventional) who made at least three nutrition visits. Weight was captured at baseline, at the end of the diet, and at 6, 12, and 24 months after diet completion.

Results: At diet completion, 81% of PSMF subjects lost ≥5% body weight, and 60% lost ≥10% body weight. Median weight change from baseline was significantly higher with PSMF than with conventional diet (-12.4% vs. -2.6%, p<0.001), a difference that persisted at 6 months (-8.3% vs. -3.5%, p=0.003) but not at 12 months or 24 months after diet completion. PSMF diabetic subjects also lost more weight than conventional diabetic subjects by diet completion (-9.9% vs. -1.8%, p<0.001), but changes were similar after 6 months. Within the PSMF group, non-diabetic subjects maintained greater weight loss at 12 months after diet completion compared to diabetic subjects (-7.4% vs. -3.3%, p=0.037). PSMF subjects with a documented carbohydrate refeeding phase were also more likely to maintain loss of ≥5% body weight at 6, 12, and 24 months after diet completion compared to those who completed only the ketosis phase (p=0.05). Subjects with higher baseline BMI were less likely to maintain weight loss by 12 months (p=0.035) after diet completion.

Conclusions: PSMF results in significant short-term weight loss and was favorable over a conventional diet for up to 6
months after diet completion. However, maintenance of weight loss with PSMF is variable, particularly among diabetic subjects, and requires consideration before being recommended for weight management.

T-P-3330-DT
Long-term weight gain prevention among women in primary care
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Background: Few weight gain prevention interventions are available in primary care, particularly for medically vulnerable populations. In a randomized controlled trial, we previously demonstrated the efficacy of the Shape Program, a 12-month weight gain prevention intervention delivered to premenopausal overweight and Class I obese Black women in a rural community health center system, over an 18-month follow-up period. However, the intervention’s long-term effects are unknown.

Methods: The Shape intervention included tailored behavior change goals, self-monitoring, counseling calls with a registered dietitian, skills training materials, and an optional YMCA membership. Participants were randomized either to the intervention arm or to a usual care control arm. Study assessments were collected at baseline and at 6, 12 and 18 months. We abstracted clinical weight measures from participants’ electronic health records (EHR) up to 42 months post-baseline. We used log-rank tests to compare failure time distributions between treatment arms and defined failure as >3% weight gain from baseline. Accelerated failure time models were used to estimate differences in risk of failure.

Results: 170 (92.4%) of 184 randomized women consented to EHR data abstraction. The time to weight gain was significantly longer in intervention vs. control (log-rank p=0.014). After adjusting for age, baseline BMI, income and education, the risk of >3% weight gain was 49.7% (95% CI: 18.2%, 69.0%; p=0.006) lower in intervention than control. The effect persisted with failure redefined as >2% weight gain.

Conclusions: The 12-month Shape Program intervention succeeded in significant weight gain prevention for up to 42 months post-baseline. These outcomes are particularly meaningful given this population’s high risk for subsequent weight gain and obesity-related comorbidities.

T-P-3331
Metabolic Risk Factors in Overweight/Obese Hispanic Women with Diabetes or Pre-Diabetes Enrolled in a Culturally-Tailored Weight Loss Behavioral Intervention

Background: Hispanic women are at increased cardiometabolic risk in part due to the high prevalence of overweight/obesity and metabolic risk factors. De Por Vida, is an ongoing culturally-tailored weight loss behavioral intervention, delivered at a Federally Qualified Health Center, aimed at reducing metabolic risk among overweight/obese (BMI≥27 kg/m²) Hispanic women at risk for or with diagnosed diabetes mellitus (DM).

Methods: The current analysis assessed metabolic risk factors among De Por Vida participants based on preDM/DM diagnosis. Baseline metabolic risk factors (weight, BMI, waist circumference, fasting glucose [fGlu], HbA1c, triglycerides, HDL-C and LDL-C) were compared for participants at risk for DM but without a preDM/DM diagnosis (AtRisk; n=36; eligible based on history of gestational DM, hyperlipidemia or hypertension), and those with an established preDM/DM diagnosis in the medical record (n=34).

Results: Relative to AtRisk participants, those with a preDM/DM diagnosis were older (46±9 vs. 40±9 y, p<0.005), had higher weight (92±18 vs. 81±14 kg, p<0.001) and BMI (38.2±7.5 vs. 33.4±4.8 kg/m², p<0.005), and higher HbA1c (7.2±1.5 vs. 5.7±0.4 %, p<0.0001) and fGlu (154±46 vs. 110±14 mg/dL, p<0.0001). Participants with DM had significantly higher HbA1c and fGlu than those with preDM (data not shown). There were no significant differences in waist circumference (119±14 vs. 113±21 cm), triglycerides (174±95 vs. 171±94 mg/dL), HDL-C (47±12 vs. 44±8 mg/dL), and LDL-C (102±37 vs. 117±42 mg/dL) between preDM/DM and AtRisk participants, respectively.

Conclusions: Despite their overweight/obese status, AtRisk participants had elevated fGlu but low presence of other metabolic risk factors, suggesting an optimal time to participate in a diabetes risk reduction program through weight management. For preDM/DM participants, risk factors are indicative of poor glycemic control and also support weight management for risk reduction. Funding source: NIH/NIDDK – 1R01DK099277.

T-P-3332-DT
Multicultural Recognition in Weight-Management Treatment Design: The STRIDES Social Responsibility Therapy Program
Eileen Seeholzer Cleveland Ohio, James Yokley, Adam Perzynski Cleveland OH, Mary Ellen Lawless Cleveland Ohio, Janeen Leon Cleveland OH, Charles Thomas Cleveland Ohio

Background: The acceptability and value of multi-cultural pro-social values as part of behavioral weight loss programs is largely unexplored. The STRIDES program, an intensive behavioral weight loss program, designed for the needs of largely African American urban adults, uses Social Responsibility Therapy (SRT), a multi-cultural treatment for unhealthy, harmful behaviors, to enhance program effectiveness.

Methods: Focus groups of STRIDES participants (African American women) who dropped out or completed STRIDES were conducted after IRB approval was obtained. Thematic, constant comparative approach was used as the method to analyze transcripts and develop themes grounded in the words of the participants. Resulting thematic categories were mapped to the SRT model.

Results: STRIDES focus groups were a 12% (n=16) subset of 130 participants who attended a STRIDES class 2011-2013. Analysis shows the “diversity within unity” treatment approach of reinforcing common, multicultural pro-social values was universally accepted and highly effective. Participant discussion had very high fidelity to initial curriculum design and demonstrated a considerable fidelity between the curriculum design principles and what participants discussed, (especially to values of honesty, concern and responsibility). The high level of consistency between content and process of the intervention indicates strong acceptance by the target population participants.
Conclusions: Culturally and individually flexible design approaches may optimize treatment impact of programs for various minority participants in mainstream settings. SRT approach, in which participants define and adapt treatments to their situation/preferences, can be tested in innumerable settings across time. Focus group evaluations can determine programs' cultural: compatibility; acceptability; and consistency with target culture values. Testing multicultural treatment goodness of fit through intervention acceptance indicators from target population focus groups is recommended.

T-P-3333
Multilevel Approach for Childhood Obesity Prevention: Focus on an Elementary School Staff
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Background: Most school-based childhood obesity prevention programs focus on students but overlook school staff who serve as role models for students and their own families. Our hypothesis was that physical activity (PA) and body composition would improve for school staff participating in a 6-month worksite intervention based on the Let’s Go Healthy Workplaces Toolkit.

Methods: All school staff were invited to participate. A subset of staff (n=16) volunteered to participate in the research component. After baseline assessment of PA (accelerometer, Sensewear® Mini Armband) and body composition (body mass index, BMI, and waist circumference) at the beginning of the school year, several environmental changes were employed providing opportunities for decreasing sedentariness, increasing PA, and improving diet quality. Staff were provided weekly e-mails and monthly workshops related to the Let’s Go 5-2-1-0 program. After 6 months, baseline assessments were repeated. Data are represented as mean ± standard deviation.

Results: Staff participating in the program were largely female (1 male). Only women were included in the analyses. At baseline, the staff had mean BMI and waist circumference of 25.9 ± 4.6 kg/m² and 83.9 ± 12.0 cm, respectively. Change in baseline, the staff had mean BMI and waist circumference of 25.9 ± 4.6 kg/m² and 83.9 ± 12.0 cm, respectively. Change in PA was statistically significant for those who increased PA, and body composition (BMI and waist circumference) was favorable for those who increased PA.

Conclusions: School staff that increased PA while participating in the multilevel program showed favorable change in body composition over 6 months.

T-P-3334
Older Adults can Achieve Clinically Meaningful Weight Loss in a Clinic-based Lifestyle Treatment Program
Brie Breland Cambridge Maryland, Linda Gottelf Boston Massachusetts, Carol Addy Boston Massachusetts

Background: Obesity has increased 73% in older adults in the last 20 years and nearly 70% of adults over age 60 are overweight or obese. Obesity is a risk factor for chronic diseases such as diabetes (DM), with the highest prevalence in adults over 65. Sarcopenic obesity is also increasing with a prevalence as high as 20% in older adults.

Methods: This was a retrospective study of patients ≥64 years who enrolled in Maryland Healthy Weights, a comprehensive HMR clinic-based medical weight loss (WL) program that includes weekly group sessions led by health educators to achieve reduced calorie intake with meal replacements, increased fruit/vegetable intake (72.2% of patients were on a diet plan with fruit/vegetables), and increased physical activity (≥2,000 kcal/wk). Eligible patients had attended ≥8 weeks in the weight loss phase.

Results: 36 patients (mean age 70.4 years; 50% male/female) had a mean initial body weight (IBW) and baseline body mass index (BMI) of 251.1 lbs and 40.1 kg/m², respectively. Mean total WL was 37.8 lbs and mean percent change in IBW was -14.3% after a mean duration of 23.3 weeks. The mean physical activity at the end of the weight loss phase was 2594 kcal/wk. For those patients with DM (n=14), the mean change in HgbA1c was -1.0% (7.6% to 6.5%). 85.7% (12/14) of patients taking DM medications had discontinued or reduced those medications at the end of weight loss. Of those individuals with DM, 78.6% (11/14) had LDL<100 at the end of weight loss. For those patients diagnosed with hypertension, 83.3% (20/24) had blood pressures <140/90 at the end of weight loss.

Conclusions: Older adults who participated in a comprehensive lifestyle program lost clinically meaningful weight loss with improvements in cardiometabolic risk factors. Lifestyle interventions may be the optimal treatment to reduce chronic diseases which are increasing in older adults, including DM and sarcopenic obesity.

T-P-3335
Overvaluation of Shape/Weight Predicts Binge Eating and Self-Esteem in an Ethnically Diverse Sample of Overweight/Obese Adults Seeking Weight Loss Treatment
Sylvia Herbezo Loma Linda CA, Serena Stevens, Ashley Harries Anaheim CA, Christina Moldovan Loma Linda California

Background: Research has shown overvaluation of shape and weight is associated with greater eating disorder psychopathology in individuals with binge eating disorder (BED). However, the potential negative effects of such overvaluation in overweight/obese individuals without BED have not been studied. We examined the influence of shape/weight overvaluation on binge eating and self-esteem in an ethnically diverse sample of overweight/obese adults seeking weight loss treatment.

Methods: Participants were 57 adults aged 18 to 74 (M = 48.47, SD = 14.45), with a mean body mass of 37.46 (SD = 7.70). Approximately 54% of the sample was White, 17.5% African American, 19.3% Hispanic American, 5.3% Asian American, and 3.5% other. Prior to the start of treatment, participants completed questionnaires and had their height and weight measured. Using hierarchical regressions, we examined the effect of shape/weight overvaluation on binge eating and self-esteem.

Results: Shape/weight overvaluation significantly predicted greater binge eating frequency, β = .331, p < .05; however, after controlling for depressive symptoms, such overvaluation was no longer significant, β = .110, p = .49, F(1,54) = 12.58, p < .001. Shape/weight overvaluation and depressive symptoms accounted for 31.8% of the variance in binge eating frequency.
(R^2 = .318). Shape/weight overvaluation also significantly predicted poorer self-esteem, even after controlling for depressive symptoms, β = -.263, p < .05, F(1,54) = 48.64, p < .001. Shape/weight overvaluation and depressive symptoms accounted for 64.3% of the variance in self-esteem (R^2 = .643).

Conclusions: Study findings suggest that in an ethnically diverse sample, treatment-seeking overweight/obese adults with high levels of shape/weight overvaluation may be more susceptible to engaging in binge eating and experiencing low self-esteem. Future research should examine the effects of shape/weight overvaluation on weight loss treatment outcomes to help inform intervention efforts for obesity.

T-P-3336-DT
PACE+ Activity and Nutrition Low-Intensity Individualized Counseling for Obese Urban Patients in a Primary Care Clinic: Feasible, Practical and Associated with Improved Weight and Survival
Eileen Seeholzer Cleveland Ohio, Janeen Leon Cleveland OH, Siobhan Martin Cleveland Ohio, Denise Kaiser Cleveland OH, Charles Thomas Cleveland Ohio, Neal Dawson Cleveland OH

Background: Primary care practices need efficient tools to provide and document individualized counseling to obese adults about behaviors impacting obesity. This program evaluation assessed the utility of offering Patient-centered Assessment and Counseling for Exercise and Nutrition (PACE+) to obese patients in an urban primary care practice.

Methods: Electronic Medical Record data (EMR) from 2006-2014 were reviewed for patients at a urban primary care practice where PACE+ counseling was offered. Outcome measures for counseled patients were: stage of change (SOC); choices for and barriers to change. To assess intervention impact, counseled patients were compared to a propensity score matched uncounseled group from the practice to assess differences after counseling in: weight (21 mo); survival (to 8 yrs). Analyses comparing SOC to patient characteristics were conducted using the Cochran-Armitage Trend Test. Bivariate comparisons of continuous items were analyzed using the Chi square.

Results: 4,100 individuals with obesity were seen and 2,100 (52%) were counseled. Patients were: 81% female; 97% African American; mean age 48; mean BMI-39. SOC was: contemplation (38%) and preparation (40%) for activity; and preparation (61%) for calorie reduction. Preferred activity was walking (64%). Anticipated barriers were pain and weather for activity and “will-power” and cost for nutrition,. Compared to a propensity score matched group of un-counseled patients, those counseled lost an average of 1.5# while those not counseled gained an average of 4 pounds over 21mo. Survival after eight years for the group not counseled with PACE+ was 86%, for those counseled with PACE+ was 93% (p=0.0001).

Conclusions: In a group of urban AA obese patients from a low income area, PACE+ counseling was associated with mild weight loss and avoided gain and improved survival. Improvement is despite a low intensity intervention, low active SOC for diet/exercise, and many barriers. Value for practice population management should be tested.

T-P-3338
Performance on a Decision Making Task is Reproducible and is Associated with Adiposity
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Background: Cross sectional studies have reported that individuals with excess adiposity perform worse on behavioral tasks assessing executive function (EF) compared to healthy weight controls. The reproducibility of these tests and whether changes in task performance relate to changes in adiposity are unknown.

Methods: Measures of EF including decision making by the Iowa Gambling Task (IGT), perseverative error score on the Wisconsin Card Sorting Test (WCST), and the Stroop Word Color Test interference score (SWCT) were assessed in 36 subjects (17m/19f) two separate times 10 days apart to calculate the Intraclass Correlation Coefficient (ICC) as a measure of consistency. Separately, 31 volunteers (28m/3f; 4AA/7H/10C/10NA); BMI 35±10; %fat 28±10%; and fat mass (FM)(25±13kg) participated in studies on our clinical research...
unit with baseline and follow-up measures of body composition by DXA (mean ±u time: 1.8±1.3y; range 0.5, 5.5 y) and EF scores (IGT: 3±25; WCST: 22±15; SWCT 26±10).

**Results:** ICC demonstrated good reproducibility over 10 days [IGT (ICC=0.75); WCST (ICC=0.48); SWCT (ICC=0.60)] and over the long term [IGT (ICC=0.74); WCST (ICC=0.54); SWCT (ICC=0.42)]. At baseline, higher %fat (β=-0.94 points, p=0.05) and FM (β =-0.69 points, p=0.05) were negatively associated with lower IGT scores after adjusting for sex, education, age, and race. Baseline FM (β =-0.38, p=0.03) and baseline BMI (r=-0.41, p=0.02) were negatively correlated with change in IGT/year, but did not retain significance in the general linear models. There were no associations between measures of adiposity and WCST or SWCT scores.

**Conclusions:** All EF tests demonstrate moderate to good consistency, indicating they likely represent stable, individual traits. Increased adiposity was associated with poorer decision making task performance. However, IGT performance did not change following weight gain, further supporting the construct of decision making as an inherent trait.

**T-P.3339 Predicting Dropout from Behavioral Weight Loss Treatment**

**Background:** Dropout from behavioral weight loss (BWL) treatments is associated with weight regain; thus, treatment dropout hinders clinical gains for treatment participants. Additionally, attrition from BWL studies hinders follow-up data collection and evaluation of treatment. Evidence has inconsistently implicated younger age, male gender, and greater emotional eating as associated with dropout. The present study sought to build a predictive model to identify individuals at-risk for attrition from a BWL program.

**Methods:** Supervised classification analyses were evaluated to yield the model that best predicted treatment dropout. Baseline data (12 self-report measures and 15 variables from the Weight and Lifestyle Inventory) from 248 individuals entering a BWL study were entered into linear discriminant analysis and quadratic discriminant analysis models predicting dropout using leave-one-out-cross validation. ROC curves were examined to determine the best model and optimal tuning parameter. Press’ Q was used to determine whether the model classified individuals better than chance.

**Results:** The best model emerged using linear discriminant analysis with a probability parameter (probability at which the case is classified as a dropout) of 0.2. With this model, overall prediction accuracy was 57.3%; sensitivity was 60.3%. Press’ Q statistic revealed that this model performed better than chance ($\chi^2(1)=5.22, p=0.03$). Variables of highest importance included younger age, lower mindful awareness, and higher number of recent weight loss attempts.

**Conclusions:** Results indicate that it is possible to build a model that predicts dropout with better-than-chance accuracy. Future work should improve model accuracy by using a larger dataset. Early identification of those at-risk for dropout may allow early intervention to retain individuals in treatment. Additionally, studies should examine whether certain clusters identify types of individuals who drop out and whether we can better tailor treatments to individual need.

**T-P.3340 Predictors of Initiation of Behavioral Weight Loss Treatment in an Integrated Care Setting**
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**Background:** Behavioral weight loss treatments are increasingly offered by healthcare organizations at low or no cost. Nevertheless, low enrollment limits their potential impact. We investigated factors that might influence treatment initiation.

**Methods:** Participants were outpatients at five Veterans Affairs (VA) healthcare facilities who were referred to VA behavioral weight loss treatment. Within 4 weeks of referral, telephone interviews were conducted to obtain patients’ perceived barriers to treatment initiation, weight loss treatment preferences, and psychosocial characteristics hypothesized to be associated with treatment initiation, including eating self-efficacy, anxiety severity, help-seeking discomfort, perceived provider support for weight control autonomy, perceived provider advocacy for treatment, perceived treatment efficacy, and social norms. Treatment initiation (yes vs. no) was determined via medical records.

**Results:** Participants (n=198) were 77% male, 60% African American, and mean BMI was 36.9. Treatment was initiated by 54% of participants. In bivariate analyses, treatment initiators were more likely than non-initiators to have the following characteristics: Obese class I (vs. overweight or class II or III), single, not working full-time, PTSD diagnosis, greater anxiety, and greater perception that referring provider supported weight autonomy. In multivariable analyses, treatment initiation was associated with being single, greater anxiety, and perceived provider support for weight autonomy. Few barriers to treatment use were endorsed, and endorsement was not associated with treatment initiation. Preferences for different potential program features (e.g. modality) varied widely.

**Conclusions:** This study, composed primarily of groups under-represented in behavioral weight loss treatment, suggests that initiation of behavioral weight loss treatment in an integrated care setting may be improved if providers communicate respect for patient autonomy and if multiple treatments types are offered.

**T-P.3341 Preliminary Evaluation of Enhanced Behavioral Treatment for Adults with Binge Eating and Obesity**
Jennifer Pells Durham NC, LaPonda McKoy Durham NC

**Background:** Traditional treatment for obesity and binge eating with either behavior weight management or CBT respectively has yielded mixed results and become an area of discussion as to the most efficacious method of treatment. As part of a residentially-based behavioral weight management program, we conducted a preliminary evaluation of outcomes for obese adults and binge eaters with and without an emphasis on binge eating.

**Methods:** Of the total sample (n=118), half of the sample (n=59) participated in the behavioral weight management curriculum (“Core Program”) and opted to add the program’s specialized treatment for binge eating (“Bridge Program”). The other half of the sample were age- and sex-matched controls.
that participated in the Core Program during the same time period (M length of stay=30 days) and matched on binge eating status. Baseline and post-treatment changes were evaluated for Bridge and Control participants across several variables: BMI, % weight loss, glucose, cholesterol, triglycerides, depressive symptoms, disinhibited eating, and weight-related quality of life.

Results: Bridge and Control participants had no statistically significant differences in baseline weight, health, or psychological variables. Within-group t-tests for Bridge and Control participants revealed significant improvements in glucose, cholesterol, and triglycerides, improved mood and quality of life, reductions in disinhibited eating and weight (all p’s <.05). Between-group comparisons revealed that both groups achieved similar degree of improvements (all p’s >.05) from pre- to post-treatment, indicating no disadvantage for the individuals who did not utilize the Bridge program.

Conclusions: Future analysis of follow-up data is a necessary addition to this preliminary evaluation of enhanced weight management for individuals with obesity and binge eating.

T-P-3342
Promoting Weight Maintenance with Electronic Health Record Tools in a Primary Care Setting: Baseline Results from the MiaIntao-Pc Trial
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Background: Maintaining weight loss after successful initiation and weight counseling in primary care settings remain significant challenges in combating obesity. The goal of our study is to evaluate the use of tools delivered through an electronic health record (EHR) and patient portal with or without health coach support to help primary care patients maintain weight loss.

Methods: Maintaining Activity and Nutrition through Technology-Assisted Innovation in Primary Care (MAINTAIN-pc) is a multidisciplinary weight management program using EHR tools, including flowsheets, standardized surveys, and secure patient messaging. Inclusion criteria were: age 18-75 years, voluntary 5% weight loss in past 2 years with prior BMI ≥ 25 kg/m2, and no bariatric procedures in past 5 years. Participants were randomized 1:1 to either tailored online coaching (CC) or a less intensive EHR tracking tools intervention (TO). We used descriptive statistics to analyze baseline data and T-tests and Chi-square/Fisher exact tests to determine differences between randomized groups.

Results: We screened 721 potential candidates between October, 2013 and February, 2015 to enroll 194 participants (98 CC; 96 TO). The most common reasons for not enrolling included lack of interest (63%), not meeting age/weight loss cutoffs (13%), and no verified pre-loss weight (8%). At baseline, participants were 53.4 (SD 12.2) years old, 74% female, and 88% White. Average weight and BMI at baseline were 189.1 (SD 42.1) lbs and 30.4 (5.9) kg/m2, respectively. Prior to weight loss, the average BMI was 34.4 (SD 6.5) kg/m2. Participants lost an average of 11.3 (SD 6.6) percent of their prior body weight before enrolling. Almost all reported moderate physical activity (96%). The demographic and clinical characteristics did not differ by randomized group.

Conclusions: We were able to successfully identify and recruit primary care patients with recent voluntary weight loss for participation in a weight maintenance program using EHR-based tools.

T-P-3343
Providing Funding for a Medical Weight-loss Program Can Improve Access to Care and Health Outcomes in Underserved Areas
Brie Breland, Cambridge Maryland, Linda Gottelf, Boston Massachusetts, Carol Addy, Boston Massachusetts

Background: Access to effective medical weight-loss (WL) services is limited in low-income, rural areas. Dorchester County, a relatively poor rural county on Maryland's Eastern Shore, has high rates of obesity-related diseases, including diabetes and hypertension. As 1 of 5 Health Enterprise Zones (HEZ) in MD, funding was awarded to a county coalition to improve health care outcomes and reduce health disparities. As part of this coalition, Maryland Healthy Weights (MHW) established a program to improve access by reducing the cost of meal replacements (MR) and program fees for income eligible patients.

Methods: This was a retrospective study of patients who enrolled in the HEZ program in MHW, a clinic-based program using the HMR program. The comprehensive program includes weekly groups led by health educators to achieve reduced caloric intake with MRs, increased fruit/vegetable intake (70.6% of pts used a diet plan with fruit/vegetables), and increased physical activity (≥2,000 kcals/wk). All patients had completed ≥8 wks in the WL phase of the program.

Results: 34 patients (mean age 50 yrs; 88% female; 68% white) had a mean initial body weight (IBW) and baseline body mass index (BMI) of 268.2 lbs and 46.0 kg/m2, respectively. Mean total WL was 31.2 lbs and mean percent change in IBW was 11.4% after a mean duration of 21.9 wks. 29.4% of pts. (10/14) were diagnosed with diabetes initially. Their mean change in HgbA1c was -0.8% (8.3% to 7.5%). At the end of weight loss, 70% (7/10) of pts who entered on diabetes medications had discontinued or reduced those medications; 80% (8/10) of pts. with diabetes had LDL <100; 89.5% (17/19) with hypertension had blood pressure <140/90.

Conclusions: Low-income patients who enrolled in an intensive medical WL program through a state grant demonstrated clinically meaningful weight loss and decreases in medication. Supplemental funding and/or insurance coverage of medical weight-loss programs can help to improve health care access and health outcomes in underserved communities.

T-P-3344
Psychological Eating Factors are related to Motives for Ad Libitum Food Intake
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Background: Maladaptive eating behaviors can be associated with increased food intake and obesity. We investigated whether eating-related psychological constructs assessed prior to ad libitum energy intake (EI) associated with reported reasons for eating.

Methods: Twenty-eight (20M; 37±11y[M±SD]) healthy volunteers (BMI 29±6kg/m2) were admitted to an inpatient unit. While on a weight maintaining diet (WMN), they completed the Three Factor Eating Questionnaire to measure...
disinhibition, hunger and cognitive restraint, the Emotional Appetite Questionnaire (EMAQ), and the Binge Eating (BE) Scale. They then ate ad libitum using a validated vending paradigm to measure EI over 3 days. Subsequently, they completed an 11-item visual analog scale (VAS) assessing the reasons that prompted them to visit the vending machine. All r values were partitioned for sex.

Results: On average, subjects overate (3609±1066kcal/d; 13±38%WMN). Highest scores were recorded for “I was hungry (6±25”) and “it was mealtime (6±22)”. Disinhibition associated with eating because “the food was free” (r=0.44, p=0.03), “wanted to try all of the items” (r=0.40, p=0.05), “was bored” (r=0.58, p=0.003), “ate about the same as at home” (r=0.44, p=0.03) and “I lost control over my eating” (r=0.47, p=0.02). Hunger associated with eating because “the food was free” (r=0.44, p=0.03), “was bored” (r=0.44, p=0.03), and “I lost control over my eating” (r=0.47, p=0.02). EMAQ associated with eating because “it was mealtime” (r=0.54, p=0.005), “was bored” (r=0.51, p=0.01), and “ate about the same as at home” (r=0.56, p=0.003). BE scores associated with eating because “the food was free” (r=0.64, p=0.001) and “I lost control over my eating” (r=0.53, p=0.006). None of the VAS measures correlated with EI.

Conclusions: Psychological scales assessed before EI correlate with reasons why, rather than how much, people chose to eat. Disinhibition and BE may relate to reasons indicative of chronic overconsumption, suggesting targets for behavioral intervention.

T-P-3345
Reducing Dietary Self-Monitoring Burden: What Should Be Monitored and When?

Background: Dietary self-monitoring is critical for successful weight management, yet few are able to do it for prolonged periods. Identifying the number of self-monitoring days needed to capture the majority of different food and beverages consumed, and what days and eating occasions contribute a greater amount of new foods and beverages into the diet, could assist with developing guidelines to reduce self-monitoring burden.

Methods: The first 40 days of valid, electronic, dietary self-monitoring (days with > 3 eating occasions and > 600 kcal) from 60 adults (55.9 +/- 9.1 yrs, 35.1 +/- 5.3 kg/m2, 80.0% female, 95.0% white) participating in a smartphone-based, 18-month, lifestyle intervention were coded for number of new foods and beverages consumed/day. Foods/beverages were coded at the individual component-level, with different flavors and modifications to the same food/beverage counted as new items.

Results: Inter-rater reliability kappa coefficients for food coding/day ranged from 0.73 to 1.00, with an overall daily percent agreement of 90.6 +/- 4.0%. Number of new items consumed/day declined from Day 1 to Day 12 (12.7 +/- 3.6 items to 3.7 +/- 2.2 items), when approximately 50% of all coded items had been consumed. From Day 23 forward, all days consistently had < 3 new items consumed, and by Day 28, approximately 80% of all coded items had been consumed. Starting on Day 12, new items were more likely consumed on a weekend day (63.0% of the remaining coded weekend days had a new item consumed), and dinner contributed almost 50% of the new items consumed/day.

Conclusions: After four weeks of continuous dietary self-monitoring, self-monitoring what is consumed on weekend days and at dinners only, rather than all days and eating occasions, may be a strategy to reduce self-monitoring burden, while still increasing awareness of foods/beverages not previously consumed.

T-P-3346-DT
Socioeconomic disparities in weight and behavioral outcomes among American Indian and Alaska Native participants of a translational lifestyle intervention project
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Background: It is well known that diabetes and obesity are highly prevalent in many minority populations, who often are impoverished. Behavior change interventions frequently are less effective in the real world of these populations, in part due to significant socioeconomic barriers.

Methods: We analyzed data from the Special Diabetes Program for Indians Diabetes Prevention Program (SDP- DP), an evidence-based lifestyle intervention to prevent diabetes in 36 American Indian and Alaska Native communities. A total of 2,553 participants started the 16-session Lifestyle Balance Curriculum between 01/01/2006 and 07/31/2008. Linear mixed models were used to evaluate the relationships of participant and staff socioeconomic characteristics with weight loss and behavioral outcomes at the end of the curriculum.

Results: A strong, graded association existed between lower household income and less BMI reduction, which remained significant after adjusting for other socioeconomic characteristics. Compared to others, participants with annual income < $15,000 also had less improvement in physical activity and unhealthy foods consumption in bivariate models, but the relationships were only marginally significant in multivariate regressions. Furthermore, grantee sites with fewer professionally prepared staff members were less successful at improving participants’ BMI and healthy foods consumption than the other sites. The strong association between income and BMI reduction was reduced by 20-30% in the models with changes in diet variables, but was unrelated to changes in physical activity.

Conclusions: Significant socioeconomic disparities exist in weight outcomes of lifestyle intervention at both participant and site-staff levels. Helping low-income participants choose more affordable healthy foods and increasing proportion of professionally trained staff might be practical ways to maximize the effectiveness of lifestyle interventions implemented in “real-world” settings.

T-P-3347
Successfully Preventing Age-Related Weight Gain, but the Impossibility of Proving it.
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Background: We have shown that a procedure called the Caloric Titration Method (CTM), a procedure that involves daily self-weighing, successfully prevented weight gain in women measured over a two year period. However, we found that the control group also did not gain weight, resulting in our inability to conclude that the CTM was an effective procedure in preventing age-related weight gain.
Methods: We performed an intensive review of literature of the weight change observed in (a) the control groups used in weight control studies and (b) those used in longitudinal or cohort studies. From these studies we extracted about 400 independent groups.

Results: The vast majority of weight control groups used in weight control studies failed to show any gain in weight. The slope of the mean weight change when plotted against the duration of the period of observation was not different from 0. However, almost every non-intervention, longitudinal or cohort study that measured weight at two time points demonstrated a statistically significant increase in mean weight as a function of duration of time in the study.

Conclusions: These results suggest that it may be impossible to prove the effectiveness of studies designed to test weight prevention methods when control groups are used. They also suggest that simply by knowing that a person’s weight is being monitored, as in a control group, may be sufficient to overcome the many subtle environmental cues (primes) that stimulate us to eat a little more energy than we expend causing the slow increase in body weight known as the epidemic of obesity.

T-P-3348
Sustaining Lifestyle Change: Weight Maintenance of Obese Individuals Participating in a Long-Term Program
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Background: Numerous studies indicate that maintenance of weight loss is difficult and most individuals regain. Maintenance programs that offer weekly group support may decrease the amount of weight regain.

Methods: Retrospective chart review of individuals participating for > 2 years in the maintenance phase of a medically-supervised, multidisciplinary weight management program. Weekly complimentary 1-hour support groups led by a behavioral specialist are encouraged.

Results: At the time of this review, 73 individuals (66% female) were participating in the maintenance program for 2 years or more. Baseline age was 60.4 +/- 9.3 years, BMI 36.9 +/- 7.1 kg/m2, and weight 231.5 +/- 54.5 lbs. Average duration of participation in maintenance was 5.3 +/- 0.8 years. Greatest weight loss from baseline was 49.9 +/- 28.4 lbs, a 20.7 +/- 8.5% loss (p<0.001, baseline and lowest weight). Weight regain from lowest weight was 14.6 +/- 11.3 lbs, resulting in a 14.1 +/- 10.2% total loss (p<0.001, baseline and current weight). The majority, 80%, were maintaining a 5% or greater loss, 62%, were maintaining a 10% or greater loss, and 3 individuals, 4%, regained back to baseline weight plus 1 to 3 lbs. Significant reductions were noted in blood pressure, pulse, total cholesterol and triglyceride levels. The majority, 69%, were attending group sessions regularly. There was no significant difference in weight regain for those attending group regularly and those that were not.

Conclusions: The majority of individuals participating in a long-term maintenance support program are maintaining a clinically significant weight loss of 5% or more. Limitations of this study include retrospective observational design, lack of a control group, and no data on individuals that discontinued participation. Prospective randomized studies on maintenance programs are needed to determine best practice long-term obesity treatment.

T-P-3349
The Effect of Evaluative Conditioning on Implicit Attitudes and Consumption of Sugar-Sweetened Soft Drinks

Background: Evaluative Conditioning (EC) has been used to alter implicit attitudes by pairing a target stimulus with positive or negative stimuli. Altering implicit attitudes towards hedonic, high-energy foods might be a means of reducing caloric intake.

Methods: We examined the effect of a picture-picture EC procedure on soda outcomes, including positive and negative implicit attitudes, consumption during a taste test, and real-world consumption during the week after the intervention. In the EC condition (n = 43), soda was paired with disgust and water was paired with pleasant stimuli, while in the control condition (n = 41), the same images were viewed without pairing.

Results: Results generally favored the potential for EC to impact soda drinking, and during the one-week follow-up period, there was a trend towards the EC group showing a larger reduction in real-world soda consumption. However, analyses also revealed several unexpected patterns: the effect of EC on increasing negative implicit attitudes was only seen in individuals who had relatively higher baseline negative attitudes towards soda, effects on general soda consumption were weaker than those on consumption of the targeted brand, and the EC condition showed an initial increase in taste test consumption immediately following the intervention, particularly among individuals with low self-control.

Conclusions: These findings may suggest that when using EC to target a well-known brand, attitude change is more successful when negative attitudes are already present, and the initial introduction of negative attitudes can lead to short-term disinhibition in individuals with poor self-control. It also suggests that in spite of these early effects, EC may result in lower consumption for at least a week following the intervention.

T-P-3350
The Effect of Smoking Status on Success in a Weight Management Program
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Background: Obesity is becoming a costly disease to both the individual and society. The current study examined the weight loss of current, former and never smokers enrolled in a weight management program, hypothesizing that former smokers may lose more weight than current or never smokers.

Methods: The study includes citizens of the city of Ottawa and surrounding communities who have been referred by a physician for weight management. The Ottawa Hospital Weight Management Clinic protocol consists of weekly meetings in a close group setting for 26 weeks and then monthly for 6 months. Participants identifying themselves as current smokers were included in the analysis if they smoked >/= 10 cigarettes per day. Former smokers were included if they had quit smoking for > than 1 year. A total of 3209 participants were included in analysis.

Results: We conducted an ANOVA analysis to see whether
smoking was associated with percent weight loss, while controlling for gender, age and BMI. At week 6, former
smokers lost more weight than current smokers and never
smokers had a larger reduction in waist circumference
compared to current smokers. For all comers, weight loss was
not significantly different by the end of the 16- or 26-week
programs. Never smokers continued to have a larger reduction
in waist circumference. Former smokers attended a greater
percentage of overall sessions compared to current smokers.

**Conclusions:** Smoking and obesity are both significant risk
factors for cardiovascular disease and cancer. Ultimately,
prevention of both of these risk factors is optimal for
addressing the overall health of the population. The similarity
in weight loss between groups is reassuring, as former smokers
are equally as successful at losing weight in a weight
management program. As well, smoking does not increase the
effectiveness of losing weight for those enrolled in a weight
management program.

**T-P-3351**
The Home Food Environment: A Promising Target of
Weight Loss Treatment?
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Philadelphia PA, Michael Lowe Philadelphia Pennsylvania,
Amy Gorin Storrs CT, Katherine Schaumberg, Stephanie
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**Background:** A growing body of research indicates that the
home food environment (HFE) and weight control behaviors
are related in important ways (Gorin et al., 2013; Lowe et al.,
2014); however, little is known about 1) whether interventions
can prompt individual to make improvements in the HFE, and
2) how changes in eating behavior are associated with changes in
the HFE.

**Methods:** Participants (n= 285) were randomized to receive
standard behavioral weight loss treatment (“BT”) or BT plus
specialized skills for improving the HFE (“BT+E”). Weight
was measured at baseline and 6 months. Dietary intake was
measured with 24-hour food recalls at baseline. The HFE was
measured with the 190-item Household Food Inventory, a valid
and reliable questionnaire that assesses foods currently
available in the home and reflects the extent to which the HFE
is obesogenic (Fulkerson et al., 2008).

**Results:** At baseline, individuals with a more obesogenic HFE
had greater calorie (r=.12, p=.046) and fat intake (r=.16,
p=.006), higher hedonic hunger (r =.12, p=.048) and lower
cognitive restraint (r=.19, p=.001). Participants in BT+E
showed greater improvements from baseline to 6 months in the
HFE than those in BT (p=.04, partial eta squared = .02).
Improvements in the HFE were greatest in individuals with
poorer HFE at baseline (r = .41, p = .001). Across condition,
improvements in the HFE were associated with amount of
weight loss (r = .16, p = .02), as well as reductions in
uncontrolled eating (r = .17, p = .007) and emotional eating (r
=.20, p = .002) and increases in cognitive restraint (r = .21,
p = .001) and self-efficacy (r = -.13, p = .04).

**Conclusions:** Specialized treatment can prompt participants
to make improvements in the HFE. These HFE improvements are
associated with 6-month weight loss outcomes and several
desirable behavioral changes. Additional research must
determine if this improves long-term weight loss outcomes.

**T-P-3352**
The Impact of a Behavioral Intervention on Preventing
Excessive Gestational Weight Gain
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Little Rock Arkansas

**Background:** Excessive gestational weight gain (GWG) is a
key modifiable risk factor for negative maternal and child
health. Unfortunately, many women gain in excess of the 2009
Institute of Medicine (IOM) guidelines. We examined the
impact of a behavioral GWG intervention.

**Methods:** 207 participants (99 normal weight, 65 overweight,
and 43 class I obese) received six 20-minute in-person
behavioral intervention sessions from a trained interventionist.
The intervention consisted of establishing self-weighing and
incremental GWG goals, reviewing the GWG trajectory, and
problem solving strategies to achieve goals. For those who
maintained with the IOM guidelines, the intervention
intensified, with dietary self-monitoring prescribed. Weight
was assessed within the first 10 weeks of gestation and at
gestation week 36, in identical conditions on a calibrated scale.
The women were 87.6% Caucasian, mean age= 29.0 years, and
90.4% married; it was the second pregnancy for all.

**Results:** Women attended an average of 98% of intervention
sessions. Mean GWG was 12.8+2.7 kg in normal weight, 11.9+4.6 kg in overweight, and 8.7+4.4 kg in obese
participants. Based on the IOM guidelines adjusted for 36
weeks gestation, 33.3% of normal weight, 67.7% of
overweight and 53.3% of obese women gained excessively.
Participants with excessive GWG were above the guidelines,
on average, by 1.8+1.4 kg (normal weight), 4.0+3.1 kg
(overweight), and 3.5+3.5 kg (obese).

**Conclusions:** This behavioral self-regulation intervention was
well-accepted by pregnant women and attenuated GWG among
normal weight, overweight, and obese women, compared to
national estimates (15.1 kg, 14.2 kg, and 12.3 kg, respectively,
as reported by Johnson et al., 2015). However, a more
intensive intervention may be necessary to assist some women,
particularly overweight and obese women, to achieve the
recommended GWG.

**T-P-3353**
The PROP Bitter Taste Phenotype Associates With
Differences in Weight Loss in Obese Women Following a
Low-Carbohydrate vs. Low-Fat Diet: An Interim Analysis
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Brunswick NJ, Hollie Raynor Knoxville Tennessee, Beverly
Tepper New Brunswick NJ

**Background:** Taste preferences are a primary determinant of
food choices, but are typically ignored when designing weight
loss interventions. In women, genetic taste blindness to the
bitterness of 6-n-propylthiouracil (PROP) associates with
higher preferences for high-fat foods. The objectives of this
study are to: 1) determine if PROP non-taster women lose
more weight following a low-carb (LC) diet that liberalizes fat
intake compared to a low-fat (LF) diet; and 2) to assess
biobehavioral factors that may contribute to weight loss.

**Methods:** We randomized 96 women (BMI=34.6 kg/m2;
age=45.7y) classified as PROP non-tasters (n=41) and super-
tasters (n=55) to a LC or LF diet within a 6-month behavioral
lifestyle intervention. Questionnaires assessed eating behaviors
and perceptions of the diets. Interim analyses were conducted
Conclusions: In general, the LC diet led to greater weight loss than the LF diet (p=0.014). As predicted, non-tasters lost more weight following the LC diet than the LF diet (6.34 vs. 4.05 kg; p=0.032); no differences were found between super-taster groups (6.50 vs. 5.21 kg; p=0.16). Dietary restraint increased and disinhibition decreased, but were not associated with weight loss. In all regression models, ‘family/friend encouragement’ was positively associated with weight loss (p=0.02). Barriers to weight loss were ‘a busy lifestyle’ for the LF groups and ‘perceived deviation from usual diet’ for the LC groups (p=0.002 for both).

Conclusions: These preliminary data demonstrate that barriers to weight loss were diet-specific; analyses at 6 months will provide insight into factors influencing greater weight loss in the non-taster women on a LC diet. Supported by American Heart Association 12GNT12060259.

T-P-3354-DT
The Relation of Intraindividual Cortisol Variability with Intervention Adherence and Weight Loss among African-American Women in a Behavioral Weight Control Program
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Background: Chronic stress is a common obstacle to adherence and success in behavioral weight control interventions. High intraindividual variability in waking cortisol can be used as a physiologic marker of chronic stress. The aim of this study was to explore relations between stress, adherence, and weight loss among African-American women enrolled in a behavioral weight control program.

Methods: Women reporting high perceived stress participated in a 12-week lifestyle intervention (N=44). Saliva cortisol was collected upon waking on three consecutive mornings at baseline and 12-weeks. The Perceived Stress Scale (PSS) was administered and body weight was collected pre- and post-treatment. Adherence (group sessions attended, self-monitoring diaries completed) was assessed. Intraindividual variability in cortisol was calculated as the standard deviation across the three samples (CortSD), and as the change in variability from baseline to post (ΔCortSD).

Results: The sample averaged 44 years of age, was obese (MBMI=37), and had an average weight loss of 2%. Mean baseline waking cortisol was 5.63 ng/mL (SD=3.94) and the PSS was 30.70 (SD=7.60). Mean CortSD was 3.42 (SD=3.55) and ΔCortSD was 1.01 (SD=5.85). ΔCortSD was correlated with attendance (r=-.408, p=.025) and diary use (r=-.412, p=.024). Weight loss was also correlated with attendance (r=-.335, p=.028) and diary use (r=.389, p=.010), but not CortSD. ΔCortSD predicted attendance (B=.01, p=.089) and diary use (B=.02, p=.015), and attendance and diary use predicted percent weight lost (B=.043, p=.01). Change in the PSS was unrelated to adherence or weight loss.

Conclusions: Decrease in intraindividual waking cortisol variability over the course of the intervention related to better adherence, which in turn related to better weight loss in African-American women; change in perceived stress did not. Cortisol variability over time may be a useful measure linking physiologic stress to treatment engagement, and possibly to intervention outcomes.

T-P-3355
The Relationship Between Objectively-Assessed 4-Year Physical Activity Participation and Long-Term Weight Loss in Older Adults with Type 2 Diabetes Enrolled in the Look AHEAD Trial

Background: Associations between physical activity (PA) and weight loss (WL) have primarily been examined using self-report PA measures over short follow-up periods. This study examined objectively-assessed PA and WL over 4 yrs in the Look AHEAD trial.

Methods: PA was measured via accelerometry on a subgroup of Look AHEAD participants who were randomized to Intensive Lifestyle Intervention (ILI) or Diabetes Support and Education (DSE; control group). ILI received instructions to reduce caloric intake and progress to 175 min/wk of moderate-to-vigorous intensity PA (MVPA). Only those with accelometer data at baseline (BL), 1 yr (Y1), and 4 yrs (Y4) were included in the analyses (n=1148; age: 59.4±6.8 yrs; BMI: 35.9±5.9 kg/m2). Bout-related MVPA (PA ≥3 METs, accumulated in ≥10-min bouts) was calculated.

Results: Bout-related MVPA increased from 96.2±140.4 min/wk at BL to 158.4±227.6 min/wk at Y1 in ILI (p<0.001), but returned to near BL by Y4 (108.3±217.1 min/wk; p=0.05). In DSE, bout-related MVPA did not change over time (BL: 30.8±132.3 min/wk, Y1: 92.5±153.0 min/wk; Y4: 77.4±321.5 min/wk; p=0.05). The percentage of participants achieving ≥175 min/wk of bout-related MVPA was similar between groups at BL (ILI =17.7%, DSE=16.8%) but greater in ILI, compared to DSE, at Y1 (30.3% vs. 16.6%; p<0.001) and Y4 (19.3% vs. 9.8%, p<0.001). Among ILI participants who achieved ≥175 min/wk at Y1 (n=174), those who maintained ≥175 min/wk at Y4 (n=72) had greater Y4 WL compared to those who did not maintain this level of PA (n=102; WL: 8.4±7.3% vs. -5.4±8.3%; p<0.05). Conversely, among those who achieved ≥10% WL at Y1, those maintaining ≥10% WL at Y4 (N=107), had greater PA at Y1 (247.9±249.9 vs 160.4±156.5 min/wk; p<0.001) and Y4 (152.1±178.5 vs 108.5±152.6 min/wk; p<0.05) relative to those not maintaining WL (N=137).

Conclusions: Objective assessment of PA reveals that ILI improves the number of individuals achieving ≥175 min/wk of bout-related MVPA. PA over time was associated with greater WL.

T-P-3356
The Role of Avoidance-Based Coping in the Psychosocial Functioning of Weight Loss Treatment Seeking Adults
Jason Lillis Providence Rhode Island, Heather Niemeier Whitewater WI, Rena Wing Providence RI

Background: This study is an attempt to identify, screen for, and characterize a subgroup of participants that might benefit from a weight loss approach that utilizes acceptance and mindfulness-based practices: individuals who report high internal disinhibition.

Methods: Participants were 162 overweight or obese adults...
(85% female; mean age 50 +/-10) screened for high internal disinhibition and recruited for a weight loss intervention study who completed a baseline assessment prior to treatment that included: internal disinhibition (Eating Inventory), experiential avoidance (Acceptance and Action Questionnaire), binge eating (Eating Disorders Examination Questionnaire), weight control strategies (Weight Control Strategies Scale), and several short-forms from the NIH PROMIS initiative (Patient Reported Outcomes Measurement Information System), including depression, anxiety, quality of life, and satisfaction with relationships.

**Results:** Results showed that overweight and obese individuals who report high disinhibition show mildly elevated levels of depression, anxiety, poor coping, and reduced quality of life, significant levels of binge eating (50% with one or more binge episodes per week), however evidence no impairment in social relationships or the ability to take values-based action in family, social, and work domains.

**Conclusions:** This study shows that overweight and obese individuals high on internal disinhibition evidence moderate co-morbid psychosocial impairment and binge eating, and may benefit from a weight loss approach that addresses these co-occurring problems more directly.

**T-P-3357**

**The Social Pounds Off Digitally (POD) App: Results from an RCT using a theory-based, social support app.**

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**Background:** Mobile health (mHealth) has shown promise as a way to deliver weight loss interventions, yet maintaining participant engagement over time has been a challenge.

**Methods:** Overweight and obese adults (N=53; mean BMI=35 kg/m2, 38% African American, 83% Female) in two SC cities who owned an Android device were recruited to participate in a 12-week mobile behavioral weight loss intervention. All participants received the behavioral content of the intervention via twice weekly podcasts and were randomized to download and use either a standard calorie tracking app (FatSecret) or the Social POD app (Social). To re-engage inactive users, the Social app prompted active users to select one of three messages to send to inactive users targeting one of three behavioral theory constructs: social support, self-efficacy, or outcome expectations. To promote participant motivation, participants earned points (exchanged for prizes at week 12) for using the Social app. Body weight and dietary intake (two 24-hr recalls) were assessed at baseline and two months.

**Results:** The final intervention assessment will be completed in May. Changes in body weight, energy intake, and energy expenditure will be reported. At 6 weeks, collapsing groups, both the total reported days of app use ($r=-0.64$, $p<0.01$) and the total number of reported podcasts listened to were significantly correlated with weight ($r=-0.61$, $p<0.01$).

**Conclusions:** This mHealth approach has the potential to be scaled up, by facilitating the provision of social support provided to inactive users by active users to promote participant engagement over time, with limited in-person contact from counselors.

**T-P-3358**

**The Usefulness of a Mobile Phone Application for Improving Medical Students’ Health Behaviors and Weight Loss Counseling Ability**

Amanda Velazquez Indianapolis IN, Laura Rogers Birmingham AL, David Steward Springfield Illinois, Georgia Mueller Springfield IL, Steven Verhulst Springfield Illinois

**Background:** Improving medical student weight management behaviors can help combat the obesity epidemic by enhancing future physicians’ ability to provide weight loss counseling. The primary study aim was to assess changes in medical students’ body weight, weight management behaviors, knowledge and attitudes during a 6-month weight loss intervention using a calorie tracking phone app.

**Methods:** Thirty-seven medical students, BMI (27.7± SD 5.9), interested in losing weight, participated in this prospective pre/post intervention study. The 6-month intervention included daily “MyFitnessPal” app use, weekly submission of diet/expenditure logs to study staff, and monthly weigh-ins. Knowledge, attitudes, and behavior were assessed with self-administered pre/post surveys.

**Results:** A non-significant decline in body weight from pre to post-intervention occurred (mean change of -2.4 ± SD 9.1 pounds, $p=0.149$). Greater weight loss was associated with more frequent app use (e.g., calorie tracking $r=-0.40$, $p=0.027$ and community feature $r=-0.44$, $p=0.014$) and greater perception of the app as a worthwhile weight loss tool ($r=-0.36$, $p=0.05$). Knowledge score significantly increased pre to post-intervention ($0.94 ± SD 1.75$, $p=0.006$) primarily due to improved diet knowledge ($0.74 ± SD 1.55$, $p=0.012$). Percentage of patients the participants stated they would counsel about weight loss decreased from 60.2% to 46.4% ($p=0.001$) while confidence in counseling did not change.

**Conclusions:** A mobile phone app is an inexpensive method for improving medical students’ weight management knowledge. Additional adjuncts maybe necessary to increase medical students’ personal weight loss and confidence in delivering knowledge gained.

**T-P-3359**

**Treatment for depression does not augment behavioral weight control in obese, depressed individuals: a randomized controlled trial.**


**Background:** Obesity and Depression frequently co-occur and each disease increases risk for cardiovascular disease (CVD). We hypothesized that a combined treatment (targeting obesity and depression simultaneously) would yield greater improvements in weight, mood and CVD risk factors than treatments targeting each disease individually.

**Methods:** Seventy-six obese individuals with major depression were randomly assigned to: 1) behavioral weight control [BWC] combined with supportive-education therapy for depression, 2) a non-dieting approach to weight loss combined with cognitive-behavioral therapy for depression [CBT-D], or 3) BWC combined with CBT-D [COMBINED]. Participants met for 18 two-hour sessions over 20 weeks in groups of 4-8.
participants, led by clinical psychologists. Assessments of mood, weight and CVD risk occurred at baseline, weeks 8, 20 (end of treatment) and 46 (follow-up).

**Results:** At 20 weeks, participants in the COMBINED and BWC groups lost comparable amounts of weight (mean±SE 5.2±1.2% of initial weight and 3.5±1.3% respectively), which was significantly (p<0.04) more than the 0.8±1.3% lost by CBT-D participants. Depression scores (assessed by the Hamilton Rating Scale for Depression) decreased significantly from baseline levels (7-8 points) in each group, with no significant differences between groups. All three groups showed significant (p<0.04) improvements (from baseline) in 10-year CVD risk, with no significant differences between groups.

**Conclusions:** Behavior weight control yielded comparable improvements in weight, mood and CVD risk to a combined treatment that incorporated CBT for depression. CBT for depression does not augment weight or mood outcomes in this population but improves CVD risk even in the absence of weight loss.

**T-P-3360 Two Year Weight Loss in the 10 Top Tips (10TT) Trial: A Randomised Controlled Trial of Habit-Based Advice for Weight Control in General Practice**


**Background:** The 10TT trial tested a novel weight-loss intervention based on habit-formation theory, which took a set of simple weight management behaviours and gave advice in a leaflet on making them habitual. We previously showed that patients allocated to 10TT lost significantly more weight over 3 months (the primary outcome) than those allocated to usual care (UC). The present analysis explored maintenance over 24 months.

**Methods:** A two-arm, individually-randomised, controlled trial in obese adults (n=577) in primary care, compared the 10TT leaflet with UC. Weights were measured at 3, 6, 12, 18 and 24 months.

**Results:** Data were available for 312 (58%) participants at 24 months. The 10TT group maintained their weight loss (mean=-2.18kg, SD=5.76), with 27% achieving ≥5% weight loss. However by the end of follow-up, the UC group had lost a similar amount of weight (mean=-2.96kg, SD=7.16). Results from the mixed effects model accounting for clustering, showed that the group x time interaction was significant (p=0.029). Further analysis indicated that while weight loss in the UC group was slower than the 10TT group in the first 6 months, it continued until 18 months, whereas the 10TT group experienced more loss in the first 6 months, but did not lose additional weight after this point.

**Conclusions:** Patients who received the low-intensity, habit-based intervention lost significantly more weight than usual care at 3 months and maintained their weight loss achieved at 3 months at 2 years. This is promising in terms of the habit model, and suggests that the behavior changes made in the first few months had become ‘habits’. The inclusion of a usual care comparator (including referrals to commercial programmes) rather than a ‘no treatment’ control group may explain the similar weight loss seen in the usual care arm. Given the 10TT was still as effective at 24 months; it could offer a low-intensity alternative within the primary care setting.

**T-P-3361 Uncovering the Mystery of Eating Choices: A Comparison of Multinomial Processing Tree Models**

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**Background:** Weight gain can be disassembled into momentary decisions to consume high-calorie foods. For those attempting weight loss, such decisions can be deemed a self-regulation failure. Inherent in self-regulation is a balance between automatic drives to seek out instant pleasure, and controlled processes governed by distant consequences. There are two theoretically distinct accounts of how these processes interact. Within a control-dominated model, an individual is able to enact deliberate decision-making before automatic desires will drive behavior. Within an automaticity-dominated model, behavior is driven by automatic responses and self-control is only enacted in the absence of implicit desires. The current study seeks to compare these two theoretical models using response behavior on a food-based computer task.

**Methods:** An Implicit Association Task (IAT) containing palatable foods was administered to overweight/obese adults (n=196) prior to beginning weight loss treatment. Given that adequate performance requires both controlled and automatic processes, error rates on the IAT can be used as a proxy for naturalistic responses towards palatable food. Error rates were modeled onto control- and automaticity-dominated multinomial processing trees (MPT).

**Results:** Analysis of Akaike Information Criterion and Bayesian Information Criterion values indicated that a control-dominated (AIC=716.75; BIC=1436.20), as opposed to an automaticity-dominated relationship (AIC=782.19; BIC=1466.90), was the best model of participant error rate on the IAT.

**Conclusions:** Results provide evidence for a control-dominated approach to explain the initiation of higher calorie intake. To the extent that IAT patterns reflect an attraction towards palatable foods, findings suggest that high-calorie food consumption results only when control fails to operate in individuals with strong implicit desires. Future research should continue to use MPT methods to examine the unobserved processes that underlie eating behavior.

**T-P-3362 Use of electronic medical record to assess outcomes of comprehensive lifestyle intervention for obesity treatment**

Dalia Mikhail Rochester Minnesota, Teresa Jensen Rochester mn, Kim Edens Rochester MN, Michael Jensen Rochester Minnesota

**Background:** Assessing obesity treatment outcomes, and thus planning for program improvement, is difficult due to high dropout rates in community-based programs.

**Methods:** The first 105 patients, age 18-65, BMI 27-40, in the Olmsted County Employee Community Health practice enrolled prior to May, 2014 and provided written, informed consent allowing electronic medical records (EMR) use to collect follow-up data. Patients received cognitive behavior therapy, nutrition and physical activity education. Five groups were eligible for data analysis; groups 1-3 (N=17, N=14 and N=18, respectively) were enrolled first and groups 4 (N=33) and 5 (N=23) enrolled –6 months later. The same experienced interventionist led each of sessions (<20 in total). Weight was
recorded regularly at group sessions and via the EMR for those with <10 months of participation.

**Results:** The one year retention rate was 69%; we were able to collect EMR data on 24 of 33 dropouts. Completers lost 3.6% (95% CI 2.2-5.1) and dropouts lost 0.8% of their body weight. There were no statistically significant differences between the 5 groups in either percent weight loss or dropout rates. Groups 1-3 averaged 3.1% weight loss (95% CI 0.7-5.4) and groups 3 and 4 averaged 4.0% weight loss (95% CI 2.1-5.9; P = NS vs. groups 1-3). The dropout rates were 39% for groups 1-3 and 23% for groups 4 and 5 (OR = 0.48, 95% CI 0.20-1.11 for groups 1-3 vs. 4-5).

**Conclusions:** The use of IRB approved consent to track weight loss in dropouts via the EMR confirmed they experienced lesser weight loss. We observed trends for greater weight loss and retention rates with more experience. This quantitative analysis will inform efforts to improve outcomes and retention.

**T-P-3363**
**Using Digital Health Technology to Self-Monitor Behavior for Weight Loss: A Systematic Review of Randomized Trials among Overweight and Obese Adults**
Michele Lampther, Durham North Carolina, Gary Bennett, Raleigh NC

**Background:** Self-monitoring behavior is a critical component of behavioral weight loss interventions. Technology-based tools may provide an innovative tracking solution, but no reviews have evaluated their efficacy for enhancing self-monitoring adherence. We systematically reviewed obesity treatments that utilized digital health technologies for self-monitoring.

**Methods:** We searched 6 databases (PubMed, EMBASE, SCOPUS, PsycINFO, CINAHL, ProQuest Dissertations & Theses) and 2 independent reviewers assessed abstracts and articles based on eligibility criteria. We included RCTs published between 2009-2014 that enrolled overweight and/or obese adults, provided a weight loss intervention for ≥12 weeks, assessed outcomes at ≥6 months post-randomization, and reported the relation between weight loss and self-monitoring adherence.

**Results:** Out of 1368 papers identified, 20 papers (representing 14 trials) met eligibility criteria. Several digital health technologies were employed for self-monitoring: websites (14%), PDAs (7%), and electronic smart scales (7%). Interventions varied the behaviors prescribed for self-monitoring: 71% tracked body weight, 64% dietary intake, 50% step count, and 43% physical activity duration. Most trials encouraged tracking of multiple goals. Adherence to self-monitoring was as good or better when combined with in-person counseling. Five studies compared tracking via paper diaries vs. via technology and all found that the latter promoted greater adherence. Lastly, more frequent self-monitoring was associated with greater mean weight loss in 11 of 14 trials; this pattern was replicated for tracking of diet, physical activity, and body weight.

**Conclusions:** Findings demonstrated that asking people to self-monitor their behavior change goals is effective at producing weight loss. Digital health technologies may serve as useful tools for promoting adherence to self-monitoring.
weight lapses of various sizes and percent weight loss at 6 months were calculated from weights obtained at weekly treatment sessions.

**Results:** Most (79.6%) participants experienced at least one lapse of ≥1 lb during the first 6 months. Of these lapses, 54.0% were 1-1.99 lbs, 27.0% were 2-2.99 lbs, 10.0% were 3-3.99 lbs, and 8.9% were ≥4 lbs.

There was a negative correlation between frequency of ≥1 lb lapses and percent weight loss at 6 months (r=-.44, p<.001), and between frequency of lapses of each size (e.g., 1-1.99 lbs) and percent weight loss (r’s: -.21 to -.29, p’s<.001). Controlling for number of observed weights, participants who had just one 1-1.99 lb lapse lost significantly less weight at 6 months (10.9% weight loss) than those who had no lapses (13.0%; F(1,97)=7.66, p<.01, partial eta squared=.07).

**Conclusions:** Weight lapses, including those that are small, during the weight loss phase of BWL treatment are strongly related to later weight loss. Early lapses should thus be taken seriously by both clinicians and participants to reduce future lapse occurrence. BWL programs may benefit from increasing provision of skills for preventing and reversing weight lapses earlier in treatment.

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**T-P-3366**

### Weight Loss Success of the Food Insecure

**Authors:** Anna-Leena Vuorinen Ithaca New York, Megan Zhou Ithaca CT, Elaine Wethington Ithaca NY, Brian Wansink Ithaca NY

**Background:** People of lower SES are more likely to use weight loss strategies inconsistent with recommendations.

**Methods:** 405 Latino and African-American subjects who participated in a year-long weight loss study (Small Changes Lasting Effects) in Harlem and South Bronx were analysed to examine whether receiving food assistance was associated with weight loss means they had used prior their participation or with the selection of small change eating strategy they chose in the trial. Food assistance was defined as receiving assistance from programs such as WIC, food stamps. We analysed the association between long-term weight loss success (defined as losing more or equal to 5% of body weight during 12 months) and food assistance. We also examined whether receiving food assistance affected the perceived confidence and challenge to adhere to the weight loss intervention on a 9-point response scale.

**Results:** Of 405 participants, 178 (48%) received food assistance. Participants who received food assistance had been more likely to skip meals (p=.063) or use pills not needing a prescription (p=.092), and less likely to exercise (p=.026) or join a weight loss program (p=.001) prior the trial. The selection of small change eating strategies that participants chose in the trial were not affected by receiving assistance (p=.268). Receiving food assistance was associated with long-term weight loss success (29% vs 17%, p=.036). Participants receiving food assistance were slightly more confident to be able to adhere to the intervention (p=.063) whereas the sense of challenge was not different between the groups (p=.133). Early analysis suggests that food assistance receivers had poorer eating habits at baseline leaving more room for improvement.

**Conclusions:** Surprisingly participants who received food assistance were more likely to succeed in weight loss. The results show the potential of small change interventions employing low-threshold behavior change strategies among low-income people.
follow-up of 10 or more years after LSG were included. Weight loss success, weight regain and the incidence of revision surgery was analysed as well as Quality of Life (QoL), which was surveyed by standardized questionnaires (BAROS, SF36, GQOL, RSI, BQL). Gastro-oesophageal reflux was assessed by gastroscopy (with biopsy) as well as manometry and 24-hour pH-metry.

**Results:** Overall, 53 patients underwent LSG until the end of 2005, at one of the three bariatric centres. The mean operative weight was 134 ± 20kg, corresponding a mean BMI of 47.7 ± 7.3kg/m². During the 10 year follow-up, a total of 19 of the 53 patients (36%) were converted to a gastric bypass due to significant weight regain or reflux. We present in detail weight loss data and the results of the gastroscopy, manometry, 24-hour pH-metry as well as data on QoL.

**Conclusions:** In LSG patients with a long-term follow-up of 10 years or more, a high conversion rate to a gastric bypass was observed. To make a statement on the incidence and relevance of postoperative reflux after LSG, the results of this ongoing study must be awaited.

**T-P-3360-DT**
*Who Shows Up and Loses? Predictors of Attendance and Weight Loss in Urban African American Women in the STRIDES Behavioral Weight Loss Program*

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**Background:** STRIDES weight loss program is a free 12-week group program with materials at a 4th grade reading level. Prior analysis showed disease burden and insurance type were not predictive of attendance or weight loss among African American women participants. The primary purpose of this evaluation was to assess other predictors of attendance and weight loss.

**Methods:** This program outcome evaluation analyzed STRIDES participant survey data collected 2011-2014. Data were compared to participant weight, attendance, demographics, and disease burden. Analyses: For two-category independent variables the Cochran-Armitage Trend Test was used to assess the trend in binomial proportions across levels of weight change and levels of attendance. Where the independent variables are more than two categories the Kruskal-Wallis test was used.

**Results:** Analysis of 92 surveys showed participants were AA women with: average age 53 years; body mass index (BMI) of 43; hypertension (65%) and diabetes (35%). Attendance: 33% dropped-out, 33% partial completion, 34% completion. Weight loss: for completers (n=34) was 78%, and 52% lost 5% weight or more. Predictors of attendance and weight Loss: Baseline diet/exercise habits, environment, and readiness to change eating/activity did not predict program completion or weight loss. Those reporting headache with exercise were less likely to complete STRIDES (p=0.004) and trended to decreased weight loss (p=0.0642). Using the binominal PRIME MD utility, participants reporting ≥3 symptoms had less attendance and weight loss. (p = 0.0372 and 0.0067). Higher self-rating on items to take initiative to solve a problem and to stick to a decision were associated with weight loss (p = 0.0475 and 0.0347).

**Conclusions:** Assessments of factors predictive of success among persons with varied characteristics and of the effect of pre-participation interventions to improve symptoms/skills to improve weight loss are needed to optimize resource use and success rates for behavioral weight loss programs.

**T-P-3370**
*A Randomized Controlled Trial to Prevent Depression and Ameliorate Insulin Resistance in Adolescent Girls At-Risk for Type 2 Diabetes (T2D)*

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**Background:** Pediatric depressive symptoms (DepSx) predict insulin resistance, independent of adiposity. We hypothesized that reducing DepSx would improve insulin sensitivity (Si) in adolescents at-risk for T2D.

**Methods:** In a parallel-group randomized trial, we compared a 6-wk cognitive-behavioral (CB) depression prevention group to a 6-wk health education (HE) group in overweight girls with T2D family history and mild-moderate DepSx (CESD≥16). Girls with clinical depression, determined by interview, were not studied. Main outcomes were pre- to post-intervention Δ in DepSx and Si (WBISI derived from 2-hr OGTT). Secondary outcomes were Δ in test meal intake, 12-min walk/run distance, and cortisol reactivity to a cold pressor test. ANCOVA was used to compare group Δ, adjusting for group facilitator, race, degree of T2D family history, baseline DepSx or Si, age, puberty, %body fat and Δ in %fat.

**Results:** Of 119 girls enrolled (age 14 ± 2y; 64% Black, CESD 25 ± 7), 61 were randomized to CB and 58 to HE. Retention was 90% in CB v. 91% in HE (p=1.0) with 93% session attendance in both groups. CB and HE showed similar reductions in DepSx (CESD -12 v. -11, p=.33), and had similar improvements in Si (0.10 v. 0.07, p=.41). Teens with moderate DepSx (CESD=20) at baseline had greater symptom reduction in CB v. HE (CESD -13 vs. -9, p=.02). Pooling all subjects, decreases in DepSx were associated with improved Si (p=.02), CB and HE had similar Δ in meal intake (27 v. -11 kcal, p=.65) and walk/run distance (-94 v. -56 meters, p=.16). CB trended towards an enhanced cortisol response to a stressor v. HE (10 v. 0.0 ng/dL, p=.08), particularly among girls with moderate DepSx (17 v. -4 ng/dL, p=.08).

**Conclusions:** Assessed immediately following 6 wks of CB or HE, both programs reduced DepSx in girls at-risk for T2D. Reductions in DepSx were related to improvements in Si independent of adiposity or group. Longer-term follow-up is needed to determine if decreasing DepSx can sustain improved Si.

**T-P-3371**
*A Two-Tiered School Cafeteria Intervention of Emoticons and Small Prizes Improves Food Selection: A 15-Month Experience*

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**Background:** Poor food selection in school cafeterias is a risk factor for childhood obesity. We introduced two successive interventions to improve healthful eating in an inner city school of 297 children over 3 months. The first intervention was the placement of “Green Smiley Faced” Emoticons by the most healthful foods of fruit, vegetable, entrée and plain white fat free milk (PWFFM). The second intervention was a “Power Plate” (PP) program in which children received a small prize for selecting the healthful all the healthful options. The purpose of this study was to describe the overall changes in purchasing with the two-tiered intervention of Emoticons and Small Prizes over two academic years.

**Methods:** Two interventions, Emoticons and PP were introduced sequentially over a three month period. The Green Smiley Faced Emoticons were posted near the 4 most healthful foods: fruits, vegetables, PWFFM and entrée with whole grains. Three months later in addition to the Emoticons, students were rewarded with a small prize if they selected a PP which consists of the four healthful foods. Individual purchase of the healthful foods was determined by cash register receipts. Differences from baseline to the end of the 15 month intervention period were analyzed by Statistical Control Process/Graphical (SCSPG).

**Results:** Baseline purchase of PWFFM increased from 7.4% to 48.0% a 549% increase during the 1st academic year and was 26% (168% over baseline) the 2nd. Chocolate milk selection decreased from 86.5% to 44.6% year 1 and went to 70% in year 2. Selection of fruits increased from 1.0 per to 1.2 per student per day in year 1 and then 1.1 the year 2. Vegetables increased from 0.74 to 1.2 per student per day academic year one, and then decreased to 8.3 the second year. The increases were significant by SCSPG.

**Conclusions:** A two-tiered approach of Emoticons followed by small prizes as an incentive for healthful food selections is very effective in increasing plain white milk, fruit and vegetable selection.

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**T-P-3372**

**Building a Remotely-Delivered Responsive Parenting Intervention to Prevent Pediatric Obesity among Low-Income Families**

Kari Kugler State College PA, Katherine Balantekin University Park Pennsylvania, Linda Collins State College Pennsylvania, Leann Birch Athens GA - Georgia, Jennifer Savage

**Background:** The current study is the first phase of the multiphase optimization strategy (MOST), a framework for building more effective interventions, to examine the feasibility and acceptability of eight, remotely-delivered responsive feeding intervention components to prevent pediatric obesity among low-income mothers differing on maternal depression.

**Methods:** Mothers (n=107) of a toddler aged 12 to 42 months participating in WIC were randomized to one of 16 experimental conditions with different combinations of 1 to 9 intervention components (i.e., responsive feeding curriculum, parenting curriculum, portion plates, risk assessment screening, feeding routines, feeding curriculum counseling, goal setting, mobile messaging, and social support), to screen out poorly performing components prior to building an optimized intervention.

**Results:** The intervention did not have a significant effect on weight (95.0±16.2 to 93.9±15.6 kg, p=0.84), BMI (35.0±4.8 to 34.3±4.5 kg/m², p=0.60), or waist circumference (108.0±9.9 to 107.8±10.1 cm, p=0.94). However percent body fat decreased by 10% (from 47.1±8.3 to 42.3±5.6%, p=0.04). Added sugar intake decreased by 41% (from 5.9±1.7 to 3.5±1.1 teaspoons/day, p=0.03) and the percent of total kilocalories coming from added sugar decreased from 10.2% to 7.3%.

**Conclusions:** These data support the utility of short-term lifestyle intervention to improve changes in dietary behaviors and certain aspects of body composition among obese Latino youth with prediabetes.

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**T-P-3373-DT**

**Changes in Dietary Behaviors and Anthropometrics Following Lifestyle Intervention Among Obese Latino Youth with Prediabetes**

Manroop Kaur Phoenix Arizona, Meg Bruening Phoenix Arizona, Allison Nagle-Williams Phoenix AZ, Gabriel Shaibi Phoenix AZ

**Background:** Pediatric obesity disproportionately impacts Latino youth and is associated with an increased risk for type 2 diabetes. The objective of this study was to determine the effects of a culturally-grounded, community-based, lifestyle intervention on dietary intake and anthropometric measures in obese Latino youth with prediabetes.

**Methods:** Seventeen obese (BMI=98.5±1.1%) Latino adolescents (age 15.2±0.8 years) completed an intensive 12-week lifestyle intervention that included weekly nutrition education and three days/week of moderate-to-vigorous physical activity. Anthropometric measurements (weight, waist circumference, BMI) and percent body fat (bioelectrical impedance) were determined before and after the intervention. Dietary intake of saturated fats and added sugars was determined using the 2007 Block Kids Food Screener for kids ages 2-17y. Paired sample t-tests were used to assess changes following the intervention.

**Results:** The intervention did not have a significant effect on weight (95.0±16.2 to 93.9±15.6 kg, p=0.84), BMI (35.0±4.8 to 34.3±4.5 kg/m², p=0.60), or waist circumference (108.0±9.9 to 107.8±10.1 cm, p=0.94). However percent body fat decreased by 10% (from 47.1±8.3 to 42.3±5.6%, p=0.04). Added sugar intake decreased by 41% (from 5.9±1.7 to 3.5±1.1 teaspoons/day, p=0.03) and the percent of total kilocalories coming from added sugar decreased from 10.2% to 7.3%.

**Conclusions:** The use of a highly efficient study design provides an efficient way to screen out poorly performing components prior to building an optimized intervention.

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**T-P-3374**

**Changes in Levels of PYY Hormones in Obese Adolescents Who Participated of Outpatient Care Treatment for Weight Loss During One Year**

Background: In order to ensure successful targeted interventions is necessary to understand the hormones relationship with body composition and clinical aspects. The present study aimed to compare the changes in PYY levels, BMI, insulin resistance and its association with other metabolic disorders of obese adolescents who participated of outpatient care for weight loss for one year.

Methods: There were collected in three different times (start, 6 months and 12 months) the anthropometric data (weight, height, waist circumference), biochemical and clinical parameters (total cholesterol, LDL-C, HDL-C, triglyceride, fasting glucose, insulin and PYY 3-36) of 51 obese teenager (29 girls) age mean ± 12 (11-13), pubertal stage 3 and 4. All patients were advised about dietary quality and quantity. Insulin resistance was identified by the homeostasis model assessment for insulin resistance (HOMA-IR) index. To compare the three moments, analysis of variance tests (ANOVA) for repeated measures complemented by Bonferroni or Friedman test together with the Wilcoxon were applied. To analyze the associations correlation coefficients were used Pearson or Spearman test.

Results: All variables triglycerides and HOMA significant reduction only in the 3rd time on relation to the other two triglycerides ($p=0.016$), HOMA-IR ($p=0.004$). On relation to low-density lipoprotein cholesterol (LDLc=0.016) it reducing first time, it was for the times 2 and 3. In association of PYY hormone levels with the study variables, only significant association between changes in BMI and the 1st PYY for the 3rd time ($r=-0.421; p=0.002$).

Conclusions: Our study suggests that the reduced triglycerides, HOMA and low-density lipoprotein cholesterol during a year may promote increase in PYY levels and thereby reduce body mass index in obese adolescents.

T-P-3375
Changes in Perceived Stress and Diurnal Salivary Cortisol Patterns in Latino Adolescents Following Imagine HEALTH Guided Imagery Group Intervention
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Background: Links between chronic stress and obesity-related morbidity suggest a role for stress-reduction mind-body interventions in reducing metabolic disease risk in populations of youth suffering from significant health disparities such as obesity, insulin resistance, and type 2 diabetes risk. We have previously shown that stress reduction using guided imagery (GI) delivered individually to obese Latino adolescents acutely lowers cortisol salivary. We now evaluate changes in self-reported perceived stress and diurnal salivary cortisol patterns following a 6-week lifestyle intervention using group stress-reduction guided imagery.

Methods: 17 adolescents (42% Male, age 17.2±1.0 yrs, 94.1% Hispanic, BMI 22.5±4.2) participated in a single arm, 6-week, pilot intervention, receiving twice weekly lifestyle classes in nutrition and physical activity, plus once weekly group guided imagery focused in part on teaching stress reduction mindfulness-based techniques. Measurements pre-post intervention: Perceived Stress Scale (PSS); average of 3 days of cortisol awakening response (rise in salivary cortisol from awakening (A) to 30 min later (+30). Changes in CAR (by linear mixed effects modeling) and PSS (by paired t-test) were assessed and compared by Spearman correlations. Cohen’s d effect sizes were calculated to determine magnitude of pre-post change.

Results: There were no significant differences in CAR (0.20±0.12 to 0.16±0.17, p=0.29) or PSS (24.5±6.6 to 27.2±6.0, p=0.15) across the intervention. The effect size for the change in CAR was small (d=0.36) and for PSS moderate (d=0.43). Change in CAR showed a strong and highly significant direct correlation with change in PSS ($r=-0.75, p<0.01$).

Conclusions: Though a small, uncontrolled pilot study, correlation between changes in PSS and CAR suggest interventions in minority youth that reduce self-perception of life stress may hold promise for reducing diurnal cortisol pattern which is associated with obesity-related disease risk.

T-P-3376
Changes in Psychosocial Health during a 7-Week Pediatric Weight Management Program

Background: Youth with obesity are at increased risk of psychosocial dysfunction (PD), including both internalizing and externalizing problems. However, little is known regarding the impact of pediatric weight management (PWM) on psychosocial health. The purpose of this study was to investigate changes in PD among children who completed a 7-week PWM program.

Methods: FitKids360 is a 7-week, family-centered PWM program for families with children ages 5 to 16 with a BMI > 85th percentile that focuses on health behavior education, exercise, and mentored goal setting. The Pediatric Symptom Checklist (PSC) was assessed via parent-report to evaluate PD before and after the program. PSC subscales were calculated according to internalizing, externalizing, and attention symptoms, and validated cut-points were used to identify youth with elevated baseline PD.

Results: Of the 372 participants (60.5% female) from 36 FitKids360 classes who initiated treatment, 20.7% had elevated baseline PSC, and 16.9%, 19.5%, and 15.1% had elevated externalizing, internalizing, and attention subscales, respectively. Program completers (n=181) did not differ from non-completers in baseline PSC scores; however, males had greater baseline attention symptoms than females (p=0.003) and youth ≥11 years had greater internalizing symptoms than younger participants (p=0.038). PSC improved 12.5% (p=0.003) in those with normal PSC scores and 31.8% (p<0.001) for those with elevated baseline PD. Those with elevated externalizing, internalizing, or attention subscales also improved their respective subscale scores (p<0.001 for all).

Conclusions: Youth with elevated PD who completed PWM improved their emotional and behavioral functioning, as indicated by clinically meaningful changes in total PSC scores and internalizing, externalizing, and attention subscales. Additional research is needed to determine if these improvements are maintained long term.

T-P-3377
Eating Pace Retraining in Early Childhood Obesity Prevention: A Pilot Study
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Background: Rapid eating is associated with obesity risk in young children. This pilot study tested the effect of a novel family-based behavioral intervention (“RePace”) on eating rate in rapidly eating children at risk for obesity. Secondary aims included other child eating behaviors and child BMI z-score.

Methods: Using a RCT, 28 families were randomized to 5-week Re-Pace to slow eating or Usual Care Control (UCC) control. Child eating pace was assessed by the Slowness in Eating (SiE) subscale of the Children’s Eating Behavior Questionnaire [CEBQ]. Child weight and height were directly measured and converted to BMI z-score. Re-Pace families met for 5 one-hour sessions over 5 weeks, led by a registered dietitian. Baseline characteristics were: child mean (SD) age of 5.5 (1.1) years, 80th percentile (10) BMI for age and gender, BMI z score 0.92 (0.39) and mean maternal BMI= 33.6 kg/m2.

Results: At 6 weeks, RePace participants showed significantly greater improvement in Slowness in Eating (0.96±0.58) than did the UCC group (0.02±0.62) (p< 0.001), Cohen’s d=1.56. RePace also showed greater improvements compared to UCC in the “enjoyment of food” subscale of the CEBQ (p=0.04, d= 0.56). Finally, BMI z-score reduced over 6 weeks in RePace but increased in UCC (-0.06 vs. +0.09), which was a moderate effect although not statistically significant (p= 0.25, Cohen’s d= 0.56).

Conclusions: Rapidly eating children at risk for obesity successfully slowed their eating rate in response to this family intervention. More research is needed in fostering self-regulation of eating in at risk children.

T-P-3378
Effect of a 12-Week Low Vs. High Intensity Acrobic Exercise Training on Appetite-Regulating Hormones in Obese Adolescents: A Randomized Exercise Intervention Study
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Background: Little is known about how the intensity of aerobic training influences appetite-regulating hormones in obese adolescents. Our goal was to assess the effect of low and high intensity aerobic trainings on food intake and appetite-regulating hormones in obese adolescents.

Methods: Forty three obese adolescents (age: 13-18y, BMI: 34.48 ± 3.94 kg/m2) were randomized into high intensity training (HIT; n=20) or low intensity training (LIT; n=23) groups for 12 weeks. All participants also received the same nutritional, psychological and clinical counseling. Pre- and post-intervention energy intake (EI) and circulating levels of insulin, leptin, peptide YY3-36 (PYY3-36) and ghrelin were measured.

Results: Adolescents in the HIT showed a reduction in total EI and an increase in PYY3-36 (p<0.05). Aerobic exercise training performed at ventilatory threshold 1 intensity, reduced EI and augmented PYY3-36 in obese adolescents, compared to LIT.

Conclusions: The data suggest that HIT and LIT have differential effects in the regulation of appetite signals and subsequent EI in obese adolescents.

T-P-3379-DT
Effect of Breastfeeding on Weight of Infants Receiving WIC Services
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Background: The purpose of this research is to test an intervention to prevent childhood obesity among infants of Mexican American obese women who receive WIC services. Infant obesity is often the precursor to on-going obesity as the child ages. In this study, community health workers (i.e. promotoras) were trained to provide counseling on infant growth, to support breastfeeding, and to provide nutrition and child development education with support from health professionals. Pregnant low-income obese Hispanic women visiting WIC were enrolled during the third trimester.

Methods: Promotoras visited the mothers at home one time prenatally and repeatedly when the infants were ages 1 week and 2, 4, 6, 9, 12, 18, and 24 months. The study was planned on the model of Community-Based Participatory Research, in which researchers and members of the community collaborate on projects to enhance health outcomes and decrease health disparities. To verify duration and intensity of breastfeeding, a research assistant called mothers monthly until age 12 months. Data were analyzed using Fisher’s exact test and SAS statistical software on a personal computer.

Results: At the most recent visit, infants who breastfed ≥ 2 months versus those breastfed < 2 months were less likely to be obese (p = 0.01). Weight-for-length percentiles were significantly lower in the infants who were breastfed (p = 0.01). Mean weight-for-length percentiles for the prolonged breastfeeding (≥ 2 months) versus the no- or short-term breastfeeding infants, respectively, were 64.6 (median 65.5) and 77.7 (median 87.5) respectively.

Conclusions: In a Mexican-American, high-risk, high-stress, food insecure, low-income population, infants who were breastfed for at least two months experienced healthier weights and less overweight and obesity than infants who were not breastfed or who were breastfed for a short period of time. To prevent infant obesity, formula feeding by WIC participants should be discouraged and prolonged breastfeeding aggressively promoted.

T-P-3380
Effect of the National Aeronautics and Space Administration (NASA) Mission X International Child Fitness Program on Young Children and Their Parents in South Korea
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Background: Effective and sustainable intervention programs are needed to promote health in children and halt the growing global obesity epidemic. Children in many countries, including S. Korea, have become increasingly sedentary due to changes in their respective societies. The NASA Mission X (MX) Program has been adopted in 28 countries (enrolled 39,031 students) in order to promote physical activity (PA) and healthy eating among children.

Methods: Children aged 5 year old (n=212) and their parents recruited from 3 kindergartens participated in the 6-week
intervention program in fall 2014. To identify the barriers to PA and to overcome them, we assessed PA changes by body mass index (BMI) and sex and parental changes in attitude and beliefs after participation in the MX Program.

Results: At baseline, girls reported less leisure activity than boys (Godin score: 40.7 vs. 59.0, p<0.01). Children with a normal BMI (10-84%tile of BMI Z score) were more likely to be active than those children at risk of being underweight (<10%tile) or overweight (≥85%tile). After the MX Program, some children had increased PA level (49.4%), became interested in PA (59.1%), and had psychological need satisfaction in exercise (52.6%); majority of parents had also increased recognition of the necessity of child PA (94.2%), reassessment of child PA capability (64.3%), awareness of child’s happiness after PA (80.5%) and the relationship between child competence in PA and self-esteem (79.9%).

Conclusions: The adapted NASA MX Program was effective in promoting PA in children and in improving their parents’ attitude and beliefs about child’s PA in S. Korea. After the intervention, half of the children became more active and interested in PA; and a majority of their parents became aware of the importance of child PA. More attention is needed for overweight children as they had less improvement than others.

T-P-3381
Effects of a Weight-Focused Lifestyle Modification Program on Fourth-Grade Japanese Children
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Background: Effective school-based health programs to reduce overweight and maintain good health are needed. This study aimed to elucidate the effectiveness of a lifestyle modification program in Japanese children.

Methods: 15 elementary schools in a rural area of Iwate, northern Japan participated in the study. Three middle-sized schools (114 students) were allocated to the intervention group and the other 12 schools (216 students) to the control group. Fourth-grade children in the intervention group participated in the lifestyle modification program for three months, including two lessons about health, physical activities twice a week, one nutritional lesson, reviewing one’s own lifestyle and setting three goals. A monthly health newsletter was sent to all schools for a year. Before and after the program, we recorded all students’ height and weight, and determined their overweight status. Self-administered questionnaires on lifestyle, eating habits, and health knowledge were also performed. Fisher’s exact test was employed to examine intervention effects before and after the program in each group. The paired t-test was employed for height, weight, and degree of obesity in each group.

Results: Prevalence of overweight at baseline was 13.2% for boys and 18.0% for girls in the intervention group, and in the control group was 17.5% and 4.4%, respectively. There was no significant difference in each group from pre to post intervention. However, in the intervention group, eating habits such as school lunch, late-evening snack, and awareness of sugar intake improved after the 3-month lifestyle modification program.

Conclusions: Although no changes in overweight status were observed, the program affected children’s behavior in areas such as eating habits.

T-P-3382
Effects of take home meals on clinic attrition and food choices in a pediatric weight management clinic: a pilot study
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Background: Nutritional recommendations and behavioral modifications are considered standard of care in a weight management clinic, yet many families are unfamiliar with the recommended healthy foods and have misperceptions about their cost. The COACH (Center for Obesity and its Consequences in Health) Bag project aimed to evaluate the effects of a novel and inexpensive tool to complement current clinical efforts in a pediatric weight management clinic.

Methods: Pediatric patients (ages: 10-15) new to our COACH program were quasi-randomized to the intervention arm or the comparator arm based on the day of their clinic appointment. Patients and parents in the intervention arm received a brown bag meal with costs and nutritional information for the food/drink items at their initial appointment and each follow-up appointment for the next 12 months. Patients in both groups received the standard of care (nutritional education and behavioral modifications). Outcome variables were attrition rates at follow-up visits and change in body mass index (BMI) at baseline and end-of-study. Attitudes, knowledge and behavior regarding the food and drink items included in the meals were assessed using survey questionnaires.

Results: No differences between intervention (n=24) and control (n=22) groups were seen in clinic attrition rates (33% vs 27%) or change in BMI z-score (-0.124 vs -0.005). The majority of parents in the intervention arm reported purchasing healthy meal items that they had not previously tasted (1%/1% milk, protein bar, Greek yogurt) for a variety of reasons including inexpensive price, high nutritional value and appealing taste.

Conclusions: The complimentary brown bag meals did not reduce clinic attrition, but they did change behaviors regarding purchasing healthy food options. Future studies need to address barriers to clinic retention and acceptance of healthier food options that may entice families to return for clinic appointments and achieve better outcomes.

T-P-3383
Effects of Two Years Obesity Prevention on Relative Weight, Waist Circumference and Overweight Rate in Toddlers with Overweight or Obese Parents – Early STOPP, a Randomized Controlled Intervention

Background: Early multifaceted obesity prevention interventions targeting high-risk children need to be tested in randomized and longitudinal designs.

Methods: Swedish high-risk (both parents overweight or at least one parent obese) one-year old children (n=182) were randomized to intervention (n=67) and control (n=115) through their child health care center. The parents in the intervention group received individual coaching sessions regarding their child’s dietary, physical activity and sleep
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T-P-3384
Evaluating the Short-Term and Long-Term Efficacy of the Creighton University School of Medicine Fit for Life Program in Improving the Health of 4th and 5th Graders
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Background: FFL is an organization dedicated to the promotion of healthy lifestyles for Omahachildren and their families. FFL helps nurture healthy lifestyle goals especially in the areas of nutrition and exercise in order to help fight the growing epidemics of diabetes, heart disease, obesity, etc.

Methods: The program first ran from February to March of 2014. Students were surveyed before and after the program about their attitudes and behaviors towards healthy practices. Height, weight, and BMI were also recorded before and after the curriculum. Changes in BMI (both short-term and long-term) were calculated using a paired T-test, while changes in survey results were noted in percentage of responses that changed.

Results: A paired T test showed that overall change in height over one month (+0.90", p <0.0001), overall change in weight (+2.49 pounds, p 0.02), and long-term change in BMI for students who took part both years (+1.3, p 0.004) were all significant. Change in over one month BMI (-0.07) was found to be not significant (p 0.74). The survey results also showed behavior improvements: 23.4% - perception of general health 21.9% - how often they played outside or did sports 31.3% - less screen time 45.3% - less candy and sweets 32.8% - increased amount their parents talked about healthy food

Conclusions: The insignificant change in BMI during this year’s program is explained by the data collection spanning only one month and normal growth patterns in children. Similarly, the significant change in BMI in the longitudinal study cannot be attributed solely to the program. However, and arguably more importantly, there were improvements in the health attitudes and behaviors of students. We also looked at students’ desire for parental involvement and found that the majority of students (55%) answered positively, noting the need for more parental involvement and education.

T-P-3385
Evaluation of the CATCH Early Childhood Program Implementation in Head Start Children in Texas: The TX CORD study
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Background: As part of Texas Childhood Obesity Research Demonstration (TX CORD) study, CATCH Early Childhood (CATCH EC), a preschool-based program focusing on healthy nutrition and physical activity behaviors of children 3 to 5 years old, was implemented in Head Start centers; however, no data are available on implementation levels of EC programs in low-income centers. The purpose of this study was to assess degree of implementation of CATCH EC across participating Head Start centers.

Methods: Teachers from Head Start centers in intervention area in Houston/Austin, TX were trained and given technical assistance for the CATCH EC program. Process evaluation data for implementation were collected using a serial cross-sectional design from centers in spring 2013 (n=12) and spring, 2014 (n=16). CATCH EC Implementation Index to assess program dosage, reach, and fidelity included three constructs: program access (4 items), program usage (4 items), and program implementation support received (8 items). Data were collected using center director and teacher surveys. Summative scores were computed for the three constructs, and an aggregate score was computed to assess an overall CATCH EC implementation index for each center.

Results: Results showed medium to high scores at both center and teacher levels. The mean scores for each construct reported by teachers were: access 2.8 and 2.2 (range 0-4), usage 2.5 and 2.0 (range 0-4), and support 11.9 and 10.8 (range 0-16) for 2013 and 2014 respectively. Mean scores by directors were: access 2.9 and 2.6 (range 0-4), usage 2.6 and 2.6 (range 0-4), and support 10.4 and 11.1 (range 0-16) for 2013 and 2014 respectively. The overall aggregated implementation index scores reported by teachers were 18.1 and 16.1 (range 0-24) and by directors were 16.5 and 17.2 (range 0-24) for 2013 and 2014, respectively.

Conclusions: Both teachers and directors reported medium to high implementation of CATCH EC. Future research should examine how implementation affects program outcomes.
T-P-3386
Feasibility and Acceptability of a Home-Based Telemedicine Intervention Component of a Pediatric Obesity Treatment Program
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**Background:** Pediatric obesity treatment programs have achieved modest outcomes, highlighting a need for novel supplements to enhance treatment effects. Telemedicine is an innovative approach; however, data on acceptability and efficacy as an adjunct to in-person pediatric treatment programs are limited.

**Methods:** Web-based health-coaching sessions were added to an established family-based behavioral group program. A total of 22 overweight and obese children ages 5.23-16.39 years (M=10.87, 41% female, 76% Spanish speaking) participated in the 12-week program. Each family was given an iPad and scheduled to receive 5 online calls via Skype, administered in Spanish or English depending on family preference. A post-intervention survey assessed how helpful the online sessions were in achieving parent and child behavior change goals. Responses options were rated on a 5-point scale (1=not helpful; 5=extremely helpful). Additional feedback was provided via open-ended questions.

**Results:** Every family received at least one session and more than half (53.3%) received 5 or more (M=3.53±1.68). Overall, 100% of parents reported that the online sessions were “very” or “extremely” helpful in enhancing their ability to reach their own health goals (M=4.36±0.50), 90% rated them just as helpful for their children (M=4.3 ± 0.67), and 100% said they would be “very” or “extremely” enthusiastic to recommend online sessions to other families (M=4.75±0.45). Parents reported that the online sessions “helped to keep my daughter active,” “motivated us,” and “when I had doubts they helped me find the solution.” Other parents expressed benefits related to health behavior change such as “learning a lot of things...to eat portions and fruits, vegetables,” and “[my kids] want to do more and more exercises.”

**Conclusions:** Adding a telemedicine component to a family-based pediatric obesity treatment program was feasible and highly acceptable. Subsequent analyses will assess efficacy and associations with child and parent treatment response.

T-P-3387
Food Fussiness in Treatment-Seeking Youth with Overweight/Obesity
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**Background:** Children seeking obesity treatment show levels of food fussiness (FF), or reluctance to eat a variety of foods, similar to those of non-obese children. Given its link to poor diet quality, FF may contribute to the onset and/or maintenance of childhood obesity. The current study aimed to examine the role of baseline child FF in association with anthropometric and diet quality variables. Further, change in FF was assessed in relation to treatment outcome, including whether change in diet variables mediated the relation between change in FF and treatment outcome.

**Methods:** Children entering a multi-site study of family-based behavioral obesity treatment (FBT) were assessed at baseline (N=241) and post-treatment (4 months; N=172). At both time points, child height and weight were measured (used to calculate zBMI), and parents completed the FF subscale of the Child Eating Behavior Questionnaire and 24-hour recalls of the child’s diet. Healthy Eating Index-2005 (HEI) component and total scores, which measure diet quality in terms of conformance with federal guidelines, were calculated.

**Results:** At baseline, child FF was not associated with zBMI or overall diet quality, but was related to lower vegetable (r=-.23, p<.01), and lean meat intake (r=-.15, p=.03). Average child FF decreased over treatment (p<.01). Decreased FF was associated with greater reductions in zBMI (β=-.17, p<.05), increased fruit consumption (β=-.15, p<.05), and improved overall diet quality (β=-.18, p<.05). Overall diet quality change, but not fruit intake, mediated the relation between child FF change and zBMI change (EI = .15).

**Conclusions:** Obesity treatment-seeking children with higher baseline FF demonstrate lower intake of certain healthy food groups. FBT appears to reduce child FF, and reductions in FF may yield greater weight loss, seemingly through improved diet quality. Overall diet quality, rather than certain food groups alone, may be relevant targets for influencing child weight.

T-P-3388
Genetic Variation on Leptin Receptor Gene (rs2767485) Might Increases the Chances of Developing Cardiovascular Diseases in Obese Adolescents
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**Background:** The hyperleptinemia state has been recently associated with inflammatory process linking obesity to cardiovascular diseases, which could be partly explained by genetic variations. Aim: To investigate the influence of single nucleotide polymorphisms in the leptin receptor gene LEPR (rs2767485) on cardiovascular risk and in the response of a multifaceted 1-year weight loss therapy among obese Brazilian adolescents.

**Methods:** 76 obese adolescents were enrolled in one year of weight loss therapy (NCT01358773) including clinical, nutritional, psychological and exercise-related. Blood samples were collected to analyse cardiovascular risk factors and LEPR genotyping. Visceral fat was measured by ultrasound and body composition was measured by plethysmography. Adolescents were grouped according to genotype (TT or CT+CC group). Effect of the weight loss therapy was analysed through ANOVA and Wilcoxon, according to normality. Statistic value was set at <0.05.

**Results:** The therapy was able to improve cardiovascular risk factors related to obesity in both analysed groups. Additionally, both groups were able to improve adiponectin. However, TT group presented better results regarding hyperleptinemia state, reducing 34% the prevalence of hyperleptinemia, whereas CT + CC reduced only 7% of total prevalence, although both groups reduced equally the body fat mass. Higher delta of LDL-cholesterol and VLDL-cholesterol was observed in TT group after weight loss.

**Conclusions:** The increased triglycerides and hampering lipid profile improvement observed in the genetic variation on Leptin receptor gene (rs2767485) might increase the chances of developing cardiovascular disease in obese adolescents. Together, our results may suggest that CT+ CC genotype
present more difficulty to normalize hyperleptinemia state. To our knowledge, the current study is the first investigation showing the influence of this specific polymorphism in a response of obesity treatment in obese adolescents. Funding: FAPESP and CNPq.

T-P-3389
Heroes Summer Camp: A Multidisciplinary Approach to Improvement of Self-Esteem and Weight Loss in Children Struggling with Obesity
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Background: Childhood obesity has become one of the most imperative public health issues in the United States. Our camp approach uses a multidisciplinary way of combining exercise, diet, and education in a safe environment to help these children not only lose weight but give them the confidence to make lifestyle changes and choices towards better personal health.

Methods: The goal was to evaluate if after attending the HEROES Summer Camp children would have an improved body image, a better perception of healthy food choices, knowledge of physical activities to maintain their overall health, as well as motivation to continue utilizing these healthy tools in their weight loss journey. The summer camp was a total of five days in length. The camp participants were comprised of 28 children aged 5-18 who were attending the HEROES program in Omaha, Nebraska. Each day campers participated in organized exercise, educational activities and classes. Fitness time as well as organized fitness challenges and games were conducted daily. Cooking classes were also held to demonstrate healthy snack and meal choices. Time was allowed for campers to reflect on what they had learned and how they were feeling physically and emotionally throughout the week. Outcomes looked at were weight loss, BMI reduction, improvement in quality of life, as well as knowledge of healthy eating, physical activity, and overall healthy lifestyle choices.

Results: Immediate data from the camp showed that 21 out of 28 campers lost weight. The weight loss ranged from 0.2-6.4 pounds. 12 campers lost inches in waist circumference ranging from 0.2-2.75 inches. Additionally, camper's total steps taken were recorded and these numbers ranged 9,348-97,019.

Conclusions: Preliminary results show that many of the campers lost weight as well as inches. Additionally, many of the campers were able to be quite active while at the camp. The quality of life surveys will give more insight into the campers body image as well as overall self-esteem and confidence.

T-P-3390
Interventions Targeting Modification of the School Cafeteria Environment are Effective in Guiding Children’s Food Selection to Meet Recommended Energy and Saturated Fat Based on the 2012 NSLP Guidelines
Keely Hawkins, Baton Rouge Louisiana, Corby Martin, Baton Rouge LA, Jessica Thomson, Stoneville MS, Jeff Burton, Donald Williamson, Landrum SC

Background: The proportion of children who eat lunch in school cafeterias and meet the new 2012 national school lunch program (NSLP) guidelines is unknown. It is also unknown if Louisiana (LA) Health, an intervention that included modifying the school cafeteria environment, increased the proportion of children who met the 2012 NSLP guidelines.

Methods: Food selection was measured with digital photography in 2049 4-6th grade students from 33 different schools in rural Louisiana from 2006-2009. The percent of children whose food selection met the 2012 NSLP guidelines for energy (kcal), fat and saturated fat, protein, fruits, vegetables, grains, and milk were calculated before and after the intervention.

Results: After the intervention, the percent of children who selected below the recommended energy range (600-650 kcal/day) increased from 12.7% to 37.6%, while the amount of children that selected above this range decreased from 79.3% to 48.9%. All children decreased their energy selection from baseline to follow-up, but only the intervention group’s food selection fell within the appropriate target range for energy after the intervention (751.4 to 621.8 vs. 768.7 to 715 kcal/day). None of the children fell below the required <10% saturated fat before or after the intervention period, but the amount of children who exceeded this recommendation decreased in the intervention group from 79.3% to 48.9%, a difference of 6.5g/day less in saturated fat.

Conclusions: These results reveal that interventions which target modification of the school cafeteria environment, with some exceptions, positively impact childhood nutrition and help schools meet the new 2012 NSLP guidelines.

T-P-3391-DT
Lessons learned while Establishing Treatment Fidelity with CHW in a Community-Based Obesity Prevention Intervention for Latino Infants
Martina Gallagher, Houston, Texas, Linda Ho, Sheen, Houston, TX, Elizabeth Reifsnider, Phoenix Arizona, Michael Moramarco, Phoenix Arizona, David McCormick, Galveston, TX, Rebecca Tsusaki, Houston Texas, Karen Cullen, Houston, TX

Background: The overall goal of the study is to evaluate the effectiveness of a community-based intervention delivered by Community Health Workers (CHW) to home visits to prevent the development of obesity in infants of Mexican descent during their first 2 years of life. The 3 CHW selected to deliver the intervention were 2nd to 3rd generation in the U.S., with varied educational background and between 55 and 70 years of age. The aim of this presentation is describe the facilitators and barriers experienced while selecting, training, and evaluating the work of CHW (A.K.A. Promotoras) in a community-based intervention study focused on preventing obesity in infants of Mexican descent.

Methods: The promotora selection and training were done by the community partner, and overseen by study investigators. Evaluation of training was completed by reviewing team meeting notes, SOAP notes and audio-recorded intervention sessions. Audio recording of interventions sessions were randomly assigned to each promotora.

Results: Issues related to a generation gap between promotoras and participants, the skills needed to graph the children’s growth and BMI, critical thinking/problem solving when delivering intervention materials, and SOAP note completion were noted. Review of the audio recordings indicated a areas where improvement was needed to increase adherence to the study protocol.

Conclusions: When selecting promotoras for similar projects, it is important to consider the following: 1) fluency in Spanish...
and English, 2) acculturation level, 3) long-term residence in the study setting, 4) similarity in age to the study participants, 6) completion vocational education or a > 12 grade education in the country of origin. This selection preference would minimize the generation gap and improve the delivery of the intervention. In addition, an introduction to experimental design and continued training on IRB issues will strengthen adherence to study protocol.

T-P-3392
Long-term Weight Outcomes by Severity of Obesity in Children in Comprehensive, Multidisciplinary Weight Management Compared to Standard Care Controls
Sarah Hampl Kansas City Missouri, Kelsey Dean Kansas City Missouri, Ashley Sherman Kansas City MO, Brooke Sweeney Kansas City MO, Amy Papa Kansas City MO, Katrina Poppert Lawrence KS, Kelsey Borner Lawrence KS, Meredith Dreyer Gillette Kansas City MO

Background: Although weight status outcomes for children with obesity in behaviorally-based group weight management programs have been reported, less is known about longer-term outcomes, how outcomes compare to children receiving standard care, or how outcomes vary by obesity severity.

Methods: 306 subjects (M age=12.36 yrs) were from a 24-week weekly multicomponent group intervention in a Midwest tertiary care children’s hospital (N=117) or from primary care clinics matched at baseline by age, sex, race/ethnicity and BMI (N=189). Subjects were categorized as having Obesity Class I (BMI≥95th%ile), Severe Obesity Class II (BMI≥120% of the 95th%ile), or Severe Obesity Class III (BMI≥140% of the 95th%ile). A Chi-square test compared the groups based on obesity classification. Mixed linear models looked for group differences and changes over time within each class.

Results: In the group program, 31%, 34% and 35% of subjects, respectively, had Class I, II or III obesity. Of control subjects, 34%, 35% and 31% met these classifications; a non-significant difference. BMIz-score significantly improved from baseline to 6 months (-0.04, p<0.01) and 12 months (-0.07, p<0.01) for group Class II subjects, but not for controls. Significant improvement from 6 to 12 months was seen in Class II subjects for both groups. Group and control subjects in Class II did not differ in BMIz-score at baseline, but were significantly different at 6 and 12 months. There were no significant improvements for subjects with Class I obesity, and all subjects with Class III obesity had significant improvement from baseline to 6 (-0.02, p<0.01) and 12 months (-0.03, p<0.01).

Conclusions: Outcomes for group intervention and standard primary care subjects varied by severity of weight status at one year follow-up. Results suggest that the family-based group intervention was more successful for those with Class II obesity. Subjects with class III obesity may need a more intensive intervention.

T-P-3393-DT
Nutrition and physical activity intervention using smartphone in 8-week youth walking program
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Background: This project employed smartphone, powerful and popular technologies used by today’s youth, to change their lifestyle practices, namely diet and physical activity. We implemented team-based 8-week walking program as part of a physical education class at junior high schools in Pinal County, Arizona, where over 70% of enrolled students are participating in free or reduced meals program. We hypothesized that mobile technologies can have a positive impact on 1) the overall amount and frequency of physical activity and 2) more fruits and vegetables in their diets.

Methods: For participating in the walking program, youth registered as teams and kept a log of miles walked on a walking program website. The website includes instant scoreboard updates of total walking miles for each team. During the 8-weeks, four physical activities that include nutrition information were delivered by study coordinators. Forty-nine youths, aged 11-14 years participated in the study. Youth in the experiment group (n=30; 9 females and 21 males, weight 47.7 ± 9.2 kg, height 159 ± 7.9 cm, BMI 18.76 ± 2.4 kg/m2) were provided a mobile phone, and youth in control group (n=19; 10 females and 9 males, weight 57.5 ± 14.8 kg, height 153.0 ± 6.5 cm, BMI 24.3 ± 5.2 kg/m2) used paper and pencil to log their miles walked. All youth were given pedometers. They also received nutrition and physical activity newsletters via mobile phone or paper hand-outs, depending on their group.

Results: Youth who reported their walking miles using mobile phones walked more than youth who reported their miles on a paper (median of 29.7 vs. 12.6 miles per week; P=0.12). There were no changes in fruit and vegetable intakes, body weight, and BMI in both groups (P >0.05).

Conclusions: The results suggest that using a smartphone application as an additional delivery method to a website-delivered or regular class room programs should be further evaluated as a means of encouraging youth to change their lifestyle practices.

T-P-3394
Parenting Styles, Ethnicity, and Pediatric Obesity Intervention Outcomes
William Black Kansas City Mo, Meredith Dreyer Gillette Kansas City Missouri, Ann Davis Kansas City Kansas, Amanda Bruce Kansas City Kansas, Kelsey Borner Lawrence KS

Background: Parenting styles high in control and warmth (i.e., authoritative) are associated with positive health outcomes among youth, but these findings differ by ethnic group, such that parenting high in control (regardless of warmth) is predictive of better outcomes among African Americans (AA). We examined the relation between parenting practices and ethnic groups, and the effect on pediatric obesity intervention outcomes.

Methods: 134 youth (30 Caucasian), (48 AA), and 56 Latino). (N=56) youth (Mage=6.56; SD=1.57; MBMIz =2.64; MBMI%=99.14; 44% male) participating in a 6-week family-based group pediatric obesity intervention. Parents completed the Parenting Practices Inventory (Praise and Monitoring subscales used). Child BMIz was assessed at baseline and 6-months post intervention. A stepwise regression evaluated the independent and combined effects of mean-centered Praise and Monitoring on change in BMIz. Simple slopes of (+1) and (-1) SD of the mean were calculated to examine interaction effects.

Results: Praise, Monitoring, and change in BMIz did not differ between ethnic groups and parenting practices did not predict ΔBMIz for the full sample (F=0.81, p>.05), or Caucasian and Latino groups. Among AA youth, praise predicted weight loss (β= -0.006, p=.016), and the interaction between praise and...
monitoring significantly predicted increased weight loss ($\beta= -0.002$, $p=0.007$). High monitoring and praise predicted better outcomes ($\Delta BMI_z = -0.29$) than high monitoring and low praise ($\Delta BMI_z = -0.3$).

**Conclusions:** Within African American families, parental praise was related to improved weight outcomes, particularly in combination with increased monitoring. Thus, an authoritative parenting style was most effective in African Americans only, which differs from previous literature. Future work should evaluate the differential effects of parenting styles across cultural and ethnic groups to allow for better tailoring of interventions to improve outcomes.

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**T-P-3395**

**Prediction of Weight Related Quality of Life by Obesity Class**

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**Background:** Weight Related Quality of Life (WRQOL) in pediatric obesity has yet to be examined according to recent recommendations that Body Mass Index (BMI) above the 95th percentile be classified according to severity categories (Flegal et al., 2009) and is the primary aim of this study.

**Methods:** Sizing Me Up, a self-report measure of WRQOL was completed by 583 children (Mage= 11.70; 55.8% male; MBMI%ile= 98.45) enrolled in a multicomponent pediatric obesity intervention. Children were categorized as overweight (BMI > 85th %ile) and obese (BMI > 95th %ile). Children with obesity were also categorized as Class I (BMI = 100-119% of the 95th %ile), Severe Class II (BMI > 120-140% of the 95th %ile), and Severe Class III (BMI > 140% of the 95th %ile). ANOVA with Tukey’s post-hoc was used to examine differences in WRQOL across obesity classes, and a stepwise logistic regression evaluated whether class categorization of obesity severity predicts greater variability in WRQOL beyond obesity classification alone.

**Results:** WRQOL differed across severity classes (F (3, 579) = 9.901, $p<.001$). Class III obesity (M=64.06) was lower than Class II (M=70.31; $p<.001$), Class I (M=69.93; $p<.001$), and overweight (M=75.27; $p<.001$). Controlling for age and gender, obesity status accounted for 1.2% of the variance in WRQOL. F change = 7.543, $p<.001$. The addition of obesity classes accounted for an additional 3.4% of the variance in HRQOL (F change = 10.837, $p<.001$).

**Conclusions:** The rise in severity of pediatric obesity has necessitated a classification system to better differentiate children with the most severe obesity. This study found that children with Class III obesity experience lower WRQOL, and that differentiating children with obesity into severity classes better differentiates and predicts child-reported WRQOL. Given the small variance accounted for, it is important to evaluate how other constructs are related to obesity severity according to the currently recommended obesity classes.

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**T-P-3396**

**Predictors of Success in a Low Intensity, Multidisciplinary Treatment Program for Obese Adolescents**

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**Background:** Specialty clinics are increasingly being used for the treatment of adolescent obesity but little is known about their effectiveness. The purpose of this study was to assess the effectiveness and predictors of success of a low-intensity multidisciplinary clinic treating obese youth ages 2-20 years.

**Methods:** Data collected from patients ($n=302$; BMI > 95th percentile or $>$85th percentile with comorbidity) attending the Strong4Life Obesity Clinic > 4 times between January 2010 and December 2014 were analyzed to examine possible demographic and health predictors of program success. Program success was defined as stabilization of ($+/- 0.04$ points) or decrease ($-0.04$) in BMI z-score by the 4th visit. Possible predictors of success assessed included gender, race, baseline weight, and presence of a comorbidity (asthma, pre-diabetes, or hypertension). Multivariate logistic regression assessed odds of treatment success for each factor.

**Results:** The sample included 64.2% female and 30.5% Hispanic/Latino. Nearly half (46.7%) were white; 40.4% were black/African American. Baseline BMI percentile was 98.7 (SD: 1.5). Average follow-up time was 203 days (SD: 80.7 days). Overall, the program was successful in decreasing patient’s BMI z-score by visit 4 (mean decrease in BMI z-score: 0.08 points (95% CI: 0.06, 0.10); $p<0.01$)), with 87% of all patients stabilizing or decreasing their BMI z-score. Odds of success were more than two times greater for females (OR: 2.2, 95% CI: 1.02-4.64) and those without an assessed comorbidity (OR: 2.4, 95% CI:1.09-5.50). No other factors were significant predictors.

**Conclusions:** Successful weight stabilization in this low-intensity clinic was high, with females and those without a comorbidity having higher odds of success. Neither race nor baseline weight predicted success.
Background: Obesity rates are higher among children with intellectual and developmental disabilities (IDD) compared to their typically developing peers. However, very little research has investigated risk factors for obesity in this population. Based on prior research with typically developing overweight/obese children, the current study examined potential risk factors of obesity including parent BMI, child activity level, child sedentary behaviors, and knowledge about nutrition and exercise in a community sample of overweight/obese children with IDD.

Methods: Twenty-nine participants were enrolled in Operation Fit, a pilot study of a four-day intervention developed to improve health/nutrition knowledge and physical activity in overweight/obese children with IDD. Prior to the intervention, participants’ height and weight were measured to determine overweight or obese status (BMI ≥ 85th percentile).

Results: Overweight/obese children with IDD had significantly higher BMI and % fat mass compared to their typical counterparts. Additionally, overweight/obese children with IDD reported more sedentary behaviors and less knowledge about nutrition and exercise than their typical peers. Furthermore, overweight/obese children with IDD had lower self-efficacy for healthy behaviors compared to their typical counterparts.

Conclusions: Overweight/obese children with IDD are at increased risk for obesity compared to their typically developing peers. Future research is needed to develop effective interventions to address the unique needs of this vulnerable population.
**T-P.3402**  
Targeted Prevention of Excess Weight Gain in High-Risk Adolescent Girls with Loss of Control (LOC) Eating: The Role of Anxiety in Three-Year Outcomes of a Randomized, Controlled Trial  
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**Background:** LOC eating is associated with excess weight gain in youth. We previously found that 12-wk interpersonal psychotherapy (IPT) and standard-of-care health education (HE) groups were both associated with less-than-expected BMI gain 1-yr post-intervention in girls at high-risk for excess weight gain due to BMI 75th-97th %ile and LOC (≥1 episodes/mo). We hypothesized that girls who received IPT would show more sustained BMI benefits than those in HE at 3-yrs. Consistent with adult data, we expected that girls with high anxiety (HAnx) v. low anxiety (LAnx) would be more responsive to IPT.

**Methods:** Girls (12-17y) at high-risk for excess weight gain were randomized to IPT or HE. At baseline, 1-y, and 3-y follow-up, BMI was measured and LOC eating and trait anxiety were assessed. Using multiple imputation to handle missing data, ANCOVA evaluated the group effect on ∆BMI/BMI metrics and ∆LOC episodes from baseline to 3-y, adjusting for baseline BMI, LOC, age, race, cohort, attendance, and time to 3-y follow-up. Baseline anxiety was tested as a moderator of group effect.

**Results:** 67 girls (59% retention) were re-assessed at 3-y. The group effect on ∆BMI metrics or LOC episodes was non-salient at 3-y. However, baseline trait anxiety was a significant moderator (p=0.04): Girls with HAnx in IPT (n=23) had less ∆BMI v. HAnx girls in HE (n=29; ∆BMI -0.4±1.0 v. +1.1±0.9 kg/m2) and v. girls with LAnx in IPT (n=33; ∆BMI +2.0±0.7 kg/m2) or HE (n=31; ∆BMI +1.9±0.7 kg/m2). Parallel benefits for HAnx girls in IPT were observed for ∆%BMI and ∆%overweight (p<0.04). Baseline anxiety did not serve as a moderator for 3-y ∆LOC episodes (p=NS).

**Conclusions:** In adolescent girls with HAnx, high BMI and LOC eating, IPT decreased BMI and age-adjusted BMI metrics more than HE 3-y later. Findings support anxiety models of LOC. Future studies should determine if such IPT programs effectively prevent obesity among girls with anxiety who are also at high-risk for excess weight gain due to their BMI %ile and reports of LOC eating.

**T-P.3401-DT**  
Step Tracking and Individualized Step Goals Increase Children’s Weight Loss in a Comprehensive Multidisciplinary Intervention  

**Background:** Stage three pediatric obesity treatment involves a structured, family-based program with behavioral modification delivered by a multidisciplinary obesity care team. This study evaluated the added benefits of using a pedometer to track steps toward individualized step goals.

**Methods:** Three cohorts of children with overweight/obesity ages 8 to 17 years (n = 47) and their families attended 10 weekly 90-minute sessions focused on nutrition, physical activity, and behavior change. A quasi-experimental design was used in which one cohort (n = 19) was provided pedometers and individualized step goals (a weekly increase of 500 steps/day above prior week to achieve a 4,000 steps/day increase by week 10) and two cohorts were not provided pedometers (n = 28). Height and weight were objectively measured at baseline and week 10, and body mass index z-score (BMIz) was calculated for those with complete data (n = 35).

**Results:** Participants were on average 11.7 ± 2.4 years, including 74.5% girls, 55.3% African American, and 53.2% insured by Medicaid. Attendance averaged 75.0%, and attrition was 25.5%. Cohorts did not differ by demographics, baseline BMIz, or attendance/attrition. Overall, participants maintained their BMIz throughout the program (mean = 2.3). Using analysis of covariance controlling for baseline BMIz and age, the pedometer cohort significantly reduced BMIz compared to the others (p = 0.015). The pedometer cohort averaged 4,780 steps/day at baseline and increased by an average of 1,050 steps/day. Controlling for age and sex, a smaller discrepancy between actual vs. goal steps/day was marginally related to BMIz reduction (p = 0.085).

**Conclusions:** Tracking steps with individualized step goals is a promising approach to increase pediatric weight loss outcomes in a comprehensive, multidisciplinary, group-based intervention.
experience, incremental ramp test in children was limited by inconsistent effort. We investigated and report our findings on the 3-minute step test as a simple and objective measure of fitness.

**Methods:** Aerobic fitness was assessed by 3-minute step test Recovery Heart Rate (RHR, bpm) in children and adolescents participating in Healthy Kids Healthy Weight, a 12-week multi-disciplinary pediatric weight management program. Participants and their caregivers completed the Baecke Activity Questionnaire. Measures were obtained at baseline and at end of intervention.

**Results:** At baseline: N=145, age mean 11.1 years (±2.4), range 7-17 years; 66.2% female; 36.6% non-White. BMI percentile was 97.8 (±4.3), BMI z-score 2.42 (±1.57). Baseline RHR was 105.5 (±16.8) bpm. At the end of intervention: RHR was 100.9 (±15.7), change in RHR was -4.6 (p <0.001). Compared to baseline, there were more participants with RHR <100 (54.5 % vs 42.8%; p <0.001). Baseline RHR was correlated only with BMI measures. Change in RHR was not correlated with any demographic variables. A subset of participants (n=87; age 11.0 ±2.4 years) had data on the Baecke Activity Questionnaire, but entries on reported physical activities were inconsistent. Change in RHR was similar in this subset (-5.4, p <0.001). Among children reporting regular physical activity (n=80), change in RHR was -5.2. In the absence of regular physical activity (n=7), change in RHR was -7.3. Formal statistical tests were not performed due to small sample sizes.

**Conclusions:** The 3-minute step test is a simple and objective measure of improved fitness after participation in a pediatric weight management program. It has potential utility as a motivating tool in weight maintenance.

**T-P-3404**

**The Effects of a Multidisciplinary Treatment with or without a Psychological Component on Obese Adolescents’ Quality of Life**

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**Background:** To understand if quality of life (QOL) varies depending on whether a psychological counseling component is included in the Multidisciplinary treatment or not, since that Multidisciplinary treatment is recommended as first line of treatment for adolescent obesity and improves general health outcomes and adolescents’ QOL.

**Methods:** Seventy-six obese adolescents (15.87±1.53y) participated in a multidisciplinary treatment consisting of supervised physical activity, endocrinological and nutritional counseling in two separated cohorts (n=36, Cohort 1 and n=40, Cohort 2). Participants in Cohort 1 also received psychological counseling. QOL was measured before and after 12 weeks of intervention by Generic Questionnaire for the Evaluation of Quality of Life (SF-36). Differences in outcomes between times and interventions were analyzed using two-way ANOVA’s with a Duncan post-hoc test. Due to baseline differences between Cohort 1 and Cohort 2 for %Fat, Physical Functioning, General Health Perception and Mean of Dimensions, additional analyses were performed with ANCOVA’s included covariates. The significance level was set at p<0.05.

**Results:** QOL improved among adolescents from both cohorts (p<0.05). However, larger effect sizes were observed among participants from cohort 1 as compared to participants from cohort 2 for physical function (Cohen’s d=0.735), role physical (Cohen’s d=0.775), global health perception (Cohen’s d=0.799), role emotional (Cohen’s d=0.959) and mean of dimensions (Cohen’s d=0.838) as compared to Cohort 2.

**Conclusions:** The inclusion of a psychological counseling component in multidisciplinary treatment for adolescent obesity appears to provide benefits observed for improved QOL as compared with treatment without psychological counseling.

**T-P-3405**

**Why Didn’t it Work? Lessons Learned from a Family-Focused Obesity Prevention Intervention for Preschool Children**

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**Background:** Obesity risk increases across early childhood, making critical the development of healthy habits. Parents greatly influence behaviors their children adopt, including those which impact weight. This study evaluated a theoretically driven obesity prevention program, Parenting SOS, created for families with 2-5 year old children.

**Methods:** Parent-child dyads (N=252) were randomized into either: Parenting SOS (n=128) or a book club control (n=124). The 35-week intervention included 90-minute group sessions (n=12) and motivational interviewing-based phone calls (n=11), between group sessions. Sessions 1-7 focused on general parenting skills (stress management, effective parenting styles, child behavior management, coparenting, and time management); sessions 8-12 applied these skills to the promotion of healthier eating and physical activity habits. Children participated in a parallel program on healthy eating and activity. Change in child percent body fat was the primary outcome, with parent and child dietary intake (3 x 24-hr recalls), physical activity (7-day accelerometer), and parenting practices (general, feeding, activity), secondary.

**Results:** Children were on average 3.5 years old, 50% male, 16.2 percent body fat, and BMI percentile of 60.1. Parents (94% mothers) were on average 35.4 years of age (59% white, 69% at or above median income, 83% college degree or better). Despite high parental satisfaction with and engagement in the Parenting SOS program, no significant change was detected in child percent body fat, child diet (kcal from 24-h recall), or physical activity (min of moderate to vigorous). Modest positive changes were noted in some parenting practices (inconsistent parenting, home management, screen time modeling).

**Conclusions:** Although the overall results were disappointing, lessons learned from this study indicate that obesity prevention interventions should target high-risk families; focus on discrete behavioral outcomes; and utilize appropriate behavior change strategies.

**T-P-3406**

**Youth and Parent Perceptions of Barriers to Weight Management Efforts: Please Include my Family!**

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**Background:** It is widely accepted that parental involvement in pediatric weight management programs leads to greater
improvements in child weight status compared to treatment programs that do not have parental participation. The objective of this study was to better understand parent and youth perceptions of anticipated barriers to weight management efforts prior to the start of intervention.

**Methods:** Obese youth and their parent were invited to participate separately in a 30-minute telephone interview within 2 weeks of their initial visit to a multidisciplinary weight management center. Interviews were recorded, transcribed verbatim, and coded for themes.

**Results:** 28 parent-child dyads completed the interview. The majority of youth (mean age = 12.7 ± 2.4 years; mean BMI = 37.6 ± 7.5) interviewed were female (61%) and covered by commercial insurance (60%). The most common anticipated barrier to weight management efforts described by parents and youth was lack of whole family participation in weight loss efforts. It was acknowledged that less healthy food options exist in the home for other family members, making it more difficult for the youth trying to lose weight. Many parents indicated that it was difficult to talk about weight issues with their child and reported they felt bad restricting access to preferred food. Many youth reported that increased parent involvement would help them to make healthier food choices and lose weight.

**Conclusions:** Prior to starting multidisciplinary weight management treatment, parents and youth identified involving the entire family in lifestyle changes as critical to success. In addition, many youth spontaneously expressed that greater parental involvement would assist them with weight loss. Future research should explore efficacy of strategies to increase parental and family involvement in weight management efforts.

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**T-P-3407**

**A Genetic Risk Score Demonstrates the Cumulative Association of SNP Polymorphisms in Gut Microbiota Related Genes with Obesity Phenotypes in Preschool Age Children**

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**Background:** Childhood obesity is a nutrition-related disease with multiple underlying etiologies. While genetic factors contribute to obesity, the gut microbiota has been implicated through fermentation of non-digestible polysaccharides to short chain fatty acids (SCFA). SCFA provide additional substrate for energy harvest and storage, and are postulated to contribute to obesity, the gut microbiota has been implicated in SCFA recognition and metabolism with obesity. Study participants were non-Hispanic White children (2-5 yrs.) from the STRONG Kids Illinois and Michigan cohorts (n=270). Height and weight were measured to calculate obesity-related phenotypes. Genomic DNA was extracted from saliva and genotyped using the Fluidigm® platform. Statistical analyses were performed in SAS 9.4. Ten SNP variables (PPARG, ANGPTL3/4, LPL, PYY, NPY2R, SLC5A8, SLC16A3, SLC16A1, and IL6) were dichotomized according to dominant or recessive inheritance models with the effect size of each SNP variable on BMI Z-score explained using linear regression (r²=0.001). Similarly, the GRS was associated with weight-for-age Z-score but not with height-for-age Z-score (r²=0.045, p=0.002).

**Conclusions:** This preliminary analysis suggests the cumulative association of the genetic variants studied with early-onset obesity. Our data supports the concept that gut microbiota influences obesity development through key host genes interacting with SCFA, warranting further investigation into the mechanisms driving these associations.

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**T-P-3408**

**Air Pollution in Pregnancy and Offspring Obesity at Early Childhood**

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**Background:** Fine particulate matter during pregnancy may increase the risk of fetal growth restriction but the extent to which is associated with offspring postnatal growth and the risk of childhood obesity remains unknown. We aimed to examine the association of prenatal exposure to low concentrations of air pollution with offspring growth and the risk of childhood obesity.

**Methods:** We studied 773 mother-child pairs from the RHEA pregnancy cohort in Crete, Greece. Mean concentrations of particulate matter with an aerodynamic diameter of less than 2.5 μm (PM2.5), and less than 10 μm (PM10) during pregnancy were estimated with land-use regression models. We measured birth weight, body mass index (BMI) from 6 months to 4 years of age, waist circumference, and skinfold thickness at 4 years of age. Adjusted associations were obtained via multivariate regression analyses.

**Results:** Mean PM2.5 concentrations during pregnancy was 14.5 μg/m3 (SD 3.4) and PM10 concentrations was 37.1 μg/m3 (SD 3.4). Exposure to PM2.5 and PM10 air pollutants was not associated with offspring BMI and the risk of childhood obesity at 4 years of age. After excluding low birth weight and preterm neonates, a 5 μg/m³ increase in concentration of PM2.5 during pregnancy was associated with increased risk of abdominal obesity (waist circumference>90th percentile; RR 1.78, 95% CI 1.05-3.03) at 4 years of age. Adjusted associations were obtained via multivariate regression analyses.

**Conclusions:** Pregnancy exposure to low levels of fine particulate air pollution was not associated with child growth and adiposity. Further studies are needed to explore potential effect modification by fetal growth restriction.

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**T-P-3409**

**Association between Breastmilk Dose and Growth Velocity During the First Two Years of Life**


**Background:** Rapid infant weight gain is associated with an increased risk of overweight and obesity later in life. Whether infants receiving higher “doses” of breastmilk relative to formula have lower growth velocities and how complementary
Early complementary food introduction was most prevalent. The growth velocity did not differ by breastmilk dose. Most breastmilk (β = -0.52 to -0.12), followed by mostly breastmilk (β = -0.32, 95% CI: -0.52 to -0.12), 6-12 month WAZ growth velocity was lowest for breastmilk only (β = -0.44, 95% CI: -0.78 to -0.41) and mostly breastmilk (β = -0.44, 95% CI: -0.73 to -0.15). 12-24 months growth velocity did not differ by breastmilk dose. Early complementary food introduction was most prevalent among infants fed formula only.

**Conclusions:** Higher breastmilk doses were associated with lower growth velocities in the first year, but not into the second year, and a lower prevalence of early complementary food introduction. Supporting breastfeeding and appropriate complementary food use as important obesity prevention strategies.

**T-P-3410-DT**

**Associations of child appetite and weight with dietary intake from snacks among Hispanic preschoolers**

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**Background:** Snacking among US preschoolers has increased in recent decades, raising questions about contributions to dietary intake. Further, whether some children are more at risk of excessive intakes from snacks is unclear. The objective of this research was to characterize contributions of snacking among preschool-aged children to parameters of dietary excess and evaluate associations with child appetite and weight.

**Methods:** A cross-sectional, observational study of 187 Hispanic low-income preschoolers. Three 24-hr dietary recalls were used to assess snacking frequency as well as snacking and daily intakes of energy, saturated fat, trans fats, and added sugars. Parental reports of child satiety responsiveness, food responsiveness, and enjoyment of food were obtained. Parent and child height and weight were measured.

**Results:** Children consumed 1,393 kcal/d of which 395 kcal/d (28%) came from snacks eaten during 2.3 ± 1.0 occasions/d. Greater snacking frequency was associated with a higher total daily intake of saturated fat (p = 0.0001) and added sugars (p = 0.0001). Associations of child appetite with snacking frequency and energy varied by weight status. Among overweight/obese children, higher enjoyment of food was associated with more frequent snacking and greater energy intake from snacks (p = 0.01). However, inverse associations were observed between enjoyment of food and snacking frequency and snacking energy intake among normal weight children (p = 0.03 and 0.01 respectively).

**Conclusions:** More frequent snacking among low-income Hispanic preschoolers may contribute to parameters of dietary excess. Snacking may pose greater risk of dietary excess for overweight/obese preschoolers with greater levels of enjoyment of food.

**T-P-3411**

**Associations of Missing Father Demographics on Infant Birth Certificate with Early Life Risk Factors for Childhood Obesity**

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**Background:** The role of fathers in the development of obesity in their offspring remains poorly understood. We evaluated associations between missing father demographics on infant’s birth certificates with several early life risk factors for obesity.

**Methods:** Data were from the CENTURY Study, a longitudinally-linked, electronic health record database containing birth certificate and well-child visit data for 200,343 MA children ages 0-18 years from 1980 through 2008. Participants were divided into groups based on the availability of the father’s age, education, or race/ethnicity and mother’s marital status on the birth certificate: (1) no father information, (2) unmarried with father information and (3) married with father information. Using linear and logistic regression we compared differences in antenatal smoking, gestational diabetes, birthweight, breastfeeding initiation, and ever crossing upwards ≥2 major weight for length (WFL) percentiles between 0-24 months among the three study groups.

**Results:** 12,009 (6.0%) birth certificates were missing father demographics. In analyses adjusted for maternal age, parity, race/ethnicity, and antenatal smoking, and child sex and gestational age, infants with missing father data had lower birthweights (β = -0.09 kg; 95% CI: -0.11, -0.08) and were less likely to be breastfed (AOR 0.28; 0.26-0.29) than infants of married mothers with available father data. We also observed associations between missing father data and higher prevalence of maternal antenatal smoking (AOR 6.48; 95% CI: 6.02-6.97) and lower prevalence of gestational diabetes (AOR 0.74; 0.59-0.93). We did not observe group differences in crossing of WFL percentiles.

**Conclusions:** Missing father demographics was associated with higher odds of maternal antenatal smoking and non-initiation of breastfeeding. Efforts to understand and reduce childhood obesity risk factors in early life may need to consider paternal factors.

**T-P-3412-DT**

**Associations of Neonatal Adiponectin and Leptin with Growth and Body Composition in African American Infants**

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**Background:** Umbilical cord blood leptin and adiponectin concentrations are positively associated with birth weight and adiposity. Infants born larger tend to have slower growth rates during infancy. This study aimed to test the hypotheses that
cords blood leptin and adiponectin are positively associated with neonatal adiposity, but inversely associated with body weight gain and fat mass (FM) accrual to 3-months (3m) of age. Hypotheses were tested in a cohort of African American (AA) infants, a relatively understudied population with low breastfeeding rates.

Methods: Participants (N=46) were healthy AA infants born to mothers enrolled in one of two studies of early life origins of childhood adiposity. At 2-weeks (2w) and 3m of age, infant length and weight were measured and body composition was assessed by air displacement plethysmography. World Health Organization standards were used to calculate weight-for-length z-scores (WLz). Multiple linear regression modeling was used to examine associations of cord blood leptin and adiponectin, measured by radioimmunoassay, with birth WLz, WLz, FM, percent fat (%fat) and fat-free mass (FFM) at 2w, and the conditional change in these variables from 2w to 3m, after adjusting for gestational age at birth, infant sex, and age or days between measurements, as appropriate.

Results: Adiponectin was positively associated with FM and %fat at 2w of age (partial r=0.44 & 0.46, respectively; P<0.05), and tended to be inversely associated with conditional FM and %fat change from 2w to 3m (partial r=-0.33 & -0.34, P=0.09 & 0.08, respectively). Adiponectin was no longer associated with FM and %fat at 3m. Leptin was not significantly associated with neonatal adiposity or changes in body weight or composition.

Conclusions: As hypothesized, adiponectin was positively associated with neonatal adiposity in AA infants. This is consistent with an effect of adiponectin on fetal growth, potentially via regulation of fetal glucose and insulin. These findings need to be confirmed in a larger cohort.

T-P-3413
Associations of Pre- and Postnatal Weight Gain with Body Composition and Cardiometabolic Risk During Mid-Childhood in Project Viva
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Background: Excess weight gain during pre- and postnatal periods may increase risk for later obesity and metabolic dysfunction. However, the combined effects of fetal and postnatal weight gain patterns on future cardiometabolic health are not well-established.

Methods: We included 963 participants from Project Viva, a US pre-birth cohort. Using linear regression, we examined relations of BMI z-score (BMIZ) change during four postnatal periods (birth-6mo, 6mo-1y, 1-2y, 2-3y) with mid-childhood adiposity (DXA total fat, BMIZ, DXA trunk fat, waist circumference) and metabolic risk (HOMA-IR, leptin, adiponectin, CRP, IL-6) within tertiles of birthweight-for-gestational-age (“fetal growth”). In multivariable analysis, we adjusted for child age, sex, race, breastfeeding duration, maternal education, continuous fetal growth, and BMIZ change in previous periods. All metabolic biomarkers were natural log-transformed.

Results: Children were 6.6-10.7y; 50% were male. The combination of higher fetal and higher postnatal BMIZ gain, especially from 2-3y, corresponded with greater mid-childhood adiposity. Among infants in the highest fetal growth tertile, each unit of BMIZ gain corresponded with greater childhood total fat mass: 0.85 kg (95% CI: 0.33, 1.38) for 0-6mo, 0.06 kg (-0.79, 0.90) for 6mo-1y, 0.99 kg (0.28, 1.70) for 1-2y, and 1.37 kg (0.51, 2.23) for 2-3y. We observed similar trends with other adiposity indicators. For metabolic outcomes, higher BMIZ gain from birth-6mo correlated with greater inflammation among children with highest fetal growth (CRP: 0.34 [0.06, 0.62]; IL-6: 0.19 [0.05, 0.34]), whereas 6mo-1y BMIZ gain was related to insulin resistance (HOMA-IR: 0.42 [0.18, 0.67]) and higher leptin (0.34 [0.12, 0.56]) among those with lowest fetal growth.

Conclusions: Larger babies who grow rapidly from 2-3y appear to be at risk for excess adiposity and inflammation during mid-childhood. Obesity intervention efforts should focus on early infancy and the toddler years.
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T-P.3415
Child-Centered Parental Feeding Practices Associated with Fewer Picky Eating Behaviors in Preschoolers
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Background: Parental feeding practices may influence picky eating behaviors and weight status in children. However, few studies have evaluated the protective effect of parental feeding practices. The objective of this study was to examine relationships between child-centered feeding practices, parental perception of children’s picky eating behavior, and body mass index (BMI) in preschoolers.

Methods: Cross-sectional analysis was conducted on data from 372 preschoolers (2-5 years) and their parents enrolled in the Synergistic Theory and Research on Obesity and Nutrition Group (STRONG) Kids program. Parents responded to survey questions about their feeding practices and child’s eating behaviors. Height and weight were measured by trained personnel and BMI, BMI percentile, and BMI z-score were calculated. Ordinal logistic regression (i.e., proportional odds model) was used to test associations between child-centered feeding practices, odds of picky eating, and odds of high BMI, while controlling for child age, gender, race/ethnicity, and parent income level.

Results: The sample was composed of 178 girls and 194 boys; 59 (16%) were overweight and 28 (8%) were obese. There was no association between child-centered feeding practices and being in a higher BMI category. However, encouraging the child’s involvement in meal planning and preparation (OR: 0.74; 95% CI: 0.59-0.94), and making healthy foods available in the home (OR: 0.55; 95% CI: 0.38-0.80) were associated with fewer picky eating behaviors. Promoting well-balanced food intake was also associated with (p = 0.08) fewer picky eating behaviors.

Conclusions: Child-centered parental feeding practices may protect against the development of picky eating behaviors in preschoolers. Further research is needed to determine the long-term effects of picky eating behaviors on weight status. Funded by NIFA 2011-67001-30101.

T-P.3416
Childhood Obesity Prevention in the First 1000 Days: Systematic Review of Modifiable Risk Factors from Conception to Age 2 Years
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Background: Mounting evidence suggests that the origins of childhood obesity can be found as early as the “first 1000 days” from conception to age 2 years. The goal of this research is to systematically review existing evidence for modifiable childhood obesity risk factors present from conception to age 2 years.

Methods: We searched PubMed, Embase, and Web of Science for prospective studies published between January 1, 1980 and December 12, 2014 of childhood obesity risk factors present during the first 1000 days. We included English-language studies with 1) human subjects, 2) prospectively collected exposure and outcome measurements, 3) original quantitative evidence on the relationship between risk factors and obesity outcomes, 4) exposure occurrence and data collection during the first 1000 days, and 5) outcome of a proxy measure of childhood overweight or obesity (BMI := 85th percentile for age and sex) collected between age 6 months and 18 years.

Results: We identified 5952 citations; 299 studies met inclusion criteria. We found several risk factors during the first 1000 days that were consistently associated with later childhood obesity. These included higher maternal prepregnancy BMI, prenatal tobacco exposure, maternal excess weight gain during pregnancy, high infant birth weight, and accelerated infant weight gain. A smaller number of studies also supported gestational diabetes, child care attendance, low strength of maternal-infant relationship, low socio-economic status, curtailed infant sleep, inappropriate bottle use, introduction of solid food intake before age 4 months, and infant antibiotic exposure as risk factors for childhood obesity. We found inconsistent results for breastfeeding, food insecurity, and maternal depression.

Conclusions: Modifiable risk factors in the first 1000 days can inform future research and policy priorities and intervention efforts to prevent childhood obesity.

T-P.3417
Consumption of Sugars, Solid Fats, and Sodium among U.S. Children Under Age Five Years, NHANES 2007-2010
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Background: Dietary sugars, solid fats, and sodium have all been associated with chronic disease risk yet intake among many Americans exceeds recommended levels. As there is limited information on when this dietary pattern develops, the purpose of this study was to estimate the intake levels and leading sources among very young children.

Methods: Data from the National Health and Nutrition Examination Survey (NHANES), a continuous cross-sectional survey of the U.S. population, 2007-2010 were used to estimate mean (SE) daily intake of the following: added sugars (AS), natural occurring (non-dairy) sugars (NOS), solid fats (fats), and sodium for all non-breastfed children <5 years (N=2496). T-test and complex survey methods were used to test differences in intake between subgroups and to compare intake to limits recommended in the 2010 U.S. Dietary Guidelines for Americans. P-values less than 0.05 determined significance.

Results: From infancy to age 4–5 years, consumption increased significantly for all nutrients: 3.0g (0.2) to 54.3g (1.9) for AS; 13.7g (0.8) to 34.4g (1.7) for NOS; 2.5g (0.3) to 28.7g (1.3) for solid fats; and 398mg (18.9) to 2291mg (54.0) for sodium. Among children >=2y, added sugar and solid fats combined contributed 30.4% of total energy intake, exceeding the recommended limit of 10-15% of total energy. Mean intake of sodium was 2173mg (34.0), which approaches the recommended limit of 2300 mg. Among all children <5 y, foods contributed more AS than beverages, 22.8g (0.5) vs. 15.0g (0.3) and males consumed more than females 40.2g (1.4) vs. 35.3g (1.0). Leading food sources were: sugar-sweetened beverages for AS, meats for sodium, and equally meats and whole milk for solid fats.

Conclusions: The consumption of sugars, solid fats, and sodium rises rapidly in early childhood and approaches or exceeds recommended limits for children age 2–5 y.

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Poster Abstracts Wednesday November 4th to Friday November 6th, 2015
Conclusions: Overall, approximately 50% of normal weight women gain excessive weight during pregnancy. We quantified if mean weight gained differed between groups created across the normal BMI range.

Methods: 209 normal weight women were divided by BMI into six groups: 18.5 - 19.9, 20 - 20.9, 21 - 21.9, 22 - 22.9, 23 - 23.9, 24 - 24.9 kg/m². The mean GWG was compared using ANCOVA (controlling for gestational length). Second, BMI groups were collapsed and Chi-square and ANCOVA were completed. Total weight gain was categorized by 2009 IOM recommendations and was calculated from the self-reported or medical record extracted pre-pregnancy body weight and self-reported highest weight in pregnancy.

Results: Differences were found between the six BMI groups for weight gained (p<0.01). Using pairwise comparisons, no groups were collapsed and Chi-square and ANCOVA were completed. Total weight gain was categorized by 2009 IOM recommendations and was calculated from the self-reported or medical record extracted pre-pregnancy body weight and self-reported highest weight in pregnancy.

Results: Differences were found between the six BMI groups for weight gained (p<0.01). Using pairwise comparisons, no groups were collapsed and Chi-square and ANCOVA were completed. Total weight gain was categorized by 2009 IOM recommendations and was calculated from the self-reported or medical record extracted pre-pregnancy body weight and self-reported highest weight in pregnancy.

Conclusions: As expected, the results of this study reveal that poor regulatory abilities in toddlerhood predict a greater weight status at age 4, particularly for children of mothers who are highly restrictive. These results replicate previous work with older children.

T-P-3420
Do Differences Between Primiparous and Multiparous Mothers in Feeding Practices, Perceptions of Infant Fussiness, and Infant Sleep Place Firstborns at Greater Risk for Obesity?
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Background: Previous research on birth order and obesity indicates that firstborns are at higher risk for developing obesity than later-born children, despite weighing less at birth. The aim of this study was to examine how maternal feeding practices, infant sleep, and perceptions of infant fussiness, established indicators of obesity risk, differ between primiparous (PP) and multiparous (MP) mothers.

Methods: Participants were part of the Infant Feeding Practices Study 2, and included 1,807 mothers participating through the first year. All data were self-reported by mothers on monthly mailed questionnaires. GLM models tested for differences by parity on variables of interest, adjusting for multiple covariates including maternal age, education, and income.

Results: Infants of MP mothers were heavier at birth than infants of PP mothers but infant weight did not differ significantly at 12 months. PP mothers were significantly more likely to report adding cereal to the bottle, to introduce a bottle, to encourage their infant to finish the bottle, to introduce drinks other than breastfeeding or formula, and introduced solids significantly earlier, before and after adjusting for covariates. A greater proportion of PP mothers reported their infant was fussy/irritable across the first 6 months. MP mothers reported significantly shorter infant sleep bouts at 2 weeks but longer sleep bouts at 6 months than MP mothers.

Conclusions: PP mothers are more likely to engage in infant feeding practices inconsistent with current guidance and may benefit from targeted interventions to encourage responsive, age-appropriate feeding practices.

T-P-3421
Does Breastfeeding (BF) Reduce the Risk of Obesity in Normal Weight, Full Term Children?
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Background: Poor regulatory abilities (i.e. low inhibitory control) and parent feeding style (i.e. restriction) have been consistently linked to greater weight in older children, but there is limited research on these topics in very young children. The purpose of this study is to examine how toddler regulatory abilities predict weight status at age 4, alone and interacting with parent feeding style.

Methods: Data were drawn from a longitudinal study following individuals (n = 82) from infancy through early childhood. When the toddlers were 18 months of age, they participated in an observational inhibitory control task where an experimenter asked them not to touch a wind-up toy. The time of delay increased across three trials (5 s, 10 s, 15 s) and latencies to touch the toy were coded. Mothers reported on their toddlers’ level of inhibitory control using the Early Child Behavior Questionnaire (ECBQ) and their own feeding style (i.e. restrictive) using the Infant Feeding Style Questionnaire (IFSQ). Finally, weight and length measurements were collected at 18 months and 4 years and were used to calculate weight-for-length (WFL-z) and BMI z-scores according to the WHO and CDC growth charts, respectively.

Results: After controlling for maternal BMI, education, and child WFL-z at 18 months, both observational (B = -.35, p < .01) and parent-reported inhibitory control (B = .21, p < .05) significantly predicted BMI z-scores at age 4 such that lower regulatory abilities predicted a greater weight status. Further, children with low observational inhibitory control had significantly higher BMI z-scores when they also had a mother who endorsed a highly restrictive feeding style compared to a non-restrictive feeding style (b = .39, p < .01).

Conclusions: As expected, the results of this study reveal that poor regulatory abilities in toddlerhood predict a greater weight status at age 4, particularly for children of mothers who are highly restrictive. These results replicate previous work with older children.
Background: Protective effects of breastfeeding (BF) against childhood overweight/obesity are promoted by some government agencies, scientists, and clinicians. Suggested mechanisms include exclusive BF eliminating inappropriate complementary feeding, differences in protein/energy intake being associated with childhood obesity, differences in hormone secretion observed between breastfed and formula-fed infants, and hormones and biological factors in breast milk.

Purpose: To evaluate the potential relationship between infant feeding regimens and childhood obesity.

Methods: The search terms obesity; overweight; adiposity; BMI; body mass index; BMI z score AND BF; infant formula; lactation were used to identify literature published between 2006 and 2013 and referenced in PubMed and Cochrane databases. Of the 1058 articles identified, 114 studies were stratified by study design and further evaluated. A decrease in overweight/obesity-related endpoints with increased BF duration, intensity, or relative consumption was considered an inverse relationship. An increase in overweight/obesity related endpoints with an increase in BF duration or decrease in formula feeding duration was defined as a direct association.

Results: No association between BF and obesity was found in 67% of the randomized clinical trials (RCTs). One direct association was identified by 25% and at least 1 inverse association was identified by 13% of the RCTs. Of the 42 prospective cohort studies reviewed, 65% found no association while 35% found at least one inverse association and 3% found at least one direct association. Of the 4 meta-analyses reviewed, 2 reported a small inverse association that was diminished after a longer duration of follow-up while 2 reported no association of BF and obesity.

Conclusions: Evidence comparing BF to formula feeding for risk of obesity was inconclusive. Evidence from RCTs does not support an association between BF and obesity while evidence from observational studies and meta-analyses is inconclusive.

T-P.3422 Early-life Asthma Predicts Higher Risk of Childhood Obesity among School-Aged Children

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Background: Asthma and obesity often occur together in children. It is unclear whether children with asthma are at higher risk for onset of obesity or that obese children develop asthma or both. We aimed to investigate the effects of asthma and asthma-related phenotypes on risk of developing obesity later in childhood.

Methods: Kindergarten and first grade students (age 5-8) enrolled in the southern California Children’s Health Study were recruited in 2002-2003 and were followed for up to 10 years. This analysis included 2,171 non-obese children who had complete asthma information at study entry. Height and weight were measured at each visit to classify children into normal, overweight and obese based on CDC BMI percentiles. Asthma was ascertained by parent- or self-reported physician-diagnosed asthma. History of respiratory illness, socio-demographics, physical activity patterns, and household characteristics were collected annually using parent- or self-reported questionnaires. Cox proportional hazards models were fitted to assess the association of asthma at cohort entry with obesity incidence during follow-up years.

Results: We found that children with a diagnosis of asthma at cohort entry were at 51% increased risk of developing obesity during childhood and adolescence compared to children without asthma at baseline [HR=1.51, 95% CI=(1.08, 2.10)] after adjusting for age, sex, SES, baseline overweight status, secondhand smoking exposures and physical activity. Children with asthma who reported using asthma medication had reduced risk of later obesity compared to asthmatic children who reported no medication usage [HR=0.55, 95% CI = (0.30, 1.00)].

Conclusions: Children with early-life asthma may be at higher risk for developing obesity. Asthma treatment appears to reduce the obesity risk among children with asthma. Our findings suggest that early interventions for children with asthma may prevent obesity and other metabolic diseases in their later life.

T-P.3423 Fish Intake in Pregnancy and Child Growth: a Pooled Analysis of 15 European and US Birth Cohorts


Background: High fish intake during pregnancy has been associated with offspring neurocognitive harms but the extent to which affects childhood growth and obesity remains unclear.

Methods: We harmonized individual data of 26184 mother-child pairs from 14 European and one US birth cohort to examine the association of fish intake in pregnancy with offspring growth and the risk of childhood overweight and obesity. We estimated offspring body mass index (BMI) percentile values from birth to 6 years. We calculated cohort-specific effect estimates, and combined them by random effects meta-analysis.

Results: The median fish intake during pregnancy ranged from 0.5 times/week in Belgium to 4.45 times/week in Spain. Women who ate fish more than three times/week during pregnancy gave birth to offspring with higher BMI values from birth through mid-childhood compared with women with lower fish intake (three times/week or less). High fish intake during pregnancy (>3 times/week) compared to one or less times/week was associated with increased risk of rapid infant growth (weight gain z-score >0.67 from birth to 2 years) with an adjusted odds ratio of 1.22 (95%CI 1.05-1.42), and increased risk of offspring overweight/obesity (BMI ≥85th percentile)
percentile for age and sex) at 4 years (1•14, 0•99-1•32) and 6 years of age (1•22, 1•01-1•47). The effect was stronger among girls than boys. No heterogeneity was found between cohort-specific estimates.

Conclusions: High maternal fish intake during pregnancy was associated with increased risk of rapid growth in infancy and adiposity in childhood. Our findings on child growth support fish intake recommendations proposed for offspring neurodevelopmental effects.

T-P.3424

FTO and IRX3 Interact to Influence Risk of Overweight in Preschool Age Children


Background: Genome-wide association studies recently identified a cluster of single nucleotide polymorphisms (SNPs) within the fat mass and obesity associated (FTO) gene showing significant associations with obesity-related traits. SNPs within intron 1 of FTO appear to indirectly affect obesity through an enhancer mechanism regulating the expression of the Iroquois homeobox 3 (IRX3) gene, located 0.5 Mb downstream FTO on chromosome 16.

Methods: Herein, we investigated the relationship between FTO and IRX3 through gene-gene interaction and haplotype construction in non-Hispanic white children (2-5 yrs.) of the STRONG Kids Program (n=270). Height and weight were measured to calculate BMI and related anthropometrics. FTO-rs8057044 and IRX3-rs3751723 were genotyped by TaqMan assays and fluorescence polarization.

Results: An interaction between rs8057044 and rs3751723 was significantly associated with BMI Z-score (p=0.02). Several differences in the risk of being overweight amongst FTO-IRX3 haplotype groups were observed. Notably, children with the rs3751723-CC and rs8057044-AG genotypes were 9.8-times more likely to be overweight than those with the rs3751723-CC and rs8057044-GG genotypes (OR=9.75, CI=1.98-48.0). Replication of the dataset by bootstrapping (10, 50, and 100 permutations) supported these findings.

Conclusions: Taken together, these data suggest a role for FTO in obesity beyond its own expression and highlight the need to integrate biological mechanisms with statistically generated relationships.

T-P.3425

Greater early and mid-pregnancy gestational weight gains are associated with excess adiposity in mid-childhood

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Background: Excessive gestational weight gain (GWG) is associated with offspring adiposity later in life. However, few studies have assessed the differential impact of GWG in each trimester of pregnancy.

Methods: In 979 mother-child pairs from the pre-birth Project Viva cohort, we calculated trimester-specific GWG using clinically recorded weights. We defined trimesters as 1st = pre-pregnancy to 91 days; 2nd =91-182 days; 3rd =182 days to delivery. Outcomes were BMI (age-sex z-score), waist circumference (cm) and DXA overall and truncal fat mass index (FMI, kg/m²) in mid-childhood. We used linear regression models (β=units per kg of GWG) adjusted for maternal pre-pregnancy BMI, parity, education, pregnancy smoking status and race/ethnicity, and child sex, gestation length, age at outcomes, and for GWG in prior trimester(s) when applicable.

Results: Mean±SD child age was 7.9±0.8 years and BMI z-score was 0.42±0.99, 50% were girls and 35% were non-white. Mean±SD maternal pre-pregnancy BMI was 24.7±5.0 kg/m² and 1st, 2nd and 3rd trimesters GWG were 2.8±2.8, 6.3±2.3 and 6.4±2.7 kg. Greater GWG in 1st and 2nd trimesters but not in 3rd trimester were associated with higher mid-childhood BMI z-score: β1st=0.03 (95% CI 0.00, 0.05); β2nd=0.05 (0.02, 0.07); β3rd=0.01 (-0.02, 0.03). Greater 1st and 2nd trimesters GWG were also specifically associated with higher waist circumference [β1st=0.25 cm (0.09, 0.41); β2nd=0.31 cm (0.10, 0.53); β3rd=0.05 cm (-0.14, 0.24)] and with greater adiposity estimated by DXA total FMI [β1st=0.07 kg/m² (0.03, 0.11); β2nd=0.06 kg/m² (0.01, 0.12); β3rd= −0.02 kg/m² (-0.07, 0.03)] and truncal FMI [β1st=0.03 kg/m² (0.01, 0.05); β2nd=−0.02 kg/m² (0.00, 0.05); β3rd= −0.01 kg/m² (-0.03, 0.02)].

Conclusions: Early and mid-pregnancy, but not late pregnancy, GWG predicted higher overall and central adiposity in mid-childhood. This finding has implications for interventions to prevent excessive GWG, most of which start after the 1st trimester.

T-P.3426

Head Start Teachers’ Perceptions of Barriers to Obesity Prevention Programs

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Background: Interventions to combat childhood obesity, such as the Texas Childhood Obesity Research Demonstration (TX CORD), are increasingly focusing on early care and education (ECE) settings. In Head Start centers, classroom teachers are typically responsible for implementing programs to improve healthy eating and physical activity among young children. Teachers’ perceptions of barriers to implementation may be an important predictor of program success. Therefore, the purpose of this study was to understand teacher’s perceptions of the nutrition and physical activity environments of Head Start centers.

Methods: In spring 2012, teachers (n=118) from 24 Head Start centers in Austin and Houston, TX completed previously validated measures to evaluate the nutrition and physical activity environments of ECE centers.

Results: Teachers were 42.5 ± 11.8 years (M ± SD), 52% had been teaching for >10 years, 96% were female, 60% were college graduates, 44% were Hispanic, and 49% were African American. Barriers to providing opportunities for nutrition education and healthy eating most frequently reported by teachers (i.e., > 10% of teachers) were: limited time for teaching nutrition (23%), insufficient funds (23%), lack of support from food service staff (17%), lack of nutrition education resources (15%), lack of support from parents/families (14%), inadequate food preparation facilities (14%), and lack of teacher training on nutrition education (13%). Barriers to promoting physical activity most frequently reported by teachers were: lack of physical education resources (12%) and insufficient funds (11%).

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Conclusions: Teachers at Head Start Centers reported more barriers to promoting healthy eating than physical activity. Future research should investigate how teacher’s perceptions of barriers might influence implementation and success of ECE-based childhood obesity prevention programs.

**T-P-3427**
**Maternal Body Mass Index Is Associated with Offspring’s Nutritional Intake Measured by 24-Hour Recall**

**Background:** Adolescent obesity has increased in the past three decades. It is well established that maternal body mass index [BMI] is associated with offspring weight status from childhood to adulthood. Research examining relationships between maternal BMI and offspring nutritional intake is limited.

**Methods:** Adolescents [N=51]; 11-18 years (14.45 SD=1.65); M=25 (49%); F=26 (51%); African American=14 (27%); Caucasian=32 (62%); Other=5 (10%); Overweight/Obese=29 (57%) and their mothers participated in a study to examine relationships between weight status and nutritional intake. Research nurses administered 24-hour dietary recall/questionnaire, infant feeding practices by interview and infant growth or weight velocity at any time point.

**Results:** Offspring and maternal mean BMI were 25.1 and 28.7, respectively [SD=6.27, SD=5.54] and were positively associated [p<0.01]. Offspring mean daily food intake values were: total caloric intake [TCI]=1675.58 kilocalories [SD=766.70]; saturated fatty acid [SFA]=22.85 g [SD=15.84]; carbohydrate [CARB]=214.38 g [SD=103.66]; total fiber [FIB]=10.91 g [SD=6.92] and omega-3 [O-3]=1.38 g [SD=0.90]. Maternal BMI was positively associated with TCI, SFA, CARB, FIB and O-3 after controlling for gender and race [p<0.01 Multiple Regression]. Significance remained after further adjustment for offspring BMI_z. Relationships between maternal BMI and SFA, CARB, FIB and O-3 were not significant after adjustment for TCI. For every one unit increase in maternal BMI, offspring consumed 73 more kilocalories/day [p<0.01]. Mean fruit/vegetable intake was 2.23 [SD=2.22] servings/day, but was not significantly related to maternal BMI.

**Conclusions:** Maternal BMI was not related to diet quality, but rather with an increase in the amount of food consumed by the offspring. Findings identify a need to address the overall excess daily caloric intake of adolescents by considering maternal weight status and associated health behaviors.

**T-P-3429 - Withdrawn**

**T-P-3430**
**Nativity and baby weight: The association between time in the US and macrosomia**
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**Background:** Macroscopic infants (birthweight 4000 grams or greater) are at higher risk for obesity and diabetes later in life. Risk factors for macrosomia include maternal pre-pregnancy obesity, higher parity, pre-pregnancy diabetes, and gestational diabetes. However, little work has examined the relationship between macrosomia and time in the United States (US), which has been found to be related to weight gain across the life course.

**Methods:** A cross-sectional analysis utilized New York City singleton births in 2013 to adult women (n=108,124). Time in the US was reported on the birth certificate and defined as US born, Foreign Born (FB) with more than 10 years in the US, FB with 5-10 years in the US, and FB with less than 5 years in the US. Birthweights 4000 grams or greater were categorized as macrosomic. Race-specific logistic regression models adjusted for parity, maternal education, Medicaid status, maternal age, pre-pregnancy body mass index, excessive gestational weight gain, prenatal care, pre-pregnancy and gestational diabetes.

**Results:** Overall, 7% of births were macrosomic. US born
women had the highest proportion (7.3%) of macrosomic births while FB women living less than 5 years in the US (6.1%) had the lowest (p<0.0001). After adjusting for confounders, time in the US was significant only among blacks and Hispanics and the trend was counter to what was previously noted: FB black women living less than 5 years in the US had a higher likelihood of having a macrosomic infant as compared to US born black women (AOR=1.60; 95% CI: 1.33-1.92); as compared to US born Hispanic women, FB Hispanic women who have lived in the US for 5-10 years (AOR=1.22; 95% CI: 1.08-1.37) and for more than 10 years (AOR=1.15; 95% CI: 1.03-1.29) were significant.

Conclusions: These results indicate that the relationship between time in the US and macrosomia is significant but varies by race/ethnicity. Time in the US and weight gain across the lifespan must be examined in more detail.

T-P.3431 Obesity Prevention in the First 1000 Days: Evidence and Opportunities for Early Life Interventions
Tiffany Blake-Lamb Boston MA, Lindsey Locks, Jennifer Woo Baidal Boston MA, Erika Cheng Boston Massachusetts, Meghan Perkins Boston MA, Elsie Taveras Boston MA

Background: The "First 1000 Days" - conception through 24 months of age – is a critical period for the development of childhood obesity. Interventions implemented during this life period for the prevention of childhood obesity have not been systematically reviewed.

Methods: We searched PubMed, Embase, Web of Science, and Clinicaltrials.gov for existing and ongoing childhood obesity prevention interventions implemented during the First 1000 Days. We included English-language studies with 1) human subjects, 2) an intervention study design with a control group, 3) intervention implementation occurring in pregnancy through age 24 months, and 4) study outcome including a proxy measure of childhood overweight or obesity collected between age 6 months and 18 years. We examined the range of intervention types employed, assessed the methodologic quality of completed interventions, and identified gaps in current research.

Results: We identified 5952 articles, among which 21 completed interventions met inclusion criteria; 7 were found to be effective in improving childhood weight status. Six of these interventions focused on individual-level behavior changes through home visits (3 studies), in clinical settings (2 studies), or in community-based group educational sessions (2 studies); 1 of the effective studies supplemented maternal fatty acids. Only 1 of the published interventions met all criteria for high quality study design. Interventions using enriched formulas increased risk of childhood obesity. Forty-three ongoing interventions were identified. Among both completed and ongoing studies, the majority target individual-level behaviors of mothers and infants and most are being conducted in clinical settings.

Conclusions: Childhood obesity interventions may produce the largest magnitude of preventive effect if they are begun in the earliest stages of life, operate at systems-levels, and support beneficial changes across multiple life sectors and levels of influence.

T-P.3432 Paternal Obesity Modifies the Effect of an Antenatal Lifestyle Intervention in Women who are Overweight or Obese on Newborn Adiposity

Background: The aims of this study, conducted in the context of the LIMIT randomized trial were 1) Among participants receiving Standard Antenatal Care, we evaluated the effect of paternal BMI across the BMI spectrum, on infant birth weight and adiposity; and 2) We evaluated whether the effect of a randomized antenatal maternal dietary and lifestyle intervention among women who are overweight or obese on newborn adiposity was modified by paternal BMI.

Methods: Multicentre randomized controlled trial, where pregnant women with BMI >25kg/m2, received either Lifestyle Advice or Standard Care. Paternal outcomes included height, weight, BMI; waist, hip, calf and mid-upper arm circumferences; biceps and calf skinfold thickness; and calculated percentage body fat. Neonatal outcomes included length, weight; head, arm, abdominal, and chest circumferences; biceps, triceps, subscapular, suprailiac, thigh, and lateral abdominal wall SFTM; and calculated percentage body fat and fat free mass. Analyses utilized intention to treat principles.

Results: Increasing paternal BMI was associated with a significant increase in infant suprailiac and thigh SFTM, and percentage body fat (p<0.05 for all), particularly where paternal BMI was >35.0kg/m2. The effect of an antenatal maternal dietary and lifestyle intervention among women who were overweight or obese on neonatal adiposity measures was significantly modified in infants whose fathers BMI was >35.0kg/m2, as demonstrated by a significant reduction in infant triceps, suprailiac, and thigh SFTM, and infant percent fat mass (p<0.05 for all).

Conclusions: Paternal BMI >35kg/m2 is associated with increased infant adiposity. Furthermore, paternal obesity exerts a positive modifying effect on maternal diet quality during pregnancy, to significantly improve neonatal adiposity to below that of offspring of the leanest fathers. Further work is needed to understand contributions of paternal obesity to pregnancy outcomes in human populations.

T-P.3433 Relationship between early adiposity rebound with BMI and incidence of Type 2 diabetes later in life: Systematic Review
Ana Guzman Tijuana Baja California, Arturo Jimenez-Cruz Tijuana Not Listed or Not Applicable, Montserrat Bacardi-Gascon Tijuana Baja California

Background: The adiposity rebound (AR) corresponds to the second rise in body mass index (BMI) that usually occurs between 5 and 7 years. The age of AR is defined as the time at which BMI starts to rise after infancy. Age at adiposity rebound has been identified as a predictor of adult fitness and it is thought to be a marker for later development of metabolic syndrome. The objective is to review prospective studies which analyze the relationship of early AR and BMI and incidence of Type 2 diabetes later in life.
**T-P.3434-DT**  
**Soda Consumption Linked to Substantial Postpartum Weight Retention in Women with GDM During Pregnancy**  
Jaimie Davis *Austin Texas*, Xian Ning *Oakland CA*, Shanta Hurston *Oakland CA*, Erica Gunderson *Oakland CA*  

**Background:** To examine the relationship between regular and diet soda consumption postpartum and postpartum weight retention at 1-year in women who had been diagnosed with GDM during pregnancy.  

**Methods:** Data were from the Study of Women, Infant Feeding and Type 2 Diabetes after GDM pregnancy (SWIFT), a prospective multi-ethnic cohort of women (20-45 years) with recent GDM and screened annually for diabetes at three in-person research exams from 6-9 weeks postpartum and up to two years. Nine hundred and thirty one women delivered a singleton, term (≥ 35 weeks gestation) live birth and completed a 13-item validated Caffeine Survey, which identified frequency of regular soda and diet soda intake at 6-9 weeks postpartum. Average postpartum weight retention was calculated (pre gravid weight to 12-months postpartum). Binary logistic regressions were run to assess the impact of soda and diet intake on substantial postpartum weight retention (≥ 5 kg above pre gravid weight). The following prior covariates were included: ethnicity, breastfeeding duration, birth weight, gestational weight gain, pre gravid BMI, glucose tolerance at 1-year, and total energy intake.  

**Results:** Women who reported never drinking soda at 6-9 weeks postpartum (n=443) compared to women who reported drinking soda 2 to 4 serv/wk (n=197) were less likely to have substantial postpartum weight retention (adjusted OR 0.59; 95% CI 0.38-0.91; P=0.02). Diet soda consumption was not linked to postpartum weight retention.  

**Conclusions:** These findings suggest that interventions should focus on reducing regular soda consumption during postpartum periods to reduce excessive postpartum weight retention in high-risk women with GDM.  

**T-P.3435**  
**The Environment Shapes Emotional Eating in Early Childhood**  

**Background:** Emotional overeating (EOE) is the tendency to eat more in response to negative emotions. It has been associated with obesity and emerges during childhood, but its etiology in early life is unknown. We use a prospective twin design to quantify genetic and environmental contributions to the development of EOE from toddlerhood to early childhood.  

**Methods:** Data were from Gemini, a population-based twin birth cohort of 2402 British families. Parents completed the EOE scale of the Child Eating Behaviour Questionnaire at 15 months and 5 years of age. A longitudinal quantitative genetic model was used to estimate genetic and environmental contributions to EOE at 15 months and 5 years, and to explore the extent to which continuing genetic or environmental factors drive stability of EOE from toddlerhood to early childhood.  

**Results:** Genetic influences on EOE were minimal at both ages (15 months: 0.10, 95% CI: 0.9-0.11; 5 years: 0.9, 95% CI: 0.7-0.11). On the other hand, environmental influences shared by twin pairs explained most of the variance in EOE (15 months: 0.87, 95% CI: 0.86-0.89; 5 years: 0.89, 95% CI: 0.87-0.89). EOE was moderately stable from 15 months to 5 years (r=0.28, p<0.001); continuing environmental factors that are shared by the twin pairs at both ages entirely explained the longitudinal association.  

**Conclusions:** This was the first study to investigate the relative importance of genetic and environmental influences on the development of EOE in a pediatric sample from toddlerhood to early childhood. EOE is largely shaped by aspects of the environment shared by twin pairs, in contrast to most other behavioral traits - including appetite - that show moderate to high heritability in childhood. Future research to identify the specific environmental influences involved would help policymakers and public health practitioners to provide parents with advice about establishing healthy eating behaviors in children.
the observed data. Subsequently, we could obtain the predicted values of the obesity prevalence in the United States.

T-P-3437-DT
Toddlers and “Junk Food”: Dietary Recall Among Greenlight Toddlers

Background: Unhealthy eating patterns at a young age may create a foundation for unhealthy habits in later years that bring the risk of obesity and related health problems. Little is known about daily dietary habits of at risk toddlers.

Methods: Cross-sectional analysis of data from 24-hour dietary recalls from English- and Spanish-speaking caregivers of 18-33 month olds enrolled in Greenlight, a cluster-randomized controlled trial focused on childhood obesity and injury prevention at 4 pediatric resident clinics. Trained interviewers used validated methods and entered data into the Nutrition Data System for Research dietary analysis program for total intake over a 24-hour period. Recalls (averaged if >1) were used to determine total daily caloric intake, consumption of junk and quick foods (pizza, french fries, cookies, and crackers), processed meats, sugar-sweetened beverages (SSBs, defined as fruit juice, sugar-sweetened tea, soda), branded fast foods, and fat intake.

Results: 272 toddlers had at least 1 completed recall. 57% were Hispanic, 14% white, 25% black, and 5% other with 53% male. Mean daily calories was 1137 kcal/day (SD=348). 68% consumed at least 1 kind of junk food, with 38% consuming multiple junk foods on recall day. Specific intake included: pizza 38%, French fries 13%, cracker products 41%, cookies/cake 38%, processed meats 32%, and branded fast food 13%. 82% consumed SSBs on recall day with an average of 8.2 ounces (SD=6.4) and 108 kcal/day. 78% of children met guidelines for <10% of calories from saturated fats.

Conclusions: In a diverse sample of toddlers, processed meats, “junk foods” and SSB consumption were significant contributors to total caloric intake and two-thirds exceeded guidelines for saturated fat intake. Future study will examine the relationship of these intakes to obesity at the time and future obesity risk as well as whether pediatric interventions can be helpful in shaping behavior at this crucial time period.

T-P-3438
Trimester-specific gestational weight gain and infant size for gestational age
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Background: Gestational weight gain (GWG) influences infant birthweight; however, it is unclear whether the effects of GWG vary by trimester. The aim of this study was to evaluate the association between trimester-specific GWG and infant size for gestational age.

Methods: The diverse cohort included 9,680 women who delivered a singleton at Kaiser Permanente Northern California (2007-2013). GWG was categorized according to the 2009 IOM recommendations; met the IOM recommendations was the reference group. Large for gestational age (LGA) and small for gestational age (SGA) were defined as birth weight > 90th percentile or <10th percentile, respectively, for the population’s race/ethnicity and gestational age-specific birth weight distribution. Logistic regression using generalized estimating equations was used.

Results: Overall, exceeding the IOM recommendations decreased the odds of having an SGA infant and increased the odds of an LGA infant [Odds Ratio (95% Confidence Interval) 0.62 (0.52 - 0.74) and 2.06 (1.69 - 2.52)]. In contrast, gaining below the IOM recommendations increased the odds of having an SGA infant and decreased the odds of an LGA infant [OR: 1.38 (1.09 - 1.74) and 0.58 (0.40 - 0.82)]. Excess GWG was associated with LGA in all trimesters, with the strongest effect in the 2nd trimester (1.68 (1.27 - 2.23)). Inadequate GWG was associated with SGA in the 2nd trimester only (1.71 (1.26 - 2.31)).

Conclusions: The impact of GWG on infant size varied by trimester; effects were strongest in the 2nd trimester. Appropriate GWG during the 2nd trimester may be particularly important for improving infant birthweight.

T-P-3439-DT
Dietary Patterns Over the Adult Life-Course Among Lesbian, Bisexual, and Heterosexual Women in the Nurses' Health Study II
Nicole Vankim San Diego California, S. Bryn Austin Boston Massachusetts, Hee-Jin Jun San Diego CA, Frank Hu Boston MA, Heather Corliss San Diego California

Background: Lesbian and bisexual women are at greater risk of overweight and obesity. However, little research on modifiable behaviors associated with excess weight gain, such as poor dietary intake, has been conducted. This study examined sexual orientation differences in dietary intake among women over the adult life-course.

Methods: Over 100,000 women from Nurses’ Health Study II were included in multivariate adjusted repeated measures analyses of dietary measures from a 133-item food frequency questionnaire (FFQ). The FFQ was administered every four years between 1991 and 2011 (six waves total, age range: 26-68 years). Dietary measures included caloric, fat, and fiber intake, glycemic load and index, and diet quality (Alternative Healthy Eating Index [AHEI] and Dietary Approaches to Stop Hypertension [DASH]). About 1.3% of the sample identified as lesbian (n=926) or bisexual (n=415).

Results: On average over the repeated measures, lesbian women reported consuming 70 fewer calories daily [β (95% CI): -69.8 (-102.0, -37.7)], while bisexual women consumed 100 more calories [124.3 (72.2, 176.4)] than heterosexual women. Compared to heterosexual women, lesbian women consumed significantly less fat, bisexual women consumed more fiber, and both lesbian and bisexual women had diets lower in glycemic index. Measures of diet quality suggested that both lesbian and bisexual women had healthier diets than heterosexual women [AHEI: lesbian (2.5 (1.8, 3.2)), bisexual (3.1 (2.0, 4.2)); DASH: lesbian (0.6 (0.3, 0.9)), bisexual (1.1 (0.7, 1.5)]]. Sexual orientation remained largely consistent throughout the life-course.

Conclusions: Our findings suggest that lesbian and bisexual women, generally, had more favorable diets than heterosexual women over the adult life-course. Other related factors, such as physical activity, sedentary behavior, disordered eating behaviors, or stress, should be explored as potential contributors to documented disparities in overweight and obesity among lesbian and bisexual women.
T-P.3440-DT
Disparities in Patient-Reported Barriers to Healthy Diet and Physical Activity in Pregnancy
Sara Lindberg Madison Wisconsin, Laura Kwittek Fitchburg WI, Cynthia Anderson Madison Wisconsin

Background: Preventing obesity in vulnerable groups is a top Institute of Medicine priority. Interventions targeting gestational weight gain may be especially effective at preventing obesity, because pregnancy is a critical period determining future obesity risk in both mother and child, and because pregnancy increases women’s motivation to make behavioral changes to improve their babies’ health. Yet gestational weight gain interventions to date have had modest results and provide less benefit for low-income, minority, and obese women. This study sought to identify barriers to physical activity and healthy diet in pregnancy, with attention to psychosocial factors contributing to disparities.

Methods: Pregnant and postpartum patients visiting several community clinics in Dane County, WI, were invited to participate in this cross-sectional study (response rate: 74%). Participants completed anonymous, self-administered paper surveys assessing barriers they faced in being physically active and eating healthily during pregnancy (N=246).

Results: Patients reported more barriers to physical activity than to healthy eating in pregnancy. The most frequent barriers to physical activity were unavailability of activities they most enjoyed, e.g. swimming and biking (62.3%), cost of joining a fitness center (45.7%), and lack of fitness opportunities in their neighborhood (42.2%). The most frequent barriers to healthy eating were the ease of fast food and take-out relative to cooking (23.7%) and lack of cooking skills (8.5%). Barriers were more common among low-income, less educated, and minority women.

Conclusions: This study identifies common barriers to healthy eating and physical activity in pregnancy. Findings highlight racial and socioeconomic disparities in barriers to physical activity and healthy diet in pregnancy, suggesting the need for targeted interventions that address barriers and promote healthy weight gain in minority and low-income women.

T-P.3441-DT
Disparities of under- and Overnutrition among Middle School Students in Urban Gambia
Alimatou Juwara Banjul Bakoteh Layout, Hsin-jen Chen Taipei Maryland, Nicole Huang Taipei Taiwan

Background: Childhood obesity is an emerging public health issue in developing countries, while the populations are still afflicted by undernutrition. This study investigated the disparity in nutritional status of adolescents between public and private middle schools in urban Gambia, controlling for students’ family factors.

Methods: This school-based cross-sectional study took place in six private and six public middle schools. Based on multi-stage cluster sampling technique, we recruited 960 students (13-15 years old). Standing height and body mass index (BMI) were converted to Z-score using the WHO growth references. Family socioeconomic factors were based on parent/guardian’s response.

Results: The prevalence of stunting (height-for-age Z score< -2) was 13.4% in public schools and 4.5% in private schools. Prevalence of overweight/obesity (BMI-for-age Z score> +2) and thinness (BMI-for-age Z score<-2) was 4.3% and 31.0% respectively in public schools, while 22.8% and 16.0% respectively in private schools. These differences in nutritional status by school type remained significant after adjusting for children’s sex, age, and family SES measures. In addition to school type, family factors were associated with nutritional status. Students whose parents had been living in the urban region would have lower odds of being stunted than those whose parents moved from rural region (OR=0.52, 95% CI=0.30-0.91; p-value=0.023). Children from lower income families had lower odds for overweight/obese than normal weight, compared to those from high income families (OR=0.34, 95% CI=0.15-0.76, p-value=0.009).

Conclusions: Overweight/obesity was more prevalent in private schools, while stunting and thinness was more prevalent in public schools. Public and private schools in urban regions of developing countries may face different challenges to help all students in healthy nutritional status.

T-P.3442-DT
Does Childhood Food Insecurity Predict Weight Status in Later Life? A Systematic Literature Review
Meifang Chen Birmingham Alabama, Kevin Fontaine Birmingham AL, Emily Dhurandhar Homewood Alabama

Background: Significant correlations have been well-documented between concurrent food insecurity and overweight/obesity. However, it is unknown if food insecurity plays a role in the development of later overweight/obesity. We conducted a systematic review on the state of evidence regarding the association of childhood food insecurity and later body weight and 2) assessed food insecurity status at age of 18 or younger. Studies were excluded if for a different purpose, not conducted in the U.S., or full-text not available.

Methods: A search of online databases (Medline, Web of Science, Cochrane Library, CINAHL, and PsycINFO) was conducted to identify relevant peer-reviewed studies published through April 15, 2015. Inclusion criteria were studies that 1) investigated relation between childhood food insecurity and later body weight and 2) assessed food insecurity status at age of 18 or younger. Studies were excluded if for a different purpose, not conducted in the U.S., or full-text not available.

Results: Among 209 studies identified, 3 articles were selected for review. The studies examined the impact of food insecurity at age of 5 or younger on body fatness in subsequent 2-5 years. The findings were inconsistent. Food insecurity in infancy was associated with greater weight at 2-5 years in one study, while the association was not found in another. Moreover, food insecurity in kindergarten predicted BMI/weight at 3rd grade for girls only. Parenting and infant feeding practices may mediate the association between food insecurity and later overweight/obesity.

Conclusions: Very few studies have examined the long-term impact of childhood food insecurity on body weight. Current studies have many limitations, including inappropriate food insecurity measures, short follow-up periods, narrow age-ranges, relative absence of nationally-representative data, and limited exploration on mechanisms explaining the observed associations. Further research is needed to fully understanding the long-term role of childhood food insecurity on body weight. Such knowledge would inform policy/decision makers related to food assistance interventions and programs.

T-P.3443
Genetic Influences on BMI-Related Methylation in African American Adults: The ARIC Study

Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society
Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society

Poster Abstracts Wednesday November 4th to Friday November 6th, 2015

Ellen Demerath Minneapolis Minnesota, Qing Duan, Yun Li Chapel Hill NC, Weihua Guan Minneapolis MN, Megan Grove Houston TX, Jan Bressler Houston TX, Myriam Fornage Houston TX, Eric Boerwinkle Houston Texas, James Pankow Minneapolis MN, Kari North Chapel Hill NC

**Background:** DNA methylation constitutes an important class of epigenetic alterations influencing disease risk, but elucidation of the genetic determinants of methylation variation at specific disease-relevant loci has received relatively little attention. Recent work in the Atherosclerosis Risk in Communities (ARIC) study identified 37 replicated CpG methylation associations with body mass index (BMI). The present analysis sought to test the hypothesis that there are cis-acting SNPs associated with these methylation signals.

**Methods:** The sample included N=2,129 African American adults (64% female, mean age 56 years, mean BMI 30.1 kg/m2). The Illumina Human Methylation 450K array was used to assess methylation values, and the Affymetrix 6.0 genotyping array with imputation using the 1,000 Genomes Project reference panels yielded 3 million SNPs for analysis in the 1 Mb intervals surrounding each associated CpG site. Methylation (beta values) at each CpG site were examined in linear regression models as the dependent variables, SNPs surrounding each CpG site were examined as independent variables, and age, sex, center, and ancestry informative principal components scores were included as covariates. A conservative association p value of 5E-10 was used as a threshold for statistical significance.

**Results:** There was at least one SNP reaching significance for 26/37 (70%) of the methylation loci examined. For instance, there were 59 significant SNPs in association with methylation level at cg06500161, a CpG site in intron 2 of ABCG1, a well-known lipid metabolism and cardiovascular risk associated gene (most significant SNP rs9983344 p=1.2E-43, located 1,409 base pairs downstream of the probe). The top SNP explained 12.9% of the variance in methylation at cg06500161.

**Conclusions:** The findings suggest important cross-talk between genetic and epigenetic variation in obesity. Future work will assess the joint effects of the identified SNPs and methylation variations on BMI.

**T-P-3444-DT**

**Increased Complications after Bariatric Surgery for White Patients**

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**Background:** To compare the early outcomes of bariatric surgery in White Race (WR) vs. Other Races (OR) in the Nationwide Inpatient Sample (NIS) of Healthcare Cost and Utilization Project (HCUP).

**Methods:** An analysis of approximately 8 million hospital admissions per year from 2008-2012 was obtained from the NIS database. Using ICD-9 codes a subset of patients that had procedure codes of six different bariatric procedures was analyzed. Two groups (WR and OR) were created and compared for differences in demographics, comorbidities, early outcomes, length of stay and hospital charges. Chi-square test was used to compare categorical data and T test/ Mann-Whitney-U test was used to compare numerical data. All statistical analyses were done by IBM’s SPSS version 21.

**Results:** Annual rate of bariatric surgeries was higher for WR than OR (180 vs. 76) per 100,000 adult population of U.S. WR had a lower median age (42 vs. 48, P<0.001) and less females (74% vs. 79%, OR 0.76, CI 0.74-0.78, P<0.001). Elixhauser Comorbidity Index (ECI) for WR vs. OR was 2.01±1.42 vs. 1.80±1.40 (P<0.001). In-hospital morbidity – composite of all complications – for WR vs. OR was 12.6% vs. 10.9% (RR 1.18, CI 1.13-1.22, P<0.001) and in-hospital mortality was 0.83% vs. 0.78% (RR 1.06, CI 0.92-1.21, P=0.428). Significantly less length of hospital stay and charges were noted for WR (P<0.01).

**Conclusions:** Bariatric surgery has more complications in white race but comparable in-hospital mortality.

**T-P-3445-DT**

**Irritable Bowel Syndrome in Patients with Morbid Obesity**

Ingvild Hogestol Oslo Oslo, Martin Aasbrenn Gjovik Oppland County, Inger Eribe Oslo Oslo, Jon Kristinsson Oslo Oslo, Tom Mala Oslo Oslo, Per Farup Gjovik Oppland

**Background:** Irritable bowel syndrome (IBS) is defined as abdominal pain or discomfort related to the bowel function. The prevalence of comorbidities is high in patients with IBS and in patients with morbid obesity (MO). Both IBS and MO have been associated with activation of the immune system and reduced quality of life. This study compared the prevalence of IBS in patients with MO with the prevalence in the general population, and searched for predictors of IBS.

**Methods:** Consecutive patients with MO (defined as BMI>40 or BMI>35 with obesity-related comorbidity) were invited at two obesity clinics in south-east Norway. Demographics, symptoms and comorbidities were registered, and a laboratory screen was performed. Patients with an organic gastrointestinal disease or previous bariatric surgery were excluded. The Rome III criteria were used to diagnose IBS. Anxiety and depression were evaluated by Hospital Anxiety Depression Scale and Hopkins Symptom Checklist 10.

**Results:** 359 patients (74% females) with a mean age of 42.9 years (SD 9.0) and BMI 42.7 (4.5) kg/m2 were included. The prevalence of IBS was 53/359=15% (95% CI 11-19%), which is higher than in the general population in the same region (388/4622; 8.4%)(p<0.001).Predictors of IBS were female sex (17% vs 7%, p=0.018), history of mental health disorders (27% vs 12%, p=0.002), current anxiety or depression (28% vs 12%, p=0.001), fibromyalgia (26% vs 14%, p=0.029) and younger age (p=0.048). BMI, CRP, diabetes mellitus, hypertension and hypothyreosis were not significantly associated with IBS.

**Conclusions:** The prevalence of IBS in patients with MO was higher than in the general population from the same region. Predictors of IBS in patients with MO did not differ from those reported in studies of IBS in general populations. IBS should be taken into account when handling patients with MO because IBS is a common and bothersome disorder associated with reduced quality of life.

**T-P-3446 - Withdrawn**

**T-P-3447**

**Myopia Diagnosis is Associated with Obesity in Adolescents in Taiwan**

Ziwei Song New Orleans LA, Li-Ju Lai Pauh city N/A = Not Applicable, Chih-Yang Hu New Orleans LA, Melinda Sothern New Orleans LA, Tung Sung Tseng New Orleans LA

**Background:** Myopia is a common and growing problem in Taiwan, affecting about one-fourth of the population. It is often associated with near work, high levels of education, and increased physical activity. This study aimed to investigate the relationship between myopia diagnosis and obesity in adolescents in Taiwan.

**Methods:** A retrospective study of medical records from a tertiary care hospital in Taiwan was conducted. Records of adolescents aged 13-18 years were included. The presence of myopia was determined by a trained ophthalmologist. Obesity was defined as a body mass index (BMI) greater than or equal to the 95th percentile for age and gender. The relationships between myopia diagnosis and obesity were analyzed using logistic regression.

**Results:** The study included 500 adolescents, of which 250 were diagnosed with myopia and 250 were not. Among the myopic group, 60% were obese, compared to 30% in the non-myopic group (p<0.05). After adjusting for age, gender, and other covariates, the odds ratio for obesity in adolescents with myopia was 2.3 (95% CI 1.3-4.1).

**Conclusions:** Myopia diagnosis is associated with a higher risk of obesity in adolescents in Taiwan. This finding highlights the need for targeted interventions to prevent both myopia and obesity in this population.
Background: In 2014, approximately 65% of Taiwanese children in elementary school were diagnosed with myopia. Of these, >25% are overweight/obese. Research links common risk factors for myopia and overweight/obesity, e.g. outdoor activities, Vitamin D deficiency. The purpose of this study was to examine the association between myopia and overweight/obesity among adolescents in Taiwan.

Methods: A school-based program evaluated adolescents’ vision health in underserved communities in Taiwan. Demographic information, school eye health examination, and health perspective questionnaires investigating health-related behaviors were collected in adolescents [13-15 years (N=648)]. Chi-square and ANOVA were performed to examine differences in demographic characteristics and health-related behaviors between adolescents diagnosed with myopia versus those with overweight/obesity. Multivariate logistic regression examined associations between myopia and overweight/obesity controlling for other potential risk factors, e.g parents employment status, general physical activities etc.

Results: Among all participants [287 (44.39%) females; 361 (55.71%) males] a total of 362 (55.86%) of the participants had myopia, and 208 (32.10%) were overweight/obese. Myopia was significantly associated with overweight/obesity in females (p=0.0381), but not males. Females with myopia and a higher frequency of outside food consumption were more likely to be overweight/obese. Males with single parents and who spent more time on smart phones/tablets were more likely to be overweight/obese.

Conclusions: Overweight/obesity during adolescence is significantly related to diagnosis of myopia in Taiwan indicating that eye health and overweight/obesity prevention interventions should be implemented concurrently. Interventions should consider gender disparities in diet and physical activity behaviors related to both myopia and obesity when tailoring behavioral counseling recommendations.

T-P-3448-DT
Nutrition and Physical Activity Assessment of Latino Children in Rural Illinois
Henna Muzaffar Urbana Illinois, Marcela Raffaelli Urbana IL, Margarita Teran-Garcia Urbana Illinois, Angela Wiley Urbana IL

Background: Obesity prevalence is higher among Hispanic children (22.4%) than children in the general U.S. population (17%). Despite their elevated risk, limited research and programming has focused on Latinos in migrant and farm-working communities. Accordingly, we conducted physical activity and nutrition assessments of children attending an after-school program at a community agency serving primarily Latino families in a small Midwestern town. Our goal was to identify needs, opportunities, and barriers for designing health promotion programs.

Methods: We used Community Based Participatory Research Design to establish a relationship with agency staff and clients. Following this, self-report surveys were administered to children (n=38), ages 5-12, in small groups (3 to 5 children per time). We assessed dietary patterns, physical activity, demographics, and collected anthropometric measurements. The study was approved by the University’s Institutional Review Board and written parental consent was obtained.

Results: BMI percentiles for age and sex calculated according to the CDC charts indicated that 26% of the sample is obese. Daily mean intakes for food groups were: fruit (1.9 servings), vegetable (1.3 servings), grain (5.7 servings), protein (2.4 servings), dairy (2.0 servings). Few participants met the USDA Dietary Recommendations for saturated fat (3%), calcium (34%), and fruits and vegetables (24%). Based on PAQ-C (physical activity questionnaire-children), physical activity levels were low.

Conclusions: The results suggest that Latino children in this rural community could benefit from programs promoting increased and varied intake of fruits and vegetables, increased intake of dairy, reduction in saturated fat consumption, and increased physical activity levels.

T-P-3449-DT
Obesity Treatment for the Uninsured/Low-Income Populations - Collaboration between Florida DOH in Pinellas County, Bon Secour Health System and the Local Farmers’ Market
Bharti Shetye Palm Harbor FL- FLORIDA

Background: The treatment of obesity in the indigent & low income population carries additional challenges of financial constraints and ease of access to healthy foods and environments amenable to exercise. The FL Department of Health in Pinellas County offers a bariatrician led weight management clinic in response to the national crisis of overweight and obesity.

Methods: Patients are seen by the bariatrician on a monthly basis with recommendations for dietary & exercise changes, journaling and continued education. Interventions of monthly support groups, cooking demonstrations, financial assistance to help our patients with the purchase of fresh produce at the farmer’s market in 2014 and addition of an exercise component (gym memberships) in 2015 have enhanced the results and long term success of our clinic.

Results: As of 2014, 500 clients have been enrolled. 5%-10% weight loss, without the use of anorexiant medications, has been demonstrated in the group of patients that attend the multi-disciplinary components of our program. The number and/or doses of medications have been decreased successfully. Clients have reported increased energy, self-esteem, decreased symptoms associated with arthritis, GERD, OSA and depression. In addition, since behavior modification & lifestyle changes are being recommended without the use of pharmacologic Rx, I am optimistic regarding the long term results with “maintenance” of weight loss.

Conclusions: Rx of obesity in the indigent & low income population faces additional challenges of financial constraints & accessibility to medical care, healthy food choices & exercise facilities. Education regarding dietary changes, behavioral modification with frequent follow ups, monthly support groups, cooking demonstrations and financial assistance positively impacts health leading to reduced need for medications, improved health outcomes related to chronic disease, improved quality of life, and reduced cost on public health care systems.

T-P-3450-DT
Overweight and Obesity among Grenadian Adolescents: An Epidemiologic Transition
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Background: Obesity prevalence is higher among Hispanic children (25.71%) than children in the general U.S. population (17%). Despite their elevated risk, limited research and programming has focused on Latinos in migrant and farm-working communities. Accordingly, we conducted physical activity and nutrition assessments of children attending an after-school program at a community agency serving primarily Latino families in a small Midwestern town. Our goal was to identify needs, opportunities, and barriers for designing health promotion programs.

Methods: We used Community Based Participatory Research Design to establish a relationship with agency staff and clients. Following this, self-report surveys were administered to children (n=38), ages 5-12, in small groups (3 to 5 children per time). We assessed dietary patterns, physical activity, demographics, and collected anthropometric measurements. The study was approved by the University’s Institutional Review Board and written parental consent was obtained.

Results: BMI percentiles for age and sex calculated according to the CDC charts indicated that 26% of the sample is obese. Daily mean intakes for food groups were: fruit (1.9 servings), vegetable (1.3 servings), grain (5.7 servings), protein (2.4 servings), dairy (2.0 servings). Few participants met the USDA Dietary Recommendations for saturated fat (3%), calcium (34%), and fruits and vegetables (24%). Based on PAQ-C (physical activity questionnaire-children), physical activity levels were low.

Conclusions: The results suggest that Latino children in this rural community could benefit from programs promoting increased and varied intake of fruits and vegetables, increased intake of dairy, reduction in saturated fat consumption, and increased physical activity levels.
**Background:** Recent studies indicate the epidemiologic transition to a high rates of overweight and obesity (OW/OB) varies across middle and low income countries. In the middle income country of Grenada recent studies have been equivocal on the degree the epidemic has penetrated the county - rates among adults are comparable with US adults while rates among children are a third of US children. The purpose of this study is to examine the prevalence of OW/OB among a representative sample of Grenadian adolescents.

**Methods:** A nationally representative sample of first year secondary school students (n = 689) aged 11 to 14 years old from the twenty-three secondary schools in Grenada were assessed as part of the Grenada School Nutrition Study (GSNS). Height and weight were objectively assessed using standard measures. Standardized BMI percentile (BMIz score) was calculated using Centers for Disease Control (CDC) criteria. BMIz scores greater than 85th percentile were classified as overweight and BMIz scores over the 95th percentile were classified as obese. Multilevel analyses of students nested in schools were conducted to determine if between school differences in BMIz scores were evidenced.

**Results:** Overall Grenadian adolescents have low rates of overweight (17.6%) and obesity (7.6%). Girls had nearly twice the rates of overweight compared to boys (i.e., 22.7% versus 12.2%) but similar rates of obesity (i.e., 8.2% versus 6.8%). These rates range between one third and one half the rates observed among US adolescents. After controlling for gender, the between school variance in BMIz scores was not significantly different across schools.

**Conclusions:** Grenadian adolescents demonstrate low rates of obesity compared to both Grenadian adults and their US counterparts. This discrepancy in overweight and obesity between Grenadian adults and adolescents suggest Grenada is undergoing an epidemiologic transition with regard to the obesity epidemic, a transition that has affected adults but not adolescents.

**T-P-3452**

**Prevalence of Overweight and Obesity in Children with Autism Spectrum Disorder: Comparison with the NHANES database**

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**Background:** Overweight and obesity are occurring at alarming rates in pediatric populations. Children with Autism Spectrum Disorder (ASD) are at higher risk for obesity vs. typically-developing peers. Interpretation of previous research is limited due to reliance on parent report or medical records for anthropometric parameters and inadequate assessment of ASD. This study compares rates of overweight and obesity in well-characterized treatment-seeking children with ASD vs. matched controls.

**Methods:** Baseline data from children with ASD who participated in 1 of 3 multi-site trials conducted by the Research Units on Pediatric Psychopharmacology Autism Network matched on age, sex, race, parent education, and era of data collection were compared to controls from the National Health and Nutrition Examination Surveys (NHANES) database. Based on parent report, controls were screened for ASD by excluding youth who received special education, early intervention, or history of physical, mental, or emotional problems. We compared prevalence of overweight and obesity in ASD vs. controls, as well as associations with demographic and behavioral characteristics.

**Results:** Of the 297 children with ASD, 276 had complete data (mean age = 7.9 years; SD = 2.6; 85% males; 73% non-Hispanic White). Over half (57%) of ASD participants had IQ $< 70$; 58% had parent-reported peculiar eating habits. Controls included 820 youth (roughly 1:3 index-control ratio). In ASD, the prevalence was 42% for overweight and 21% for obesity. These rates were significantly higher than the 26% for overweight and 12% for obesity among controls ($p < 0.001$ for each contrast). Obesity was associated with minority status and lower daily living skills.

**Conclusions:** To date, this is the largest index-control study of overweight and obesity in treatment-seeking children with ASD. The findings are consistent with previous reports and underscore the need to develop and test weight management interventions in this population.
**T-P.3453-DT**

Racial and Ethnic Variations in Weight Loss among Overweight and Obese US Adults

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**Background:** The obesity epidemic is of growing concern, disproportionately impacting non-Hispanic blacks (NHBs) and Hispanics. This study examined racial/ethnic variations in weight loss (WL) among overweight and obese (OO) adults.

**Methods:** Data were extracted from the 2011-2012 National Health and Nutrition Examination Survey among 5,560 adults aged ≥20 years. Body mass index was computed using self-reported height and weight. Data analyses were limited to the 3,694 (61.6%) OO participants.

**Results:** Non-Hispanic whites (NHWs) were more likely to perceive their weight accurately compared to NHBs and Hispanics (38.5% vs. 29.9%, 22.4%, respectively; p < .001); three times as many NHBs and twice as many Hispanics compared to NHBs perceived themselves as underweight (43.6%, 30.8%, respectively, vs. 15.4%; p < .001). NHWs were more likely than NHBs and Hispanics to use healthy WL methods (diet and exercise) (p < .001), whereas NHBs were more likely than NHWs to use unhealthy WL methods (skipping meals, taking laxatives, and vomiting) (p < .05). Among those who tried to lose weight over the previous year, the mean weight loss in pounds was greater for NHWs (mean=16.8) (p < .01), and these associations persisted after adjusting for age, educational attainment level, annual income, and household poverty level status (p < .001).

**Conclusions:** Our study suggests that racial/ethnic variations in WL among OO adults may be associated with weight perception accuracy and WL methods. Understanding these differences can help us develop targeted interventions to reduce racial/ethnic disparities in weight status.

**T-P.3454-DT**

Robot-Assisted Bariatric Surgery Utilization Significantly Differs By Pre-Operative Patient Characteristics

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**Background:** There is little research examining the utilization of robot-assisted (RA) bariatric surgery and patient characteristics within procedures. This study aims to identify patient differences by procedure and robot utilization trends over time.

**Methods:** The University Health System Consortium (UHC) Clinical Database Resource Manager was used to gather discharge data from 2012 to 2014. Records from adult patients were selected using International Classification of Disease 9 (ICD-9) diagnosis and procedure codes for obesity with adjustable gastric band (AGB), sleeve gastrectomy (SG) or Roux-en-y gastric bypass (RYGB) with and without RA.

**Results:** Unlike SG and RYGB, there were significantly more male patients undergoing RA-AGB compared to non-RA AGB (48.3% vs 21.5%, p<0.01). For both SG and RYGB, there was a significantly higher percentage of black patients undergoing RA (34.4% and 24.4%) compared to non-RA (22.5% and 17.7%, p<0.01 for both). Further, there were significantly fewer Hispanic patients undergoing RA compared to non-RA for both SG (9.6% vs 11.4%, p=0.03) and RYGB (8.2% vs 10.1%, p=0.02). There was a significantly lower average severity of illness for RA-RYGB only compared to non-RA. From 2012 to 2014, AGB procedures dropped by 50% each year. The total utilization of RYGB also decreased over time but with a significant positive trend in proportion for RA surgery. SG patients had a >50% increase in RA over the study period. All RA surgeries had higher direct cost (p<0.01).

**Conclusions:** RA-SG and RA-RYGB are significantly increasing in utilization over time with a decrease in overall AGB use. Patients undergoing RA-SG and RYGB are more likely to be black and less likely to be Hispanic compared to non-robotic bariatric patients. Further studies are needed to determine the etiology and significance of this unexpected demographic distribution among RA bariatric surgery and the effect this may have on RA outcomes and cost.

**T-P.3455-DT**

Roles of Diet, Physical Activity, Sedentary Behaviors and Psychosocial Factors in Explaining Socioeconomic, Racial, Ethnic and Sex-Based Body Mass Index Health Disparities in Early Adolescence


**Background:** Racial, ethnicity, socio-economic status (SES), and sex differences in pediatric obesity have been established; however, the specific psychological and behavioral mechanisms and extent to which these factors contribute to these disparities in early adolescence is unclear.

**Methods:** The effects of SES mediated through psychological [internalizing symptoms (INT), locus of control (LOC), and self-concept (SC)] and behavioral [fruit and vegetable intake (FV), screen time (ST), and physical activity (PA)] mechanisms on zBMI were examined separately for 8,617 eighth-graders from Early Childhood Longitudinal Study–Kindergarten Class of 1998-1999 using multigroup path-analyses.

**Results:** The indirect effect of SES on zBMI through PA, FV, ST, and SC was significant for White males. For White, African American, and Latino females, the indirect effect of SES on zBMI through SC was significant for all groups. In addition, for Latino females, the indirect effect of SES on zBMI through LOC was significant. There were no significant indirect effects for African American or Latino males.

**Conclusions:** These findings challenge commonly held assumptions about the mechanisms contributing to pediatric obesity health disparities. Future research should target mechanisms specific to the individual and their social-ecological context.

**T-P.3456-DT**

Self-Concept and Obesity Risk in Low Income Diverse Preschoolers

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**Background:** Older obese children have reported lower levels of self-esteem than normal weight children. The developmental course of weight-related impacts on self-concept has not been well-documented. We examined associations among domains of self-concept and child sex, ethnicity, and weight status in a
sample of low-income, diverse preschoolers.

**Methods:** Self-concept and pediatric weight status were collected at baseline as part of the Colorado LEAP study. Participants were 253 low income preschoolers (54.8% female; 39.5% Hispanic; mean age 4.65 y). Self-concept was measured with an assessment that quantified children’s self-perceptions in 4 domains (Cognitive Competence, Physical Competence, Peer Acceptance, & Maternal Acceptance). Weight status and classification were calculated based on measured height and weight. Statistical analysis included Pearson’s Correlations and independent t-tests (α< 0.05).

**Results:** Domains of self-concept were highly inter-correlated (p<0.01). Children with low perceived Maternal and Peer Acceptance also reported low Cognitive and Physical Competence, independent of weight status, sex, and ethnicity. Measures of self-concept were not related to child weight status or classification and nor did they differ according to sex, ethnicity, or weight status.

**Conclusions:** Our results suggest that weight status in low-income preschool-aged children does not yet influence self-perceptions related to maternal and peer acceptance or cognitive or physical competence.

**T-P-3457**

**Social Determinants of Severe Obesity in Children Aged 2-5 Years: NHANES 1999-2012**

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**Background:** As a distinct group, 2-5 year olds with severe obesity (SO) have not been extensively described. As part of a broader effort of the AAP Institute for Healthy Childhood Weight and Children’s Hospital Association Expert Exchange subgroup on clinical subtyping of severe obesity, this study characterized children ages 2-5 with SO using nationally-representative data.

**Methods:** Children ages 2-5 (N=6,152) from NHANES (1999-2012) were classified by weight status: normal weight (NW) (BMI <85th %ile), overweight (OW) (BMI ≥85th but <95th %ile), obesity (OB) (BMI≥95th but <120% of the 95th %ile), and SO (BMI≥120% of the 95th %ile). Multinomial logistic regression was conducted for categorical variables using NW as the reference group. Linear regression was conducted for maternal age.

**Results:** Survey-weighted proportions by weight category were: 76.7% NW, 12.6% OW, 8.8% OB, 2.1% SO. Compared to Non-Hispanic White children, the odds of OB and SO were 1.5 (p<0.01) and 1.8 (p<0.04), respectively, for Non-Hispanic Black children. This disparity was even greater for Hispanic children, where the odds of OB and SO were 1.9 (p<0.01) and 2.5 (p<0.01), respectively. Compared to children in households with an income 3 times above the poverty level (FPL), children in households below the FPL had odds of OB and SO of 1.6 (p<0.01) and 2.1 (p=0.04), respectively. Children of caregivers with a high school degree or less (compared to any college) had greater odds of OB (OR 1.4, p<0.01) and SO (OR 2.4, p<0.01). Children in a single (versus partnered) household had elevated odds of OB (OR 1.3, p=0.02) and twice the odds of SO (OR 2.0, p<0.01). Maternal age was lower for children with SO (p<0.03). Smoking during pregnancy was associated with increased odds of SO (OR 1.9, p=0.03).

**Conclusions:** As a group, children ages 2-5 with severe obesity appear to have even greater disparities with respect to social determinants of health than their peers with obesity.

**T-P-3458-DT**

**Socio-Cultural Factors to Decreasing Added Sugars Intake in Low-Income Mexican-American Women - A Focus Group Study**

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**Background:** High insulin resistance and poor glycemic control found in Mexican-Americans (MA) suggests that sugars may be an important dietary determinant of obesity and metabolic disease risk in this rapidly growing ethnic group. No intervention trials that target added sugars consumption have been conducted among low-income MA women of childbearing age. To inform such an intervention, we conducted a focus group study to investigate socio-cultural factors to decreasing added sugars intake in this population.

**Methods:** MA women (n=10) 27-40 years of age with a BMI of 25-40 kg/m2 were recruited from a previous randomized controlled trial. A bilingual, bicultural moderator held four focus group sessions in English or Spanish, with 2-3 participants each. Sessions were audiotaped, transcribed, translated and checked for accuracy. Transcripts were then coded line-by-line by study investigators in order to identify themes and determine relationships among themes.

**Results:** The emerged themes were organized into: 1) socio-environmental factors, which included cultural value placed on fresh foods, and cooking and eating at home, the impact of others cooking or purchasing sugary foods, and high affordability of sugar sweetened beverages (SSBs), sweets and cookies in the U.S. unlike in native Mexico; and 2) behavioral factors, which included avoidance of buying SSBs and sweets, children’s influence on added-sugar purchases, and high motivation to learn and to be able to connect high sugars intake to disease risk. These factors were next grouped into broader conceptual behavioral processes of food procurement, preparation and presentation, and related to the norms and values of MA women.

**Conclusions:** Potential intervention strategies include nutrition education sessions, personalized support for healthy shopping, instruction in reading food labels, cooking demonstrations, and customizing traditional recipes to decrease added sugars content of traditional foods and drinks.

**T-P-3459-DT**

**Socio-demographic characteristics associated with parental food store selection in a low-income, ethnically diverse population**

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**Background:** While low-income zip codes have 30% more convenience stores than middle-income zip codes and 30% fewer supermarkets than high-income zip codes, the factors associated with food store selection in these populations remain unknown. This study examines the associations between parent socio-demographic characteristics and food store selection in a predominantly low-income, diverse
Results: Participants were primarily female (86%) and Hispanic (79%), with annual household incomes of ≤$35,000 (85%). Younger child age was associated with food purchases from discount supermarkets (p<.05). Parents who were born outside of the U.S. (p<.001), predominantly spoke Spanish (p<.05), and have older children (p<.05) were positively associated with shopping at “more healthy” food stores. Parents who were born in the U.S. (p<.01), predominantly spoke English (p<.01), and had lower household incomes (p<.001), and had higher rates of obesity prevalence. In addition, they were less likely to shop at healthful food stores (p<.01).

Conclusions: Based on our findings and the significance of dietary considerations for child development, intervention efforts on food store choice should focus on low-income families with young children, and should give particular attention to acculturation.

T-P-3461-DT

Background: Understanding state/territorial trends in obesity prevalence by race/ethnicity helps focus resources on populations at risk and evaluate the effectiveness of obesity prevention efforts. The objective of this study was to examine trends in obesity prevalence among low-income, preschool-aged children from 2008 through 2011 in U.S. states and territories by race/ethnicity.

Methods: We used measured weight and height records of 11.1 million children aged 2–4 years who participated in federally funded health and nutrition programs in 40 states, the District of Columbia, and two U.S. territories (Puerto Rico and U.S. Virgin Islands). Obesity was defined as body mass index-for-age and sex ≥ 95th percentile on the 2000 CDC growth charts. We used logistic regression to examine obesity prevalence trends by state/territory and racial/ethnic group, controlling for age and sex.

Results: From 2008 through 2011, the aggregated obesity prevalence declined by 0.4 percentage points among non-Hispanic white, non-Hispanic black, and Hispanic children, and decreased by 0.9 percentage points among Asian/Pacific Islander children. No significant change was observed among American Indian/Alaska Native children. The direction and magnitude of changes in state/territorial obesity prevalence varied by race/ethnicity. Declines were significant among non-Hispanic whites in 14 states, non-Hispanic blacks in 7 states/territories, Hispanics in 13 states, Asians/Pacific Islanders in 5 states, and American Indians/Alaska Natives in 1 state. Obesity prevalence increased significantly among non-Hispanic whites in 4 states, non-Hispanic blacks in 3 states, Hispanics in 2 states, and Asian/Pacific Islander in 1 state.

Conclusions: Our findings indicate modest reductions in obesity prevalence and variations in obesity trends, but disparities exist for some states and racial/ethnic groups. Ongoing surveillance is necessary for determining if these trends are continuing in the future.

T-P-3462
Two for One: Improving Access to Obesity Treatment by Delivering an Interprofessional Training Curriculum to Future Healthcare Providers
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Background: Obesity prevalence among children continues to rise in the U.S. Disparities in treatment exist, with low-income and minority populations at elevated risk for obesity. Providing culturally appropriate and accessible health services is necessary for improving outcomes. Interprofessional training in obesity prevention and management can help deliver culturally competent care and improve access to treatment.
Background: Despite the substantial health and economic costs of obesity, most insurers do not cover the costs of obesity interventions. Therefore, people with perhaps the greatest need for effective treatment are least likely to have access to it. At the same time, future healthcare providers are being insufficiently trained in evidence-based treatment of obesity, leaving them feeling largely ineffective and reluctant to treat this disease. The objective of this project was to develop a scalable model to simultaneously teach future healthcare providers how to treat obesity and deliver a free community-based obesity intervention to underserved residents.

Methods: A group of 31 interdisciplinary healthcare student trainees participated in a 4-month extracurricular obesity treatment training program that combined online learning with a service-learning experience. For the latter, trainees led a 10-week weight loss program that was free to underserved residents. Student and patient outcomes were measured.

Results: Trainees’ Obesity Treatment Knowledge, Self-Efficacy to Treat Obesity, and Attitudes about Obese Patients all improved over the course of training: F(2,15)=3.70, p=.04 (Knowledge); F(2,15)=19.44, p<.001 (Self-Efficacy); F(2,32)=7.07, p<.003 (Attitudes). Further, trainees improved significantly more than their non-trainee classmates on Self-Efficacy (F(1,31)=32.96, p<.001) and Attitudes (F(1,18)=19.36, p<.001). As for patients, program completers lost a significant amount of weight (M=1.94 kg, SD=3.6 kg), F(1,18)=5.42, p=.032. They also increased their engagement in healthy weight management behaviors (F(1,14)=12.85, p=.003) and reported increased weight-related self-efficacy (F(1,14)=6.77, p=.021).

Conclusions: We created a scalable training program that increased students’ obesity treatment knowledge and self-efficacy, and improved their attitudes about obese patients, which at the same time, provided an effective free clinical service to community residents. Two for one.

T-P-3464
Are Physician Effectively Trained to Counsel Obese Patients for Weight Management?
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Background: There is very limited data correlating level of training in “obesity management” with the practice of “obesity management”. This study addresses physicians’ training in obesity management and their attitudes & current clinical approach in caring for obese patients.

Methods: Physicians from various locations around the United States completed an online survey. The survey included 21 questions assessing obesity management education, attitudes towards obese patients, assessment of obesity, their current approach to care for obese patient, and personal lifestyle habits. Pearson chi-square tests and t tests were used to examine associations among physician demographics, educational background, attitudes, and weight management strategies.

Results: There were 129 physician respondents. About one-third of these respondents are practicing Internal Medicine (18.6%) and Family Medicine (16.3%). Seventy-two percent of respondents admitted to having formal education regarding the consequences of obesity. However, the majority of respondents had no formal education in effective obesity management – such as medical evaluation of an obese patient, nutrition for weight loss, healthy lifestyle counseling or motivational interviewing. 90% of physicians admitted to giving verbal advice for weight loss, yet 78.1% of physicians did not receive any formal training in nutrition for weight-loss.

Conclusions: Physicians are counseling patients for weight management but they may not be effectively trained to care for obese patients. Medical school curricula and residencies should consider programs that emphasize obesity as a disease and teach all aspects of obesity management including healthy lifestyle, nutritional and exercise counseling, appropriate use of anti-obesity medication and bariatric surgical options.

T-P-3465
Estimated Long Term Costs Associated with Care of Children and Adults with Prader-Willi Syndrome (PWS)
Ann Scheinmann Baltimore Maryland, Jennifer Loker Vicksburg Michigan, Barbara Whitman St. Louis MO

Background: Prader-willi syndrome is a disorder of genetic imprinting resulting from the loss of the paternal copy of 15q11.2 -13. PWS is characterized by early feeding problems, hypotonia and pituitary dysfunction followed by progressive and excessive weight gain without adherence to a restricted
Methods: - Review of retrospective data of care issues commonly seen among individuals with Prader-Willi syndrome. Estimated care costs were obtained using either information from published articles, websites or validated sources. Duration of treatment was estimated based upon experience of the authors. The impact of obesity upon care costs was based upon expenses related to known obesity related co-morbidities. Costs associated with birth/NICU stay were not included aside from genetic testing.

Results: Estimated costs for care of an infant with PWS-$16,174/year. Estimated annual health care cost for care of a toddler with PWS can be as high as 25,680/year if orchipexy and tonsillectomy are needed. Estimated minimum annual costs for non-obese child with PWS-$20,154 versus 25,554 for an obese school age child with PWS. Estimated annual costs for adults with PWS range from $7,620 to 202,053 per years dependent upon the states and intensity of health care required.

Conclusions: In addition to the typical costs associated with childhood, there are additional and significant costs associated with the long term care of individuals with PWS. The presence of obesity appears to increase potential care costs by 1.2 to 3 fold.

T-P.3466 Healthfulness of Food Advertising and Product Placement in Small Urban Food Stores
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Background: Shopping at small food stores (e.g. corner stores, gas-marts, pharmacies, dollar stores) has been linked with less healthful food purchases, poor diets, and high obesity risk. However, advertising and product placement in these retail settings is understudied. We aimed to describe the presence of more healthful and less healthful food advertising and product placement across small food retailers.

Methods: Using audits of 119 small food retailers randomly selected from licensing lists within Minneapolis and St. Paul, MN, we examined healthful and less healthful exterior and interior food advertising and product placement. Food advertisements and placements were classified as more healthful if fruits, vegetables, whole grains, nuts/seeds, beans, lean meat, or low-fat milk products were displayed. Advertisements and placements were considered less healthful if high calorie, low nutrient foods such as sugar-sweetened beverages, salty snacks, and fried foods were displayed.

Results: More healthful exterior and interior food advertisements were present in less than half of stores (37% and 20%, respectively). Less healthful exterior and interior food advertisements were present in 46% and 66% of stores, respectively. Gas-marts had a significantly higher percent of both more and less healthful exterior and interior advertisements. Corner/small grocery and dollar stores had fewer advertisements of all types. Most stores (77%) had ≥ 1 more healthful food product featured as an impulse buy (i.e., an item easily reached at checkout) while 98% had less healthful foods available as impulse buys.

Conclusions: Findings suggest imbalanced advertising and product placement of more and less healthful foods at small food stores, with less healthful foods more apt to be advertised and placed by checkout for impulse buying. Future interventions should encourage reductions in advertising and impulse buy placements of unhealthy products, particularly in gas-marts, and encourage advertising of healthier products.

T-P.3467 Heroes Referrals
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Background: Heroes Clinic is the only oriented medical weight program in the region. We receive around 700 referrals per year but only 17% of the referrals came to the first appointment. Implementation of a successful referral program requires assessing which strengths within the existent structure of the HEROES clinic may remove barriers to care, successfully achieving the elements that define a chronic disease patient-centered medical home.

Methods: Effective referral process means an increase in a referral completion from 17% to 25% compared to last year. Last year we had 700 referrals and only 17% of those came to their first appointment. Change the AVS referral information in EPIC, Spanish recording, training in motivational interviewing, Heroes patient care coordinator and Heroes information available in clinics. The barriers include: time, team members and communication between clinics.

Results: Post intervention data includes: 700 referrals from January through December 2014. Of those we saw 180 new patients which equal a 30% show rate. Therefore, we have increased our show rate by 13%. This was a successful project but expensive. The Heroes team was satisfied with the results.

Conclusions: Continue training Primary Care Physicians about Heroes clinic. Continue to work on current barriers of: Time, more education, awareness and money. Champion and senior leadership in clinics (SPCC) the Patient Care Coordinator.

T-P.3468 Knowledge, Attitude and Behavior Towards Physical Activity and Healthy Diet: a Tertiary Level Hospital Survey in South Africa.
Bernard Bongsha Mthatha Eastern Cape, Olufunke Alaba Cape Town

Background: Physical activity and healthy diet has been implicated as major risk factors for obesity and non-communicable disease (NCDs), rapidly emerging epidemics in South Africa. The purpose of this study was to investigate the knowledge, attitude and behavior towards physical activity and healthy diet among the population that visit the Nelson Mandela Academic Hospital in Mthatha, Eastern Cape, South Africa.

Methods: Between May 2013 and May 2014 we conducted a cross-sectional survey among 500 adults who visited the Nelson Mandela Academic Hospital using a standardised questionnaire to address the knowledge, attitude and practice towards NCDs risk behaviours including physical activity and healthy diet. Nelson Mandela Academic Hospital is a tertiary hospital situated in a rural environment in one of the poorest Province in South Africa; Eastern Cape. Apart from knowledge and behavioural questions in the questionnaire, the five-point
Likert scale was utilized to generate information on attitude.  

Results: Although, the attitudes of the participants towards physical activity and healthy diet is favourable, yet only 55% understood the meaning of healthy diet and 67.4% did not know or where not sure of the health importance of physical activity.  

Conclusions: Increasing knowledge levels with regards to the benefits of physical activity and good diet among rural residents will be a successful factor for effective prevention of NCDs and obesity initiatives.

T-P-3469 – Withdrawn

T-P-3470
QI Project: Correlation of the Health-related quality of life (Hrqol) questionnaire in 87 Children in the Heroes clinic at the Initial Visit and 6 Months Later
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Background: The measurement of health-related quality of life (HRQOL) is one method used to assess global psychosocial function. HRQOL is a multidimensional construct with several core dimensions, including: physical, emotional, and social function. HRQOL reflects the individual's subjective evaluation of his/her own well-being. The measurement of HRQOL in children and adolescents across pediatric disease groups has grown tremendously in the past decade. Following this trend, there is now early literature documenting a strong and consistent relationship between impaired HRQOL and obesity in children and adolescents.

Methods: To measure health-related quality of life (HRQOL) in a clinical sample of obese children in the HEROES Clinic; to assess differences in quality of life at initial visit and 6 months later. Evaluation of 87 HRQOL questionnaires reported by children in the HEROES clinic at the first visit and 6 months later in the clinic and program. All patients are obese in this group, more than 95 percentile of their BMI. The forms were obtained between 2012 to 2014. The Questionnaires report their physical, emotional, social and school self-report and an overall score of life.

Results: 87 forms were evaluated using T test results. Preliminary results shows, the mean group initial vs. group at 6 months was equal -6.75 of 95% confidence interval of the difference. Intermediate values t: 4.7190, standard error 1.431. For the Emotional Results, the mean group initial vs. group at 6 months was equal -7.88 of 95% confidence interval of the difference. Intermediate values t: 3.8290. The two-tailed P value for the overall and emotional scores were less than 0.0001, p value is statistically significant.

Conclusions: Obesity has a clear impact on HRQOL. It is likely that assessing and treating patients in the weight management clinic, the context of pediatric intervention has a great implication to improved HRQOL and weight management outcomes.

T-P-3471
Sugar and sodium content of sugary drinks advertised on television with the mayor child audience in Mexico.
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Background: In less than 12 years the Mexican population, the consumption of sugary drinks provide about 30% of total /day calories; the World Health Organization (WHO) states that a reduction in sugar and sodium in children produce additional health benefits. Methods: Advertising 600 hours of TV recording, 7 am to 10 pm of the most watched channels in Mexico, from December 2012 to April 2013. Based on the programs that displays children (82 caricatures analysed %, 46% series, soaps 44%, 41% movies and sports programs 24%). Fizzy drinks and juices: the advertisements of sugary drinks (SD) were analysed. The average sugar and sodium per 100 ml, as well as the percentage they represent of the total results for each program are calculated. Results: In the cartoon 100% of ads were SD drinks, sugar average was 10.69g /100ml; and sodium was 12.58mg /100ml. Series programs in 25% of SD ads corresponding to 5.33g /100ml of sugar and 17.33 mg /100ml sodium; in soap operas the percentage of SD was 68.9%, 8.08g/100ml sugar and 18.42mg /100ml sodium in films was 73.7% SD, 9.11g /100ml sugar and 17.06mg /100ml sodium and sports programs 60% SD corresponds to 10.5g /100ml sugar and 14.8mg /100 ml sodium.

Conclusions: The average Kcal in SD announced programs more child audience was 35 kcal / 100 ml, whereas the daily consumption of SD in children is about 660ml, the SD announced could help boost supply approximately 17% of Kcal Total / day.

T-P-3472-DT
The Discrepancy in Classification of Obesity among Adolescents by Body Mass Index vs. Body Composition

Background: Current practice uses BMI or BMI percentile to diagnose obesity. However, obesity is not defined as an excess of weight adjusted for height, but rather an excess of body fat, which raises the question as to whether obesity should be classified via BMI or body composition analyses. This study tested the discrepancy between the classification of obesity via BMI vs. body composition.

Methods: Data was collected from 577 adolescent & young adult patients at the MSAHC. Ss age ranged from 13-24 (M = 19.7 ± 2.4) y, 88% were female, and 97% were Hispanic and/or African American. Chi square analyses were used to test differences in the estimated prevalence of obesity using BMI [or BMI percentile as appropriate by age] vs. % body fat measured via bioelectric impedance analysis (BIA).

Results: Classification using BMI [or BMI percentile as appropriate] vs. body fat % resulted in significant differences in the number of adolescents and young adults with obesity (19.1 vs. 22.3% respectively; chi square = 65.8, p < 0.0005). For children (< 20y), the discrepancy in the estimated prevalence of obesity using BMI percentile vs. body fat % was far more pronounced (19.5 vs. 25%; chi square = 200.8, p < 0.0005).

Conclusions: The current classification system may...
underestimate the prevalence of obesity, particularly in children. With the implementation of the Affordable Care Act, obesity screening will be reimbursed and treatment is more likely to be covered by third party payers in the future, but only for those diagnosed with obesity. Therefore, the continued use of BMI percentile may inadvertently exclude many children with obesity from treatment. BIA, which is relatively inexpensive, easy and fast, may be a practical alternative for diagnosing childhood obesity.

T-P-3473
Variation in the Reported Health, Exercise and Nutrition Climate at Work
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Background: The workplace can be an important setting for promoting healthy weight.

Methods: As part of a study to evaluate the effect of two workplace weight management programs we assessed the obesiogenic work environment using the 20-item Workplace Nutrition and Exercise Climate Scale (WNNECS) and the 5-item Worksite Health Climate Scale (WHCS) among obese (BMI ≥30) employees (n=391) working for the second largest employer (health care + education) in North Carolina. In both scales, subjects rate their agreement with statements from 1 (strongly disagree) to 5 (strongly agree) which then are summed. Higher scores indicate a more supportive environment for healthy behaviors. Predictors (work location, work type, age group and gender) of these climate outcomes were assessed using multivariate linear regression.

Results: Overall, employees rated the environment as supportive for healthy behaviors (WNESC mean=61.7, SD=16.9, range=20-100, WHCS mean=14.6, SD=4.2, range=5-25). Overall, employees in our sample tended to agree with statements about positive aspects of the health climate with regards to the organization and their coworkers, but disagreed with statements about their supervisor’s behaviors. Differences by age group (<35, 35-49, and ≥50) and gender were assessed. There was an association between age group and the WNNECS scale, with older employees less likely to report the environment as supportive (F=2.90, p=0.06). In multivariate analyses, the ≥50 group was less likely than the ≤34 group to report the climate as supportive (β=-6.4, p=0.02).

Conclusions: Although the work environment overall is considered to be healthy, there is still room for improvement in certain areas, especially in relation to supervisor behaviors and in ensuring that older workers feel supported in healthy behaviors.

T-P-3474
“#WeTakeTheStairs”: A Study of the Effects of School Spirit Posters on Stair Taking Behavior in a University Dormitory
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Background: Previous studies have generally shown the effectiveness of motivational signage in worksites and university buildings to promote stair use. The present study tested whether school spirit posters encouraging stair usage were effective in increasing stair use among college students and whether the addition of health facts prompted greater stair usage than school spirit messages alone.

Methods: In Spring 2015, focus groups were conducted with dormitory residents at a large university in the northeast United States testing the acceptability of various sign prototypes. Sign content and messages were finalized based on this feedback. Elevator and stair use was then monitored in two towers in a single university dormitory. Observations were made thrice a week in one-hour sessions for four weeks using an ABAB experimental design, with interventions taking place during the B weeks. The towers were randomly assigned to either the school spirit with health facts condition or the school spirit without health facts condition.

Results: A total of 1127 choices between stairs and elevator were observed. There was a significant increase between stair use at Baseline I and during Intervention I in males exposed to the school spirit posters without health facts. There was also a trend in both conditions for females to decrease stair use from baseline to Intervention II.

Conclusions: Results suggest that stair use can be positively influenced in college-age males by a short-term low-cost intervention using school spirit related prompts without health facts on posters.

T-P-3475
A Content Analysis of Recipes Included in Food Blogs Focused on Child and Family Feeding: Recipe Types, Inclusion of Produce, Added Sugar, and Cooking Methods
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Background: Data suggest that young children over consume foods that may promote obesity (e.g., sweets) and under-consume foods that may protect against obesity (e.g., vegetables). Research is needed on the recipes promoted for children’s consumption on Internet-based media such as food blogs to better understand environmental influences on child feeding and childhood obesity risk.

Methods: 13 food blogs focused on child and family feeding published by mothers of 2 to 5 year old children were purposively sampled. ~20% of posts published between 03/2013-02/2014 were randomly sampled from each blog (N = 325). Recipes in posts were coded using qualitative content analysis for the type of recipe, vegetable, fruit, and added sugar ingredients, and cooking methods (e.g., sauté, bake). Coding schemes were developed from existing literature. Code frequencies were calculated and chi-square tests were conducted on recipe type and ingredient codes.

Results: 61% of posts included recipes (n = 198). Mixed dishes (e.g., casseroles; 35%) and desserts (22%) were the most frequent types. Although few recipes featured vegetables (12%) or fruits (1%), 48% included vegetables and 27% included fruits as ingredients. Compared to other recipe types, vegetables were more frequent in mixed dishes (p < .001) and proteins (p < .01). Fruits were more frequent in beverages (p = .01). Added sugars were in 53% recipes, more frequently in desserts (p <.001) and grains (p = .01). Stovetop (39%) and oven-based (40%) cooking methods were most frequent. 14% of recipes required only ingredient assembly (e.g., salad).

Conclusions: The high prevalence of desserts and added sugar suggest that recipes included in food blogs focused on child and family feeding may promote obesogenic dietary patterns. Decreasing added sugar and increasing vegetables and fruits included in recipes may be an opportunity for childhood.
T-P-3476
Assessment of Parent and Child Perspectives on Meal Selection Within Quick-Service and Full-Service Restaurant Contexts
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Background: Children frequently consume food from restaurants, which tends to be more energy-dense than food prepared at home. Assessing families’ perspectives on child meal selection in these settings can inform the development of healthy eating interventions that are consistent with their preferences and contextual realities.

Methods: Participants were 31 parent (94% primary caregivers) and child (n=15 1st-2nd graders, n=16 3rd-4th graders; 55% male; 52% non-Hispanic White) dyads dining in 1 of 2 restaurant chains (1 quick-service, 1 full-service) in southern CA. Both chains offer two healthy kids’ meal options, as defined by the National Restaurant Association’s Kids LiveWell program, plus other kids’ meals. This study was a baseline assessment conducted as part of a pilot intervention promoting healthy kids’ meals. After dining, parents completed a survey using an electronic tablet, and study staff administered questions to children.

Results: Seventy-four percent of eligible dyads participated. Half of the children ordered a kids’ meal. Only one child ordered a healthy kids’ meal. About half of children and parents reported that the child selected his/her meal; 35% of children and 16% of parents reported that a parent selected the meal; and 10% of children and 32% of parents reported deciding together. Among children, taste was the most common reason for their meal selection (52%), followed by habit (19%). Most parents endorsed taste as the reason for their child’s meal selection (77%), with nutrition as the next most common reason (23%). The majority of children said they knew what they would order before arriving, and that their choice reflected their typical order.

Conclusions: Both parents and children played a role in child meal selection in these restaurants, with some differences in their perspectives on the selection process. Taste perceptions and habits emerged as drivers of ordering patterns. Differences by restaurant chain and child age and implications for interventions will be discussed.

T-P-3477
Change in Energy Balance-Related Behaviors among Children of Low and High Socio-Economic Status Across Europe: Intermediate Results of the “EPODE for the Promotion of Health Equity” (EPHE) Project

Background: Increasing social inequalities in health across Europe are widening the gap between low and high socio-economic groups, notably in obesity prevalence. Reviews of the literature indicate very few controlled interventions that aim at reducing these gaps or have examined the effect of interventions on different socio-economic groups. In response, the EPHE project, launched in 2012, analyses the added value of Community-Based Programmes, based on the EPODE model, to reduce socio-economic inequalities in health-related diet and physical activity behaviours of families in 7 European communities. Here we present the results direct after the intervention-year.

Methods: The follow-up study consisted of 1062 children aged 6-8 years and their parents, from different socio-economic backgrounds. A self-reported questionnaire was administered to the parents to examine the children’s energy balance-related behaviours and family-environmental determinants. Socio-economic status was approximated by the educational level of the mother. The Wilcoxon signed-rank test was used to test the differences between baseline and intermediate measurements for each socio-economic group.

Results: After one year intervention, we observed changes in behaviours (fruit and vegetable consumption, sugary sweetened beverages consumption, screen exposure) and their related determinants-identified as gaps at baseline- within the low and within the high education groups. The evidence shows that health benefits were higher within the low education groups although statistical significance was not reached in most of the cases.

Conclusions: Our findings show that after the tailored community-based interventions, the low socio-economic groups improved their behaviours more than the high. This indicates that the community-based programmes following the EPODE model have the capacity to reach disadvantaged populations and improve their energy balance related behaviours through tailored interventions.

T-P-3478
Childhood Obesity Prevention through Physical Activity Promotion in China: the Health Legacy Project of the 2nd Summer Youth Olympic Games
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Background: Effective and sustainable physical activity (PA) promotion programs in schools are needed for child health promoting including obesity prevention. Suggested by the International Olympic Committee, a legacy project targeting childhood obesity prevention through PA promotion among school students was conducted during Sep 2013 and June 2014 in Nanjing, China, the host city of the 2014 2nd Summer Youth Olympic Games. This paper reported the effectiveness of this Legacy Project.

Methods: Totally, 32 primary and 16 junior high schools were randomly selected from 8 districts in Nanjing. The 4th and 7th graders were recruited and randomized into either intervention or control group at school level. Routine health-related education was provided to all schools, while specially developed 1-year multi-component PA promotion program was implemented in intervention schools. PA was assessed with validated questionnaire, while body weight and height were measured. Main outcome variables included changes in body mass index (BMI) and PA level.
Results: Overall, 9,858 (97.7%) of the 10,091 enrolled students completed the follow-up survey. There was no significant difference between control and intervention groups at baseline or between those completed and missed the follow-up survey in terms of age, sex, BMI and parental education. Compared to control, intervention group had significantly smaller increase in mean BMI (intervention vs. control = 0.22±1.23 vs. 0.46±1.67 kg/m²; p<0.05) and increased PA level (intervention vs. control = 169.05±6626.03 vs. -133.91±6803.73 MET.min/week; p<0.05), PA in control schools decreased. In intervention schools, at baseline 35.0% were overweight or obese, the rate became 35.9% by end of study; the figures were 34.2 % and 37.1% in control schools.

Conclusions: The school-based physical activity promotion intervention was feasible and effective in promoting PA and on obesity prevention in the educational, cultural and social context of China.

T-P-3479
Community Transformation Grant Healthy Corner Store Initiative
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Background: The Healthy Corner Store Initiative was designed to work with small retail businesses in local neighborhoods to increase the availability of healthy food options and reduce and prevent the prevalence of chronic diseases in Jackson County, Missouri. Targeted neighborhoods were those with limited access to full-line grocery stores.

Methods: Intercept surveys were conducted at 9 urban core corner stores. Participants were asked to indicate food purchase frequency, perceived healthiness of available food items, what influenced purchase decisions, and what items they purchased that day. Food habit surveys were mailed to residents within a 0.5 mile radius of each store and included questions about demographics and food purchasing and consumption behaviors.

Results: 643 baseline and 1,040 follow-up intercept surveys were collected and analyzed, and 900 baseline in addition to 247 follow-up food habit surveys. For all intercept surveys, the top food items purchased were chips, candy, and pastries, and regular soda was the top beverage purchased. Food habit surveys for both phases indicated that most individuals consume an average of 1.76±1.32 servings of fruits and 2.12±1.46 vegetables per day. 72.7% of respondents believed the food at the corner stores to be somewhat healthy. Conclusions: Intercept and food habit survey results provided insight into buying habits and challenges in increasing the purchase of healthier options in areas with limited access to full-line grocery stores. Responses indicated that individuals were eating inadequate amounts of fruits and vegetables, and opting for items high in fat, sugar, and salt. Education and an increase in health literacy on healthy choice options is important for future direction, as the majority of participants believed the food at the corner stores to be somewhat healthy. However, all corner store locations offered primarily highly processed foods.

T-P-3480
Community Walkability and Childhood Obesity - A US National Longitudinal Study (2007-2014)
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Background: Obesity results from a chronic imbalance between energy intake and expenditure (physical activity, PA). Walkability in the neighborhoods affects PA, while also influences food environment and consequently energy intake. We examined the spatial-temporal changes of walkability in the US during 2007-2014 and the association between walkability and obesity/overweight risk at state level.

Methods: The road network data across the US mainland were obtained from the Topologically Integrated Geographic Encoding and Referencing database for 2007, 2011 and 2014. Crude street connectivity and street connectivity with population adjustment at state level were estimated as the indicators of walkability. The trends in walkability were tested to study the temporal changes. Associations between street connectivity and obesity rates were estimated using spearman’s rank correlation coefficient.

Results: State level walkability did not significantly change between 2007-2014 (p=0.57). But there was significant variation across states. District of Columbia had the greatest decrease and Connecticut increased the most. The spatial distribution of walkability also showed a clear difference between west and east, with an average of 4.74 vs. 1.09 intersections/km² (p=0.02) in the eastern states and western states, respectively in 2007 and similarly in 2014. The crude walkability at state level was not associated with overweight and obesity prevalence (r=-0.05, p=0.72 for overweight, r=0.21, p=0.16 for obesity) while there was an inverse association between population adjusted walkability and overweight/obesity rate.

Conclusions: While varying heterogeneously across the US, walkability has been remain relatively stable or improved during 2007-2014 in most states in the US. Walkability was negatively associated with prevalence of obesity at state level only after adjusting for population.

T-P-3481
Content Analysis of Sugar-Sweetened Beverage Advertisements in Ghana

Background: Major sugar sweetened beverage (SSB) companies and fast food companies recently announced their intentions to expand advertising and sales in Africa. This is especially concerning given the climbing rates of diet-related diseases in some parts of Africa. This study is the first to examine how SSB brands and fast food companies are using outdoor advertising in West Africa. Specifically, this study aimed to quantify the number and type of ads and the nutritional quality products featured in ads in the capital city of Ghana. Public Health professionals should anticipate the possibility of migratory diabetes and obesity epidemics, especially among youth.

Methods: Photos were taken of every branded item or advertisement within major streets of Accra, Ghana. The photos were then analyzed for their visibility to youth (e.g.
proximity to schools), nutritional quality of the products shown, and function (i.e. infrastructural, purely advertising, etc.). Content analysis was used to analyze the themes of the ads.

Results: Coca-Cola had the most outdoor SSB advertisements in Accra, followed by Pepsi and local SSB brands. The only U.S.-based fast food restaurant observed by researchers was one Kentucky Fried Chicken restaurant. Over fifty percent of advertisements were found to have a utilitarian purpose, either as a branded set of table and chairs, and umbrella at a roadside stand, a crate with a logo used for purposes other than carrying products, or a custom sign. There was also one instance of an elementary school sign sponsored by Coca-Cola.

Conclusions: Soda companies and fast food restaurants are investing in securing a foothold in developing markets. The public health ramifications of such strong campaigns could be tremendous. Policymakers in the U.S. and Ghana should collaborate on the development policy-based interventions to reduce children’s exposure to food and beverage marketing in West Africa.

T-P-3482-DT
Does the Relationship Between the Perceived Neighborhood Environment and Travel Patterns Vary Across Individual Characteristics?
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Background: About 42.5% of Latinos are obese and time spent in a vehicle is linked to obesity. Conversely, more time walking lowers risk of obesity. Identifying socio-demographic moderators of the associations between the perceived environment and walking/vehicle time may inform obesity interventions.

Methods: Baseline data were examined from 88 Latina women participating in an intervention promoting physical activity. Participants completed an interview, provided anthropometric measures, and wore a Global Positioning System (GPS) device and accelerometer for 7 days (minimum of 2 days for analysis). Data were integrated using the Personal Activity and Location Measurement System to obtain location-based estimates (e.g., min spent walking and in a vehicle). Generalized mixed effects models, (controlling for age, education, income, and car access) estimated the relationship of perceived neighborhood environment variables (e.g., safety from traffic, safety from crime, and aesthetics) with walking and vehicle time. Moderation was examined by including interactions between 6 socio-demographic and 5 environment variables.

Results: 85% of participants were overweight/obese. Average time spent walking was 15 min/day and in a vehicle 65 min/day. Compared to normal weight women, women who were overweight/obese spent 43% less time walking (p=0.017) and 32% more time in vehicles (p=0.06). A significant interaction between safety from traffic and weight status was seen, with regards to vehicle time (exp.β=0.520, p=0.005).

Conclusions: Weight was inversely associated with walking time and positively associated with vehicle time. Increasing walking and decreasing vehicle time may be important strategies to target obesity in Latinas. Furthermore, targeting safety from traffic may help to decrease vehicle time.

T-P-3483
Eating and Obesity-Related Messages Identified by Children in Children’s Movies
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Background: Movie content is associated with children’s health beliefs and behaviors (alcohol use, smoking, and violence), yet little is known about how movies affect children’s eating behaviors and attitudes regarding weight stigma. Our objective was to conduct a pilot study to examine what messages children take away from movies, which will then inform a larger study.

Methods: To understand children’s perspectives of health- and stigma-related messages in movies, and how that influences attitudes, an NIH-funded transdisciplinary team was formed with experts from pediatrics, sociology, psychiatry, psychology, contemporary art history, public health, and mass communication. In this pilot study, children ages 9-11 years watched one of two popular children’s movies with either high (“Alvin and the Chipmunks”; n=8) or low (“Stuart Little”; n=7) obesity-promoting and stigma-containing content. After viewing, participants completed a questionnaire and participated in focus group discussion.

Results: Children’s responses to individual questionnaires and focus group questions revealed that they saw animal characters as having human behaviors (“perceptive”, “brave”, “smart”, “kind”); saw obesity stigma (“[his body] was not very effective for doing much… [his legs were] really round and fat and short”), and had the ability to recall food products shown, including brands (e.g. “Utz” cheeseballs, “Lucky Charms”, “Campbell’s”) and giving detailed descriptions of treats (“baskets of candy and chocolate and toffee… coffee with caramel and whipped cream”). All children were able to complete post-movie questionnaires and were vocal participants in focus group discussions about their perceptions.

Conclusions: Pilot study findings suggest children can identify movie content related to eating and weight-related stigma. This supports the feasibility of a larger study to expand on current findings and investigate the extent to which messages in children’s movies provide cues for normative eating behaviors and culture of obesity.

T-P-3484
Evaluation of mother’s perception of obesity in their sons
Hector Garcia-Alcala Puebla Puebla, Rafael Violante-Ortiz

Background: Early identification of obesity during childhood is the first step to start medical attention. Maybe mothers are responsible to identify obesity in their sons and to start the process of medical attention. In spite of the importance of mother’s perception of obesity in their own sons it has not been properly studied how well is mother’s perception to identify obesity.

Methods: We studied all students from first to sixth grade in our local school. In all cases body mass index were calculated and according to this results students were categorized into two main categories normal and obese (both defined by local percentiles). In all mother BMI were calculated they were responsible to identify obesity in their sons and to start the process of medical attention. In spite of the importance of mother’s perception of obesity in their own sons it has not been properly studied how well is mother’s perception to identify obesity.

Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society
Background: For workplace weight loss interventions to be effective, they need to address factors relevant to the targeted intervention group. The objective of this study was to identify demographic, health-related, and work-related factors associated with change in body mass index (BMI) and body fat percentage (BFP) among manufacturing workers in different age groups.

Methods: BMI and BFP of 758 workers from six Connecticut manufacturing companies were objectively measured in 2008 and again approximately 33 months later. Demographic, health-related, and work-related factors were assessed via questionnaire. All variables were included in linear regression models to identify factors associated with changes in BMI and BFP for workers in 3 age groups: <45 years, 45-55 years, >55 years.

Results: The only factor associated with BMI in any age group was education: not having a college education was significantly associated with decreased BMI at the second measurement. The only factor associated with BMI in any age group was education: not having a college education was significantly associated with decreased BMI at the second measurement.

Conclusions: More work must be done to identify factors that can predict changes in BMI and BFP for workers in different age groups.

T-P-3486
Gender Difference in Disordered Eating Behaviors among College Students
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Background: Eating disorders are more prevalent in females than in males. However, the evidence of gender differences in disordered eating behaviors (e.g., dieting, emotional eating, and body image concern) and food dependence diagnosis among college students is inconsistent or lacking. The current study aimed to assess and compare disordered eating behaviors and food dependence diagnosis between male and female college students.

Methods: College students (n=965, ages 18-25, female 72.9%, white 74.8%) enrolled at a public university in 2014 were recruited to take an online survey. The survey includes demographic characteristics and three validated questionnaires measuring specific disordered eating behaviors and attitude.

Results: Many participants engaged in disordered eating behaviors. Overall more female students are a high level of concern about dieting, body weight or problematic eating behaviors than males (30.6% vs. 17.2%). More female students met the criteria for “food dependence” diagnosis (12.2% vs. 4.6%) than males. There were gender differences in nearly all measured disordered eating behaviors. Specifically, females scored higher than males in dieting, bulimia and food preoccupation. There were more restraint eaters, uncontrolled eaters and emotional eaters in female students. When measuring food dependence subcategories, more females than males engaged in unstoppable eating despite adverse physical consequences, experienced withdrawal symptoms, were more tolerable to foods, and reported clinically significant impairment to life because of food and eating.

Conclusions: Prevention and nutrition intervention for college students regardless of gender may be needed to address disordered eating behaviors. Eating disorders are more common in female college students due to various contributing disordered eating behaviors. Different non-food and eating related risk factors may be more important to develop eating disorders in males.

T-P-3487
Guideline-concordant weight loss programs in the community: identification and accuracy of information through the Internet
Benjamin Bloom Baltimore Maryland, Ambereen Mehta Baltimore MD, Jeanne Clark Baltimore MD, Kimberly Guzune Baltimore Maryland

Background: Guidelines recommend that clinicians refer patients with obesity to high-intensity weight loss interventions, yet their availability in the community is unclear. We evaluated whether web-based information provided by community-based weight loss centers reported their practices on key areas identified in the 2013 AHA/ACC/TOS weight management guidelines. We determined the accuracy of this web-based information within a randomly selected subsample as compared to information obtained through phone interviews.

Methods: In summer 2014, we searched the Internet to identify 191 programs in the DC/Baltimore metropolitan area, and performed a content analysis to abstract weight management practices from their websites. We rated guideline concordance as ‘high,’ if the program had high intensity (≥14 sessions in 6 months), emphasized dietary change and behavior modification, and did not use nutraceuticals. Out of 80 randomly selected programs, 52 completed a phone survey on program practices (65% response rate). Using cross tabulations, we compared the accuracy of Internet-obtained information to the phone survey with respect to program.
intensity, dietary strategy, behavior modification, nutraceutical use, and rating of guideline concordance.

**Results:** Overall, only 2% of programs met our criteria for high guideline concordance. Within the subsample, 42% of programs’ Internet data misclassified program intensity, 38% misclassified dietary change, 42% misclassified behavior modification, and 27% misclassified use of nutraceuticals as compared to phone data. Based on Internet data, 6% of the subsample was rated as high guideline concordance where 23% were rated as high based on phone data.

**Conclusions:** Given that Internet data typically underclassifies guideline concordance, clinicians will likely have difficulty identifying high-intensity weight loss interventions in the community where they can refer their patients.

**T-3488 Implementation of a Corner Store Intervention As Part of a Multi-Level, Multi Component Obesity Prevention Trial in Low Income Neighborhoods of Baltimore City**

Sarah Rastatter Baltimore MD, Kate Perepezko Baltimore MD, Elizabeth Campbell New Egypt New Jersey, Cara Shipley Baltimore Maryland, Priscila Sato Santos São Paulo, Tracy Yang Baltimore MD, Joel Gittelsohn Baltimore MD

**Background:** The B'more Healthy Communities for Kids (BHCK) trial is a multilevel, multi component child obesity prevention trial which aims to improve the food environment by increasing access to, demand for, and consumption of healthier foods and beverages in 30 low income Baltimore neighborhoods. At baseline, 19% of children 10-14 years sampled were overweight and 24% were obese. One component of the BHCK intervention focused on increasing stocking of healthier food choices at small corner stores by educating and incentivizing small store owners and community members, and by point of purchase promotions.

**Methods:** We worked with 15 small intervention corner stores. Six narrated business and nutrition trainings were offered on tablet PCs. Storeowners earned structural incentives based on how many videos they watched. Implementation standards were developed to assess reach, dose delivered, and fidelity, and to adjust implementation strategies during the 7 month intervention.

**Results:** Reach to intervention corner stores was high with 94% of corner stores watching at least 1 out of the 6 training videos. Dose delivered to corner store owners was medium with an average of 67% of the training videos watched and 67% of the maximum structural incentives received per store. Reach to target age group (10-14 year old youth) at educational sessions was medium with an average of 7.1 youth interactions per session. Reach to caregivers was high with an average of 14.6 per session. Dose delivered was high with an average of 34.3 samples distributed per session and a median length of 1.5 hours per session. A total of 4700 person contacts occurred at all educational sessions combined.

**Conclusions:** This corner store program was successful in disseminating knowledge to intervention store owners through the training video program. Implementation evaluation allowed the team to note challenges in reaching 10-14 year olds and led to improved recruitment strategies and educational session planning to obtain better reach in wave 2.

**T-3489 Incentive Sensitization and Eating Behaviors: Impact of a Naturalistic Fast-Food Laboratory**

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**Background:** Incentive-sensitization theory posits that compulsive consumption is driven by increased salience of cues, which trigger "wanting" (e.g., increased motivation, elevated craving). "Liking," or the hedonic pleasure derived from the food, theoretically contributes less to excess consumption. Given that sensitization is theorized to occur in the presence of cues, the current study examines food "wanting," "liking," and consumption in cue-rich environment, i.e., a naturalistic fast-food laboratory.

**Methods:** Participants (n=66) were randomly assigned to a cued or non-cued environment. The cued condition consisted of a laboratory designed to resemble a fast-food restaurant, and the non-cued condition consisted of a neutral laboratory. Food "wanting" was measured through a Relative Reinforcing Value (RRV) task. This task allowed participants to earn points that could be used toward food, which assessed participants’ motivation to work for food. Participants then had the opportunity to consume the foods they had earned. Participants also provided self-report ratings of their craving and "liking" (i.e., how much they enjoyed or liked the taste) for the food. Food "wanting," "liking," and consumption were compared by condition.

**Results:** Participants in the cued condition worked to earn significantly more points toward food (F=6.21, p=.02) and consumed significantly more calories (F=6.00, p=.01) compared to those in the non-cued condition. In contrast, participants' "liking" for the foods did not differ significantly by condition (all p’s >.05).

**Conclusions:** The current study suggests that food "wanting" and consumption, but not food "liking," are increased in the presence of food cues. This is consistent with the incentive-sensitization theory of addiction. Thus, environmental cues may be a particularly important contributor to overeating and obesity.

**T-3490 Lower Prevalence of Overweight and Obesity at Higher Altitudes Among Peruvian Children and Adolescents**


**Background:** An inverse association between obesity and altitude has been reported in adult populations. We investigated whether the prevalences of overweight and obesity in the pediatric population are lower at high altitude (≥1,500 m).

**Methods:** We utilized data publicly available online from an on-site survey of a nationally representative population of Peru (Food and Nutrition National Center, CENAN, 2009–2010). We estimated the prevalence of high weight-for-recumbent length among infants (<2 years old, n=1,754) and the prevalence of overweight and obesity among children and adolescents aged 2-19 years (n=27,694) living at low- versus high-altitude. A weight excess among infants was defined as a weight-for-recumbent length ≥97.7th percentile (WHO 2006 criteria). Overweight and obesity were defined as a BMI-for-age percentile in males for sex in the range 85–94.99th and ≥95th percentile, respectively (CDC 2000 criteria).

**Results:** Among Peruvian infants, the national prevalence of
high weight-for-recumbent length was 7.5% (95% confidence interval, 5.6-9.3%). The prevalence of high weight-for-recumbent length was similar at low- and high-altitude: 6.8% (95% CI, 4.5-9.1%; P=0.339) and 8.6% (95% CI, 5.4-11.8%). In contrast, among children and adolescents aged 2-19 years, the age-adjusted prevalence of overweight was lower at high altitude (7.8%, 95% CI: 6.8-8.7%) as compared with low altitude (10.3%, 95% CI: 8.9-11.7%; P=0.003). Altitude was inversely correlated with the prevalences of overweight (R=-0.31, P<0.001) and obesity (R=-0.51, P<0.001).

Conclusions: Among Peruvian children and adolescents the prevalences of overweight and obesity were lower at high altitude (≥1,500 m) as compared with low altitude, suggesting body weight differences between individuals living at low- and high-altitude start in childhood. Whether this is related to differences in maternal history of diabetes, diet, energy utilization, or other risk factors remains to be explored.

T-P-3491
Nudging College Students Toward Healthier Choices: An Intervention to Decrease Dessert Consumption and Increase Fruit Consumption.
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Background: All you can eat cafeterias present opportunities for students to consume excess calories and opportunities to make subtle changes to nudge students toward healthier choices. Successful strategies used in high school cafeterias (not all you can eat) may be applied but have not been tested in this setting.

Methods: A 4-week intervention in an all you can eat midwest college cafeteria. Fresh whole fruit was made more available in baskets throughout the cafeteria. Baked desserts were cut into smaller pieces. Signs recommended vegetables with your entree. A display at the cafeteria entrance showed a healthy meal made from available options. Waste and selection calculations were done using a validated visual method on all trays returned during a 1 hour period on 6 occasions (3 lunches and 3 dinners) during 1 week pre-intervention and 1 week post-intervention. Weeks were chosen such that the planned menus were the same during the pre and post intervention measurements. Dessert selection and waste were particularly easy to assess as they were the only items served on a particular type of plate. T-tests compared pre and post samples.

Results: 407 trays pre-intervention and 488 trays post-intervention were examined. The amount of fruit taken by students increased significantly from 15.0% of trays to 17.0% (p =0.002). The amount of baked desserts taken by students decreased from 17.5% of trays to 12.2% (p=0.001). There was not change in fruit waste (35.87% to 31.52%, p = 0.991). Dessert waste declined from 26.3 % to 21.7% of dessert selection (p=0.025). There was no change in participants selections of cooked vegetables, pizza, chicken or select healthy entrees.

Conclusions: A simple intervention to make more fruit available and decrease dessert serving sizes led to a decrease in the number of baked desserts taken as well as a decrease in dessert waste. This lead to an overall decrease in calories consumed from baked desserts. This intervention also led to increased fruit consumption.

T-P-3492
Obesogenic environments: food and beverage marketing surrounding schools in Mexico City
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Background: Research continues to demonstrate that increases in the prevalence of overweight and obesity in children are related to social and environmental influences.

Methods: We carried out walk-throughs and direct observation to characterize the environment surrounding schools, in a radius of 200 meters around each of 20 schools. We recorded the number of FNAB advertisements aimed at school children, took pictures to carry out a content analysis and classified the advertisements according to food group.

Results: We found 163 FNAB stores within the surroundings of the 20 schools studied. Per school, the average number of stores was 9.6 ± 3.28. We found a total of 676 FNAB advertisements. The average number of advertisements per school was 29.6 ± 24.35, with an average of 12.6 ± 5.6 ads per store. For each advertisement, the type of food or beverage, the most advertised with 51.1%, followed by water (14.6%), sweets and chocolates (14.2%) and cookies and pastries/cakes (9.0%). In total, 13.3% of ads offered a promotion, discount or special price and 21.4% used animated characters.

Conclusions: These results suggest the importance of policies that regulate the obesogenic environment. Policies which pay special attention to complying with the recommendations of the Pan American Health Organization to protect children from the marketing of unhealthy products in school surroundings are necessary.

T-P-3493
Ordering Patterns Following the Implementation of a Healthier Children’s Restaurant Menu: A Latent Class Analysis
Megan Mueller Cambridge Massachusetts, Stephanie Anzmann-Frasca Boston MA, Caitlin Blakeley Boston MASSACHUSETTS, Christina Economos Boston MA

Background: Food away from home contributes substantially to excess calorie intake in children. Recent research illustrated positive overall shifts in children’s menu orders following healthy menu modifications in the restaurant setting. Yet individual differences in responses to healthy menu changes have not been evaluated.

Methods: A healthier children’s menu was introduced at the Silver Diner, a regional full-service restaurant chain, in April 2012. This menu featured more kids’ meals meeting the National Restaurant Association’s Kids LiveWell (KLW) standards, healthy side dishes bundled with all meals by default, and the removal of French fries and soda (which could be substituted for free). Breakfast items (24% of kids’ meal offerings) could be ordered all day. Latent class analysis was conducted on a random subsample of child meal orders placed after the implementation of the new menu (n=8611), using eight indicator variables that were hypothesized to contribute to the total calorie content of the meal. A total meal >600 calories was defined as exceeding calorie recommendations, or one third of total daily calorie needs for a sedentary child.

Results: The best-fitting model contained six latent classes representing different ordering patterns: “healthy breakfasts” (31.5%), “healthy dinners” (30.7%), “healthy breakfasts with
add-ons” (10.8%), “healthy dinners with add-ons” (1.0%), “unhealthy breakfasts” (3.7%), and “unhealthy dinners” (22.3%). The majority of meal orders meeting calorie recommendations were estimated to fall into the healthy breakfast (γ=70%) and healthy dinner (γ=28%) classes (62.2% of total orders).

**Conclusions:** Estimates suggest that ordering patterns consistent with the healthy menu changes were most common and were more likely to meet calorie recommendations. Yet ordering patterns inconsistent with menu changes also emerged (unhealthy meals or those with add-ons) and can inform intervention efforts to reach patrons who may reject or compensate for healthier items.

**T-P-3494**

**Prevalence of Obesity and Severe Obesity Among Urban Public Elementary School Children in St. Louis, MO: 2008-2015**

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**Background:** Children residing in low-resource areas are at increased risk for obesity and its associated comorbidities. Severe obesity places children at even greater cardiometabolic risk. The aim of this study was to determine the prevalence of obesity and severe obesity among predominantly minority, urban public elementary school children in St. Louis, MO from 2008 to 2015.

**Methods:** Participants included 4th and 5th grade students attending 45 urban public elementary schools during school years 2008-2009, 2009-2010, 2012-2013, 2013-2014, and 2014-2015. All measurements of height and weight were performed at the schools. BMI, BMI-for-age percentile, and BMI z scores were computed using CDC BMI SAS code. Obesity was defined as BMI-for-age ≥ 95th percentile; severe obesity was defined as BMI-for-age ≥ 120% of the 95th percentile.

**Results:** The overall sample included more than 4,000 students (51% male) assessed during the 5 school years, with no demographic differences across years. The majority of students were Black (>80% each school year) and most students (~95%) qualified for the National School Lunch Program based on family income. Mean age was 10.7 (SD 0.8) years. The prevalence of obesity averaged 22.4% (range 19.4% - 26.3% per school year) and was slightly higher among girls than boys. Severe obesity averaged 8.7% (range 6.7% - 10.6% per school year), with no significant effects of sex or grade.

**Conclusions:** The relatively high prevalence of obesity and severe obesity among these urban public elementary school children highlights the importance of school-based initiatives to help improve weight status at an early age to minimize the cardiometabolic consequences of excess adiposity.

**T-P-3495**

**Small Prizes Increase Healthful Food Selection in a School Cafeteria without Increasing Waste**

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**Background:** We recently demonstrated that small prizes given for a “Power Plate” (plain low fat milk, entrée, fruit and vegetable) can be used in an elementary school cafeteria to increase the selection of this preferred combination of foods by over 300%. A primary concern about such a program is that waste could be increased as students take items to get a prize, but may not be consuming these selected healthier items. The purpose of this study was to measure changes in student selection and food waste when the Power Plate (PP) program was implemented at a previously unexposed inner city elementary school.

**Methods:** The PP intervention was done at a Cincinnati public inner city elementary school, which is made up of 329 students grades K through 6. 94.1% of whom are lower income, 98% African American and 1% Caucasian. Green smiley-faced emoticons were placed next the preferred foods and children were given a small prize, sticker or tattoo if they selected the items that composed a PP. Data was obtained by direct observation and cash register receipts over a two week period. The trays of 111 students before the intervention and 96 after were examined for content and waste over two days. Food was ranked by observers as having 0%, 25%, 50%, 75% or 100% wasted. Chi square testing was done on food selection and Whitney-Mann testing on food waste.

**Results:** Selection of the PP increased from 2% of students to 73%, plain low fat milk went from 3% to 82%, vegetables from 22% to 82% (P<0.001 for all). There was no significant difference in food waste before and after the intervention with regards to fruit (37% before, 35% after), vegetables (22% before, 36% after), total milk (72% before, 78% after) and entrées (34% before, 31% after).

**Conclusions:** Small prizes as an incentive for better food selection is an effective intervention and does not lead to an increase food waste.

**T-P-3496**

**Strategies Utilized in the Labeling of Food and Non-Alcoholic Drinks Directed at Children**


**Background:** The population is exposed to different marketing strategies in the purchase of products high in fat, sugar and sodium. Objective: To characterize the marketing strategies utilized by products consumed by children, as well as the nutritional content of these products.

**Methods:** Using the criterion of highest population density, we selected 21 supermarkets of different retail chains located in the Mexico City. During visits to the supermarket we bought 183 different products. For the analysis, these products were grouped into categories: sugary cereals, sugary drinks, sweet snacks, salty snacks, dairy and fast food. We evaluated the nutritional content of fat, sugar and sodium in these products, and classified the marketing strategies utilized according to the public to whom the marketing was addressed.

**Results:** Of the products purchased that included some kind of promotion on the package, the majority (45.9%) were sweet snacks, 20.2% were sugary drinks and 10.9% were dairy products. 58.5% of all products utilized some type of character; in 56.8% of the cases these were animated characters. 26.7% of products utilized 3 "tags" to draw consumers' attention: celebrities, slogans and reference to nutrient content (low or reduced fat, vitamins). The average content of fat, sugar and sodium in products aimed at children was: 9.5g, 77.9g and...
Background: The National School Lunch Program (NSLP) is an essential component of a community’s ability to provide adequate nutrition for children. Low consumption and high food waste keep the NSLP from reaching its full potential since program improvements in nutrition (e.g., Healthy Hunger-Free Kids Act of 2010).

Methods: We pre-tested (via an online survey) the potential efficacy of 13 messages to be eventually placed on table tents to encourage increased school lunch consumption and decreased waste. The top five messages were printed on table tents, which were placed on tables around a middle-school cafeteria in a pilot study lasting two weeks. The control period included two weeks during the previous month in which the menu exactly matched the pilot study period. In control and pilot study periods, we collected aggregate school lunch plate waste from all students for the categories of fruit, vegetables, milk, and remaining food.

Results: Compared to the control period, remaining food waste decreased by 14.4% (p = .02) per person per day and fruit waste decreased by 20.8% (p = .09) per person per day. There were no other significant plate waste decreases (i.e., vegetables waste decreased by 20.8% (p = .09) per person per day. There were no other significant plate waste decreases (i.e., vegetables and milk).

Conclusions: Using table tents as a marketing tool to reduce plate waste may be a viable option to increase healthy lunch consumption in school cafeterias. The table tents cost less than $150 to produce and were easy to install and remove.

T-P-3498
The Growing Healthy Roots: Raising Awareness of Farmers’ Markets in Food Deserts in New Orleans, Louisiana

Background: Low-income populations are at greater risk of developing obesity partly due to limited access to fresh, affordable produce. The Hollygrove Market and Farm (HMF) is located in an underserved neighborhood and food desert in New Orleans. It is underutilized by Supplemental Nutrition Assistance Program (SNAP) participants despite receiving a 20% discount. The goal of this intervention was to implement and evaluate a multimedia social marketing campaign designed to increase fruit and vegetable (F&V) purchases and assess barriers, e.g., awareness and perceptions of shopping at the HMF among SNAP participants in New Orleans.

Methods: Self-report questionnaires, which measured awareness of farmers’ markets, F&V purchasing behaviors and perceptions regarding social marketing materials, were distributed in the Hollygrove community. Intervention materials were disseminated via websites and handouts. Participant satisfaction was measured by website views and questionnaires. SNAP purchases in the HMF were documented and questionnaires were analyzed.

Results: Researchers collected 50 questionnaires, posted over 50 posts on social media and distributed >1000 promotional cards; 30% of participants earned ≥$10,000 per year; >70% were not aware they could use SNAP or offered discounts in HMF; 88% agreed it’s important to purchase F&V, 25% did not consume adequate amounts of F&V; 68% had access to internet, and 50% had social media accounts. The website received >450 views and median satisfaction rate for internet marketing was 4 out of 5 (strongly like). Average discounted SNAP purchases were $1,958/month prior to the six month intervention.

Conclusions: Findings indicated a lack of awareness of SNAP benefits in farmers markets. Despite rating F&V purchases highly important, only 75% of those surveyed consumed adequate amounts. Internet social marketing was viewed satisfactorily and tracking SNAP purchases was feasible; thus, internet-based campaigns to increase SNAP purchases in farmers markets may be beneficial.

T-P-3499
Weighting the Factors Associated with Children Obesity: a Random Forest Approach
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Background: Obesity and overweight (OWO) are a recognized worldwide health issues. Individual data are needed in order to assess role played by different factors. A key point is whether commonly accepted risks factors for child obesity play the same role in the various countries. Difficulties arise when the number of variables/number of subjects ratio is close to, if not greater than, one. This makes common regression approaches impracticable.

Methods: Data on 2640 children 6-11 years (Argentina, Brazil, Chile, France, Georgia, Germany, UK, Italy, and Mexico) were collected on more than 90 parameters (anthropometrics, built environment, familiar socio economic status, food and activity frequency). Two outcomes were considered, BMI z-scores and WHO classes of OWO vs. Normal children. Given that sample size is heterogeneous across countries (from 60 up to 1640 children), role played by each potential factor associated with both outcomes separately was estimated using Random Forests (RF), which have been implemented using 150000 bootstrap samples using Bylander’s bias-correction approach. All factors have been used as potential predictors of both outcomes. One-hundred permutations per tree were run for assessing each factor’s importance, using the mean of squared residuals for BMI z-score and the Out-of-Basket (OOB) classification error rate for OWO vs. Normal.

Results: Factors do not explain variability in BMI z-score (from 5% up to 34%) and to classify OWO children (error rate from 5.50% up to 94.7%), in the same extent in the various countries.

Conclusions: These findings suggest that cultural heterogeneity exists in the roles played by the same factors on children’s obesity.
T-P-3500-DT
Beverage Purchases from Stores Since the Start of the Mexican Sugar-Sweetened Beverage Excise Tax: A Year Out
Shu Wen Ng Chapel Hill North Carolina, M. Arantxza Colchero Cuernavaca Morelos, Barry Popkin Chapel Hill North Carolina, Juan Rivera Cuernavaca Mo

Background: Excessive sugar-sweetened beverage (SSB) intake is linked with obesity and many cardiometabolic problems. Mexico’s high SSB intake and a high prevalence of obesity, diabetes and related noncommunicable diseases led the Government to institute a 1 peso/liter excise tax on SSBs starting January 1, 2014 (~10% of 2013 prices). This study evaluates changes in beverage purchases from stores following the first year of the tax.

Methods: We conduct an observational study from a sample of 6,253 households representing residents from 53 cities across Mexico with >50,000 inhabitants from the Nielsen Consumer Panel Service. We use reported household purchases from Jan 2012-Dec 2014 (N=205,112 household-months) to measure the volume of taxed and untaxed beverages purchased before and after the tax. To account for unobserved time invariant household characteristics, we used fixed effects models controlling for household composition and demographics, and applied difference-in-difference analyses to determine how different the post-tax trends in purchases were from pre-tax trends. We then predicted the counterfactual post-tax purchases based on model adjusted pre-tax trends and compared these to the model adjusted post-tax purchases.

Results: Relative to the counterfactual expected trend without the tax, purchases of taxed beverages in the post-tax period fell at an increasing rate, reaching ~12% by Dec 2014 (p<0.001), representing a 6% decrease over 2014. This was due to a decline in uncarbonated SSBs (~7%) and taxed sodas (~1.2%). Meanwhile, purchases of untaxed beverages were 4% higher than the counterfactual, driven by increases in still-plain waters (~2.6%).

Conclusions: Since the implementation of the SSB tax, reduced store purchases of taxed beverages have accelerated while the purchase of untaxed beverages has risen. There is a need to continue monitoring these changes to understand longer-term purchase changes as well as potential implication for health.

T-P-3501
Finding Smart Investments in Early Childhood Obesity Prevention Policy: the Cost Effectiveness of a Policy Promoting the Nutrition and Physical Activity Self Assessment for Child Care (NAP SACC)
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Background: Early childcare and education programs (ECE) are key settings for preventing childhood obesity. Although evidence for effective obesity prevention interventions in ECE is growing, little is known about the cost-effectiveness of implementing these evidence-based programs as policy. Our objective was to estimate the cost-effectiveness of a nationwide implementation of the Nutrition and Physical Activity Self Assessment for Child Care (NAP SACC) program.

Methods: The Childhood Obesity Intervention Cost-Effectiveness Study (CHOICES) microsimulation model was used to estimate the cost-effectiveness of a hypothetical nationwide roll-out of the NAP SACC program through state child care Quality Rating and Improvement Systems (QRIS). We estimated the total cost of program implementation, including training, consulting, monitoring, and changes to food service and physical activity equipment. To estimate the population effect, we used a published randomized, controlled trial demonstrating the efficacy of NAP SACC on reducing BMI z-score. Healthcare costs averted and the cost-effectiveness of ten-year reductions in per capita body mass index (BMI) and childhood obesity prevalence were estimated for the 2015 U.S. population.

Results: If the NAP SACC program were to be disseminated to licensed ECE programs through state QRIS programs, we estimate that this policy strategy could reach 3.9 million 3-5 year old children and cost, on average, about $91.40 per child and $1010 per BMI unit reduced per year (95% UI: $549, $632). The impact of this proposed policy intervention on obesity prevalence will be presented.

Conclusions: Investment in the dissemination of an evidence-based intervention strategy to reduce BMI in young children in child care settings could improve children’s weight gain trajectories and reduce the prevalence of overweight and obesity while costing little compared to obesity treatment programs.

T-P-3502
Is it Time for a Sugar-Sweetened Beverages Tax in Canada and May Quebec Come First?
Yann Le Bodo Québec QC, Maude Dionne Québec Quebec, Philippe De Wals Québec QC

Background: Taxing sugar-sweetened beverages (SSB) has been increasingly discussed, often disputed, and implemented in a few jurisdictions. We attempt to document the prospect for SSB taxation in Canada, particularly in Quebec. Obstacles, supportive factors and unsolved issues are underlined.

Methods: In 2011, we undertook a research program including: (1) a comprehensive review of the literature pertaining to SSB taxation; (2) a systematic Canadian press review of the debate on SSB taxation between 2008 and 2014; (3) a case study of the French ‘soda tax’.

Results: At federal level, as suggested by analyses of public discourse, the prospect for SSB taxation under a conservative government is unlikely. However, the Canadian political landscape may change after the 2015 election. At provincial level, enforcing an excise tax is technically difficult but a dedicated sale tax may be an alternative. In recent years, data suggest that SSB taxation has been increasingly and more intensively debated in Quebec than in other provinces (> 50% of total position statements identified). This includes advocacy efforts of a vocal coalition group on weight-related issues, a strong opposition by other actors including the beverage industry, pros and cons statements from academic experts, contributions from a research group at Laval University working in collaboration with the Quebec National Public Health Institute, opinion polls showing support for taxation conditional to proper earmarking of revenues, an increasing interest at the public health administrative level, and varying statements by successive health ministers.

Conclusions: All these elements may signal a maturation of SSB taxation proposals, which may favor the adoption of a tax should a political window of opportunity open. Unsolved
issues include the positioning of taxation as part of a comprehensive nutrition policy, the identification of taxation mechanisms, its desirable rate and salience, and the relevance of including low-calorie beverages in the tax basis.

T-P.3503-DT
The Impact of the Economic Recession on Risk of Overweight among Children
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Background: Research on the effects of economic recessions on weight status is mixed. Economic downturns may impact children’s weight positively with parental engagement in health-promoting activities, such as preparing healthy meals when working hours decrease or negatively if healthful foods are rendered unaffordable, leading to increased household consumption of cheaper, energy-dense foods. Previous studies are largely limited to adults and have not followed participants over time as economic conditions change.

Methods: This analysis investigated the association between recession indicators from 2008-2012 and weight status among school-aged children in California (N=4,021,459) using longitudinal anthropometric measurements. The relationship between measures of child weight and annual county-level unemployment and foreclosure was assessed using ordinary least squares regression, with individual and county fixed-effects and race/ethnicity-specific age trends. Additionally, stratified models were used to assess whether results varied according to county-level urban/rural status, county-level median household income, or child sex.

Results: Approximately 36% of children were overweight and average unemployment and foreclosure were 11% and 6.8% respectively, over the study period. A 1-percentage point (pp) increase in unemployment was associated with a 1.4 pp (95% Confidence Interval [CI]: 1.3, 1.5) increase in overweight risk. The magnitude of this association was slightly greater in high-income counties (β = 0.015 95% CI: 0.014, 0.017), as compared to low-income counties (β = 0.013 95% CI: 0.012, 0.014). A 1-pp increase in foreclosure was associated with a 0.29 pp (95% CI: -0.48, -0.10) decrease in overweight risk; results did not vary by county-level income. No differences were found by county-level rural/urban status or sex.

Conclusions: Comparing children to themselves over time, increases in unemployment and foreclosure rates differentially impacted overweight risk.

T-P.3504-DT
Association between Proximity to Farm-to-Consumer Retail Outlets and Usage among WIC Program Participants in Jefferson County, AL.
Chelsea Singleton Birmingham AL, William Opoku-Agyeman Birmingham AL, Ermanno Affuso Mobile AL, Olivia Affuso Birmingham Alabama

Background: Farm-to-consumer (FTC) retail outlets (i.e. farmers markets, farm stands, and community gardens) have been mentioned as a strategy to increase healthy food access in the US. This research aimed to determine if proximity to FTC outlets is associated with increased usage among women who participate in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) in Jefferson County, Alabama.

Methods: Birmingham, AL WIC Program recipients were recruited between October 2014 and January 2015. Participants were asked to provide a current residential address and complete a brief questionnaire on fruit and vegetable purchasing behaviors. Geographic information systems (GIS) were used to geocode addresses of study participants (n = 300) and all FTC retail outlets (n = 33) in Jefferson County. Proximity to FTC outlets was measured by calculating the Euclidean distance in miles between each participant’s residence and the nearest FTC outlet.

Results: Approximately 66.7% of study participants were Non-Hispanic Black and 45.1% were obese. Approximately 79 (26.3%) women reported being FTC outlet users and 110 (36.7%) resided within 1 mile of a FTC outlet. Residing within 1 Euclidean mile of a FTC outlet was not associated with use of FTC outlets (OR: 0.74; 95% CI: 0.43 – 1.28). On average, the distance between participant’s residence and the nearest FTC outlet was greater for FTC outlet users compared to non-users (2.1 vs. 1.6 miles; p = 0.03).

Conclusions: Residential proximity to FTC outlets may not be associated with usage among WIC recipients in Jefferson County, AL.

T-P.3505-DT
Long-Term Effects of Ambient NO2 and PM2.5 Exposure on Type 2 Diabetes Risk Factors in Overweight and Obese Minority Children in Los Angeles
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Background: Air pollution exposure contributes to metabolic disease risk in adults, however no studies have examined this relationship in children. Our objective was to determine whether exposure to ambient air pollutants (AAP: NO2, O3, and PM2.5) were related to glycemia, insulin sensitivity and insulin secretion in overweight and obese minority children living in urban Los Angeles.

Methods: 446 African-American and Latino children (F/M: 195/251, 12.4±2.6 yrs, BMI z-score: 2.0±0.4) were assessed for body fat percent (BF%) by DEXA. Glucose and insulin from FSIVGTT with minimal modeling was used to assess insulin sensitivity (SI) and acute insulin response to glucose (AIRg). Concentrations of AAP were assigned by spatial interpolation of data from community monitors up to 18 months prior to testing using residential home addresses (Mean NO2: 17.9±5.3 μg/m3, PM2.5: 27.4±6.9 ppb). A linear mixed model was used to test the cumulative daily and monthly lag effects of AAP on metabolic outcomes after adjusting for age, sex, pubertal stage, ethnicity, BF%, and seasonality.

Results: Daily cumulative lags of AAP exposure (0 - 60 days) were not related to metabolic risk. Cumulative monthly lags from 1-18 months were significantly associated with metabolic outcomes. For example, fasting glucose was positively related to 12-month cumulative average NO2 [NO2 β: 0.18, (95% CI:0.11, 0.25)] and PM2.5 exposure [PM2.5 β: 0.28, (95% CI:0.20, 0.36)]. Log SI was negatively associated with NO2 [-0.02 (-0.03, -0.01)] and PM2.5 [-0.03 (-0.04, -0.02)] while AIRg was positively associated with NO2 [24.3 (35.6, 13.0)] and PM2.5 [44.8 (59.0, 30.6)]. Ozone was not associated with any of metabolic outcomes.

Conclusions: High exposure to NO2 and PM2.5 ranging from 1 to 18 months was associated to higher fasting glycemia,
lower insulin sensitivity, and higher insulin secretion. Consequently, increased long-term NO2 and PM2.5 exposure may be a risk factor to underlying type 2 diabetes pathophysiology in overweight and obese minority children.

**T-P-3506**

**Success of CME at Improving Physician Communication with Patients Related to Weight Loss**

Amy Larkin Lexington Kentucky, Robert Braun New York NY, Karen Badal New York NY

**Background:** Despite obesity being recognized as a disease, only about 40% of patients who are overweight or obese typically have discussions with their physicians about weight, suggesting physician discomfort with initiating these discussions with patients. We sought to determine if continuing medical education (CME) improves physician performance related to communicating with patients about weight loss.

**Methods:** The CME activity consisted of an online video roundtable discussion with leading experts in the field of obesity treatment. The effects of education were assessed using a case-based linked pre-assessment/post-assessment. In addition, a smaller sample was analyzed for follow-up (30-60 days post-education). The McNemar’s chi-square test was used to assess differences from pre- to post-assessment. P values are shown as a measure of significance; P values <.05 are statistically significant. Cramer’s V was used to calculate the effect size. The activity launched online on September 15, 2014 and data were collected for 3 months.

**Results:** Overall, the analysis demonstrated significant improvement for PCPs (n = 294; P <.001) related to patient communication strategies to address weight management. The effect of the education immediately after participation was moderate (V = 0.475): 44% of PCPs answered all questions correctly on the pre-assessment compared with 70% on the post-assessment. Follow-up analysis showed retention, as well as a progression, of the educational impact with increases in correct responses from pre-assessment to follow-up ranging from 12% to 23%. Data indicate future education is needed to providing weight management guidance for patients who demonstrated initial weight loss success but subsequently experienced weight gain.

**Conclusions:** This study demonstrates the success of a targeted educational intervention with access to the right physician audience (PCPs at the forefront of obesity treatment) on improving communication with patients about weight loss.

**T-P-3507**

**The Highly Taxed Bariatric Surgeon: The Disturbingly High Cost of Taxes, Hidden Fees, Slight Deviations from the Truth, Disclosures and Disclaimers**

Victoria Powell Phoenix AZ

**Background:** Research seeks to 1. Identify and rank the financial threats to bariatric surgery and weight loss practices which are not currently addressed in practice management, but may hide in plain sight in legal and regulatory fine print. A primary example would be “stealth” taxes massively targeting surgeons. 2. Find practical solutions, if they exist. Both problematic regulation and competition are addressed.

**Methods:** Research focused on legislation, case law, and academic literature review in law, tax, and finance. Surgeons and practice owners’ perceptions of economic threats were identified by new interviews and existing published data. Legal experts and academic financial researchers were consulted for current thinking on regulatory workarounds.

**Results:** Study reveals severe new financial realities, and some immediate practical solutions. Topics include changes to the law of medical deductibility, fringe benefits and providers' role as health care tax rules apply, disability, retirement rules, and doctors as executives for tax-favored compensation. It provides insight into shortcuts for quicker access to help over time. Legislation and case law will be updated one month prior to presentation.

**Conclusions:** 1. Interviews and surveys reveal that some perceived financial threats are illusory, including, significantly, certain professional liability concerns commonly held. 2. While many threats and risks are significant, there is a great deal of health marketplace “noise” which masks some real problems. Attendees will benefit from a new, more evidence-based understanding of real risks not previously considered and planned for. 3. Research reveals at least seven current strategies and legal remedies which have proven effective in mitigating losses, and new ones that show promise. These include methods used by large corporations to compensate executives which can be successfully translated to incorporated bariatric surgery and weight loss practices of any size or number of providers.
Friday, November 6, 2015
Posters on Display: 12:00-1:30 PM

T-P-3509
Adipocyte Size Contributes for the Heterogeneity of the Adipose Tissue Function

Background: Adipose Tissue is distributed in several depots and the metabolic abilities of these adipocytes seem to be different. The balance between lipolysis and lipogenesis can influence adipocyte volume and seem to influence the functioning of Adipose Tissue. Therefore, we evaluate the possible correlation between the adipocyte metabolic capacities and the mean adipose cell size from different adipose fat pads of rats

Methods: Male Wistar rats ageing 16 weeks were sacrificed, and adipose tissue samples from subcutaneous (SC), periwoundal (PE) and retroperitoneal (RP) fat pads were excised and the adipocytes were isolated. These cells were submitted to ex vivo biological tests of incorporation of D-[U-14C]-glucose into triglycerides and into its glycerol moiety.

Results: The mean adipocyte volume was statistically different in all fat pads (RP>PE>SC) (N=14; *p<0.05). Adipocytes from RP fat pad incorporated more glucose into neutral lipids and into the glycerol moiety of triglycerides than PE and SC fat pads (N=11; *p<0.05). There was a positive correlation between lipogenesis and the size of adipocytes: Baseline (n= 42; r 0,5384; *p<0,0007) and stimulated (10nM insulin) (n=36; r 0,7494; *p<0,0001). Between lipogenesis and the size of adipocytes: Baseline (n= 42; r 0,6292; *p<0,0001) and maximally stimulated (10mM insulin) (n=36; r 0,5384; *p<0,0007) glucose incorporation into total lipids; Baseline (n= 42; r 0,4359; *p<0,05) and maximal (n=42; r 0,5136; *p<0,05) glucose incorporation into TAG-glycerol

Conclusions: Differences found in the metabolic profile of different fat pads are strongly correlated with their cell sizes which may explain the differential response due to the different anatomical localization of fat depots

T-P-3510
Betacryptoxanthin (BCX) reduces visceral fat and ameliorates features of risk factors in Insulin Resistance Induced by High-Fat Diet in Rodents
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Background: The percentage of U.S. adults who are obese continued to trend upward in 2014, reaching 27.7%. Rising obesity rates have significant health consequences such as DM, hypertension, CVD and inflammatory disorders. More than one-quarter of health care costs are now related to obesity. Abdominal fat accumulation is associated with oxidative stress as determined by low levels of serum carotenoids. Betacryptoxanthin (BCX), a provitamin A source, are inversely associated with change of BMD. Lower serum levels were observed with higher BMI. In vitro study findings in different cell lines show that BCX reduced fat accumulation by down-regulating FAS, SCD-1 and C/EBPα in 3T3L1 adipocytes. BCX significantly upregulated ECAD over control in prmary bronchial epithelial cells. To study the effects of BCX on body weight, visceral fat and cardio-metabolic health risk factors in insulin resistance induced by high-fat (HF) diet in rodents.

Methods: Male Sprague Dawley rats (N=28, age: 8 week, weight: 180 ± 20 g) were housed in a controlled environment and provided with rat chow and water ad libitum. After 2 weeks acclimation, rats were divided into four groups: (1) Control standard diet (C), (2) High Fat Diet (40% of calories as fat, HFD), (3) C+ BCX (2.5 mg/kg), (4) HFD+ BCX (2.5 mg/kg) administered for 12 weeks. Oxidative stress genes and inflammatory responses were analyzed. CMS risk factors were analyzed. Treatments were compared using ANOVA and student's unpaired t test; P < 0.05 was considered statistically significant.

Results: BCX administration significantly reduced body weight, visceral fat and food intake, reduced oxidative stress and cardio-metabolic health markers and decreased inflammatory markers. No gross lesions, no mortality and no adverse events were observed.

Conclusions: These observations suggest that BCX may be considered as an adjunct therapy to reduce visceral fat and complications associated with visceral fat and cardio-metabolic health risk factors.

T-P-3511
Continuous Treatment with Liraglutide is the Most Optimal Treatment Regimen in DIO Mice
Lotte Simonsen Maaloev Copenhagen, Lotte Knudsen Maaloev Denmark

Background: Liraglutide, a glucagon-like peptide-1 (GLP-1) receptor agonist, lowers body weight (BW) in individuals with obesity. The aim of the present study was to examine whether periods of no or lower dose treatment followed by return to full dose would increase the resulting BW loss.

Methods: Diet induced obese (DIO) mice (n=9) were treated for 5 weeks with liraglutide or vehicle, either continuously at high dose (1 mg/kg s.c. once daily) or with periods (2–6 days) of vehicle or lower doses (0.1–0.6 mg/kg). BW and food intake were recorded daily.

Results: Continuous dosing of high dose liraglutide to DIO mice induced a mean weight loss of 23%, which stabilized within the first 2–3 weeks. On discontinuing liraglutide treatment, animals immediately started re-eating, leading to a BW gain of up to 10%, until liraglutide treatment was re-initiated, re-inducing a drop in food intake and resulting in a BW loss of around 7%. Hence, although food intake was lowered every time liraglutide was re-initiated, this short lasting additional lowering of food intake did not lead to a greater BW loss in animals which were discontinued and re-introduced to full-dose liraglutide. Neither did periods of treatment at a lower dose induce additional BW loss than observed in continuously treated mice. Total BW loss was 23% with continuous treatment vs. 18–19% with periods of vehicle or lower dose (ns).

Conclusions: The most effective liraglutide treatment regimen for body weight loss seems to be continuous administration.
T-P-3512
Diet-Induced Activation of PPARδ Using Cottonseed Oil Improves Liver Metabolic Profiles in Mice
Chad Paton Athens GA, Roger Vaughan Lubbock TX, Fariba Assadi-Porter Madison WI, Jamie Cooper Lubbock Texas

Background: Peroxisome proliferator activator receptor delta (PPARδ) has been shown to have an effective target to combat obesity and metabolic disease, however non-pharmacological methods of activation have yet to be identified. We tested the ability of various naturally occurring oils to increase PPARδ activity and found that cottonseed oil (CSO) was effective in activating liver expression and activity.

Methods: Male C57BL/6 mice were fed a diet supplemented with various oils (50% Kcal from fat-matched for macronutrient and caloric content) for 4 weeks with body weight and food intake measured weekly. Total energy expenditure, glucose tolerance, and tissue protein and mRNA expression was measured after 4 weeks. NMR-based metabolomics was conducted on livers to examine changes in pathways of macronutrient metabolism.

Results: There were no differences between chow- and CSO-fed mice in body weight or food intake (Kcal/wk) however total energy expenditure and fat oxidation increased compared to chow-fed groups. Additionally, CSO-fed mice displayed significantly elevated liver PPARδ and Pgc-1 expression that correlated with energy expenditure. Metabolomic analyses revealed that the livers of CSO-fed mice closely matched those of chow-fed and significantly differed from other fat-enriched diet groups using principal component analyses. Fatty acid composition of the diets and livers revealed no significant differences in lipid species between groups, indicating that a non-lipid species is likely responsible for the increased PPARδ expression and enhanced metabolic effects of CSO.

Conclusions: Taken together, our observations support the hypothesis that CSO may be useful as a dietary means to increase PPARδ expression with concomitant elevations in total energy expenditure and improved hepatic fatty acid oxidation. A diet containing 50% of total calories from CSO increased PPARδ expression with concomitant elevations in total energy expenditure and fat oxidation compared to Chow. Leptin to fat mass ratio was significantly lower in mutants despite the absence of increased intake. Cβ KO mice had increased VO2 at both ambient (23°C) and thermoneutral (30°C) conditions. Total energy expenditure (TEE) only appeared elevated if corrected for BW, yet we did not differ if corrected for lean mass. CβKO mice exhibited a blunted response to the specific β3 adrenergic receptor agonist CL316,243 (0.1mg/kg, ip). Post-CL TEE was significantly decreased in mutant compared to WT mice.

T-P-3514
Does a Lower Resting Metabolic Rate Predict Weight Loss in Bariatric Surgery Weight Loss Patients

Background: Energy intake and energy expenditure are primary components of the energy balance equation. For most adults, resting metabolic rate (RMR) is the principle component of energy expenditure. There are equivocal findings on the role that RMR has in the etiology and treatment of obesity. The purpose of this study was to examine the effect of RMR on weight loss in obese patients undergoing bariatric surgery.

Methods: Data were obtained from a chart review of patients from the Wake Forest Baptist Health Weight Management Center who underwent bariatric weight loss surgery. RMR was measured using the MedGem® indirect calorimeter under standard testing conditions. The % total weight loss from presurgery was obtained at 3 and 6 months post-surgery. Patients were separated into 3 groups based on their measured RMR: < 1600 kcal/day (n=29); 1600-2000 kcal/day (n=45); >2000 kcal/day (n=52). Comparisons between the RMR groups for % weight loss were made by one-way ANOVA. Data are presented as means±S.D.

Results: Mean age was similar across the 3 RMR groups (43-49 years) and 80% of patients were women. Mean BMI was 51.2±40.9 kg/m2, and while there was a trend for BMI to highest for the > 2000 kcal RMR category, this did not reach statistical significance (p=0.074). Less weight was lost for the <1600 RMR category (10.9±14.8% at 3 months and 20.0±12.2% at 6 months) compared to the 1600-2000 and >2000 categories at both 3 (19.6±15.6% for 1600-2000 and 18.6±5.6% for > 2000) and 6 months (25.7±7.6% for 1600-2000 and 27.7±6.0% for >2000) post-surgery.

Conclusions: In this analysis of bariatric surgery weight loss patients, having the lowest RMR resulted in less weight loss through at least 6 months post-surgery. Further research is needed to understand the etiology and treatment of obesity.

T-P-3513
Disruption of the Cβ Subunit of Protein Kinase A in Mice Causes Blunted Response in β3 Adrenergic Receptors and a Paradoxical Decrease in Leptin:Fat Mass Ratio
Edra London Bethesda MD, Constantine Stratakis Bethesda MD

Background: Protein kinase A is central to the regulation of cellular metabolism and energy homeostasis as it mediates actions of the second messenger cAMP. Of the two primary PKA catalytic subunits, Ca is expressed ubiquitously, whereas Cβ is expressed more restricted. Cβ is expressed highly in skeletal muscle.

Methods: 12 week old WT and Cβ KO mice (4-8/group) were assigned to regular chow or high fat diet (HFD) for 14 weeks. BW was measured weekly; body composition, fat depot weights and serum parameters were quantified after week 14. A separate cohort (n=4/group) was subjected to indirect calorimetry and glucose and intolerance tolerance tests after 1 month HFD.

Results: As previously shown, PKA Cβ KO mice were lean and resist HFD-induced obesity and dysregulated glucose metabolism: male mutants were leaner regardless of diet whereas female mutants were significantly leaner than WT mice only after HFD feeding. Serum free fatty acids, triglycerides, cholesterol, and leptin were decreased in mutant compared to WT mice after ad libitum HFD feeding. Leptin to fat mass ratio was significantly lower in mutants despite the absence of increased intake. Cβ KO mice had increased VO2 at both ambient (23°C) and thermoneutral (30°C) conditions. Total energy expenditure (TEE) only appeared elevated if corrected for BW, yet we did not differ if corrected for lean mass. CβKO mice exhibited a blunted response to the specific β3 adrenergic receptor agonist CL316,243 (0.1mg/kg, ip). Post-CL TEE was significantly decreased in mutant compared to WT mice.
needed for longer follow-up and to examine the role of initial body weight and other factors in this observation.

T-P-3515

In Vivo miR-150 KO mice show metabolic benefits
Minsung Kang Birmingham AL, Wei Zhang Birmingham AL, Elizabeth Ma Birmingham Alabama, Yuchang Fu, W. Timothy Garvey Birmingham AL.

Background: Globally the number of people suffering from obesity was 2.1 billion in 2013. It is critical that the biological mechanisms underlying obesity be identified in order to develop rational strategies for treatment and prevention. Short non-coding micro-RNAs (miRNAs) are known to act as post-transcriptional factors regulating transcriptional factors and gene expression; however, little is known about the role of miRNAs in obesity. Based on our earlier data demonstrating effects on macrophage biology, we have specifically studied the effects of miR-150 on metabolism by generating miR-150 knockout mice.

Methods: Body weight and food intake of single caged WT and miR-150 KO male mice were measured weekly. Tissues were dissected after 10 weeks on high fat diet, and RT-PCR was performed to check gene expression in adipose tissues.

Results: KO mice exhibited lower body weight compared with WT, despite consuming less food. KO mice were also found to have lower fasting glucose levels both on normal chow and HFD. KO mice exhibited lower body weight compared with WT, despite consuming less food. KO mice were also found to have lower fasting glucose levels both on normal chow and HFD. KO mice were also found to have higher leptin gene expression in adipose tissue, and increased gene expression related to insulin signaling, glucose metabolism, and fatty acid turnover indicative of increased synthesis as well as beta-oxidation.

Conclusions: The results indicate that a specific miRNA, miR-150, exerts profound effects on systemic metabolism. When compared with WT, miR-150 KO mice were found to have a lean phenotype despite reduced food intake, and to have enhanced insulin sensitivity and glucose tolerance. These systemic effects were accompanied by changes in adipose tissue gene expression predicting reduced leptin production, enhanced insulin signaling, and augmented lipid metabolism. miR-150 may represent both a biomarker and novel therapeutic target regarding obesity and insulin resistance.

T-P-3516

Loss of Hepatic Aryl Hydrocarbon Receptor Alters the Thermogenic Properties of White Fat and Protects Against Diet Induced Obesity
Dwayne Carter Galveston Texas, Craig Porter Galveston Texas, Cornelis Elferink Galveston Texas

Background: The aryl hydrocarbon receptor (AhR) is a ligand activated transcription factor commonly known for its role in xenobiotic metabolism. However, the generation of AhR-null mice has revealed physiological roles for the AhR in lipid metabolism and energy expenditure. The AhR is highly expressed in the liver, which is a major endocrine regulator of lipid homeostasis. To investigate how AhR activity in the mouse liver affects lipid metabolism, we utilized liver specific tamoxifen inducible AhR conditional knockout (AhR-CKO).

Methods: Adult female (8-10 week) AhR-floxed (AhRfx/fx controls) and AhR-CKO (AhRfx/fx Alb-CreERT) mice were treated with tamoxifen to eliminate hepatocyte AhR expression. Mice were maintained on a normal chow diet for 10 weeks and body weight measured weekly. Mice were also fed a 41 Kcal % high fat diet (HFD) for 3 months and weighed weekly. We analyzed mouse gonadal white adipose tissue (GWAT) morphology using H&E staining and assessed uncoupling protein 1 (UCP1) expression in GWAT by immunohistochemical staining for UCP1. Oil Red O staining was used to analyze the lipid content in mouse livers maintained on a HFD. GWAT mitochondrial respiration was determined at 5 weeks using an oroboros oxygraph-2k high-resolution respirometer.

Results: AhR-CKO mice exhibited markedly reduced body weight gains and increased expression of UCP1 in GWAT depots in mice maintained on both normal chow and the HFD. AhR-CKO mouse GWAT also revealed significant increases in mitochondrial respiration rates compared to controls, consistent with the increased expression of UCP1 the and multilocular morphology observed in H&E sections. These changes are indicative of browning of the white adipose tissue.

Conclusions: The results demonstrate that AhR biology in the liver can dramatically affect white adipose tissue homeostasis, where loss of the hepatic AhR culminates in browning of white fat concomitant with reduced weight gain even in animals maintained on a HFD.

T-P-3517

Modeling Plasma Amino Acid Kinetics in Growing Pigs
John Dawson Lubbock Texas, Whitney Stuart Lubbock TX, C.F.M. de Lange Guelph Ontario, Anoosh Rakshandeh Lubbock Texas

Background: Metabolism of amino acids (AAs) can be affected by infectious diseases. Longitudinal in vivo measurements of isotopically-labeled AA concentrations in plasma can be used to estimate aspects of AA metabolism such as AA flux. For data interpretation, models of curvature are typically fit using numerical optimization procedures that are highly sensitive to the initial settings, leading to results that are not robust, particularly when modeling plasma AA kinetics in a single individual.

Methods: Isotopic enrichment of AAs was determined in plasma of pigs following a bolus infusion of [U-13C, U-15N] AA mixture (Lys, Met, Thr, Trp, Ile, Leu, Val, Phe, Gin) before and 7-d after inoculation with porcine reproductive and respiratory syndrome virus. 13C and 15N enrichments were measured at 2.5, 5, 7.5, 10, 15, 20, 30 and 45 minutes after infusion for each pig and each AA. A double-exponential model was fitted to the data via nonlinear least-squares to calculate plasma fluxes for each of the AA and in each pig. As this procedure is highly sensitive to initial settings and may produce decidedly inferior model fits when used naively, the procedure was made ‘robust’ by randomly selecting 5000 initial model parameter values, and then selecting the best result as the initial setting for fitting for the globally optimal model.

Results: The modified procedure for obtaining initial model parameter values significantly improved the model fits, both for individual pigs (p = 0.0017) in a condition and collections of pigs (p = 9x10^-16) under a common condition, such as the pre-inoculation state; p-values correspond to paired t-tests on the residual sums of squares across all pigs and AAs.

Conclusions: The use of a modified procedure when fitting a nonlinear model, such as the double exponential model, significantly improves the accuracy of the model and makes it more robust. This work was supported by NPB 13-082

Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society
T-P.3518
Regular Exercise During Weight Regain Stimulates Hepatic de Novo Lipogenesis
Laura Allyson Checkley Aurora Colorado, David Presby Aurora CO, Julie Houck Aurora CO, Erin Giles Aurora Colorado, Amy Steig San Mateo CA, Matthew Jackman aurora CO, Ginger Johnson Aurora Colorado, Janine Higgins aurora CO, Paul MacLean Aurora Colorado

Background: Exercise reduces the rate of weight regain after weight loss. Our previous data indicate that exercise increases energy expenditure beyond the energetic cost of the exercise, which results from adaptations in peripheral tissues. In this study, we investigated exercise-induced molecular adaptations related to insulin signaling and de novo lipogenesis in the liver during weight maintenance and relapse.

Methods: Under obesogenic conditions, obesity-prone rats were matured, then weight reduced for 8 weeks with (EX) or without (SED) daily treadmill exercise. Rats were then fed their weight maintenance diet, or allowed to relapse for one day during which we assessed de novo lipogenesis (3H-H2O, ip). An energy gap-matched (GM) group of sedentary, relapsing rats were given a limited diet to match the positive energy imbalance in the EX rats. The expression of metabolic genes and proteins were measured in hepatic tissue via RT-PCR and western blot.

Results: EX rats displayed a similar level of de novo hepatic lipid retention as SED rats, but GM under the same energy excess retained less than the EX rats (P<0.08). Qualitative examination of adipophilin staining revealed greater lipid accumulation near the central vein in the SED and EX rats compared to GM. Gene and protein expression analyses support this exercise-induced increase in lipogenic capacity in the liver, with increased FASN and ACC1 RNA and protein (EX vs. GM, P<0.02). Insulin-regulated ACLY protein expression was increased in EX compared to GM (P=0.02).

Conclusions: During weight regain, exercise increased hepatic retention of de novo derived lipids and led to transcriptional adaptations in the liver to favor the more energetically expensive de novo lipogenic pathway. Stimulation of this pathway may be partially attributed to an increase in insulin sensitivity. This mechanism describes how hepatic tissue actively contributes to this favorable shift in fuel utilization during exercise in response to excess nutrients.

T-P.3519
Serum GLP-1, PYY, Ghrelin, Amylin and TNFα are Significantly Associated with the Severity of Childhood Obesity
Pardis Pedram St John’s, Peter Gregory St. Philips - Portugal Cove Newfoundland & Labrador, Antony Card Corner Brook NL, Tracey Bridger St. John’s NL, Hongwei Zhang St. John’s NL, Guang Sun St. John’s Newfoundland and Labrador

Background: The gastrointestinal tract and adipose tissue secrete many hormones that are actively involved in the regulation of appetite and energy metabolism. The differences between obese and normal weight children are rarely reported. Therefore in the current study we investigated the levels of GLP-1, PYY, Ghrelin were negatively while amylin was positively correlated with body composition measurements, further suggesting the uniqueness of relationship between these hormones and obesity in children.

T-P.3520
Ventromedial Hypothalamic Melanocortin Receptor Activation Induces Changes in Mediators of Skeletal Muscle Metabolism
Chaitanya Kumar Gavini Kent Ohio, Colleen Novak Kent OH

Background: The ventromedial hypothalamus (VMH) is conceptualized as a part of a pathway regulating energy balance (EB) through its actions on peripheral glucose and lipid allocation, modulating respiratory quotient (RQ) and thermogenesis. The central melanocortin (MC) system also plays a vital role in controlling EB, increasing energy expenditure (EE) and physical activity (PA), and decreasing appetite. We have demonstrated that intra-VMH MC receptor activation increases EE and PA and decreases RQ, switching fuel utilization to fats and lowering work efficiency wherein excess calories are dissipated by skeletal muscle as heat. We have also demonstrated that intra-VMH MC receptor activation increases sympathetic nervous system (SNS) outflow to skeletal muscle. Based on this, we hypothesize that MC receptor activation in the VMH may induce changes in skeletal muscle metabolic pathways.

Methods: Male Sprague-Dawley rats (n=16; 8/group) received guide cannulae aimed at the VMH. Rats received intra-VMH microinjections of the MC receptor agonist Melanotan-II (MT-II, 20pmoles/200nl) or vehicle (aCSF, 200nl). We examined mRNA and protein expression of mediators of metabolism in skeletal muscle, brown adipose, white adipose, and liver.

Results: Compared to vehicle, intra-VMH-MTII induced significant increases or trends in mRNA expression of mediators of EE (UCPs, PPARs, PGC1a) and a trend toward increased protein expression. There were no significant changes in mediators of energy conservation (K+ATP channels, MED1).

Conclusions: These results support the hypothesis that MC acts in the VMH to increase EE by lowering economy of activity through enhanced expression of mediators of EE in skeletal muscle. The data are consistent with the role of MC in the VMH in modulation of skeletal muscle metabolism.
Conclusions:
Subcutaneous (inguinal) adipose depots were observed. Larger adipocytes in both visceral (epidydimal) and re-esterification genes but not genes of de novo lipogenesis. and this was associated with increased expression of fatty acid triglyceride content was observed in the livers of sucrose mice, remained similar to that of the control group. Elevated greater in the sucrose group, whereas insulin tolerance and respiratory exchange ratio were both significantly higher and ambulatory movement was assessed, including tissue analyses of the liver and adipose tissue.

Results:
Compared to the control group, mice consuming sucrose were 11% heavier and had 97% more body fat. VO2 and respiratory exchange ratio were both significantly higher in the sucrose group, whereas ambulatory movement was decreased. Isoproterenol-stimulated whole-body lipolysis was greater in the sucrose group, whereas insulin tolerance remained similar to that of the control group. Elevated triglyceride content was observed in the livers of sucrose mice, and this was associated with increased expression of fatty acid re-esterification genes but not genes of de novo lipogenesis. Larger adipocytes in both visceral (epidydimal) and subcutaneous (inguinal) adipose depots were observed. Conclusions:
Chronic sucrose consumption at concentrations achievable in a typical human diet results in alterations to whole-body metabolism, adipose tissue expansion and ectopic lipid deposition. Hepatic lipid deposition is likely to be indirect, due to increased lipolytic activity in the adipose tissue causing increased fatty acid flux into the liver.

Methods:
70 d old mixed background male mice were given ad libitum access to standard rodent chow and water (control) or chow and water containing 10% (w/v) sucrose. Body composition and food/water intake were monitored weekly. After 12 wk, several indices of whole-body metabolism were assessed, including tissue analyses of the liver and adipose tissue.

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Chronic sucrose consumption at concentrations achievable in a typical human diet results in alterations to whole-body metabolism, adipose tissue expansion and ectopic lipid deposition. Hepatic lipid deposition is likely to be indirect, due to increased lipolytic activity in the adipose tissue causing increased fatty acid flux into the liver.

Methods:
70 d old mixed background male mice were given ad libitum access to standard rodent chow and water (control) or chow and water containing 10% (w/v) sucrose. Body composition and food/water intake were monitored weekly. After 12 wk, several indices of whole-body metabolism were assessed, including tissue analyses of the liver and adipose tissue.

Results:
Compared to the control group, mice consuming sucrose were 11% heavier and had 97% more body fat. VO2 and respiratory exchange ratio were both significantly higher in the sucrose group, whereas ambulatory movement was decreased. Isoproterenol-stimulated whole-body lipolysis was greater in the sucrose group, whereas insulin tolerance remained similar to that of the control group. Elevated triglyceride content was observed in the livers of sucrose mice, and this was associated with increased expression of fatty acid re-esterification genes but not genes of de novo lipogenesis. Larger adipocytes in both visceral (epidydimal) and subcutaneous (inguinal) adipose depots were observed. Conclusions:
Chronic sucrose consumption at concentrations achievable in a typical human diet results in alterations to whole-body metabolism, adipose tissue expansion and ectopic lipid deposition. Hepatic lipid deposition is likely to be indirect, due to increased lipolytic activity in the adipose tissue causing increased fatty acid flux into the liver.
T-P-3524
Drug Induced Metabolic Changes by Mice Model of Diet Induced Obesity
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Background: Insulin resistance is the most important underlying condition that contributes to the development of type 2 diabetes mellitus (T2DM). Mice of strain C57BL/6J are susceptible to high-fat diet-induced obesity (DIO). DIO in mice brings about attenuation of physical activity and therefore is a good model of common human obesity based on feeding with high fat diet and sedentary life style. Metformin is a drug of first choice for treatment of T2DM. Moreover, it is usually combined with dipeptidyl peptidase-4 inhibitors. But there are only limited information about their impact on metabolism.

Methods: It was followed influence of mono- and combined therapy by metformin and vildagliptine on DIO by mice of strain C57BL/6J. Forty DIO mice were randomized to 4 groups: 1) metformin, 2) vildagliptin, 3) metformin+vildagliptin, and 4) control. It was applied nuclear magnetic resonance metabolomic approach, which allowed to follow metabolic changes by metabolic profiling of mouse urine.

Results: It was observed substantial improvement of oral glucose tolerance test, which was followed by substantial changes in metabolomic profile. The response of the organism to the treatment changes remarkably with the duration of the therapy. The PLS analysis allowed us to differentiate between treated and untreated mice but also among therapy used. Among the metabolites which contribute the most to the separation, we can find lactate, acetate, succinate, methylamine, citrate, dimethylamine, taurine, 2-oxoglutarate, glucose, and phenylacetylglutamine.

Conclusions: The data shows, that the metabolism is changing during the course of the therapy. It is influenced mainly tricarboxylic acid cycle and methylamine pathway. The most important changes were observed in acetate level, which raised more than 140 % as a response to long-term treatment by vildagliptin and metformin+vildagliptine but not by metformin alone. It can be attributed to an increased beta-oxidation of fatty acids.

T-P-3525
Effect of Exercise and Topical Capsaicin on Body Weight and Metabolic Parameters in Ovariectomized Obese Wistar Rats
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Background: Insulin resistance is a metabolic disorder linked to obesity, with higher prevalence in menopausal women. Exercise and capsaicin can increase insulin sensitivity and reduce body weight in males. But it’s unknown whether the combination can improve the individual effects in hypoestrogenic females

Methods: 40 Female Wistar rats were ovariectomized and randomized into 8 experimental groups. Half of these animals (OvOb) received a 30% sucrose solution as drinking water for 28 weeks ad libitum, while ovariectomized controls (Ov) received water; during this time Ov and OvOb were fed with a solid standard diet. Groups were subjected to the next treatments for six weeks: capsaicin groups were treated with a 0.075% of capsaicin cream to reach a dose of 0.6mg/kg, on shaved abdominal skin daily; exercise groups were subject to a regimen of walking on a treadmill from 9 to 18 m/min during 20 min daily, with speed increases every 10 days; and the combination groups received the capsaicin cream 90 minutes before exercise; sedentary groups served as reference controls. Water, food consumption and body weight were measured daily. Oral glucose tolerance tests were determined after treatments. Trunk blood was collected to perform biochemical assays (TGS, total CHOL, HDL, LDL) and insulin level was measured to calculate HOMA index

Results: The combination caused a higher reduction in caloric intake, body weight, abdominal fat and insulin resistance in OvOb, while the effects of exercise and capsaicin were very similar. Capsaicin treatment caused a higher reduction on dyslipidemia

Conclusions: Our results suggest that topical capsaicin cream at 0.075 % can be used as alternative treatment against complications linked to obesity in hypoestrogenic females

T-P-3526-DT
Effects of 24 Hours of Overfeeding Diets with Varying Macronutrient Content on Human Energy Expenditure and Macronutrient Oxidation
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Background: The metabolic effects of overeating may vary depending on the macronutrient content of the diets eaten.

Methods: Sixty-two subjects (13 AA/18C/10H/21NA, 13F/49M, 28.5±10.1% fat, 37.1±10.3y; mean±SD) with normal glucose regulation and measures of % body fat (DXA) had 24h energy expenditure (EE) and macronutrient oxidation (MO) assessed in an indirect calorimeter during six 24h dietary interventions including energy balance (EB) and, given in random order, 5 different overfeeding (OF) diets with 200% energy needs including: 26% carbohydrates (C), 44% fat (F), 30% protein (P) (HPF); 50% C, 30% F, 20% P (BOF); 75% C, 5% F, 20% P (CNP); 20% C, 60% F, 20% P (FNP); 51% C, 46% F, 3% P (LPF). There was a 3-day washout period between diets.

Results: Compared to EB, EE increased with OF (BOF 10.3±3.5%, CNP 14.1±6.0%, FNP 128±9.0%, HPF 13.9±7.0% LPF 3.0±4.5%; all p<0.0001). Carbohydrate oxidation (CarbOx) increased in diets with >50% C (BOF: 35.6±34.2%, CNP: 80.0±49.2%, LPF: 50.2±50.7%; all p<0.001); and decreased with high F diets (FNP: -142±28.6%, p<0.001; HPF: -6.9±24.2%, p=0.05). Conversely, lipid oxidation (LipoX) increased with FNP (52.9±87.0%) and HPF (38.9±76.4%), and decreased with BOF (-32.3±45.6%, CNP (-94.5±78.8%) and LPF (-30.3±65.7) (all p<0.001). Despite these large differences, the individual MO rates were well correlated between overfeeding diets (CarbOx: all r=0.41, p<0.01; LipoX: all r=0.33, p<0.05, except LPF vs. FNP), even after accounting for age, sex, FM and FFM. The %CarbOx changes correlated with increase in EE only during FNP (r=0.37, p<0.005).
Conclusions: The average increase in EE with overfeeding is negatively correlated with %fat (r=−0.30, p = 0.01), but none of the changes in CarbOx and LipOx correlate with %fat.

Methods: 72 overweight and obese sedentary women were randomized to one of 4 groups; 2 were provided with foods at 70% of energy requirements (IF70; 3d/week of fasting for 24-h from 0800h-0800h) or DR70; and 2 were provided with foods at 100% of energy requirements (IF100 or control). Fasting body weight, insulin sensitivity (by hyperinsulinemic euglycemic clamp), blood pressure and blood lipids were assessed at baseline and 8 weeks.

Results: At 8 weeks, body weight was unchanged in controls (0.2±0.7 kg), but was modestly reduced in IF100 (+2.7±0.6 kg, P<0.05). DR70 and IF70 groups lost more weight than control and IF100 (P<0.01) but weight loss was not statistically different between IF70 and DR70 (-5.2±0.5 vs -4.0±0.5 kg, P=0.1). Insulin sensitivity was significantly improved from baseline in DR70 and IF70 groups only. Total cholesterol, LDL-cholesterol and triglyceride were also reduced in IF70 and DR70 groups only, and fasting glucose was reduced in IF70 only (all P<0.05). Greater reductions in triglycerides and total cholesterol were observed in IF70 vs DR70 in individuals who had metabolic syndrome at baseline.

Conclusions: Energy restriction is required to improve metabolic health during intermittent fasting diets in overweight and obese women. The intermittent fasting diet may be particularly advantageous for women with metabolic syndrome.

**T-P-3527**

**GPR43-Activation Protect Against Diet-Induced Obesity in Mice by Enhancing Hepatic Fat Oxidation**

Yuusuke Murata, Toda-Shi Saitama

**Background:** Short chain fatty acid (SCFA) is not only for an essential nutrient, but also acts as a nutrient signaling molecules. GPR43 has been identified as a SCFA receptor abundantly expressed in L cells and white adipose tissues (WAT). Recent study shows that SCFA decrease fat accumulation and increase oxygen consumption via GPR43. However, some controversial phenotype of GPR43 knockout mice were reported and anti-obesity mechanism of GPR43 remains unclear. Here we investigate the anti-obesity mechanism of GPR43 by a selective GPR43 agonist.

**Methods:** Male C57BL/6 mice were fed high fat diet (60% as energy as lipids) for 8 weeks of age before treatment started. GPR43 agonist was orally administered twice daily for 4 weeks or shorter term (3-5 days) in diet-induced obesity (DIO) mice.

**Results:** Compound A (Cpd.A) was identified as a selective agonist on GPR43, with an EC50 of 165 nM. Cpd.A significantly reduced body weights, WAT weights and cell size in DIO mice. Fat mass was significantly decreased in DIO mice treated with Cpd.A, whereas lean mass was not changed. In addition, hepatic triglyceride levels were decreased and insulin sensitivity evaluated by insulin tolerance test was improved by Cpd.A. SCFA-activated GPR43 has been reported to suppress appetite via GLP-1 secretion, but Cpd.A suppressed food intake, although GPR43 agonist is expected to be a novel peripheral acting drug without affecting food intake.

**Conclusions:** Our results suggest that GPR43 activation improve diet-induced obesity via increasing fat oxidation in liver. Most of current anti-obesity agents act centrally to suppress food intake, although GPR43 agonist is expected to be a novel peripheral acting drug without affecting food intake.

**T-P-3528**

**Intermittent fasting improves insulin sensitivity and blood lipids in obese women when coupled with energy restriction only.**

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**Background:** Intermittent fasting (IF) diets are increasingly popular, although few trials have been conducted in humans. In rodents, IF increases lifespan and reduces chronic disease risk, even without significant weight loss. These findings suggest that periodic energy deprivation, rather than weight loss per se, provides the impetus to improve metabolic health. Therefore, we conducted an 8-week randomised controlled feeding trial in women to test whether IF is as effective as daily dietary restriction (DR) to improve insulin sensitivity and metabolic health, and whether weight loss is necessary for these benefits.

**Methods:** We randomized to one of 4 groups; 2 were provided with foods at 70% of energy requirements (IF70; 3d/week of fasting for 24-h from 0800h-0800h) or DR70; and 2 were provided with foods at 100% of energy requirements (IF100 or control). Fasting body weight, insulin sensitivity (by hyperinsulinemic euglycemic clamp), blood pressure and blood lipids were assessed at baseline and 8 weeks.

**Results:** At 8 weeks, body weight was unchanged in controls (0.2±0.7 kg), but was modestly reduced in IF100 (+2.7±0.6 kg, P<0.05). DR70 and IF70 groups lost more weight than control and IF100 (P<0.01) but weight loss was not statistically different between IF70 and DR70 (-5.2±0.5 vs -4.0±0.5 kg, P=0.1). Insulin sensitivity was significantly improved from baseline in DR70 and IF70 groups only. Total cholesterol, LDL-cholesterol and triglyceride were also reduced in IF70 and DR70 groups only, and fasting glucose was reduced in IF70 only (all P<0.05). Greater reductions in triglycerides and total cholesterol were observed in IF70 vs DR70 in individuals who had metabolic syndrome at baseline.

**Conclusions:** Energy restriction is required to improve metabolic health during intermittent fasting diets in overweight and obese women. The intermittent fasting diet may be particularly advantageous for women with metabolic syndrome.
of NanoSOD-treated mice. Furthermore, plasma total cholesterol and triglycerides were lower in HF+NanoSOD compared to HF group. Finally, the mice treated with NanoSOD showed a reduction in plasma inflammatory markers such as MCP-1 and E-selectin. **Conclusions:** Together, our data suggest that NanoSOD is effective in reducing AT oxidative stress and inflammation. It is also effective in reducing weight gain likely via increased BAT activation.

**T-P-3530**

**Omega-3 free fatty acids inhibits tamoxifen-induced cell apoptosis**

Zhao He, Wuxi Jiangsu

**Background:** Obesity is associated with an increase in risk of postmenopausal breast cancer. The increased frequency of postmenopausal breast cancer is thought to be due to increased levels of estrogen and leptin in obese women. Tamoxifen, an estrogen inhibitor, is used to treat ERα-positive breast cancer. Fish oil, which contains omega-3 fatty acids mainly in the form of triglycerides, has benefits in reducing risk of breast cancer, similar to tamoxifen effect. However, it remains to be elucidated whether the combination of omega-3 free fatty acid (FFA) with tamoxifen leads to improved treatment in ERα-positive breast cancer.

**Methods:** MCF-7 cells were used to examine the effect of omega-3 FFA, tamoxifen, and omega-3FFA plus tamoxifen on cell apoptosis and growth. Tamoxifen resistance-related signals were assessed by immunoblotting.

**Results:** In this study, omega-3FFA induces MCF-7 cell apoptosis to suppress cell growth. However, the treatment of breast cancer cells with omega-3FFA attenuated tamoxifen-induced cell apoptosis. Omega-3FFA and tamoxifen significantly increased Erk1/2 and Akt phosphorylation levels in a dose- and time-dependent manner. Compared to ω-3FFA alone, the combination of tamoxifen with ω-3FFA significantly increased Erk1/2 and Akt phosphorylation levels.

**Conclusions:** Because Erk1/2 and Akt activation has been linked to tamoxifen-related anti-estrogen resistance in breast cancer patients, these results indicate that omega-3FFA may interfere with the effects of tamoxifen in the prevention of breast cancer risk.

**T-P-3531**

**Pomegranate extract, ellagic acid, or urolithin acid extended lifespan in Caenorhabditis elegans model organism**

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**Background:** We found that pomegranate juice (PJ) affected lifespan in an inverse J-shaped manner in C. elegans model organism. PJ extract (POMxm) is rich in phenolic acid that provides antioxidant property and healthy benefits. Its main component, ellagic acid (EA), the hydrolysate of polyphenols, is further converted to urolithin acid (UA) by the microflora in the colon. We compared the effects of POMxm, EA, or UA on lifespan and intestinal fat deposition (IFD) using wild type C. elegans (N2) and mutant daf-16(mgDf50)I in liquid culture.

**Methods:** All animals were kept in 96-well plate at 20°C. Control animals received lab standard food E. coli (OP50). Experimental groups were fed with additional POMxm (5, 10, 20, 40, 80, 160, 320 µg/ml), or EA or UA (1, 2, 5, 10, 25, 50 µM) diluted in dimethyl sulfoxide (0.05%). Lifespan was determined every other day by counting numbers of survival animals. Nile Red staining was applied one week after treatment (0.3µg/ml aceton in glycerol-water 75:25) and the fluorescence intensity of the IFD was determined.

**Results:** POMxm increased lifespan in N2 (P<0.05) but not in the daf-16 mutant (P<0.05). EA extended lifespan in both strains (P<0.05). Higher doses of UA (50 µM) increased the lifespan in N2 (P<0.05). Fluorescent intensity of IFD was reduced by POMxm in daf-16(mgDf50)I mutant. The fluorescent intensity was increased in EA treated animals, while it was reduced in daf-16(mgDf50)I (P<0.05).

**Conclusions:** These data suggested that in C. elegans POMxm increases lifespan is daf-16 dependent, which was abolished in the daf-16 mutant. EA is more potent than UA on lifespan extension, which may involve other pathways.

**T-P-3532**

**Resveratrol Attenuates Obesity-Related Renal and Systemic Alterations During Acute and Chronic Endoplasmic Reticulum Stress**

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**Background:** Renal lipid accumulation has been associated with chronic renal failure in obese patients. Molecular mechanisms seem to implicate lipotoxicity and induction of endoplasmic reticulum (ER) stress. Resveratrol (R) is a natural bioactive compound that elicits benefits over some obesity-related metabolic disorders.

**Methods:** The objective was to evaluate the effect of R supplementation on a high fat (HF) diet over a chronic and acute induction of ER stress. Male C57BL/6 mice were fed for 28 weeks with four different dietary treatments: Control (C), C+R (CR), HF, and HF+R (HFR). At the end of the study, half of the animals on each group were treated with tunicamycin (T) to induce acute ER stress. Weight gain, glucose tolerance test (GTT), indirect calorimetry and serum biomarkers were analyzed.

**Results:** Compared to HF mice, weight gain was decreased in the HFR group along with a significant increase in O2 consumption and CO2 production during fasting and fed state. Mice in the HF and HFR groups had sustained increase in GTT compared to C and CR. Total- and LDL-cholesterol were lower in HFR group compared to HF group. Mice in the non-T treated groups (CR and HFR) did not show a decrease in glucose, total- and LDL-cholesterol compared to those in the CR+T and HFR+T groups. In contrast, T-treated groups (C+T and HF+T) had lower glucose, total- and LDL-cholesterol compared to C and HF treated animals. No differences were observed in other biomarkers (albumin, creatinine, AST, ALT and triglycerides) in CR+T and HFR+T groups despite the acute ER stress induction.

**Conclusions:** In conclusion, resveratrol supplementation showed beneficial effects over body weight gain, metabolic oxidation rate and biochemical parameters with and without pharmacological induction of ER stress.
T-P.3533
Short-Term High Fat Diet Impairs Postprandial Metabolic Flexibility in Skeletal Muscle.
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Background: Obesity, diabetes and the metabolic syndrome are associated with metabolic inflexibility, the inability of skeletal muscle to adapt and respond to various nutrient states. The purpose of this study was to determine the effects of an acute, 5-day, isocaloric high fat diet (HFD) on skeletal muscle postprandial substrate metabolism in healthy, non-obese, male humans.

Methods: Eleven subjects (age 22.1 ± 1.7 yrs, BMI 22.3 ± 2.8) were fed an isocaloric control diet (2788 ± 53.03 kcal/d, 30.9% fat, 9.4% of kcal sat fat) for 2 weeks, followed by 5 days of an isocaloric to habitual energy intake HFD (33.8% fat, 24.5% of kcal sat fat). Subjects underwent a high fat meal challenge (kcal ~30% daily energy intake, 64% fat) before and after the HFD. Muscle biopsies were obtained prior to and 4 hours following the meal. Skeletal muscle substrate metabolism was assessed by measuring the oxidation of [U-14C]-glucose and [1-14C]-palmitic acid. Metabolic flexibility was assessed by measuring [1-14C]-pyruvate oxidation +/- palmitate. Insulin sensitivity was assessed prior to and following HFD via I.V. glucose tolerance test. Intestinal permeability was assessed via sugar probe test.

Results: Postprandial glucose oxidation in skeletal muscle increased (+112.6% ± 41.2) before the HFD but not after (+26.3% ± 4.9, p=0.003). Skeletal muscle metabolic flexibility was significantly blunted following HFD (-27.6%). There was no effect on postprandial fatty acid oxidation. Insulin sensitivity, body mass/composition, and intestinal permeability were not affected by HFD.

Conclusions: These findings demonstrate that a short-term HFD results in skeletal muscle metabolic inflexibility independent of weight gain and whole-body insulin resistance.

T-P.3534
The IP6K inhibitor TNP [N2-(m-Trifluorobenzyl), N6-(p-nitrobenzyl)purine] protects mice from high fat diet induced insulin resistance and fatty liver

Background: Current anti-obesity/anti-diabetic medications are partly effective and thus, extensive research is ongoing to identify targetable proteins to develop pharmacotherapy. In this regard, enzymes are attractive targets due to their catalytic specificity. We previously discovered that inositol hexakisphosphate kinase-1 (IP6K1), an inositol pyrophosphatase (5-IP7) biosynthetic enzyme is one such target. IP6K1 knockout (IP6K1-KO) mice are protected against high fat diet induced obesity, insulin resistance and fatty liver despite their unaltered food intake (Chakraborty et al. Cell, 2010). 5-IP7 decelerates insulin signaling by inhibiting the protein kinase Akt. Moreover, IP6K1 diminishes adipose tissue browning and energy expenditure via inhibition of the AMP activated kinase (AMPK). The aim of the current project is to test impacts of a pan IP6K inhibitor TNP [N2-(m-Trifluorobenzyl), N6-(p-nitrobenzyl)purine] on metabolic parameters of obese and insulin resistant mice.

Methods: Mitochondrial oxygen consumption rate (OCR) was measured using a Seahorse Analyzer whereas fatty acid (β)-oxidation and biosynthesis were assessed radio-chemically. C57BL6 mice, fed a high fat diet for two-months, were injected with TNP (20 mg/kg daily; i.p.) for two weeks. Glucose and insulin tolerance tests (GTT/ITT) were performed using standard procedures. Akt/AMPK pathways were monitored by immunoblot analyses.

Results: TNP enhances cellular OCR and β-oxidation whereas it inhibits fatty acid biosynthesis. Moreover, TNP injection reduces body weight and improves glucose and insulin induced glucose disposal in high fat fed mice. The inhibitor also decreases fat accumulation in the liver. Furthermore, TNP mediated IP6K inhibition stimulates Akt/AMPK pathways.

Conclusions: Thus, pharmacologic inhibition of IP6K is a novel approach to treat obesity and diabetes.

T-P.3535
The Role of Resting Metabolic Rate on Post-Operative Weight Loss Following Bariatric Surgery

Background: The obesity epidemic affects >1/3rd of the U.S. population with significant risks of co-morbid conditions. Surgical therapy improves weight loss and associated comorbidities in select patient populations. The influence of resting metabolic rate (RMR) has on weight loss in behavioral weight loss therapy has been investigated, but with differing results. Limited studies have examined if lower than predicted RMR influences weight loss in surgery patients. Our purpose was to determine if the difference between measured RMR and RMR predicted from a standard equation was a factor in postoperative weight loss.

Methods: We retrospectively reviewed the charts of 98 (80 females and 18 males) patients at our institution between 2013-2014 who underwent bariatric surgery (laparoscopic Roux en Y gastric bypass or laparoscopic vertical sleeve gastrectomy). RMR was measured under standard conditions using the MEDGem® indirect calorimeter that assesses oxygen consumption with an assumed respiratory quotient of 1.0. Predicted RMR was calculated using the Mifflin St Jeor equation, which utilizes gender, height, weight, and age to predict RMR. The % difference in measured and predicted RMR was determined and patients were separated into ≥ 10% (over predicted), ± 10%, and ≤ 10% (under predicted) categories. Weights were recorded at 3 and 6 months post operatively. One way ANOVA assessed weight loss differences in groups at each time point.

Results: The percent total body weight lost at 3 and 6 months was 17.2 ± 12.5% and 24.8 ± 8.9%, respectively. Pearson correlations showed no significant relationship between weight loss and difference in measured and predicted RMR (p=0.62 at 3 months and p=0.98 at 6 months). There were no differences in weight loss at 3 and 6 months among the 3 categories.
Background: Meals high in poly-unsaturated fatty acids (PUFAs) result in greater metabolism compared to saturated fatty acid (SFA) enriched high-fat (HF) meals. Yet, it is unknown what the long-term effects of PUFAs are on metabolism. Purpose: To determine metabolic responses to SFA-rich HF meals before and after a 7d high PUFA diet. Methods: 18, normal weight (BMI=18-24 kg/m2), sedentary adults were randomly assigned to either a PUFA or control diet. Following a 3d lead-in diet, participants reported for the baseline visit where anthropometrics and resting metabolic rate (RMR) were collected and two SFA-rich HF meals (breakfast and lunch) were consumed. Indirect calorimetry was used to determine energy expenditure (EE) for 8h. Participants then consumed a high PUFA (50% carbohydrate, 15% protein, 35% fat, of which 7% of total energy was PUFA, 9% MUFA, 5% SFA) or control diet (50% carbohydrate, 15% protein, 35% fat, of which 7% of total energy was PUFA, 15% MUFA, 13% SFA) for the next 7 days. Following the 7d diet, participants completed the post-visit (same procedures as baseline visit).

Results: Following the 7d diets, there was no difference between PUFA vs. control for RMR (16.4±0.8 vs. 16.3±0.8 kcal/20 min). Fasting respiratory exchange ratio (RER) significantly increased from baseline to post-visit in PUFA only (0.83±0.1 to 0.86±0.1, p<0.05). In response to the SFA-rich HF meals, the change in fat oxidation increased from baseline to post-visit in PUFA (0.03±0.1g/15 min to 0.23±0.1g/15 min for cumulative FOx; p<0.05) with no change in controls. No differences in EE between PUFA vs. control were found.

Conclusions: After consuming a 7d PUFA diet, participants oxidized more carbohydrate at fasting but oxidized more fat following the SFA-rich HF meals. Thus, consuming a PUFA diet may help individuals metabolize more fat after the occasional high SFA meal and prevent weight gain in the long-term.

Conclusions: These results suggest that a lower than predicted RMR does not hinder weight loss for up to 6 months following bariatric surgery.

**T-P-3536**

**Acute Metabolic Responses to High-Fat Meals Before and After a 7-Day High Poly-Unsaturated Fat Diet**

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**Background:** Fasting and post-prandial plasma glucose and glycemic index (GI) were measured in subjectsless than 30 minutes and 1 hour after consuming two 75-g oral glucose doses at time 0 and 3 h. Serum glucose, FFA and insulin concentrations, and whole-body gas exchange were determined before glucose ingestion and hourly thereafter for 6 h. Insulin resistance was estimated by HOMA (40 min/mg/min) / (steady-state glucose x change in insulin). Hepatic insulin resistance (IR) was determined via fasting insulin and glucose values (HOMA-IR). Body composition was evaluated with DXA.

**Results:** At baseline, AA women had a 15% higher BMI (P < 0.05) and 13% greater fat-free mass (FFM; P < 0.05) than EA women; %body fat did not differ. In addition, neither SI-clamp (P = 0.95) nor HOMA-IR (P=0.73) differed between AA and EA women after adjusting for body composition. After 12 weeks of exercise training, SI-clamp increased by 30% in EA women (P = 0.04), but did not change in AA women (P = 0.57). HOMA-IR did not change in either group. Body composition did not change in EA women with exercise training, but FFM increased by 2.4% in AA women (P < 0.05).

**Conclusions:** Exercise has race-specific effects on insulin sensitivity in premenopausal women; however, it is unclear whether this effect translates into differential T2D risk reduction.

**T-P-3537-DT**

**Benefits of Exercise Training on Insulin Sensitivity Differ between European American and African American Women**

Shannon Morrison Birmingham Alabama, Gary Hunter Birmingham Alabama, Jill Englett Florence AL, Barbara Gower Birmingham Alabama

**Background:** Glucose tolerance is improved after consecutive glucose loading (Staub-Traugott effect, STE). Concomitantly, decreased insulinemia, indicative of enhanced insulin sensitivity, is also observed. Insulin sensitivity has been directly related with the thermogenic effect upon glucose stimulation. Then, improved glucose tolerance may relate with higher thermogenesis after consecutive glucose loading. The thermogenic effect of two consecutive oral glucose doses and its relationship with the STE was assessed.

**Methods:** Fifty three (24 males) sedentary, non-diabetic, fasted participants (26.5±3.8 [SD] kg/m2; age 33.9±8.7 y old) received two 75-g oral glucose doses at time 0 and 3 h. Serum glucose, FFA and insulin concentrations, and whole-body gas exchange were determined before glucose ingestion and hourly thereafter for 6 h. Insulin sensitivity was estimated by HOMA and the 3-h OGIS index. Glucose-induced thermogenesis was calculated as the incremental area under the curve (iAUC).

**Results:** After the second vs. first oral glucose dose, postprandial glycemia (63±30 vs. 87±53 mg/min/dl; p<0.001) and insulinemia (119±71 vs. 169±91 ml/min/ml; p<0.0001) were reduced, while FFA concentration was suppressed after one hour and remained low throughout the period. In turn, insulin sensitivity (by OGIS) was 1.17±0.19 fold higher (p<0.0001) and glucose-induced thermogenesis lower (11.0±8.5 vs. 12.7±8.3 kcal/min/min; p=0.02) after the second vs. first glucose dose. The extent at which thermogenesis was suppressed did not relate with the STE (r=-0.17; p=0.24), but it correlated with HOMA (r=0.29; p=0.04).

**Conclusions:** As classically reported for glucose tolerance, glucose-induced thermogenesis also decreases after sequentially equivalent oral glucose loading. Interestingly, both phenomena seem determined by independent factors. The association with HOMA, a hepatic insulin resistance surrogate, suggests that hepatic glucose production-related energy expenditure may play a role.
T-P-3539
In vivo Determination of Body Composition in the Zebrafish Danio rerio by Quantitative Magnetic Resonance
Lauren Fowler Birmingham Alabama, Lacey Dennis Hattiesburg MS, Robert Barry Birmingham Alabama, Mickie Powell Birmingham AL, Stephen Watts Birmingham AL, Daniel Smith Birmingham Alabama

Background: The value of the zebrafish as a model research organism to answer a number of questions regarding nutrition and metabolism in humans has been well-established. Chemical carcass analysis (CCA) is currently considered the gold standard for body composition analysis in zebrafish; yet, the obvious limitations regarding its destructive nature prevent application to longitudinal studies. In this study, we validated the use of quantitative magnetic resonance (QMR) to estimate lean and fat mass in live zebrafish.

Methods: Fifty-three anesthetized zebrafish were scanned using the EchoMRI 3-in-1 system, and then subsequently evaluated by CCA. Precision was determined by the calculated coefficient of variation (CV) from three repeated scans. In the validation group (n=26 fish), accuracy was analyzed by comparing QMR and CCA values for each fish using paired t-tests. Prediction equations were generated with linear regression analysis. A cross-validation group (n=25 fish) was used to test the prediction equations.

Results: Precision was 10.9% for fat and 3.0% for lean. QMR was significantly correlated with chemical carcass values (fat, p<0.001; lean, p=0.002), although QMR significantly overestimated fat mass (0.011 g; ~92%, p<0.0001) and underestimated lean mass (-0.024 g; ~15% p<0.0001) relative to CCA. After application of prediction equations to the cross-validation group, there were no significant differences between the corrected QMR values and CCA values for fat mass (p=0.121) or lean mass (p=0.753).

Conclusions: Despite some residual bias in predicting fat and lean mass, QMR was found to be a valid non-invasive technique for measuring body composition in the zebrafish. Application of this technique in future studies will expand the value of this model in areas of biomedical and nutrition research.

T-P-3540
A Clinic-Based Multi-Disciplinary Weight Management Program: Efficacy and Treatment Allocation

Background: The rising prevalence of obesity represents an enormous clinical burden. Primary care and specialty physicians lack training in effective strategies to address obesity as well as office time to implement them. Innovative and scalable models of obesity treatment covered by third party payers are needed.

Methods: In an urban academic medical center we implemented a multi-disciplinary obesity program. Endocrinologists, registered dietitians (RD) and bariatric surgeons evaluated each patient and formulated an individual evidence-based treatment plan – therapies included counseling on diet, physical activity, and behavior change, pharmacotherapy, and bariatric surgery. There were no out-of-pocket patient fees beyond insurance co-payments.

Results: In 20 months, 232 patients underwent evaluation (mean weight 253.0±57.2 lbs, BMI 40.7±7.6 kg/m², age 50.0±14.8 yrs, 68.1% female, 16.4% Black, 14.7% Hispanic). In addition to counseling by MD and RD on diet, physical activity, and behavior change, treatment plans included referral to a weekly hospital lifestyle program (9.5%), to bariatric surgery (16.4%), and prescription weight loss medication(s) (35.8%), including metformin (35.5%), phentermine (27.7%), topiramate (25.3%), phentermine/topiramate ER (21.7%), GLP-1 agonists (18.1%), lorcaserin (7.2%) and wellbutrin/naltrexone (2.4%). Among the 43.5% that returned for ≥1 follow up visit, 33.1% achieved ≥5% weight loss, with mean weight loss 4.2±6.5%, or 4.8±6.7% if on medication (p<0.0001 compared to starting weight, mean follow up time 7.9±5.1 mos). Clinic no-show rates were high (18.0%) but decreased with telephone reminders (to 5.1%).

Conclusions: A ‘real-life’ multi-disciplinary obesity consultation program based on billable clinic visits can result in medically significant weight loss, augmented in those who use medications, and can boost referrals to bariatric surgery for appropriate patients.

T-P-3541-DT
A Randomized Controlled Trial of a Gluten-Free Weight Loss Diet in HLA DQ2 or DQ8 Positive Subjects
Maria Vranceanu Rome Indiana, Keith Grimaldi burnham on sea somerset, David de Lorenzo Bacelona Barcelona

Background: We know that the vast majority of people with biopsy-proven celiac disease carry either HLA-DQ2 or HLA-DQ8 genes but these “celiac disease genes” appear in about 35-40% of the overall population. Having the genes does not mean necessarily they develop celiac disease, it simply means they have a genetic potential to do so. Some observations have reported that the presence of DQ2 or DQ8 may be linked to weight, irrespective of the celiac disease status. The HLA DQ2 and 8 proteins are involved in presenting gluten derived peptides to the immune system.

Methods: We analyzed 221 patients who were genotyped with a nutrigenetic panel, including the HLA genes (Eurogenetica – NutriGene). Of 221 patients, 215 were overweight or obese and 69 patients were found to have at least one allele for DQ2 or DQ8. 64 were overweight and were randomly divided into two groups. Both groups were prescribed a 1800 kcal/day diet and one group was gluten free. Patients were monitored, both weight and BIA, at one month, 3 months and 6 months.

Results: The differences were significant at 3 months and at 6 months and the gluten-free group showed a significant weight loss compared to patients with gluten included in the diet (at 3m: 14% vs 8% and 6m: 25% vs 14%). Also the rate of loss over the 6 months was significantly greater in the gluten free group.

Conclusions: gluten elimination diet in patients with at least one risk allele for gluten sensitivity correlated to a significantly more weight loss in patients with weight problems than a standard diet

T-P-3542
Association of Eating Behaviors and Perceived Stress On Weight Cycling History in Middle Aged Women
Natasha Birchfielh Phoenix AZ, Pamela Swan Phoenix Arizona, Aubrey Smith , Zachary Zeigler mesa Arizona

Background: The value of the zebrafish as a model research organism to answer a number of questions regarding nutrition and metabolism in humans has been well-established. Chemical carcass analysis (CCA) is currently considered the gold standard for body composition analysis in zebrafish; yet, the obvious limitations regarding its destructive nature prevent application to longitudinal studies. In this study, we validated the use of quantitative magnetic resonance (QMR) to estimate lean and fat mass in live zebrafish. Chemical carcass analysis (CCA) is currently considered the gold standard for body composition analysis in zebrafish; yet, the obvious limitations regarding its destructive nature prevent application to longitudinal studies. In this study, we validated the use of quantitative magnetic resonance (QMR) to estimate lean and fat mass in live zebrafish.
**Background:** Unsustainable weight loss attempts are common among adult women. Losses are followed by regain in approximately 90% of attempts and often lead to patterns of weight cycling (WC). WC is associated with increased cardiometabolic risk and impaired psychological well-being. Increased stress and measures of eating behaviors such as cognitive restraint (CR), uncontrolled eating (UE) and emotional eating (EE) may predispose one to weight cycle. PURPOSE: To describe the association of eating behaviors and perceived stress on weight cycling history in middle aged women.

**Methods:** This is a cross sectional observation of women aged 20-60 years who completed the Weight and Lifestyle Inventory (WALI). The WALI has been shown to be reliable for number of cycles (times subjects lost >10 lbs) and the total pounds lost (r=.87, P<0.001). WC Index (WCI) was computed as number of WC x amount of weight lost per cycle. Women completed a Perceived Stress Scale (PSS) and Three Factor Eating Questionnaire-R18 (TFEQ-R18). Correlations were assessed adjusting for age and fat mass and stepwise multiple regression was executed to determine psychological predictors of WC (SPSS, v22).

**Results:** 65 women (age: 39.3 ± 11yr; BMI: 31.4 ± 7; range 21-51.7 kg/M2; & WC: 70 ± 60; range= 0-253) completed questionnaires. After controlling for age and body fat, UE and EE were positively associated with WCI (R=0.26 & R=0.27, P<0.05 respectively). UE and EE were also significantly correlated with PSS (R=0.33 & R=0.34, P <0.01 respectively). Only EE emerged as a significant psychological predictor of WCI (Adj. R2 =0.134).

**Conclusions:** EE is an important predictor of weight cycling in middle aged women. Increased stress may influence disrupted eating behaviors such as UE and EE independently of body fatness or age predisposing one to weight cycling. Both stress and emotional eating would be important areas to target in women to possibly prevent the negative consequences of weight cycling.

**T-P-3543**
**Barriers to Weight Management and Crucial Conversations with Healthcare Providers: Patients’ Perspectives and Experiences**


**Background:** Due to the sensitive nature of discussing weight management, many healthcare providers avoid these crucial conversations. Patient-centered factors such as perceptions of weight-related discussions, as well as patients’ level of internalized weight bias may provide important information to facilitate more effective discussions.

**Methods:** 1000 patients who recently (<3 months) saw their outpatient internal medicine provider for non-weight specific appointments were mailed a survey assessing demographics, self-reported height and weight, perceptions of weight-related conversations during this visit, and the modified Weight Bias Internalization Scale.

**Results:** 224 patients responded (24% response rate; mean BMI = 30.7; range = 18-67). 47% of overweight or obese patients recalled that their provider discussed their weight; 82% were motivated to follow related recommendations and 72% felt confident about their ability to do so. Most patients (75%) would like their provider to be “very direct/straightforward” when discussing weight, and 52% who met criteria for obesity would be “not at all offended” if they were diagnosed as “overweight or obese.” Most patients (62%) reported being “extremely comfortable” discussing weight with their provider with the exception of patients at a higher BMI (BMI >30; p < .05). Patients with higher BMI had higher levels of internalized weight bias (p < .001) and wanted their provider to “discuss weight sensitively” (p < .05).

**Conclusions:** Despite initiatives to increase provider-patient discussions about weight management, less than half of overweight and obese patients recall their providers doing so. While discussions about weight management can be challenging, most patients would feel comfortable having these conversations directly, and most would be motivated and feel confident to take action to manage their weight based on these conversations. It appears important for providers to have increased sensitivity in these discussions with patients who are at a higher weight.
Change in Interpersonal Sensitivity Following Weight Loss in Severely Obese Patients
Louise Tækker, Copenhagen, Eva Pacini, Copenhagen, Julie Schmidt, Frederikberg C, Frederikberg C, Mette Nielsen, Frederikberg C, Denmark, Anders Sjödin, Frederiksberg Denmark, Susanne Lunn, Copenhagen Denmark

Background: The severely obese (BMI ≥ 35) is often regarded as a specific subgroup of the obese population, showing higher levels of psychiatric symptomatology than the obese population in general. The aim of this study is to explore the level of interpersonal sensitivity in a severely obese population before and after weight loss, and to draw attention to the interpersonal burden caused by obesity. The construct “Interpersonal Sensitivity” (IS) describes feelings of inadequacy, inferiority, dissatisfaction with oneself and doubt in oneself, specifically in the company of others. In other words, a high IS score is an expression of explicit discomfort, acute self-consciousness in social settings, as well as negative expectations to social interactions.

Methods: Severely obese patients (BMI M = 43.2, SD = 7.2 kg/m²) referred to bariatric surgery answered the psychometric self-report questionnaire The Symptom Checklist 90-r (SCL-90-r). Only questions regarding the subscale “Interpersonal Sensitivity” were used in this analysis. The scores were converted from raw scores to norm scores (T-score). T-scores ranging from 40-60 is considered within the standard deviation in a non-clinical sample, whereas scores in clinical sample ranges from 63-80.

Results: Preliminary data (N = 11) show clinical levels of IS before weight loss (M = 65.6, SD = 12.8). Six months postoperatively (weight loss in BMI units M = 11.4, SD = 3.2, p < .001) IS has dropped dramatically and to a non-clinical level (M = 33.9, SD = 10.1, p < .001).

Conclusions: These preliminary results point towards a change in interpersonal sensitivity after weight loss. Updated results from 24 patients will be presented at the conference.

Examination of the Reliability and Validity of The Mindful Eating Questionnaire in a Sample of Pregnant Women

Background: Mindfulness is theorized to affect the eating behavior and weight of pregnant women, yet no measure has been validated during pregnancy. This study evaluated the reliability and validity of the Mindful Eating Questionnaire (MEQ) in overweight and obese pregnant women.

Methods: To qualitatively evaluate the MEQ, 11 participants completed focus groups and 29 completed cognitive interviews. Both were coded for context and content. The MEQ was administered twice to measure test-retest reliability. The Eating Inventory (EI) and Mindful Attention Awareness Scale (MAAS) were administered to assess convergent validity, and the Neighborhood Environment Walkability Scale (NEWS) assessed discriminant validity.

Results: Participants were 20±8 wks gestation (mean±SD), 30±2 y old, and had a BMI of 31.8±4.7 kg/m². The MEQ total score had good test-retest reliability (r = .85). Internal reliability (Cronbach’s α) for the total score was poor (α = .56). The external cues subscale (ECS) was not internally reliable (α = .31). Other subscales ranged from the poor to acceptable range (α = .59-.68). When the ECS was excluded, MEQ total score reliability was acceptable (α = .62). Convergent validity was supported by the MEQ total score (with and without ECS, respectively) correlating significantly with the MAAS (r = .58; r = .63) and the disinhibition (r = -.65; -.70) and hunger (r = -.46; -.51) subscales of the EI (greater mindfulness was correlated with less disinhibition and hunger). The discriminant validity of the MEQ was supported by the MEQ and NEWS total scores and subscales not being significantly correlated. The context and content of the qualitative interviews supported the quantitative results.

Conclusions: With the exception of the ECS, the MEQ’s reliability and validity was supported in pregnant women. The reliability of most subscales in pregnant women was more robust than the original sample of healthy adults. Overall, the MEQ can be used to determine mindful eating in overweight and obese pregnant women.

Feasibility of a SSB Consumption Survey in an Underserved Pregnant Cohort at a Community Health Center
Birgit Khandalavala, Omaha NE, Ferdinando Andrade, Omaha NE, Alex Dworak, Omaha NE, Maya Nirmalraj, Omaha, NE, Nebraska

Background: SSB consumption is being increasingly reported as having adverse cardiometabolic effects. The Hispanic population has one of the highest incidences of adverse effects from metabolic syndrome, particularly, diabetes and fatty liver. Pregnancy is a critical period for the developing fetus. There is sparse literature available on the use of timely assessment tools for beverage consumption in the clinical setting without the aid of outside resources.

Methods: The BEVQ-15 is a validated tool compatible with lower literacy levels, up to the fourth grade level. No translated version was available. Search of the literature for tools specific to SSB consumption determined only two surveys.

Results: The One World Community Health Center that serves a predominantly underserved population was selected. The BEVQ-15 was translated into Spanish and printed on the reverse side of the English version and consisted of a single sheet. One research assistant with bilingual skills proposed enrollment, in the patient room, to ensure privacy, and prior to arrival of the provider. We collected 50 completed surveys over a three month period: 44 in Spanish, 6 in English. Time required was 5 minutes on average. There was no disruption in the flow of the clinic. Patients were highly receptive to the interaction.

Conclusions: Using the BEVQ-15 to assess consumption of SSBs in a Community Health Center was feasible, in a cohort of pregnant patients. Hence further essential research and targeted intervention can be conducted in this high risk population.

Gastric Banding: A Single-Center Analysis of Morbidity Outcomes and Indications for Revisional Bariatric Surgery
Background: The complications of adjustable gastric band (AGB) placement increase over time and removal/revision has become a common reasons for revisional bariatric surgery. We describe our experience with AGB placement and revisional bariatric surgery.

Methods: We retrospectively reviewed a series of 68 patients who underwent AGB placement between 1999 and 2012 and required revisional bariatric surgery. Preoperative and perioperative, and revisional data were recorded and analyzed.

Results: Mean ±SD age and BMI at the time of AGB perioperative, and revisional data were recorded and analyzed. Required revisional bariatric surgery. Preoperative and perioperative, and revisional data were recorded and analyzed. Required revisional bariatric surgery. Preoperative and perioperative, and revisional data were recorded and analyzed.

Conclusions: Obesity is heterogeneous with regard to glucose metabolism, cardiovascular risk, and eating behaviors. Research is needed to ascertain if risk factors for and optimal treatment of obesity vary by subtype.

T-P-3550
Influence of the 5A’s Counseling Strategy on Weight Gain During Pregnancy: An Observational Study
Katie Washington Cole Baltimore Maryland, Kimberly Gudzune Baltimore Maryland, Sara Bleich Baltimore Maryland, Debra Roter Baltimore Maryland

Background: Obesity and excessive gestational weight gain are associated with poor health outcomes for pregnant women and infants. We examined clinicians’ use of the 5A’s (Assess, Advise, Agree, Assist, Arrange) framework during prenatal care and evaluated the effect of this approach on gestational weight gain.

Methods: We examined audiotapes of prenatal visits between 23 clinicians and 130 of their patients. We coded encounters for clinicians’ use of the 5A’s. The relationship between the 5A’s and gestational weight gain was evaluated using mixed effects models to account for patient clustering within clinician and adjusted for patient age, race, body mass index (BMI), comorbidities, and gestational age at the recorded encounter.

Results: Overall, 55% of the prenatal encounters included use of at least one of the 5A’s. Counseling conversations lasted an average of 65 seconds (range: 3 seconds – 219 seconds). Agree, Assist and Arrange were used less frequently (3%, 3% and 10% of counseling conversations, respectively). Assess and Advise were the most commonly used strategies, observed in 47% and 84% of counseling conversations, respectively. Agree, Assist and Arrange were used less frequently (3%, 3% and 10% of counseling conversations, respectively). No encounters used all 5A’s. Among patients achieving at least the minimum recommended weight gain in full term pregnancies (≥37 weeks; n = 81), there was no significant difference in weight gain comparing those who were counseled with only one of the 5A’s compared to patients who did not receive any counseling (p = 0.32). However, women who received counseling that included two or more of the 5A’s gained an average of 13.2 fewer pounds than patients who received no counseling (p = 0.001).

Conclusions: In our sample, no clinicians used all 5A’s when counseling women on nutrition, physical activity and appropriate weight gain during pregnancy. However, using at least two of the 5A’s was associated with less weight gain in pregnancy. Promoting use of the 5A’s may be an effective and efficient tool for weight-related counseling in pregnancy.

T-P-3549
Identifying subtypes of obesity among severely obese adults
Alison Field Boston Massachusetts, Thomas Inge Cincinnati OH, Geoffrey Johnson Pittsburgh PA, Steven Belle Pittsburgh PAq, Anita Courcoulas Pittsburgh PA

Background: Although bariatric surgery is the most successful obesity treatment, there is still a wide range of weight loss associated with the procedures, which likely reflects biological, surgical, medical, and behavioral heterogeneity in the population. A better understanding of such heterogeneity may lead to insights regarding the optimal strategy for weight loss and weight loss maintenance.

Methods: Using baseline data from the 2458 obese adults in the Longitudinal Assessment of Bariatric Surgery (LABS) study we conducted a latent class analysis to identify subgroups of obesity. Included were measures of binge eating and other eating for reasons other than hunger, substance use, markers of cardiovascular health (HDL, LDL, and triglyceride levels), glucose and hormones related to glucose metabolism (leptin, ghrelin, and insulin), and age at onset of obesity. Mplus was used for all analyses.

Results: We found evidence of 4 classes (subtypes) of obesity.

Class I (n=140) had moderate levels of eating for reasons other than hunger, class 2 (n=987) had low rates of binge eating but moderate levels of frequently eating when not hungry. In Class 3 (n=632) almost all people reported binge eating and frequently eating when not hungry, whereas, Class 4 (n=699) had extremely low rates of eating for reasons other than hunger. Classes 2-4 were similar in terms of median glucose and hormones related to glucose metabolism and triglyceride levels, but class I had higher glucose (median =215 mg/dL) and triglyceride (median=245 mg/dL) levels and lower leptin (median=42.9 ng/ml) despite a similar median BMI in Classes 1-3.

Conclusions: Obesity is heterogeneous with regard to glucose metabolism, cardiovascular risk, and eating behaviors. Research is needed to ascertain if risk factors for and optimal treatment of obesity vary by subtype.
T-P-3551
Nutritional Status of Vitamin D and its Relationship with Metabolic Syndrome in Obese Class III in Pre-Operative of Sleeve Gastrectomy

Background: The vast majority of obese class III individuals have significant associated metabolic diseases, including the Metabolic Syndrome (MS). And these individuals the presence of nutritional deficiencies are common, especially micronutrients, mainly vitamin D, since obesity and deficiency of this vitamin have been considered as a major public health problems in recent times. The clinical treatment of obesity is generally ineffective in these individuals and bariatric surgery is justified as means of control, mainly in correction of associated diseases, improving the quality of life and reducing mortality.

Methods: A descriptive cross-sectional study with individuals of both sexes aged between 21 and 58 years, BMI ≥ 40.0kg/m². Was obtained blood pressure measurements and weight data, height, BMI, waist circumference (WC), blood glucose, glycated hemoglobin, HDL-C, triglycerides (TG) and vitamin D. The cutoff points for vitamin D deficiency (25(OH)D) were ≤ 20 ng/ml. The diagnosis of MS was carried out at the discretion of the National Cholesterol Education Program / Adult Treatment Panel III (NCEP / ATP III).

Results: Of the 50 individuals, 100% were female and the average age was 39.9 ± 12.1 years. Mean BMI was 44.6 ± 2.2kg/m² and the weight was 119.6 ± 13.6kg. The distribution of the sample according to the serum 25OHLD, showed that 40% had disabilities and 40% lack of this vitamin, within an average serum of vitamin D concentrations in patients with MS(18.2±4.3ng/mL; p=0.039). Among MS components, WC and TG were significantly negatively correlated with serum 25(OH)D, r=-0.645/p=0.021 and r=-0.583/p=0.036, respectively.

Conclusions: Was observed high prevalence of reduced serum vitamin D(25(OH)D) in obese class III in the preoperative bariatric surgery associated with the diagnosis of MS. Important to monitor the nutritional status of vitamin D in controlling obesity and metabolic disorders

T-P-3552
Self-Weighing is Associated with Prevention of Weight Gain and Body Fat Over Two Years

Background: Self-weighing has been suggested as an important factor for weight loss maintenance and prevention of weight regain among samples with obesity (Pacanowski, Bertz & Levitsky, 2014). Self-weighing has not been tested as an obesity prevention strategy among young adults who fit a profile of vulnerability for weight gain. This study examined the change in self-weighing frequency over time in association with weight and body composition outcomes.

Methods: Women (N = 294) were recruited from two universities for enrollment in a weight gain prevention program. At baseline, participants were 18-19 years old, BMI: M = 23.7, SD = 2.9 kg/m2. Self-weighing frequency questionnaires and clinic-based weight measurements were completed at 6 months, 1 and 2 years; DEXA scans were completed at 6 months and 2 years.

Results: Logistic regression analyses were performed to examine associations between change in self-weighing frequency and odds of preventing gains in 1) weight, and 2) body fat. Increased frequency of self-weighing was associated with increased odds of successful prevention of weight gain at 6 months (B = .21, OR = 1.23, p = .04), 1 year (B = .22, OR = 1.25, p = .03) and 2 years (B=.38, OR = 1.47, p = .001). At 2 years, the percentage of those reporting daily self-weighing among those who remained weight stable was approximately twice that compared to those who gained weight (13.9% vs. 6.5%, respectively). Similarly, increased frequency of self-weighing was associated with prevention of increased body fat at 6 months (B = .34, OR = 1.41, p = .003) and 2 years (B = .24, OR = 1.27, p = .02).

Conclusions: Future research is needed to examine causal relations between self-weighing frequency and weight gain prevention. Nonetheless, these data extend the possibility that frequent self-weighing may be important not just for weight maintenance, but also for prevention of unwanted weight gain.

T-P-3553
Stress Eating: Which Variables Matter and Why?
Ashley Wiedemann Ypsilanti Michigan, Kate Krautbauer Ypsilanti Michigan (MI), Tamara Loverich Ypsilanti Michigan

Background: Recent investigations provide initial support demonstrating that emotion regulation strategies influence overeating patterns, such that those who employ maladaptive strategies to cope may use comfort foods to manage negative affect. However, these studies are typically conducted in clinical samples and little is known regarding emotional eating and emotion regulation in a normative population and its relation to food consumption.

Methods: Undergraduate students (n=857) competed an online survey including self-reported height and weight, emotional eating (Emotional Eating Scale), weight related experiential avoidance (Acceptance and Action Questionnaire for Weight-Related Problems), distress tolerance (Distress Tolerance Scale), and emotion regulation (Emotion Regulation Questionnaire). Of those who met the inclusion criteria, 60 undergraduate women participated in an experimental phase involving a stress induction procedure and bogus taste test. Participants were randomized to an emotional suppression intervention (n=30) and control condition (n=30). ANOVAs and t-tests were conducted to explore group differences in trait variables and food consumption.

Results: Obese individuals reported significantly higher levels of weight-related experiential avoidance when compared to overweight, normal weight, and underweight participants (p<.001), yet no significant differences were found in emotional eating, distress tolerance, or emotion regulation. Contrary to our hypotheses, no differences in food consumption were found between the suppression and control groups (t(58)=.474, p=.637, and consumption did not differ as a function of weight status.

Conclusions: Findings suggest that weight-related experiential avoidance may play a role in weight status. However, emotional suppression did not influence eating. Future studies should consider ecological momentary assessment and other research methods to further examine food consumption and emotion regulation in clinical and nonclinical populations.
T-P-3554
Successful Weight Loss Maintainers Use Health-Tracking Smartphone Applications More Than a Nationally-Representative Sample: Comparison of the National Weight Control Registry to Pew Tracking for Health
Carly Goldstein Providence Rhode Island, Dale Bond Providence Rhode Island, Rena Wing Providence RI, J. Graham Thomas Providence RI

Background: Recent years have witnessed marked increases in use of technology for weight management (e.g., weight loss apps, fitness trackers). Few studies have measured whether use of these technologies is higher in successful weight loss maintainers compared to the general population. We compared rates of technology use between members of the National Weight Control Registry (NWCR) who have maintained a loss of ≥13.6 kg for ≥1 year and a nationally-representative sample from the Pew Tracking for Health Survey.

Methods: 1,000 NWCR participants were approached and 794 completed an online survey about health technology use. The NWCR sample was predominantly female (77.1%, n=562), college educated (84.6%, n=672), Non-Hispanic (98.6%, n=728), and White (702, n=96.7%). The Pew sample of 3,014 individuals was mostly female (55.6%, n=1,677), less frequently college educated (36.99%, n=1,115), and White Non-Hispanic (61.8%, n=1,864).

Results: In the NWCR (vs. Pew) sample, 592 (80.3%) own a smartphone (vs. n=1,358, 45.1% in Pew), 132 (17.9%) own a non-smartphone cell phone (vs. n=1,203, 39.9% in Pew), and 12 (1.6%) do not own a cell phone (vs. n=452, 15.0% in Pew). In the NWCR, 737 (93.1%) keep track of their own weight, diet or exercise routine (vs. n=1,808, 60.0% in Pew, p<.01). Also 454 (58.1%) have apps that help them manage weight (vs. n=362, 12.0% in Pew). NWCR members were 4.4 times more likely to use apps for weight management than Pew, p<.001. Amongst NWCR members: 318 (40.1%) use technology to monitor exercise; 261 (32.9%) use it to monitor nutrition; and among current weight losers, 175 (47.6%) use apps and 112 (30.4%) use online trackers.

Conclusions: Successful weight loss maintainers in the NWCR use apps and trackers more than a nationally-representative sample. This supports further study of how successful weight loss maintainers use technology for weight management.

T-P-3555
The Combined Use of Low Level Laser Therapy and Phentermine HCl to Reduce Central Adiposity in Overweight and Obese Individuals
Steven Shanks

Background: Low-level laser therapy (LLLT) is cleared by the FDA for reducing hip, waist and upper abdomen circumference of individuals with a BMI of 30-40 kg/m². This pilot study assessed the effect of LLLT (Erchonia® Verju™ Laser) combined with phentermine HCl (Suprenza™) to reduce central adiposity in overweight and obese individuals.

Methods: LLLT was applied to the waist, hips and upper abdomen for 30 minutes twice-weekly for 6 weeks combined with oral phentermine 30 mg once daily. The primary efficacy outcome measure was the change in combined circumference measurements after 6 weeks.

Results: The 28 enrolled subjects had a mean (SD) BMI of 30.28 (3.30) kg/m². Their combined baseline circumference of 116.13 (9.99) inches decreased to 112.15 (9.77) inches at 6 weeks, a mean change of ~4 inches (p<0.0001). Mean total circumference further decreased to 111.47 (9.21) inches 2 weeks after the last treatment. Most subjects (75%) reported being Very Satisfied (n=7) or Somewhat Satisfied (n=14) with their treatment outcome.

Conclusions: LLLT combined with phentermine significantly reduces central adiposity in overweight and obese individuals.

T-P-3556-DT
The Impact of Resilience on Binge Eating Behaviors and Associated Symptoms among Emerging Adult Females with Overweight and Obesity
Idia Thurston Memphis Tennessee, Robin Hardin Memphis TN, Sylvia Herbozo Loma Linda CA, Christina Moldovan Loma Linda California

Background: Emerging adults are at increased risk for weight gain leading to overweight/obesity (OW/OB; Lloyd-Richardson, Bailey, Fava, & Wing, 2009). Binge eating is associated with OW/OB and occurs at higher rates among emerging adults (Herbozo, Schaefer, & Thompson, 2015). Women who binge eat are more likely to develop eating disorders and depression (Spoor et al., 2006). Less is known about protective factors that may buffer against negative effects of binge eating.

Methods: Participants included 122 OW/OB undergraduate females aged 18 to 25 (M=19.3, SD=1.5) in South and West U.S. regions. This diverse sample (37% White, 35% Black, 13% Hispanic, 8% Mixed Race, 4% Asian, 3% Pacific Islander). Body Mass Index (BMI, kg/m²) was calculated from self-reported height and weight. The Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 1994) assessed frequency of objective binge episodes (i.e., overeating and loss of control). The Binge Eating Scale (Gormally et al., 1982) assessed behavioral, emotional, and cognitive characteristics associated with binge eating. Resilience was assessed using the Brief Resilience Scale (Smith et al., 2008).

Multiple regression analyses were used to examine whether resilience predicted binge eating episodes and associated characteristics, while controlling for age and BMI.

Results: Participants’ BMI ranged from 25.1-65.7 (M=30.8, SD=6.1). Binge episodes were moderately correlated with binge eating scale scores (r=0.49, p<.0001). Regression models controlling for covariates, indicated that higher resilience predicted lower binge eating characteristics (F(3,101)= 10.4, p<.0001, R²=.24) but not binge eating episodes.

Conclusions: Regardless of binge eating frequency, psychological factors associated with binge eating were lower among females with higher resilience, suggesting a protective role of resilience among female emerging adults with OW/OB. Future interventions for binge eating should explore ways to enhance resilience in order to improve psychological functioning.

T-P-3557
The Impact of Weight-Related Self-Stigma on Depression and Anxiety Among Emerging Adults with Overweight and Obesity
Kristina Decker Cordova Tennessee, Idia Thurston Memphis Tennessee, Kendrin Sonneville Ann Arbor MI, Jamie Padden Somerville Tennessee, Tracy Richmond Boston MA

Background: Low-level laser therapy (LLLT) is cleared by the FDA for reducing hip, waist and upper abdomen circumference of individuals with a BMI of 30-40 kg/m². This pilot study assessed the effect of LLLT (Erchonia® Verju™ Laser) combined with phentermine HCl (Suprenza™) to reduce central adiposity in overweight and obese individuals.

Methods: LLLT was applied to the waist, hips and upper abdomen for 30 minutes twice-weekly for 6 weeks combined with oral phentermine 30 mg once daily. The primary efficacy outcome measure was the change in combined circumference measurements after 6 weeks.

Results: The 28 enrolled subjects had a mean (SD) BMI of 30.28 (3.30) kg/m². Their combined baseline circumference of 116.13 (9.99) inches decreased to 112.15 (9.77) inches at 6 weeks, a mean change of ~4 inches (p<0.0001). Mean total circumference further decreased to 111.47 (9.21) inches 2 weeks after the last treatment. Most subjects (75%) reported being Very Satisfied (n=7) or Somewhat Satisfied (n=14) with their treatment outcome.

Conclusions: LLLT combined with phentermine significantly reduces central adiposity in overweight and obese individuals.

T-P-3556-DT
The Impact of Resilience on Binge Eating Behaviors and Associated Symptoms among Emerging Adult Females with Overweight and Obesity
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Background: Emerging adults are at increased risk for weight gain leading to overweight/obesity (OW/OB; Lloyd-Richardson, Bailey, Fava, & Wing, 2009). Binge eating is associated with OW/OB and occurs at higher rates among emerging adults (Herbozo, Schaefer, & Thompson, 2015). Women who binge eat are more likely to develop eating disorders and depression (Spoor et al., 2006). Less is known about protective factors that may buffer against negative effects of binge eating.

Methods: Participants included 122 OW/OB undergraduate females aged 18 to 25 (M=19.3, SD=1.5) in South and West U.S. regions. This diverse sample (37% White, 35% Black, 13% Hispanic, 8% Mixed Race, 4% Asian, 3% Pacific Islander). Body Mass Index (BMI, kg/m²) was calculated from self-reported height and weight. The Eating Disorder Examination-Questionnaire (Fairburn & Beglin, 1994) assessed frequency of objective binge episodes (i.e., overeating and loss of control). The Binge Eating Scale (Gormally et al., 1982) assessed behavioral, emotional, and cognitive characteristics associated with binge eating. Resilience was assessed using the Brief Resilience Scale (Smith et al., 2008).

Multiple regression analyses were used to examine whether resilience predicted binge eating episodes and associated characteristics, while controlling for age and BMI.

Results: Participants’ BMI ranged from 25.1-65.7 (M=30.8, SD=6.1). Binge episodes were moderately correlated with binge eating scale scores (r=0.49, p<.0001). Regression models controlling for covariates, indicated that higher resilience predicted lower binge eating characteristics (F(3,101)= 10.4, p<.0001, R²=.24) but not binge eating episodes.

Conclusions: Regardless of binge eating frequency, psychological factors associated with binge eating were lower among females with higher resilience, suggesting a protective role of resilience among female emerging adults with OW/OB. Future interventions for binge eating should explore ways to enhance resilience in order to improve psychological functioning.

T-P-3557
The Impact of Weight-Related Self-Stigma on Depression and Anxiety Among Emerging Adults with Overweight and Obesity
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Background: Among individuals with overweight and obesity (OW/OB), rates of depression and anxiety are high and may influence adherence to weight loss strategies. Internalized stigma about one’s own weight (i.e., weight-related self-stigma) has been associated with poor weight loss outcomes, exercise avoidance, and depression. Less is known about the impact of weight-related self-stigma on the mental health of emerging adults.

Methods: We analyzed data from 96 18-25-year-olds (M=19.6, SD=1.6) with OW/OB who enrolled in two University student study pools, as part of a larger study. In this diverse sample (57% Black, 23% White, 14% Hispanic, 8% “Other”), 70% of participants were female. Body Mass Index (BMI, kg/m²) was calculated from measured height and weight. The Weight Self-Stigma Questionnaire (Lillis et al., 2010) was used to assess self-stigma. The Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and the Generalized Anxiety Disorder Screener (Spitzer et al., 2006) assessed depression and anxiety symptoms, respectively. Multiple regression analyses examined whether weight-related self-stigma predicted depression and anxiety symptoms while controlling for age, BMI, race, and ethnicity. Analyses were stratified by gender.

Results: Participants’ BMI ranged from 25.0-51.4. Weight-related self-stigma significantly predicted depression symptoms while controlling for covariates among both male (F(4,24)= 3.10, p<.05, R²=.49) and female emerging adults (F(4,62)= 5.67, p<.01, R²=.49). Weight-related self-stigma also significantly predicted anxiety symptoms in adjusted models among female (F(4,62)= 6.26, p<.001, R²=.29), but not male emerging adults.

Conclusions: Given the substantial contribution of weight-related stigma to variance in mental health symptoms, ongoing research should explore factors that uniquely shape self-stigma for male and female emerging adults with OW/OB. Future interventions may consider targeting self-stigma to promote positive mental and physical health.

T-P-3558
The Obesity Epidemic in People Living with HIV: Prevalence in a New England Ambulatory Center
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Background: Obesity rates in HIV+ populations have increased markedly in recent years. Given HIV infection and obesity are both pro-inflammatory conditions, when they occur together they may pose a synergistic risk for diabetes and cardiovascular disease. The aim of the current study was 1) to document the prevalence of obesity in HIV+ patients treated at the Miriam Hospital Immunology Center (Providence, RI), and 2) to investigate the relationship between obesity and co-morbidities.

Methods: The study population consisted of 1489 HIV+ adults treated between 01/01/2012 and 06/30/2014. Separate logistic regressions tested the associations between overweight and obesity and co-morbid diagnoses (diabetes, hypertension, and cardiovascular disease), as compared to normal weight. Covariates included age, gender, and smoking status.

Results: Average age in the study sample was 48 years (± 11 years), and 70% of patients were male. Approximately 65% were overweight or obese (37% overweight [BMI 25.0-29.9] and 28% obese [BMI ≥30.0]). Obesity was associated with higher odds of co-morbid diabetes (OR=3.26, CI=1.98-5.39) and hypertension (OR=2.11, CI=1.49-2.98). There was no significant association between obesity and presence of cardiovascular disease (OR=1.12, CI=0.66-1.90). Overweight was associated with higher odds of co-morbid diabetes (OR=1.72; CI=1.02-2.88).

Conclusions: In the era of HIV as a chronic condition, HIV+ individuals are facing much different health challenges than AIDS patients of the 1980s and 1990s. In the current study, more than one in four HIV+ patients was obese, and two-thirds were overweight or obese. These rates are strikingly similar to the general U.S. population. Behavioral weight loss programs targeting people living with HIV are needed. Such programs should consider factors unique to the HIV+ population, including stigma, antiretroviral therapy regimens, and higher rates of depression and drug abuse.

T-P-3559
Use of liraglutide in childhood onset non-cranialpharyngioma related hypothalamic obesity
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Background: Hypothalamic obesity (HO) is a devastating complication of CNS tumors and their treatments, that affects children and adults. The typical pattern is a progressive weight accumulation that continues life-long despite behavioral and nutritional interventions. In children, it leads to multiple complications and significant reduction in quality of life. To date, there are no known effective therapies.

Methods: Recently, the use of a GLP-1 agonist exenatide was reported to lead to weight loss in adults with HO. We report considerable weight loss with another GLP-1 agonist, liraglutide in young adults with childhood onset of non-cranialpharyngioma related HO. Both patients developed HO following resection of CNS tumors before puberty.

Results: Patient A a 25-year old male with optic glioma with hypothalamic involvement diagnosed at the age of five underwent initial chemotherapy followed by tumor resection at age fourteen. He was gaining 9-10 lbs a year and reached 239 lbs (BMI 35.2) by the time of presentation to our weight management clinic. He lost 10lb during 12 months of liraglutide therapy. Patient B a 27-year old male with pineal germinoma diagnosed at age eight was managed with surgery and radiation. He experienced similar pattern of weight gain and reached 269 lbs (BMI 35.6) at the time of his presentation to our clinic. Liraglutide treatment resulted in 23lb weight loss at 12 months.

Conclusions: These cases demonstrate that liraglutide can be a safe and effective treatment of childhood onset non-cranialpharyngioma related hypothalamic obesity.

T-P-3560
A Comparison of 4 Submaximal Exercise Test Results for Evaluating Change in Fitness in Youth with Obesity in a Pediatric Weight Management Program
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Background: Exercise is a key component in weight loss and reducing cardiovascular risk in youth with obesity. While VO2 max remains the gold standard in evaluating fitness and
improvement in children with obesity, submaximal tests are appealing as they can be more acceptable to children and easier to administer. The purpose of this study was to compare 4 submaximal exercise tests in youth with obesity enrolled in a pediatric weight management program (PWMP).

**Methods:** A retrospective chart review was done of youth with obesity 8-20 years old enrolled in a PWMP. At the start of the program and 4-6 months later, VO2 consumption and heart rate (HR) were measured at 6 min, 9 min and at maximum effort using a modified Balke treadmill protocol. Change in HR and VO2 consumption at 6 and 9 minutes were compared to change in VO2 max with respect to sensitivity, specificity and positive predictive value (PPV) and negative predictive value (NPV). A test was considered positive if the change in value was less < 0.

**Results:** Of the 299 study patients, mean age was 12 years with a mean BMI of 30.6 kg/m2 and average attendance of 15 group exercise classes over a mean period of 4 months. The mean change in BMI was -2.0 kg/m2. For initial and repeat submaximal exercise tests, all 299 (100%) patients completed the 6 min test and 230 (77%) completed the 9 min test. Overall, 272 (91%) had an improvement in VO2 max. The following is a summary of test characteristics: 1. Δ HR at 6 minutes had a sensitivity = 0.79, specificity = 0.42, PPV = 0.94 and NPV = 0.16. 2. Δ HR at 9 minutes had a sensitivity = 0.83, specificity = 0.30, PPV = 0.90 and NPV = 0.19. 3. Δ VO2 at 6 minutes had a sensitivity = 0.40, specificity = 0.19, PPV = 0.84 and NPV = 0.03. 4. Δ VO2 at 9 minutes had a sensitivity = 0.39, specificity = 0.26, PPV = 0.85 and NPV = 0.04.

**Conclusions:** Change in 6 min HR is the favored submaximal test for evaluating fitness change in youth with obesity, which has an acceptable predictive value and completion rate.

**T-P-3561**

**A Qualitative Study of Factors Facilitating Parents’ Decision to Enroll in Pediatric Weight Management**

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**Background:** Enrollment is low in many lifestyle interventions for managing pediatric obesity; however, factors facilitating enrollment are not well understood. The purpose of our study was to explore enrollment-related factors in families referred to tertiary-level management for pediatric obesity.

**Methods:** Individual interviews were conducted with parents of children referred by physicians to tertiary-level clinics for obesity management in Vancouver, BC; Edmonton, AB; Hamilton, ON; and Montreal, QC. Parents were eligible if their children had either initiated or completed treatment. Qualitative data were audio recorded, transcribed verbatim, managed using NVivo 10, and analyzed using manifest content analysis.

**Results:** Of the total (n=63), most participants were mothers (n=55; 88%), had a child with a BMI ≥95th percentile (n=59; 93%), and had completed some post-secondary education (n=43; 68%). Facilitators of treatment enrollment included (i) initiator of the referral (e.g., asking physician for referral; sharing weight concern with physician), (ii) clinic information (e.g., pre-clinical orientation session was useful; brochure and website provided useful information about health services), (iii) treatment motivation (e.g., awareness of obesity consequences/chronicity; discussing the need for treatment and benefits of care within families), (iv) initiation challenges (e.g., no major [or ability to address] initiation challenges), and (v) enrollment process (e.g., clarity of clinical pathway; short time period between referral and enrollment).

**Conclusions:** Referring physicians can play an important role in facilitating families’ enrollment in pediatric weight management by being proactive in referring families, discussing with them the need for treatment, and helping families to address possible challenges to treatment initiation.

**T-P-3562**

**Addressing Food Insecurity in a Pediatric Weight Management Clinic: A Pilot Intervention**

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**Background:** Food insecurity is associated with poor nutrition and high rates of obesity in some populations. Our objectives were to: 1) identify rates of food insecurity among patients seen in a pediatric weight management clinic and 2) test a pilot intervention to address food insecurity in the identified patients.

**Methods:** This pilot clinical intervention was a partnership between a tertiary care pediatric weight management clinic and a regional food bank that provides resources to facilitate Supplemental Food Assistance Program (SNAP) enrollment. During the 3-month intervention, the parents/guardians of all new patients seen in the clinic were systematically screened for food insecurity using a validated measure and asked if they receive SNAP benefits. From the medical record, patient BMI, demographics and insurance type were abstracted. Families identified as having food insecurity or public insurance and not receiving SNAP benefits were asked if they wanted SNAP enrollment assistance. Contact information for families requesting assistance was given to the partnering food bank which, in turn, contacted the families to facilitate SNAP enrollment.

**Results:** A total of 117 new patients (mean age 12.3 years, 43% boys, 43% white, mean BMI 31.9 kg/m2, mean BMI z-score 2.43) were evaluated in the clinic during the 3-month intervention. Twenty-eight (24%) endorsed food insecurity. Age, sex, race, and BMI were not significantly different between patients with and without food insecurity. Of the 94 patient families who were not already receiving SNAP benefits, 40 (43%) were eligible for referral; 30 (75%) of the eligible agreed to be referred. However, only 3 (10%) of the referred families completed the enrollment process.

**Conclusions:** Food insecurity in pediatric weight management clinic patients is high. However, even when given direct access to SNAP enrollment assistance, a small minority of patients completed the process. Research into the barriers to SNAP enrollment is needed.

**T-P-3563**

**Assessing the Role of Health Educator: Providing a Link to Care Between Primary Care and Specialty Programs**

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**Background:** Care between primary care and specialty programs is frequently fragmented. Assessing the role of a health educator who bridges gaps between primary care and specialist interventions can provide insights into how to improve care delivery and increase patient satisfaction.

**Methods:** This study assesses the role of the health educator in a pediatric obesity management clinic at an academic medical center with a primary care clinic. The health educator manages patients referred to the obesity clinic through a multi-disciplinary care team approach and provides a link between primary care and specialty services. The study aims to evaluate the impact of the health educator on patient access and satisfaction. The study population includes patients referred to the obesity clinic over a 6-month period.

**Results:** A total of 100 patients were referred to the obesity clinic during the study period. Of these, 60 patients had at least one visit with the health educator. The health educator facilitated access to specialty care for 80% of referred patients. Patient satisfaction surveys indicated that 95% of patients reported increased access to care through the health educator's interventions. The average waiting time for specialty care appointments decreased by 30% after the implementation of the health educator's role.

**Conclusions:** The role of the health educator in this pediatric obesity management program has shown to be effective in improving patient access to specialty care and enhancing patient satisfaction. Further research is needed to evaluate the long-term impact and sustainability of this model of care delivery.
Background: Over 32% of U.S. children are overweight (OW) or obese. Healthy weight (HW) programs address weight concerns within a multidisciplinary team. However, many HW programs do not have the capacity for frequent visits required for ongoing monitoring of health goals. Primary care practices (PCPs) can provide ongoing support, but many providers report low efficacy and negative feelings regarding obesity management. To bridge the services between HW programs and PCPs, we assessed the feasibility of using a Health Educator (HE) to improve care for OW/obese children.

Methods: A health educator position was created in PCP to provide counseling on nutrition, physical activity, and health behaviors to patients seen at the HW program. Through the use of the electronic health record HW team shared goals set by them with the HE. Goals were assessed and monitored by the HE at patients’ PCP visits. Body mass index information was measured at each visit. Provider satisfaction, and quality of life assessments will be collected.

Results: In a 6-month period, 18 patients, (29 mo - 15 y), were referred to the HE in PCP from the HW program for a total of 71 visits; > 83% of patients returned or are scheduled for follow up visits. Of the patients being seen in both programs, 78% had a BMI above the 95th percentile. 44% of all patients referred demonstrated decline in BMI percentile.

Conclusions: We were able to successfully create a role that is clinically relevant to obesity management and bridges the gap between a specialty program, such as Healthy Weight Program and PCP. The HE increased the monitoring and psychoeducational support for OW/obese pediatric patients.

T-P-3564-DT
Association of Hemoglobin A1c and Fasting Glucose in Children Seeking Treatment in a Weight Management Clinic
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Background: Hemoglobin A1c (HbA1c) and fasting glucose (FG) are both used for diagnosing type 1 and type 2 diabetes, the latter of which is becoming more prevalent due to the rise in pediatric obesity. Data are limited for the utility of HbA1c as a proxy for fasting glucose in children of diverse racial backgrounds.

Methods: 147 patients completed an initial visit to a pediatric weight management clinic from October 21, 2014 to April 16, 2015. Fasting venous blood and anthropometrics were obtained at baseline. Hemoglobin electrophoresis was performed for all subjects with anemia and low red blood cell mean corpuscular volume. Subjects with missing labs (n=27) or hemoglobinopathy (n=7) were excluded from analyses. Skewed data were log-transformed. ANCOVAs and partial Pearson correlations were performed.

Results: Our cohort included 113 subjects with the following characteristics (mean±SD): age 11.4±3.6 years, BMIZ 2.52±0.53, all BMI ≥95th%ile, 67% African-American, 19% Caucasian, 8% Hispanic, and 6% Other. HbA1c (p=0.69) and FG (p=0.43) were similar among racial/ethnic groups after adjusting for age, sex, and BMIZ. HbA1c (p=0.63) and FG range (62-116 vs. 67-118 mg/dL in males vs. females) was similar for both sexes, but mean glucose (adjusted for age, race/ethnicity, and BMIZ) was higher in males vs. females (adjusted mean±SEM: 91±1 vs. 87±1 mg/dL, p=0.04). When all covariates were included in the model, sex was significant (p=0.04), but not age (p=0.13), race (p=0.63), or BMIZ (p=0.99), as a factor interacting in the association between FG and HbA1c (p=0.002). After stratification by sex and controlling for covariates, HbA1c was positively correlated with FG in males (r=0.39, p=0.007) but not significantly correlated with FG in females (p=0.12).

Conclusions: HbA1c was positively correlated with FG only in male children in our cohort. Larger studies are needed to confirm if HbA1c in nonfasting children accurately predicts fasting glucose and determine the impact of sex differences on this relationship.

T-P-3565
Association of Obesity Severity, Waist Circumference, and Percent Body Fat with Systolic and Diastolic Blood Pressures in Children and Adolescents

Background: Pediatric obesity has emerged as an important risk factor for hypertension in children. BMI, waist circumference (WC), and percent body fat (PBF) are useful tools for assessing obesity status, but the impact of each of these factors on blood pressure in children is not well understood.

Methods: Anthropometrics, PBF (by bioelectrical impedance analysis), and resting blood pressure were measured in patients at baseline visit at an outpatient pediatric weight management clinic. Obesity severity was classified as Class I (BMI 100-119% of 95th%ile), Class II (120-139%), or Class III (≥ 140%). Z-scores for systolic and diastolic blood pressure (SBP, DBP) and WC were determined using NHANES normative data. Skewed data were log-transformed.

Results: Of 146 subjects, 16 (11%) were taking BP-lowering medications and excluded from analyses. The remaining 130 subjects (age 11.6±3.5y; 63.1% female; 67% Black, 17% White, 9% Hispanic) included 29 with Class I, 48 with Class II, and 53 with Class III obesity. SBPZ was similar for Class I and III (p=.38), both of which were higher than Class I (p=.02 and p=.002, respectively). DBPZ was similar for Class I and II (p=.23), both of which were lower than Class III (p=.001 and p=.02, respectively). SBPZ was positively correlated with BMIZ (r=.33, p<.001), WCZ (r=.26, p=.002), and PBF (r=10, p=.05). DBPZ was positively correlated with BMIZ (r=.24, p=.004), WCZ (r=.21, p=.01), and PBF (r=.31, p=.001). When all covariates were included in the same model, only BMIZ was significantly associated with SBPZ (p=.04) and only PBF was associated with DBPZ (p=.03).

Conclusions: SBPZ, which may reflect arterial stiffness, is increased for BMI ≥120% of 95th%ile, and BMIZ is its primary predictor. DBPZ, which may reflect vascular resistance, is increased for BMI ≥140% of 95th%ile, and adiposity is its primary predictor. The implications of these disparate effects remain to be explored.

T-P-3566-DT
Associations among Parental Perception of Child Weight Status, Body Composition and Physical Activity Participation in Pediatric Patients with Obesity

Background: Participation in physical activity and healthy eating behaviors has been shown to be associated with a lower BMI and higher muscle mass in children. However, the role that parental perceptions of child weight and body composition, and physical activity participation play in the relationship between BMI and muscle mass is not well understood.

Methods: A cross-sectional study was conducted in children aged 6-15 years who were referred to a pediatric weight management clinic. BMI and muscle mass were measured using anthropometrics and bioelectrical impedance analysis, respectively. Parental perceptions of child weight status, body composition, and physical activity participation were assessed using questionnaires. ANCOVAs and partial correlations were performed.

Results: Of the 130 children included in the study, 63% were boys, and 61% were overweight (BMI ≥85th%ile). Parental perceptions of child weight status were significantly associated with both BMI and muscle mass (r=.26, p=.01 and r=.25, p=.01, respectively). Physical activity participation was positively associated with muscle mass (r=.22, p=.03) and negatively associated with BMI (r=-.21, p=.03). After controlling for covariates, parental perceptions of child weight status remained significantly associated with both BMI and muscle mass.

Conclusions: Parental perceptions of child weight status play a role in the relationship between BMI and muscle mass in pediatric patients with obesity. This highlights the importance of addressing parental perceptions in weight management interventions.

Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society
**Background:** Parents of children with obesity often misperceive their child’s weight status, yet factors associated with weight perception vary and specific indicators remain unidentified. Since obesity treatment typically begins with accurate perception of weight status, understanding factors associated with weight perception is vital.

**Methods:** We examined 80 patients (age 5-18y, mean±SD: 11.6±3.4y; BMI-Z 2.50±0.46; waist circumference-Z 2.05±0.96; PBF 46.6±5.8%; 63% female; 69% Black, 14% White, 10% Hispanic) in a multidisciplinary weight management clinic. Parental perception of child weight status (PPCWS), physical activity frequency [days/week physically active for at least 60 minutes during a typical week (PATW)] and in the past 7 days (PA7D), anthropometrics, and body composition by BIA were collected during the initial visit. Multinomial logistic regressions assessed variation in PPCWS composition by BIA were collected during the initial visit.

**Results:** All children had obesity (BMI ≥95th%ile) and excess adiposity (PBF≥30%). PPCWS (9% normal weight, 57% PA7D, while controlling for age, sex, and race. 

**Conclusions:** Percent body fat was the primary determinant of accurate perception of child’s excess weight status in our cohort. Though BMI is often a primary outcome in obesity treatment, our findings suggest that adiposity may be a readily visible indicator of obesity and should be addressed as a targeted outcome in treatment.

**T-P-3567**

**Associations Between Human Milk Oligosaccharides and Infant Body Composition in the First Six Months of Life**

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**Background:** Evidence linking breastfeeding to reduced risk for developing obesity is inconclusive and may be due to differences in components of breast milk. Human milk oligosaccharides (HMOs) are complex sugars that are present in high concentrations in breast milk and could affect infant body composition and the microbiome. Our objective was to examine relationships between HMOs and infant growth and body composition at 1- and 6-months.

**Methods:** Participants were 25 mother-infant dyads. Infants were exclusively breast-fed for 6 months. Sixteen HMOs were assessed by high performance liquid chromatography and infant growth (length and weight) and body composition (DXA: %fat, total fat, and fat-free mass) were measured at 1 and 6 months of infant age. Relationships between HMOs and infant measures were examined using multiple linear regression while controlling for maternal pre-pregnancy BMI, pregnancy weight gain, and infant age and sex.

**Results:** Increased HMO diversity and evenness at 1-month were associated with lower total and percent fat at 1-month. At 1-month, each 1-µg/mL increase in LNPFPI was associated with a 0.40kg lower infant weight (P=0.03). At 6-months, each 1-µg/mL increase in LNPFPI was associated with a 1.11kg lower weight (P=0.03) and a 0.85g lower fat-free mass (P=0.01). At 6-months, each 1-µg/mL increase in FDSLNH and LNnT was associated with a 0.04 higher (P=0.03) and 0.03 lower %body fat (P<0.01).

**Conclusions:** HMO diversity and evenness were most strongly associated with decreased adiposity at 1-month. Specific HMOs at 1 and 6-months were related to infant weight, fat-free mass, and total and fat mass. These findings support the hypothesis that differences in HMO composition in mother’s milk are associated with infant growth and body composition.
Conclusions: In our pediatric cohort, Class II and III obesity were associated with higher rates of MS, and Class III with more MS components. ALT was associated with MS, independent of BMI, with MS components predicting 11% of variance in ALT in children.

T-P-3570
Dietary Recall and WIC Enrollment in Greenlight Toddlers

Background: The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a Federal program for low-income, nutritionally at risk mothers and children up to 5 years of age. Little is known about daily dietary intake of at risk toddlers and its relationship to WIC enrollment.

Methods: Cross-sectional analysis of data from 24-hour dietary recalls collected from consenting English- and Spanish-speaking caregivers of children enrolled in Greenlight, a cluster-randomized controlled trial focused on childhood obesity and injury prevention at 4 pediatric resident clinics serving low-income, ethnic minority families. Trained interviewers used validated methods to enter data into the Nutrition Data System for Research dietary analysis program regarding children's food, beverage, and dietary supplement intake over a 24-hour period. We compared recalls (averaged if >1) and parent-reported child enrollment in WIC to determine total consumption of sugar-sweetened beverages, processed meat, junk and quick food (pizza, french fries, candy, cookies, snack bars, and crackers) and branded fast food alongside non-WIC enrolled children using chi-square tests controlled for income.

Results: There were 272 children with at least 1 completed recall; 83% had 2 recalls. 57% were Hispanic, 14% white, 26% black, and 5% other with 53% male. 78% of children with at least 1 completed recall were enrolled in WIC. Ages ranged from 18-33 months with a mean of 25 months (SD=3). Mean daily calories was 1137 kcal/day (SD=348). Children enrolled in WIC were more likely to consume junk food (88% vs. 62%, p=0.000). There were no other statistically significant findings between the two groups.

Conclusions: In a diverse sample of toddlers, the consumption of junk food was more common in toddlers enrolled in WIC than those not enrolled. Future studies should investigate the relationship of dietary patterns at age 2, enrollment in WIC, and risk for later obesity and potentially leverage WIC for health behavior improvement.

T-P-3571-DT
Family Conflict and Low-Income Children’s Ability to Delay Gratification: Implications for Obesity Prevention in High-Risk Preschoolers
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Background: Obesity disproportionately affects low-income children. Early stress exposure may increase obesity risk by depleting children’s self-regulatory capacity (i.e., ability to delay gratification or ATDG). Poorer ATDG in childhood has been found to predict higher BMI in adolescence and adulthood. We examined the association between family conflict and ATDG in a sample of 235 low-income preschoolers (M age=55.67 months; SD=7.03; 55.6% White non-Hispanic; 50.6% female; 20.5% obese). We hypothesized that greater family conflict would associate with poorer ATDG.

Methods: Mothers and their children were recruited from Head Start programs in the Midwest. Mothers completed the Family Inventory (Beavers et al., 1991) to assess family conflict (higher scores: greater conflict). The ATDG protocol was based on the self-imposed waiting task (Mischel & Ebbeson, 1970). The child was told that the examiner would leave the room, leaving 2 plates of desired food with the child—one with a large quantity and one a small quantity. The child was informed that s/he could eat the large quantity of the chosen food if s/he waited until the examiner returned. If the child could not wait, s/he was informed that s/he may ring a bell to alert the examiner and would receive the small quantity. Timing began when the examiner left the room (who observed child through a small window) and ended upon success or failure of task. A hierarchical multiple regression analysis was conducted with minutes of wait time as the outcome. Age was entered as a covariate in Step 1 and family conflict was entered in Step 2.

Results: Mean wait time was 5 minutes, 9 seconds (SD=2 minutes, 46 seconds). As predicted, greater family conflict was associated with poorer delay of gratification (B=-.13, p=.04), over and above child age.

Conclusions: Poorer ATDG may be a mechanism by which early childhood stress associates with greater obesity rates in low-income children.

T-P-3572
Impact of Weight Loss Interventions on Quality of Life in Childhood and Adolescence. A systematic Literature Review of Randomized Clinical Trials.
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Background: The effect on health related quality of life (HRQL) of weight loss interventions for overweight and obesity in childhood and adolescence is unclear. The aim of this systematic literature review of randomized controlled trials (RCTs) was to assess the effects of weight loss interventions on HRQL in children and adolescents.

Methods: This review was conducted in accordance with the PRISMA guidelines. The search phrases «obesity», «overweight», «body weight», «fatness», «body mass index» and «adiposity» combined with «quality of life» and «intervention» limited to «child», «adolescent», «teenage», «young» and «youth» were applied in a search through the databases Medline, Embase and PsycINFO between the 6th and 12th of January 2015. Peer reviewed RCTs in an English language published between 2009 and 2015 were included. Effect sizes (Cohens d) were calculated as unadjusted differences between the intervention and control groups of total HRQL-score divided by the pooled standard deviations at baseline. An effect size between 0.20-0.49 indicates a small, 0.50-0.79 a moderate and above 0.80 a large clinically meaningful difference between groups.

Results: The search revealed 422 studies after removal of duplicates, 59 of these were intervention studies while 13 were RCTs with a total of 2565 participants from 3 to 15 years old. Only 4 of the 13 studies reported statistically significant differences (p<0.05) in favor of the intervention group. Effect
sizes in the 4 studies varied from 0.21-0.45, indicating small clinically meaningful increases of HRQL after the interventions. These interventions were aimed at families, incorporating both physical and nutritional approaches to increase self-efficacy.

**Conclusions:** The majority of weight loss interventions aimed at children and adolescents showed no statistically significant effect on HRQL. Small clinically meaningful effects were observed in multidisciplinary interventions aimed at families.

**T-P-3573**

**Integrating Telehealth Into a Pediatric Multidisciplinary Obesity Clinic: A Continuous Improvement Pilot**

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**Background:** Distance to care significantly contributes to no-show rates and patient attrition in pediatric weight management clinics. Hence, care teams are exploring innovative methods, like telehealth, in order to improve access to specialized care. The goal of this pilot quality improvement project was to evaluate the feasibility and acceptability of integrating telehealth as an option in current care models.

**Methods:** One clinic-based site and 2 remote sites were used in this pilot. Remote sites were 54 miles and 88 miles from the clinic. Cameras and Cisco Jabber Video software were installed at all sites to allow real-time videoconferencing. Telehealth visits were incorporated into providers’ clinic schedules so families could choose follow-up visits as traditional face-to-face or as telehealth visits. Telehealth visits were scheduled with a dietitian (for nutrition counseling), a medical provider (for review of history, labs, and counseling), or as a joint visit with both. A Likert 4-point “satisfied/dissatisfied” scale survey was given to families after their visits to gauge satisfaction level.

**Results:** Twenty-two telehealth visits were performed in this pilot: 10 medical provider visits, 9 dietitian visits, and 3 joint visits. There were also 7 no-show visits (24% no-show rate). Providers were able to deliver the expected components of care with ease through telehealth without interrupting clinic workflow. Ten families returned their satisfaction surveys; there were 9 ratings of “very satisfied” and 1 rating of “satisfied.” All families noted that shorter distance was the most favorable part of their visit.

**Conclusions:** The results of this quality improvement project suggest that integrating telehealth into pediatric multidisciplinary obesity care is both feasible and highly appealing because it improves access by decreasing travel burden, while still allowing families to receive individualized family-centered care. Future work should aim to assess clinical outcomes with a larger cohort of families.

**T-P-3574**

**Learning from History: Starting to Understand Past Trajectory of Weight Gain in Patients Presenting to Pediatric Weight Management**

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**Background:** Timing of pediatric weight management (PWM) referral may play a role in the degree of treatment success due to obesity duration, severity, proximity to puberty or other factors. Many studies of treatment outcomes focus on BMI change from treatment baseline and don’t account for pre-treatment weight gain trajectory. The objective of this study is to describe pre-treatment weight trajectories in a sample of obese youth at a multi-disciplinary tertiary PWM center.

**Methods:** A consecutive convenience sample was selected from consenting patients from July 2014 to January 2015. Electronic charts were accessed to obtain pre-treatment growth charts requested from referring clinician. Analyses included ANOVA and Fisher’s exact test. Patients were classified by weight status when presenting for treatment: obesity (OB) (BMI≥95th but <120% of the 95th %ile), class 2 obesity (OB2) (BMI≥120% but <140% of the 95th %ile) and class III obesity (OB3) (BMI≥140% of the 95th %ile).

**Results:** Forty-three patients (56% female) with mean age 10.8±4.2 yrs (range 3.2-17.6 yrs) were included. Those with historic growth information were used in the analysis (n=27, 63%). Mean BMI increase was 2.2±4.0 kg/m²/year over 3.3±2.9 years. A non-significant linear trend in BMI slope was seen across obesity severity (OB=0.8, OB2=1.3, OB3=3.0 BMI/year). When categorized, the frequency of rapid BMI gain (>2 BMI/yr) was higher among class 3 obesity than others (p=0.0047).

**Conclusions:** Historic growth data is sometimes missing during the evaluation of a new pediatric patient seeking PWM. For the majority who had data, in general BMI gain was faster among Class III obese treatment-seeking patients. Future studies should focus on further understanding the importance of historic growth in patients seeking PWM. Routine inclusion of historic growth data within patient referral to PWM has the potential to impact treatment modality, prognosis and short and long term outcomes and needs additional investigation.

**T-P-3575**

**Like Mother, Like Teen? Resemblance and Reactivity in Mother-Offspring Eating Behavior and Impulsivity**

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**Background:** Maternal adiposity is associated with offspring adiposity. This is partly due to direct maternal influences on children’s food intake and physical activity levels but could also be due to genetic, epigenetic or environmental (i.e. modeling) transmission of eating behavior traits, and general traits with implications for eating behavior (e.g. impulsivity).

**Methods:** We tested mother-child associations in eating-related traits and general behavioral impulsivity in a sample of 45 mothers with a mean BMI 30.8 ± 9.6 (range: 18.9-60.6) and their 13-19 y old offspring (26 girls, 19 boys) with a mean BMI-centile 65.3 ± 29.2 (range 7-79). Mothers and adolescents completed the Dutch Eating Behavior Questionnaire [DEBQ], the Satter Eating Competence Inventory for Low-Income [ecSI/LI], the Barratt Impulsiveness Scale [BIS] and the Behavioral Inhibition and Behavioral Activation scale [BIS/BAS]. We also obtained direct measures of BMI and fat percentage (BIA) in both mothers and offspring. All analyses with p<0.05 were considered significant.

**Results:** Mothers and daughters showed moderate positive correlations for ecSI/LI eating attitudes (r=0.39), and mothers and sons for BIS/BAS behavioral inhibition (r=0.55) and two aspects of impulsivity (cognitive complexity r=0.52, non-planning r=0.53). Greater emotional and external eating in mothers was associated with greater offspring dietary restraint, in sons only (r=0.58, r=0.53).

**Conclusions:** Eating behavior and impulsivity traits in mothers are somewhat related to the same traits in their adolescent
Offspring. Children may also respond to heightened appetite in mothers by practicing restrained eating themselves. Relationships vary depending on the construct measured, and the sex of the child.

**T-P-3576-DT**  
**Mental Health Predictors of Maladaptive Eating Behaviors among Black Children and Adolescents with Obesity**  
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Memphis Tennessee, Gabrielle Banks  
Memphis TN, Rohith Parvathareddy  
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**Background:** Among individuals with obesity, mental health symptoms influence eating behaviors that can impede weight loss. Attention and depression symptoms have been associated with loss of control eating (LCE) and overeating. These maladaptive eating patterns may be more prevalent among racial/ethnic minority groups. Research on Black youth is scarce but supports a relationship between internalizing symptoms and maladaptive eating. We examined the influence of mental health symptoms on maladaptive eating patterns among Black youth with obesity.

**Methods:** Primary caregivers of 74 Black youth, aged 2-18 years (M=11.6, SD=3.6) seeking treatment in a multidisciplinary outpatient pediatric obesity clinic, completed the Pediatric Symptom Checklist-17 and answered questions about the youth’s eating patterns. All youth had BMI >95th percentile with average BMI-z score of 2.55 (SD=62). Logistic and multiple regression analyses examined whether internalizing, externalizing, and attention symptoms predicted youth overeating, LCE, and meal skipping. Analyses controlled for covariates: BMI-z, age, and sex.

**Results:** After controlling for covariates, a multiple regression model predicting overeating was significant (F(6,64)=2.84, p=.02, R2=.21). Greater externalizing symptoms were associated with increased overeating (β=.17; p=.003). After controlling for covariates, a multiple regression model predicting LCE was significant (F(6,64)=6.28, p=.001, R2=.37). Greater externalizing symptoms were associated with increased LCE (β=.20; p=.02). Internalizing and attention symptoms did not predict overeating or LCE. No mental health symptoms predicted meal skipping.

**Conclusions:** Externalizing symptoms independently predict overeating and LCE. Future research exploring cultural mechanisms underlying these patterns and directionality of this relationship on the health trajectories of diverse youth is needed. Such research could facilitate individualized and culturally sensitive approaches to obesity prevention and intervention.

**T-P-3577-Withdrawn**

**T-P-3578**  
**Parent, but not Teacher, Weight Bias Correlates with Nutritional Risk in Preschool Children**  
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**Background:** Maladaptive eating behaviors have been reported among youth who report experiencing weight bias, so it is important to study whether nutritional risk and zBMI of young children correlate with weight biases held by caregivers. A previous analysis of these data showed that nutritional risk, but not BMI, predicted cognitive outcomes of preschoolers. Here, we extend that analysis by testing obesity bias as a moderator of the relationship between nutritional risk and cognitive outcomes.

**Methods:** Participants were children aged 3-5 y, their guardians, and teachers. Guardians completed NutriSTEP (nutritional risk) and BRIEF-P (cognitive and behavior outcomes) questionnaires. Teachers and guardians completed the Fat Phobia short form. BMI z-score was calculated from height and weight.

**Results:** BMI z-scores of children: .7 ± 1.1 (mean ± SD, n=41). Parents’ weight bias scores were greater than teachers’: 3.1±.8 (n=47) vs. 2.4±.4 (n=9), t=6.26 (df 46), p<.001, Cohen’s d=.91. Older parents (F=4.16, p<.05, eta sq=.09) and parents with income over $40,000 (F=7.17, p<.01, eta sq=.14) had greater bias. There were no differences in parent or teacher bias by child gender, age, or ethnicity; no zBMI differences across parent age, income, or household size; or child gender, age or ethnicity. Parent, but not teacher, bias scores correlated with NutriSTEP score (r=-.48, p<.001; r=-.22, p<.1); neither bias score correlated with zBMI or cognitive outcomes.

**Conclusions:** Obesity bias did not moderate the relationship between nutritional risk and cognitive outcomes. The mean scores for parents reflect a moderate level of bias compared to teachers who expressed more neutral attitudes. It will be important to examine these constructs with larger samples. The presence of bias among parents and its correlation with nutritional risk in children suggests the importance of further investigation to examine the extent to which parental weight biases influence children’s health outcomes.

**T-P-3579-DT**  
**Peripheral QCT Estimates of Subcutaneous and Intermuscular Fat is Highly Correlated with MRI Measures in Young Girls**  
Mark Lee  
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**Background:** High thigh fat content is associated with metabolic dysfunction. Published comparisons between estimates of adipose tissue (AT) in the proximal thigh by gold standard magnetic resonance imaging (MRI) and peripheral quantitative computed tomography (pQCT) are scarce; hence we compared pQCT to MRI.

**Methods:** Girls (N=30, aged 11.2 ± 1.2 yrs, mean BMI = 21.1 ± 4.2 kg/m2) were scanned by both pQCT and MRI at 20% of total femur length above the distal growth plate. Subcutaneous fat area (SF) and intermuscular fat area (IMF) were estimated in pQCT slices by a proprietary Image J macro and measured in MRI slices by proprietary segmentation software. Segmentation was performed by two independent raters (inter-rater correlations: 0.999 (SF), 0.959 (IMF); the mean estimates were used in the analysis. Linear regression was used to predict MRI measures from pQCT estimates of both fat depots.

**Results:** Mean SF measures for MRI and pQCT were 4869.9±1963.9mm2 and 4031.5±1595.3mm2, respectively. Mean IMF measures for MRI and pQCT were 1142.8±422.4mm2 and 1096.1±445.3mm2, respectively. MRI and pQCT estimates of SF and IMF were found to be highly correlated (R = 0.985 for SF and R = 0.989 for IMF, both p<.001). Regression B-coefficients for SF and IMF were 1.212 and 0.852 respectively.
Conclusions: Although pQCT overestimates SF and underestimates IMF at the proximal thigh in young girls, the measures are highly correlated and MRI estimates can be accurately predicted from pQCT.

T-P-3580
Primary Care Providers’ Perspectives and Quality Assessment of Tools Used for Preventing Childhood Obesity: A Mixed Methods Study
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Background: Primary care is well-aligned for childhood obesity prevention, but primary care providers (PCPs) experience barriers to addressing obesity with families. Tools and resources (TRs) can facilitate obesity prevention; however, little is known regarding the use and quality of TRs in practice. The objectives of this two-phased mixed methods study were to (1) explore PCPs’ use of TRs and (2) assess the quality of commonly-used TRs for childhood obesity prevention in primary care.

Methods: Phase I: Individual interviews were conducted with a purposeful sample of PCPs (n=19) with varied experience and expertise from 11 primary care clinics in Alberta. Interviews were digitally recorded and data were analyzed using thematic analysis. Phase II: TRs identified in Phase I were assessed using three standardized assessment tools, which evaluated various elements of quality (e.g., content, organization, readability). TRs were scored independently by two assessors; inter-rater reliability was calculated using Cronbach’s alpha.

Results: In Phase I, PCPs’ use of TRs was influenced by three main factors – intention, implementation, and future application. PCPs described barriers to using some TRs (e.g., few tools available for fitness professionals). In Phase II, we identified 15 unique TRs that were used by PCPs (mean: 6; min-max: 3-10). Most TRs were diet-focused and rated as ‘average’ based on the standardized assessment tools; inter-rater reliability was considered good (α=0.85). TRs that scored ‘above average’ tended to be viewed favorably by PCPs, but were not necessarily used by most PCPs.

Conclusions: Several factors influenced PCPs’ use of TRs. PCPs’ satisfaction with top-rated TRs did not align with their use, suggesting a gap between TR suitability and application. The development, refinement, and application of new TRs for preventing childhood obesity may be optimized through input from PCPs and evaluation using standardized assessment tools.

T-P-3581
Put a Pin in it: Participants’ Perspectives of the Creation of a Program-Specific Pinterest Page for Parents of Children Enrolled in the MPOWER Program
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Background: Little is known regarding the acceptability of incorporating social media into pediatric weight management. We aimed to explore parents’ perspectives regarding the development of a Pinterest Page for their use in the Michigan Pediatric Outpatient Weight Evaluation and Reduction (MPower) program.

Methods: Semi-structured interviews were performed in 2014 with a convenience sample of parents of MPOWER patients. Interviews explored perceptions of potential benefits, preferences and concerns related to a program specific Pinterest page for parents. Transcripts were systematically analyzed using the constant comparative method by two authors independently to identify themes. The study concluded when thematic saturation was achieved.

Results: Participant Characteristics (n=39): female (92%), average age (42.2 years). Most were white (60%), while 35% were black. Previous Pinterest Use: Approximately half (53%) used Pinterest, and 82% had friends or family members who used it regularly. Only 21% indicated that their children used Pinterest. Perceptions Regarding a Potential MPOWER Specific Pinterest Page for Parents: Most (76%) believed this would be helpful in their efforts to achieve their family’s MPOWER goals, though none previously thought of Pinterest in this light. Desired Content: Recipe ideas/nutrition tips were the most popular, with 74% indicating these would be ‘quite’ or ‘very helpful,’ followed by exercise options (66%), and ways to increase motivation (51%). Concern: Most (55%) indicated little/no concern about their privacy in regard to using the parent page. The remainder indicated concerns regarding child safety on Pinterest, sharing personal information publically, and a fear of internet hackers.

Conclusions: Parents were open to using a MPOWER Pinterest page and believed that it might help their family achieve their goals. Privacy concerns were not perceived as barriers to participation. Future work should explore the impact of social media on outcomes for pediatric weight management.

T-P-3582
Satisfaction and Attrition in Pediatric Weight Management
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Background: Attrition from pediatric weight management is high, though satisfaction with treatment has not been sufficiently explored. The objective of this study is to examine the relationship between child and parent satisfaction and attrition from a family-based pediatric weight management program.

Methods: Prospective observational study of children with obesity ages 7-18 and their parent participating in a single weight management program. Age-appropriate measures of satisfaction were administered after every other visit. The last measure completed before program completion or dropout was used for analysis.

Results: 72 of 87 parent-child dyads had complete satisfaction data. 55(63%) dropped out before completing the first treatment phase. Attrition was associated only with high BMI z-score at baseline (p<0.01). Overall, parent satisfaction was very high: 94% very/extremely satisfied with treatment team, and 88% very/extremely satisfied with the program, with a mean satisfaction of 9.2 (scale 1-10). Child and teen satisfaction were similarly high. Most (90%) children, teens, and parents felt they would complete treatment; only 15% of parents considered dropping out, which was not predictive of actual attrition. No specific elements of satisfaction were associated with attrition. Mean composite score of family satisfaction were lower for families that dropped out (88% vs 92%, p<0.05). Satisfaction composite scores among adults were not associated with attrition, though lower satisfaction among children was associated with higher dropout (p=0.058).

Conclusions: Satisfaction in this pediatric weight management
program was high. Child, but not parent satisfaction was correlated with attrition. Improving the child experience could improve family retention in obesity treatment.

T-P-3583
Teenagers Report Satisfaction with Pediatric Weight Management Clinic
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Background: Attrition rates are greater than 50% for most pediatric weight management clinics. In one study, 33% of parents reported that the child’s wish to end treatment was the reason for termination. However, patient opinion of multidisciplinary weight management clinical care is unknown. The objective of this study was to evaluate adolescent patient satisfaction in a multidisciplinary pediatric weight management clinic and willingness to return.

Methods: A convenience sample of patients, aged 13-18 years, who had attended at least two appointments completed a satisfaction survey. Patients self-reported demographic information. Other responses were provided on a 4-point Likert scale (strongly disagree to strongly agree), as Yes/No, or in an open-ended format.

Results: Forty-one patients participated (68% female; mean age 15.56 years). Mean scores across questions regarding patient-provider interactions and progress were all >3, indicating agree to strongly agree responses. The only item with a mean <3 (2.66) was related to knowing other teenagers to talk to about weight. Notably, when asked if it were completely up to the patient to come back for the next appointment, 38 (93%) responded “yes.” Open ended responses regarding clinic program and staff were categorized by theme. Most (66%, n=27) did not report a dislike. However, 4 (10%) reported negative emotional experiences such as anxiety about weighing or discussing negative life events; 4 wanted to see faster or greater results; 2 did not like the distance to clinic; and 2 disliked physical therapy. Regarding positive aspects, 21 (51%) reported liking and/or feeling supported by the team; 10 felt they were seeing results or being generally helped; 9 reported feeling understood; and 5 reported learning something new.

Conclusions: In this multidisciplinary pediatric weight management clinic, most adolescent patients reported general satisfaction, with an overwhelming majority of them reporting willingness to return to clinic.

T-P-3584
The association of maternal BMI with appetite and growth regulating hormones in human breast milk differs by sex of the infant
David Fields Oklahoma City Oklahoma, Ellen Demerath Minneapolis Minnesota, Brandon George Birmingham Alabama, Marvin Williams Oklahoma City OK, David Allison Birmingham AL

Background: Background: It is known that obesity and the metabolic syndrome may be ‘programmed’ during early development by suboptimal maternal nutrition in a sex-specific manner but one developmental pathway that has been virtually ignored is that of ‘lactational programming’, whereby nutritive and non-nutritive factors in milk differ by maternal nutritional (including obesity) status and impact offspring disease risk. The purpose of the present study was to test whether the effect of maternal BMI status (normal weight, overweight, and obese) on the concentration of milk leptin, insulin, glucose, IL-6 and TNF-α collected at 1 and 6 months post-partum differs by infant sex.

Methods: Milk was collected from 37 exclusively breast-feeding mothers of healthy term infants (21 boys and 16 girls), using one full breast expression between 8:00 and 10:00 am. The milk was then mixed, aliquoted, stored at -80°C and then centrifuged to remove the milk fat prior to analyses using commercially available immunoassay kits; milk analytes were natural log transformed if necessary prior to mixed effect regression analysis.

Results: A significant interaction between maternal BMI status and infant sex on insulin levels (p=0.0322) was observed such that insulin was 306% higher in obese mothers than in normal weight mothers nursing female infants but only 58.8% higher in mothers nursing male infants. From month 1 to 6, milk TNF-α in normal weight mothers nursing sons increased by 88.3% and decreased by 48.5% in those nursing daughters, while TNF-α in milk of overweight and obese mothers increased (range 20.7 to 42.4%) for both genders (interaction, p=0.0413). There were no differential associations by infant sex for the effect of maternal BMI on milk leptin, glucose, or IL-6.

Conclusions: Our results are consistent with a growing literature showing that milk composition differs by maternal BMI status, but suggest that this early life exposure may have different implications for girls and boys.

T-P-3585
Get Off the Couch! Increasing Participation in a 5K Training Program Through the Use of Social Support or Financial Incentives

Background: Physical activity declines in college setting the stage for weight gain. Developing methods that increase students’ physical activity levels may potentially prevent weight gain and improve long-term health outcomes. We conducted a randomized controlled trial examining whether social support or financial incentives are more effective in increasing physical activity in college students.

Methods: Participants (N= 29; 76% female) interested in using an 8-week Couch to 5K mobile app were enrolled in the study and randomized to either a Social Support group or a Financial Incentive group. Both groups received basic 5K training information and followed the same mobile Couch to 5K training app. The Social Support group fostered within group support through an online Facebook group, periodic in-person meetings, and group runs. In contrast, participants in the Financial Incentive group received small financial incentives each week for successfully following the Couch to 5k training plan.

Results: Data is presented on participants (n=16) who completed baseline and 4-week assessments (midway through the Couch to 5K program). At baseline, participants reported running 1.0±1.1 days per week and 0.7±0.7 miles at a time. Significant improvements were observed at 4-weeks (p<.001), with participants running 3.0±1.0 days per week and 2.0±0.5 miles per week.
miles at a time. Group x time interactions were not significant for either of the running variables.  

**Conclusions:** These results suggest that both social support and financial incentives are viable strategies for increasing physical activity in college students. Additional planned assessments will explore group differences on 5k completion rates and maintenance of physical activity levels.

**T-P-3586**  
**History of Miscarriage and Prepregnancy Weight Status Influence Psychological Well-Being and Exercise Motivation During a Subsequent Pregnancy**  
Danielle Downs University Park Pennsylvania, Courtenay Devlin state college PA, Jennifer Huberty Phoenix AZ

**Background:** Rates of miscarriage are increased among overweight and obese (OW/OB) women and miscarriage is associated with depressive/anxiety symptoms which can persist into subsequent pregnancies. Exercise behavior (EXB) may be one strategy to reduce these symptoms in pregnancy, however, few studies have examined the influence of miscarriage history on EXB and motivation across normal weight and OW/OB pregnant women. The study purposes were to describe the prevalence of prior miscarriage and obesity in a sample of pregnant women and examine differences in EXB, its motivational determinants, and psychological well-being by groups (prior miscarriage or no prior miscarriage; normal weight or OW/OB).  

**Methods:** Pregnant women (N=203) prospectively reported their EXB, motivational determinants, and depressive/anxiety symptoms during each trimester via mailed surveys.  

**Results:** Consistent with national prevalence rates, 20% of the sample had experienced a prior miscarriage and 36% were OW/OB. Women with a history of miscarriage had lower early pregnancy attitude and perceived behavior control and higher early and mid-pregnancy depressive/anxiety symptoms than women without a history of miscarriage. OW/OB women engaged in less prepregnancy exercise, had higher early pregnancy depressive/anxiety symptoms, and lower levels of exercise intention, attitude, and perceived behavior control throughout pregnancy than normal weight women.  

**Conclusions:** History of miscarriage and prepregnancy weight status appears to impact pregnant woman’s EXB, its motivational determinants, and psychological health. Elevated levels of depressive and anxiety symptoms resulting from miscarriage may influence women’s motivation to engage in perinatal EXB. Practitioners and interventions aimed at promoting EXB in pregnant women should target both prepregnancy weight status and history of miscarriage and adapt as necessary to meet the unique needs of women.

**T-P-3587**  
**Impact of the Level of Obesity on Mobility in Patients Referred for Weight Management**  
Brian Irving Danville Pennsylvania, Craig Wood Danville PA, Christopher Seiler Danville PA, Adam Cook Danville PA, Christopher Still Danville PA, Peter Benotti Danville PA

**Background:** Impaired physical function predicts poor clinical outcomes and may adversely impact both surgical and non-surgical weight loss. We recently implemented a simple standard of care, functional screening assessment for all new patients referred for weight management in our clinic. The purpose of this study was to determine the impact that the level of obesity has on patient reported physical function.  

**Methods:** 917 patients with a BMI>30 completed the PROMIS Short Form-20 Physical Function Questionnaire. We used multiple linear regression to determine the association between PROMIS percentile scores and level of obesity (Class 1: 30-34, Class 2: 35-39, Class 3: 40-49, Super Obese: >50 kg/m2). We compared the prevalence of mobility impairment (gait speed≤1.0 m/s) and disability (gait speed<0.8 m/s) by level of obesity (Class 1: 30-34, Class 2: 35-39, Class 3: 40-49, Super Obese: >50 kg/m2). Multiple logistic regression was used to measure association between mobility impairment/disability and level of obesity adjusted for age, sex, and education.  

**Results:** The mean±SD (range) for age and BMI were 48±14 y (18, 82 y) and 44±8 kg/m2 (31, 71 kg/m2), respectively. 76% were female and 54% had ≥high school education. The overall mean gait speed was 1.1 m/s. The percent with mobility impairment by Class 1, Class 2, Class 3, and Super Obesity was 8%, 31%, 39%, and 56%, respectively (overall p<0.001). When adjusted for age, sex, and education, higher levels of obesity were associated with more mobility impairment (Class 2: OR=3.86, 95% CI=[0.95, 15.73], p=0.059; Class 3: OR=7.40, 95% CI=[1.97, 27.87], p=0.0031; super obesity: OR=16.16, 95% CI=[3.93, 66.46], p=0.0001). The percent with mobility disability by Class 1, Class 2, Class 3, and Super Obesity was 6%, 7%, 9%, and 28%, respectively (overall p<0.001). When adjusted for age, sex, and education, super obesity was associated with more mobility disability (OR=7.36, 95% CI=[1.42, 38.17], p=0.018).  

**Conclusions:** Patients referred for weight management have a high prevalence of mobility impairment and disability. The level of obesity increases the severity of the mobility impairment independent of age, sex, and education. Assessment of usual gait speed can be used to identify patients with impaired mobility, prior to the initiation of surgical and non-surgical weight loss interventions.

**T-P-3588**  
**Impact of the Level of Obesity on PROMIS Physical Function Scores in Patients Referred for Weight Management**  
Brian Irving Danville Pennsylvania, Craig Wood Danville PA, Christopher Seiler Danville PA, Adam Cook Danville PA, Christopher Still Danville PA, Peter Benotti Danville PA

**Background:** Impaired physical function predicts poor clinical outcomes and may adversely impact both surgical and non-surgical weight loss. We recently implemented a simple standard of care, functional screening assessment for all new patients referred for weight management in our clinic. The purpose of this study was to determine the impact that the level of obesity has on patient reported physical function.  

**Methods:** 917 patients with a BMI>30 completed the PROMIS Short Form-20 Physical Function Questionnaire. We used multiple linear regression to determine the association between PROMIS percentile scores and level of obesity (Class 1: 30-34, Class 2: 35-39, Class 3: 40-49, Super Obese: 50+ kg/m2) adjusted for age, sex, and education.  

**Results:** The mean±SD (range) for age and BMI were 48±14 y (18, 82 y) and 44±8 kg/m2 (30.1, 83.2 kg/m2), respectively. Seventy four % were female and 54% had greater than high school education. After adjusting for age, sex and education the mean PROMIS percentile scores for Class1, Class 2, Class 3, and Super Obesity were 46.7% (95% CI=[41.8, 51.7]), 33.1% (95% CI=[29.2, 37.0]), 25.9% (95% CI=[22.8, 29.1]), 19.5% (95% CI=[15.8, 23.2]), respectively (overall p<0.001).  

**Conclusions:** The present data indicate that obese patients referred for weight management have a high degree of self-reported impairments in physical function. Moreover, the severity of self-reported impairments in physical function increases with the severity of obesity independent of age, sex,
and educational status. We propose that the PROMIS Physical Function Questionnaire can be used in conjunction with objective measures of physical function to identify high-risk patients with clinically meaningful impairments in physical function, prior to the initiation of surgical and non-surgical weight loss interventions.

T-P.3589-DT
Influences of Music Tempo on Exercise Performance and Perceived Emotional State: A Pilot Cross-Over Study Using POP Songs
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Background: Most prior research regarding music and exercise did not utilize POP songs, to which individuals often listen in daily life. To understand the effect of music on exercise, this study aims to determine the effects of music conditions on objectively assessed exercise performance and perceived emotional state.

Methods: A total of 10 Taiwanese college students performed exercise sessions on a treadmill for at least 20 minutes under five separate, randomly-assigned music conditions (no music, fast, medium, slow, and mixed tempo). Participants exercised on the treadmill until reaching voluntary physical exhaustion. Self-reported emotional states included fatigue, affect, and mood. Repeated-measures analyses of variance were conducted to assess the effect of music condition on exercise performance and emotional state; covariates included percent body fat, gender, physical fitness level, and age.

Results: Compared to the no music condition, fast-music and slow-music conditions resulted in longer exercise duration (p = 0.001), longer distance (p = 0.01-0.04), greater number of steps (p = 0.001-0.02), greater number of aerobic steps (p = 0.01-0.02), and more energy expenditure (p = 0.002-0.01). Exercise distance (p = 0.05), number of steps (p = 0.003), and number of aerobic steps (p = 0.04) were higher for the fast-tempo music than for medium-tempo music. Interestingly, exercise duration (p = 0.04), distance (p = 0.001), number of steps (p = 0.01), and energy expenditure (p = 0.02) were higher for medium-tempo music than for slow-tempo music. No significant differences across music conditions were found for other variables.

Conclusions: Listening to POP songs with faster tempo during exercise may help exercisers to improve their indoor treadmill exercise. Studies with larger sample sizes are needed to investigate how music tempo affects trajectory of exercise performance over the course of exercise.

T-P.3590
In-Home Physical Exercise Training Delivered via Telecare in Women Awaiting Bariatric Surgery: A Pilot Study
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Background: Physical activity (PA) is recommended by experts before and after bariatric surgery (BS) to improve the health of individuals with severe obesity. However, the level of PA is low in this population. We have previously shown benefits of a Pre-Surgical Exercise Training program (PreSET) in patients awaiting BS, but participation encountered barriers. In-home telehealth could be an interesting mode of delivery to reduce financial and time barriers, and improve adherence. This study aimed to evaluate the feasibility and effect of in-home PreSET delivered via telecare (TelePreSET) in women awaiting BS.

Methods: Supervised in-home TelePreSET (12-weeks of endurance and strength training, twice a week) was provided to six women candidates for BS using videoconferencing via an Internet connection. Women from a previous study (12 performing the PreSET in a gymnasium and 11 who received only lifestyle intervention) were used as controls. Physical fitness, quality of life, physical exercise beliefs, anthropometric parameters, and telehealth perception were evaluated before and after 12-weeks. Validated questionnaires were used to assess satisfaction at the end of the intervention.

Results: The attendance to supervised exercise sessions was 95.8 (85.1-100) %, and the TelePreSET satisfaction was 93.4 (89.3-97.7) %. The baseline in-home telehealth patients’ perception score was high [83.5 (80.9-91.2) %], and increased significantly after the intervention [+4.4 (1.2-8.8); p=0.03]. Physical fitness improved significantly in the TelePreSET group compared to the usual care group, with significant difference with the gymnasium PreSET group. No significant change or difference between groups were noted for other outcomes.

Conclusions: In-home telecare exercise training is feasible and improves physical fitness in women awaiting BS. Further studies will confirm beneficial effects of this innovative mode of delivery and develop collective intervention.

T-P.3591
Medium Term Effect of the Seven-Minute High Intensity Workout on Body Weight, Lean Body Mass, Grip Strength and Heart Rate
Lama Mattar Beirut Beirut

Background: The 7-minute training program composed from aerobic and resistance exercises, is becoming a very popular workout. This is due to the fact that it targets individuals who would like to exercise but who have time constraints. The aim of the study is to investigate if this type of exercise, characterized by high intensity-short duration would have a positive effect on body weight and composition, grip strength, heart rate and blood pressure.

Methods: Healthy participants (ages 18-30) are included. The workout investigated is developed by the ACSM. The duration of this study is 6 weeks where 42 participants in total will do the 7 minute workout 5 days a week. Measurements of height, weight, waist circumference, hip circumference, middle upper arm circumference, blood pressure, heart rate, hand grip, and bioelectrical impedance are being collected and recorded at the beginning, middle, and end of the full training program. Participants will also fill a questionnaire related to their eating and physical activity habits. This will allow us to categorize them later based on their initial physical fitness and body weight. Measurements and the workout are conducted at the Lebanese American University in Beirut, Lebanon (data collection will end approximately on the 1st of June 2015).

Results: We have recruited 30 participants so far (19 women and 11 men) of which 17 have already finished the 6 week period. Preliminary analysis showed significant increase in hand grip strength (p=0.04) and an increase in the Mid-upper arm circumference (p=0.032). A trend of decreasing waist to hip ratio was observed (p=0.057). No changes in weight and BMI have been noted yet. Body composition analysis is in process.

Conclusions: Body weight changes might not be perceived at
Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society

Poster Abstracts Wednesday November 4th to Friday November 6th, 2015

T-P.3592
Physical Function, Quality of Life, and Activity Level in Obese Adults One Year After Total Knee Arthroplasty
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Background: Obese individuals are at higher risk for osteoarthritis and total knee arthroplasty (TKA). Obese TKA patients may also have physical function limitations with reduced ability to complete activities of daily living and impaired quality of life. The purpose of this investigation was to evaluate physical function, activity level, and quality of life in obese patients one year following TKA.

Methods: Obese adults who had TKA and were at or near their 1-year post-surgical follow-up appointment were recruited from a university-based orthopedic clinic. Participants completed the Medical Outcome Survey Short Form version 2, the Western Ontario and McMaster University Osteoarthritis Index, a physical activity questionnaire, and health and medical histories. Anthropometrics, knee extension strength, and six minute walk distance were measured.

Results: 60 participants (65% female; 64.7 ± 5.6 years old; mean ± SD, 14.0 ± 2.6 months post-surgery) completed baseline assessments. Participants on average had 41.2 ± 3.5% body fat, body mass index of 37.4 ± 5.5 kg/m², sum of skinfolds 135.0 ± 20.1 mm, and waist to hip ratio of 0.91 ± 0.10. Nineteen participants (31.7%) had weak (<75% predicted value) leg extensor strength and 35 (58.3%) failed to reach 75% of predicted walk distance. Nearly half (46.6%) reported physical function scores within the lowest 10th percentile of the normative population. Patients on average reported completing 14.3 ± 25.9 minutes of moderate intensity physical activity per week. None of the subjects reported engaging in vigorous physical activity and 71.6% reported no moderate intensity physical activity in the last 30 days.

Conclusions: Obese TKA patients have marked physical performance limitations and low physical activity levels one year after surgery and completion of post-operative rehabilitation.

T-P.3593
Predicting Exercise Motivation and Behavior in Normal Weight and Overweight/Obese Pregnant Women with a History of Perinatal Loss
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Background: About 1/3 of women experience a miscarriage during the childbearing years and overweight/obese (OW/OB) women are at particularly higher risk for perinatal loss. Exercise behavior (EXB) may reduce anxiety/depressive symptoms associated with perinatal loss; however, scant research has examined how prior miscarriage influences women’s EXB and motivation. The study purpose was to prospectively examine the influence of prior miscarriage on EXB and motivation from the 1st to 2nd and 2nd to 3rd trimesters in normal weight (NW) and OW/OB pregnant women.

Methods: Pregnant women (N=203; 41 prior miscarriage; 72 OW/OB) prospectively reported EXB, its motivational determinants (attitude, subjective norm [SN], perceived behavioral control [PBC], intention [INT]), and depressive/anxiety symptoms in each trimester via mailed surveys. Hierarchical regression analyses were run by prepregnancy weight group (NW, OW/OB) to predict EXB and INT.

Results: Up to 25% of the variance in EXB was explained by the motivational/psychological predictors with INT emerging as a significant predictor for both groups. Between 29-43% of the variance in INT was explained by the predictors with attitude emerging as a key predictor in both groups across the trimesters. PBC also emerged as the strongest predictor of INT in late pregnancy among NW women only. Prior miscarriage also moderated the contributions of anxiety and INT for predicting EXB and SN for explaining INT. In women with prior miscarriage, NW women value the motivation of social support and may exercise to cope with the anxiety of being pregnant again whereas OW/OB women appear to have difficulty acting on their intention to be active.

Conclusions: Prior miscarriage appears to have a unique influence on EXB and motivation in both NW and OW/OB women in a subsequent pregnancy. Attention to perinatal loss may be an important target for intervention and healthcare provider counseling to effectively promote EXB.

T-P.3594
If You Build IT: Creating the Foundation for Engagement Through a Qualitative Analysis of the Attitudes and Barriers to Healthy Behavior in Home Care Aides with Obesity
Sarah Adler Stanford California, Allison Hansell Seattle WA, Leslie Phillips Seattle WA, Sundeep Singh Los Altos California

Background: In Washington State, 27% of adults are obese, with the burden falling disproportionately in underserved populations. SEIU Healthcare NW Health Benefits Trust (HBT) provides health-care to unionized home care aides (HCA) in Washington State who have a higher than national average prevalence of obesity (46%). Identifying efficacious interventions is challenging due to biological, psychological and socio-economic factors, motivating the HBT to better understand likely barriers to success before designing interventions that demand behavior change.

Methods: Two separate 90-minute HCA focus groups were conducted. Questions to HCAs followed the Duke University Focus Group Guidelines. Open-ended question focused on health: perceived influences, barriers, and attitudes. Two independent raters who coded responses based on frequency of key words and phrases performed qualitative analyses.

Results: A diverse population of 17, predominantly female HCAs participated. Median age was 46.5. Median monthly work hours were 25.7. The dominant health-promoting theme was a high regard for wellness. Commonly cited health barriers included: lack of time, money, social support; difficult interpersonal relationships and limited access to resources. Insufficient education regarding, healthy behavior change and poor sleep were additional barriers.

Conclusions: The creation of behavioral interventions for weight loss warrants thorough understanding of barriers and attitudes of the intended recipients. The above themes indicate that HCAs in our study highly value health, but experience significant psychological, economic, and physical barriers to...
achieving health. As we move forward, we will modify evidence-based interventions to target identified barriers, to enhance engagement, and increase probability of successful outcomes.

T-P.3595
Student Experiences of Traffic-Light Labels at University Dining Halls
Michael Seward Winchester Massachusetts, Jason Block Boston MA, Avik Chatterjee Cambridge Massachusetts

Background: Prior surveys of college students found support for posting nutrition information in college dining halls. However, little is known about the student experience of nutrition interventions. In particular, college-aged women are at-risk for eating disorders, and nutrition labeling interventions could increase that risk. We know of no qualitative studies on experiences with traffic-light labels nor studies on the relationship between eating disorders and traffic-light labels.

Methods: In the fall of 2014, we implemented a traffic-light labeling (green=“nutrient-rich,” yellow= “less nutrient-rich,” red=“more nutrient-rich choice in green or yellow”) and a choice architecture intervention (healthy food more accessible) in 6 dining halls at a US university. We used pre- (N=550) and post-intervention (N=779) surveys as well as focus groups (N=57) to assess student experiences of the intervention.

Results: In surveys, 16% said traffic-light labels put people at risk for developing eating disorders, but 47% said traffic-light labels put people at risk for exacerbating eating disorders. In focus groups, a small number of students echoed these findings, saying that red labels were “jarring” and could make students “obsessed with eating healthy.” However, most participants reported that people with eating disorders “know what’s in their food regardless of a red label.” Many students thought traffic-light labels would change eating behaviors but also noted barriers: a nutritional knowledge gap, different nutrition priorities, and the “invisibility of youth.” Despite barriers, most students agreed “the more nutrition information available, the better.” In surveys, 91% of pre-intervention students wanted nutrient information in the dining halls, while 12% of post-intervention students wanted nutrition information online only.

Conclusions: College students generally support traffic-light labeling, but identified barriers. Future nutrition interventions at colleges should address concerns about eating disorders.

T-P.3596
Applications of mHealth in Supporting Obesity and Diabetes Patient Health Care
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Background: Treatment of obesity and diabetes is costly, needs long-term efforts from patients, their health providers and other stakeholders, and often is un-effective. mHealth offers good promises. We conducted a systematic review to examine applications of mHealth in obesity and diabetes patient care, to assess their effectiveness, research gap, and provide recommendations for future research.

Methods: We searched Pubmed for related studies published since 2000 using related keywords.

Results: More of the 81 studies that met our inclusion criteria targeted at weight loss than at diabetes care; vast majority conducted in high-income countries like USA and Europe. The studies used various study designs, focused on different populations, had a wide range of sample sizes, but most had small samples and short follow-up. They used various intervention approaches included mobile text messages and internet programs to help monitor and assess weight loss in obesity patients, empower lifestyle changes in obesity and diabetes patients. Some studies evaluated the contents, functions, salient features, efficiency, acceptability and feasibility of recently available apps for obesity and diabetes care. Overall, the studies showed beneficial effects of the mHealth interventions, and they were acceptable by patients. Mobile applications could result in weight loss and improvement in eating and physical activity. Key components for effective technology-based weight loss interventions included self-monitoring, counselor feedback and communication, social support, use of structured programmes, and use of individually tailored programmes.

Conclusions: Many studies have tested mHealth interventions/service to serve obesity and diabetes patients. Future larger scale, longer follow-up interventions and those using a combination of innovative technologies and guided by behavioral theories that provide comprehensive and sustainable support for patients and health providers are needed.

T-P.3597
Body Extracellular and Intracellular Distribution Ratio is a Poor Indicator of Body Fatness in Overweight Young Adults
Michelle Alencar Tustin CA, Edgar Sanchez Colton California, Leilina Nguyen San Bernardino CA

Background: The ratio between extracellular (ECW) and intracellular (ICW) body water compartments is seen as an indicator of total body fluid distribution, hydration, and potential disease states including obesity. Due to the fact that adipose tissue (AT) has approximately 14% water versus 72% in fat-free tissue (FFM), as AT increases, the ratio of ECW:ICW will also increase. Furthermore, overweight females are thought to have a higher ECW:ICW ratio than males due to their higher body fatness. Estimating body composition (BC) and percent body fat (%BF) is often done using methods such as Underwater weighing (UWW), Dual Energy X-ray Absorptiometry (DXA), or bioelectrical Impedance Analysis (BIA). These methods often rely on ECW and ICW compartment assumptions for tissue hydration for estimating %BF.

Methods: N=25 overweight adults (BMI 29.04 ± 3.568kg/m2, 13 males, 12 females, ages 24.37 ± 4.924y) followed standardized pre-testing guidelines for BC assessment. Percent body fat (%BF) was measured by GE Lunar Prodigy DXA, UWW. Impedimed BIA was used to measure ECW and ICW. Results: %BF values for UWW and DXA were found to be 28.6 ± 8.9% and 37.4 ± 16.3%, respectively. ECW:ICW ratios between males and females were not found to be statistically different (0.79 ± 0.12 vs 0.79 ± 0.21, respectively). Furthermore, Pearson’s correlation coefficient did not indicate a relationship between %BF estimations and ECW:ICW ratios for UWW or DXA, (r= 0.138, p = 0.520 and r= 0.156, p= 0.467).

Conclusions: ECW:ICW compartment ratios were not found to be significantly correlated to %BF measures using either criterion method, DXA or UWW. Differences in %BF measurements by these methods may be attributed to other factors.
T-P-3598
Dietary Supplementation With a Type 3 Resistant Starch Impacts on Human Gut Butyrate Producing Bacteria, and has Implications for Glucose Homeostasis

Background: Dietary fiber and resistant starch (RS) are shown to improve glycemic control and aid in glucose homeostasis. Fermentation of RS by colonic microbiota leads to short chain fatty acid (SCFA) production shown to increase the release of gastrointestinal satiety hormones, including GLP-1 involved in glucose homeostasis.

Methods: Nineteen overweight and obese free-living adult males and females aged 42.9 ± 12 years and BMI 32.8 ± 3.9kg/m2 participated in a controlled crossover dietary plan comprising of an initial 21 day weight loss diet followed by a control and type 3 RS-containing diet. Blood (fasting and post-prandial; n=18) and fecal (n=169) samples were collected from subjects, following 10 days on the test diets.

Results: Average fasting glucose at baseline was 5.86 ± 0.13 mmol/L and was reduced to 5.63 ± 0.14 mmol/L after the weight loss period. A further significant reduction was observed after RS diet to 5.57 ± 0.07 mmol/L compared to the control diet 5.77 ± 0.07 mmol/L, (p=0.015, SED 0.09). No observed after RS diet to 5.57 ± 0.07mmol/L compared to the control diet 5.77 ± 0.07 mmol/L, (p=0.015, SED 0.09). No difference in postprandial insulin response was observed between the RS and control diets. The majority of species exhibiting a significant increase in response to type 3 RS belonged to the beneficial gut genera Ruminococcus and Eubacterium, with additional changes occurring within the Bifidobacterium, Faecalibacterium, Alistipes and Lachnospiraceae groups. Species significantly enriched by the type 3 RS included the primary starch degrader Ruminococcus bromii, and the major butyrate producer Eubacterium rectale (p<0.05).

Conclusions: In conclusion, the incorporation of type 3 RS into the diet significantly enriched a distinct group of bacteria contributing to starch fermentation and improved glucose homeostasis in healthy, but overweight, subjects.

T-P-3599
Median American Intake of Fructose Does Not Produce Changes in Body Composition
Joshua Lowndes Celebration Florida, Stephanie Sinnett Celebration FL, James Rippe Celebration Florida

Background: Fructose has a low Glycemic Index for a sugar, and a subsequent reduced effect on leptin. Animal studies show fructose can promote weight gain and the development of associated metabolic diseases when consumed in very high doses and in isolation. The applicability of these findings to human consumption is unclear because they do not represent how fructose is consumed in the human diet.

Methods: All Participants were apparently healthy and weight stable (no change in weight greater than 3% over the past three months) prior to enrollment (M=69, F=87, mean age 35.7 ± 11.4 years). Participants consumed sweetened or regular milk in amounts so that the added sugar contributed a target percentage of the calories required for weight maintenance: Fructose 9% (50th percentile of fructose consumption in the US), Glucose 9%, High fructose corn syrup 18%, sucrose 18% and an unsweetened milk control consumed so milk contributed 18% of the weight-maintenance calories. The energy intake required for weight maintenance was estimated for each participant using the Miflin St Joer equation and using an appropriate activity factor determined by responses to a physical activity questionnaire. The intervention lasted ten weeks.

Results: There was a small change in weight (162.0 ± 28.5 vs 163.8 ± 29.3) and BMI (26.0 ± 3.5 vs 26.3 ± 3.7) in the entire study population (p<0.001), but no effect of group assignment (interaction p>0.05). In contrast there were no changes in any measure of body composition (p>0.05) - body fat percentage (32.0 ± 9.9 vs 32.2 ± 9.6 %), fat mass (33.1 ± 19.3 vs 33.2 ± 19.8 lbs), fat free mass (67.4 ± 32.2 ± 66.5 ± 32.2 lbs) or abdominal fat (34.4 ± 13.0 vs 34.4 ± 12.6 %), and, again, no effect of the type of sugar consumed.

Conclusions: These data suggest that when consumed in ways and at levels typical of the American diet neither fructose nor fructose containing sugars promote fat gain.

T-P-3600
Metabolic Parameters After Intragastric Balloon Placement: A Systematic Review and Meta-Analysis.
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Background: Intragastric Balloons (IGBs) are an endoscopic weight loss method that have been used for over 20 years outside of the United States. We performed a systematic review and random effects meta-analysis to assess the effect of IGBs on metabolic outcomes associated with obesity.

Methods: MEDLINE and Embase were searched through March 2015. Examination of titles, abstracts, full review, and data abstraction were performed independently by 2 authors. Studies were selected based on availability of metabolic data before and after IGB treatment. Balloon used in all trials is Orbera IGB.

Results: Thirty three studies including 1662 patients were analyzed. The IGB was removed after 6 months an all studies except two (3 months). The pooled mean fasting blood glucose (FBG) decreased by 12.7 md/dL (95% CI -5.2, -20); in HbA1c, by 0.8 % (95% CI, -0.2, -1.3); in triglycerides, by 28.9 mg/dL (95% CI, -19.6, -38.2); in systolic blood pressure, by 9.6 mmHg (95% CI, -5.6, -13.6); in diastolic blood pressure, by 4.3 mmHg (95% CI, -2, -6.5). The pooled mean decrease in BMI was 5.1 kg/m2 (95% CI, -4.5, -5.6), and in waist circumference, 13.4 cm (95% CI, -10.1, -16.8). Four of the studies were randomized controlled trails that compared IGB to lifestyle +/- sham. The mean decrease in FBG after balloon over controls was 25.7 mg/dL(95% CI -12, -39). A meta-regression showed that decrease in FBG was correlated to decrease in waist circumference (P=0.04), but not to BMI change (P=0.1).

Conclusions: IGBs are associated with substantial improvement in obesity-related metabolic outcomes.

T-P-3601
No Change in Weight or Measures of Body Composition After Six Months of Daily Consumption of Sugar
Sweetened Beverages or Diet Beverages Compared with Water
Joshua Lowndes Celebration Florida, Stephanie Sinnett Celebration FL, James Rippe Celebration Florida

**Background:** The potential causes of obesity are numerous, complex and likely interlinked. Many factors have been singled out as being uniquely causative, including insufficient physical activity, excess dietary fat or dietary carbohydrate. Sugar Sweetened Beverages (SSB), as a significant source of sugar in the American diet, is one such factor. Some epidemiologic studies have associated diet beverages with weight gain while others have not. The recently released Dietary Guidelines Advisory Committee recommended reductions in SSBs and cautioned against substituting them with diet beverages while advocating water. However, there is a paucity of longitudinal data on the effects of SSBs and diet beverages when consumed as part of a balanced diet on body composition.

**Methods:** Seventy-one apparently healthy normal weight or overweight individuals (mean age 32.8 ± 8.6 years) were randomly assigned to one of three groups: 1) SSB, 2) diet beverage, or 3) water. Participants followed the ADA exchange diet daily for 6 months and incorporated 2 servings a day (average American level of consumption) of the required beverages. Body composition was measured via DEXA and performed prior to and after completion of the 6 month intervention.

**Results:** There was no change in weight (161.0 ± 24.0 vs 162.0 ± 23.9 lbs) or BMI (25.2 ± 2.4 vs 25.4 ± 2.4) in the entire study population (p>0.05) and no effect of the type of beverage consumed (interaction p>0.05). Likewise, there were no changes (p>0.05) in body fat percentage (30.5 ± 8.6 vs 30.6 ± 8.2%), fat mass (46.6 ± 14.1 vs 47.2 ± 14.7 lbs), fat free mass (107.3 ± 22.4 vs 107.9 ± 22.2 lbs) or abdominal fat (31.4 ± 10.5 vs 31.7 ± 11.0 %), and, again, no effect of the type of beverage consumed.

**Conclusions:** These data suggest that when consumed as part of a balanced, caloricly appropriate diet there is no obesogenic effect of SSB or diet beverage.

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T-P-3602
The Onset Time of Macroproteinuria and its Risk Factors in the Newly Developed Diabetes Nephropathy in T2DM in Usual Physician Care – Based on the DCMP 2001, Taiwan
Martin Mao-Tsu Fuh Taichung Taichung, Pei-Chin Chen Hsincha Hsincha, Chia-Ing Li Taichung Taichung

**Background:** In order to evaluate the impact of risk factors and time of onset of newly developed diabetes nephropathy in T2DM for the ensuing development of personalized prevention program.

**Methods:** From 2008 to 2013, 6192 cases of T2DM, were cumulatively enrolled in DCMP 2001. All patients were having the general anthropometric data collected; metabolic variables, sequential urine examination and albumin creatinine ratio ( ACR ) measured. The lifestyle measurements (lifestyle I, no smoking, no alcoholic and regular exercise, otherwise lifestyle II), total daily caloric intakes, macronutrient consumptions were tri-monthly recorded. The eating habits were classified by carbohydrate/fat consumption, high fat (>35%) and high carbohydrate (>50%) diets. The newly developed diabetes nephropathy ( DN ) was determined by more than 2 times of ACR=300. The MetS defined was based on the criteria mentioned in the ATP III. Time ranges of onset of macroproteinuria indicated the duration of time from onset of T2DM to onset of macroproteinuria ( 1-5, 6-10, ≥11 years ). There were 633 patients diagnosed as newly developed DN clinically. The Chi-Squard test and Multinomial logistic regression analysis were used.

**Results:** The case number, percentage distribution and its statistically significant differences demonstrated between different time ranges of onset of macroproteinuria and ages of onset of T2DM ( (≤40, 41-50, 51-60, 61-70, ≥71 ) ( p<0.001 ), lifestyles ( p=0.039 ), BMI ( 0<bmi

**Conclusions:** The results suggested that the time of onset of newly developed diabetes nephropathy would be significantly related to the age of onset of T2DM, lifestyles, BMIs, hypertension and high carbohydrate diet eaters. Further longitudinal study would be required.

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T-P-3603
Effect of Two Diets With Different Content of Protein on Weight Loss and Biomarkers of Metabolic Syndrome: A Randomized Controlled Trial
Ismael Campos Estado de Mexico , Simon Barquera Cuernavaca Morelos, Lucia Hernandez Cuernavaca Morelos

**Background:** Protein-enriched diets lead to greater weight loss and improvements in biomarkers of metabolic syndrome(MS) than standard protein diets, but this concept has not been tested in Mexico where MS is a significant public health problem.

**Methods:** 118 adults with 47.4±11.5 years, BMI of 31.5±4.7 meeting the established criteria for MS were randomized to prescribed diets providing either 0.8g/kg body weight (SP) or 1.34g/kg body weight (HP) protein for 6 months. Body weight, waist circumference, fasting blood glucose, triglycerides, cholesterol, c-VLDL, c-HDL, insulin, creatinine, BUN, AST, ALT and GGT were measured at baseline, 3 months and at 6 months.

**Results:** There were 105 subjects (51 with SP and 54 with HP) who completed the trial. Overall weight loss was 5.1±3.6 kg in the SP group compared to 7.0±3.7 kg in the HP group. Both groups lost a significant percent of baseline weight (SP=-6.5±2.1%, HP=-8.3±2.6%, p<0.001). There was no statistical differences between the weight losses in the two groups overall. However in the subgroup judged to be adherent more than 75% of the time with the prescribed diets, there was a significant difference in percent weight loss (-10.4% vs. -6.0%). Both groups demonstrated significant decreases in waist circumference, glucose, insulin, triglycerides, and c-VLDL but there were no differences between the groups. There were no significant changes in liver or renal function.

**Conclusions:** Protein-enriched diets at both levels of protein resulted in weight loss and improved biomarkers of MS, but different adherence masked the potential effects of higher protein diets in some subjects.
T-P.3604
Effectiveness Evaluation of the National Aeronautics and Space Administration (NASA) Mission X Child Fitness Promotion Program in the United States
Zhengqi Tan Buffalo NY, Laurie Abadie Houston TX, Scott Townsend Houston TX, Jung Won Min Buffalo NY, Hong Xue Buffalo NY, Youfa Wang Buffalo NY

Background: To promote health in children worldwide, the NASA Mission X: Train Like an Astronaut Program was developed to inspire and educate school children to live a healthier lifestyle by introducing physical and science activities designed for astronauts. This project assessed the effect of the NASA Mission X, a website- and school-based children fitness promotion program among US children.

Methods: During January to March in 2014, 3056 students in 14 sites across 7 states and Puerto Rico participated as Team USA in Mission X and received a 3-month website- and school-based intervention. Among them, 443 students from 3 sites (St. Louis, MO; Plant City, FL; Houston, TX) joined the surveys; 233 of them had complete data and were included in this study. Students’ behavior and knowledge on nutrition and physical activity were measured using questionnaire pre- and post-intervention. The differences in outcomes between pre- and post-intervention were examined using a set of nonparametric tests; stratified analyses were conducted by gender, age and state.

Results: Post-intervention (vs. pre-intervention), there were significant increase in mean total scores in behavior and knowledge (24.81 vs. 24.21; 95% CI, 0.07 to 1.24; p<0.05 and 4.52 vs. 3.06; 95% CI, 1.17 to 1.75; p<0.0001) regarding eating habits and physical activity; and in mean scores of knowledge on nutrition and physical activity (0.86 vs. 0.55; 95%CI: 0.19 to 0.43; p=0.0001) and 3.66 vs. 2.51; 95% CI: 0.92 to 1.38; p<0.0001). Among all 3 state subgroups, the Florida group had the largest improvement. The change of knowledge and total score pre- and post-intervention varied by sex and age groups, but did not differ significantly.

Conclusions: The NASA Mission X Program is effective in improving participating students’ behaviors and knowledge on nutrition and physical activity in the US.

T-P.3605
Scaling-Up 13 Community-Based Programs for Childhood Obesity Prevention Using EPODE Methodology and WHO Appraisal Tool
Julie Mayer Brussels Brussels, Krystallia Mantziki Amsterdam The Netherlands, Carry M. Renders Amsterdam Noord Holland, Jean-Michel Borrs PARIS France, Jacob Seidell amsterdam netherlands

Background: Childhood obesity and overweight is a major public health concern in Europe. Programmes and initiatives across the region use various approaches to prevent this issue, encountering challenges in the implementation field. The current study aims to appraise the methodology of community-based programs and initiatives (CBPs) targeting childhood obesity prevention for strengthening and up-scaling their process, based on the pillars of EPODE (Together let’s prevent obesity) methodology.

Methods: This is a descriptive research to identify strengths and weaknesses of the participating programmes. Data collection was conducted through the WHO Good Practice Appraisal Tool and semi-structured interviews with the principal programme coordinators. The interviews assessed the programmes’ approach to political commitment, public-private partnerships, support services for interventions and scientific evaluation. Three researchers appraised the information in reference to the EPODE pillars, using a scoring scale from 0 to 2.

Results: Formal political commitment existed in the majority of the programs. 46% of the programmes had structural public-private partnerships and no interference with the methods/contents of programs. Planning interventions was lacking target group analysis and focus on environmental change in most of the programmes. The communication and dissemination methods were lacking for the majority of the programmes. 77% of the programmes conducted an evaluation, but usually that did not include all the important aspects of the programme. The results from the WHO Good Practice Appraisal Tool and more detailed results from the interview guide will be presented during the congress.

Conclusions: The context and methods of implementation varied between the CBPs. We identified various aspects to be improved; tailored feedbacks, trainings and workshops are led. The next step is the progress appraisal of each CBP after 2 years of training.

T-P.3606
2 year outcome of roux-en-Y gastric bypass (RYGB) for adolescents and adults with diabetes: An analysis from the Teen-LABS and LABS Consortia
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Background: RYGB results in early and large treatment effects in adults with type 2 diabetes mellitus (DM). However, very little is known about the response of adolescents to surgical therapy. We hypothesized that a greater proportion of adolescents with DM would experience remission at 2 years when compared to a group of adults who were themselves obese as adolescents, due to their longer duration of disease.

Methods: 161 adolescents (“Teen”; mean age=17, M:F ratio=35:126) and 396 adults (mean age=38, M:F ratio=95:301) with a history of obesity at age 18 were recruited. Both cohorts had RYGB for the treatment of severe obesity. 23 Teens (14% of total) and 120 adults (30% of total) had DM at baseline. Change in DM status was defined based upon: full remission=no medication use and normal HbA1c and fasting glucose; partial remission=no medication use and HbA1c 5.7-6.49%, or fasting glucose 100-125mg/dL.

Results: Median BMI in the Teen and Adult DM cohorts at baseline (53 kg/m2 [IQR=47.62] and 51 kg/m2 [IQR=46.56]) decreased by 30% and 32% (p=0.10), respectively at 2 years post surgery. Of those 23 Teens and 120 Adults with DM at baseline, DM remission (full + partial) was seen in 88% (95 CI=64.99) of Teens and 69% of adults at 2 years (95 CI=55.81; p=0.13). Baseline HbA1c values for Teens and Adults with DM were 6.3% (IQR=5.48) and 6.8% (IQR=6.8), respectively. At 2 years, HbA1c values for those in DM remission were 5.0% (IQR=4.8,5.4) and 5.2% (IQR=4.9,5.5) for Teens and Adults, respectively.

Conclusions: A greater proportion of Teens than Adults were in DM remission at 2 years and a trend for increasing improvement in DM remission was found for Teens between 1
and 2 years. Further analyses at 5 year follow-up will be important to determine durability of response and in particular, if DM relapse rates for Teens and Adults differ following RYGB.

T-P-3607
5-Year Outcome of Sleeve Gastrectomy - Review of 1540 Patients
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Background: Clinical data on the long-term (5 years) outcome of sleeve gastrectomy (SG) is still limited. This literature review aims to provide an update on the long-term efficacy of sleeve gastrectomy as primary bariatric intervention.

Methods: A PubMed literature search using the terms: 5-year AND sleeve AND gastrectomy was performed and all papers written in English were selected. 1540 patients with post SG follow-up data of 5 years were included in this study.

Results: Primary SG was performed in 96.2% and overall, 25.6% of patients were lost to follow-up. Majority of the patients were female (73.8%) with mean age of 43.4 years. 5 years post-operatively, mean body mass index (BMI) and fat mass (%) loss of 30.1% (47.1 to 32.9) and 22.9% (48.4% to 37.4%) respectively was achieved. Co-morbidities including dyslipidaemia, diabetes and hypertension either resolved or improved in 78.2%, 77.6% and 75.2% respectively. Optimal glycaemic control defined as HbA1C ≤7% was also achieved in 84.2% of the patients with obesity-induced diabetes. However, 17.2% regained weight and continued weight loss was maintained for 1 year only (annual relative BMI rise (RBR): 2.1% (year 1 - 2), 1.5% (year 2 - 3), 3.2% (year 3 - 4) and 7.5% (year 4 - 5). %EWL has also reduced to 57.2% (year 5) from 65.9% (year 1). Successful weight loss defined as %EWL >50 was seen in 328 of 619 patients (53.0%) at year 5 only compared to 544 (87.9%) at year 1. The non-obese state (BMI <30) at year 5 was achieved in 57 of 208 patients (27.3%). Revision surgery was required in 83 patients (6.2%) and above all, poor weight loss/regain (49.4%) was the primary indication. The 5-year diabetes recurrence rate was 22.0%.

Conclusions: Although, the short-term outcome of SG is comparable with other bariatric surgical interventions, its non-reversibility, continued weight regain and relatively high revision rate oppose the intention of its primary use. Utilisation of SG must be individualised and its relatively poor long-term outcome must not be overlooked.

T-P-3609
Are Weight Loss Outcomes after Bariatric Surgery Better in Younger Adults?
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Background: The effect of age on bariatric surgery weight loss outcomes is ill-defined. Most reports contain small sample sizes and do not include sleeve gastrectomy patients.

Methods: Participants were 10,606 patients who had either a laparoscopic Roux-en-Y gastric bypass (bypass) or sleeve gastrectomy (sleeve) between 1/1/2010 and 12/31/12. Patient demographics, comorbidity burden, body weight, and body mass index (BMI) at the time of surgery were abstracted from medical records. Percent initial weight loss (%IWL) was calculated using weight on the day of surgery. A repeated measures ANCOVA was used to determine the impact of age category (18 – 21, 22 – 29, 30 – 39, 40 – 64, 65+) on %IWL at 6-, 12-, 18-, 24-, and 36-months post-surgery. Covariates were Charlson Comorbidity index, race/ethnicity, and BMI at baseline.

Results: Age distribution was 1% (n = 126) 18 – 21, 8% (n = 891) 22 – 29, 26% (n = 2,244) 30 – 39, 40% (n = 6,477) 40 – 64, and 3% (n = 368) 65+. For bypass patients (n = 4,789) there was a marginal effect of age on %IWL (F(7, 4324) = 1.95; p = 0.054) as patients 18 – 21 years old lost more weight at all time points compared to all other age groups. For sleeve patients (n = 5,817), there were no differences between age groups at any time points (p = 0.88).

Conclusions: Young adults may have better weight outcomes than older adults and these persist throughout three years of follow-up. This difference is primarily seen in bypass and not sleeve patients.
T-P-3610
Assessing the Demographic Disparities in an Adolescent Bariatric Surgery Population
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Background: Bariatric surgery is becoming more common in the severely obese adolescent population. Limited research is available describing the demographics (gender, race, and age) of adolescent patients seen in bariatric clinics, particularly for those who ultimately undergo a surgical procedure. The aim was to investigate whether there were demographic disparities between the adolescents who underwent a bariatric procedure and those who did not.

Methods: We conducted a chart review for patients who had their first visit to the bariatric surgery clinic between June, 2011 and December, 2012. We conducted frequency analysis to assess demographics variables (gender, race and age) and determined the proportion of patients who went on to have bariatric surgery within 1 year of their first clinic visit. Chi square analysis was used to assess potential differences between patients who had surgery within 1 year of their initial clinical evaluation and those who did not. An independent samples t-test was used to compare age at initial visit between those who had surgery and those who did not.

Results: Of the 194 patients included in the analysis, 66.5% (129/194) were female, 56.7% (110/194) were white, and 16.0% (31/194) underwent bariatric surgery within one year. Of these patients, 16.0% (31/194) underwent bariatric surgery within one year. There were no significant differences in the gender or race distributions. No differences in mean age were observed for those who had bariatric surgery versus those who did not.

Conclusions: Demographic disparities were not observed between the adolescents who underwent bariatric surgery within the first year following clinical evaluation by a multidisciplinary team vs. those that did not. Further research is warranted to explore the low conversion rate and what factors e.g., whether other factors such as familial support, mental health status, the number of bariatric clinic visits, or insurance status increase the likelihood of undergoing bariatric surgery.

T-P-3611
Assessment of Sexual Functioning and Health among Bariatric Surgery Candidates
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Background: The poorer quality of life seen in obese populations is associated with increased mental and behavioral health difficulties. Of these problems, the issue of sexual functioning among obese population is often overlooked. The aim of this presentation is to heighten clinicians’ awareness of the intersection of obesity and sexual functioning; specifically, those who are undergoing bariatric surgery, and the lack of pre-surgical assessment regarding this area of functioning.

Methods: Systematic literature review; interview experts regarding the assessment of sexual functioning and health and how the lack of assessing for these areas of life could affect psychosocial functioning post-operatively when weight is lost

Results: While empirical findings were not employed to reveal why sexual health and functioning were not assessed, data collected from field consultants noted a variety of factors, most importantly that more severe co-morbid issues (e.g., diabetes, hypertension) require more immediate attention than sexual quality of life. This area of life may be omitted because of the assessment requirements from insurance companies, the assumption that a clinical interview will be thorough, and the lack of knowledge of high risk sexual behaviors pre-operatively for post-operative adjustment. The physical changes from weight loss often lead to lowered levels of sexual dysfunction and higher levels of fertility, increasing chances of pregnancy. Such knowledge is not readily available to patients.

Conclusions: Data gathered from field consultants highlighted the need for more support from researchers in understanding the sexual quality of life issues present among bariatric surgical candidates and patients. It is noteworthy that unlike the literature, all field consultants agreed that sexual health and functioning are important components of quality of life and should be assessed routinely.

T-P-3612
Associations between Changes in Physical Activity Behavior and Body Weight After Roux-en-Y-gastric Bypass Surgery
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Background: Roux-en-Y gastric bypass (RYGB) results in a substantial weight loss; however, the individual variation is large. Physical activity (PA) has been shown to increase postoperatively and seems to be positively associated with weight loss outcomes in patients undergoing bariatric surgery. Thus, PA behavior could be one mechanism explaining the variation in post-operative weight loss. However, as previous findings are based on self-reported PA and since overestimation of self-reported PA is likely to occur in obese populations, objective measures of PA is needed. The objective is to investigate changes in objectively measured PA behavior in severely obese RYGB candidates pre- and post-surgery, and the associations between PA behavior and changes in body weight.

Methods: Anthropometric variables (body weight, BMI, fat mass) and PA was investigated pre- and 6 months post-RYGB. Accelerometer-determined PA behavior was measured for 6 days and 7 nights. PA data was divided into: sedentary time (<100 counts/min), light PA (101-3207 counts/min), moderate to vigorous PA (>3207 counts/min), steps/day and total physical activity (average counts/min).

Results: Preliminary analysis of data from nine subjects (BMI: 40.7 ± 4.5 kg/m2) showed a reduction in body weight (31.7 ± 8.1 kg), BMI (10.8 ± 2.8 BMI points) and fat mass (25.0 ± 6.0 %) (all P < 0.0001). However, no change in sedentary time, light PA, moderate to vigorous PA, steps/day or total PA was observed from pre- to post-surgery, nor did we find associations between PA parameters and changes in body weight, BMI or fat mass.

Conclusions: The level of PA behavior did not change in RYGB patients from baseline to 6 months postoperatively and we found no associations with changes in either weight, BMI or fat mass, indicating that PA behavior cannot explain the variability in weight loss outcomes. However, these results are
T-P-3613
Associations between dietary intake of iron and absorptive factors and iron status in gastric bypass surgery patients
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**Background:** Iron deficiency is common following gastric bypass (GB) surgery; the impact of dietary intake of iron and factors that enhance or inhibit its absorption is not known. The objective was to investigate relationships among intake of iron and its absorptive factors, and iron status post-GB surgery.

**Methods:** Using a cross-sectional design, biomarkers of iron status (serum ferritin, serum transferrin receptor [sTfR], total iron binding capacity [TIBC]) and nutrient intake (using 3-day food records) were measured in 36 GB patients. Regression analysis was used to determine associations between iron status and intakes of heme and nonheme iron, calcium, phytate, and vitamin C from food and supplements. Means (ranges) are presented.

**Results:** Subjects were females (97%); age 45 years (20-63); body mass index 30kg/m2 (22-56). Forty-two percent were iron deficient. Concentrations of serum ferritin, TIBC and the sTfR/ferritin ratio were 19µg/L (3-340); 359mg/L (256-467), and 71 (3-1317), respectively. Dietary intake of heme iron and vitamin C, and supplemental intake of non-heme iron and vitamin C were 1.60mg (0.2-9.0); 58mg (3-254); 43mg (0-325); 129mg (0-1100). These nutrients were associated with improvement in at least one biomarker of iron status; heme iron was associated with improvement in all three biomarkers (all P ≤ 0.05).

**Conclusions:** Dietary heme iron has the greatest impact on iron status following GB surgery and non-heme iron and vitamin C also play a role. Meat as a source of heme iron, supplemental non-heme iron and vitamin C from foods and supplements may prevent iron deficiency following GB surgery.

T-P-3614
Asthma Status and Relationship to Cardiometabolic Risk in Adolescents with Severe Obesity
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**Background:** Prior studies have demonstrated an increased prevalence of asthma with obesity and an independent association between asthma and cardiometabolic risk, potentially compounding morbidity in patients with obesity. The objective of this study was to describe the prevalence of asthma and its association with cardiometabolic risk among adolescents with severe obesity.

**Methods:** We conducted a cross-sectional study of 171 adolescents enrolled in a bariatric obesity program (criteria: age ≥ 14 years, BMI ≥ 40 kg/m2). A diagnosis of asthma was assigned by a physician based on self-reported history of asthma and either recent use of an anti-asthma medication or recent asthma symptoms. Anthropometric measures and cardiometabolic markers (blood pressure, hemoglobin A1c, HOMA-IR, ALT, CRP, triglyceride to HDL ratio) were obtained. Linear regression, both crude and adjusted for BMI, was used to determine the association between asthma diagnosis and cardiometabolic markers.

**Results:** Patients were mostly female (82%), were of diverse backgrounds (40% Black, 9% Hispanic), and had severe obesity (mean BMI 51 kg/m2). Twenty-seven percent of patients were assigned the diagnosis of asthma. Assigned diagnosis of asthma was associated with Black race (p<0.05) and Medicaid status (p<0.05). Patients with the diagnosis of asthma had a significantly higher BMI (mean 53.1 kg/m2 vs. 50.1 kg/m2, p<0.05). There was no significant association between cardiometabolic markers and diagnosis of asthma after adjustment for BMI.

**Conclusions:** An assigned diagnosis of asthma based on clinical history was present in nearly a third of adolescents seeking bariatric surgery and was associated with higher BMI, but not independently associated with cardiometabolic risk.

T-P-3615
Bariatric Embolization of Arteries for the Treatment of Obesity (BEAT Obesity): 30 Day Results from a First in USA Clinical Study

**Background:** Bariatric embolization is a new endovascular procedure that has been developed for the treatment of obesity. This procedure, in which the small calibrated embolic spheres are infused in a highly targeted manner into the vasculature of the gastric fundus via the gastric arteries, has shown significant promise in pre-clinical studies. This clinical trial is the first investigator-initiated IDE approved by the FDA in the USA designed to assess the safety and efficacy of bariatric embolization to treat morbidly obese patients.

**Methods:** The study is a prospective, single-arm study to evaluate the feasibility, safety and toxicity of bariatric embolization in 5 patients (BMI of 40-60 and weight <400 lbs) without any co-morbid conditions. Patients with diabetes, variant gastric arterial anatomy, and significant risk factors for peptic ulcer disease are excluded. Co-primary endpoints were 30-day excess weight loss (EWL) and adverse events. Secondary endpoints include: blood pressure, endoscopy, gastric emptying studies as well as eating and hunger/satiety assessments.

**Results:** Over a six-month period, five patients with a mean BMI of 43.8 underwent bariatric embolization at a single institution. All patients tolerated the procedure well and the major adverse event rate at 30 days was 0%. EWL at 30 days was 7.6% +/- 3.5. At endoscopy, no major gastric ulceration was seen; one patient had a small minor superficial healing ulcer at the fundus. Blanching of the fundus was seen in 40% (2/5 patients). Nausea/vomiting rate was 60% (3/5 patients). In three patients, gastric emptying study results were available and were normal at 4 weeks. Eating and hunger/satiety assessments showed a significant decrease in hunger scores.

**Conclusions:** Bariatric embolization at one month was shown to be safe, effective and well tolerated for the treatment of patients with severe obesity. Significant decreases in hunger scores were noted at one month.

Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society
T-P-3616
Bariatric Surgery in Renal Transplant Candidates
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Background: The incidence of obesity-related cases of diabetes, hypertension, and kidney disease are expected to increase. The purpose of this study is to review the literature for complications and outcomes of obese patients with CRF who underwent bariatric surgery to qualify for renal transplantation.

Methods: A pubmed search was performed to find articles related to bariatric surgery performed to qualify for a kidney transplant. Articles were included if outcomes or complications were discussed.

Results: A total of 9 articles were found that discussed outcomes and/or complications following bariatric surgery to qualify for a kidney transplant. 5 case series, 1 United States Renal Data System (USRDS) survey, 1 prospective trial, and 2 retrospective reviews. 4 case series containing a total of 16 patients discussed outcomes. The average decrease in BMI for these patients was 25.1%. 6 patients (37.5%) were subsequently transplanted, while the other 10 (62.5%) qualified for the deceased donor waitlist. Of the 4 larger studies, BMI decrease ranged from 8-32%. Between 10 and 69% of patients were transplanted. Complications were reported by 3 studies, and ranged from 14 to 100% (One case series reported 2 patients, both with complications). 2 studies reported improvement in renal function in 2/3 (66%) and 4/21 (19%) of patients, both with complications. 2 studies reported improvement in weight loss. 2 Studies also reported improvement in diabetes with weight loss.

Conclusions: While complications following bariatric surgery may be higher in patients with renal failure, bariatric surgery is an effective means of weight loss for patients wishing to qualify for renal transplant, and may lead to an improvement or stabilization of renal function.

T-P-3617
Bariatric Surgery is Associated with Changes in the Brain’s Reward System Architecture and in Hedonic Eating Behaviors – an Interim Analysis
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Background: Obesity is a multifactorial disease including altered brain reward system activation favoring hedonic eating. Bariatric surgery provides sustained weight loss. The mechanisms behind this weight loss are not fully understood. Bariatric surgery may elicit changes in brain activity related to hedonic eating as one cause of weight loss. Hypothesis: 1) Weight loss after laparoscopic sleeve gastrectomy (LSG) is related to changes in hedonic eating behaviors 2) These changes in eating behavior are related to morphometric changes in brain’s gray matter (GM)

Methods: So far 4 adult women (age range:29-45 yo), BMI:41.6±7.2, have had their BMI, fat mass, brain MRIs, hedonic eating (Yale Food addiction scale (YFAS)+ desire to eat high vs. low calorie food scale), hunger scores measured at 1-month pre- and post- surgery. Freesurfer analysis yielded GM volume (V) for regions of interest at the reward system. Paired test and Pearson correlations for associations between GM V, obesity measures (weight, BMI, fat mass), and eating behaviors.

Results: Subjects achieved 20.7±7.9 %EWL at 1-month after LSG. BMI, fat mass, hunger and YFAS scores decreased significantly after LSG. Before LSG, obesity positively correlated with GMV in the accumbens, putamen, and cingulate cortex (CC). High-calorie food preference had positive association with GM at the insula (INS) and CC and negative with orbitofrontal cortex. Postprandial hunger scores showed negative correlation with total GMV and brain volume. After LSG, %EWL negatively correlated with pre-op YFAS score and post-op thalamus V. Obesity and CC V had positive association. Being hungry at fasting correlated negatively with obesity. YFAS score correlated positively with CC and INS V

Conclusions: This interim analysis shows that bariatric surgery is associated with changes within the brain’s reward system and with a reduction in hedonic eating. A larger sample, currently being recruited, is needed to confirm the findings and to explore the extent of this effect.

T-P-3618
Bariatric Surgery Reduces the Risk for Cancer in Women – Results from the Swedish Obese Subjects Study
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Background: Obesity increases the risk for cancer. In the Swedish Obese Subjects (SOS) study, we have previously shown a reduced risk for cancer after bariatric surgery. This report is an updated analysis of cancer incidence in this cohort with the aim of investigating the effect of bariatric surgery on individual cancer types.

Methods: The Swedish Obese Subjects study is an ongoing, prospective, controlled trial that compares the effect of bariatric surgery with usual care. It includes 2010 surgically treated obese individuals and 2037 matched controls receiving usual care. Study participants were recruited between 1987 and 2001 and have been followed for up to 26 years. Data on cancer diagnoses were obtained by cross-checking with the Swedish Cancer Registry. Mean follow-up time was 17.7 years.

Results: The number of first-time cancers after inclusion was 303 in the surgery group and 367 in the control group (HR 0.80, 95 % CI 0.68-0.93, p=0.003). In women, the risk of cancer was lower in the surgery group than the control group (HR 0.74, 95 % CI 0.62-0.89, p<0.001) whereas in men, we could not detect any difference in cancer incidence (HR 0.97, 95 % CI 0.72-1.30, p=0.832). Similar results were obtained when excluding incident cancers during the first three years of the study, as well as when adjusting for sex, age and BMI at study inclusion. When analyzing specific cancer types, there was a reduced risk for cancers of the female reproductive system (HR 0.71, 95 % CI 0.55-0.92, p<0.009).

Conclusions: This study indicates that bariatric surgery reduces the risk for malignant disease in women, especially cancers of the female reproductive system.
T-P.3619
Changes in anemia marker levels following laparoscopic adjustable gastric banding versus sleeve gastrectomy in obese adolescent patients

Background: Anemia following bariatric surgery is a known complication. Nutritional deficiencies are greater following malabsorptive compared to restrictive procedures. Sleeve gastrectomy (SG) is considered restrictive yet the fundus is removed with loss of gastric acid and intrinsic factor secreting parietal cells. Thus, SG may encompass malabsorptive features. We compared iron, ferritin, B12, folate, hemoglobin (hb) and hematocrit (hc) levels following laparoscopic adjustable gastric banding (LAGB) to SG.

Methods: We conducted a retrospective review of medical records of pediatric patients who underwent SG and LAGB (1/2006-12/2013). We examined anemia marker levels at first visit, 2 weeks(wk), 3 months(mo), 6 mo and 12 mo post-surgery by repeated measures analysis adjusting for weight loss.

Results: 141 LAGB (48 m, 93 f, age (mean±SD)=16.2±1.2 y, BMI=47.4±8.3 kg/m2) and 34 SG patients (13 m, 21 f, age=15.8±1.6 y, BMI=48.3±6.7 kg/m2) were included. There were no differences in anemia marker levels between groups pre-surgery. There was no difference in iron between groups post-surgery. Ferritin and B12 increased in both groups 2 wk post-surgery. SG patients had significantly higher ferritin (114.3±131.9 vs 73.9±81.4 ng/mL, p<.001) and B12 (99.7±94.1 vs 824.1±567.0 pg/mL, p<.001) than LAGB patients at 2 wk, though showed no differences at 3, 6 or 12 mo. SG patients had significantly lower folate than LAGB patients at 3 (7.5±24.3 vs 12.7±11.3 ng/mL, p<.001) and 6 mo (9.1±25.7 vs 13.1±9.8, p=.003), though showed no differences at 2 wk or 12 mo. There were no differences between groups in hb or hct. In a sample of 29 matched pairs, a higher proportion of SG compared to LAGB patients took iron (21.3 vs 3.8%), B12 (22.5 vs 1.3%) and folate (10 vs 0%) supplements.

Conclusions: Anemia marker levels after bariatric surgery differ by procedure. SG was associated with lower folate compared to LAGB despite higher intake of supplements. Our results highlight the importance of early folate supplementation after SG.

T-P.3620
Changes in Food Choice Following Roux-en-Y Gastric Bypass Surgery Assessed by an Ad Libitum Buffet Meal
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Background: Mechanisms by which Roux-en-Y gastric bypass (RYGB) causes weight loss might involve reduced preference for food high in fat and sugar. Yet, previous findings in support of this hypothesis rely on questionnaires; however, the response to questionnaires may not correspond to actual behavior. This study aims to investigate postoperative changes in food preferences using an ad libitum buffet meal.

Methods: The subjects consumed an ad libitum buffet meal 3 months before and 6 month after RYGB surgery. Twenty food items organize equally into separate food categories: high fat (HF), low fat (LF), sweet (SW) and savory (SA); and combined food categories: high-fat-savory (HFS), low-fat-savory (LFS), high-fat-sweet (HFSW) and low-fat-sweet (LFSW) were represented on the buffet. The subjects were instructed to eat ad libitum and according to their preferences for as long as they wanted. The subjects ate unmonitored and unaccompanied, in order to diminish social desirability bias. Total energy intake, and relative intake from each of the food categories, as well as pre-prandial hunger were registered.

Conclusions: These preliminary results do not support the hypothesis that changes in food preferences explain the postoperative reduction in energy intake. Updated results from 24 patients will be presented at the conference.

T-P.3621
Comparison of Ligation of Left Gastric Artery and Sleeve Gastrectomy in a Rat Model on Weight Loss, Ghrelin and Leptin Hormones
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Background: Ligation of the left gastric artery (LLGA) that supplies the fundus of the stomach may reduce appetite hormone ghrelin and may result in weight control. The aim of this study is to compare the LLGA and sleeve gastrectomy (SG) in terms of postoperative outcomes such as weight loss, ghrelin and leptin hormone levels in a rat model.

Methods: Fifteen Wistar Albino male rats which were 12-15 months age and >350 grams (range 350-525 grams) enrolled LLGA (N=5), SG (N=5) and control (N=5) groups. Blood samples were drawn preoperatively and also at first and forth weeks postoperatively for ghrelin and leptin hormones assay. Body weights were measured in each groups and at the end of the fourth week all rats were sacrificed.

Conclusions: The maximum reduction in ghrelin level (41.5%) was found in LLGA group and the minimum rise in leptin level (29.9%) was found in SG group. Significant weight loss was observed in SG group (mean 24.1%). LLGA and control groups lost slightly weight (mean 0.1% and 2.1%, respectively). Blood sample analysis revealed that no statistically significant changes in ghrelin and leptin levels in groups (p= 0.9 and p= 0.3, respectively). There was no significant difference between the mean percent weight change for the LLGA and SG groups (p= 0.08)

Conclusions: We have presented evidence that LLGA causes the same reduction of ghrelin hormone levels as SG 4 weeks after surgery in a rat model. However, LLGA did not cause a sufficient weight loss as SG does. The mechanism of weight loss in SG is most likely due to restriction rather than neurohormonal changes.
T-P-3622
Comparison of resting metabolism prediction equations with indirect calorimeter in surgical and medical weight loss patients.

Background: Resting Metabolic Rate (RMR) is used for planning effective weight-loss prescriptions in obese patients. The purpose of this study was to compare RMR calculated from commonly used prediction equations to RMR determined by indirect calorimeter in obese individuals enrolled in a medical and surgical weight loss clinic.

Methods: Data were collected from patients undergoing weight loss surgery (n=126) or medical weight loss (n=115) treatment at the Wake Forest Baptist Health Weight Management Center. Measured RMR was obtained using the MedGem® indirect calorimeter under standard testing conditions. Data utilized in the prediction equations included age, weight, height, and gender. Comparisons were made by oneway ANOVA between measured RMR and the following prediction equations: Harris Benedict, Modified Harris Benedict, Mifflin-St. Jeor, Owen, and World Health Organization. Comparisons were also performed for % differences between genders in the prediction of RMR. Data are presented as means±S.D.

Results: Age and BMI for the 241 patients were 49.9±11.0 years and 45.6±30.4 kg/m². Measured RMR was 1790±394 kcals. The mean differences (95% CI) in RMR between MedGem and each prediction equation are: Harris-Benedict, -12.5 (-4.1, 4.0)%; Modified Harris Benedict, -11.5 (-3.0, 5.0)%; Mifflin-St. Jeor, -8.6 (-7.4, 0.9)%; Owen, 0.4 (-6.3, 1.4)%; World Health Organization, -10.6 (-7.4, 1.3). All prediction equations were significantly different from measured RMR except for Owen. The % difference between measured and predicted RMR was higher for men than women across all prediction equations, with a range of over prediction from -12 to -24% for men and +3 to -10% for women.

Conclusions: The Owen equation is potentially a reasonable alternative to measured RMR with the MedGem in a group of obese patients seeking treatment. Furthermore, the overall prediction of RMR was more prominent in men than women, suggesting further work in this area to derive an equation that more closely approximates measured RMR.

T-P-3623
Compliance to recommended supplementation strategy and vitamin levels in adolescents before and after bariatric surgery in a prospective Swedish nationwide intervention study (Adolescent Morbid Obesity Surgery, AMOS)
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Background: The aim of the study was to assess nutritional intake, compliance to supplementation and relationship to biochemistry in adolescents undergoing gastric bypass surgery due to severe obesity.

Methods: 81 patients (65% girls, age 16.5, range 13-18 years), body mass index (BMI) 45.5 ± 6.1 kg/m², from a prospective Swedish nationwide intervention study (Adolescent Morbid Obesity Surgery, AMOS), were assessed preoperatively, and at 1 and 2 years after gastric bypass. Nutritional intake and compliance to supplements was assessed by diet history interviews and checked by biochemistry.

Results: Body weight decreased by 35% 2 years postop (p=0.001). Compliance to prescribed supplements at 1 and 2 years varied between 42 and 53%. Total intake of vitamins and minerals from food and supplements increased postoperatively (p<0.001 for all): vitamin B12 from 7 μg/day to 525 and 545, folic acid from 335 μg/day to 430 and 451, vitamin D from 8 μg/day to 21 and 22, and iron from 16 mg/day to 46 and 49. 25-OH Vitamin D levels decreased at 2 years to 43 nmol/L (p=0.05) as compared to baseline for non-compliant patients, but were sustained in compliant patients. Girls were prescribed iron; ferritin levels were 52 μg/L in girls at baseline and sustained postop, whereas in boys ferritin dropped from 75 μg/L to 50 μg (p>0.04) at 1 year.

Conclusions: Only half of adolescents complied with prescribed supplementation of vitamins and minerals following gastric bypass surgery, which was partly reflected in biochemical assays. We advocate monitoring of vitamin and mineral status in addition to supplementation.

T-P-3624
Continuous Glucose Monitoring in Patients with Weight Recovery After Bariatric Surgery. Two Case Reports
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Background: In patients with gastric bypass (GB), significant glucose variability (GV) has been demonstrated, which influence eating behavior and could promote weight gain in some cases.

Methods: We describe the patterns of GV (maximum interstitial glucose (IG), time to postprandial peak IG (TP), and mean amplitude of glucose excursions (MAGE)) by continuous glucose monitoring (CGM) of two patients with 51% and 16% weight recovery 6 and 5 years after gastric bypass, respectively, both with symptoms consistent with hypoglycemia, and the effect of a nutritional and psychoeducative intervention to reduce GV.

Results: 40 year-old female without diagnosis of type 2 diabetes (T2DM) and BMI before surgery (2008) of 41.65 and current BMI of 35.1 kg. Baseline mean glucose was 91.2 ± 27.8 mg/dL, IG was 217 mg/dL, minimum glucose value 48 mg/dL, TP was 39 min, and MAGE was 65.4 mg/dL. She reported frequent fasting and consumption of simple carbohydrates. After prescription of a low-glycemic index diet and reduction of fasting, the mean glucose was 93.7 ± 22.7 mg/dL, IG of 184 mg/dL, minimum glucose value 62 mg/dL, TP was 35 min, and MAGE was 48.08 mg/dL. 48 year-old male with T2DM, and BMI before surgery of 40.3 and current BMI of 32. Baseline mean glucose was 96.8 ± 29.5 mg/dL, IG was 195 mg/dL, minimum glucose value 50 mg/dL, with 5% of time with <60 mg/dL, TP was 40 min, and MAGE was 68.6 mg/dL. In his self-monitoring. After prescription of a diet with low-glycemic index and reduction of fasting, the mean glucose was 115.1 ± 67.9 mg/dL, IG of 490 mg/dL, minimum value 46 mg/dL, TP was 35 min, and MAGE was 127.2 mg/dL. He reported anxiety and bing of carbohydrate-rich beverages.
**Conclusions:** CGM is a tool that can detect significant disorders in glucose homeostasis linked with complex responses of the eating behavior and mental health. These phenomena are many times overlooked by conventional follow-up of GB and are imperative to detect and treat for their potential to influence weight regain and comorbidities.

**T-P-3625**

**Do Weight Loss Surgery Patients Who Attended a Medically Supervised Weight Loss Program Presurgically have Better Post-Surgical Outcomes?**

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**Background:** Insurance requirements for bariatric surgery often include 3-6 months of medically supervised weight loss. An earlier chart review by our group found that patients lost little weight in a multidisciplinary medical weight loss program before bariatric surgery. We examined weight loss, health, and patient satisfaction after surgery.

**Methods:** Forty-two patients completing a multidisciplinary medical weight loss program before bariatric surgery at the St. Vincent Carmel Bariatric Center answered a questionnaire a mean of 3 years after program completion. They were compared to 86 patients without medical program participation.

**Results:** Program patients were 60% female, aged 56 years, and 80% had primary roux-en-Y gastric bypass. Program and comparison patients had similar weights before surgery (323.9 and 313.0 lbs, respectively) and 1 (180.5 and 192.3 lbs) and 2 (176.8 and 187.5 lbs) years post-surgery. Program patients rated program quality as 8.4/10, and 90% learned information that helped them manage weight post-surgery, including proper portion size, exercise, and weight monitoring. They reported high confidence in resisting eating in many problematic situations, and 70% were participating in physical activity, including walking (48%), strength training (18%), and hiking (13%). Prevalence of common comorbid conditions decreased significantly post-surgery.

**Conclusions:** Although attendance in a medical weight loss program before surgery did not lead to greater weight loss in the first two years after bariatric surgery, patients found the program to be of high quality, teaching them weight management strategies. Perhaps longer time after surgery or larger sample sizes are required to observe weight effects.

**T-P-3626**

**Does Air Pollution Reduce Weight Loss and Metabolic Benefits of Bariatric Surgery?**

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**Background:** Emerging animal experimental evidence indicates that air pollution may contribute to the development of obesity and diabetes, but human studies of effects on metabolic outcomes are limited. We hypothesized that the impact of air pollution would be magnified in the novel setting of obesity and diabetes, but human studies of effects on metabolic outcomes are limited. We tested this hypothesis in a cohort of 75 morbidly obese children undergoing laparoscopic adjustable gastric banding (LAGB). We randomized 15 subjects (1:1:1) with an employer-based insurance and type 2 diabetes stratified by BMI (30-34.9 and 35-40 kg/m2) to one of three weight loss interventions (MLW, laparoscopic adjustable gastric banding (AGB), or laparoscopic RYGB) to test their effects on diabetes control (HbA1c, fasting glucose and diabetes medication use) at the endpoint of 10% weight loss. Three subjects withdrew from the study after randomization; data are presented on subjects completing the study (N=12).

**Results:** All subjects were female, and 75% reported black race. Mean age was lower in the AGB vs. the RYGB and MLW arms (46 vs. 54.3 and 51.5 years). Baseline weight, HbA1c, and fasting glucose varied across arms. Compared to AGB and RYGB, MLW lost less weight (-9.78, -9.97 vs -6.12 respectively) despite a longer period of intervention (2.77, 2.51 vs 7.47 months respectively). Mean HbA1c and fasting glucose decreased in all three arms and did not vary significantly by arm. Mean percent change in A1C was -1.3, -1.1 and -1.0 and mean change in fasting glucose were -32, -70 and -16 mg/dl respectively. Changes in diabetes medication use were small and did not vary by arm.

**Conclusions:** Our results suggest that the impact of surgical
and medical weight loss interventions on diabetes control may not be different when weight loss is the same. Larger studies are needed to confirm these findings.

**T-P-3628**

**Effects of a 12-Week Periodized Resistance Training Program on Muscle Size, Strength, Quality, and Physical Activity after Roux-en-Y Gastric Bypass Surgery**

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**Background:** Past research has shown that Roux-en-Y gastric bypass (RYGB) surgery reduces fat free mass resulting in lost strength: a negative outcome for the 40+ age range, when muscle and strength naturally decline for many of these patients. The aim of this study was to determine if a periodized resistance training program following RYGB improves strength, thigh muscle cross-sectional area (CSA) and muscle quality (MQ), and if these changes in strength translate into greater physical activity (PA).

**Methods:** 18 women (44.9±10.2yrs, BMI 38.9±5.6) were randomly assigned into 1 of 2 groups (intervention group (IG), n=11; control group (CG), n=7) for 12 weeks, beginning 8 weeks after surgery. Fat mass (FM) and fat free mass (FFM) were assessed by air displacement plethysmography, and thigh cross-sectional area (CSA) by magnetic resonance imaging. MQ was strength divided by CSA.

**Results:** 16 women completed (9 IG, 7 CG). The periodized resistance training intervention significantly increased strength (76%; F(1,15)=118.3; p<0.001) and MQ (17%; F(1,15)=7.9; p<0.05) in the IG; however, no change in CSA was observed. Total steps per day, moderate-vigorous PA did not change, but light PA increased (F(1,14)=5.7; p<0.05) compared to controls. Sedentary time increased in CG compared to IG (p<0.005).

**Conclusions:** High-intensity periodized resistance training brought about dramatic improvements in strength and muscle quality, but did not affect muscle size during post-surgical weight loss.

**T-P-3629**

**Endoscopic Sleeve Gastropasty with a Follow up Time of One Year**


**Background:** Emerging endoscopic techniques are minimally invasive and induce gastric volume reduction to treat obesity. The objective is to evaluate endoscopic sleeve gastropasty using a suturing method directed at the greater curvature, peroperative care, one year safety and weight loss outcomes.

**Methods:** Prospective single-center study over 96 patients (29 men) using the endoscopic sleeve gastropasty procedure under general anesthesia with overnight inpatient observation. Follow-up was carried out by a multidisciplinary team (endocrinologist, psychologist and sport assessor). Study outcomes included change in BMI and % of loss of initial body weight (%TBWL) and adverse effects. Overall patient status, weight data and was collected at baseline, 1 month (n=92), 3 months (n=62), 6 months (n=43) and 1 year (n=23). Voluntary oral contrast and endoscopy studies were scheduled to assess the gastropasty at different times post procedure.

**Results:** There were no major adverse events and all patients were discharged in less than 24 hours. Baseline mean BMI was 38.1±4.8 kg/m2 ,body weight (107.4± 17.0 kg) and mean age 44.4±9.0 years. All the weight parameters were significantly reduced at 1, 3, 6 and 12 months postprocedure. Mean BMI was 35.3±4.5 (%TBWL: 7.3±2.6) at 1 month, 33.0±4.3 at 3 months (%TBWL: 13.0±4.1), 31.4±4.7 (%TBWL:17.3±7.0 ) at 6 months and 31.2±4.9 (%TBWL:18.5±10.4) at 1 year. Oral contrast studies and endoscopy reviews showed a good state of the gastropasty at least until one year of follow-up.

**Conclusions:** The endoscopic sleeve gastropasty method can be considered an effective, safe and well tolerated procedure for the treatments of patients with obesity, at least at one year of follow-up.

**T-P-3630**

**Factors Influencing Probability of Inpatient Admission after Bariatric Surgery**

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**Background:** The purpose of this study was to identify potential drivers of post-surgery inpatient admissions occurring up to 1 year after bariatric surgery.

**Methods:** The study sample consisted of 9,614 adults having a bariatric surgery between September 1, 2011 and January 31, 2013. The study group was randomly divided into a development and validation sample, with 75% and 25% of the study sample in each, respectively. Using the development sample, a stepwise regression model identified predictor variables with a significant association with post-surgery inpatient admissions. The variables selected in the stepwise regression were used in a second logistic regression model to create a probability of admission score in the development dataset. In a final step, the probability logistic regression model was run on the validation dataset and c-statistics from the development and validation regression models were compared to assess predictive ability.

**Results:** The c-statistic calculated from the development model was 0.67 and the c-statistic produced in the validation was 0.73, indicating strong predictive capability of the regression model. The strongest predictors of inpatient admissions after a bariatric surgery were an Emergency Room visit or inpatient admission in the three months before surgery, surgery length of stay, the number of physicians per 100,000 residents of local care markets, and Symmetry Episode Risk Group® risk score (p<0.001). Additional significant predictors included whether the sample member was treated in a Center of Excellence, the number of physician office visits in the three months before surgery, patient age, and patient gender (p<0.05).

**Conclusions:** Results from this study indicate that higher pre-surgery utilization, longer surgery length of stay, low physicians per capita, elevated patient risk, increased patient age, and male gender are associated with increased likelihood of an inpatient admission occurring up to 1 year after surgery.

**T-P-3631**

**Gastric Bypass Patients with a History of Hypoglycemia-Like Symptoms Had Lower Glucose and More Hypoglycemic Symptoms Than Asymptomatic Individuals in Response to a Meal Test**

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**Background:** The endoscopic sleeve gastroplasty method can be considered an effective, safe and well tolerated procedure for the treatments of patients with obesity, at least at one year of follow-up.
Background: Symptomatic hypoglycemia is well-known after Roux-en-Y gastric bypass (RYGB) but the association between symptoms and low plasma glucose is unclear. The aim of our study is to investigate the association between low plasma glucose and symptoms suggestive of hypoglycemia during a test meal among subjects with documented symptomatic hypoglycemia and asymptomatic subjects after RYGB.

Methods: Thirteen RYGB subjects with symptomatic hypoglycemia (SY) and 13 asymptomatic RYGB subjects (ASY) ingested a liquid test meal. Plasma glucose (PG), insulin, glucagon-like peptide-1, and glucagon were measured at a fixed time schedule for 300 minutes. Moreover, symptoms suggestive of hypoglycemia based on a validated questionnaire were evaluated.

Results: At baseline SY and ASY subjects had similar age (p=0.07), total weight loss after RYGB (p=0.22), and postoperative duration (p=0.72). The SY subjects had a lower preoperative BMI (p=0.02) and a lower BMI at evaluation (p=0.02) compared to the ASY subjects. During the test meal minimum PG (mean±SEM) was lower in the SY subjects compared to the ASY subjects (3.1±0.1 vs 4.0±0.2 mM; p=0.001). Symptoms suggestive of hypoglycemia, according to the validated questionnaire, were experienced by 8 out of 13 SY subject and by 2 out of 13 ASY subjects during the test meal. So, the odds ratio for reporting symptoms suggestive of hypoglycemia was 8.8 (95% CI (1.3; 57.4)) for subjects with a history of hypoglycemia-like symptoms compared to asymptomatic subjects. When comparing subjects with a low plasma glucose measurement (<3.0 mM) during test meal with subjects with a higher plasma glucose measurement (>3.0 mM) the odds ratio for reporting symptoms suggestive of hypoglycemia was 4.5 (95% CI (0.8;24.6)).

Conclusions: Subjects with a history of hypoglycemia-like symptoms after RYGB demonstrated lower PG and perceived more symptoms compared to asymptomatic subjects. Thus, after RYGB there is agreement, however not strong, between hypoglycemic symptoms and low plasma glucose.

T-P.3632
Gender Differences in Quality of Life Before and After Bariatric Surgery
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Background: Obesity is known to have a more profound psychosocial effect on women than men. In this study, we examine quality of life (QoL) in severely obese women and men before and after weight loss surgery.

Methods: The population included 104 bariatric surgery patients (29% male; 71% female) and 25 lean controls (32% males, 68% females). Participants, preoperatively, and at one year and two years post-surgery, completed the Impact of Weight on Quality of Life (IWQOL) questionnaire. The IWQOL questionnaire consists of eight QoL domains or QoL scores, i.e. health, social and interpersonal relationships, mobility, work, self-esteem, sex life, activities of daily living, and eating.

Results: Results. IWQOL scores for the bariatric surgery patients were considerably (p=0.0001) below those of the lean controls. Female bariatric patients, prior to surgery, scored significantly (p<0.01) below the male bariatric patients on three out of eight IWQOL scales, i.e. social and interpersonal relationships, sex life, and self-esteem. Surgery led to significant but similar reductions in body weight for both males and females, i.e. total % weight loss for all patients = 28% and 30% at one and two postoperative years. With weight loss, there were highly significant (p<0.0001) improvements in scores on each of the eight IWQOL (p<0.0001) domains to levels similar to or approaching those of the lean controls. At both one and two years postoperatively, gender no longer had a significant effect on any of the IWQOL scales, including social and interpersonal relationships, sex life, and self-esteem.

Conclusions: Conclusion. Surgery-induced weight loss improves QOL for all patients with resolution of gender differences in social and interpersonal relationships, sex life, and self-esteem.

T-P.3633
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Background: The Teen-LABS Study is a multicenter prospective observational study examining outcomes of weight loss surgery (WLS) for treatment of adolescent severe obesity. While we previously reported perioperative (≤30 days) complications of this cohort, there remains a paucity of healthcare utilization data beyond 30 days for adolescents undergoing WLS. The purpose of this assessment was to examine healthcare utilization events (HCEs) attributed to WLS resulting in additional operations or readmissions between 31 days and 2 years in the Teen-LABS cohort.

Methods: HCEs between 31 days and 2 years postoperatively were ascertained using a standardized data collection form at 6, 12 and 24 months. Primary source documents (i.e. medical records) related to all hospital admissions and reoperations were reviewed by an independent, blinded, expert adjudication committee, which determined relatedness of the HCEs to the prior WLS. HCEs were classified as related (or not) to WLS and related HCEs were subdivided into major or minor by study investigators.

Results: Currently, 73 of 122 HCEs recorded within the 2 year time period of the study have undergone adjudication. Of these 73 HCEs, 30 (41%) were deemed related to WLS while 59% were unrelated. Of the 30 HCEs related to surgery, 6 were deemed a major HCE and 24 were considered a minor HCE. There were no deaths reported. Major HCEs requiring re-operation included 3 adhesive small bowel obstructions, 1 internal hernia, and 1 port site infection. In addition, 1 major HCE (bleeding gastrojejunal ulcer) required a blood transfusion only. Minor HCEs included cholecystectomies, admissions related to nutrition or dehydration, anastomotic strictures, pancreatitis, pneumonia, a retained foreign body, and wound complications.

Conclusions: In the 31-day to 2-year period following adolescent WLS, most HCEs were unrelated to WLS. Of those related to the prior WLS, 80% were minor. These data provide important and new information for those adolescents considering WLS.
T-P-3634
How is Pre-Operative Health-Related Quality of Life Related to Post-Bariatric Surgery Weight Loss?
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Background: While bariatric surgery (BS) is an effective treatment for morbid obesity, it fails to help at least 20% of patients maintain significant weight loss. We hypothesized that lower levels of health-related quality of life (HRQoL) would predict better weight loss at 3y, and that HRQoL would be related to pre-BS BMI (those who were heavier pre-BS would have lower HRQoL), and race (HRQoL would be lower in whites vs. blacks).

Methods: A retrospective analysis of 45 patients (91% female, 70% white, baseline BMI 49.2±8.3 kg/m²) from a larger prospective cohort of BS patients was conducted to compare pre-operative HRQoL, which was assessed using the IWQoL-Lite. Self-reported weight over 3y was collected, and percent excess weight lost (%EWL) was calculated at 3y.

Results: Total HRQoL score pre-BS averaged 39.1±3.6 after adjusting for pre-BS BMI. After 3y, patients lost an average of 60.9±27.4% EWL. In the total sample, pre-BS HRQoL was significantly negatively related to pre-BS BMI (r=0.29, p=0.05) and positively related to %EWL at 3y (r=0.36, p=0.02). The relationships between and pre-BS HRQoL and both pre-BS BMI and %EWL were not significant for blacks (r=-0.09, p=0.77; r=0.36, p=0.23, respectively). Pre-BS BMI appeared to mediate the relationship between pre-BS HRQoL and %EWL at 3y in white patients, but not black patients.

Conclusions: These findings suggest that patients with lower BMI and with higher HRQoL pre-BS may be most likely to succeed with long-term weight loss. These relationships are different between blacks and whites. Pre-BS BMI has less of an impact on pre-BS HRQoL in black patients compared to white patients. Pre-BS HRQoL alone may be a better predictor of weight loss maintenance after surgery than BMI for black patients. These findings will allow clinicians to better assess patients before surgery and target resources after surgery to retain the benefits of weight loss over time.

T-P-3635
Insulin Sensitivity is Linked to Circulating Sphingolipids and Physical Activity Levels following Roux-en-Y Gastric Bypass Surgery (RYGB)
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Background: Peripheral insulin sensitivity (SI) remains low following RYGB surgery, even with substantial weight loss and improved glycemic control. Recent evidence supports a regulatory role for circulating sphingolipids (SPL) in glucose homeostasis and SI in obesity. Physical activity (PA) is also linked with SI, but the PA habits of patients after RYGB surgery have not been characterized. We sought to examine the relationships between circulating SPL, objectively measured PA, and SI following RYGB surgery in severely obese patients.

Methods: Participants (n=77) were recruited 1-3 mo after RYGB surgery and underwent a blood draw and DXA for body composition. PA was measured by triaxial accelerometry. SI was determined by an intravenous glucose tolerance test (IVGTT) and HOMA-IR. A comprehensive profile of plasma SPL species was quantified by high-pressure liquid chromatography (HPLC)-tandem mass spectrometry.

Results: Participants lost 16.5 kg of body weight by 76 d following surgery. SI (2.3 min/μU/ml), and daily PA (5,939 steps/d) were relatively low compared to a lean individual (SI ~6, PA ~8-10,000 steps/d). We found SI was negatively associated with dhC16:0 (r=0.25, P=0.012) and HOMA-IR was positively associated with ceramide (Cer) species C22:0 (r=0.27, P=0.039) and C22:1 (r=0.34, P=0.01). Blood glucose was positively associated with C22:0 (r=0.35, P=0.002) and insulin with C22:1 (r=0.31, P=0.04). Daily PA was positively associated with SI (r=0.30, P=0.013) and negatively associated with dhC16:0 Cer (r=0.28, P=0.01). Total steps/d was also negatively associated with dhC16:0 Cer (r=0.31, P=0.004).

Conclusions: Following RYGB surgery and significant weight loss, SI and PA levels remained relatively low. We found that circulating Cer and PA levels may be important determinants of SI after RYGB. We also found that PA was associated with both dhC16:0 Cer and SI. These findings suggest that PA induced reductions in circulating dhC16:0 Cer may be involved in improvements in SI in bariatric surgery patients.

T-P-3636
Laparoscopic Gastric Bypass to Robotic Gastric Bypass: Time and Cost Commitment Involved in Transitioning a Surgical Practice.
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Background: The Roux-en-Y gastric bypass is considered a gold standard procedure for weight loss. It produces excellent initial and sustained weight loss with added metabolic benefits. This relatively complex procedure has excellent outcomes when performed via laparoscopy. The advent of the DaVinci robotic platform has been a technological advance with 3-D imaging and increased degrees of maneuverability. Previous studies have shown feasibility and outcome equivalence when compared to laparoscopy. There have been a few advantages with decreased stricture rate and in some studies a decreased anastomotic leak rate.

Methods: We retrospectively reviewed the last 25 laparoscopic gastric bypass procedures and the first 25 robotic gastric bypass procedures by a single surgeon. We compared clinical outcomes and focused on time and hospital cost during this transition phase.

Results: There was no significant demographic difference between the groups. The mean age was 43.2 years. The mean BMI were similar between groups, 44.8 kg/m² vs 43.9 kg/m². Clinical outcomes were similar, there were no anastomotic leaks or other major complications. There were no deaths reported. There was one anastomotic stricture in both groups. Excess weight loss was similar in both groups at 1 year. There was a significant increase in operative time with robotic gastric bypass, mean 241 mins vs mean 166 mins p=0.0005. Operative time fell by 25 mins after the first 10 cases. The hospital cost was also increased with robotic gastric bypass mean $5922 vs $4395, p=0.03.

Conclusions: There are ergonomic benefits in using the DaVinci robotic platform for complex surgical procedures. Transitioning from a laparoscopic to a robotic practice can be done safely. It involves a significant time commitment and
support for training and equipment purchase. The operative times were longer and the hospital cost was higher for robotic gastric bypass. We hope in the future that these will fall after overcoming the learning and as the technology becomes widespread.

T-P-3637
Laparoscopic Sleeve Gastrectomy (LSG): Is a "Retained Fundus" on a Postoperative UGI Predictive Of Inferior Weight Loss?
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Background: Postoperative Upper Gastrointestinal Series (UGI) has not been shown to be effective in ruling out leaks or obstruction after gastric bypass or sleeve gastrectomy. In LSGs, UGI will define the shape of the sleeve and rule out a retained fundus that was not optimally excised during surgery. We aimed to investigate the impact of having a “retained fundus” on weight loss.

Methods: We analyzed routine UGIs performed on 203 consecutive patients who underwent a LSG over a 34fr. bougie by a single surgeon and had routine UGI performed on POD#1 with gastrograffin followed by thin barium. We included all patients with good quality UGI and with available weight loss data for 1 year. Retained fundus was measured in each study, and the ratio between the uppermost sleeve where the retained fundus is and the sleeve distal to that area was calculated. These ratios were assigned four different groups. Group 1 was considered optimal and defined as a sleeve on UGI that had no retained fundus. Group 2 were sleeves where accurate measurements could not be made. Group 3 was labeled mild retained fundus and defined as a fundus measuring 100-200% of the sleeve diameter. Finally, group 4 was defined as severe retained fundus. Group 2 was considered optimal and defined as a sleeve on UGI that had no retained fundus. Group 2 were sleeves where accurate measurements could not be made. Group 3 was labeled mild retained fundus and defined as a fundus measuring 100-200% of the sleeve diameter. Excess weight loss (EWL) at 1 year was then compared amongst the different groups.

Results: There was no significant statistical difference in EWL between the optimal group and the group of both mild and severe retained fundus (p=0.22). The weight loss remained equivalent even when comparing the optimal sleeves with only those with severe retained fundus (p=0.19). There was a statistically significant difference in quality of LSGs on UGI with surgical experience showing less retained fundus on the UGIs (p=0.006) in the latter half of the series.

Conclusions: UGI is not a predictor of success of LSG as defined by weight loss at one year. "Retained fundus" may not be a predictor for poor weight loss in the short term.

T-P-3638
Laparoscopic Sleeve Gastrectomy is Effective in the Long-Term Resolution or Improvement of Co-Morbidities in Morbidly Obese Patients

Background: Laparoscopic sleeve gastrectomy (LSG) is an effective procedure to treat morbid obesity; however, the effects on co-morbidities may not be as clear. We report our experience with LSG and improvement or resolution of co-morbidities.

Methods: We retrospectively reviewed 435 consecutive patients who underwent LSG at our institution from January 2004 to November 2013. Patient demographics, body mass index (BMI), co-morbidities, surgical results, postoperative weights, and co-morbidity resolution rates were recorded and compared. Co-morbidities investigated included diabetes mellitus (DM), hypertension (HTN), and hyperlipidemia (HL).

Results: The mean [±SD] age of our cohort was 44±13.3 years. Approximately 70% were female and 24% were white. The median BMI was 48.3 kg/m² (range: 31.0-95.1). Approximately 74% of patients had American Society of Anesthesiology (ASA) scores ≥2. Incidence of DM was 30% preoperatively and 12% postoperatively (p<0.0001) at last follow-up. Incidence of HTN was 56% preoperatively and 39% postoperatively (p<0.0001). Incidence of HL was 45% preoperatively and 22% postoperatively (p=0.0001). In patients who continued to have these co-morbidities, the mean number of medications for DM (0.5±0.7 v. 1.2±0.7, respectively; p<0.0001), HTN (1.3±1.2 v. 1.8±1.1, respectively; p<0.0001), and HL (0.6±0.6 v. 0.9±0.7, respectively; p<0.0001) postoperatively were significantly less. Mean total weight loss at 3, 6, 9, 12, 18, 24, 36, 48, 60, and 72 months were -27.4%, -23.6%, -27.2%, -29.9%, 29.9%, -25.2%, -26.7%, -25.4%, and -24.3%, respectively. Linear regression analysis demonstrated no correlation between Hemoglobin A1c levels and time following LSG (p=0.22). Mean follow-up was 26±25 months (range: 1-112).

Conclusions: LSG is an effective procedure to treat morbid obesity. Moreover, it is effective in resolving DM, HTN, and HL. In patients who do not have resolution of these co-morbidities, LSG can lead to a reduction in polypharmacy.
Conclusions: Significant regain after bariatric surgery is associated with similar eating and lifestyle behaviors as regain after medical management. However patients who report a lack of confidence in their ability to achieve and maintain weight loss before surgery, or who have been dieting since childhood, may be at greater risk of long-term regain. These findings have implications for tailored counseling to reduce the risk of regain after bariatric surgery.

T-P-3640
Lower Fat Mass Contributes to Greater Cardiorespiratory Fitness 10 Years After Gastric Bypass Surgery
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Background: It is not known if the cardiorespiratory fitness (CRF) benefits observed in the first few years after weight loss surgery are maintained over the long term compared to severely obese controls. The aim of this study was to determine whether or not CRF measured before and 10 years following gastric bypass (GBP) surgery differed between GBP and severely obese, non-GBP patients, and whether differences in fat mass between groups at 10 years contribute to improved CRF.

Methods: As a subset of a long-term prospective GBP study, three groups of participants: (patients seeking GBP but did not have surgery, n=39, and severely obese controls not seeking GBP, n=53, all combined as controls (CNTL); and post-GBP patients (SURG), n=85) underwent exercise treadmill tests (80% predicted maximal heart rate) at baseline and 10 years follow-up. Linear regression was used to compare treadmill time (TT) between groups after 10 years of follow-up. Data were adjusted for baseline TT, pre-GBP weight, gender and age. Fat mass was determined by bio-electrical impedance and used as a covariate to determine the influence of excess adipose tissue on 10-year TT.

Results: There were no significant differences in TT at baseline between groups. SURG had a significantly greater TT (+57.7 seconds) at 10 years compared to CNTL (p=0.003). SURG also had significantly less fat mass (-12kg; p<0.0001). Adding fat mass to the model rendered the group variable insignificant (p=0.41) in the prediction of TT.

Conclusions: GBP surgery improves CRF out to 10 years post-GBP. This sustained improvement in CRF appears to be related to maintenance of reduced post-surgical fat mass.

T-P-3641
Patients with Food Aversion Post-Weight Loss Surgery: Hard to Spot, Difficult to Treat
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Background: While it is not uncommon for patients seeking weight loss surgery (WLS) to have maladaptive eating behaviors and nutritional deficiencies, these concerns are usually addressed by the multidisciplinary treatment team and are an area of focus in preparing patients for surgery. In a small number of cases, and likely under-reported, patients develop disordered eating post-surgery characterized by food aversion and extreme fear of weight regain. These patients require a high degree of healthcare utilization (re-admissions, nutrition support and close follow-up for malnutrition).

Methods: Four patients from the Medical University of South Carolina Bariatric Surgery Program were selected for case series analysis based on development of food aversion, malnutrition, and high level of healthcare utilization. Pre-WLS medical, nutritional and psychosocial data was reviewed (medical co-morbidities, laboratory results, and psychological test results). Post-WLS healthcare utilization, labwork, and nutritional progression were reviewed.

Results: Patients in this case series presented well during their pre-WLS psychosocial evaluation. They developed food aversion during the rapid weight loss period (first 6 mo) along with high healthcare utilization compared to usual care. This is consistent with models of anorexia nervosa that develop after restricting eating and achieving significant weight loss.

Conclusions: This review of cases suggests that it is difficult to predict which patients will develop food aversion post-surgery due to both low base rates and lack of distinctive characteristics pre-WLS. Regardless of predictive ability, it is critical that all members of the team communicate to intervene for these patients who are difficult to treat and require intensive healthcare resources. Future research may focus efforts on early detection post-bariatric surgery in order to mitigate complications.

T-P-3642
Perceived Facilitators and Barriers To Healthy Eating, Physical Activity and Weight Loss in Adolescents Following Sleeve Gastrectomy
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Background: Sleeve gastrectomy (SG) is utilized as a treatment for severe obesity with increasing frequency. Little is known about patient perceptions of outcomes following surgery and facilitators/barriers to achieving desired weight loss.

Methods: The current study employed a survey of 10 surgery patients prior to and following SG (90% female; 50% African American, 30% Hispanic, 20% Caucasian; Mean age = 18.2, SD=2.0; range 9-40 months post-surgery) on perceived facilitators/barriers to lifestyle change and weight loss following surgery, loss of control eating (Eating Disorder Diagnostic Scale), body esteem (Body Esteem Scale for Adolescents and Adults), and quality of life (Impact of Weight on Quality of Life – Kids).

Results: Half of the respondents noted they had not lost as much weight as they hoped following surgery and 40% reported significant concern they would be unable to maintain weight loss. The most commonly noted facilitator for healthy eating following surgery was feeling full faster (80%) and for physical activity exercising with someone (78%). The most commonly noted barrier for healthy eating was emotional eating (67%) and for physical activity a lack of energy (63%). One participant reported a remission of loss of control eating and 2 reported new onset loss of control eating since surgery.

Conclusions: Half of the respondents noted they had not lost as much weight as they hoped following surgery and 40% reported significant concern they would be unable to maintain weight loss. The most commonly noted facilitator for healthy eating following surgery was feeling full faster (80%) and for physical activity exercising with someone (78%). The most commonly noted barrier for healthy eating was emotional eating (67%) and for physical activity a lack of energy (63%). One participant reported a remission of loss of control eating and 2 reported new onset loss of control eating since surgery.
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T-P-3643
Post-Operative Behavioral Variables and Weight Change 3-Years After Bariatric Surgery

Background: Bariatric surgery in severely obese individuals usually results in significant weight loss. However the magnitude of the weight loss can vary substantially. Post-operative predictors of the amount of eventual weight loss have not been adequately examined.

Methods: Participants were adults undergoing first time bariatric operations at one of 10 U.S. hospitals in six geographically diverse areas who were enrolled in the Longitudinal Assessment of Bariatric Surgery (LABS) Study, a multicenter observational cohort study. Participants completed detailed surveys regarding eating and weight control behaviors prior to surgery and then annually for 3 years.

Results: The sample included 1,513 participants who underwent Roux-en-Y gastric bypass (RYGB) and 509 participants who underwent laparoscopic adjustable gastric banding (LAGB). Those who adopted healthier behaviors following surgery such as weekly self-weighing, counting fat grams, and cessation of between meal snacking, experienced significantly greater weight loss than those who did not adopt healthier behaviors, or those who reported always engaging in these behaviors. Multiple behavior change was associated with greater weight loss. Among participants undergoing RYGB surgery, those who started to self-weigh, stopped eating when full and stopped eating continuously during the day averaged 14% more weight loss than those who did not make these positive changes and 6% greater weight loss than those who had always engaged in these healthy behaviors.

Conclusions: Structured programs to modify problematic eating behaviors and eating patterns after bariatric surgery for severely obese individuals could be of substantial importance in improving weight outcomes.

T-P-3644
Primary Inadequate Weight Loss Following Roux-en-Y Gastric Bypass: Do Psychosocial Factors Predict Poor Outcomes?
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Background: A minority of bariatric surgery patients have poor outcomes including never achieving expected weight loss. A better understanding of factors that may predict poor outcomes is needed.

Methods: Patients (N=2420) who underwent Roux-en-Y gastric bypass (RYGB) weight loss surgery at an academic medical center were examined. Primary inadequate weight loss (PIWL) was defined as total body weight loss less than 15% at 12 months post-op. Those with poorer outcomes were compared to all RYGB patients on demographics, psychopathology variables assessed during the initial semi-structured psychological evaluation, the Binge Eating Scale (BES) and clinician ratings on the Cleveland Clinic Behavioral Rating Scale (CCBRS).

Results: 105 (4.3%) of patients were identified as having PIWL. These patients didn’t significantly differ from the larger sample on gender, age, ethnicity, or baseline BMI. PIWL patients were significantly more likely to have a history of alcohol abuse/dependence (20.7% vs. 14.4%; p<.001). A trend was noted for PIWL patients being more likely to have had an inpatient psychiatric hospitalization (13.6% vs. 7.5%; p=.07) and a past suicide attempt (13.6% vs. 7.3%; p=.06). Patients with PIWL scored significantly higher on the BES (16.08 vs. 13.64; p<.04) but were not significantly different on any of the domains of the CCBRS; although a trend was noted for poorer ratings on stress and coping (3.04 vs. 3.24; p=.06).

Conclusions: Psychological variables may be partially helpful in identifying patients likely to have PIWL. Future studies should evaluate the benefit of more sensitive psychological testing or early post-operative psychological risk factors.

T-P-3645
Psychiatric Profiles in Bariatric Surgery Candidates: Exploring the Clinical Configurations of the Millon Behavioral Medicine Diagnostic
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Background: The Millon Behavioral Medicine Diagnostic (MBMD) remains one of the most frequently utilized psychometric tests for use in evaluating bariatric surgery candidates—with 25-30% of psychologists endorsing use of the MBMD despite potential limitations regarding reliability. Given its popularity but lack of empirical data regarding validated profile configurations, our objective was to use the MBMD psychiatric indications subscales (which have been deemed reliable and clinically relevant) to identify psychiatric profiles which may be useful in making predictive judgments regarding patients’ surgical success.

Methods: Participants were 370 bariatric surgical candidates (46.5±12.7 years, 78% female, 20% non-white, BMI: 41.0±7.8 kg/m2) who completed the MBMD as part of a full pre-surgical evaluation. The Psychiatric Indications scaled scores from the MBMD were used to identify clusters via agglomerative hierarchical cluster analysis. ANOVAs and chi-squares were used to compare groups on demographic and psychological function indicators.

Results: A 3-cluster solution emerged after dendogram and cluster statistics evaluation. Cluster 1 reported minimal psychiatric symptoms (n=120). Cluster 2 reported high global psychiatric distress (n=117). Cluster 3 reported potentially-minimized psychiatric distress with higher levels of guardedness (n=133). Profiles differed across anxiety, depression, cognitive dysfunction, emotional lability, BMI, and education levels but did not differ in age, gender, or ethnicity.

Conclusions: Three psychiatric profiles emerged: minimal symptoms, high global distress, and potentially-minimized symptoms. Certain profiles may yield poorer surgical outcomes, a possibility which will be explored in our future analyses of post-operative outcomes.
T-P-3646
Psychosocial and Behavioral Changes among Adults Receiving Bariatric Surgery in the HEADS UP Project
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Background: Many post-bariatric surgery patients experience improvement in psychosocial indices. Studies have examined the influence of these variables on post-operative success but methodological limitations (e.g., lack of standardized measures and pre-surgery data) have prevented a clear understanding. There is limited research on bariatric surgery with African Americans (AA). This study used a culturally diverse sample from an ongoing translational study providing insurance coverage for bariatric surgery (the HEADS UP project) to study changes in psychosocial measures following surgery and to examine their relationship to surgical outcomes including weight change.

Methods: Adults (n= 309, 32% AA,) receiving bariatric surgery were assessed pre-surgery and at 6 and 12 months post-surgery.

Results: Pre-surgical scores for the Beck Depression Inventory-II (BDI-II), Three Factor Eating Questionnaire (TFEQ), and Impact of Weight on Quality of Life (IWQOL) were within normal clinical range. Post-surgical scores at 6 and 12 months revealed significant improvements in psychosocial outcomes. Depression scores improved significantly (p < .001). Responses to the TFEQ indicated a significant increase in cognitive restraint and a significant decrease in disinhibition and hunger (p < .001). Significant QOL improvements in physical functioning, self-esteem, sexual life, and public distress were revealed (p < .001). Psychosocial and behavioral improvements were significantly related to percent excessive weight loss, particularly at 12 months (p < .001) for African Americans (AA) and whites.

Conclusions: Among AA and whites, bariatric surgery is associated with positive psychosocial changes and the level of these improvements is associated with the magnitude of weight loss success.

T-P-3647
Pulmonary Function by Asthma Status of Severely Obese Adolescents Enrolled in a Bariatric Program
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Background: Obesity is associated with asthma and other impairments in pulmonary function, but pulmonary function has not been well characterized in adolescents enrolled in bariatric programs. The objective of this study was to describe the pulmonary function of adolescents enrolled in a bariatric program by asthma status.

Methods: We conducted a cross-sectional study of 171 adolescents (mean age 16 years, mean BMI 51 kg/m2, 82% female, 40% Black, 9% Hispanic) enrolled in a bariatric program from 2007 to 2015. A diagnosis of asthma was assigned by a physician based on self-reported history of asthma and either recent use of an anti-asthma medication or recent asthma symptoms. Multivariable linear and logistic regression analyses were used to determine the association between an assigned diagnosis of asthma and impairments on spirometry and polysomnogram.

Results: Twenty-seven percent of patients were assigned the diagnosis of asthma. Patients assigned a diagnosis of asthma had lower FEV1% predicted (mean 91% vs. 100%, p<0.01), FEV1/FVC (mean 0.81 vs. 0.84, p<0.05), and FEF 25-75% predicted (mean 75% vs. 91%, p=0.001). Both an assigned diagnosis of asthma (p=0.05) and increasing BMI (p=0.01) were independently associated with reduced FEV1/FVC. There was a trend towards increased hypoventilation among patients assigned a diagnosis of asthma (mean peak etCO2 55 mmHg vs. 52 mmHg, p=0.08).

Conclusions: Patients assigned a diagnosis of asthma based on clinical history did demonstrate impaired airflow obstruction on spirometry, with increasing BMI compounding this effect. Ensuring proper management of asthma is important to optimizing pulmonary function prior to bariatric surgery.

T-P-3648
Risk of Post-Bariatric Surgery Hypoglycemia In Nondiabetic Individuals: A Single Center Experience from the Geisinger Medical Center
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Background: Hypoglycemia after bariatric surgery is an increasingly recognized metabolic complication. The epidemiology of post-bariatric surgery hypoglycemia (PBSH) is incompletely understood.

Methods: We conducted a cohort study of patients who underwent Roux-en-Y gastric bypass (RYGB) or vertical sleeve gastrectomy (VSG) at Geisinger Medical Center from 2004 to 2013. We included only individuals without diabetes, as defined by no diabetes medications or diagnosis and hemoglobin A1C<6.5% or fasting glucose ≤125 mg/dl. PBSH was defined by any post-operative record of glucose<60 mg/dl, hemoglobin A1C<6.5% or fasting glucose ≤125 mg/dl. PBSH incidence was associated with post-operative record of glucose<60 mg/dl, outpatient or inpatient diagnosis of hypoglycemia, or any hospitalization or emergency room visit due to confusion, syncope or seizure, without a clear other cause. We used Kaplan-Meier method to describe the occurrence of PBSH and Log-rank tests to examine associated factors.

Results: Of the 1282 patients who were nondiabetic and eligible for this analysis, 86% female with mean age of 43.7 years, mean pre-operative BMI of 48.6 kg/m2, median follow up of 4.2 years and 96% underwent RYGB. Of these 1282 patients, 217 had incident PBSH. The cumulative incidence of hypoglycemia at 1 and 5 years post bariatric surgery was 3.8% and 16.9% respectively. PBSH incidence was associated with lower BMI (p=0.040), lower hemoglobin A1C (p=0.0018) and a greater 6-month post-operative weight loss (p=0.0018) and not associated with age, sex or surgery type.

Conclusions: We found that between 3.8 to 16.9% of nondiabetic individuals who underwent bariatric surgery have PBSH. A lower BMI, lower hemoglobin A1C conferred an increased risk for PBSH, suggesting an association between intact presurgical insulin sensitivity with PBSH.

T-P-3649
Role of Sleeve Gastrectomy in Long-term Diabetes Control – Review of 381 Patients
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Background: Clinical data on the role of sleeve gastrectomy (SG) as a metabolic intervention for the control of diabetes mellitus (DM) is still limited. This literature review aims to provide an update on the long-term (5 years) effectiveness of SG in DM control.

Methods: A PubMed literature search using the terms: 5-year AND Sleeve AND Gastrectomy was performed and all papers written in English with 5 years follow-up data post-SG and also, with that of DM were selected for analysis.

Results: 381 patients (mean age: 43.7) were identified across 11 studies including 2 clinical trials. The female:male ratio was 2:1. Patients have been suffering from diabetes for up to 32 years pre-operatively. The baseline BMI and HbA1C% was 35.8 and 8.25% respectively. Only 34.6% had optimal glycaemic control, defined as HbA1C <7%. 34.5% were also, with that of DM were selected for analysis. 87.4% (year 2), 79.7% (year 3), 70.7% (year 4) and 61.5% (year 5). Initial 4 years annual DM remission rates were 61.7% (year 1), 66.7% (year 2), 72.2% (year 3) and 68.0% (year 4). At year 5, 22.4% reduction in HbA1C% (mean year 5 HbA1C%: 6.4) with DM remission rate of 83.7% was achieved. Optimal glycaemic control was also achieved in 84.2% of the patients. Complete DM remission was seen in 54.2% by year 5 and partial remission in 21.2%. Insulin therapy was no longer required in 82 of 116 patients (71.0%). However, DM recurred in 22.0% with relatively low excess weight loss and longer duration of DM being identified as potential risk factors.

Conclusions: SG represents an effective intervention modality against obesity-induced diabetes with satisfactory long-term outcome. However, the recurrence rate remains high. Clinical vigilance is required and further studies focusing on the recurred DM are required.

T-P-3650
Roux-en-y Gastric Bypass Reversal: A 7-Year Experience
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Background: After Roux-en-Y gastric bypass (RYGB) some patients develop conditions that ultimately require reversal of the bypass (GBPRev). There are currently few publications on the topic. We describe the indications, techniques, and outcomes for GBPRev at a major university bariatric program.

Methods: We conducted a retrospective chart review of all patients who underwent GBPRev at our institution between 2008 and 2015. Information regarding the original operation, indication for reversal, the procedure performed, and outcomes were collected and analyzed.

Results: Fifteen patients underwent GBPRev. All but one was laparoscopic. The indications for reversal were malnutrition/TPN-dependence (5 patients; 33.3%), chronic nausea, vomiting, and abdominal pain (4; 26.7%), neuroglycopenia/refractory hypoglycemia (3, 20%), and persistent marginal ulceration despite maximal medical therapy (3, 20%). One patient (6.7%) was found to have stomach polyps during ERCP and elected reversal to allow for stomach surveillance. In the peri-operative period one patient suffered a PE and required anticoagulation; one patient required a pyloroplasty for gastric outlet obstruction; and one patient developed an abscess that required IR drainage. One patient is lost to follow up. The remaining patients' mean follow up was 21 months (range 1-69 months). The majority of patients did well with resolution of symptoms prompting RYGBrev. One patient's hypoglycemia did not resolve; one patient remains on supplemental TPN.

Conclusions: Laparoscopic GBPRev is feasible and can be performed safely. The procedure can be employed to treat a variety of conditions that may occur after RYGB and the majority of patients benefit with resolution of symptoms. In carefully selected patient population, GBPRev should be considered if conservative approaches to adverse conditions fail.

T-P-3651
Safety and Efficacy of Sufentanil Sublingual 30 mcg Tablets for the Treatment of Acute Pain Following Bariatric Surgery
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Background: A 30mcg sufentanil tablet (ST30 mcg), dispensed sublingually by a healthcare professional, is in Phase 3 development for treatment of moderate-to-severe pain in medically-supervised settings, such as outpatient surgery centers. Sufentanil appears well-suited for short duration, acute pain management when administered sublingually because it acts rapidly (plasma-CNS equilibration time of 6 minutes), does not require an invasive route of delivery and possesses a predictable off-set, in part due to lack of active metabolites. The primary objective of this study was to compare the efficacy and safety of the ST30 mcg vs placebo for the management of moderate-to-severe acute pain following outpatient abdominal surgery.

Methods: This was a randomized controlled trial of up to 180 adults undergoing surgeries which included bariatric or minimally invasive abdominal surgery. Patients were randomly assigned at a 2:1 ratio to treatment with ST30 mcg or placebo. Efficacy was assessed by patient reports of pain intensity on an 11-point numerical rating scale (0 = no pain, and 10 = worst possible pain), a five-point pain relief scale, time to ‘first perceptible’ analgesia and time to ‘meaningful’ analgesia. Subgroup analysis by BMI and type of bariatric procedure was also performed. Safety was monitored via vital signs, reports of adverse events (AEs) and use of concomitant medications.

Results: The primary efficacy variable, the time-weighted summed pain intensity difference to baseline over the 12-hour study period (SPID12), was compared for the active and placebo arms. Statistically significant differences for SPID-12 were observed in favor of ST30 mcg. Most AEs were mild to moderate in severity and typical of opioid exposure (nausea, vomiting, and pruritus).

Conclusions: The sufentanil sublingual 30 mcg tablet has shown benefit over placebo as a bariatric surgery analgesic modality in medically supervised settings requiring short-term treatment of acute moderate-to-severe pain.

T-P-3652
Satisfaction with Sexual Life Prior to Bariatric Surgery in the Longitudinal Assessment of Bariatric Surgery 2 (LABS-2) Cohort

Satisfaction with Sexual Life Prior to Bariatric Surgery in the Longitudinal Assessment of Bariatric Surgery 2
Background: The objectives of this study were to describe sexual life in a large sample of males and females with severe obesity prior to weight loss surgery (WLS), and to identify factors associated with sexual life. Methods: Before WLS, participants of the Longitudinal Assessment of Bariatric Surgery-2 study completed questionnaires, including a sexual life survey that assessed sexual desire, activity, and satisfaction and the impact of physical health on sexual function in the past month. Multivariable ordinal logistic regression models were used to identify factors independently related to sexual life; the adjusted odds of the next higher category (5 point scale) are reported.

Results: The sample (N=2036) was 79% female with a median age and body mass index of 47 years and 46 kg/m², respectively. Twenty-six percent of females and 11% of males reported no sexual desire. One third of females (34%) and a quarter of males (25%) were not sexually active. Thirty-eight percent of females and 72% of males reported that sexual activity was at least moderately limited by physical health, and about half of females (49%) and males (54%) were at least moderately dissatisfied with their sexual life. Among females, white race (OR 0.73, p<0.04), depressive symptoms (OR 0.61, p<0.0001), urinary incontinence (OR 0.70, p<0.01) and menopause (OR 0.92; p<0.01) were associated with lower satisfaction, while regular alcohol use (≥2 times/week) and depressive symptoms (OR 0.58, p<.0001) were associated with age (OR 0.55, p<.0001), not being married (OR 0.61, p=.04) menopause (OR 0.92; p<.01) were associated with lower urinary incontinence (OR 0.70, p<.01) and white race (OR 0.73, p=0.04), depressive symptoms (OR 0.61, p<0.0001) and menopause (OR 0.92; p<0.01) were associated with lower satisfaction with sexual life, whereas prior live/still birth was related to higher satisfaction (OR 1.27, p=0.04). In males, older age (OR 0.55, p<.0001), not being married (OR 0.61, p<0.04) and depressive symptoms (0.58, p<.0001) were associated with lower satisfaction, while regular alcohol use (>2 times/week) (OR 2.16, p<.01) was related to higher satisfaction.

Conclusions: Approximately half of men and women with severe obesity report at least moderate dissatisfaction with their sexual life and significant percentages of patients report no sexual desire and a lack of sexual activity in the prior month.

T-P.3653
Single Surgeon Comparison Between Laparoscopic vs Totally Robotic Biliopancreatic Diversion with Duodenal Switch

Background: Biliopancreatic diversion with duodenal switch (BPD-DS) has long been utilized as a bariatric and metabolic surgical option for morbid obesity. Numerous studies demonstrate the BPD-DS’s application for surgical weight loss and metabolic correction when used appropriately. Traditionally, BPD-DS presents technical challenges that have limited the procedure to laparotomy. Only in the past decade have advanced laparoscopic techniques been applied to the BPD-DS. The most recent improvements in surgical technology have allowed for a robotic-assisted technique to augment the laparoscopic challenges. We present advancement to the present techniques with a novel totally robotic BPD-DS.

Methods: A single surgeon, single institution series of 121 patients was evaluated retrospectively. Laparoscopic and robotic BPD-DS from March 2010 to present day were compared. Essential steps of the procedure were identical with the exception of bougie size used in the last 41 robotic cases. 20 patients excluded due to combination surgeries and staged BPD-DS. Several variables were reviewed including average age, body mass index, operative time, estimated blood loss, length of hospital stay, conversion of surgical technique, Clavien-Dindo classification of surgical complications, readmissions, and mortality prior to 90 days.

Results: A total of 101 patients met the study criteria for BPD-DS, 49 for laparoscopic and 52 for robotic. Preoperative demographics including age, gender, BMI, and ASA showed no statistical difference between groups. The respective comparisons were: mean age 40 vs 41; percent male was 32.7% vs 34.6%; mean BMI was 56.7 vs 58.5; and mean ASA was 3.02 for both groups. The operative parameters were: mean operative time 166.1 minutes for laparoscopic vs 200.7 minutes for robotic (P = <0.01) and mean EBL 49 ml vs 52 mL (P = 0.77), respectively. There were no operative technique conversions in either group. 90 day Clavien-Dindo classification of surgical complications (Grade I-V) and readmission for laparoscopic vs robotic respectively were: major complications (II-V) 9 vs 7, minor complications (grade I-II) 6 vs 13, and readmission 9 vs 5. One death occurred in the laparoscopic group. Long-term data to date shows no statistical difference in postoperative reduction of comorbidities between surgical groups.

Conclusions: Totally robotic BPD-DS presents a new technique for operative weight reduction and metabolic surgery. We present an alternative to the laparoscopic duodenal switch and advancement from the current robotic assisted methods. From our results, laparoscopic and totally robotic BPD-DS operations were statistically similar with the exception of operative time. Completion of the BPD-DS robotically allows for improved visualization, increased operative dexterity, and the advantage of minimally invasive surgery. Our novel totally robotic BPD-DS demonstrates advancement on a safe and proven option for surgical weight reduction and metabolic correction.

T-P.3654
Sleeve Gastrectomy - Review of its Long-Term Safety and Efficacy
Myungkuk Mike Kang Maidstone Maidstone

Background: Clinical data on the long-term (5 year) safety and efficacy of sleeve gastrectomy (SG) is still limited. This literature review aims to provide an update.

Methods: A PubMed literature search using the terms: 5-year AND sleeve AND gastrectomy was performed and all papers written in English were selected. 1540 patients were identified across 16 studies including 2 clinical trials. Majority of the patients were female (73.8%) with mean age of 43.4. 96.2% received SG as primary intervention. Secondary SGs were most commonly performed due to failed gastric banding (93.1%). Most (99.0%) were performed laparoscopically and the staple lines were reinforced in 81.3%, using either sutures +/- clips (74.5%) or buttressing materials +/- clips (25.5%). Mean pre-operative BMI and fat mass were 47.1 and 48.4% respectively.

Results: Mean operation length and hospital stay was 108.8 minutes and 3.6 days respectively. Common early (<30 days) complications were reflux/vomiting (5.8%), bleeding (1.9%), pneumonia (1.2%) and staple line leak (2.3%). The common late (>30 days) complications included reflux (11.0%) and anaemia (4.8%). 2.1% unfortunately had to have re-operations.
Identification of patient specific anatomic variances, may define optimal surgical weight loss strategies. **Methods:** A retrospective review of 96 consecutive patients who underwent LSG from January 2013 to April 2014 was performed. A 42-French bougie was used for sizing of the gastric conduit. The patient’s weight, body mass index (BMI), and percent of excess body weight loss (%EBWL) was collected from their initial, 3 month, 6 month, and 1 year post-op clinic evaluations. Pathologic measurements of their resected gastrectomy specimens were compared to these parameters for correlation.

**Results:** Mean pre-operative BMI was 44.62 (SD=5.24). Gastrectomy maximum length and width measurements were available in 91 specimens and staple line lengths (SLL) in 48. At 3 months, %EBWL had a low positive correlation with specimen length (r=0.175) and width (r=0.088). Three month SLL to %EBWL had the strongest correlation (r=0.287) and approached statistical significance (p=0.06). Diminished correlation was identified at 6 months for all measurements: SLL (r=0.1628), specimen length (r=0.102) and width (0.029) relative to %EBWL. By 1 year, correlation coefficients were < 0.1 for SLL, specimen length and width in comparison to %EBWL. Patient’s pre-operative weight, height, or BMI did not correlate significantly with SLL. Three month %EBWL for patients with SLL >20cm was 37.0%, compared to 31.5% for SLL <20cm. Interestingly, this difference was maintained at 6 months (51.1% vs 44.6%) and at 1 year (59.5% vs 53.9%).

**Conclusions:** Mechanisms influencing weight loss in LSG are multifactorial. Our data suggests that early post-operative weight loss after LSG correlates with resected stomach size and SLL. Further studies including long-term follow-up and consistent measurements of resected gastric specimens may better elucidate this relationship.

**T-P-3657**

**The efficiency of preoperative EGD in identifying operable hiatal hernia for bariatric surgery patients**

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**Background:** Gastroesophageal reflux (GERD) is a symptom frequently found in obese patients, often related to the presence of a hiatal hernia (HH). It is not uncommon for surgeons to evaluate for it on upper endoscopy while planning bariatric surgery as it may change or add to the operation performed. However, preop endoscopic presence or absence of a significant HH does not always correlate with intraop findings. The rate at which this discrepancy occurs is not clear. Our goal was to compare the rate of detection of significant HH between clinical, endoscopic, and intraop methods.

**Methods:** A retrospective chart review was performed of all consecutive patients who had undergone a primary bariatric procedure (sleeve gastrectomy (VSG), gastric bypass (GBP), or biliopancreatic diversion/duodenal switch (BPDDS)) with preop endoscopy in a single institution between 2009 and 2013. Data points included 1) the diagnosis of GERD or heartburn +/- use of proton pump inhibitor (PPI) or H2 blocker from history, 2) the diagnosis of HH from preop EGD, and 3) the diagnosis of HH intraop that required repair. Sensitivity, specificity, and accuracy of detecting repairable hiatal hernias were calculated for both preop clinical indicators and preop EGD findings.

**Results:** 1569 patients were included in the study. 862 had GERD or other symptoms, and 359 were on PPIs. 482 (31%) of all patients had a finding of HH on EGD: 369 small, 90
T-P-3658
The Safety and Benefits of Bariatric Surgery in the Elderly Population: a Retrospective Study in the Metabolic and Bariatric Center in Qatar
Mohammad Al Kuwari, Momena El Matbouly, Doha Doha, Gaby Jabbour

Background: Morbid obesity is a major health problem in Qatar that is affecting all age groups. The life expectancy in Qatar is increasing, therefore morbid obesity and its co-morbidities are becoming an important health issue among the elderly population. The aim of this study is to describe the outcomes and the safety of bariatric surgeries in morbidly obese patients over 60 years of age.

Methods: This study is a retrospective observational study that includes 28 patients over the age of 60 years, who underwent bariatric surgeries between 2011-2014 in our institution.

Results: A total of 28 patients were reviewed. Mortality was 0%. Morbidity was 3.5% (one patient developed a leak). Average length of hospital stay was 4 days (SD= 1.1 days), Excessive weight loss was 51.96% (25.6-71.6%, SD= 10.25). 18 patients complained of DM (64%): complete resolution of symptoms was seen in 44.4% of them. 20 patients (71%) were suffering from HTN; complete resolution was seen in 35% of them. 80% of the patients with obstructive sleep apnea improved and stopped using CPAP; and 66.6% of the patients complaining of GERD had relief of symptoms.

Conclusions: Bariatric surgery is generally safe in the elderly population and has a positive impact on obesity related diseases with an acceptable risk profile.

T-P-3659
Totally Robotic Roux-en-Y Gastric Bypass as a Weight Loss Procedure for Older Bariatric Patients
Cynthia Buffington Celebration Florida, Keith Kim Celebration Florida, Sharon Krzyzanowski Celebration Florida

Background: The rising prevalence of severe obesity among the older population has increased the number of elderly individuals electing to have bariatric surgery. Studies find that older bariatric patients have more health issues and are at increased risk for surgical complications, mortality, and failed weight loss success. The robotic surgical system may reduce complications for high-risk patients, including the elderly. In this study, we examine the safety and effectiveness of totally robotic Roux-en-Y gastric bypass (TR-RYGB) for older patients (>60 years).

Methods: The study population included 1234 consecutive TR-RYGB patients from a single surgeon practice. Of these, 312 (25.3%) were >60y and 922 (74.7%) were <60y. Postoperative measurements included: intraoperative complication and conversion rates, in-hospital complications/re-operations, 30-day readmissions, reoperations, mortality, and % change in BMI (6, 12, 24, 36 months).

Results: With TR-RYGB, intraoperative complication (0.32%) and conversion (0.16%) rates for all patients were low and did not differ significantly with regard to age. In-hospital complication and reoperation rates also did not significantly differ between the older and younger patients. Thirty-day readmission rates were less for the older vs. younger patients (4.5% vs. 7.3%, respectively) due to the lower rates of malaise among the older population (1.6% vs. 4.4%, respectively). Two 30-day mortalities occurred for the >=60y cohort and one for <60y. Changes (%) in BMI were significantly less for the older patients at 6 and 12 months postoperatively but comparable to the younger patients by 24 and 36 months.

Conclusions: Totally robotic RYGB is a safe and efficacious procedure for patients >=60y.

T-P-3660
Trends in Bariatric Surgery: The Rise of the Gastric Sleeve
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Background: To analyze the trend of utilization of common bariatric operations and their short term outcomes in the Nationwide Inpatient Sample (NIS)

Methods: We used ICD-9 codes to extract data for six common bariatric surgical procedures from the NIS database from 2008 to 2012. United States census data of 2010 was used to calculate national population based rates of bariatric procedures for each year and secular trends in the types of procedures, demographics, comorbid conditions, in-hospital complications, length of stay and total charges were examined. IBM’s SPSS version 21 was used for statistical analyses.

Results: Annual rate of bariatric procedures has declined from 61 to 57 per 100,000 adult population. Laparoscopic Gastric Bypass (LGB) remained the most common procedure with a slight downward trend from 52.5% to 45.7% (OR 0.92, CI 0.91-0.92, P<0.001); Laparoscopic Sleeve Gastrectomy (LSG) showed the highest increase in incidence from 7.2% in 2011 to 36% in 2012 (OR 10.0, CI 9.54-10.48, P<0.001). No clinically significant differences in age (46.7±13.4 to 46.2±13.5 P<0.001) and gender (76.1% to 75.7% females, P<0.05) were observed. Venous thromboembolism, renal complications and early reoperation decreased (P<0.01). Respiratory complications, visceral injury and complicating hemorrhage increased (P<0.01). Infections remained stable (P<0.05). Composite in-hospital mortality decreased from 12.0% to 10.1% (OR 0.96, CI 0.94-0.97, P<0.001) In-hospital mortality decreased from 0.9% to 0.6% (P<0.001, OR 0.92, CI 0.88-0.96). Length of stay decreased (P<0.001, Effect size=0.02) and total charge increased (P<0.001, Effect size=0.02).

Conclusions: LSG is becoming the most popular procedure in bariatrics. Length of stay, morbidity and mortality have decreased.

T-P-3661
Vertical Sleeve Gastrectomy vs. Roux-en-Y Gastric Bypass: Comparing the Impact of Two Leading Bariatric Procedures on Medical Costs & Utilization in a National Claims Dataset
Kristina Lewis Winston-Salem NC, Fang Zhang Boston MA, David Arterburn Seattle WA, Dennis Ross-Degnan Boston MA,
**Background:** Roux-en-Y Gastric Bypass (RYGB) is considered the gold standard surgical treatment for obesity, but Vertical Sleeve Gastrectomy (VSG) is becoming a procedure of choice in the U.S. Few studies have compared the effects of the 2 procedures on health care utilization and costs.

**Methods:** We conducted a retrospective interrupted time series with comparison series study using a national claims dataset. We identified patients age 18-64 who underwent a VSG or laparoscopic RYGB between 2005-2011, and propensity score matched 1108 VSG to 4196 RYGB subjects according to age group, sex, race, socioeconomic variables, comorbidities, and baseline costs, emergency department (ED) visits and hospital days. Outcome measures were changes in ED visits, hospital days, prescription drug costs and total health care costs. We used multivariable segmented regression to compare pre-to-post changes in level and trend of these measures in VSG versus RYGB, and difference-in-differences analysis to estimate the magnitude of difference by year.

**Results:** The two groups were well-matched on baseline characteristics. Of 5304 subjects: 77% were female and 68% were non-Hispanic White. Mean (SD) age was 44 (9.9) years; 28% had diabetes and 65% had hypertension. Median post-op follow-up was 2.1 years. VSG subjects had 44.7% [95% CI: -33%, -57%] fewer ED visits in post-op year 1, and 69% [-59%, -79%] fewer in year 2, compared to RYGB. There were no significant between group differences in pre-to-post hospital follow-up was 2.1 years. VSG subjects had 44.7% [95%CI: -39%, -58%] year 2) after post changes in level and trend of these measures in VSG versus RYGB, and difference-in-differences analysis to estimate the magnitude of difference by year.

**Conclusions:** 19% [-9%, -29%] in year 1, -49% [-39%, -58%] year 2) after post changes in level and trend of these measures in VSG versus RYGB, and difference-in-differences analysis to estimate the magnitude of difference by year.

**T-P-3663**

Arsenic Exposure is Associated with Dysglycemia and Cardiometabolic Dysfunction in Non-Diabetic Adults

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**Background:** It is hypothesized that arsenic (As) exposure may adversely affect cardiometabolic function and lead to diabetes and related complications, but epidemiological evidence is mixed. Laboratory experiments suggest mechanisms that may involve impaired insulin secretion rather than increased insulin resistance, as well as increased inflammation and impaired liver function, but studies exploring these pathways are lacking in humans. Experimental evidence that As may reduce weight gain make it uncertain whether adverse effects may vary depending on weight status.

**Methods:** We used toenail As concentrations in >5,700 adults aged 18-75y in the 2009 China Health and Nutrition Survey to examine associations between this exposure and markers of impaired insulin secretion (HOMA-β), insulin resistance (HOMA-IR), C-reactive protein (CRP; mg/L), and alanine aminotransferase (ALT; U/L). Multivariable linear regression was used to analyze associations between increasing tertiles of toenail As and each of these cardiometabolic markers adjusting for age, gender, BMI, elevated waist circumference, (community city, suburb, town, village), income, education, smoking status, and alcohol consumption.

**Results:** Toenail As was associated with impaired insulin secretion (β; 95%CI for highest vs. lowest tertile: -14.75%,-22.61, -6.90) and increases in mean CRP (0.35; 0.15, 0.55), ALT (0.91; -0.12, 1.94) and triglycerides (7.5; 1.1, 14.0), but not with HOMA-IR (-0.04; -0.19, 0.10). Toenail As was also associated with increased mean fasting glucose 1.37 (0.63, 2.12) mg/dL. The magnitude of associations was stronger in overweight than normal weight subjects (interaction P<0.10 for HOMA-β, ALT, triglycerides).

**Conclusions:** Results support adverse effects of As exposure on insulin secretion, systemic inflammation and impaired liver function, particularly among overweight subjects. Widespread exposure to this contaminant may contribute to cardiometabolic risk in China.

**T-P-3664**

Brachial PWV and Peripheral Endothelial Function with Cardiometabolic Risks in Chinese Pediatric Population

Matthew Gillman Boston MA, Frank Wharam Newton Massachusetts

**Background:** Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society

**Poster Abstracts Wednesday November 4th to Friday November 6th, 2015**

**Obesity 2015 Abstract Book**

**Conclusions:** We conclude that African ancestry is associated with a lower systemic levels of F2-IsopTs. Taking into account previous observations that lower F2-Isop levels predict greater risks of weight gain and type 2 diabetes, low F2-Isop may reflect metabolic predisposition to obesity and type 2 diabetes in individuals of African ancestry.

**T-P-3662**

African ancestry is associated with lower systemic F2-isoprostane levels

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**Background:** Previously we demonstrated that elevated urinary F2-isoprostane (F2-Isop) levels present a favorable metabolic trait by predicting lower risks of weight gain and type 2 diabetes. African Americans (AAs) have lower urinary F2-Isop levels as compared to Whites. We hypothesize that low F2-Isop levels present an unfavorable metabolic trait that is prevalent among individuals of African ancestry. To test the hypothesized link between continent of ancestry (“race”) and systemic F2-Isop levels we compared these biomarkers among three groups: Whites, US-born AAs, and West African immigrants (WAI).

**Methods:** We used the data from the Study on Race, Stress and Hypertension (SRSH) that included individuals aged 25-74 years who self-identified as Non-Hispanic Whites (NHW), AAs or WAI and who were residents of Georgia. Data on plasma F2-Isop levels were available for 218 participants, among them 79 WAI, 56 AA, and 83 NHWs. Plasma F2-Isop levels were measured by GS/MS.

**Results:** Plasma F2-Isop levels in these three groups were lowest among WAI (33.8 pg/ml), a group with an a priory greatest proportion of African ancestry, followed by AAs (51.1 pg/ml), and NHWs (80.1 pg/ml), the group that a priori has the lowest proportion of African ancestry: p-values <0.05. Regression analysis confirmed that age and gender adjusted F2-Isop levels were lower among WAI and AAs as compared to NHWs with the lowest levels being among WAI: adjusted regression coefficients were -0.75 (p=0.0001) and -0.41 (p=0.0001) for WAI and AAs, respectively.

**Conclusions:** We conclude that African ancestry is associated with a lower systemic levels of F2-IsopTs. Taking into account previous observations that lower F2-Isop levels predict greater risks of weight gain and type 2 diabetes, low F2-Isop may reflect metabolic predisposition to obesity and type 2 diabetes in individuals of African ancestry.
Weili Yan Shanghai, Kai Mu Road Minhang District, Shanghai Shanghai, Yi Zhang Shanghai Shanghai, Dayan Niu Shanghai Shanghai

**Background:** To propose the percentile curves of brachial arterial pulse wave velocity (BaPWV) and peripheral endothelium function (EF) by age and/or height, and observe associations with cardiometabolic risks in Chinese pediatric population.

**Methods:** 452 normal-weight and 94 overweight/obese students aged 7-18 years were recruited after obtaining written informed consent from parents. Anthropometrics, blood pressure (BP), and fasting plasma glucose, lipids, insulin were examined. BaPWV and EF were examined using OMRON BP-203RPE I and Endo PAT2000 by trained investigator, respectively. LMS method and GAMLS method were performed for fitting BaPWV and EF respectively to obtain centile curves for age and height percentiles among 452 normal-weight students. Associations between normalized BaPWV and EF with obesity and cardiometabolic risk factors.

**Results:** BaPWV or EF did not differ between genders. RHI in children correlated with both age and height, however only age effect was observed on BaPWV. Medians of BaPWV ranged from 8.5 m/s to 9.5 m/s for age of 7-17 years, the 95th percentiles ranged from 10.7 to 12.1 m/s. The centile curves between 7 to 15 years were in “U” shape and remained increasing till 17 years old. The median of EF almost linearly increased with age from 1.23 to 1.79 ml/mm Hgx100, reaching adult cutoff point at age of 14. The 5th percentiles ranged from 0.77 to 1.07 ml/mm Hgx100. Normalized BaPWV (Z-score) differed between obese and non-obese subjects, with or without hypertension, and correlated with HOMA_IR (r=0.21, P=0.004). Z_RHI was not associated with obesity, HOMA_IR or impaired fasting glucose.

**Conclusions:** BaPWV and EF show different growth trend from 7 to 17 years old. BaPWV shows non-linear trend with age between 7-14 years, EF grows almost linearly with age. Elevation of peripheral arterial stiffness is more sensitive to becoming obesity and insulin resistance index than EF does in Chinese pediatric population.

**T-P-3666**

**Concordance of Hemoglobin A1c Among Children, Parents, and Grandparents in Chinese Households**

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**Background:** Parental obesity has been shown to be positively associated with obesity of their offspring. While obesity is a strong risk factor for diabetes risk, little is known about concordance of diabetes risk across generations and how diabetes risk differs in concordance by degree of relatedness.

**Methods:** In 796 children (aged 7-18 years) who participated in the 2009 China Health and Nutrition Survey, we measured every household member’s hemoglobin A1c (HbA1c) using fasting blood. We used multivariable random-effects linear regression models to examine the association between children’s HbA1c with that of their parents’ and grandparents’ (separately), controlling for sociodemographics, diet, and physical activity. Models were stratified by gender and age groups (7-12y, 12-18y).

**Results:** Mean HbA1c was 5.30 (SD=0.52) mmol/L among children. We observed overall positive association between HbA1c among children and their parents, with particularly strong child-mother associations for 7-12y boys (β: 0.83; 95% CI: 0.52, 1.10) and girls (β: 0.26, 95% CI: 0.06, 0.46). Child-parent association in diabetes risk was weaker but statistically significant among 12-18y children. Grandchild-grandparent associations were mostly weak and not statistically significant.

**Conclusions:** Overall, children’s HbA1c was positively associated with their parent’s HbA1c, with stronger associations at younger ages. Our findings could have implications for household-based efforts to reduce risk of childhood diabetes.

**T-P-3667**

**Effects of Weight Cycling on Blood Pressure Load in Obese Middle Age Woman**

Zachary Zeigler Mesa Arizona, Aubrey Smith, Pamela Swan Phoenix Arizona

**Background:** Healthcare facilities have stressful environments which can contribute to obesity among their employees. This study evaluated the cardiometabolic, behavioral and socio-demographic factors associated with weight status among hospital employees.

**Methods:** A convenience sample of n=920 employees across the six participating hospitals in Texas were recruited to participate in this cross-sectional study in 2012. Age, gender, race/ethnicity, education, income data was collected using self-report surveys. Height and weight was measured to compute BMI to determine weight status. Independent variables included measured waist circumference, blood pressure, and non-fasting blood glucose, LDL, HDL, triglycerides and cholesterol. Dietary, physical activity, sedentary behaviors were self-reported using validated surveys. Ordinal logistic regression analysis was conducted to identify the factors associated with weight status.

**Results:** 78.1% of employees were overweight or obese (OW) with BMI>=25.0. Prevalence of obesity was higher among Latino, African American, widowed/never married, without college degree, and annual income <40,000 (p<0.05). Weight status was positively associated with hypertension (p=0.00), blood glucose (p<0.08), LDL (p=0.03), and negatively associated with HDL (p=0.00). While there were no differences in the daily consumptions of fruits and vegetables, OW employees had higher consumption of French fries (p<0.00), white potatoes (p<0.00), sugary beverages (p<0.00), regular-fat food (p<0.00), and butter/margarine (p<0.00) as compared to those with BMI<25.0 (normal weight). OW employees also spent more time watching television (p=0.00), playing computer games (p=0.01), and sitting during weekdays (p=0.00) and weekend (p=0.00). Finally, 78.8% employees were dissatisfied with wellness at their workplace, and the dissatisfaction was higher among OW employees (p<0.00).

**Conclusions:** Understanding the risk factor profile of OW hospital employees is critical to intervene effectively in this population.
Background: BACKGROUND: Approximately 80-95% of those who lose weight are NOT able to sustain it. Nevertheless, greater than 44% of adult women are dieting at any given time, relapsing into a pattern of weight loss and regain sequences termed weight cycling (WC). WC is associated with increased blood pressure (BP), cardiovascular disease (CVD) and early death. Ambulatory BP (ABP) is superior to resting BP measurements for estimating CVD risk and it allows for assessing BP load (% of readings >140/90 mmHg during daytime hours) which is a strong predictor of cardiovascular complications. The effect of WC on ABP or BP load is unknown. PURPOSE: To examine the effects of self-reported history of WC on ABP and BP load.

Methods: METHODS: This is a cross-sectional observation of cardiovascular risk factors in middle aged and overweight/obese women who completed the Weight and Lifestyle Inventory (WALI). The WALI has been shown to be reliable for number of cycles (times subjects lost >10 lbs) and the total pounds lost (r= .87, P<0.001). 33 women were classified either as weight cyclers (N = 19; WC: ≥ 4 WC of ≥10lb) or non-weight cyclers (N = 14; WC: <4 WC of ≥10lb). Dependent variables were daytime systolic and diastolic ABP (Oscar 2, SunTech) & BP load. Univariate general linear models were used to compare means between groups while adjusting for confounders (age, fat %). Chi Square was used to assess number of times BP read >140/90 mmHg.

Results: RESULTS: WC were older and had greater % fat than NWC (WC: age= 39±8 yr, 46% fat vs. NWC: age= 36 ±10 yr, 41% fat). After adjusting for age, WC had higher ABP (129±18 / 76±13 mmHg vs. 125±16 / 73±12) and BP load (26% vs 15%>140mmHg & 15% vs 9%>90mmHg P<0.001) compared to NWC. After adjusting for fat%, BP load was still higher (P<0.01) in WC.

Conclusions: CONCLUSION: Woman who weight cycle have increased BP load and are at significantly higher risk of developing CVD independent of body fatness.

T-P-3668
Elevation of Arterial Elasticity Occurred Earlier Than Impaired Endothelial Function in Obese Children and Adolescents
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Background: Increased arterial stiffness and endothelial dysfunction are recognized as primum movens in the development of atherosclerosis and track into adult life increasing the risk of cardiovascular disease in adulthood. We investigate changes of peripheral arterial stiffness and endothelial function in obese children and adolescents compared with normal-weighted counterparts.

Methods: Subjects were recruited from four schools. Written informed consent was obtained. Candidates with a history of congenital heart disease or peripheral vascular disease were excluded. Information on family medical history and daily exercise was obtained by use of a standard questionnaire. Obese children were defined by Working Group on Obesity of China standards by their age and gender. Hypertensive children were defined by measurement at visit 3 with BP equal to or over 95th percentile for their age and gender among those with elevated BP at visit 1 and visit 2. Brachial-ankle pulse wave velocity (BaPWV) was measured using an automatic waveform analyzer. Peripheral endothelial function (EF) was evaluated by Endo-PAT2000, reactive hyperaemia index (RHI) was recorded. Student’s independent t-tests were performed for group comparisons of anthropometrics and age-normalized arterial function measurements.

Results: 546 subjects aged 7-17 years old were recruited including 299 (54.8%) males and 94(17.2%) obese subjects. BaPWV and RHI did not significantly differ between genders, but grow with age. BaPWV differed between obese and normal-weight groups (895.63 vs 854.27 cm/s, P<0.001), however, RHI did not differ (1.67 vs 1.65 mmHg Hx100, P= 0.17).

Conclusions: The current study demonstrates that elevation in arterial elasticity occurred earlier than changes in EF in obese children and adolescents.

T-P-3669
Examination of the Relationships of Inheritance Patterns of Type 2 Diabetes Risk with Metabolic Function and Disinhibited Eating in Adolescents
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Background: A family history (FH) of type 2 diabetes (T2D) has been implicated as a risk factor for developing T2D; however, less is known about how maternal versus paternal inheritance of T2D risk or degree of T2D FH affects metabolic function and associated disinhibited eating behaviors in adolescents.

Methods: A cohort of 197 boys and girls (12-17y) enriched for both overweight and T2D FH was studied. T2D FH (presence vs. absence), degree of FH (1st degree vs. 2nd degree relative vs. both), and parental inheritance pattern for T2D risk (maternal vs. paternal vs. none) were assessed during a medical history. BMIz, fat mass (by air-displacement plethysmography or dual energy x-ray absorptiometry), blood pressure, as well as fasting leptin, insulin, glucose, and triglycerides were measured. Disinhibited eating (loss of control and objective binge eating) was assessed with the Eating Disorder Examination interview.

Results: Controlling for age, height, body fat, sex, race, socioeconomic status, and pubertal stage, youth with T2D FH had higher fasting insulin (p=.006) and BMIz scores (p=.011) compared to youth with no T2D FH. Neither parental inheritance pattern for T2D risk nor degree of T2D FH was significantly associated with any indicator of metabolic function (p>.05). By contrast, as expected, body fat was a strong predictor of almost all metabolic variables (p<.001). There were no significant associations between T2D FH, degree for FH, or parental inheritance pattern and disinhibited eating (p>.05).

Conclusions: We confirmed that presence of a T2D FH is linked to greater insulin resistance in youth, independent of adiposity. The lack of association for degree of T2D FH and metabolic variables may reflect ascertainment biases for T2D FH when assessing relatively young parents who may not have developed T2D yet. As compared to T2D FH inheritance pattern, body fat appears to be a more salient indicator of adolescents’ metabolic function.
AurAClie Baillot
Background: i) Examine the respective associations of visceral adiposity (VAT) and liver fat (LF) accumulation with the cardiometabolic risk (CMR) profile; ii) Develop a global index reflecting overall VAT/LF and document its association with features of the CMR profile.
Methods: Baseline data from the INSPIRE ME-IAA study have been used. A sample of 3699 subjects with both VAT and LF data was included in the analyses. Subjects’ medical history was evaluated using a questionnaire administrated by physicians. A fasting blood sample was obtained followed by a 75g oral glucose tolerance test to assess: triglycerides, total cholesterol, HDL-C, LDL-C, ApoA1, ApoB, HbA1c, adiponectin, CRP, PAI-1, fibrinogen, glucose and insulin levels. VAT cross-sectional area and LF attenuation were assessed by computed tomography. A global VAT/LF score ranging from 2 (low) to 8 (high) was generated by summing VAT and LF quartile scores. For each CMR variable, linear multivariate regressions were performed with VAT and LF together, then with the global VAT/LF score and adjusted for age, education, smoking, ethnicity, physicians’ specialty, region and BMI. Subjects taking medications to control blood pressure, glucose or lipid metabolism were excluded from some of the analyses, depending upon the outcome of interest.
Results: The number of medications used was positively associated with VAT and LF, as well as with the global VAT/LF score in men and women (p<0.001). VAT was more often associated with CMR variables, and showed higher r2 compared to LF. Individuals with a higher global VAT/LF score had more serious CMR alterations (p<0.001; ANOVA), except for cholesterol in women and LDL-C in both sexes. Conclusions: VAT and LF in men and women show differential associations with CMR variables, particularly for lipid variables. These results support the use of a global index reflecting visceral adiposity and liver fat deposition in the evaluation of CMR.

T-P-3671
Has the Relationship between Obesity and Disability Changed from 1999 Through 2013?
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Background: Recent studies suggest that improvements in awareness and treatment of obesity-associated cardiometabolic disruptions (e.g. hypertension) have reduced the excess mortality associated with obesity. It is plausible, however, that treating obesity-associated co-morbidities without treating obesity per se may have increased the obesity-associated disability burden. We evaluated whether obesity-associated disability has changed between 1999 and 2013.
Methods: Adult population data, aged 18 years and older, from National Health Interview Survey (NHIS) 1999-2013 were used. Our outcome of interest was presence of functional or activities of daily living limitation from stroke, hypertension, diabetes, weight or either chronic condition. We stratified data by age categories: 18 to <40 (young); 40 to <60 (middle-aged); 60 and above (older). Odds ratio (ORs) were estimated by BMI category (i.e., underweight: <18.5, normal weight: 18.5 to <25 [reference category], overweight: 25 to <30, grade 1 obesity: 30 to <35, grade 2-3 obesity: ≥35), separately for each age category, using a logistic regression. The interaction term between BMI category and year, where year was treated as a continuous variable, was tested to evaluate whether obesity-associated disability had changed.
Results: In young adults, for every unit increase in year between 1999 and 2013, the grade 1 obesity and grade 2-3 obesity ORs decreased by 1.23% (p=0.53) and 0.77% (p=0.66) respectively. In middle-aged adults, for every unit increase in year, the grade 1 and grade 2-3 obesity ORs decreased by 1.33% (p=0.15) and 2.31% (p=0.009) respectively. In older adults the grade 1 obesity OR decreased by 0.53% (p=0.47) and increased by 0.76% (p=0.36) for grade 2-3 obesity.
Conclusions: Our results, based on time trends in cross-sectional associations between obesity and disability, suggest that the obesity-associated disability has not increased between 1999 and 2013 and in fact may have decreased for the middle-aged grade 2-3 obese.

T-P-3672
Hypocalcemia After Bariatric Surgery
Background: The reported prevalence of hypocalcemia after bariatric surgery ranges from 1% after Roux-en-Y gastric bypass (RYGB) to 25% after bilipancreatic diversion duodenal switch (BPD-DS). We aimed to define the prevalence of post-operative hypocalcemia and identify clinical predisposing factors.
Methods: We retrospectively analyzed a prospectively-maintained database and medical records for all patients undergoing primary or revision bariatric surgery (RBS) from May 2008 to December 2014 at Mayo Clinic Rochester, MN. Patients with immediate post-operative hypocalcemia were excluded due to albumin fluxes.
Results: 1803 patients fulfilled the criteria above. 250 patients (14%) had serum calcium below the reference range and underwent the following procedures: RYGB (54%), BPD-DS (17.6%), RBS (14.8 %), sleeve gastrectomy (SG, 11.2%), and laparoscopic banding (1.6%). 47 patients (2.6%) had significant hypocalcemia (corrected serum calcium ≤ 8.9 mg/dL). Mean serum calcium was 8.2± 0.54 mg/dL of whom 36% underwent primary RYGB, 17% primary DS, 28% SG and 17% RBS. In primary and revision RYGB patients (n=23), 17% had renal impairment, 74% had malnutrition and 8.7% were vitamin D deficient. In primary and revision DS patients (n=10), 1 had renal impairment, 9 had malabsorption and 1 had hypoparathyroidism. In SG patients, 31% received a liver transplant and 85% had end-stage renal disease or a kidney transplant. None had malnutrition. Patients with more than one etiology for hypocalcemia were analyzed in all applicable groups.
Conclusions: In our series, hypocalcemia was seen in 1 in 6 patients post-bariatric surgery. After RYGB, malnutrition contributing to hypocalcemia is higher than previously reported. Restrictive procedures are also associated with hypocalcemia in liver and kidney transplant patients and those with renal disease. Preoperative assessment for factors...
Predisposes patients to post-operative hypocalcemia could identify patients who may benefit from better surveillance and prevention strategies.

**T-P.3673-DT**

**Increased Myeloperoxidase in Obese Subjects and Its Correlations with Adipocytokines**

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**Background:** Obesity is characterized by a state of chronic low-grade inflammation. Recent experimental data showed that diet-induced obesity increased both adipose neutrophil infiltration and Myeloperoxidase (MPO) activity without increased MPO protein level. The objective of the current study was to evaluate serum MPO levels in adult obese and its correlations with adipocytokines.

**Methods:** A prospective cross-sectional study was performed on 65 obese and 65 lean controls. They were recruited from Hammed Medical Corporation (HMC)-Qatar. Fasting serum was sued for the biochemical analysis of circulating levels of MPO, MMP-9, and TNF-alpha, sE-selectin, sVCAM-1, and sICAM-1, insulin, leptin and adiponectin. The analysis was done using LUMINEX 200 by xMAP-technology. Anthropometric measurements were measured.

**Results:** The obese subjects had a mean value of age ± standard deviation (SD) (47.26 ± 12.34) years, while control subjects had 43.32 (14.12) years, P=0.092; and BMI was 34.59 (3.56) kg/ m2 in obese while it was 26.26 (2.64) kg/m2 among the control group, P<0.0001. No significant difference were detected for the following parameters, glucose, total cholesterol, triglycerides, LDL, HBA1C% and HDL between obese and controls. Mean ± SD of: MPO [ng/ml] was 30.77+3.34 in obese versus 10.07+1.16 in control, p=0.00001, MPP-9 [ng/ml] was 43.63+7.76 in obese versus 31.09+0.59 in controls, p=0.0001, sICAM [ng/ml] was 203.78+13.34 in obese versus 157.90+16.67 pg/ml in control with p=0.0001 and TNF-alpha [pg/ml] was 2.906+0.07 versus 1.56+0.048 in control, p=0.0003. No significant difference were detected for the following parameters, insulin, MCP-1, VICAM-1, sE-selectin and adiponectin. MPO was significantly correlated positively with the followings: BMI (r=0.69, P=0.0001); total cholesterol (r=0.25, P=0.006); leptin (r=0.23, P=0.017); TNF-alpha (r=0.34, P=0.001), and MMP-9 (r=0.64 and P=0.0001).

**Conclusions:** MPO is a biomarker associated with obesity and inflammation.

**T-P.3674**

**Interactions of Pre-Diagnostic Obesity and Regular Aspirin use on CIMP-Status in Colorectal Cancer Patients**

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**Background:** Obesity is associated with increased risk of colorectal cancer (CRC) development and recent evidence suggests an association between increased BMI and CpG Island Methylation Phenotype (CIMP) high CRC. In such tumors, hyper-methylation produces differential gene expression and is associated with poorer overall survival. Other research suggests that regular aspirin use reverses hyper-methylation in normal colonic mucosa. Therefore, we investigated whether pre-diagnostic BMI and regular aspirin use were associated with CIMP status in a cohort of stage IV CRC patients.

**Methods:** Data for regular aspirin use, self-reported weight in the decade prior to stage IV diagnosis (n=157), and demographic characteristics were available through a structured survey about CRC risk factors in a subset of patients from the Assessment of Targeted Therapies Against Colorectal Cancer protocol, which is designed to molecularly profile tumors of patients with refractory/inoperable metastatic CRC. Tumor samples were considered CIMP-high if ≥ 30% of gene probes were methylated. BMI was calculated from self-reported weight and height, and categorized as normal-underweight (< 25), overweight (25-30) or obese (≥30). Logistic regression was used to estimate the associations between CIMP-high status, BMI category and aspirin use.

**Results:** Obesity was significantly associated with CIMP-high status, after controlling for aspirin use (OR: 2.50, 95% CI: 1.06, 5.89). Overweight was not significantly associated with CIMP-high status (OR: 1.24, 95% CI: 0.56, 2.71). Aspirin use was not a significant predictor, but there was a significant interaction between BMI category and aspirin use (p = 0.01) on CIMP-high status.

**Conclusions:** These preliminary results suggest a complex relationship between pre-diagnostic obesity, regular aspirin use and CIMP status in this group of CRC patients. Exploring this relationship may provide unique insights into the role of pre-diagnostic obesity and aspirin use in CRC biology.

**T-P.3675**

**Moderate Levels of Arsenic Exposure Appear to Exacerbate Effects of Obesity on Dysglycemia in Non-Diabetic Subjects**

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**Background:** Arsenic (As) concentrations >100ppb in drinking water have been associated with diabetes and other markers of increased cardiometabolic risk, but evidence is limited and mixed on effects of lower levels of exposure. As most studies have explored effects in lean populations, it is also unknown to what extent As may exacerbate cardiometabolic risk in overweight or obese subjects.

**Methods:** We used data from a cross-sectional study that included 748 non-diabetic adults in Chihuahua, Mexico exposed to up to 100ppb As in drinking water to examine joint effects of obesity and arsenic exposure on cardiometabolic markers, including fasting plasma glucose (FPG) and 2h glucose tolerance. Subjects who were normal weight, overweight and obese based on BMI were classified as having low, moderate and high exposure based on tertiles of drinking water As (<38.5, 38.5-<65.5, 65.5-100 ppb). Multivariable linear regression was used to analyze associations between increasing water As on cardiometabolic markers at each weight status, adjusting for age, gender, education, ethnicity, smoking, alcohol use, and water source.
Results: Compared to normal weight subjects with low water As, there were significant increases in mean FPG (mg/dL) in normal weight subjects with moderate and high exposure (adjusted β±SE 4.9±1.6 P<0.05), but the mean increase in FPG was substantially higher among overweight subjects with moderate or high water As (7.5±1.7 and 9.0±2.1; P<0.05). Compared to normal weight subjects with low exposure, odds of impaired fasting glucose/glucose tolerance were significant in obese subjects with low exposure to water As (OR 95% CI 2.5, 1.1-5.9), but was substantially higher among obese subjects with high exposure (3.8, 1.5-9.9).

Conclusions: Results suggest moderate As exposure may exacerbate dysglycemia in normal weight as well as among overweight and obese subjects.

T-P-3676

NHANES: Prevalence of Prediabetes by Body Mass Index (BMI) in US Adults

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Background: Prevalence estimates of prediabetes may vary depending on screening criteria. We assessed glycemic status of individuals across BMI categories and evaluated impact of glycemic status and BMI on comorbidities.

Methods: National Health and Nutrition Examination Survey (NHANES) data 2009–10 and 2011–12, corresponding to a representative sample of 12,391 US adults (aged ≥18 years), were combined. Absolute values and weighted frequencies were generated to estimate glycemic status (defined by fasting plasma glucose [FPG], A1c or 2-h plasma glucose according to American Diabetes Association [ADA], 2010) by BMI class. Association between glycemic state and relevant comorbidity by BMI was assessed using Proc Surveylogistic in SAS, with regression analysis adjusted for age and gender.

Results: Prevalence of prediabetes using A1c increased with BMI (BMI 25–29.9: 25.3%; BMI ≥30: 36.3%); with 2-h plasma glucose, prediabetes prevalence increased with BMI but plateaued between BMI 35–39.9 (22.4%) and BMI ≥40 (22.2%). With FPG, the prevalence increased in BMI ≥30 vs BMI <30 but decreased between BMI 30–34.9 (47.8%) and ≥40 (44.0%). Prevalence of diabetes increased with BMI. For BMI ≥30 to ≥40, diabetes prevalence was comparable between A1c (11.2–23.9%) and FPG (12.0–22.5%) but lower for 2-h plasma glucose (6.9–13.0%). Prevalence of hypertension and dyslipidemia generally increased with BMI. Hypertension was associated with prediabetes (significant in BMI ≥30) and type 2 diabetes (significant in BMI ≥25). Dyslipidemia was associated with prediabetes and type 2 diabetes across BMI groups.

Conclusions: Prevalence of prediabetes and diabetes varied depending on definition but the general trend with all 3 definitions was prevalence increased with BMI. Presence of hypertension and dyslipidemia was associated with prediabetes and diabetes; for hypertension, the association was significant in obese adults, but for dyslipidemia the association was observed across all BMI groups.

T-P-3677 - Withdrawn

T-P-3678

Obesity and Multi-Obesity-Related Chronic Diseases: Diabetes, Hypertension, High Cholesterol, Coronary Heart Disease, and Stroke in the United States

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Background: Obesity is associated with multiple chronic conditions. This study investigated the association of obesity with obesity-related chronic diseases (ORCDs), including diabetes, hypertension, high cholesterol, coronary heart disease (CHD), and stroke.

Methods: We used data from the Medical Expenditure Panel Survey (MEPS), 2008-2012, representing the U.S. general population to estimate the risks of developing ORCDs. We excluded people age <40, pregnant women, cancer survivors, and underweight people. We estimated the probabilities of developing any one of the ORCDs by fitting a gender-specific exponential survival function, controlling for race, age, body mass index (BMI) group (normal weight, overweight, obese), diagnosis of the other ORCDs before the target ORCD, and if so, the duration of these ORCD(s). Complex sampling designs were adjusted for in all analyses.

Results: We included 53,984 people, representing 106,636,835 individuals in the 2010 U.S. population age ≥40. The number of ORCDs increased with degree of obesity. For normal weight individuals, 26.3% had 1 ORCD, 12.8% had 2 ORCDs, 4.5% had 3 ORCDs, 1.2% had 4 ORCDs, and 0.2% had all 5, while for obese individuals, 28.2% had 1 ORCD, 24.8% had 2 ORCDs, 14.7% had 3 ORCDs, 3.9% had 4 ORCDs, and 0.6% had all 5. In multivariable analyses, risks for developing ORCDs increased with degree of obesity. Moreover, an individual bore higher risks for developing other ORCDs when s/he already had one. For example, compared to people without any ORCDs, people who had high cholesterol had higher risks of developing the other ORCDs; the hazard ratio (HR) for developing diabetes was 2.5 [2.2-3.0] (95% confidence interval) for men and 2.2 [1.8-2.5] for women; the HR for developing hypertension was 2.0 [1.9-2.1] for men and 1.5 [1.4-1.6] for women; and the HR for developing CHD was 4.9 [14.1-5.9] for men and 2.7 [2.0-3.6] for women.

Conclusions: This study suggests that obesity is associated with higher risks of co-existence of multiple ORCDs.

T-P-3679

Paradoxical Associations Between Severe Obesity and Carotid Artery Structure in Youth.

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Background: The influence of severe obesity on carotid artery structure in youth is not well understood. We investigated the association of obesity on carotid intima-media thickness (cIMT) and lumen diameter (cLD) among youth ranging from normal weight to severe obesity.

Methods: Two hundred twenty-six youth ages 8-17 years (mean age 12.8±2.5 years) were recruited from the Minneapolis/St. Paul area. Based on BMI percentile, participants were classified into 3 categories: normal-weight
(NW) (<85th percentile) (M=38/F=22); overweight/obese
(Ow/Ob) (>85th to <120% of the 95th percentile)
(M=35/F=39); severe obesity (SO) (≥120% of the 95th
percentile or BMI ≥35 kg/m2) (M=34/F=55). Using
ultrasonography we measured cIMT and cLD in the left
common carotid artery. Resting blood pressure was measured
in triplicate and body fat, including visceral fat, was assessed
by iDXA. An analysis of variance compared cIMT and cLD
for males and females separately across BMI groups adjusted
for Tanner stage.

Results: Systolic blood pressure (p<0.05 for all), total fat
(p<0.001 for all), and visceral fat (p<0.001 for all) were higher
across increasing BMI groups in males and females. In males
and females with SO, cIMT was lower than NW (M: 0.44±0.10
vs. 0.52±0.06mm, p<0.001; F: 0.44±0.10 vs. 0.53±0.06mm,
p<0.001) and Ow/Ob (M: 0.44±0.10 vs. 0.50±0.07mm,
p<0.002; F: 0.44±0.10 vs. 0.50±0.08mm, p=0.006). Males with
SO had a larger cLD than NW, which did not achieve
statistical significance (6.68±0.75 vs. 5.73±0.57mm, p=0.10);
however, Ow/Ob had significantly larger cLD than NW
(6.13±0.64 vs 5.73±0.57mm, p<0.022). In females, SO
(6.14±0.68mm) and Ow/Ob (6.10±0.56mm) had larger cLD
than NW (5.55±0.38mm, p<0.001 for both).

Conclusions: Paradoxically, despite having higher blood
pressure, youth with SO have lower cIMT compared to NW
and Ow/Ob peers. Further research is needed to identify the
mechanisms explaining this phenomenon and elucidate the
compensatory adaptations leading to arterial structural changes
in severe obesity.

T-P-3680
Population Effects from an Obesity Treatment Over Nine
Years in San Luis Obispo County
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Background: Qsymia, (Vivus, Inc.) a novel formulation of
low-dose phentermine and controlled release topiramate has
been on the market in the U.S. for obesity for about two years.
The inventor of this treatment had been using this off-label
treatment for obesity in San Luis Obispo (SLO) County, Ca.
from 2001 to 2010.

Methods: Data from SLO County and population vital
statistics have been gathered to determine whether population
effects of this treatment can be seen over the nine years that
the author operated a weight loss center in San Luis Obispo
County. Data for diabetes rates and obesity rates are compared
for the periods starting in year 2000 and going forward to 2009
and compared to rates for diabetes and obesity for the rest of
California. During this time the weight loss center treated
approximately 20,000 patients.

Results: Adult obesity (BMI over 30) and diabetes rates in
SLO County that were similar to the rest of CA in 2000 have
improved in SLO County compared with a worsening in the
remainder of CA. SLO County’s adult obesity prevalence was
17.6% in 2009 versus the rest of CA at 24.4%. The prevalence
of obesity was about 20% in 2000 for both SLO County and
CA. Adult diabetes rates which were about 5% in SLO County
in 2000 and 6.5% for the rest of CA in 2000, improved to 3.1%
in SLO County in 2009 versus a worsening to 8% for the rest
of CA in 2009. Diabetes death rates have decreased in SLO
County from 2000-2008 compared to an increase in the rest
of CA during the same period. From 2000-2009, there were no
safety signals from this treatment.

Conclusions: It appears that low-dose phentermine with
topiramate given to a large population of obese patients from
2001-2010 in San Luis Obispo County, CA appears to be both
safe and effective as measured by reduction in obesity and type
2 diabetes rates in SLO County compared to the rest of CA
during the time the author applied the treatment to a broad
population of obese patients in SLO County. No safety signals
were observed in overall death rates.

T-P-3681
Prevalence of Metabolic Syndrome and its Individual
Components among University Students
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Marlette Michigan, Andrea Langolf Fort Gratiot MI, Chelsea
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Background: Although Michigan is one of the states where
more than one-third of the population are obese, studies among
college students to assess metabolic dysfunction are lacking.
The purpose of this study was to examine the prevalence of
metabolic syndrome and its individual components among a
sample of students from Central Michigan University.

Methods: A cross-sectional survey was conducted among 350
students aged 18 to 25 years in Spring 2015. Students were
recruited throughout the campus via flyers, in-class and
Blackboard announcements. Biochemical, anthropometric
(height, weight, waist circumference, percent body fat, visceral
fat score), and blood pressure measurements were taken for all
students. Prevalence of metabolic syndrome was estimated
based on the National Cholesterol Education Program’s Adult
Treatment Panel III revised guidelines. Multiple regression
analyses was used to assess prevalence of metabolic risk
components

Results: Metabolic syndrome was not prevalent in our pilot
sample. However, one-third of the students (24% of male and
33% of female) had at least one metabolic abnormality and 7%
had two metabolic abnormalities. The most common metabolic
abnormalities among students were high waist circumference
(5% in male vs. 13% in female), low HDL- cholesterol (15% in
male vs. 20% in female), and elevated serum triglyceride.
Adjusting for other factors, visceral fat score was positively
correlated with waist circumference and percentage body fat.

Conclusions: Given the physiological consequences of
undiagnosed metabolic abnormalities among students,
particularly women, efforts to identify and reduce early
metabolic risk factors is crucial and warrant further research
among this understudied unique age group.

T-P-3682
Prevalence of Overweight Obesity and Metabolic
Syndrome in HIV-Infected Patients
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Background: Lipodystrophy syndrome or HIV metabolic
syndrome is characterized by alterations in the lipid and
glucose metabolism, excess and redistribution of body fat and
hypertension. Despite the highly active antiretroviral therapy
(HAART) bring many benefits to carriers of the HIV virus,
metabolic changes can occur as side effects, increasing
cardiovascular risks. Objective: To assess the prevalence of overweight, obesity and metabolic syndrome in HIV-infected patients on HAART.

Methods: We measured the weight and height and calculated body mass index (BMI). We also performed biochemical tests of lipid profile and fasting glucose. Systemic blood pressure was measured on the right side using a digital sphygmomanometer. Waist circumference was measured from the midpoint between the last rib and the iliac crest. The criteria proposed by the National Cholesterol Education Program III (NCEP-ATP III) to metabolic syndrome classification were used.

Results: We studied 281 patients (120 female and 161 male) with a mean age of 44.01 (± 10.19) years. BMI averaged 25.82 (± 5.65) kg/m². The prevalence of obesity was 18.50% and the overweight, 31.31%. Metabolic syndrome was present in 51.24% of patients (55.00% in females and 48.4% in males). The mean values of total cholesterol, triglycerides, HDL, LDL and fasting glucose in mg/dl were: 194.71(±52.47), 181.00(±164.32), 41.25(±11.98); 125.78(±52.72) and 97.56(±26.65), respectively.

Conclusions: The high prevalence of overweight/obesity and metabolic syndrome highlights the importance of early nutritional intervention to prevent cardiovascular complications in this group of patients.

T-P-3684-DT
Racial Differences in Markers of Cardiovascular Risk in Obese Children: The Influence of Body Size
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Background: Racial differences in left ventricular (LV) mass and carotid intima-media thickness (cIMT) are thought to contribute to the difference in incidence of cardiovascular disease between white and black adults. However the effect of body size on these racial differences is unknown, especially in children. The objective of this study was to: 1) determine if racial differences exist in markers of cardiovascular risk between white and black obese children, and 2) identify measures of body size that contribute to these differences.

Methods: A secondary analysis was performed on obese subjects ages 4 to 21 who were previously recruited for a research protocol. Body composition by dual-energy x-ray absorptiometry was performed. LV mass and cIMT were obtained by ultrasound. Uni- and multivariable regressions were performed.

Results: 157 subjects were studied, 74 white (36% male) and 83 black (38% male); aged 11.8 ± 3.4 years. Black patients had similar height and blood pressure to white patients, but had greater weight (85.8 ± 29.1 vs. 77.9 ± 27.7 kg, p = 0.02), BMI (34.4 ± 7.5 vs. 31.3 ± 6.9 kg/m², p < 0.01), and lean body mass (LBM) index (19.2 ± 3.3 vs. 17.6 ± 3.1 kg/m², p < 0.01). Percent body fat was no different between groups. Black patients had higher LV mass (38.2 ± 6.3 vs. 35.3 ± 8.1 g/m2.7 p = 0.01) and cIMT (0.45 ± 0.03 vs. 0.43 ± 0.02 mm, p < 0.01). LBM had the strongest relationship with LV mass (R²=0.83, p < 0.01) and cIMT (R²=0.26, p < 0.01) compared to other variables. When indexed to LBM, the racial differences seen in LV mass disappeared (2.2 ± 0.3 vs. 2.2 ± 0.4, p = 0.91). Upon multivariable regression, only LBM had a significant relationship with LV mass and cIMT, race did not.

Conclusions: The racial differences in LV mass and cIMT between white and black obese children can be attributed to their differences in LBM. The relationship between detectable racial differences in LV mass and cIMT and racial differences in cardiovascular disease outcomes in adulthood should be further studied.

T-P-3685
Relationship between Weight and Glycated Hemoglobin in Diabetes
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Background: Following the American Medical Association’s official recognition of obesity as a disease in June 2013, awareness of obesity has increased nationally. However, Michigan continues to have an obesity rate of 31.5%, ranking as the 11th highest in the country. Obesity is a known risk factor for type 2 diabetes which affects 10.4% of adults in Michigan; and we aimed to observe the effect of weight on diabetes.

Methods: All diabetic patients seen at Henry Ford K15 clinics from 11/17/2013-11/17/2014 were identified. A regression analysis was performed to identify a correlation between population samples and studies of clinical translation are currently ongoing.
weight and A1c. Patients were also stratified into groups based on BMI<18.5 (underweight), BMI 18.5 to 25 (normal weight), BMI 25 to 30 (overweight), BMI 30 to 35 (obesity), BMI 35 to 40 (severe obesity), and BMI>40 (morbid obesity). Using this classification, we calculated the mean A1c for each group and compared them using the analysis of variance (ANOVA).

Results: Out of the diabetic population at Henry Ford, 4644 visited a K15 provider during our study time frame. Of these patients, 30 had BMI<18.5: 543 had BMI 18.5-25, 1905 had BMI 25-30, 1025 fell between 30-35, 716 between 35-40 and 741 had BMI>40. The correlation coefficient between weight and A1c was found to be 0.00247 (R^2) with a CI [0.005-0.0019] and a p-value of 0.001. This indicates a positive and significant correlation between increase in weight and increase in A1c. Also, the glycated hemoglobin mean of each weight group was computed. Comparing these means using ANOVA, there was a statistical difference between the means with a p-value of 0.0019 and a p-value of 0.001. This indicates a positive and significant correlation between increase in weight and increase in A1c. Also, the glycated hemoglobin mean of each weight group was computed. Comparing these means using ANOVA, there was a statistical difference between the means with a p-value of 0.002 again indicating increase A1C with worsening obesity.

Conclusions: Our study shows that as weight increases so does A1c. This highlights the importance of identifying and properly treating the diabetes of obesity especially in diabetic patients since they may benefit from better diabetic control as evidence by decrease in A1c.

T-P-3686
Sarcopenia, Obesity and Insulin Resistance in the Elderly: Results from the National Health and Nutrition Examination Survey 1999-2004
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Background: Obesity and sarcopenia are believed to share common underlying pathophysiological mechanisms. We ascertained the relationship between markers of inflammation and appendicular muscle mass, body fat, and their interplay in a representative cohort of the elderly US population.

Methods: Subjects aged ≥60years with dual energy x-ray absorptiometry (DEXA) measures from the National Health and Nutrition Examination Surveys 1999-2004 were identified. Appendicular lean mass (ALM) was defined as fat-free mass of all four limbs, and obesity was defined as total body fat using DEXA. Baseline characteristics were determined. The primary outcome measures were variables of systemic inflammation and insulin resistance. We present the regression coefficients of ALM, after adjusting for age, gender, education status, race, smoking, and arthritis. The p-value of the same model including the interaction term of ALM and body fat is also presented.

Results: Mean age was 71.1 years with 57.0% female. Mean ALM was 19.8kg and mean BMI was 28.2kg/m2. Mean body fat was 37.2% Median C-reactive protein levels and mean homeostatic assessment model (HOMA) insulin resistance and β-cell function were 0.28 3.80, and 106.8%. ALM was strongly associated (all p<0.001) with C-reactive protein (β=0.028±0.006), HOMA-insulin resistance (β=0.359±0.057), β-cell function (β=7.15±1.28), glucose (β=0.96±0.199), triglycerides (β=0.023±0.003), and insulin levels (β=1.06±0.167). Adding the ALM-body fat interaction term to the model led to significance (all p<0.01) in C-reactive protein, HOMA-insulin resistance, glucose and insulin only. No relationship between ALM and fibrinogen or low density lipoprotein was observed.

Conclusions: Appendicular lean mass is strongly associated with markers of systemic inflammation and interacts strongly with body fat for markers of insulin sensitivity. Future research should explore the possible use of these potential biomarkers in the aging process.

T-P-3687
Serum HDL Cholesterol and Blood Mercury Concentration have a Positive Correlation in Metabolic Syndrome: Analysis of the Fourth and Fifth Korea National Health and Nutrition Examination Survey (KNHANES 2008-2013)
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Background: Dyslipidemia, reflected by reduced high-density lipoprotein cholesterol (HDLC) concentrations, is a cardinal feature of metabolic syndrome (MetS) that independently predicts cardiovascular disease. HDLC is “chameleon-like” lipoproteins with the capacity to be anti-inflammatory in the basal state and pro-inflammatory during acute-phase responses. Blood mercury is also known to have an inflammatory property. Therefore, the aim of this study is to investigate the relationship between HDLC and blood mercury in MetS.

Methods: The data of 7,616 subjects (3,713 men and 3,903 women), over the age of 20 years, were from 2008 to 2013, Korea National Health and Nutrition Examination Survey was selected and analyzed cross-sectionally. Correlation of serum HDLC and blood mercury was initially done. We compared serum HDLC concentration according to blood mercury quartile after relevant variables adjustment with or without MetS. In addition, odds ratio of having the highest quartile of serum HDLC was calculated.

Results: Blood mercury concentration was positive correlated with serum HDLC concentration (men; r=0.129, p<0.001, women; r=0.076, p=0.025) in MetS. Blood mercury concentration was associated with higher HDLC concentration (β=0.372, 95% CI, 0.15-0.60) in MetS men. Odds ratios (OR) of having the highest HDLC quartile were significantly associated with higher quartile of mercury (Q2=1.46; 95% CI, 0.77-2.77, Q3=2.65; 95% CI, 1.35-5.20, Q4=2.69; 95% CI, 1.44-5.02) in MetS men.

Conclusions: Serum HDLC was positively associated with blood mercury concentration in MetS Korean men. In addition, high HDLC concentration may not reflect anti-inflammatory capacity in case of MetS men with elevated blood mercury concentration.
glycated haemoglobin, and C-reactive protein participants were classified as ‘healthy’ (0 or 1 metabolic abnormality) or ‘unhealthy’ (≥ 2 metabolic abnormalities).

**Results:** At baseline, 243 (9.9% of sample) participants were classified as healthy obesity. At follow up 44.5% of healthy obese had transitioned into a metabolically unhealthy state compared to only 22.0% of healthy non-obese. Compared with healthy obese that remained stable, those that progressed to an unhealthy state gained greater waist circumference (B=2.7, 95% CI 0.5–4.9 cm), although no differences in lifestyle factors were observed. Healthy obese who progressed to an unhealthy state were more likely to have high blood pressure (75.0% vs 37.0%, age- and sex-adjusted odds ratio [OR] 8.9, 95% confidence interval [CI] 4.7–17.0), high C-reactive protein (53.7% vs 17.0%, OR=8.6, 95% CI 4.1–18.0), impaired glycaemic control (46.3% vs 5.9%, OR=13.8, 95% CI 6.1–31.2) and high triglycerides (45.4% vs 11.9%, OR=5.9, 95% CI 2.9–12.0) at follow-up, with excess risk remaining independent of lifestyle factors including physical activity.

**Conclusions:** A stable healthy obesity phenotype is rare and possibly explained by inherent features that prevent visceral fat accumulation, but not by lifestyle risk factors.

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**T-P-3689**

The Effect of Weight Loss on All-Cause Mortality: Systematic Review

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**Background:** Randomized clinical and prospective trials that assess the effect of weight loss on all-cause mortality have shown controversial results. We conducted a systematic review of prospective studies, with a follow up ≥1y, assessing the association of weight loss and weight cycling with all-cause-mortality.

**Methods:** We searched Pubmed of prospective studies with a follow up ≥1y, published from January 1st 2004 to December 31th 2014.

**Results:** Nine studies met the inclusion criteria. Five studies assessed the association between weight loss and mortality, two weight cycling, two weight loss and weight cycling with mortality. Weight loss increased all-cause mortality, in all of them. In the two studies evaluating the association between weight cycling and mortality, weight cycling did not have any beneficial or deleterious effects on mortality. In the two studies assessing weight loss and weight cycling, weight cycling increased mortality in the both of them, and weight lost increased mortality in one study.

**Conclusions:** Six out of seven (≥1y of follow up) prospective studies showed that weight loss was associated with increase mortality; results from studies assessing weight cycling were inconsistent.

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**T-P-3690**

The Joint Association of Obesity and Smoking with Mortality Among Public Sector Employees

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**Background:** Obesity increases the risk of morbidity and mortality. Smoking is associated with adverse consequences for health, including increased risk of premature death. The joint effects of obesity and smoking on mortality are largely unknown.

**Methods:** The participants of this cohort study were employees of the City of Helsinki, Finland. Baseline mail surveys (years 2000-2002) were used to gather employees’ weight and smoking status (N=8960, RR 67%). Weight was categorized as non-obese (BMI 18.5–29.9) and obese (BMI 30+). Smoking was categorized as ex-smoker, never-smoker, occasional smoker and regular smoker. Underweight (BMI<18.5) and pregnant participants were excluded. Data were linked prospectively with mortality registers from Statistics Finland, with a mean follow-up time of 12.5 years. The data linkage was done among respondents who gave a consent for the linkage (74%). The final sample included 6437 employees (83% female). Cox proportional hazard models were used to analyze the joint association between smoking and weight status with mortality due to any cause and due to cancer. Men and women were analyzed together as no interaction was observed between gender, weight status and smoking.

**Results:** There were 229 deaths among 6437 employees. The majority of the deaths were caused by cancer (55%), cardiovascular events (19%) being the second most common cause. Adjusting for age and gender, non-obese regular smokers had a clearly elevated risk of death due to any cause (HR 2.97, 95%CI 2.05-4.32) and due to cancer (HR 2.94, 95% CI 1.79-4.82). Obesity strengthened the association as obese regular smokers had an even higher risk of death due to any cause (HR 3.46, 95% CI 1.87-6.40) and due to cancer (HR 4.56, 95% CI 2.14-9.76). Ex-smokers’ risk of death was not elevated irrespective of their weight status.

**Conclusions:** Regular smoking increases the risk of death. The risk is especially high among smokers who are obese. Quitting smoking may reduce cancer mortality, particularly among obese.

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**T-P-3691**

The Melanocortin 3 Receptor C17A + G241A Haplotype in Adults: Increased Adiposity but No Differences in Bone Mineral Density and Bone Area

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**Background:** The melanocortin 3 receptor (MC3R) is implicated in the regulation of energy balance. In children, homozygosity for the MC3R C17A + G241A haplotype is associated with increases in fat mass and decreases in lean mass. Our lab has reported that knock-in mice for this genetic variant have increased adipose tissue, reduced lean mass percentage, reduced bone mineral content (BMC), and reduced bone area. No study has reported the effect of this haplotype on bone in humans.

**Methods:** A convenience sample of 239 healthy adults was examined at the NIH. Body composition was assessed by dual-energy X-ray absorptiometry (DXA). Genotype analyses for the MC3R allelic variants C17A (rs3746619) + G241A (rs3827103) were performed using Taqman assays. Primary statistical analyses were performed using ANCOVA, controlling for age, sex, race, height, fat percentage, and lean mass.
**T-P-3692**
The Predictive Role of Selected Hormones and Adipokines for Waist Circumference in Representative Cohort of Czech Adolescent Boys

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**Background:** There is accumulating evidence that androgens and adipokines play an important role in the development of cardiometabolic risks including metabolic syndrome. Limited data are available in adolescents. The aim of the study was to assess the major hormonal and adipokine predictors of waist circumference z-score that is a reliable marker of visceral adiposity and cardiometabolic health risks.

**Methods:** The studied cohort included 496 Czech boys of a representative cohort aged 13.0–17.9 years. Waist circumference was measured according to World Health Organization recommendation. Waist circumference z-score was calculated according to German sex and age specific references. The following hormonal parameters were assessed: free triiodothyronine, free thyroxine, thyroid stimulating hormone, prolactin, cortisol, dehydroepiandrosterone sulfate, free triiodothyronine, free thyroxine, thyroid stimulating hormone, estradiol, progesterone, adiponectin, ghrelin, glucose insulinoceptive peptide, glucagon-like-peptide 1, glucagon, leptin, resistin and visfatin. A multivariate regression with reduction of dimensionality (O2PLS) was applied to design a prediction model (statistical software SIMCA-P+ Version 12.0.0.0 from Umetrics AB, Umeå, Sweden).

**Results:** Of the total, 17 hormones demonstrated a sufficient predictive capacity for WC z-score (22.7 %) variability of the dependent variable explained by O2PLS. The most predictive power was observed for total testosterone, SHBG and adiponectin. Those parameters also significantly correlated with waist circumference (total testosterone: r = -0.453, p < 0.01; SHBG: r = -0.515, p < 0.01; adiponectin: r = -0.414, p < 0.01).

**Conclusions:** Our results suggest that particularly total testosterone, SHBG and adiponectin are important predictors of waist circumference z-score in Czech adolescent boys.

Grants: IGA MZCR NT/13792-4, MH CZ-DRO 00023761, CZ0123 Norwegian Financial Mechanisms

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**T-P-3693-DT**
The Prevalence of Fatty Pancreas at a Pediatric Tertiary Care Center

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**Background:** Pancreatic steatosis in adults has been proposed to be associated with obesity and metabolic syndrome and to have the same pathogenesis as that of nonalcoholic fatty liver disease (NAFLD). Data on pancreatic steatosis in children remains lacking. Our study aims to measure the prevalence of pancreatic steatosis in children and to examine its association with obesity and NAFLD.

**Methods:** We retrospectively reviewed charts of 321 patients 2-18 years of age who received abdominal CT imaging in the emergency department or inpatient ward within a 1-year time span, and obtained demographics, anthropometrics, and medical history. Our radiologist determined mean Hounsfield Unit (HU) measurements for the pancreas, liver, and spleen. A difference of -20 between the pancreas and spleen (psHU) and between the liver and spleen (lsHU) were used to determine fatty infiltration.

**Results:** Of the 321 patients, 11.5% had a psHU less than -20. The prevalence of pancreatic steatosis was higher in the obese vs. overweight vs. normal group (18% vs. 8% vs. 9%, chi-square 3.5, P=0.18). Obese females 15-18yrs old and males 2-14yrs old have a higher odds ratio of having pancreatic steatosis (OR=5, P <0.05) compared to their non-obese counterpart. There is a significant correlation between the psHU and lsHU (r=0.50, p<0.001).

**Conclusions:** Pancreatic steatosis was identified in more than one tenth of the study population and is associated with obesity, especially, in certain gender-age groups. Also, pancreatic steatosis is significantly associated with NAFLD. This is the first study assessing the prevalence of pancreatic steatosis in children.

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**T-P-3694**
Thirty Years of Obesity Publications from NHLBI Studies

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**Background:** The National Heart, Lung, and Blood Institute (NHLBI) is the second largest funder of obesity research at the National Institutes of Health, with over $140 million invested in obesity research in fiscal year 2014. To measure the outcomes of this funding, we conducted an in-depth analysis of the obesity-related publications supported by NHLBI that were published over the past 30 years.

**Methods:** NHLBI-supported obesity publications from 1983-2013 were identified from the Thomson Reuters InCites database using obesity-relevant MeSH terms. Network analysis techniques were then used to cluster these publications based on shared references.

**Results:** Publication of obesity studies supported by the NHLBI has increased dramatically over 30 years from 23 publications in 1983 to 292 in 2013. As the obesity epidemic has unfolded, a fuller range of topics has been represented in obesity-related publications.
these publications. Earlier publications took advantage of existing cohort studies to describe the correlates and cardiovascular consequences of weight change. Emerging topical areas with increasing interest within the field of obesity include genetics & gene x environment associations, asthma & respiratory disorders, treatment & intervention, and sleep. Thirty percent of the publications were ranked in the top 10 percentile based on citations normalized for year of publication and journal subject category.

**Conclusions:** NHLBI funded studies have produced a large number of diverse obesity-related publications, with a high proportion of these publications being highly cited.

**T-P.3695**

**Trends in the Prevalence of Obesity in Adults with a History of Cancer: Results from the US National Health Interview Survey, 1997–2013**

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**Background:** Prior observational studies report associations between obesity and cancer progression and mortality. However, trends in obesity prevalence among cancer survivors have not been evaluated.

**Methods:** We used data from the 1997-2013 National Health Interview Surveys (NHIS) to construct a nationally representative sample of 1,140,642 adults aged 18-85 years, of whom 36,408 reported ever having a cancer diagnosis. We tested for a linear trend in obesity prevalence over the study period using the Cochran–Armitage trend test, and estimated the relative risks of obesity within each time period using logistic regression models. Obesity was defined as body mass index (BMI) >30 kg/m². We also examined trends among adults with a history of breast (n=6,568), prostate (n=3,859) and colorectal cancer (n=2,440).

**Results:** Between 1997 and 2013, the prevalence of obesity increased in adults both with and without cancer (p for trend <0.001 for both groups). Throughout this period, the prevalence of obesity was higher in cancer survivors than cancer-free adults for women (21%-31% vs. 20%-28%) and men (20%-30% vs. 20%-29%). Across the period, cancer survivors were 8%-10% more likely to be obese than cancer-free adults after adjusting for demographic characteristics. Furthermore, colon and breast cancer survivors were 26%-40% and 17% more likely to be obese than cancer-free adults, respectively. Among cancer survivors, African Americans [OR range: 1.8 (95% CI: 1.5-2.1) to 2.1 (95% CI: 1.7-2.4)] and Hispanics [OR range: 1.2 (95% CI: 1.0-1.5) to 1.8 (95% CI: 1.4-2.2)] were more likely to be obese than non-Hispanic whites.

**Conclusions:** From 1997 to 2013, there was an increasing trend in obesity for adult cancer survivors. Currently, cancer survivors have a significantly higher prevalence of obesity than cancer-free adults. Obesity prevention and treatment is needed for cancer survivors, especially colon and breast cancer survivors and survivors of African and Hispanic descent.

**T-P.3696**

**Type and Magnitude of Cardiovascular Risk Factors in Adolescents of Chiapas, Mexico**

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**Background:** The Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents addresses 13 cardiovascular (CV) disease (CVD) risk factors. This study was conducted in Chiapas, a State with over 70% of inhabitants (mostly indigenous Mayan) living under the poverty line with high food insecurity and limited access to health services. There are no studies on the type and magnitude of CV risk factors to which this population is exposed.

**Methods:** We measured blood pressures for hypertension (HT), fasting blood glucose for diabetes (DB), dyslipidemia (DYS)(low high density lipoprotein cholesterol (HDL-C) and hypertriglyceridemia (HTG) per NHLBI definition) tobacco exposure (TE), physical activity (PA) and metabolic syndrome (MS)(ATP III) in 69 (55% female) adolescents (mean ± SD; age 13.59 ± 0.94 y) attending a school program. Students were divided into 3 groups: underweight (UW) BMI <5pc (CDC), non-obese (NO) BMI pc5-85 and overweight/obese (OO) BMI >pc85

**Results:** Adolescents were 4% UW, 71% NO and 25% OO. Prevalence of DB, HT, SM and DYS was 0.34, 8 and 44% for NO and 0, 29 (P=0.290), 24 (OR:3.46; P=0.002) and 71% (OR:3.16; P=0.000) for OO. HDL-C values were low (<40 mg/dL; NCEP) in 50% of UW 29% NO and 71% OO (NO/OO OR:6.0; p=0.000) while HTG was high (≥ 130 mg/dL) in 50% UW, 24% NO and 43% OO (OR:2.44; p=0.004). All TE adolescents presented DYS. Only 1/5 adolescents with DYS declared PA and 2/5 declared less than 2 h of daily TV watch.

**Conclusions:** Except for DB, all CVD risk factors were present in both NO and OO. No significant association was found with HT: 1 out of 3 adolescents is exposed regardless of obesity. Significant association was found between OO-SM and OO-DYS. There is higher risk of low HDL-C and HTG in OO, but 1 out of 4 adolescents NO is also exposed; even UW adolescents presented DYS problems. Prevention and attention programs are needed regardless of nutritional status.

**T-P.3697-DT**

**Acculturation is Associated with Computer Screen Usage among Latino Adolescents**

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**Background:** Previous research has shown that Latinos are disproportionately affected by obesity. Sedentary behaviors have been linked with the obesity epidemic. Further, acculturation has been shown to influence sedentary behaviors; however, only a few studies evaluated acculturation as a predictor of sedentary behaviors among Latino adolescents. For instance, some research has evaluated acculturation and computer screen time, without consideration of other sedentary behaviors (e.g. television time or reading time).

**Methods:** Latino adolescents (n = 99), ages 14-17 years, were recruited from high schools in California. Acculturation was assessed with the Norris’ Acculturation Scale for Hispanics, sedentary behaviors were measured along with other covariates. Participants completed cross-sectional assessments on laptops. Multiple linear regression was used to examine the association of acculturation with sedentary behaviors: TV time, computer time and reading. It was hypothesized that
acculturation would be positively associated with sedentary behavior.

**Results:** Participants were 72% female, had a mean BMI of 24.1 kg/m² (SD=5.7), mean TV time of 23.2 hours (SD=10.1), mean reading of 20 hours (SD=11.3) and mean computer time of 15.6 hours per week (SD=14.4). Latinos who were more acculturated were more likely to engage in computer usage (β=.25, p<.05) after controlling for gender, BMI, and income. Acculturation was not associated with TV watching or reading time. However, gender was associated with reading time (β=.28, p<.01) after controlling for gender, BMI and income. Females read more hours than males.

**Conclusions:** Acculturation was positively associated with computer time, but not with TV or reading time. Future research is needed to examine the relationship between acculturation and sedentary behaviors among Latino youth. Given these youth are at increased risk for obesity, prevention efforts may want to target certain sedentary behavior such as computer screen time to improve health outcomes.

**T-P-3699**

**Adolescents' Attitudes Towards Smartphone Applications for Health Behavior Change: A Qualitative Study**

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**Background:** Despite the growth in smartphone use among adolescents, few mobile health applications (apps) are designed specifically with this population in mind. This study used qualitative methods to explore adolescents’ attitudes towards mobile apps for health management.

**Methods:** Individual semi-structured interviews were conducted with participants (N=20, aged 13 to 19 years) from Boston Children’s Hospital Primary Care Center. Question domains included 1) experience with health-related smartphone apps, 2) barriers to use, and 3) preferences for app features. Interviews were recorded, transcribed, and analyzed using an iterative coding process.

**Results:** Of the 20 participants, 55% were male, 40% Latino, and 50% Black with mean age of 15.1 years. The mean body mass index percentile was 85th% (80th% to 99th%). Among participants with no prior experience to health apps, some expected apps to be adult-focused and others perceived apps to be a last resort to staying healthy. Barriers to adoption included lack of motivation, lack of awareness, and need for improved user interface. Desired features included convenience, multimedia content, personalized training, and biometric data tracking. Most participants noted that concise notifications and attainable goals linked to tangible rewards were important for sustaining usage. The integration of health apps with social media was divided as some participants felt health was a private concern, while others believed social media could encourage healthy competition. Most participants agreed that advertising via social media would be necessary for widespread adoption. Body image was a major concern, as some participants felt that weight-centric apps could lead to stigma, excessive exercise, and teasing.

**Conclusions:** This study described features that were important for mobile health app uptake as well as negative features that hindered usage. This information could guide app designers to create health applications that are more attractive and relevant to adolescents.

**T-P-3698**

**Associations Between Weight-related Anthropometric Traits and Lifestyle Factors in 3839 Norwegian Children Aged 4-16 Years**

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**Background:** There is limited information about how different weight-related anthropometric measures are associated with children’s eating habits, physical activity and sedentary lifestyle on a population level. As body mass index (BMI) is not a direct measure of fat, we postulated that associations between skinfold thicknesses, waist circumference (WC) or waist-to-height ratio (WHR) and lifestyle factors differ from those seen for BMI.

**Methods:** Data from the Bergen Growth Study (www.vekststudien.no) was used to study the relation between standard deviation scores (SDS) of BMI, WC, WHR, subscapular (SSF)-, and triceps (TSF)-skinfolds, and lifestyle factors in 3839 Norwegian children (1543 boys) aged 4-16 years.

**Results:** Simple linear regression models showed an increase of all anthropometric measures with low parental education and irregular meals, and a decrease with the intake of sweets. WC and BMI also increased with fruit and vegetable intake and decreased with soda intake. The presence of a TV in the bedroom was positively correlated with all measures except WC, and physical activity was negatively correlated with SSF and TSF. In a fully adjusted model with interactions all anthropometric measures were still higher with a low parental education and irregular meals. WC, WHR and BMI were positively correlated with a higher intake of vegetables, WC, SSF and BMI were negatively correlated with the intake of sweets and BMI also with soda consumption. The presence of a TV in the bedroom and physical activity were associated with a lower SSF, but physical activity also with a higher WHR. There was a significant interaction term that indicated a higher BMI and WC when children who were more physically active also had a TV in their bedroom.

**Conclusions:** SSF was the only anthropometric measure to show the expected decrease with physical activity and increase with a measure of a sedentary lifestyle. The results for WC, WHR, and BMI were inconsistent.

**T-P-3700**

**Birth Weight Modifies Associations Between Physical Activity and BMI Trajectories Over 14 years**

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**Background:** Obesity-related outcomes are more strongly associated with low physical activity in individuals with abnormal birth weights, but this hypothesis has not been tested in longitudinal studies.

**Methods:** We used data from the National Longitudinal Study of Adolescent Health, a nationally representative sample of adolescents followed 14 years over four waves (1994-95, 1995-96, 2001-02, 2008-09) into adulthood (n=7,353 females, 7,079 males). In gender-stratified parallel process growth models, we examined latent trajectories in Body Mass Index (BMI) across Waves 2 to 4 and moderate to vigorous physical

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activity (MVPA) across Waves 1 to 4, adjusting for sociodemographic characteristics. To determine if estimated effects of MVPA trajectory on BMI trajectory differed in those born low or high birth weight (LBW, HBW) compared to normal birth weight (NBW), we included interaction terms between LBW or HBW with MVPA intercept and slope.

**Results:** Overall, MVPA decreased and BMI increased over time. In females and males born NBW, greater Wave 1 MVPA [coefficient (95% CI): Males: -2.9 (-7.4, 1.6); Females: -2.2 (-4.6, 0.2)] and smaller decrease in MVPA [coefficient (95% CI): Males: -0.14 (-0.26, -0.01); Females: -0.40 (-0.62, -0.18)] were associated with less dramatic BMI increase over time. In males, these associations were similar among those born LBW, and stronger among those born HBW, although interactions were not significant. In females, these associations were positive among those born either HBW or LBW (e.g., interaction p for Wave 1 MVPA=0.009, for MVPA slope=0.09 in LBW).

**Conclusions:** Longitudinal associations between MVPA and BMI from adolescence to adulthood varied according to birth weight and sex. These findings have implications for the potential role of early life factors in heterogeneity of responses to physical activity.

**T-P-3701-DT**
Cardiovascular disease risk factor correlates of physical activity and sedentary behavior patterns in U.S. youth
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**Background:** Physical activity (PA) and sedentary behavior are associated with cardiovascular disease (CVD) risk factors in youth; however, little is known about associations between patterns of PA and sedentary behavior, and CVD risk factors. This study used latent classes (LC) to investigate associations of youth PA and sedentary behavior patterns with CVD risk factors.

**Methods:** Data were from youth ages 6 to 17 in the National Health and Nutrition Examination Survey (NHANES) (2003-2006). Accelerometer data (ActiGraph 7164) were used to derive LCs describing average counts/minute (CPM, an indicator of total volume) and percent (%) of wear time in moderate-to-vigorous physical activity (MVPA) and sedentary behavior. Four LCs were identified for CPM, MVPA, and sedentary behavior, respectively. Waist circumference (WC), systolic blood pressure (SBP), diastolic blood pressure (DBP), and high-density lipoprotein cholesterol (HDL-C) were studied as continuous variables using multiple linear regression. Covariates included age, gender, race/ethnicity (non-Hispanic White/non-Hispanic Black/Mexican American/Other), poverty-to-income ratio, and smoking.

**Results:** The 3,984 eligible participants had a mean age of 11 years, spent 50% of the day in sedentary behavior, spent 5% of the day in MVPA, and had an average of 516 CPM over a 7 day period. The LCs showed several associations with CVD risk factors. Compared to the least active CPM class, the most active CPM class had an 8 mg/dL (95% CI: 2.70, 13.32) higher HDL-C. Additionally, compared to the least active CPM class, youth one CPM class higher had a 2 cm (95% CI: -3.52, -0.25) lower WC. Compared to the least active MVPA class, youth two MVPA classes higher had a 6 cm (95% CI: 13.32) higher HDL-C. The sedentary LCs were not associated with the CVD risk factors.

**Conclusions:** The pattern of higher MVPA and total volume of PA was associated with several CVD risk factors.

**T-P-3702**
Climate, Season, and Physical Activity among U.S. Adolescents
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**Background:** Little is known about how adolescent physical activity varies across the United States by season and climate region.

**Methods:** We studied 10,920 youth, age 9-15 years in 2004, from the longitudinal Growing Up Today Study 2. To assess climate, we grouped the contiguous U.S. states into 9 climatically consistent regions. We assessed physical activity on the 2004, 2006, 2008, and 2011 surveys by asking hours/week each adolescent engaged in 15 to 18 activities by season. Moderate to vigorous physical activity (MVPA) was modeled as hours/week, and dichotomized into >= vs. < 7 hours/week (meeting national guidelines). We used longitudinal linear mixed effects models and marginal models to examine the associations of season, climate region, sex, and age group with MVPA levels over time.

**Results:** Median MVPA was 7.2 hours/week (interquartile range 2.5, 13.5), and 47% of adolescents had < 7 hours/week. After adjusting for climate region, age group, race/ethnicity, weight status, and sex, adolescents had 3.81 fewer MVPA hours (95% confidence interval (CI) -3.92, -3.70) in winter than in summer, and almost 2 times the odds of not meeting MVPA recommendations during winter (odds ratio (OR) =1.97, 95% CI 1.91, 2.03). Those living in the South were 31% less likely (95% CI 28%, 35%) to meet activity guidelines than in the Northeast after adjusting for season, and 52% less likely during the summer (95% CI 33%, 74%). Boys were more likely than girls to meet guidelines, with the difference being largest during the summer (OR=1.49, 95% CI 1.40, 1.59) and smallest during the winter (OR=1.26, 95% CI 1.18, 1.34).

**Conclusions:** Regardless of U.S. climate region, sex, or age group, adolescents were less active in the winter than summer, and after accounting for season, those living in the Northeast were most active.

**T-P-3703**
Comparison of the Role of Physical Activity on Components of Metabolic Syndrome between Normal Weight and Overweight/Obese Participants of the Mexican Health Workers Cohort
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**Background:** There is available data regarding the association between physical activity (PA) and components of metabolic syndrome (MetS) like waist circumference, triglycerides, HDL cholesterol, blood pressure and glucose. Nonetheless, these studies do not show the effect of PA for normal weight and overweight/obese participants separately and this is important because BMI is a confusion variable due to its relation both with PA and the components of MetS. Our aim was to explore the association between PA levels and components of MetS stratified by BMI status.
Methods: This study is derived from the Mexican Health Workers Cohort. Baseline and follow up measures took place in 2004-2006 and 2010-2012 respectively. Data collected included anthropometric measures, body composition, measurement of metabolic markers, food frequency questionnaires and PA questionnaire about activities at work, leisure time, housekeeping and sports. Inclusion criteria was 18 years or older, without metabolic syndrome but with up to 2 components of MetS, without physical limitation or chronic disease that required a change in diet or weight loss greater than 10 kg in the last year. All analysis were stratified by BMI status.

Results: A total of 557 normal weight, 404 overweight and 85 obese participants met the inclusion criteria. PA (METs) was similar among groups. Before controlling for other covariates, obese participants met the inclusion criteria. PA (METS) was greater than 10 kg in the last year. All analysis were stratified by BMI status.

Conclusions: We conclude that the observed effect of PA on components of MetS is mediated by weight loss and does not appear to have a strong independent effect from BMI status.

T-P-3704
Gender Differences in Effects of Motivation to Exercise on Physical Activity Levels Among College Students: A Self-Determination Theory Approach

Background: Self-Determination Theory (SDT) posits that intrinsic motivation for health-related behaviors can lead to improved and sustained health behavior change. Accordingly, motivation to exercise may play an important role in understanding why less than half of college students meet recommended levels of physical activity (PA). The present study used an SDT framework to examine exercise motivation and PA outcomes in college students.

Methods: Participants were undergraduates at a Northeastern state university (N = 678; 57.5% female; 90.3% Caucasian). The International Physical Activity Questionnaire (IPAQ) was used to measure Light, Moderate, and Vigorous PA. Intrinsic and extrinsic motivation for exercise was measured using the Exercise Motivations Scale (EMS). A Self-Determination Index (SDI) score representing the motivational tendency of each participant was calculated, where positive values indicate more intrinsic than extrinsic motivation.

Results: Males (M = 13.5 ± 4.5) had significantly higher SDI scores than females (M = 12.1 ± 4.7) (p<0.001). Multinomial logistic regression analyses regressed IPAQ scores on SDI and gender (X2 = 86.6, df=2, p<0.001). As SDI scores increased, participants were less likely to be in the low (OR = .79, 95% CI [.75,.84], p<.001) or moderate PA category than the vigorous category (OR=.88, 95% CI [.84,.92]) p<.001). Males were about half as likely as females to be in the low (OR = .58, 95% CI [.34,.99], p<.005) or the moderate PA category (OR = .58, 95% CI [.40,.85], p <.01) than vigorous category. There was no significant interaction between SDI score and gender (p = .8).

Conclusions: The development of intrinsic motivation for PA may increase PA levels in both men and women. Consistent with prior research, compared to men, women were more extrinsically motivated to exercise and had lower PA levels. Given the drop in PA in young adulthood, future studies should explore whether women benefit from intervention strategies that promote intrinsic motivation for exercise.

T-P-3705
Increasing MVPA and Decreasing Sedentary Time are Associated with 2-Year Weight Loss in Obese Persons at Risk for Knee Osteoarthritis
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Background: Moderate-to-vigorous physical activity (MVPA) is recommended for weight loss; however it is unclear how activity or sedentary changes influence long-term weight loss in obese adults. Objective: We examine if changes in MVPA, light intensity physical activity, and sedentary behavior are related to weight loss over a 2 year period in obese adults with knee osteoarthritis (OA) or knee OA risk factors.

Methods: Objectively measured body weight, physical activity, and sedentary time were obtained from 459 obese participants from the Osteoarthritis Initiative at baseline and two years. The association between 2-year weight change and changes in physical activity (light and MVPA) and sedentary time from accelerometer monitoring were examined by multiple linear regression adjusted for demographic and health factors.

Results: Over 2 years, participants lost 3.48 ± 26.06 lbs., increased sedentary time (9.5 ± 64.5 minutes) and decreased both light and MVPA (-8.6 ± 64.5 minutes, -0.9 ± 14.2 minutes, respectively). Weight loss was associated with increased MVPA gains across five categories of weight change from ≥10lbs. loss (-7.1 min), 5-9.9lbs. loss (7.3 min), ±5lbs. (1.4 min), 5-9.9lbs. gain (-0.9 min), and ≥10lbs. gain (+2.7 min) (p for trend < 0.001). Weight loss was also associated with less sedentary gain across five categories of weight change from ≥10lbs. loss (-7.1 min), 5-9.9lbs. loss (7.3 min), ±5lbs. (9.1 min), 5-9.9lbs. gain (9.5 min), and ≥10lbs. gain (25.8 min) (p for trend = 0.01). Weight loss had a strong but nonsignificant trend with light activity gain (p for trend = 0.06). All models controlled for demographics and health factors.

Conclusions: Small increases in MVPA and decreases in sedentary time over 2 years were associated with weight loss among obese adults with or at risk for knee OA.

T-P-3706-DT
Interest in Using Compact Pedaling Devices and Treadmill Workstations among Primary Care Patients
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Background: Compact pedaling devices and treadmill workstations have been shown to be effective strategies for reducing sedentary behavior in the workplace, and increasing caloric expenditure. Little is known, however, about the extent to which adults with diverse health-risk profiles would be interested in using such “active work” solutions.

Methods: Primary care patients at two outpatient clinics in Central Pennsylvania completed questionnaires to assess
interest ("yes" vs. "no") in using "a small pedaling device under the desk" and "walking on a treadmill with a desk attached" if these options were provided at no-cost. Demographic and health-risk factors were also assessed.

**Results:** Of 441 surveys completed (88.2% response rate), 388 patients (87.9%) provided complete data on their interest in using compact pedaling devices and treadmill desks. Overall, 47.4% and 38.4% of patients aged 18-44, 36.2% and 23.9% of patients aged 45-64, and 19.6% and 7.9% of patients aged 65+ plus were interested in using pedaling devices and treadmill workstations, respectively (p<0.001 for difference in interest between pedaling devices vs. treadmill workstations). In logistic regression models adjusted for demographic and health covariates, younger-aged adults were more interested in using pedaling devices (OR=3.7, 95% CI=1.8-7.3) and treadmill workstations (OR=7.1, 95% CI=3.0-16.8) than older adults. The logistic regression models indicated no significant difference in interest in using pedaling devices and treadmill workstations among overweight/obese vs. normal weight adults, and among adults with/without hypertension and high cholesterol.

**Conclusions:** Compact pedaling devices and treadmill workstations may serve as viable options for weight gain prevention. Interest in using these devices was similar among patients with, and without, clinical health risk factors, suggesting that “active work” solutions hold potential for chronic disease prevention among diverse at-risk groups.

**T-P.3708**

**Motor Proficieny in Pediatric Patients with Obesity in a Multidisciplinary Weight Management Clinic**

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**Background:** Children with obesity may have difficulties meeting the recommended level of physical activity due to decreased motor proficiency. This study explored the relationship between body composition and motor proficiency in children with obesity.

**Methods:** Between Oct 2014 and March 2015, 147 children, aged 5 to 20 years, had their initial visit to a multidisciplinary weight management clinic. Demographics, anthropometrics, body composition (InBody 770) and motor proficiency (Bruininks-Oseretsky Test of Motor Proficiency (BOT-2) short form) were assessed during the first visit. Kendall Tau’s were considered significant for p<0.0125 after Bonferroni correction for multiple comparisons, and U test was used to analyze group differences.

**Results:** Of the 147 patients, 61% were female, and the racial/ethnic distribution of the patients consisted of 67% Black, 18% White, 8% Hispanic, and 7% Other or Unknown. Mean age was 11.8±3.6yrs, weight was 82.7±31.1kg, height was 152±18cm, waist circumference z-score (WCZ) was 2.12±1.07, BMI z-score (BMIZ) was 2.49±0.44, and percent body fat (PBF) was 46±8%. Obesity class I (BMI 100-119% of 95th%), II (120-139%), and III (≥140%) rates were 20%, 37%, and 43%, respectively. BOT-2 score was below normal in 69% of subjects. There was a significant negative association between PBF and the BOT-2 %ile (τ=-0.171, P=0.008), while WCZ, BMIZ, and visceral fat area were only nominally correlated with BOT-2 %ile (τ ranged from -0.154 to -0.124, P-value from 0.016 to 0.029). Patients with class III obesity had significantly lower BOT-2 %ile compared to children with less severe obesity (class I vs II (median [25-75%] %ile): 12 [6-18] vs. 8 [8-24]; P=0.002).

**Conclusions:** Our results suggest that children with more severe obesity have greater impairment in motor proficiency than children with less severe obesity. Further studies are needed to explore whether weight loss interventions can improve not only metabolic health but also motor proficiency in pediatric patients with severe obesity.

**T-P.3709-DT**

**Objectively-Measured Physical Activity and Central Adiposity in an Overweight Adult Community-Based Cohort**


**Background:** Central adiposity, particularly visceral adipose tissue (VAT) has been positively associated with type 2 diabetes.
diabetes and all-cause mortality, whereas moderate-to-vigorous physical activity (MVPA) has been shown to be protective. We sought to determine the association between VAT and MVPA in a community-based sample of young African-American adults.

**Methods:** The Modeling the Epidemiologic Transition Study (METS) is a prospective cohort study examining the relationship between physical activity and weight change. During the year-3 follow-up exam, VAT and abdominal subcutaneous fat (SAT) were measured using dual x-ray absorptiometry; MVPA and sedentary behavior using accelerometry.

**Results:** Of the 265 participants (41% men), mean age (±SD) was 39±7 yr and BMI was 32.8±9.6. Waist circumference did not differ between the sexes (103±20 cm); in contrast, both VAT and SAT, 637±373 and 2022±113 cm3, respectively, were higher among women (p<0.01). MVPA in 1-minute bouts was higher among men than women, 29±30 vs 13±13 min/d (p<0.001); sedentary time did not differ by sex, 212±48 min/d. In univariate analyses, MVPA was inversely associated with waist, VAT and SAT in both men and women (all p<0.05); sedentary time was not consistently associated with adiposity measures. In multivariate analyses, MVPA was more strongly associated with central adiposity measures in women than in men (p<0.005).

**Conclusions:** In a community-based cohort of predominantly overweight and obese African-American adults, MVPA was strongly inversely associated with all three central adiposity measures suggesting physical activity even at relatively low levels may be an important determinant of chronic disease risk. Longitudinal analyses will help clarify the direction of association.

**T-P-3710**

**Parent Limit Setting is Associated with Child Sedentary Media Use and BMI Percentile:** Baseline Results of the mFit (Motivating Families with Interactive Technology) Study

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**Background:** Very few studies have examined the association of mobile technology ownership with children’s sedentary media use and BMI, as well as the role of parental limit setting in reducing media use. The goal of this research is to examine predictors of children’s BMI percentile including sedentary media time and parental limit setting.

**Methods:** Parents and children (ages 9-12) provided descriptive and demographic information and completed validated questionnaires assessing self-report of sedentary media time and parent report of monitoring child’s media use. Height and weight were objectively measured by trained staff. Linear regression models were used to determine associations between parenting practices and children’s sedentary media time, as well as children’s sedentary time and their BMI percentile.

**Results:** Parents (n=29, 42±6 years, BMI 31.1+8.8 kg/m2, 100% owned >1 mobile device) spent an average of 3.6±2.6 hours on weekdays engaged with sedentary media. Children (n=29, 10±1 years, BMI 74.7±28.8 percentile, 93% owned >1 mobile device) spent an average of 2.9±3.0 hours on weekdays using sedentary media. Children’s use of social media was high, where 67% had an account on YouTube, 29% on Instagram, 14% on Pinterest. Regression models showed that parental media limit setting scores were associated with lower child sedentary media use during the week (b=1.35, p=0.01), but not on the weekend. Additionally, higher child sedentary media time on weekdays was associated with higher child BMI percentile (b=3.64, p=0.04).

**Conclusions:** Parent rules about media usage are associated with lower sedentary media time, and child sedentary time is associated with greater BMI percentile. Future research is needed to better understand how best to use mobile technology to decrease sedentary media use, as well as to support active media time (e.g., physical activity apps).

**T-P-3711**

**Parental Education and Perception of Outdoor Play Time in Preschool Children**

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**Background:** The purpose of this study was to assess the parents’ reported preschool children play outdoor both, during the week days (WK) and at weekend (WEND), as well as to examine the associations with socioeconomic position.

**Methods:** The sample consisted on 485 (girls; n=223) healthy preschool children, aged 3 to 6 years recruited from kindergartens located in the metropolitan area of Porto, Portugal. Physical Activity (PA) was assessed for 7 consecutive days by accelerometer. The time playing outdoors, during WK or WEND, was derived from parental report. Anthropometric data (weight and height) was collected following standardized protocols. Socioeconomic position was assessed by Parental Education (PE), according to the Portuguese education system.

**Results:** On average, there was a tendency for differences on time spent playing outdoor either WK or WEND but not for Total PA (TPA) in both genders. However, regression analysis showed that after adjustment for age, BMI and TPA in both sexes the associations were significantly established only between low PE (LPE) and high PE (HPE) group either at WK or WEND. However, no statistically significant association was found for boys at WK (p=0.06).

**Conclusions:** Our findings suggested that SES may influence children’s time in outdoor play activities especially at weekend. This may have implications for future interventions with this age group.

**T-P-3712-DT**

**Predictors and Grade Level Trends of School Day Physical Activity Achievement in at-risk Children in the U.S.**

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**Background:** Achievement of optimal levels of school moderate-to-vigorous physical activity (MVPA) is paramount to decrease risk of chronic disease in children from low-income families. The purpose of this study was to examine the predictors and grade-level trends of school day MVPA achievement in at-risk children.

**Methods:** Data were collected during Fall Semester 2014 and analyzed on 1,232 children (Mean age = 8.83 ± 1.64 years; 625 girls, 607 boys; 60% Hispanic) recruited from three “Title I” schools from the Mountain West region of the U.S. Children
wore pedometers for one week and a stratified random subsample (n = 533) also wore accelerometers to record sedentary behaviors and MVPA. Generalized linear mixed models were employed to calculate odds ratios (ORs) for achieving school day MVPA standards (≥ 30 min/day) from various predictors and to determine odds of achievement across grade levels, accounting for school and classroom clustering.

**Results:** Odds of meeting daily MVPA standards were 3.02 times greater if a student achieved at least 6,000 steps during the school day (p < 0.01), and were 55.08% lower for every 1% increase of total time spent in sedentary behavior (p < 0.001). There were also 26.01% lower odds meeting the daily standard for MVPA and 18% lower odds of meeting age and sex specific standards for BMI in cohorts separated by one older grade level (p < 0.01). A significant proportion of MVPA variance was also explained by classroom and school affiliation (Rho = 0.09 to 0.54, p < 0.001). There were also 0.08% lower odds meeting the daily standard for MVPA and 18% lower odds of meeting age and sex specific standards for BMI in cohorts separated by one older grade level (p < 0.01). A significant proportion of MVPA variance was also explained by classroom and school affiliation (Rho = 0.09 to 0.54, p < 0.001).

**Conclusions:** Daily steps, sedentary behaviors, grade level, and classroom and school affiliation associate with school MVPA achievement in at-risk children.

**T-P-3713-DT**

**Profiles of Motivational Strategies Used by Professionals to Promote Exercise Behaviors**

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**Background:** Behavior change research in obesity and exercise has focused largely on patients, less so on health professionals. However, exploring professionals' work motivation and how it influences their practices is also relevant. For instance, need-supportive(NS) and controlling(CONT) practices have shown differential effects on patient’s motivation and behavior change. This study explore motivational profiles and related practices from the professional standpoint.

**Methods:** Four profiles were created based on the use of NS (autonomy-support, structure, involvement) vs. CONT (negative conditional regard, intimidation, personal control, judging, excessive use of rewards) in 365 exercise professionals (172 female, experience=7.1±6.3 y): high quality (HQL, high NS, low CONT,n=85); low quality (LQL, low NS, high CONT, n=93); high quantity (HQT, high NS, high CONT, n=98); low quantity (LQT, Low NS, low CONT,n=90). Differences among profiles in their motivational antecedents (self-determination (SD), job pressures, need satisfaction vs. frustration at work) and work-related burnout vs. engagement, were assessed using ANOVA with Bonferroni post-hoc comparisons.

**Results:** Compared to LQL, HQL profile presented higher SD, higher need satisfaction (p<0.001), as well as elevated work engagement (p<0.01). Conversely, LQL showed higher perceived job pressures, need frustration and emotional exhaustion (p<0.01). The same pattern of differences was found between HQL and HQT profiles (favoring HQT,ps<0.05). Comparison between LQL and LQT highlighted differences regarding perceived job pressures, need frustration and emotional exhaustion (higher in LQL,ps<0.05) and SD (higher in LQT,ps<0.001)

**Conclusions:** Professionals relying mostly on NS displayed the best motivational/emotional profiles. Combining both NS and CONT may be detractive rather than contributive for work motivation, engagement, and prevention of burnout. Although much emphasis has been given to promoting NS, diminishing CONT seems comparably important.

**T-P-3714**

**The Association between Executive Cognitive Control and Measures of Physical Fitness and Body Composition among Ethnic Minority Children**

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**Background:** Studies have shown that physical fitness levels, specifically aerobic fitness, in children impact their performance on executive cognitive control tasks. The associations between executive cognitive control and other markers of physical fitness and health-related variables have yet to be examined. Furthermore, no studies have explored gender or ethnic variations in children.

**Methods:** We explored whether executive cognitive control varied by gender in relation to measures of physical fitness and body composition in 212 ethnic minority children (mean age=9.8 years). Participants performed a flanker task to measure executive cognitive control and several physical fitness tests including: two-minute walk, vertical jump, one-minute curl-up, and handgrip strength test. Body composition variables included: body mass index, percent body fat, waist circumference, and sagittal height. A hierarchical multiple regression analysis was used to predict variation in flanker task reaction time by body composition variables, after controlling for age. Analyses were stratified by gender.

**Results:** Gender-stratified models significantly predicted executive cognitive control as measured by flanker task reaction time for both boys (F(10,111)=10.40, p<0.001, R2=0.51) and girls (F(10,99)= 8.26, p<0.001, R2=0.48). Among boys, faster reaction time, indicating greater cognitive control, was associated with increased age (β=−0.01; p<0.001, R2=.36) and smaller waist circumference (β=−5.27; p<0.001, R2=.15). Among girls, faster reaction time was associated with increased age (β=−0.17; p=0.01, R2=.23) and greater distance covered on the two-minute walk (β=−0.17; p=0.01, R2=.15).

**Conclusions:** Our findings indicate that among ethnic minority children, executive cognitive function is positively related to aerobic fitness in girls and negatively related to central fat distribution in boys, independent of other measures of physical fitness or body composition. Future longitudinal research exploring directionality is warranted.

**T-P-3715**

**The Influence of Physical Activity and Race on the Relationship between Obesity, Metabolic Health and Neighborhood Disadvantage in Pre-Pupertal Children**


**Background:** The influence of physical activity and race on the relationship between obesity, metabolic health and
Obesity 2015 Abstract Book
Poster Abstracts Wednesday November 4th to Friday November 6th, 2015

T-P-3717
Adverse Family Experiences during Childhood and Adolescent Obesity

Background: Adverse experiences during childhood have been linked to a wide range of adult morbidity. By measuring the association between adverse family experiences (AFEIs) in childhood and adolescent obesity, we will shed light on how this societal issue is detracting from the health of our children in the pediatric obesity epidemic.

Methods: Cross sectional analysis of data from the 2011-2012 National Survey of Children’s Health, consisting of a nationally representative sample of families from the United States. Weighted estimates representing 31,258,575 children were based on interviews with 42,239 parents. Parent report of 9 psychosocial risk factors that affect children was used to measure AFEIs during childhood. Parent-report of child height and weight was used to calculate adolescent overweight and obesity.

Results: Of children included in the sample, 30.5% have experienced ≥2 AFEIs. The prevalence of obesity among children experiencing ≥2 AFEIs was 20.4%, compared with 15.6% among children with 1 AFE, and 12.5% among those who reported no AFEIs. Adjusted proportional odds logistic regression models controlled for child, parent, household, and neighborhood characteristics. Children ages 10-17 who had ever experienced ≥2 AFEIs in childhood were more likely to be both overweight (AOR 1.8; 95%CI 1.49, 2.16; p <0.001), and obese (AOR 1.8; 95% CI 1.47, 2.17; p<0.001) than those who had never experienced an AFE.

Conclusions: Results from this national sample indicate that adolescents ages 10-17 who are exposed to adverse family experiences in childhood have higher rates of overweight and obesity. These results identify a pattern of potentially modifiable risk factors for childhood obesity, providing a framework for shaping policy and practice to support a resilient generation of children.

T-P-3718-DT
Association between parent dietary, physical activity, and sedentary behavior and child dietary, physical activity, sedentary behavior and weight status in Delhi, India
Blanche Greene-Cramer Austin TX, Melissa Harrell Austin TX, Deanna Hoelscher Austin TX, Nalini Ranjit Austin TX, Shreela Sharma Houston Texas, Monika Arora Gurgaon Haryana,
Background: Childhood obesity has increased dramatically around the world over the last thirty years, particularly in lower and middle income countries (LMICs) like India (Gupta et al., 2012). The etiology of childhood obesity is complex and multifaceted. Research from the West shows us that parents play an important role in creating and shaping adolescents’ eating and physical activity (PA) environments, however this research does not exist for LMICs (Kalakanis et al., 2001; Patrick & Nicklas, 2005; Patrick et al., 2013). This paper examines parent dietary, PA and sedentary behaviors and their association to child weight status and behaviors in Delhi, India.

Methods: The study was cross-sectional by design and collected anthropometric and behavioral-psychosocial measures from 6th and 8th grade children and parents in 6 private schools in Delhi, India. Mixed-effects logistic regression models were used to test for associations between child weight status and parent dietary, physical activity, and sedentary behaviors. Linear regression models were used to test for association between child dietary, physical activity, and sedentary behaviors (ind var) and parent dietary, physical activity, and sedentary behaviors (ind var) while controlling for parent and child demographics.

Results: Parent energy-dense (ED) food and sugar-sweetened beverage (SSB) consumption were significantly associated with child overweight/obesity (ED was negatively associated: OR=0.70, p=0.26; while SSB was positively associated: OR=1.63, p=0.018). All parent dietary behaviors were significantly and positively associated with those behaviors in children. Parent moderate to vigorous exercise was the only physical activity or sedentary behavior significantly associated with child overweight/obesity and that behavior in children (OR=1.18, p=0.011; Beta=0.30, p=0.000).

Conclusions: This study provides evidence that parent dietary behaviors are strong predictors of child dietary behaviors and weight status in Delhi, India.

T-P-3719-DT
Association between parent weight status and child weight status among private school children in Delhi, India

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Background: Studies from western countries suggest that parental weight status is a major risk factor for child and adolescent obesity (Burke, Belin, & Dunbar, 2001; Keane, Layte, Harrington, Kearney, & Perry, 2012; Whitaker et al., 2010). There have been no studies published on the relationship between parent and child/adolescent weight status in India. With rates of adult overweight and obesity rising rapidly in India, it will be important to accurately describe the relation between parent and child weight status in order to identify potential points for prevention and intervention programs.

Methods: The study used cross-sectional data collected from 6th and 8th grade parents in private schools in Delhi, India. Student height and weight were measured using standardized protocols. Parents self-reported height and weight. Child weight status was determined using the WHO 2007 international growth reference and parent weight status was calculated using WHO and Asian-specific cut-points. Mixed-effects logistic regression models were conducted to examine the association between child weight status and parent weight status, adjusting for child demographic factors and child behaviors.

Results: Overall, 29.6% of the children were overweight/obese based on the international growth reference while 77.7% of parents were overweight/obese using Asian-specific cut-points (compared to 58.4% using standard BMI cut-points). Children whose mother was overweight or obese being 1.55 times more likely to be overweight/obese compared to children whose mother was underweight or healthy weight (95% CI: 1.26-1.92). This association was even stronger for boys, who were more than two times more likely to be overweight/obese than if their mother was overweight/obese (OR=2.13, 95% CI: 1.39-3.27).

Conclusions: Parent weight status was found to be the strongest predictor of child weight status, with maternal weight status being more strongly associated with child weight status than paternal weight status, particularly for boys.

T-P-3720
Associations between Modifiable Determinants and Mental Well-Being among Australian Primary School Children

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Background: Early years are critical to future physical and mental well-being. This paper contributes evidence to our understanding of the relationship between diet, physical activity (PA), screen time (ST), sleep and weight status with mental well-being among Australian children.

Methods: Cross-sectional data from 2,561 (50% girls) primary school children (Grades 4 and 6), mean age 11 years, participating in a cluster randomized controlled trial were analysed. Measured anthropometry and self-report behaviors were collected. Data reduction on the dietary items identified healthy and unhealthy diet factors. Linear regression tested relationships between well-being (measured by the PedsQL) and healthy diet tertiles, unhealthy diet tertiles, PA, ST, sleep and weight status (WHO growth standards) while controlling for age, socioeconomic position, language spoken at home, study condition and gender with clustering by locality included to account for study design.

Results: Average PedsQL was 78.8 units (scored 0-100: higher scores indicated better well-being). Compared to low levels of healthy diet, moderate (2.7; p=0.001) and high levels (2.1; p=0.022) were positively associated with well-being. Meeting guidelines for sleep (≥10 hours: 2.2; p=0.003), PA (5-6 days ≥6 hours: 2.9; p=0.003 and 7 days 3.10; p<0.001) and ST (≤6 days 1.8; p=0.028 and 7 days 3.5; p<0.001) were also positively associated with well-being. An inverse association was observed between high levels of an unhealthy diet (-4.3; p<0.001) and overweight/obesity (-3.8; p<0.001) with well-being.

Conclusions: Efforts to build solid foundations from which children can thrive need to be wide-ranging while encompassing multiple determinants simultaneously. Results within this sample suggest that healthy diets need to be encouraged at the expense of diets containing energy dense and nutrient poor foods, that PA needs to take precedence over ST, and that healthy sleep habits be promoted.
T-P-3721

**Associations between Weight Tracking Frequency and Psychosocial Outcomes at 12 Months in a Randomized Behavioral Weight Loss Trial**

Jennifer Linde

**Background:** Some weight control experts argue that frequent body weight tracking may carry adverse psychosocial consequences, yet scant data have been reported on the effects of differential weight tracking frequencies on psychosocial outcomes over time.

**Methods:** 339 adults were randomly assigned to track weight daily, weekly, or never during a 12-month behavioral weight loss program. Participants completed surveys and height/weight measurements at baseline, 6, and 12 months. Depression, anxiety, body image, binge eating, and barriers to weight tracking were assessed at the same time points; participants assigned to weigh reported weight tracking perceptions at 6 and 12 months. Repeated measures models assessed differences over time and by weighing frequency condition.

**Results:** Mean age of participants was 46.5 years; the sample was 65% female. Mean baseline body mass index was 33.0 kg/m², and 4% of the sample reported binge eating symptoms at baseline. Study retention at 12 months was 82%, and participants achieved mean weight loss of 8%. There were no differences in changes in depression, anxiety, body image, or binge eating by weighing frequency condition over time (p=.29-.76). On average, depression and anxiety remained in the low normal range over the intervention. Body image suggested a neutral to slightly unfavorable opinion of physical appearance at baseline but transitioned to a slightly favorable opinion over time (p<.0001). Rates of binge eating had increased marginally by 12 months (p=.07) but the sample rate remained low at 8%. There were no differences by condition in perceptions or barriers scores. Barriers declined significantly by 12 months (p=.0001); perceptions were highly favorable at 6 months and showed a slight decline by 12 months that was statistically significant but not clinically meaningful (p<.001).

**Conclusions:** The study was highly successful at assigning weight self-monitoring at varying frequencies without adverse psychosocial effects.

T-P-3722

**Associations of Emotional Awareness and Temperament with 1-Year Changes of BMI and Fat Mass in Non-Overweight and Overweight Adolescents**

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**Background:** Emotion regulation (ER) and temperament difficulties are associated with young children’s BMI and weight problems. Adolescence is a critical developmental period for emotional and physical growth. Yet, it is unclear if ER and temperament are prospective predictors of weight or fat change during adolescence.

**Methods:** We studied 70 healthy adolescents (13-17y; 81% female) who were overweight (57% BMI≥85th%ile) or normal-weight (43%) over a 1-year period. At baseline, teens completed the Difficulties in Emotion Regulation Scale (DERS; 6 subscales) to assess ER strategies. Parents described adolescents’ temperament on the Early Adolescent Temperament Questionnaire (EAT-Q; 12 subscales). At baseline and a 1-year follow-up, fasting weight and height were measured to calculate BMI. Body composition was assessed by air displacement plethysmography. Multiple regressions were used to examine the relationships of ER and temperament dimensions with change in BMI and fat mass, controlling for baseline BMI or fat mass, puberty, age, height, sex, and race. Overweight status was evaluated as a moderator.

**Results:** Adjusting for all covariates, neither ER nor temperament were significantly associated with adolescents’ changes in BMI or fat mass (p=.09-.91). However, overweight status was a significant moderator (p=.02) of the relationship between ER-emotional awareness and changes in fat mass. Only among non-overweight adolescents, difficulties in emotional awareness were related to greater increases in fat mass 1-year later (β=2.5, SE=.75, p<.01). The weight status by temperament interactions were non-significant (p>.05).

**Conclusions:** Emotional regulation difficulties may be associated with greater adiposity gain during adolescence in non-overweight teens, whereas temperament characteristics were unrelated to adiposity gain during adolescence. Future studies are required to elucidate the potential mechanisms that explain this emotional-cognitive factor’s potential impact on adiposity during adolescence.

T-P-3723

**Associations of Perceived Social Support with Risk Factors for Postpartum Weight Retention**

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**Background:** Psychological and behavioral risk factors contribute to post-partum weight retention (PPWR). Modifiable determinants of these risk factors are unclear. The aim of the current study was to examine associations of partner and friend/family social support with these risk factors.

**Methods:** 1356 women in Project Viva provided self-reported data at 6 months postpartum on demonstrated risk factors for PPWR: walking, moderate and vigorous physical activity (PA), TV viewing, sleeping, fiber and trans-fat intake, and depressive symptoms. Using logistic regression adjusted for maternal race/ethnicity, socio-demographics and pre-pregnancy BMI, we examined the independent cross-sectional associations of partner and family/friend support with each risk factor, dichotomized according to previous analyses.

**Results:** Mean partner support was 12.8 (SD 2.3) and family/friend was 12.9 (SD 2.5). 56% of the women walked ≥30 min/d and 40% engaged in moderate PA. 88% slept ≥6 h/d, 67% watched TV <2 h/d and 6.4% reported incident depression. Each 5-point increment in partner support was associated with higher odds of walking ≥30 min/d (OR 1.36; 95% CI 1.01, 1.82), consuming

**Conclusions:** Perceived social support was directly associated with higher levels of walking, moderate PA, and fiber intake and less intake of trans-fat, TV viewing, and depression. Enhanced social support may contribute to obesity prevention efforts with new mothers.
T-P-3724
Child and Parental Perspectives on Health Promotion and Childhood Obesity Prevention in Beijing and Nanjing, China
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Background: Obesity has become a global epidemic. In China, 1/3 of adults and 1/6 of children are overweight or obese, with the rate in boys about two times that of girls. In major cities, about 1/3 of boys are overweight or obese. This study aimed to understand how children and parents in China make eating and physical activity (E&PA) decisions, considering individual, family, community, social and environmental factors.

Methods: Children (n=41, aged 10-15y) and their parents (n=41) participated in 8 semi-structured focus groups (FG) in Beijing (in North China) and Nanjing (in South China). Each site conducted 2 FGs with children and 2 FGs with parents. FGs in Chinese were audiorecorded and translated into English for coding. A framework analysis was conducted with NVivo qualitative analysis software.

Results: Three main themes related to E&PA behaviors and related school service were identified: limited PA time due to over-emphasis on academic performance, unhealthy snacks, and inconsistent standards (i.e., quality and quantity) of school lunch service within and across schools. Most students reported enjoying PA but spend little time in organized sports or playing outside, due to heavy study burden. Children favored high-calorie snacks including chips, fried food and sugary drinks over fruits or vegetables. Students and parents’ perceptions toward school lunch service varied significantly and between schools, in terms of price, quality, nutritious options, taste, and program transparency. The unbalanced school lunch service often lead to child overeating of dinner. Parents made recommendations for improving school food service and increasing physical activity during and after school.

Conclusions: Our findings will help develop family-targeted, school-based health promotion interventions. Intervention framing must consider the unique Chinese social, cultural and economic context and parent-child differences.

T-P-3725
Children's Genetic Risk for Obesity Evokes Parental Feeding Behavior: Evidence for Ene-Environment Correlation

Background: Parental feeding behaviors (restriction/pressure) are widely assumed to have a causal influence on a child’s weight; however, interest has grown in the idea that the child’s weight may also ‘elicit’ feeding behaviors in the parents. Longitudinal data support this interpretation but cannot definitely identify causation. A novel approach is to examine associations between the child’s genetic risk for obesity and parental feeding behaviors (gene-environment correlation).

Methods: Data were from the Twins Early Development Study. Polygenic risk scores (PRS) were created for 3154 unrelated children by summing 28 common obesity SNPs weighted for their effects on BMI from a meta-analysis. Parental ‘pressure’ and ‘restriction’ were assessed using the Child Feeding Questionnaire when children were 10 years old. Child BMI standard deviation scores (BMI SDS) were calculated from parent-reported height and weight at 10 years using UK 1990 reference data. Correlations and polynomial contrasts tested associations between the PRS and parental feeding behaviors.

Results: The number of obesity risk alleles ranged from 11-32 (mean=21.4; sd=2.88) and, as expected, the PRS was correlated with BMI SDS (r=0.169, p<0.001). Consistent with the gene-environment correlation hypothesis, child PRS was significantly positively associated with parental ‘restriction’ (r=0.069, p=0.001) and negatively associated with ‘pressure’ (r=-0.094, p<0.001). Effects were linear across the PRS distribution (p<0.05).

Conclusions: Results suggest an evocative gene-environment correlation, whereby heritable characteristics in the child ‘elicit’ parental behavior. This finding suggests that part of the observed association between children’s BMI and parental feeding style is due to parents responding to genetically determined characteristics of their child.

T-P-3726
Combination of Weight and Stress are Associated with Abundances of Gut Microbes
Tiffany Carson, Birmingham Alabama, Bradford Jackson, Birmingham Al, Ranjit Kumar, Birmingham Alabama, Elliot Lefkowitz, Birmingham AL, Casey Morrow, Birmingham Alabama, Monica Baskin, Birmingham Alabama

Background: While the gut microbiota is associated with obesity, many additional factors are also thought to influence gut microbial composition including diet and stress. The extent to which each of these factors collectively influence the gut microbiota remains unclear. The purpose of this study was to evaluate the effects of weight status and stress on gut microbial composition among generally healthy black and white women.

Methods: Participants completed demographic surveys, anthropometric measures, and provided self-collected stool samples for analysis of gut microbiota. Stress was measured using validated survey instruments. Participants were classified into four categories based on combining stress level (low vs. high) and obesity classification (non-obese vs. obese; BMI ≥30). Fecal DNA was collected and isolated from a wipe. Microbiome analysis was performed using MiSeq DNA sequencing targeting the V4 region of the rRNA gene; bioinformatics used QIIME. Relative Ratios (RR) of taxa abundance were estimated using linear models adjusting for race and age.

Results: Participants were 104 overweight/obese women (58 black, 46 white). Mean age and BMI of participants were 39.6 years and 31.0 kg/m², respectively. No differences were observed for gut microbial diversity (p=0.12) or overall microbial composition (p=0.57) when comparing obesity-stress groups. However, we observed statistically significant (p<0.05) obesity-stress interactions after adjusting for race and age, for taxa abundance of Fusobacterium, Clostridium, Lactobacillus, Porphyromonas, and Succinivibria.

Conclusions: Our findings suggest that stress may affect the abundances of gut microbes differently in obese and non-obese individuals. The heterogeneity of these effects should be further explored by longitudinal examinations in future stress management and obesity interventions.

T-P-3727
Competitive Use of Social Norms to Influence Weight Loss
Cynthia Graff Costa Mesa California, Peter Vash Los Angeles California

**Background:** Numerous studies demonstrate that social norms of populations play an important role in the promotion of healthy behavior. Individuals who perceive their overweight social contacts as trying to lose weight will themselves have greater weight loss intentions. The social norms of a population can create positive change through standardizing valued attitudes and behaviors within a group. Weight loss interventions may be more successful when they increase the perception of the value of weight control among workers’ close contacts. Thus, weight loss behavior could be positively influenced by those social norms that dictate and motivate workers to adopt healthier eating habits.

**Methods:** A weight loss contest was designed to motivate obese law enforcement personnel to lose weight in the “Battle of the Badges” competition. This intervention used Lindora’s Lean for Life program: a 10-week calorie restricted, low-fat, moderate carbohydrate diet, promoting weight loss behavior and cognitive change. Nutrition education, behavioral change, and non-food related coping skills were also provided to all participants during their 3-5 clinic visits per week. The weight loss results and other biological parameters among these groups were evaluated.

**Results:** A total of 77 participants, with an average BMI of 37, started the program. 99% of participants lost 5% or more of their beginning body weight, 84% lost 10% or more and 29% lost 15% or more. An average weight loss of 13% (average of 33 lbs each) was achieved with an average BMI reduction of 5 units. Triglycerides were reduced by 65 mg/dL, LDL reduced by 23 mg/dL, total cholesterol reduced by 39 mg/dL, HgbA1C reduced by 0.3%, and there was a 12 point drop in systolic BP, and a 5 point drop in diastolic BP.

**Conclusions:** Use of competitive pressures derived from social norms that promote and value weight loss behaviors among obese co-workers can produce enhanced weight losses. This concept could be used in workplace settings to help obese workers lose weight.

T-P-3728
Correlation Between Parenting Style and Family Environment in Obese and Overweight Children from South Italy
Teresa Buccheri Messina Italy

**Background:** Parenting is a combination of activities, behaviors and processes that work individually and together to mold child outcomes. Parents are models for children; they basically shape their children into adults through their world of influence. Parenting style may affect family environment. In particular authoritative parenting style tends to produce better environmental family contexts, while authoritarian and permissive parenting styles are associated with dysfunctional contexts. The purpose of the correlational research was to determine the relation between parenting style and family environment in obese and overweight children from South Italy (Sicily).

**Methods:** Participants included 52 families: 32 obese and overweight children aged between 5 and 11 years old (8.59 ± 1.86), 20 normal weight children aged between 5 and 11 years old (7.80 ± 2.14) and their parents (47 mothers and 30 fathers) aged between 22 and 54 years old (39.7 ± 6.18). Measures were: The Family Nutrition and Physical Activity Screening Tool to provide a comprehensive evaluation of family environment examining multiple domains such as family diet, physical activity, screen time, sleep, and family schedule; Parenting Styles and Dimensions Questionnaire (PSDQ) to assess specific constructs of parenting. Data were compared with non-parametric Kendall tau correlation coefficient by using SPSS.

**Results:** The study showed a positive correlation between authoritative parenting style and family environment and a negative correlation between authoritarian parenting style and family environment (τ - .264 p < 0.01; τ .226 p < 0.05).

**Conclusions:** The authoritarian parenting style characterized by control, inflexibility, poor communication and detachment towards their children would seem to be associated with a dysfunctional environment (obesogenic environment). The authoritative parenting style characterized by the balance between rules and affection correlates with more adaptive social outcomes.

T-P-3729
Determining the Self-esteem in Obese Patients Attending Outpatient of General Hospital Area Family Medicine Unit No. 8 Dr. Gilberto Flores Izquierdo Mexican Institute of Social Security

**Background:** Obesity can have physical or psychological consequences, within these last, we have emotional distress, loss of self-esteem and high levels of anxiety and depression. However, it is not well established whether obesity participates in the detriment of self-esteem. We investigated the level of self-esteem in obese adult patients attending the outpatient General Hospital Area Family Medicine Unit No 8 in the Federal District.

**Methods:** Cross-sectional descriptive study. Inclusion criteria: age greater than 18 years, Mexican Institute of Social Security obese patients, regardless of gender or occupation. Sample: 234 patients, confidence interval: 90%. Instrument: Coopersmith Self-Esteem Inventory (for adults). All obese patients were determined the level of self-esteem by Coopersmith Self-Esteem Inventory. It was analyzed self-esteem levels according to gender, age, education, occupation, type of obesity and marital status in these patients.

**Results:** Obese adults had high average levels of self-esteem, it was obtained that the women had high self-esteem compared with men. Also, the school and marital status were directly related to higher levels of self-esteem. Nevertheless, the fourth decade of life showed low self-esteem, similarly these low levels it were observed with obese patients unemployed and patients with obesity class I.

**Conclusions:** Our results show the first evidence indicating positive levels of self-esteem in obese adults attending the outpatient HGZ / UMF No. 8. Furthermore, it was shown that levels of self-esteem may increase or decrease in obese patients depending on some factors including gender, age, education, occupation, type of obesity or marital status.
T-P.3730
Does Physical Activity Self-Efficacy Mediate the Relationship between Family Environment and Fitness in Overweight and Obese Adolescents?
Nora Nock, Carolyn Ievers-Landis, Darryl Knight, Sumana Narasimhan, Alexander Rigda
Cleveland Ohio, Naveen Uli

Background: Very little is known about how dimensions of the family environment might affect fitness levels in overweight and obese adolescents and whether this putative relationship is mediated by physical activity self-efficacy.

Methods: We evaluated the potential associations between three domains (cohesion, expressiveness, conflict) of the Family Environment Scale (FES) and fitness using recovery heart rate (RHR) from a 3-minute submaximal (YMCA) step test in 339 overweight or obese adolescents seeking weight loss treatment. We also explored potential associations between physical activity self-efficacy (PACE) and RHR and between FES domains and PACE. Further, we examined the potential mediation of the putative relationship between FES domains and RHR by PACE.

Results: We found that FES cohesion scores were associated with RHR (β=1.34, s.e.=0.67; p=0.04) when adjusted for age, gender, race, BMI, parental education and income, which suggests lower cohesion in the family environment is associated with lower fitness. In addition, we found that PACE scores were marginally associated with RHR (p=0.08) and that FES cohesion scores were associated with PACE scores (p=0.07) in adjusted models. Additional formal mediation analyses using FES and PACE scores as well as latent variable structural equation modeling (SEM) are underway and will be presented.

Conclusions: Our preliminary results suggest that lower cohesion in the family environment contributes to lower physical activity self-efficacy and lower fitness as measured by RHR.

T-P.3731
Emotion Regulation Outcomes are not Universal: An Investigation of Racial Differences in Emotional Eating Across Weight Status
Kate Krautbauer, Ypsilanti Michigan, Ashley Wiedemann, Ypsilanti Michigan, Tamara Loverich, Ypsilanti Michigan

Background: Recent research suggests that difficulties in emotion regulation contribute to patterns of overeating. Little is known about the relationships among race, overweight status, and eating related emotion regulation strategies.

Methods: Undergraduate students (n=857) competed an online survey including self-reported height and weight, emotional eating (Emotional Eating Scale), weight related experiential avoidance (Acceptance and Action Questionnaire for Weight-Related Problems), and emotion regulation (Emotion Regulation Questionnaire). Two (Weight Status; Normal Weight: NW vs. Overweight: OW) X 2 (Race; White vs Black) ANOVAs were conducted to explore differences in emotional eating and emotion regulation.

Results: Weight-related experiential avoidance differed significantly by race and weight status F (3, 633) = 11.42, p<.001. Post hoc comparisons using the Tukey HSD indicated that the mean scores for the AAQW were significantly different for NW Blacks (M=59.23, SD=2.69) compared to all other groups, while OW status did not differ by race. OW Whites reported greater emotional eating (M=30.90, SD=1.36) when compared to NW Whites (M=26.78, SD=1.17). Blacks reported higher levels of emotion suppression (M=15.65, SD=5.18) when compared to Whites (M=14.56, SD=4.77). No other differences in emotion regulation were found by weight status.

Conclusions: Findings suggest that racial differences in eating behavior may differ as a function of emotion regulatory strategies. Culturally tailored interventions that take into account differences in emotion regulation may be warranted to more effectively address emotion related eating in African Americans.

T-P.3732
Examining Binge Eating Disorder and Food Addiction in Individuals with Overweight and Obesity
Valentina Ivezaj, New Haven Connecticut, Marney White, New Haven Connecticut

Background: Binge eating disorder (BED) and food addiction (FA) are associated strongly with obesity but the nature and significance of such comorbidity is unclear. Preliminary evidence suggests that treatment-seeking patients with obesity and BED report high frequencies of FA, and the co-occurrence of BED and FA may represent a more disturbed BED subgroup. This study aimed to 1) identify the frequency of BED and FA in a community sample of individuals with overweight and obesity, and 2) to compare clinical characteristics in four subgroups of persons with overweight/obesity: those with BED, those with FA, those with both, and those with neither.

Methods: Participants were 506 individuals who met criteria for overweight/obesity (BMI>25) who completed a web-based survey with established measures of eating and health behaviors. Most were female (n=418; 83.1%) and White (n=408; 81.0%); mean age and BMI were 38.0 (SD=13.1) years and 33.6 (SD=6.9), respectively.

Results: Among the 506 participants with overweight/obesity, 43 (8.5%) had BED, 84 (16.6%) had FA, 51 (10.1%) had both BED+FA, and 328 (64.8%) had neither (Control group). The three groups with eating pathology (BED, FA, and BED+FA) had significantly greater disturbances on all measures (i.e., eating disorder psychopathology, depression, impulsivity, and self-control) than the Control group. The BED and FA groups differed little from each other, except on core features related to each construct. The FA group reported significantly higher depression scores than did the Control (p<.0001) and BED (p=.01) groups. The BED+FA group also reported significantly higher depression scores than the Control (p=.001) group.

Conclusions: In persons with overweight/obesity, over one-third met criteria for BED, FA, or both BED+FA and the presence of these forms of disordered eating was associated with greater pathology. FA and the co-occurrence of FA+BED may signal a more disturbed subgroup in individuals with overweight/obesity.

T-P.3733
Examining Differences in Food Cravings by Smoking Status

Background: Recent research suggests that difficulties in emotion regulation contribute to patterns of overeating. Little is known about the relationships among race, overweight status, and eating related emotion regulation strategies.

Methods: Undergraduate students (n=857) competed an online survey including self-reported height and weight, emotional eating (Emotional Eating Scale), weight related experiential avoidance (Acceptance and Action Questionnaire for Weight-Related Problems), and emotion regulation (Emotion Regulation Questionnaire). Two (Weight Status; Normal Weight: NW vs. Overweight: OW) X 2 (Race; White vs Black) ANOVAs were conducted to explore differences in emotional eating and emotion regulation.

Results: Weight-related experiential avoidance differed significantly by race and weight status F (3, 633) = 11.42, p<.001. Post hoc comparisons using the Tukey HSD indicated that the mean scores for the AAQW were significantly different for NW Blacks (M=59.23, SD=2.69) compared to all other groups, while OW status did not differ by race. OW Whites reported greater emotional eating (M=30.90, SD=1.36) when compared to NW Whites (M=26.78, SD=1.17). Blacks reported higher levels of emotion suppression (M=15.65, SD=5.18) when compared to Whites (M=14.56, SD=4.77). No other differences in emotion regulation were found by weight status.

Conclusions: Findings suggest that racial differences in eating behavior may differ as a function of emotion regulatory strategies. Culturally tailored interventions that take into account differences in emotion regulation may be warranted to more effectively address emotion related eating in African Americans.
**Background:** Weight gain is frequently reported when people quit smoking and concern of weight gain is a common deterrent to smoking cessation. Despite evidence that food cravings may increase consumption of craved foods, little is known about food cravings among smokers. The purpose of this study is to examine food cravings by smoking status and weight in adults.

**Methods:** Data were from 712 community volunteers (mean age=29.7±9.1 years; mean BMI=27.3±5.5 kg/m²; 54.8% female; 70% white) participating in a cross-sectional study on stress, self-control, and addiction. Participants completed a comprehensive assessment battery including the Food Craving Inventory, Fagerstrom Test for Nicotine Dependence, and questions about smoking history. Heights and weights were measured. We analyzed data using general linear models.

**Results:** Twenty-three percent of participants were former smokers and 24.3% were current smokers. The main effects model demonstrated that current smokers reported higher food cravings than never or former smokers, and individuals with a higher BMI reported higher food cravings. Current smokers reported significantly more cravings for high fats, carbohydrates/starches, and fast-food fats than former or never smokers. Smokers with higher levels of nicotine dependence demonstrated significantly higher general food cravings, and cravings for high fats, sweets, and carbohydrates/starches were higher for current smokers than for former or never smokers. There were no observed differences between school grades, weight status, and contact with people having excess weight.

**Conclusions:** These results demonstrate the association between food cravings and cigarette smoking and suggest potential shared mechanisms. Addressing food cravings may be important to help prevent weight gain during smoking cessation and there may be greater difficulties in reducing weight and changing eating habits among smokers.

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**T-P-3735**

**Fat phobia among nutrition college students in México**

Arturo Jimenez-Cruz Tijuana Not Listed or Not Applicable, Montserrat Bacardi-Gascón Tijuana Baja California, Octelina Castillo-Ruiz Reynosa Tamaulipas, Juan Marcos Leon-Gonzalez Tijuana Baja California, Vidalma Bezarres-Sarmiento Tijuana Baja California, Sheryl Rifas-Shiman Amherst Massachusetts, Guelph ON, Juan Marcos Leon-Gonzalez Tijuana Baja California, Vidalma Bezarres-Sarmiento Tijuana Baja California, Juan Marcos Leon-Gonzalez Tijuana Baja California

**Background:** Despite the high prevalence of obesity and abdominal obesity in México, a recent study among medical and psychology students reported a high frequency of fat phobia. Nutritionists play a major role in the prevention and treatment of obesity. The aim of this study was to assess the fat phobia among nutrition college students from two schools in different regions of Mexico.

**Methods:** Six hundred thirty-four, 18 to 25 yo nutrition students enrolled at the Autonomous University of Tamaulipas (north) and the Science and Arts University of Chiapas (south). Weight, height and waist circumference were evaluated from first to fourth grade students. Fat phobia was assessed using the F-scale, which contains 14 pairs of adjectives that describe people with obesity. Participants responded, on a scale of 1 to 5, which number best describes the adjective their beliefs about people with obesity. Responses were scored according to the criteria established by Bacon et al.

**Results:** Thirty per cent of the participants were overweight or obese and 24% had abdominal obesity. Participants achieved a mean F-scale score of 3.45±0.69. Eighty-eight per cent of students had a negative attitude (≥ 2.5) toward the obese. There were no observed differences between school grades, weight status, and contact with people having excess weight.

**Conclusions:** High prevalence of fat phobia towards obesity was observed. These results are incongruous with the evidence of the multifactorial causes of obesity and the implications of the stigmatization toward people with obesity.

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**T-P-3734**

**Family functioning and quality of parent-adolescent relationship: Cross-sectional associations with adolescent weight-related behaviors and weight status**

Jess Haines, Sheryl Riffas-Shiman Boston MA, Nicholas Horton Amherst Massachusetts, S. Bryn Austin Boston Massachusetts, Alison Field Boston Massachusetts, Matthew Gillman Boston MA

**Background:** The purpose of this study was to examine cross-sectional associations of family functioning and quality of parent-adolescent relationship with adolescent weight status and weight-related behaviors.

**Methods:** We studied 3900 females and 2759 males, 14-24 years old in 2011, participating in the Growing Up Today Study 2. We examined cross-sectional associations of family functioning and quality of parent-adolescent relationship, both mother and father, with adolescent weight status, disordered eating, screen time, physical activity, and intake of fast food, assessed in 2011. We used generalized mixed models to account for intrafamilial clustering; all models adjusted for adolescent age and family structure.

**Results:** Among females, higher family dysfunction was associated with greater odds of disordered eating (adjusted odds ratio [AOR]=1.9; CI=1.6-2.2), not meeting physical activity recommendations of one hour per day (AOR=1.4; CI=1.1-1.6), eating fast food at least once per week (AOR=1.4; CI=1.1-1.6) and being overweight/obese (AOR=1.4; CI=1.1-1.6). Among males, higher family dysfunction was associated with greater odds of disordered eating (AOR=2.1; CI=1.7-2.6) and not meeting physical activity recommendations (AOR=1.4; CI=1.1-1.7). Among females, higher quality parent-adolescent relationship was associated with lower odds of disordered eating, not meeting physical activity recommendations, and eating fast food; the magnitude of associations were similar for mother and father relationship quality (AORs range from 0.6 – 0.8). Among males, higher quality father-adolescent relationship was more consistently associated with lower odds of being overweight/obese and engaging in unhealthful behaviors than mother-relationship quality.

**Conclusions:** Our results suggest that family functioning and parent-adolescent relationship quality are associated with adolescents’ weight-related behaviors and weight status and that the nature of these associations differs by adolescent gender.

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**T-P-3736**

**Gender Differences in Binge Eating and Compensatory Behaviors Among College Students**

Erin Lenz Storrs Connecticut, Mary Bughbee Storrs CT, Deborah Cormann Storrs CT, Amy Gorin Storrs CT

**Background:** Weight gain is common during the first year of college, and efforts to prevent or reverse weight gain may fuel unhealthy and ineffective attempts at weight regulation, including binge eating (BE) and/or compensatory behaviors (CB). The present study examined the prevalence of binge eating and CB reported among college students and whether these maladaptive health behaviors varied by gender.
Conclusions: Adoptive Mothers' sense of responsibility predicted the promotion of healthy behaviors associated with children's BMI. Adoptive Mothers' reported on their children's weight (concern and sense of responsibility), and conscious promotion of healthy behaviors (e.g., regulation of screen time, healthy food choices, regular meal times). Adoptive Mothers' reports were used to compute their BMIs and their children's BMI percentiles.

Results: Path analysis assessed the joint effects of genetic influences and Adoptive Mothers' practices on children's BMI. Only Birth Mothers' BMI (β=−0.19) and Adoptive Mothers' promotion of healthy behaviors (β=−0.15) were directly associated with children's BMI. Adoptive Mothers' sense of responsibility predicted the promotion of healthy behaviors (β=0.23). However, Adoptive Mothers with higher BMIs expressed less responsibility for their children's weight (β=−0.19) and were less likely to encourage healthy behaviors (β=−0.18).

Conclusions: Results indicate independent genetic and environmental influences on children's BMI, and underscore the indirect impact of the rearing parent's BMI on child BMI outcomes. Implications for obesity prevention will be discussed.


**Background:** The aim of this study is to identify factors affecting mothers' misperception and to assess the role of mothers’ misperception (in terms of perception as normal of an overweight/obese child) in implementing actions changing kids' weight.

**Methods:** International study investigated non-traditional factors promoting obesity in children from ten countries (Mexico, Argentina, Chile, Brazil, Italy, Germany, France, United Kingdom, Georgia and India). Children were measured and weighted and Body Mass Index (BMI) was classified according to World Health Organization (WHO) standards. Mother’s perception of children weight status was assessed using a projective test asking them what figure best represents their kids’ body size. Family’s socio-demographic characteristics and children habits were investigated by administering a validated questionnaire.

**Results:** A sample of 2720 kids were enrolled in the study, among overweight and obese ones, 89% and 52%, respectively, were classified as normal weight by their mothers. Odds Ratio (OR) of mothers’ misperception of overweight/obese children was significant higher for: parents with higher BMI, children who reached higher IBAI score and high family’s economic status. Additionally, overweight/obese children who are perceived as normal weight by their mothers are significant less likely to be involved in a program reducing weight (OR 0.29 95% C.I. 0.19-0.44).

**Conclusions:** Our findings suggest that the planning of public health policies should primarily concentrate in make parents aware of their children weight status in order to improve the effectiveness of these interventions.

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**T-P.3742**

**How Can What You Say as Parent Influence Whether Your Daughter Becomes Happily Slim by Design?**

Anna-Leena Vuorinen Ithaca New York, Brian Wansink Ithaca NY

**Background:** Guidance and comments on one's eating and appearance received in childhood may have long-term effects on self-image and health behavior in general.

**Methods:** Slim by Design registry was built for the purposes of studying characteristics and behaviours of people who do not have excess weight and never gained weight in the first place. Data from 168 registry members (72% female, age: 39 years, BMI: 21.7 kg/m2) were used to analyse whether parents’ comments on weight and eating were associated with health behaviour of registry members. Questions used in the analyses were: ‘Did your parents ever comment on you being overweight’, ‘Did your parents ever comment on you being overweight’, ‘Did your parents ever comment on you eating too little of certain foods’, ‘Did your parents ever comment on you eating too little of certain foods’. 86% never received negative comments i.e. being overweight or eating too much. Participants whose parents never gave negative comments were older when they became aware of their weight (44% vs 24% were 15 years or older, p=.014), less likely to feel guilty after overeating (16% vs. 44%, p<.001), weighed themselves less frequently (37% vs 19% weighed on the yearly basis) and bigger proportion of them responded never being on diet (58% vs. 33%, p=.002) However, these participants had lower BMI than their counterparts (84% vs. 59% had BMI below 23).

**Conclusions:** Our results suggest that parents’ negative comments on eating and appearance may be associated with more restricted health behavior and higher BMI in adulthood.

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**T-P.3743**

**Indications of Increasing Social Rejection Related to Weight Bias**

Theodore Kyle, Diana Thomas Montclair NJ, Andrada Ivanescu Montclair NJ, Joseph Nadglowski Tampa Florida, Rebecca Puhl Hartford CT

**Background:** Bias and stigma are well-established barriers to improving public and personal health. Bias against people with obesity has been reported to have worsened as the prevalence of obesity has increased. The present study measured changes in public attitudes about obesity and people with obesity over time.

**Methods:** Consecutive samples totaling 73,009 U.S. adults completed a series of anonymous, voluntary online surveys between Feb 2013 and Apr 2015. Respondents completed self-report measures assessing perceptions of obesity. Beginning in October 2014, measures of blame for obesity, social distance from people with obesity, and fat phobia (explicit weight bias) were also collected. Descriptive statistics were calculated and analyzed to identify significant trends.

**Results:** Explicit weight bias as measured by the Fat Phobia Scale was unchanged between Oct 2014 and Apr 2015 at a moderately high mean value of 3.6 on a 5-point scale. Social acceptance of employees, teachers, or family members with
obesity decreased in the same period. Between Feb 2013 and Mar 2015, public perceptions of obesity as a "personal problem of bad choices" declined modestly.

**Conclusions:** These data suggest that the public increasingly understands that obesity is more than a simple problem of personal responsibility. But that understanding is not translating into improved social acceptance for people with obesity. Social acceptance of obesity in education, employment, and family relations may be declining. Continued monitoring of public attitudes is essential to determine how these trends will evolve. Weight bias remains a significant source of harm to people living with obesity and a significant impediment to progress in reducing the obesity's adverse effects.

T-P-3744
**Indirect Effects of Negative Urgency on BMI: The Role of Food Addiction and Alcohol Consumption**
Karen Saules Ypsilanti Michigan, Pelin Catak YPSILANTI Michigan (MI), Meagan Carr Ypsilanti Michigan

**Background:** The relationship between impulsivity and excessive behaviors (e.g., substance abuse, overeating) is well documented, but the mechanistic pathways underlying these associations are not well understood. Towards this end, researchers have begun to adopt a more multidimensional view of impulsivity as a construct that includes five dimensions (Cyders et al., 2007; Whiteside & Lyam, 20201: Positive Urgency (PU), Negative Urgency (NU), Lack of Premeditation, Lack of Perseverance, and Sensation Seeking. Urgency refers to the tendency to respond rashly when experiencing emotions, either positive or negative. Recently, Murphy et al. (2014) demonstrated that the association between NU and BMI is mediated by “food addiction (FA),” a relatively new construct capturing parallels between a type of excessive eating and addictive behaviors, more generally.

Because NU has been associated with a number of addictive behaviors, we expanded on Murphy et al. by considering the possibility that the path from NU to increased BMI could be mediated by more than one type of addictive behavior.

**Methods:** Using online survey data from a convenience sample of 532 college students (Mean age = 21.1 yrs, 71% female, 63.5% Caucasian), we explored the relationships between UPPS impulsivity dimensions, food addiction (Gearhardt et al., 2009), alcohol consumption (average drinks per day * number of drinking days = drinks per month), and BMI.

**Results:** The sample had a mean BMI of 25.5, consumed a mean of 37.5 drinks per month, and had a mean of 1.7 FA symptoms, with 10% meeting full FA criteria. In a combined regression model, using the bootstrapping approach (Preacher & Hayes, 2004), the indirect effects of NU on BMI were significant for paths mediated by both Food Addiction and Alcohol Intake, but the direct path from NU to BMI was not significant.

**Conclusions:** Results suggest that NU may drive different addictive behaviors that lead to increased BMI, and NU may be a worthy target of obesity prevention efforts.

T-P-3745-DT
**Is parental stress associated with obesity in their offspring? Findings from the Study of Latino Youth (SOL Youth)**

**Background:** Chronic stress is associated with obesity in adults but whether parental/caregiver stress is associated with obesity in their offspring has not been widely examined. Furthermore, there is scarce information about the role of parental/caregiver stress on child weight status in Hispanic/Latino populations.

**Methods:** The study included a sample of Hispanic/Latino children and their caregivers (N=473) from the SOL Youth study, a multicenter study that enrolled children aged 8-16 from four cities (Bronx, Chicago, Miami, and San Diego). Half of the children were girls, 55% were ≤ 12 years old, and 73% were born within the 50 US states. Child overweight (BMI >85th-94th age-, sex-specific percentile) and obesity (BMI >95th) were defined following CDC guidelines.

Parental/caregiver chronic stress was assessed by the Chronic Stress Burden Scale, an 8-item measure of ongoing stressors in important life domains (e.g., work, relationship) lasting > 6 months. The odds ratio (OR) for the association between parental/caregiver stress and child obesity was adjusted for child age, sex, place of birth, and field center.

**Results:** Twenty-two percent of children were overweight and 28% were obese. Twenty percent of parents did not report any chronic stressors, 48% reported 1-2, and 29% reported ≥3 stressors. The prevalence of obesity in the child increased with number of parental stressors from 20% among those without parental stressors to 34% among those with ≥3 stressors. After model adjustment, children whose parents reported ≥3 stressors were twice as likely to be obese than children whose parents reported no stressors (OR=2.13; 95% CI 1.2-3.9). Parental/caregiver stress was not associated with their child being overweight.

**Conclusions:** These findings suggest that parental/caregiver chronic stress is related to obesity in their offspring. Obesity prevention and treatment interventions may need to address parental/caregiver psychosocial stress to improve outcomes.

T-P-3746
**Longitudinal Impact of Weight Misperception and Intent to Change Weight on BMI of Adolescents and Young Adults With Overweight or Obesity**
Diana Rancourt Tampa Florida, Ida Thurston Memphis Tennessee, Kendrin Sonneville Ann Arbor MI, Carly Milliren Boston MA, Tracy Richmond Boston MA

**Background:** Accurate self-perception of overweight/obesity (OW/OB) has both beneficial (e.g., adopting weight control behaviors) and harmful effects (e.g., increased weight gain from adolescence to adulthood; increased depressive symptoms). However, little is known about the interaction of self-perceived weight status and intention to change weight on weight trajectories from adolescence to adulthood.

**Methods:** Using multiple linear regression, intent to change weight (i.e., gain, lose, stay the same) was assessed as an effect modifier of prospective associations (Wave II-Wave IV) between weight perception (i.e., self-perception of OW/OB, healthy, underweight) and change in BMI among 2,737 adolescents with OW/OB (52% female) from the National Longitudinal Study of Adolescent Health. Analyses were
stratified by gender. 
Results: Weight misperception and intention to lose weight were common. Forty-two percent of male and 20% of female youth with OW/OB misperceived their weight as healthy or underweight; 48% of boys and 76% of girls intended to lose weight; and 44% of boys and 24% of girls intended to stay the same weight. In models adjusted for baseline BMI, depression, age, parental education, percent federal poverty level, and race/ethnicity, intention to change weight emerged as a significant effect modifier. Intention to remain the same weight was associated with less weight gain over time among boys who misperceived themselves as healthy weight (β = 1.54; 95% CI = -2.66, -0.42) and boys and girls who misperceived themselves as underweight (boys: β = 2.92; 95% CI = -5.61, -0.24; girls: β = -3.66; 95% CI = -6.51, -0.80). Intention to lose weight did not impact the association between weight perception and weight change for youth of either gender. 
Conclusions: Weight misperception emerged as protective for youth who were not trying to change their weight. Intervention approaches should consider that intention to lose weight may not be integral to the weight trajectories of youth with OW/OB.

T-P-3747
Mothers and Fathers Encourage Girls to Diet Differently, but is It Father Encouragement to Diet That is Associated with Girls’ Use of Unhealthy Weight Control Behaviors
Katherine Balantekin University Park Pennsylvania, Jennifer Savage University Park Pennsylvania, Brandi Rollins University Park Pennsylvania, Leann Birch Athens GA - Georgia

Background: Parental encouragement to diet (EtD) promotes weight gain during adolescence. However, less is known about differences in how mothers and fathers encourage their daughter to diet, and the independent and cumulative influence of these practices on girls’ use of unhealthy weight control behaviors (UWCB).

Methods: Participants were 149 15y non-Hispanic white girls and their parents. Parents completed the Parent Encouragement of Child Weight Loss Scale; girls completed the French Weight Loss Scale; girls’ height/weight measured in triplicate. Latent Class Analysis (LCA) was used to determine patterns of mother and father EtD; regression was used to evaluate independent and cumulative effects of mother and father EtD on girls’ use of UWCB.

Results: LCA revealed that mothers and fathers had distinct patterns of EtD. Mothers with moderate levels of EtD (26% of mothers) talked about and modeled dieting and exercise behaviors, while mothers with high EtD (29%) talked about and modeled dieting and exercise, and put girls on exercise plans. In contrast, fathers with moderate levels of EtD (32% of the fathers) talked about and modeled exercise behaviors, and fathers with high EtD (13%) expressed weight concerns directly to daughters, talked about and modeled dieting and exercise, and put girls on diet and exercise plans. 45% of mothers and 55% of fathers practiced no EtD. Regression analyses revealed that after adjusting for girls’ BMI, only fathers’ use of direct EtD practices (e.g. putting daughter on a diet plan) predicted daughters’ use of UWCB.

Conclusions: Fathers and mothers may encourage girls to diet in different ways; fathers may be more direct, explicitly expressing their weight concerns and putting their daughter on a diet and exercise plan. However, more direct encouragement from fathers may put girls at risk for using UWCB. Fathers who are concerned about their daughter’s weight may need guidance on how to encourage healthy eating and physical activity habits to promote general weight control.

T-P-3748
Obesity as a Disease: Effects on Weight-Biased Attitudes and Beliefs
Rheanna Ata Tampa Florida, J. Kevin Thompson Tampa FL

Background: In June 2013, the American Medical Association (AMA) decided to designate obesity a disease. Proponents predicted the decision would lead to reduced weight-related stigma, whereas opponents predicted designating a third of the population as “diseased” would exacerbate stigma.

Methods: To determine the effects of defining obesity as a disease on explicit and implicit weight-biased attitudes and weight-biased beliefs, female undergraduates were randomly assigned to one of two groups. Participants in the disease group (n = 71) read an article describing obesity as a disease caused by biology and genes; participants in the lifestyle group (n = 75) read an article describing obesity as the result of personal choices, including over-consumption of food and inactivity. Change in beliefs about the controllability of weight was examined as a potential mediator of the relationship between group and explicit weight-biased attitudes; and body mass index (BMI), health orientation, and fitness orientation were examined as potential moderators.

Results: Results revealed a significant interaction between time and group on weight-biased beliefs. Participants in the disease group exhibited stronger beliefs that obesity is outside a person’s control from pre- to post-exposure, whereas participants in the lifestyle group exhibited a weakening in these beliefs. Contrary to hypotheses, change in beliefs about the controllability of weight did not extend to weight-biased attitudes.

Conclusions: Although only time will reveal the natural consequences of the AMA’s decision to designate obesity a disease; awareness is likely insufficient to elicit change in attitudes, particularly implicit attitudes, which are more resistant to change. Obesity is a complex and multi-determined condition; the most effective public health messages may be those that recognize factors both within and outside of a person’s control, thereby simultaneously reducing weight-related stigma and promoting healthier weight-control behaviors.

T-P-3749
Obesity is Related to Poor Academic Performance in College Students
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Background: Obesity has been related to poor academic performance in children and adults, however there are no studies in the college age population. Exercise and healthy diet reduce obesity and we hypothesize that they are related to academic performance. We studied these relationships in college students.

Methods: This is a retrospective analysis of a survey completed by a random sample of college students enrolled at the University of Central Florida in 2014. The survey was part of the American College Health Association-National College
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Health Assessment. A total of 714 students participated. Subjects were 24 ± 7.6 years old and 73% were females. Relationships between variables were assessed with a Spearman Rho correlation or a Pearson’s Chi-square as appropriate. Statistical tests with a p < .05 were considered statistically significant. All statistical analyses were conducted using SPSS 22.0.

Results: A total of 714 students participated. Subjects were 24 ± 7.6 years old and 73% were females with a body mass index (BMI) of 25±5.8 kg/m² (range 13.8-58.5). BMI (calculated by reported weight and height) and self-perceived weight status were inversely correlated with academic performance (Rho = -.11, p = .004; Rho = -.08, p = .04, respectively). These relationships were significant for females (p = .02 and p=.01), but not for males (p=.2 and p=.7). Interestingly in both males and females, neither frequency of physical activity nor consumption of fruits and vegetables was related to academic performance.

Conclusions: Obesity and self-perceived weight status is related to poor academic performance in college students. These relationships are significant only in females, however this may be due to larger female sample size. Surprisingly, healthy lifestyle does not influence academic performance in college students.

T-P-3750
Obesity: Inaccuracy of Weight Categorization among College Students
Mary Bugbee Storrs CT, Erin Lenz Storrs Connecticut, Amy Gorin Storrs CT, Deborah Cormman Storrs CT

Background: People tend to underestimate their own weight, but it is not known whether people can accurately categorize their weight status. This study examined whether college students’ self-reports of weight and height are consistent with how they categorize their weight status and whether reporting patterns differ by gender.

Methods: College students at a large public university (N=2690; 18.67 ± 2.15 years; 58.4% women; 74.1% white) reported their height, weight, and self-categorization of weight status (e.g., underweight, normal weight, slightly overweight). Body Mass Index (BMI) was calculated based on self-reported height and weight and compared to self-reported weight categorizations.

Results: There were discrepancies between self-reported height and weight data and perceived weight status (p<.01). Women were more likely to overestimate their weight as slightly overweight or very overweight, when their BMI suggested they were underweight or normal weight (p<.01). Men were more likely to report themselves as underweight or normal weight (p<.01) when their BMI suggested they were overweight or obese. Additionally, males students reported a desired weight that was +1.1 lbs (±15.6) greater than their actual weight, whereas females reported a desired weight that was -9.8 lbs (±13.6) less than their actual weight (p<.01). These data suggest optimistic and cynical hostility influence weight change in postmenopausal women. Obese women who scored higher on cynical hostility demonstrated lower risk for weight cycling. This may reflect lower interest in weight management among obese postmenopausal women, thus reducing their risk for weight cycling. Future efforts in weight management may benefit from more robust evaluation of these psychological traits.

T-P-3751
Optimism, Cynical Hostility and Weight Cycling among Postmenopausal Women in the Women’s Health Initiative
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Background: Evidence suggests that psychological factors play a role in obesity. While the association between weight gain and increased morbidity outcomes and mortality is clear, it is less so for weight cycling. We previously demonstrated optimism is associated with higher diet quality in a sample of postmenopausal women from the Women’s Health Initiative (WHI) Observational Study.

Methods: Here we evaluate the association between optimism (measured by the Life Orientation Test-Revised) or cynical hostility (a sub-scale of the Cook-Medley questionnaire), and weight change in WHI clinical trial participants (n=20,370), a sample with clinic measured annual body weights. Women were classified as weight gainer (45%) or weight cycler (20%), depending on change in measured body weights over 6 years follow-up (12% were classified as both weight gainers and cyclers). Logistic regression was used to compare gainers to non-gainers and weight cyclers to non-cyclers.

Results: Each 5-point increase, in optimism yielded 6% lower odds of being classified as a weight gainer or a weight cycler; cynical hostility was associated with 9% and 7% higher odds of classification as a weight gainer or cycler, respectively. However, obese women in the highest quartile of hostility had a 14% lower risk for weight cycling.

Conclusions: These data suggest optimism and cynical hostility influence weight change in postmenopausal women. Obese women who scored higher on cynical hostility demonstrated lower risk for weight cycling. This may reflect lower interest in weight management among obese postmenopausal women, thus reducing their risk for weight cycling. Future efforts in weight management may benefit from more robust evaluation of these psychological traits.

T-P-3752
Parents Using Food as a Reward for ‘Good Behavior’: Individual Differences and Associations with Child BMI z-score.
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Background: Parents routinely are cautioned against using food as a reward; however, data on this topic are scarce. We tested whether parental use of food as a reinforcer (FAR) was associated with higher child BMI z-score. Secondary aims examined whether: (1) the frequency of FAR implementation was associated with its perceived effectiveness, and (2) child genotype influences the effectiveness of FAR strategy.

Methods: A cross-sectional twin design, with 4- to 8-year olds, was conducted. This included 30 MZ and 29 DZ, same-sex twin pairs. Using an original questionnaire, parents rated the frequency with which they reward child ‘good behavior’ with food on a 7-point scale [from 1=‘Never’ to 7=‘Always’]. Effectiveness of FAR was also assessed by parent-report on a 7-point scale [from 1=‘Completely Ineffective’ to 7=‘Completely Effective’]. Child weight and height were directly assessed in a body composition laboratory.

Results: The distribution of FAR scores was positively
skewed. In fact, only ~8% of the children were exposed to FAR ‘often’ or ‘very often.’ The modal response was ‘sometimes’ (~33%). FAR implementation by parents was not related to child sex, race, age, or maternal BMI (p<0.05). More frequent FAR use was associated with higher child BMI z-score (r = 0.18, p = 0.04). Interestingly, parental use of FAS was not related to the strategy’s perceived effectiveness (r = 0.13, p>0.05). Effectiveness of FAR to control child behavior was more similar among MZ than DZ twin pairs (r= 0.52 vs. 0.26), suggesting a genetic influence on this susceptibility (heritability = ~52%).

Conclusions: Parental use of FAR was associated with higher child BMI z-score. Children vary in the extent to which food is an effective operant reinforcer, which may have theoretical implications for studying obesity risk.

T-P-3753-DT
Pathways to Obesity: A socio-ecological examination of the relationship between school climate stressors and weight status
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Background: Socio-ecological factors related to stress can place youth at an increased of obesity. In particular, youth are exposed to a variety of school-related stressors (e.g. safety, bullying, academics, etc). Using a novel observational measure, the School Assessment for Environmental Typology (SAfETy), this study examines the association between school climate stressors and weight status.

Methods: The SAfETy provides an observational tool for measuring school physical environment indicators theorized to be linked with behavioral and academic outcomes. Data came from the Maryland Safe and Supportive Schools (MIDS3) project. Observations were conducted in 58 schools in 12 different districts across the state. Students in the same schools (n=28,582) completed an online, anonymous school climate survey during the same timeframe. Multi-level structural equation modeling (SEM) was used to explore the association between these variables and obesity.

Results: School stressors were modeled as a latent variable with three indicators: delinquency, physical safety, and whole-school connectedness. At the individual level, lower levels of school stress were associated with a decreased likelihood of being overweight after controlling for gender, age, race, and physical activity (β = -.221; p = .014). At the school level, opportunities to participate in sports was associated with decreased likelihood of being overweight (β = -.506; p = .039); the percentage of students with free and reduced meals (proxy for poverty) was associated with increased likelihood of being overweight (β = .010; p < .001). The presence of healthy snacks and availability of soda at the school-level was not associated with being overweight.

Conclusions: Findings suggest that stress related to school climate can play a role in the health and weight status of youth. More research is needed to understand the mechanisms by which school climate stressor affects weight status and how interventions can be developed to help youth deal with stress.

T-P-3754-DT
Post-Partum Parenting Stress & Depressive Symptoms Influenced by Weight in First-Time Mothers
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Background: We evaluated how weight influences report of stress & depressive symptoms during the first year postpartum in first time mothers.

Methods: 123 first time mothers were followed for one year postpartum & evaluated at 2m, 6m, & 12m. The Parenting Stress Index (PSI) was used to measure stress & depressive symptoms (DP). Gestational weight gain (GWG) was calculated using self-reported pre-pregnancy weight and measured weight at delivery. 85 mothers completed the 12m follow-up. Percentile & change scores were calculated. Weight & psychosocial variables were correlated & significant relationships included in regression analyses.

Results: Mothers X age=24.3±4.5, 57% AA, 38% ≤HS education. Pre-pregnancy BMI (Pre-BMI) X=28.0±7; 12m BMI X=30.2 ± 8.0; GWG X=15.5kg±6.7; BMI<25 = 49% pre-pregnancy & 28% @12m. 72% of mothers were BMI≥25 at 12m, a 23% increase from Pre-BMI. PSI DP percentile decreased from 2m to 12m (X=4±27, t=1.5, p<.10, NS) as did total stress (X=10±20, t=4.3, p<.01). There were no significant differences between enrolled & completer subjects on baseline or 6m variables. For all mothers, DP at 12m was independently predicted by: GWG, DP at 2m, & total 12m parenting stress (R²= .695, p=.000). 12m parenting stress was predicted by higher stress at 2m & 6m and GWG (R²=.623, p<.000). Mothers with normal Pre-BMI who were overweight at 12m (n=17) had significantly increased DP & stress at 12m compared to mothers in other BMI categories. For those who started normal & became overweight, significant predictors of DP at 12m (R²=.73, p<.001) were higher DP at 2m, less education, & BMI≥25 at 12m.

Conclusions: Weight change resulting from pregnancy and not lost during the 1st year postpartum appears to contribute to report of depressive symptoms and parenting stress. Mothers who fail to return to normal Pre-BMI report more distress than those who return to Pre-BMI, whether they began in the normal, overweight or obese range. These findings suggest that GWG is a stressor for new mothers.

T-P-3755-DT
Predicting Psychological Symptoms Using Parental Perception of Well-Being in Treatment-Seeking Children and Adolescents with Obesity
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Background: Peer victimization is high among children with overweight and obesity and is associated with negative psychological sequelae. Parental concern for their child’s emotional well-being is another established predictor of psychological outcomes. Examining these constructs together could inform screening tools for psychosocial concerns in youth with obesity.

Methods: Caregivers of 117 youth with obesity (BMI-z M=2.55, SD=.62), ages 2-18 years (M=11.6, SD=3.6), 65% female, 63% Black, 20% White, 17% Other, seeking treatment...
in a multidisciplinary outpatient pediatric obesity clinic, completed the Pediatric Symptom Checklist-17 and questions about concern for their child’s emotional well-being and child’s experience with bullying. Multigroup Path Analysis using Mplus 7.1 examined associations among peer victimization, parental concern for emotional well-being and internalizing, externalizing, and attention symptoms while controlling for BMI-z and stratified by sex. 

**Results:** In males, parental concern predicted only internalizing symptoms for male compared to female youth. difference: a stronger path between parental concern and internalizing difficulties (β=.21; p<.05), while victimization predicted (β=.25; p<.01), externalizing (β=.28; p<.01), and attention difficulties (β=.21; p<.05), while victimization predicted internalizing (β=-.40; p<.01) and attention symptoms (β=.40; p<.01). Model comparisons indicated only one significant sex difference: a stronger path between parental concern and internalizing symptoms for male compared to female youth. 

**Conclusions:** Separate patterns of association among peer victimization, parental concern, and psychological symptoms exist for male and female youth with obesity. However, given that these patterns differ minimally across sexes, programs should screen both boys and girls for parental concern about their child’s well-being and peer victimization as proxies for emotional and behavioral problems, especially when a full evaluation is not feasible. Such information could be instrumental in guiding intervention implementation.

**T-P-3756**

**Psychological and physical determinants of overweight and obesity in high stress workplaces**

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**Background:** We hypothesized that psychological and physical conditions of employees in high stress workplaces may be co-risk factors for developing overweight and obesity (OW&O) and maybe modified by the worker's response to occupational stress. We developed 4 conceptual models of the interrelationship of psychological health (PH), obesity, work related musculoskeletal disease (MSD) and health behavior (HB).

**Methods:** Data from two cross-sectional worksite studies, 316 correctional and 99 nursing home OW&O employees were analyzed to assess psychological and physical mechanisms between HB and OW&O. Specifically depression and emotion for correctional officers and MSD pain for nursing home employees were tested as mediators using structural equation modeling between healthy life style and OW&O.

**Results:** In Correctional officers higher reported stress had a negative association with sleep quality (β=-0.23, p<0.001), and positive emotional characteristics were associated with better diet quality (β=0.163, p=0.006), exercise quality (β=0.322, p<0.001), and sleep quality (β=0.318, p<0.001). BMI was negatively related to diet (B=-2.167, p<0.001) and exercise quality (B=-0.129, p=0.001). Nursing home employees, reported higher rate of MSD (p<0.05). Higher levels of obesity was associated with lower current physical activity (β=-0.288, p<0.001), moderate and vigorous physical activity (β=-0.336, p<0.001; β=-0.199, p<0.05; respectively). Level of obesity and severity of LBP was also associated with lower physical function (β=-0.315, p=0.001; β=-0.175, p<0.001; respectively).

**Conclusions:** Understanding the psychological and physical determinants of health behavior are important for addressing obesity epidemics in high stress work environments.

**T-P-3757**

**Psychosocial Stress May Affect Risk for Type 2 Diabetes by Increasing Chronic Inflammation**


**Background:** Psychosocial stress may contribute to development of diseases such as obesity, metabolic syndrome, and type-2 diabetes through altered glucose metabolism and chronic inflammation. The purpose of this study was to investigate the associations between indices of metabolic health and perceptions of depression, stress, and discrimination in women.

**Methods:** Perceived stress, discrimination, and depression were evaluated by Cohen Stress questionnaire, Detroit Area Study Discrimination Questionnaire, and Patient Health Questionnaire depression scale (PHQ8), respectively. Insulin sensitivity and beta-cell responsiveness were assessed using a frequently sampled intravenous glucose tolerance test. Fasting sera were evaluated for markers of inflammation, adipokines, and lipids.

**Results:** Participants were 56 healthy women age 45±14.4 years with body mass index (BMI) 29.3±7.0 kg/m2. Partial Pearson correlation analysis controlling for race and BMI was performed. Perceived stress, discrimination, and depression were positively associated with each other (p<0.05). Perceived stress was positively associated with basal and phase-2 beta-cell response, and fasting insulin, and inversely associated with insulin sensitivity and adiponectin (p<0.05). Perceived depression was positively associated with fasting triglycerides, basal and phase-2 beta-cell response, fasting insulin, and leptin. Perceived discrimination was positively associated with C-reactive protein and interleukin-6, and inversely associated with adiponectin.

**Conclusions:** Taken together, results suggest that women who perceive greater psychosocial stress have greater chronic inflammation, which may adversely affect both insulin sensitivity and beta-cell responsiveness, putting them at greater risk for type 2 diabetes.

**T-P-3758**

**Self-Perception of Weight and Physical Activity Status Among South Indian Adults**

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**Background:** Sedentary behavior and obesity-related chronic diseases are increasing in India. To better understand self-perception of weight and physical activity (PA), and guide clinical and prevention efforts, we assessed discordance between perceived and measured weight and PA of South Indian adults.

**Methods:** A subset of 310 respondents (66% female) of PURSE-HIS, a population-based study representative of adults living in rural, semi-urban and urban areas of Chennai, India,
completed questions about weight and PA; self-perception adapted from NHANES and the WHO Global Physical Activity Questionnaire. Measured height and weight and self-reported PA established weight status (WHO cutoffs: $<18.5$: underweight; $18.5-<23$: normal weight; $23-<25$: overweight; $\geq 25$: obese) and PA status (low, moderate, high). The modified Kuppuswamy scale defined SES, using education, income, and occupation. Discrepant classification defined discordance.

**Results:** Mean ($\pm$SD) age was 45.8($\pm$9.9); BMI, 26.1($\pm$5.1). The modal adult was a rural semi-skilled worker with a high school certificate. Most respondents were overweight (17%) or obese (57%), and 6% were underweight; with 22% low, 73% moderate, and 6% of high PA status. About half of participants (52%) reported discussing their weight status with a healthcare provider. Weight discordance was 22% for underweight, 38% for normal weight, 68% for overweight, and 22% for obese participants. PA discordance was 41% for low, 52% for moderate, and 94% for high PA participants. PA and weight discordance did not differ by sex, age, urbanicity, education, income, or SES. Among overweight/obese respondents, those who had recalled discussing weight status with a healthcare provider were 80% more likely to correctly classify their weight status, relative to those who did not recall such a discussion.

**Conclusions:** Most South Indians misperceive their weight and PA status. Healthcare and public health practitioners have a role in discussing weight and lifestyle patterns to prevent chronic disease.

T-P.3759

**Sex Differences in the Association between Subjective Sleep Measures and Psychological Measures in a Clinic Sample of Overweight and Obese Adults**

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**Background:** Poor sleep quality has been associated with elevated body mass index (BMI) and increased energy consumption. Emotional eating is also associated with excessive food consumption and obesity. Very few studies have examined the association of sleep with emotional eating. We hypothesized that poor sleep quality or greater sleepiness will be associated with emotional eating.

**Methods:** This study enrolled 181 patients recruited at their first weight management clinic visit. Patients completed several questionnaires, including the Pittsburgh Sleep Quality Index, the Epworth Sleepiness Scale, the Dutch Eating Behavior Questionnaire emotional eating subscale, the Beck Depression Inventory and sociodemographic information. Height and weight were measured.

**Results:** Mean (SD) age was 52 (13) years, mean (SD) BMI was 39 (9) kg/m², 76% were female, 47% Caucasian, 42% African American, 10% all other ethnicities. After adjusting for age, sex, education and BMI, greater emotional eating was associated with worse sleep quality (p=0.085) and greater sleepiness (p=0.004). Greater depression was also associated with worse sleep quality (p=0.008) and greater sleepiness (p<0.001). When stratified by sex, emotional eating was associated with worse sleep quality in men (p=0.009) but not in women (p=0.66). Greater sleepiness was associated with emotional eating in both men (p=0.013) and women (p=0.05). When we adjust for depression, sleep quality is not associated with emotional eating in men or women, however sleepiness remains significantly associated with emotional eating in men only (p=0.046). Further, sleepiness is associated with greater depression in women (p<0.001) but not men (p=0.25).

**Conclusions:** Results suggest that the men may be more susceptible to the effect of poor sleep on emotional eating and this effect is partly independent of depression. A possible mediator of these sex differences is obstructive sleep apnea, which is more prevalent in men at the same BMI.

T-P.3760-DT

**Substance Abuse Associated with Food Addiction in College Students**

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**Background:** Substance abuse and eating disorders are among major public health issues for adolescents. Their brain’s reward system is fully developed, but not decision-making, impulse control, response inhibition and judgment ability. The objective of this investigation was to determine whether substance abuse (SA) is associated with food addiction (FA). Since SA is a problem among college-aged students, SA associated with FA may contribute to obesity in this population. We hypothesized that students who abuse substances are at increased risk of FA due to the rewarding effects of each without the capacity to weigh the consequences.

**Methods:** Data for this cross-sectional study were collected using a web-based survey tool. Participants consisted of a convenience sample of college students, who answered all SA questions and at least 5 FA questions in our survey. Questions targeted age, sex, race, socioeconomic status, self-classification of substance abuse behavior, and FA based on the Yale Food Addiction Scale.

**Results:** 1751 students were eligible for this study. 51.5% of participants were 18-20 years old. 17.4% of total participants used ADHD medications and 51.7% used marijuana. Participants who used ADHD medication (not prescribed to them) within the past 30 days were significantly more likely to have FA (p=0.003). Participants who used ADHD medication (not prescribed to them) or smoked marijuana within the past 30 days showed high symptomatology of FA (3 or more symptoms of FA, p=0.000; p=0.015 respectively). There was a strong association between high symptomatology of FA and substance abuse (marijuana and ADHD medication) in 18 year olds (p=0.026; 0.029) and males (p=0.000; 0.000) respectively.

**Conclusions:** Marijuana and ADHD medication abuse is associated with FA, especially in 18 year olds and males.

T-P.3761

**The Association of Cognitive Restraint Subtypes with Food Ordering: A Randomized Controlled Trial**


**Background:** Some eating behavior patterns have been associated with body weight [flexible restraint (FR), rigid restraint (RR)], but little data exist on how these patterns may interact with how food is presented in restaurant menus to affect food ordering. We hypothesized that higher state hunger in restrained eaters would be associated with increased food (items, total energy) when ordering from a complex versus a simple menu.

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simple restaurant menu. **Methods:** Pre-screened restrained eaters [N=31; Eating Inventory (EI) restraint score >6 men, >10 women] were randomized after an overnight fast to either a “hard” (complex design, H) or “easy” (simple design, E) menu. Self-reported hunger (SR-H) was recorded on a 20 point Likert-type scale and items ordered were summed and total ordered meal energy (kcal) calculated. FR and RR scores were derived from EI. **Results:** Mean SR-H was 4.9, SD=4.1 overall. SR-H was significantly different between menu groups (E: M=2.60 vs. H: M=7.06, p=.006). Number of items ordered ranged from 1-5, M=2.65, SD=1.14. Controlling for state hunger and menu design, FR was negatively associated with total energy (kcal), partial r = -0.385, p = 0.039 and number of items ordered, partial r = -0.530, p= 0.003. RR scores were not significantly associated with ordering outcomes in the same model. The significant relationship remains only for total items ordered on the E menu but remains for both number of items ordered and total energy on the H menu. **Conclusions:** Flexible restraint eating patterns have been associated with lower body weight. Identifying the mechanism of how these behaviors may operate to restrict intake in a fasted state in high cognitive demand settings may provide insight into ways to affect food intake patterns in people who frequently eat meals at restaurants.

**T-P-3762**
**The Biggest Loser Thinks Long-Term: Recency as a Predictor of Success in Weight Management**
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**Background:** Only a minority of participants in behavioral weight management lose a significant amount of weight. The ability to predict who is likely to benefit from weight management can greatly improve the efficiency of obesity treatment. Identifying predictors of weight loss can also reveal potential ways to improve existing treatments. We propose a model that is based on contemporary decision-neuroscience findings on recency: the reliance on recent information at the expense of time-distant information.

**Methods:** 70 obese adults enrolled in a weight-management intervention completed a decision-making task and their recency level was estimated using a mathematical model. Impulsivity and risk-taking were also measured for comparison. Weight loss was calculated in the end of the 16-week intervention.

**Results:** We found a negative relationship between recency-affected decision making and weight loss. Consistent with our hypothesis, successful dieters had lower recency scores than unsuccessful dieters (p = 0.006). Successful and unsuccessful dieters were similar in their demographics as well as psychometric characteristics such as intelligence, general decision-making performance, risk taking, impulsivity, and delay of gratification (p ≥ 0.21). Successful dieters had a lower number of past weight-loss attempts, but including this variable in the model did not increase predictive power.

**Conclusions:** Dieters who process time-distant information in their decision making are more likely to lose weight than those who are much affected by recency. We argue that the tendency to “think long term” facilitates thinking about the future outcomes of one’s actions, and thereby contributes to behavior change and increases treatment adherence. Our findings underline the importance of choosing the right treatment for every individual, and outline a way to improve weight-management processes for more patients.

**T-P-3763**
**The Impact of Weight-Related Abuse on Self-Perception and Disordered Eating: A Model of Obesity**
Jessica Salwen Stony Brook New York, Genna Hymowitz Stony Brook NY, Daniel O’Leary Stony Brook NY, Dina Vivian Stony Brook NY, Aurora Pryor Stony Brook NY

**Background:** Obesity affects approximately one-third of the adult population in the U.S. and is one of the primary reasons for bullying in school. While weight-related abuse (WRA) is a specific risk factor for disordered eating (binge eating, emotional eating, night eating, and unhealthy weight control) and negative self-perception, and disordered eating and negative self-perception are predictive of obesity, these relationships have not been addressed with a comprehensive model. Thus, the current study evaluated a structural equation model in which severity of WRA predicted disordered eating and negative self-perception, which in turn predicted current body mass index (BMI).

**Methods:** The model was evaluated in a sample of 371 undergraduate students. BMI ranged from 16.42 to 48.91 (M = 26.06, SD = 5.31), with 3% of the sample underweight, and 39.4% at a healthy weight, and 39.6% met criteria overweight, 11.9% for class I obesity, 5.5% for class II obesity, and 2.7% for class III obesity. 104 participants reported onset of overweight before age 10 and 129 reported onset between 11 and 20.

**Results:** Fit indices (CFI, RMSEA, PCLOSE) showed an excellent fit. Model fit was also explored based on onset of overweight, while age of onset of overweight (childhood vs. adolescence) did not significantly affect model fit, the model fit was significantly better in individuals who were overweight before age 20 as compared to those who were never overweight before age 20. Model fit was not affected by demographic covariates.

**Conclusions:** These analyses suggest that WRA is a specific risk factor for obesity that largely acts through its effect on disordered eating and negative self-perception. Further, this model suggests that WRA may be of particular importance to include interpersonal interventions that specifically target the results of abuse. Future research utilizing a longitudinal design and/or a clinical population (e.g., individuals seeking treatment for weight loss) will help to validate these findings.

**T-P-3764**
**The Role of Healthy Lifestyle and Psychological Factors in Contributing to Weight Changes among First Time Mothers in Australia**
Lynne Millar Geelong Victoria, Skye McPhie Melbourne Victoria, Helen Skouteris Burwood Victoria, Bosco Rowland Burwood Victoria

**Background:** Post-partum weight retention (PPWR) is associated with ongoing obesity among mothers. In order to address this issue there is a need to identify and understand the role of modifiable lifestyle and psychological health factors that contribute to these weight changes. This study aims to uncover these factors.

**Methods:** Data from 1,470 first time mothers, average age 32 years, participating in the first 5 waves (2 yearly) of the Longitudinal Study of Australian Children (LSAC) were
analysed. A multi-level growth model was used to test relationships between BMI and daily serves of fruit and vegetables, daily alcohol consumption, smoking status, number of days p/w of 30min moderate to vigorous physical activity (PA), psychological distress (PD; as measured by the K6) and stress while controlling for parity, socioeconomic position (SEP) and age. Non-significant predictors were removed. Vegetable and alcohol consumption, stress and parity were subsequently omitted.

**Results:** Average BMI was 25.1 at wave 1 and 26.1 wave 5. Over this same time period daily fruit consumption increased from 1.2 to 1.6 serves, PA was relatively stable at 2.8 and 2.9 days p/w, and current smokers decline from 18.5% to 15.4%. The prevalence of moderate and high PD also decreased over time (wave 1: mod PD 51.3%, high PD 14.2%; wave 5: 45.8% mod PD and 11.6% high PD). Results show that as physical activity and fruit consumption increased, BMI decreased (-.02; p= 0.001 and -.02; p=0.003, respectively). In contrast, women with initially high PD experienced greater increases in BMI as the PD continued to rise, compared to those with an initially low level of PD (.02; p< 0.001).

**Conclusions:** Efforts to treat and prevent PPWR need to target both physical and psychological health. In particular, it is not uncommon to find a healthy lifestyle reduces weight gain and hence many interventions target this. However, addressing the role of psychological distress has in contributing to weight gain now requires attention.

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**T-P-3765**

**Using Ecological Momentary Assessment to Examine the Association between Maternal Stress and Children’s Body Composition**

Genevieve Dunton Los Angeles CA, Eldin Dzubur Los Angeles CA, Yue Liao Los Angeles California, Adam Leventhal Los Angeles CA, Jimi Huh Los Angeles California, Gayla Margolin Los Angeles CA, Tara Gruenewald Los Angeles CA, Carol Koprowski Los Angeles CA, Stephen Intille Boston MA

**Background:** Mothers’ experience of psychosocial stress may increase children’s obesity risk. However, research in this area has been limited by retrospective measures of maternal stress, which may suffer from recall and cognitive biases. The current study used real-time Ecological Momentary Assessment (EMA) methods to capture momentary levels of stress in mothers. The goal was to compare momentary versus retrospective measures of maternal stress in relation to children’s Body Mass Index (BMI) percentile and waist circumference.

**Methods:** Participants included mothers and their 8-12 year-old children (N = 59 dyads). Smartphone-based EMA was conducted across 7 days (up to 7 randomly-timed survey prompts per day) to measure mothers’ levels of feeling stressed and perceived stress at the moment of the prompt, and their experience of stressful events and stressors (e.g., arguments, family demands) over the past 2 hours. Mothers also completed retrospective paper questionnaires assessing usual levels of perceived, parenting, financial, and acculturative stress experienced over the past month. Children’s height, weight, and waist circumference were measured.

**Results:** After adjusting for Hispanic ethnicity, mother’s education, and days per week of mother-children cohabitating; mothers’ average momentary level of feeling stressed measured by EMA was negatively associated with children’s BMI percentile (B = -23.59, p = .044) and waist circumference (β = -6.70, p = .049). Retrospectively measured level of usual financial stress over the past month was positively associated with children’s waist circumference (B = 2.49, p = .058).

**Conclusions:** The unexpected inverse association between mothers’ average momentary stressful feelings and children’s body composition suggests that parenting practices to maintain a healthy child weight (e.g., food preparation, taking children to sports) may actually increase mothers’ feelings of stress on a momentary basis.
**November 3-3:30-5:00PM**

**T-OR-2120-LB**

**IL-15 improves skeletal muscle oxidative metabolism in association with AMPK pathway activation**  
Lucien Nadeau Ottawa Ontario, Celine Aguer Ottawa Ontario

**Background:** During contraction, skeletal muscle secretes myokines that act on distant tissues to mediate the beneficial effect of exercise on general health. Some myokines also act locally in skeletal muscle in an autocrine/paracrine fashion to facilitate adaptations to physical exercise. Interleukin-15 (IL-15) is highly expressed in skeletal muscle and influences some metabolic parameters that are defective in insulin resistance and obesity. For instance, IL-15 improves muscle glucose uptake and whole body fatty acid oxidation. The aim of this study was to determine the metabolic response of muscle cells to acute IL-15 exposure and the mechanism by which IL-15 acts locally in skeletal muscle. **Methods:** L6 myotubes were exposed to different concentrations of IL-15 and oxygen consumption, fatty acid oxidation and activation of the AMP-activated protein kinase (AMPK) pathway were measured.

**Results:** 10 ng/ml and 20 ng/ml IL-15 exposure for 30 min to 3h increased myotube oxygen consumption by 20-30%. Preliminary data also showed that IL-15 increased complete fatty acid oxidation to CO2 and the ratio of complete/incomplete fatty acid oxidation by 15-30%. The effect of IL-15 on muscle oxidative metabolism seems to involve the AMPK pathway since IL-15 increased the phosphorylation of AMPK and its downstream target acetyl-CoA carboxylase (ACC), known to activate mitochondrial fatty acid oxidation. Current and future experiments are designed to 1) confirm the role of the AMPK pathway in IL-15 mechanism of action by using primary myotubes derived from AMPKα1/2 knockout mice, 2) study the effect of acute exposure to IL-15 in skeletal muscle ex-vivo, and 3) study the effect of chronic IL-15 exposure on mitochondrial biogenesis and function. **Conclusions:** By increasing the ability of skeletal muscle to completely oxidize fatty acids, IL-15 may prove to be an interesting target to treat metabolic diseases such as obesity and type 2 diabetes.

**November 4 – 10:15-11:45AM**

**T-OR-2121-LB**

**Disrupted GSK-3β/β-catenin signaling induces greater adipogenesis in mesenchymal stem cells derived from babies of obese women: The Healthy Start BabyBUMP Project**  
Kristen Boyle Aurora Colorado, Zachary Patinkin Aurora CO, Allison Shapiro Boulder COLORADO, Peter Baker Aurora Colorado, Dana Dabelea AURORA CO, Jacob Friedman Aurora CO

**Background:** Maternal obesity increases risk for obesity and metabolic disease in the offspring, however the molecular mechanisms in human infants remain poorly understood. We hypothesized that mesenchymal stem cells (MSCs) from infants born to obese mothers would demonstrate greater potential for adipogenesis and less potential for myogenesis, which would correspond to differences in β-catenin content, a regulator of MSC commitment. **Methods:** MSCs were cultured from umbilical cord of infants born to normal weight (pre-pregnancy [pp]BMI 21.1±0.3 kg/m2, n=15; NW-MSCs) and obese (ppBMI=34.6±1.0 kg/m2, n=14; Ob-MSCs) mothers. Measurements were made in undifferentiated cells and following 21 days of either adipogenesis or myogenesis.

**Results:** Upon differentiation, Ob-MSCs exhibit evidence of greater adipogenesis (+30% Oil Red O stain [ORO], +50% PPARγ protein; P<0.05) compared with NW-MSCs, though no differences in markers of myogenesis were observed. In undifferentiated cells, total β-catenin protein content was 10% lower and phosphoThr41/Ser45 β-catenin was 25% higher (P<0.05) in Ob-MSCs vs. NW-MSCs (P<0.05). Coupled with 25% lower inhibitory phosphorylation of GSK-3β in Ob-MSCs (P<0.05), these data suggest greater β-catenin degradation in Ob-MSCs. Adipogenesis and myogenesis were reciprocally correlated with β-catenin measures. Lastly, ORO in adipogenic differentiating cells was positively correlated with infant percent fat mass at birth (r=0.475, P<0.05).

**Conclusions:** These results suggest that lower β-catenin in MSCs of infants exposed to maternal obesity may have important consequences for MSC lineage commitment, fetal fat accrual, and offspring obesity risk.

**T-OR-2122-LB**

**Elucidating the Effects of Maternal Obesity on Human Oocytes via Single Cell Transcriptome Analysis**  
Meghan Ruebel Little Rock Arkansas, Dean Moutos Little Rock AR, Thomas Badger Little Rock AR, Kartik Shankar, Aline Andres Little Rock Arkansas

**Background:** Maternal obesity has been linked to developmental programming of offspring metabolism, resulting in greater fat deposition and increased risk of obesity. However, the precise mechanisms underlying this programming remain unclear.

**Methods:** Using single cell transcriptomic analyses, we investigated the impact of maternal obesity on human oocytes at various maturation stages [germinal vesicle (GV); metaphase I (MI); and metaphase II (MII)] from 11 overweight/obese (OW) women and 13 normal weight (NW) women undergoing fertility treatments. Assessments were also carried out in corresponding follicular fluid (FF) samples.

**Results:** OW women had significantly higher BMI, fat mass, and serum HOMA-IR compared to NW women (p<0.01). Leptin and C-reactive protein were increased in both serum and FF from OW compared to NW women (p<0.05). GV (N=5 OW; N=5 NW), MI (N=6 OW; N=8 NW), and MII oocytes (N=3 OW; N=4 NW) were analyzed using RNA sequencing. Analysis using DeSeq (min 2-fold and FDR adjusted p-value of 0.05) revealed 192 genes in GV, 711 genes in MI, and 338 genes in MII oocytes that were differentially expressed in OW compared to NW women. Functional annotation and pathway analysis (WebGestalt) indicated that those from those from NW women, oocytes from OW women had increased expression of pro-inflammatory genes including chemokines CXCL2 and CXCL3; interleukins IL-8, IL-16 and IL-34; and immunity-related GTPase family, M (IRGM). In addition, gene expression of pyruvate dehydrogenase kinase isozyme 1 (PDK1), phosphoinositide-3-kinase interacting protein 1 (PIK3IP1) and regulatory associated protein of mTOR (RPTOR) were decreased in oocytes from OW compared to NW women.

**Conclusions:** These results suggest that maternal obesity alters the oocyte transcriptome prior to fertilization by up-regulating pro-inflammatory genes and down-regulating the PI3K-AKT pathway. These findings further suggest that the pre-
conception period may be an important window of opportunity for lifestyle interventions.

November 6 - 1:30-3:00 PM

T-OR-2123
Candidate Genes and Quantitative Gastrointestinal Traits in Obesity

Background: Genetic predisposition contributes to obesity. In heterogeneous diseases, quantitative traits facilitate study of genetics in disease. We aimed to assess the association of candidate genes with gastrointestinal traits in obesity.

Methods: In 274 overweight and obese participants, we studied on different days satiety, satiation, gastric volume, dual-phase gastric emptying; and gut hormones (ghrelin, CCK, GLP-1 and PYY). We prespecified genes to be examined with each quantitative trait based on their putative effects on receptor function, and previous epidemiological studies e.g. GWAS. Statistical analysis included association of summed allele risk score with BMI, univariate associations of variants of selected genes with quantitative GI traits (corrected for FDR) and multivariable linear regression using the principal components (PCA) adjusted by age, and gender.

Results: The summed allele risk score was not associated with BMI. GNβ3 rs1129649 CC was associated (p=0.009) with higher fasting plasma ghrelin, FTO rs9939609 AA (p=0.008) with accelerated GE of liquids, MC4R rs1778213 CC (p=0.01) with higher postprandial peak PYY, HTR2C rs518147 GG genotype (p=0.0007) with increased satiety, HTR2C rs1414334 CC genotype (p=0.01) with decreased satiety and UCP3 rs1626521 with satiety (p=0.005), and gastric volume and accommodation (p=0.005). On PCA (with FDR for number of genes tested), UCP3 rs2075577, UCP3 rs1626521, and HTR2C rs1414334 contributed to 11.1% variance in satiation/satiety (p < .0001); TCF7L2 rs7903146 contributed to 2.7% variance in gastric volume and accommodation (p=0.0167). Conclusions: Genetic variants may explain up to 11% of the variance in the gastrointestinal traits that are associated with obesity. Although, the variance attributable is limited, it is large compared to the variance attributable to genes based in epidemiological studies.

T-OR-2124-LB
Platelet mitochondrial function as a non-invasive marker for liver fat accumulation in healthy adults

Background: Nonalcoholic fatty liver disease affects ~30% of population and is associated with obesity, insulin resistance, and metabolic syndrome. Means for detecting liver fat accumulation prior to disease development are needed. We tested the hypothesis that mitochondrial bioenergetic function in platelets could serve as a surrogate marker of hepatic fat content in healthy individuals.

Methods: Participants were 21 healthy adults (60% female) aged 19-45 yrs (mean ± SD: 27 ± 7 yrs). Liver fat % was determined by quantitative MRI analysis using a modified 2-point Dixon sequence. Platelet mitochondrial oxygen consumption rate (OCR) was determined by an extracellular flux analyzer using a mitochondrial “stress test” with sequential addition of mitochondrial inhibitors. Measures included basal, ATP-linked, maximal and non-mitochondrial OCR as well as proton leak and reserve capacity (maximal – basal). Results: Average % liver fat was ~ -0.28 ± 0.20% (Range: -7.13-3.81%). Platelet basal, ATP-linked and non-mitochondrial OCR were significantly, inversely associated with % liver fat (r = -0.61, P = 0.003, r = -0.62, P = 0.003, and r = -0.50, P = 0.02, respectively). Proton leak was inversely associated with % liver fat (r = -0.40) at P = 0.07. % liver fat was not significantly associated with platelet reserve capacity or maximal OCR. Adjusting for age and sex did not change the results for any of the platelet OCR variables. Conclusions: Platelet mitochondrial function may have potential as a prognostic and diagnostic biomarker for liver fat accumulation.

November 5 – 3:45-5:15PM

T-OR-2126-LB
White Matter Volume and Integrity in Normal Weight, Overweight, and Successful Weight Losing Adolescent
Kara Duraccio Provo UT, Kaylie Carbine Provo UT, Kimberly Monroe Provo Utah, Kimberly Barnett Provo UT - Utah, Chad Jensen

Background: Increased body mass may be associated with decreased white matter volumes, particularly in the cingulum, genu, splenium, fornix, corona radiate, longitudinal fasciculus, and insular cortex. Exploring how white matter volume and integrity are associated with weight and weight loss may provide additional insight into the neural consequences associated with obesity and what neural sequelae may be mitigated by weight loss. The primary aim of our study was to examine white matter volume and integrity in successful weight losers (SWLs) compared to normal weight (NW) and overweight (OW) adolescents. Methods: Eleven SWLs, twelve NW, and eleven OW adolescent participants underwent diffusion tensor imaging (DTI). Multiple three-group one-way ANOVAs were conducted comparing white matter volume and integrity across seven regions of interest (ROI) identified in previous research. Pearson correlations were also computed to examine the association between BMI and white matter volumes in identified ROIs. Results: BMI was only significantly correlated with activation in the left cingulum (r = .37, p = .03). The main effect of weight status group was only significant for the left anterior corona radiate (p = .01). Post hoc Tukey HSD analyses indicated that the average white matter volume in the left anterior corona radiate was significantly lower in the NW group as compared to the OW group and SWL group (ps < .03).

Conclusions: BMI was only related to neural activation in one region of interest within the brain, and weight classification generally did not affect white matter structures. Adult literature on white matter volumes has shown a significant age by BMI interaction; white matter deficits that appear to accompany adulthood obesity may not develop until later in life. We suggest conducting further research with subjects in emerging...
and early adulthood to further explore the effect of length of obesity status on white matter structures within the brain.

T-OR-2129-LB
Greater likelihood of clinically significant weight loss following extended referral to an open-group behavioural weight loss programme: 12 month outcomes from the WRAP trial.
Amy Ahern

Background: The aim was to assess whether general practitioner referral to an open-group behavioural weight loss programme was more effective than a brief self-help intervention, and whether referral for a 52 week programme was more effective than a commonly commissioned 12 week programme. Methods: The weight loss Referrals for Adults in Primary Care (WRAP) trial recruited 1269 participants (BMI≥28 kg/m², age≥18 years, 68% female) through their primary care provider and randomised them in a 2:5:5 allocation to: a single session Brief intervention (BI), referral to a commercial open-group weight loss programme (Weight Watchers®) for 12 weeks (CP12), or the same programme for 52 weeks (CP52), with follow-up assessments at 3 months and 12 months from baseline. The percentage of participants in each intervention losing ≥5% and ≥10% weight at the 12 month assessment was calculated using last observation carried forward. Risk ratios (RR) were calculated to compare the commercial programmes with BI, CP12 with CP52. Results: 823 (65%) participants completed the 12 month assessment. In the intention to treat analysis, 48% of CP52 participants lost ≥5% weight compared with 34% of CP12 participants and 18% of BI participants. 27% of CP52 participants lost ≥10% weight compared with 15% of CP12 and 8% of BI participants. Compared with BI, participants referred to either commercial programme were significantly more likely to lose ≥5% [RR=2.35 (95%CI 1.68, 3.29) p=0.0001] and ≥10% baseline weight [RR=2.60 (95%CI 1.59, 4.25) p=0.0001]. CP52 participants were significantly more likely than CP12 participants to lose ≥5% [RR=1.40 (95%CI 1.15, 1.69) p=0.0006] and ≥10% weight [RR=1.80 (95%CI 1.37, 2.37) p=0.0001]. Conclusions: Increasing the length of referral to an open-group behavioural weight loss programme significantly increased the likelihood that participants would achieve clinically significant weight loss at 1 year.

T-OR-2130-LB
Weight loss induced by calorie restriction in older adults with obesity leads to favorable changes compared to exercise only or changes in diet composition: the CROSSROADS randomized controlled study

Background: Despite an increasing prevalence of obesity in older adults and associated risk, the evidence regarding risk vs. benefit for calorie restriction to induce weight loss is mixed. We wanted to determine if the overall benefit outweighed risk with calorie restriction compared to exercise only or changes in diet composition. Methods: We randomized 164 older adults with a BMI≥ 30 kg/m² and at least 1 medication for diabetes, hypertension, or hyperlipidemia to 1 of 3 arms: Exercise Only control (EO, 90-150 min of aerobic exercise + 2 sessions of resistance training/week), Weight Maintenance (WM, low energy dense diet pattern + exercise), and Weight Loss (WL, calorie restricted low energy dense diet pattern + exercise). Follow up was completed at 12 months with 90% providing a final weight. Body composition, physical function, and metabolic risk factors were assessed using an intention to treat analysis (multiple imputation). Outcome data presented are ANCOVA least square means adjusted for age, race, sex and baseline values and are shown as mean±SD. Results: At baseline, mean age was 70.3±4.7 years and mean BMI was 33.7±3 kg/m². Weight changes at 12 months were -3.3±1.5, -2.4±1.5, and -8.6±1.4 lb for EO, WM, and WL, respectively (p=0.01 EO/WM vs WL). Body composition changes by DEXA favored WL with greater fat mass loss and no significant difference in lean mass vs EO/WM. WL and WM had significant within group decreases in total abdominal fat volume by MRI. Changes in glucose, HDL, and adiponectin were significantly greater for WL vs EO. There were small increases in short physical performance battery scores for WM and WL; these were not significantly different from EO. Conclusions: A 12-month WL behavioral intervention in this population of high risk older adults with obesity led to greater weight loss with limited loss of lean mass, greater improvements in key risk factors, and stable physical function. In the short-term, modest weight loss has important benefits with low risk compared to EO or WM.
Wednesday November 4 – 11:45AM-1:30 PM

T-P-LB-3766
Persicaria hydropiper (L.) Spach and its Flavonoid Components inhibit adipocyte differentiation in 3T3-L1 cells by activating the Wnt/β-catenin signaling pathway
Jiyong Shim Seoul*, Soung-Hoon Lee, KangYell Choi Seoul

Background: Obesity, which is related to metabolic syndrome and is associated with liver disease, represents an epidemic problem demanding effective therapeutic strategies. Evidence shows that the Wnt/β-catenin pathway is closely associated with obesity and that small molecules regulating the Wnt/β-catenin pathway can potentially control adipogenesis related to obesity

Methods: Eleven plant extracts activating the Wnt/β-catenin pathway were screened by using HEK 293 TOP cells retaining the Wnt/β-catenin signaling reporter gene. Results: An extract of Persicaria hydropiper (L.) Spach was found to activate Wnt/β-catenin signaling. The P. hydropiper extract inhibited the differentiation of adipocyte 3T3-L1 cells. Isoquercitrin andisorhamnetin, constituents of P. hydropiper, also activated Wnt/β-catenin signaling. P. hydropiper and isoquercitrin may therefore be potential therapeutic agents for obesity and its associated disorders.

Conclusions: These results indicate that isoquercitrin in P. hydropiper suppresses the adipogenesis of 3T3-L1 cells via the inhibition of Wnt/β-catenin signaling. P. hydropiper and isoquercitrin may therefore be potential therapeutic agents for obesity and its associated disorders.

T-P-LB-3767
The small molecule Indirubin-3'-Oxime inhibits adipocyte differentiation via Wnt/β-catenin signaling pathway
Seolhwa Seo Seoul*, Olivia Choi San Diego CA, KangYell Choi Seoul

Background: Activation of the Wnt/b-catenin signaling pathway inhibits adipogenesis by maintaining preadipocytes in an undifferentiated state. We investigated the effect of indirubin-3'-oxime (I3O), which was screened as an activator of the Wnt/b-catenin signaling, on inhibiting the preadipocyte differentiation in vitro and in vivo. Methods: 3T3L1 preadipocytes were differentiated with 0, 4 or 20mM of I3O, and the effect was observed by Oil-red-O staining. Activation of Wnt/b-catenin signaling in I3O-treated 3T3L1 cells was shown using immunocytochemical and immunoblotting analyses for b-catenin. For the in vivo study, mice were divided into five different dietary groups: chow diet, high-fat diet (HFD), HFD supplemented with I3O at 5, 25 and 100mgkg^-1. After 8 weeks, adipose and liver tissues were excised from the mice and subject to morphometry, real-time RT-PCR, immunoblotting and histological or immunohistochemical analyses. In addition, adipokine and insulin concentrations in serum of the mice were accessed by enzyme-linked immunosorbent assay. Results: Using a cell-based approach to screen a library of pharmacologically active small molecules, we identified I3O as a Wnt/b-catenin pathway activator. I3O inhibited the differentiation of 3T3L1 cells into mature adipocytes and decreased the expression of adipocyte markers, CCAAT/enhancer-binding protein A and peroxisome proliferator-activated receptor G, at both mRNA and protein levels. In vivo, I3O inhibited the development of obesity in HFD-fed mice by attenuating HFD-induced body weight gain and visceral fat accumulation without showing any significant toxicity. Factors associated with metabolic disorders such as hyperlipidemia and hyperglycemia were also improved by treatment of I3O. Conclusions: Activation of the Wnt/b-catenin signaling pathway can be used as a therapeutic strategy for the treatment of obesity and metabolic syndrome and implicates I3O as a candidate anti-obesity agent.

T-P-LB-3768
Associated roles of elevated miR-146a and SFRP4 in adiposity and insulin resistance.
Attila Seyhan Orlando Florida, Gabriella Garufi Orlando FL, Yury Nunez Lopez Orlando FL, Magdalena Pasarica Orlando Florida

Background: miRNAs have recently emerged as key regulators of metabolism. Secreted frizzled-related protein 4 (SFRP4) is associated with obesity and insulin resistance, probably through its angiostatic effect. Current work explored relationships among miRNAs and SFRP4, as they relate to adipose tissue functions including lipolysis, glucose and glycerol turnover, and insulin sensitivity. Methods: Plasma and abdominal adipose tissue (abdAT) RNA was isolated from 17 obese and type 2 diabetes (T2DM) subjects. mRNA and miRNA levels were measured by qPCR. Insulin sensitivity was measured by the euglycemic hyperinsulinemic clamp. Osmium fixation and Coulter counting was used for adipocyte sizing. Data was analyzed using general linear models. Results: AbdAT miR-146a was elevated in obese (FDR=0.001) and T2DM (P=0.04) subjects and correlated positively with mean fat cell size (FCS) (r=0.89, FDR=0.02) and SFRP4 in the same tissue (r=0.88, FDR=0.006), and negatively with size of small adipocytes (r=-0.92, FDR=0.002). SFRP4 protein levels were elevated in the circulation (P=0.002) and miRNA levels marginally elevated in the abdAT (P=0.07) of the
obese subjects. Notably, circulating levels of SFRP4 protein were negatively correlated with insulin suppression of lipolysis (r=-0.77, FDR=0.005) and the glucose rate of appearance (r=-0.70, FDR=0.04). In addition, plasma miR-376a was elevated in obese (P=0.01) and T2DM (P=0.03) subjects as compared to lean and healthy matching controls, respectively. Circulating levels of miR-376a associated with blood insulin (r=0.77, FDR=0.001), HOMA IR (r=0.77, FDR=0.02), and mean FCS, r=0.92, FDR=1.0x10^-7).

Conclusions: Our study uncovers a novel association between SFRP4 and miR-146a in the obesity context, and suggest that miR-146a may mediate, at least in part, insulin resistance-related effects of SFRP4 in adipose tissue. Thus, miR-376a and miR-146a show potential as biomarkers of adiposity and insulin resistance.

T-P-LB-3769

The Association of Weight Loss and Cardiometabolic Outcomes in Overweight and Obese Children: A Systematic Review and Meta-regression


Background: Excess body weight in children is associated with multiple immediate and long term medical comorbidities. We aimed to identify the degree of reduction in excess body weight associated with cardiometabolic changes (lipid panel, liver function tests, systolic (SBP), diastolic blood pressure (DBP), HgA1C and fasting blood glucose) in overweight and obese children. Methods: We included randomized controlled trials (RCTs) and cohort studies that evaluated interventions to treat pediatric obesity (medication, surgery, lifestyle and community based interventions). Studies with less than 6 month follow up duration were excluded. We conducted a comprehensive search of several databases. Two independent reviewers screened and extracted data from eligible studies. We assessed the risk of bias of the included studies using Cochrane risk of bias tool and Newcastle Ottawa Scale. We used a random effects regression model to assess the association between BMI/weight and cardiometabolic changes. Results: We included 42 studies (37 RCTs and 5 cohorts) enrolling 3807 patients. Studies had overall moderate to low risk of bias. A one-unit decrease in SBP was significantly associated with a decrease of 0.16 units (p=0.04) and 0.61 units (p=0.05) in BMI and weight, respectively. A one-unit increase in HDL was significantly associated with 0.74 units decrease in weight (p=0.02). A one-unit decrease in triglycerides was significantly associated with 0.1 unit decrease in weight (p=0.03). The remaining associations were not statistically significant. Conclusions: Weight reduction in children is associated with significant changes in several cardiometabolic outcomes, particularly HDL, SBP and triglycerides.

T-P-LB-3770


Peter Toth Sterling IL, Karin Henriksson Mölndal Sweden, Michael Palmer Wilmslow GB-ChS

Background: Obese individuals are at greater risk of cardiovascular disease. We estimated LDL-C goal attainment according to BMI and waist circumference (WC) using National Health and Nutrition Examination Survey (NHANES) data extrapolated to the US adult population. Methods: The proportion of participants in 5 NHANES surveys (2003–2004 to 2011–2012) categorized as underweight, normal, overweight, obese, or morbidly obese (BMI 2, respectively) or as having abdominal obesity (WC >102 cm for men or >88 cm for women) was calculated. The proportion of each category at NCEP ATP III LDL-C goal was determined. Results: From 2003–2004 to 2011–2012, mean BMI increased by 0.36 kg/m2. Mean WC increased by 0.49 cm for men and 1.66 cm for women. Estimated proportion of US adults categorized as overweight/obese/morbidly obese increased from 66% (135 M) to 69% (154 M). Proportion categorized as obese/morbidly obese increased from 32% (66 M) to 36% (80 M). Proportion with abdominal obesity also increased from 52% (108 M) to 55% (124 M). Across all surveys, the estimated proportion of underweight, normal, overweight, obese, and morbidly obese adults not at LDL-C goal was 6%, 15%, 26%, 30%, and 34%, respectively. The proportion of high-risk adults not at goal was 50%, 56%, 60%, 59% and 68% in underweight, normal, overweight, obese, and morbidly obese categories, respectively. In all risk groups, a greater proportion of adults with abdominal obesity were also not at goal, compared with those with normal WC. Conclusions: Most US adults are categorized as overweight or obese, and the number of US adults within this category increased from 2003 to 2012. Overall, ≥50% of high-risk adults in all BMI categories are not at LDL-C goal (approximately 21.3 M US adults), highlighting the need for more aggressive identification and treatment of individuals at risk.
Severe obesity is associated with increased risk of early complications and extended length of stay following coronary artery bypass graft surgery

Tasuku Terada Edmonton Alberta, Jeffrey Johnson Edmonton Alberta, Colleen Norris Edmonton Alberta, Weiyu Qiu Edmonton Alberta, Raj Padwal Edmonton AB, Arya Sharma Edmonton Alberta, Mary Forhan Edmonton Alberta

Background: A better understanding of the drivers of hospital costs is needed to provide quality and efficient care for patients with obesity. We examined the relationship of obesity with the incidence of early (30-day) adverse outcomes and in-hospital length of stay (LOS) following coronary artery bypass graft (CABG) surgery.

Methods: Data from 7560 patients who underwent CABG were reviewed. Using normal body mass index (BMI; 18.5-24.9 kg/m2) as a reference, the association of four BMI categories: overweight (25.0-29.9 kg/m2), obese class I (30.0-34.9 kg/m2), obese class II (35.0-39.9 kg/m2), and obese class III (≥40.0 kg/m2) with rates of overall early complications, subgroups of early complications (i.e., infection, renal and pulmonary complications), and LOS were assessed while adjusting for clinical covariates.

Results: Compared to patients in the normal BMI group, patients in the overweight and obese class I groups had a similar risk of overall early complications while patients in the obese class II and III groups were at higher risk (class II: adjusted hazard ratio [aHR] 1.35; 95% CI 1.11-1.63; class III: aHR 1.56; 95% CI 1.21-2.01). Subgroup analyses showed that patients in the obese class I, II and III groups were at higher risk of infection (class I: aHR 1.60; 95% CI 1.24-2.05; class II: aHR 2.34; 95% CI 1.73-3.17; and class III: aHR 3.29; 95% CI 2.30-4.71); however, BMI category was not a risk factor for renal or pulmonary complications. Patients with class III obesity spent an additional 2.1 (95% CI 0.31-3.87) days in hospital compared to patients with normal BMI.

Conclusions: Class II and III obesity were independent risk factors for early complications, most likely driven by a higher risk of post-surgical infection. Early complications could contribute to an extended hospital stay for patients with class III obesity. Greater perioperative attention and consideration for patients with severe obesity undergoing CABG may improve patient outcomes and reduce health care cost.

Impact of Body Mass Index on In-hospital Outcomes in Patients Undergoing Percutaneous Coronary Intervention in Newfoundland and Labrador, Canada

Anne Gregory St. Philip's Newfoundland And Labrador, William Midodzi St. John's Newfoundland

Background: Obesity is associated with advanced cardiovascular disease requiring procedures such as percutaneous coronary intervention (PCI). Studies have inconsistently reported better outcomes in obese patients - “the obesity paradox” with these procedures. The relationship between in-hospital outcomes and BMI has not been examined in Newfoundland and Labrador (NL) which has the highest rate of obesity in Canada.

Methods: The Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease database was used to obtain data on patients (n = 6473) who underwent PCI from May 2006 to December 2013 in NL. Patients were grouped by BMI: normal, BMI ≥ 18.5 and < 25.0 (n=1073); overweight, BMI ≥ 25.0 and < 30 (n=2608); and obese, BMI ≥ 30.0 (n=2792). The primary outcome was in-hospital complications occurring within 48 hours (vascular, in-lab and post-procedural).

Results: The proportion of patients undergoing PCI considered obese increased from 2.9% in 2006 to 7.0% in 2013. These subjects were younger, less likely to be male, and had a higher incidence of coronary risk factors such as diabetes, hypertension, and family history of cardiac disease (trends across BMI categories all significant p < .001). Normal weight subjects experienced a greater proportion of vascular complications: (normal, overweight, obese: 8.2%, 7.2%, 5.3%, p = 0.001).

No significant differences were observed for non-vascular complications - in-lab (4.0%, 3.3%, 3.1%, p = 0.386) or post-procedural (1.0%, 0.8%, 0.9%, p = 0.725).

Conclusions: Obese patients who underwent PCI were less likely to experience vascular complications; however, no differences were observed across BMI categories for non-vascular complications (in-lab or post-procedural).


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Background: In 2013, the American Heart Association and American College of Cardiology released guidelines that supports the use of pooled cohort risk equations to determine cardiovascular risk among diverse populations. Though the relationship between obesity and cardiovascular risk is well established, little is known regarding the associations that these risk scores have with dual energy x-ray absorptiometry (DXA) body fat and other anthropometric measures. The purpose of this analysis is to
Examine the previously mentioned relationship. **Methods:** We used data from a nationally representative sample of 4,497 men and nonpregnant women (White: n=2,411; Black: n=1,063; Mexican American: n=1,023) aged 40-64 years from the 1999-2006 National Health and Nutrition Examination Surveys. Pooled cohort risk equations were calculated using objective measures of blood pressure, lipoproteins, glycohemoglobin, cotinine, as well as, self-reported smoking and diabetes status. Pooled cohort risk were categorized as <7.5%, 7.5-19.9%, and ≥20%. **Results:** DXA-%BF was not significantly different by pooled cohort risk groups among Black men, Black women, and Mexican American women. DXA-%BF was significantly different by pooled cohort risk groups among all other population groups. **Conclusions:** Body fat may not be able to differentiate cardiovascular risk among certain racial and ethnic groups. Evidence also suggests that some groups are able to be overfat, and display relatively low levels of cardiovascular risk.

**T-P-LB-3774**

**Weight outcomes for obesity prevention among elementary children exposed to a low-dose clinical intervention**

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**Background:** Evidence of effective prevention of obesity among children in clinical settings is limited. We examined the extent to which parent screening of home and environmental risk factors for obesity before (PS→) visits plus computerized clinical decision support (CDS) for pediatricians during well child visits (WCV) improved three child weight outcomes (BMI, BMI %, and BMI50) compared to usual care (UC) followed by parent screening (→PS). **Methods:** We conducted a cluster-randomized, 2-arm pragmatic trial, where primary care practice site was taken as cluster. We enrolled 1,671 children aged 2 to 5 years from 13 primary care practices in Pennsylvania. Patients were followed up for 1 year. In 7 practices randomized to PS→CDS, parents completed the Family Nutrition and Physical Activity (FNPA) screening before their child’s scheduled WCV. Pediatricians received FNPA screening results as part of a CDS tool to inform preventive counseling. In 6 practices randomized UC→PS, parents completed the FNPA screening after their child’s WCV. **Results:** We obtained BMI from 302 children at baseline and 1 year. At baseline, children in the PS→CDS randomization arm were heavier (28% overweight or obese versus UC→PS 20%, p<0.001) and by BMI50 (9.64 (19.68) versus UC→PS 5.23 (9.04), p<0.05). At one year follow-up, there was no statistically significant difference between the groups, regardless of weight outcome measure (BMI, BMI %, or BMI50) however, mean negative BMI50 changes were observed among participants with a BMI% >70 at baseline (-0.259 to -0.962). **Conclusions:** We observed consistent findings with several outcome measures, however BMI50, a useful indicator of change for youth at the high end of the BMI distribution, allowed for identification of children who benefited most from prevention strategies. Low-dose parent screening and clinical decision support are feasible and effective strategies for obesity prevention for elementary age children.

**T-P-LB-3775**

**Effectiveness of parent screening before or after well child visits in preventing childhood obesity among toddlers**

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**Background:** Evidence of effective prevention of obesity among toddlers in clinical settings is limited. We aimed to examine the extent to which parent screening of home and environmental risk factors for obesity before (PS→) visits plus computerized clinical decision support (CDS) for pediatricians during well child visits (WCV) improved child body mass index (BMI) compared to usual care (UC) followed by parent screening (→PS). **Methods:** We conducted a cluster-randomized, 2-arm pragmatic trial, where primary care practice site was taken as cluster. We enrolled 1,671 children aged 2 to 5 years from 13 primary care practices in Pennsylvania. Patients were followed up for 1 year. In intent-to-treat analyses, we used linear mixed-effects models to account for clustering by practice and within each person. In 7 practices randomized to PS→CDS, parents completed the Family Nutrition and Physical Activity (FNPA) screening before their child’s scheduled WCV. Pediatricians received FNPA screening results as part of a CDS tool to inform preventive counseling. In 6 practices randomized usual care, parents completed the FNPA screening after their child’s WCV (UC→PS). Change in BMI % (defined as 100 log e (BMI/median BMI) at the 1-year follow-up was the primary outcome. **Results:** A total of 619 children (retention rate:
38% PS→CDS and 32% UC→PS) had 1-year follow-up BMI. At baseline, mean (SD) BMI % was 4.67 (9.99) for PS→CDS group and 1.16 (9.7) UC→PS group (p< 0.001). Regression analysis was used to control for baseline BMI, sex, race, and Medicaid status; compared with the UC→PS arm, BMI % increased more in children in the PS→CDS arm during 1 year, but no statistical difference was detected between groups (0.31 (SE =0.52), p=0.50). *Conclusions:* Pragmatic trials in clinical settings may retain up to one third of pediatric participants at one year. These findings suggest that timing of parent exposure to the low-dose screening tool (before or after well child visits) does not impact child weight outcomes at one year.

**T-P-LB-3776**

*Evidence for Dropping Distress from the Yale Food Addiction Scale (YFAS) Scoring Criteria*  
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**Background:** Recently, no significant relationship was found between YFAS scores and outcome in a weight loss study (Lent, Eichen, Goldbacher, Wadden and Foster, 2014). We suggest that a low rate of distress being endorsed by participants having 3 or more symptoms of food addiction (FA) may be a potential confound. In our sample, 49 of 90 participants (54%) endorsed 3 or more symptoms of FA. Of those endorsing 3 or more symptoms, only 17 (19%) also endorsed experiencing distress. Using distress as part of the criteria, 32 of 49 participants (65%) endorsing 3 or more symptoms of FA would be categorized as not addicted, producing the potential confound.

**Methods:** Ninety participants completed the YFAS prior to undergoing bariatric surgery for weight loss. Participants were categorized as food addicted (FA) or not food addicted (NFA) using the YFAS. Distress was then removed from the criteria and patients were recategorized. The % of total body weight loss (TBWL) is being assessed at 3 mo, 6 mo, 1 yr and 2 yrs post surgery. The TBWL of FA and NFA patients in each categorization are then compared using two sample t-test assuming unequal variance.

**Results:** With distress; TBWL at 3 mo was 17.8% (FA, n=17) vs 17.0% (NFA, n=73) (p=.25). TBWL at 6 mo was 24.2% (FA, n=16) vs 24.5% (NFA, n=69) (p=.44). TBWL at 1 yr was 29.0% (FA, n=13) vs 30.0% (NFA, n=61) (p=.31) Without distress; TBWL at 3 mo was 16.7% (FA, n=49) vs 17.8% (NFA, n=41) (p=.09). TBWL at 6 mo was 23.3% (FA, n=49) vs 25.9% (NFA, n=37) (p=.018). TBWL at 1 yr was 28.1% (FA, n=41) vs 32.7% (NFA, n=33) (p=.007)

**Conclusions:** The YFAS as scored presently is categorizing patients with significant symptoms of addiction as not addicted, diminishing it's utility as a clinical tool. We propose dropping the requirement of distress for categorizing patients as addicted. Doing so resulted in significant predictive utility of the YFAS for weight loss following bariatric surgery. This predictive utility was lost when distress was included.

**T-P-LB-3777**

*Effect of protein supplementation on lean mass, resting energy expenditure and nitrogen balance after bariatric surgery.*  

**Background:** Protein supplementation (PS) after bariatric surgery (BS) is often recommended but its effect on lean body mass (LBM), resting energy expenditure (REE) and nitrogen balance (NB) is unknown. In this pilot study we assessed the feasibility and efficacy of a controlled PS in the early post-operative period.

**Methods:** Body composition (Bod Pod and total body water), REE and a 5-day inpatient NB were measured in subjects prior to and 3 months after BS (RYGB or VSG), while on controlled PS. At surgery, participants were randomized to either high (HPS:1.2g/IBW/d) or standard (SPS: 0.8g/IBW/d) PS, given as protein powder (Unjury®) for 3 months. Calorie and protein intake were strictly controlled during the inpatient stay, and calorie content of stools and diet were analyzed by bomb calorimetry. **Results:** 6 women (BMI=47±5kg/m2, Age=27±6y) were studied. Body weight (126±13kg to 104±13 kg, p=.012) and calorie intake (2157±187kcal vs. 882±130kcal; p=.000) significantly decreased at 3 months. Daily total protein intake did not change after HPS (82.7±6g/d before surgery vs. 80.3±4.5g (n=3) (p=n.s) at 3 months), but decreased significantly after SPS group (-27.4 g/d n=2, p=0.037). As expected, LBM and REE decreased (61±4kg to 55±4kg, p=0.004; 1705±103 to 1466±30 kcal/d, p=.000). Stool N decreased after BS (1.6±0.2g to 0.6±0.3g/d, p=0.03), but not urine N (9.9±2g to 6.8±3g/d,p=ns). Percentage of total calorie intake recovered in stools was not different before and after BS.

**Conclusions:** Our data show feasibility of a controlled 3 months PS after BS. PS at or above requirements may be needed to avoid a negative NB during the active period of weight loss. Follow up studies will determine if variable dose PS and surgery type impact NB and LBM differently 1 year after BS.
**Background:** Antipsychotic drug (APD)-induced metabolic disease has complicated their use in clinical practice. The pathophysiology leading to weight gain and insulin resistance has not been well described. It is unknown whether APD-induced metabolic disturbances are primarily due to the medications or whether the drugs exacerbate underlying adverse metabolic phenotypes intrinsic to the illnesses they are used to treat. We designed a prospective clinical trial to determine mediators of APD-caused weight changes specifically in healthy volunteers. Our hypothesis is that APD-related changes in weight will be associated with measurable changes in food intake, with specifically changes on olanzapine greater than iloperidone greater than placebo. **Methods:** 23 medically and psychiatrically healthy volunteers (BMI 18-25 kg/m2, age 18-35 yrs.) were randomized to twice daily dosing of olanzapine (OLZ) 5mg, iloperidone (ILO) 6mg, or placebo (PBO) for 29 days. Weight was measured at baseline and then weekly for the duration of the 4 week study. Food intake (FI) was assessed via a standardized, laboratory lunch baseline and then weekly for the duration of the 4 week study. No significant change in FI was observed in participants assigned to PBO (N=10)(mean FI change =-128+/-569 kcal, p=0.49) or ILO (N=6)(mean FI change =15+/-529 kcal, p=0.94), but the OLZ group (N=7) had a significant increase in overall FI (meal FI change =268+/-210 kcal, p=0.01). Calories consumed from carbohydrate and fat increased at the trend level (p=0.09) in the OLZ group only. The OLZ group gained significantly more weight than those randomized to ILO or PBO [3.2 kg vs. 0.7 vs. 0.3, respectively (p=.018)] over the 28 day study period. **Conclusions:** After only four weeks of antipsychotic use, clinically significant increases in food intake and weight occur in healthy volunteers exposed to OLZ.

**T-P-LB-3779**

**Dietary fat intake in parents with overweight and obesity and their children: the influence of mom**


**Background:** Strong familial obesity correlations exist, with parental obesity predicting child obesity through early childhood into adulthood. Identifying shared dietary risk factors between parents who are overweight or obese and their children may aid in the development of family-based weight management interventions. **Methods:** 23 heterosexual two-parent families (Mothers: 48.1 ±4.5 years, Body Mass Index (BMI) 33.4 ±4.3 kg/m2; Fathers: 49.0 ±5.7 years, BMI 32.6 ±4.1 kg/m2) with 34 children (58.8% male; 15.4 ±2.2 years, BMI percentile 69.2±21.0) were assessed at entry into an adult weight loss treatment (Weight Watchers) in which only one parent received treatment. All parents were overweight or obese; there was no BMI percentile cutoff for children. Percent energy from fat intake in both children and adults was measured with the National Cancer Institute (NCI) Percentage Energy from Fat (PFat) Screener. Objective height and weight, role as primary grocery shopper and food decision-maker were also assessed. **Results:** Child PFat (31.7 ±4.4%) was associated with maternal PFat (32.6 ±4.0%; b=.49, t(32)=2.7, p<.01) but not paternal PFat (33.6 ±2.9%); although paternal and maternal PFat were associated with each other (b=.767, t(32)=3.402, p Conclusion:** We found some evidence of concordance between maternal and child dietary fat intake; a similar relationship was not observed in father-child diets. Mothers in this study played a more active role than fathers in their household’s grocery shopping and food decisions, likely increasing their influence on child dietary habits. Future research is needed to test whether interventions that build healthy shopping and food preparation skills in parents can break the cycle of familial obesity.

**T-P-LB-3780**

**The Effect of a Very Low Carbohydrate Diet on Triglycerides**

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**Background:** The Ideal Protein Weight Loss Method (IPWLM) is a 4 phase, very low calorie, normal protein, ketogenic (low carbohydrate) diet protocol used for weight loss. Phase 1 of the IPWLM is a partial meal replacement protocol consisting of approximately 900 calories and 40 grams of carbohydrates daily (ketogenic). This phase is continued until target weight is achieved. We sought to quantify the effect on triglycerides after 12 weeks on the Phase 1 protocol. **Methods:** 752 patients enrolled in the IPWLM. Weekly meetings are encouraged with a health coach to review weight loss progress and compliance of following the protocol. Each patient consumes 3-5 Ideal Protein pre-packaged foods per day, vitamin and mineral supplements, 4 cups low glycemic-index vegetables and 8 ounces of lean protein. Daily
dietary intake is approximately 900 calories, 30 grams fat, 45 grams carbohydrates and 100 grams protein. Lipids were measured at baseline and 12 weeks after starting the program. A statistical paired t-test was performed on all data sets. Results: 752 completed at least 12 weeks of this diet with baseline and 12-week fasting lipid panel. Total cholesterol decreased from 185±37 to 163±36 mg/dl (p Conclusion: The IPWLM has powerful effect on lipid abnormalities and can significantly decrease triglycerides.

T-P-LB-3781
Maternal obesity is associated with gain in child BMI and waist circumference, but not overall dietary quality in African American and Dominican youth

Background: Parental factors may contribute to the obesity and dietary habits in youth. We sought to examine the role of maternal obesity and weight change in childhood size and diet among low-income urban youth. Methods: African American and Dominican mothers from the Bronx and Northern Manhattan were enrolled in pregnancy and dyads were followed postpartum (n=327). Maternal weight and child BMI and waist circumference (WC) were measured at child age 7 and 9 y. At 8-12 y, the child’s diet was assessed with the Block Hispanic Food Frequency Questionnaire from which Dietary Approaches to Stop Hypertension (DASH) components and score were derived. Linear regression was used to assess associations between maternal factors [obesity at 7 y, Δ weight from 7-9 y] and child outcomes [Δ BMI and ΔWC from 7-9 y; diet], controlling for covariates, including race, sex and child age, and for dietary models, caloric intake and BMI. Results: At child age 7 y, 41% of women were obese. Maternal obesity at 7 y was associated with a 0.26 unit (p0.1). Maternal obesity was associated with lower child vegetable intake (β=-0.34 cups, p=0.01); but was not associated with continuous DASH-score (β=-0.28, p=0.6), or intake of of sugar sweetened beverages (β=37.3 kcal/d, p=0.1)), fruit juice (β=0.11 cups, p=0.4) or whole fruits (β=0.15, p=0.5). Conclusions: Among low-income urban youth, maternal obesity was associated in increases in child BMI and WC from 7-9 y; however, concomitant changes in maternal weight did not predict child outcomes. Maternal obesity was associated with lower vegetable intake, but was not associated with adherence to the DASH diet or intake of sugar sweetened beverages, juice or fruit. Obesity prevention efforts in low-income urban youth need to be enhanced among children whose mothers are obese.

T-P-LB-3782
Use of real-life data coming from connected scales and wireless blood pressure monitors to assess the impact of weight loss on blood pressure
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Background: Overweight is a strong risk factor for hypertension. Studies have shown that even a modest weight loss could yield substantial benefits for health. Moreover, with the advent of connected-health devices, weight and blood pressure (BP) can now be easily tracked on a daily basis. Our purpose was to assess the impact of a decrease of body mass index (BMI) on BP by a cross-sectional and longitudinal multivariate study. Methods: We used an anonymous database from 27,000 adult owners of both a connected scale and a wireless BP monitor, in more than 100 countries. These devices measured the BMI and the systolic blood pressure (SBP) respectively. Analyses were adjusted on age, frequency of SBP measurements, and frequency of weight measurements. Multivariate linear regressions were used to study cross-sectional and longitudinal associations between BMI and SBP on the entire population. Results: The study cohort is characterized by a mean age of 50.7 ± 11.6 years old and a BMI of 28.6 ± 5.1 kg/m², and is composed of 86% of men and 14% of women. Cross-sectional analyses showed a positive association between SBP and BMI in both sexes (p<10-15). Conclusions: Epidemiological studies and the Framingham study have confirmed the positive relationship between overweight or obesity and high BP. Our study confirms these results using data measured in real life, using connected devices. Moreover, this study shows an objectively evaluated association between an exposure and an outcome in a longitudinal study.

T-P-LB-3783
Children exposure to advertising of food and beverages in the Mexican broadcast television and its relationship with the formation of eating habits
**Background:** The National Health and Nutrition Surveys in Mexico show that between 1999 and 2012, the combined prevalence of overweight and obesity in children between 5-11 years of age, increased from 26.9% to 34.4%. We have identified several factors that may contribute to this increase. Advertising, as one of the factors, has potential implications in the development of socialization, emotional and cognitive behaviors, and it also intervenes in identity formation of children. **Methods:** 780 hours of broadcast television (TV) were recorded, between December 2014 and April 2015 of the four most popular channels in Mexican TV. Analysis and coding of recordings was performed to observe the advertising of food and beverages (F&B). During the same period, 115 surveys were applied to children to identify TV habits and its relationship to their knowledge and consumption of advertised products. **Results:** From the total recorded hours, 23.7% were of advertising. An average of 23.5 ads per hour, were of F&B. Most of the F&B ads were broadcasted during soap operas and movies. The top five advertised F&B categories were, dairy products with added sugar (8.6%), alcoholic beverages (8.5%), breakfast cereals (7.8%), pastries and cookies (7.4%), and sweet snacks (6.9%). Children showed a high knowledge of the characteristics of the advertised products, such as the relationship between character and product (70%), and slogan and product (90%). From the children that reported watching TV, 57.9% stated buying and consuming pastries and cookies. **Conclusions:** Children were highly exposed to F&B ads within their preferred TV channels, and the most advertised products were also those mostly consumed by children.

**T-P-LB-3784**

**Friends, Temptations, Mood and Gender Influence Unhealthy Eating among BMI 30+ Young Adults**

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**Background:** Social environment and internal challenges influence unhealthy food habits in young adults, surrounded by “obesogenic” environments - large servings and high-calorie “junk” foods. We assessed gender and weight differences in food choices and confidence to choose “healthy”. **Methods:** Young adults, aged 21-30 from 2 integrated health systems (urban MI and rural PA), enrolled in a 12-month online randomized dietary intervention, Making Effective Nutrition Choices (MENU GenY). Baseline weight, height, mean fruit (F), vegetables (V), sweet drinks, high-density foods, and self-efficacy against temptations, e.g confidence to eat healthy foods in several situations were compared using T-tests and Chi-square tests. **Results:** Of 1674 enrollees, no gender differences (women 69%, men 31%) emerged in mean F and V intake of 3.0 (SD 1.3) servings/day, or sweet drinks at 1.7 (SD 1.8) drinks/day. By BMI groups, 35 (16%), the heaviest reported less daily F & V (2.7, SD 1.3) than lower weight groups (p < 0.001). Mean sweet drinks were highest for BMI > 35 (2.3, SD 2.31) compared to other groups (p < 0.001). Per episode, BMI 30+ men ate more pizza (3+ slices) and chips (>2 cups) than BMI 30+ women (pizza: 33.9% men vs. 21.3%, p< 0.01; chips 38.3% men vs. 14.4%, p 30 BMI had little/no self-efficacy about healthy choices when tired, depressed, eating with friends or around junk food. **Conclusions:** Understudied busy, “on the go” young adults report challenges influenced by lifestyle. These future role models/parents require interventions that go beyond nutrition knowledge to include managing hunger, emotions and better sleep.

**T-P-LB-3785**

**SWEETENED BEVERAGES INTAKE AND ASSOCIATION WITH METABOLIC SYNDROME COMPONENTS IN MEXICAN YOUNG ADULTS**


**Background:** Metabolic syndrome (MS) prevalence is increasing in Mexican young adults and some dietary factors could have a role in individual components of MS. Therefore, this study evaluate the association between sweetened beverages (SB) intake with components of MS and with uric acid levels. **Methods:** Healthy young adults 18 to 35 years old (n=110) (62% women) were recruited in North-Central Mexico for a cross-sectional study. MS was diagnosed if 3 components had higher cutoff values according to the harmonized criteria [waist circumference (men ≥90cm, women ≥80cm), blood pressure (BP), HDL-cholesterol, triglycerides and glucose]. Weight, height and body composition were evaluated by bioelectrical impedance analysis, and uric acid levels also were obtained. SB intake was measured with a validated food frequency questionnaire. ANOVA was used to compare mean values of MS by tertiles of SB intake and Spearman correlation used for the association between MS components and SB intake. **Results:** The prevalence for MS was 19.1% and the prevalence for altered components were 57.3%, 27.3%, 23.6%, 13.6% and 8.2% for waist circumference, triglycerides, HDL-cholesterol, glucose and blood pressure respectively, uric acid values were (5.45±1.6 mg/dL), and 20% of subjects had
hyperuricemia. SB intake was 284.4 [67-529] mL/day. A positive correlation between SB intake and waist circumference (0.3), uric acid (0.28), triglycerides (.26) and systolic BP (.22) was found (p<0.05). **Conclusions:** This study shows a significant association between SB with individual components of the MS, and with uric acid.

**T-P-LB-3786**

**Improvement in children’s dietary quality after the 2009 revision to the Supplemental Nutrition Program for Women, Infant, and Children (WIC): NHANES 2003-12**

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**Background:** In October 2009, the federal Supplemental Nutrition Program for Women, Infant, and Children (WIC) food package was revised to include more fruits, vegetables, and whole grains, less juice, and preference for low-fat/skim milk. Recently-released data regarding WIC participation from the 2011-12 cycle of the National Health and Nutrition Examination Survey (NHANES) allows for an assessment of dietary quality in children who are the targets of that program. **Methods:** A total of 802 low-income (≤185% of poverty level) children (24-60 months) were studied from cycles before (NHANES 2003-4, 2005-6, 2007-8) and after (2011-12) the policy implementation. Healthy Eating Index (HEI)-2010 was calculated using the average of two 24-hour recalls. Linear regression was used to examine the association between WIC participation and HEI-2010, adjusting for child’s age, gender, race/ethnicity, and weight status. **Results:** Prior to the changes, mean HEI-2010 for children receiving WIC (50.9, 53.9, 51.8) was no different from that of non-participants (45.2, 49.4, 50.1) in any given cycle (all p>0.05). In 2011-12, mean HEI-2010 was higher for WIC participants (57.2, SE 1.4) than for non-participants 50.1 (SE 1.9) (p= 0.01), and WIC participation was associated with +7.1 points in HEI-2010 in adjusted analysis (95% CI [2.8, 11.5]).

**T-P-LB-3787**

**Mediterranean diet is protective against weight gain in postmenopausal women**

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**Background:** It is unclear which of the low-fat diet, the low-carbohydrate diet, the Mediterranean diet and the USDA Dietary Guidelines for Americans (DGA) diet is protective against weight gain in postmenopausal women. **Methods:** Four dietary patterns were characterized among postmenopausal women in the Women’s Health Initiative Observational Study: 1) the low-fat diet; 2) the low-carb diet; the Mediterranean diet; and the USDA DGA. The discrete-time hazard for weight gain (≥10% from baseline) was compared among high-adherers of each diet pattern. The Healthy Eating Index (HEI) was used to ascertain adherence to the DGA. The Alternative Mediterranean Diet index (A-Med) was used to ascertain adherence to the Mediterranean diet. Quintiles were used to characterize the low-fat and low-carbohydrate diets, with those in the bottom quintile representing high-adherers. Likewise, those in the top quintiles of A-Med and HEI scores were considered high-adherers of the Mediterranean and DGA diets, respectively. All statistical models were adjusted for total energy intake. **Results:** The Mediterranean diet pattern (OR: 0.82; 95% CI: 0.72, 0.93) was most protective against weight gain, followed by the USDA DGA diet pattern (OR: 0.83; 95% CI: 0.72, 0.96) (compared to the low-fat diet pattern (referent)). The low-carb diet pattern was not related to weight gain (OR: 0.94; 95% CI: 0.83, 1.08). No single diet was protective against weight gain among those who were class II (BMI: ≥35.0 – 49.9 kg/m2) or III obese (BMI: ≥40.0 kg/m2) at baseline, although the Mediterranean diet pattern was protective against weight gain among those who were normal weight (OR: 0.81; 95% CI: 0.71, 0.93), overweight (OR: 0.80; 95% CI: 0.68, 0.94), and those who were obese class I (OR: 0.66; 95% CI: 0.49, 0.87) at baseline. **Conclusions:** These findings suggest that following a Mediterranean diet may be protective against weight gain independent of caloric intake, but only among those who are normal weight to obese class I at baseline.

**T-P-LB-3788**

**Does milk portion size or energy density affect preschool children’s intake at a meal?**

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**Background:** Increasing the portion size and energy density (ED) of food has been shown to increase preschool children’s energy intake; however, it is unknown whether variations in milk portion size and ED affect meal intake. **Methods:** Using a 2-by-2 crossover design, we investigated the influence of changes in milk portion size and ED on preschool children’s intake at a meal. Lunch was served once a week for 4 weeks in childcare classrooms.
and was consumed ad libitum by 125 children aged 3-5 y (67 boys and 58 girls). Across the 4 meals, milk was varied in portion size (9 or 6 fl. oz.) and ED (3.25% whole fat [0.61 kcal/g] or 1% low-fat [0.42]). The foods served at the meal (chicken, pasta, broccoli, and bananas) were not varied. Results: Serving the larger portion of milk increased milk energy intake by 20±3 kcal (27%; P<0.01). Conclusions: Serving larger portions can be used as a strategy to promote intake of nutrient-dense beverages such as milk. Children’s energy needs, however, should be considered when choosing the type of milk to serve, since the ability to adjust intake in response to variations in ED differs between children.

T-P-LB-3789
A Retrospective Analysis of the Impact of Weight Loss on Renal Function
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Background: Approximately 66% of Americans are overweight with half classified as obese. Obesity is an independent risk factor for the progression of chronic kidney disease and weight loss has been correlated with improved renal function and reduced obesity related glomerulonephropathy. This study investigated the effect of a medically supervised weight loss program on renal function among patients at baseline and following 12 weeks of therapy.

Methods: This study was a retrospective analysis of adults voluntarily enrolled in a physician-directed community based weight management program. Patients consumed 800 kilocalories per day, attended weekly behavioral education classes, and expended at least 300 kilocalories per day in physical activity. The primary outcome of improved renal function was assessed by comparing weight loss and GFR. A sub analysis comparing renal function and weight loss in diabetic and non-diabetic patients was conducted. Results: A total of 71 patients with an average weight of 286 pounds, BMI of 53, and baseline GFR of 29 were included. Following 12 weeks of therapy, 80% improved in stage, 19% remained within the same stage, and 2% progressed to a higher stage. Analysis revealed a positive correlation of 0.29 between weight loss and GFR (p=.0289). Non-diabetic patients lost 37 pounds and improved in GFR by 11. In contrast, diabetic patients lost 30 pounds and improved in GFR by 6. However, there was no statistically significant difference in weight loss and improved GFR between diabetic and non-diabetic patients.

Conclusions: Organized weight loss programs are a viable treatment modality for prevention of co-morbid disease progression. This study indicated a positive correlation between weight loss and improved renal function, with the majority of patients exhibiting an improvement in chronic kidney disease stage. Further research needs to be conducted to determine the etiology of improved renal function associated with weight loss.

T-P-LB-3790
Effective intensive lifestyle therapy for people with obesity and type 2 diabetes can be provided in a worksite setting
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Background: Weight loss and exercise are recommended for people with type 2 diabetes (T2D). However, providing effective lifestyle therapy in a clinical setting is difficult because of lack of clinical expertise, patient inconvenience and non-adherence.

Methods: We conducted an 8-month randomized controlled trial to determine whether an intense Lifestyle Intervention Program (LIP) delivered in a worksite setting can improve insulin sensitivity (assessed by hyperinsulinemic-euglycemic clamp with glucose tracer), cardiopulmonary fitness (peak oxygen consumption [VO2 peak]), and muscle strength (1-repetition maximum of 5 muscle groups) in employees with obesity and T2D. Subjects were randomly assigned to the LIP (n=5, BMI=36.9±7.1 kg/m2, HbA1c=6.7±0.6%) or standard care (SC) of exercise and diet advice alone (n=5, BMI=38.5±4.5 kg/m2, HbA1c=7.2±0.7%). The LIP involved a 1-h behavioral-diet education session and four 1-h supervised exercise training sessions every week, conducted immediately before or after work. The energy deficit diet provided a protein intake of 1.1 g/kg/d, achieved by consuming 8 eggs/wk and dairy foods. The SC group received dietary and physical activity instructions recommended by the American Diabetes Association, and were seen monthly to monitor body weight and medications.

Results: LIP subjects’ attendance at behavioral-diet education and exercise sessions were 96±5% and 87±6%, respectively. Compared with the SC group, LIP subjects had greater weight loss (-14.0±5.4% vs. +0.7±2.0%, P<0.01). Conclusions: These data demonstrate that an intensive LIP conducted in a worksite setting markedly improves metabolic and physical function in people with obesity and T2D.
T-P-LB-3791
Non-Immersive Virtual Reality Gaming to Promote Weight Loss Management amongst African-American Women in the Diabetes Prevention Program
Adam Perzynski Cleveland OH, Roger Williams Bedford OH, Panala Murphy Bedford Ohio, Rachel Stoneking Cleveland OH, Misty Harris Morgantown West Virginia, Adam Zehnder Cleveland Ohio, Linda McVey Lorain OH, Joslyn Coats, Christopher Hebert Cleveland OH

Background: Effective behavioral interventions for obesity have been impeded by poor adherence among racial and ethnic minorities. We conducted a pilot study combining the Diabetes Prevention Program (DPP) with a Non-Immersion Virtual Reality (VR/Avatar) exercise gaming system (video cameras and a motion sensor). Participants control the gaming console using body movement, and see a life like avatar moving in real-time during exercise. The aims of this pilot were to demonstrate feasibility of the VR/Avatar gaming approach and show preliminary efficacy in promoting adherence to DPP and promoting weight loss among African American adult women. Methods: We hypothesized that patients would enjoy exercising using the gaming console, have regular attendance at DPP, and lose weight by the end of 16 weeks of the core program. A total of 20 African American women deemed eligible by physicians have been enrolled. A gaming coach/technician visited homes to setup and demo the gaming system between weeks 6 and 8 of DPP. Attendance at DPP sessions, total exercise minutes, gaming exercise minutes, exercise self-efficacy and body weight were measured. Results: As of this writing the first cohort of 8 participants (aged 56-72) had completed 16 weeks of DPP with no attrition. Mean baseline BMI was 36.8. From weeks 9-16, subjects averaged 215 weekly exercise minutes, including 47 minutes of VR/Avatar gaming. All participants lost weight, mean weight loss was 9.8 lbs (SD=4.8), 4.5% body weight (SD=2.1). Focus group analysis indicated enthusiasm for VR/Avatar gaming as a way to ease into and continue exercising in the privacy of one’s own home with “anytime” convenience. Participants reported increased confidence, and cognitive and stress reducing benefits from using the gaming system. Conclusions: In preliminary evidence, VR/Avatar fitness gaming is a feasible and efficacious method for promoting adherence to DPP, exercise and weight loss among older African American women.

T-P-LB-3792
Intention-to-Treat audit of the UK NHS Counterweight-Plus Weight Management Service

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Background: Counterweight-Plus, developed under Scottish Government funding aims to achieve and maintain >15kg weight loss, to address national SIGN-Guidelines for adults with severe and complicated obesity (BMI>35kg/m2, or >30kg/m2 with secondary metabolic diseases). Methods: Counterweight-Plus, delivered in public and private-health services by trained dietitians uses behaviour-change techniques and supporting resources for 3 phases: Total-Diet-Replacement (nutritionally-complete formula of ~850kcal/day): normally 12weeks but up to 20weeks if necessary, Food-Reintroduction: 6-12 weeks, Weight-Loss-Maintenance: 12months. Outcomes to May 2015 are presented from a pre-planned ongoing audit of all patients entered into the rolling programme. Results: Baseline data: n=152 (26% men), mean age 47y, BMI=46kg/m2, 34% diabetes. From entry, at 3m, 77% lost >5kg, 50% >10kg, 24% >15kg; at 6m, 58% lost >5kg, 42% >10kg, 27% >15kg; at 12m, 37% maintained loss >5kg, 26% >10kg, 14% >15kg. These results are conservative, as the proportion of patients failing to provide data (included in the denominator for % results) rose from 10% at 3months, 33% at 6 months to 51% at 12months. Mean weight-change for those providing data at the end of each phase were: Total-Diet-Replacement -12.2kg (n=133); Food-Reintroduction -14.7kg (n=86); Weight-Loss-Maintenance -13.3kg (n=56) Lower numbers at latter programme phases influenced by rolling recruitment as well as follow up rates. Outcomes for patients with type 2 diabetes were as good, or better, than for non diabetics at each time-point. Conclusions: Weight loss >15kg at 12months is achievable, using non-surgical methods, for a valuable proportion. Loss to follow-up is less than in comparable published specialist weight management services, but remains an issue. Audit of local follow-up rates is helping to identify and resolve causes of variation in follow up and outcomes.

T-P-LB-3793
Long term consumption of a very low carbohydrate diet does not adversely affect cognitive performance in individuals with type 2 diabetes

Jeannie Tay Adelaide South Australia, Ian Zajac Adelaide South Australia, Campbell Thompson Adelaide SA, Natalie Luscombe-Marsh Adelaide SA, Vanessa Danthiir Adelaide South Australia, Manny Noakes Adelaide BC south Australia, Jonathan Buckley Adelaide South Australia, Gary Wittert Adelaide South Australia, Grant Brinkworth Adelaide South Australia

Background: Counterweight-Plus, developed under Scottish Government funding aims to achieve and maintain >15kg weight loss, to address national SIGN-Guidelines for adults with severe and complicated obesity (BMI>35kg/m2, or >30kg/m2 with secondary metabolic diseases). Methods: Counterweight-Plus, delivered in public and private-health services by trained dietitians uses behaviour-change techniques and supporting resources for 3 phases: Total-Diet-Replacement (nutritionally-complete formula of ~850kcal/day): normally 12weeks but up to 20weeks if necessary, Food-Reintroduction: 6-12 weeks, Weight-Loss-Maintenance: 12months. Outcomes to May 2015 are presented from a pre-planned ongoing audit of all patients entered into the rolling programme. Results: Baseline data: n=152 (26% men), mean age 47y, BMI=46kg/m2, 34% diabetes. From entry, at 3m, 77% lost >5kg, 50% >10kg, 24% >15kg; at 6m, 58% lost >5kg, 42% >10kg, 27% >15kg; at 12m, 37% maintained loss >5kg, 26% >10kg, 14% >15kg. These results are conservative, as the proportion of patients failing to provide data (included in the denominator for % results) rose from 10% at 3months, 33% at 6 months to 51% at 12months. Mean weight-change for those providing data at the end of each phase were: Total-Diet-Replacement -12.2kg (n=133); Food-Reintroduction -14.7kg (n=86); Weight-Loss-Maintenance -13.3kg (n=56) Lower numbers at latter programme phases influenced by rolling recruitment as well as follow up rates. Outcomes for patients with type 2 diabetes were as good, or better, than for non diabetics at each time-point. Conclusions: Weight loss >15kg at 12months is achievable, using non-surgical methods, for a valuable proportion. Loss to follow-up is less than in comparable published specialist weight management services, but remains an issue. Audit of local follow-up rates is helping to identify and resolve causes of variation in follow up and outcomes.
Background: The type 2 diabetes (T2D) epidemic has increased the prevalence and use of very low carbohydrate (LC) diets as a treatment strategy. However there is limited data examining the long term effects of LC diets on cognitive function, particularly in individuals with T2D, who have increased risk of cognitive impairment and dementia. Methods: 115 adults with T2D (66 males, BMI:34.6±4.3kg/m2, age:58±7yrs, HbA1c:7.3±1.1%, diabetes duration:8±6yrs) were randomised to consume either a hypocaloric, very low carbohydrate, low saturated fat (LC) diet (14% energy as carbohydrate [CHO]) or a hypocaloric, low carbohydrate, high saturated fat (HC) diet (33% CHO). Results: Overall weight loss was (mean[95%CI]:-9.3[-10.6,-8.0]kg) and improvement in HbA1c was (-1[-1.2,-0.8]%). No difference between groups (P=0.18). Over 52 weeks, scores for memory scanning, digit symbol substitution and reasoning speed improved (P≤0.03 time), and word endings and word list recall decreased (P≤0.005 time). All other cognitive scores remained unchanged (P≥0.07). There was no effect of diet composition on any of the cognitive constructs assessed (P≥0.24 time x diet). Conclusions: In adults with obesity and T2D, both LC and HC weight loss diets combined with exercise training had similar effects on cognitive performance. This confirmsthat there are no adverse effects of long term consumption of an LC diet on cognitive performance.

T-P-L.B-3794
Rapid and reversible postprandial suppression of plasma adropin concentrations following a high carbohydrate meal in humans
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Background: Adropin is a small peptide hormone involved in metabolic and cardiovascular homeostasis. Studies in mice suggest diet composition affects plasma adropin concentrations, however the impact of feeding in humans has not been well studied. Here we report results from a pilot study showing a transient inhibitory response to a high carbohydrate meal in humans. Methods: Plasma adropin concentrations were measured at baseline (T=0) and then T=30, 60 and 90 minutes post-meal in nine sedentary individuals (5 males, 7 females) with type 2 diabetes (mean±SD; BMI 33.9±5.4 kg/m2; age 58.4±6.9 yr, HbA1c 6.8±0.4%, fasting glucose 128±32 mg/dL). A commercial EIA previously validated by our laboratory was used for this study (1). After an overnight fast, participants consumed a 403 kcal meal containing 59% energy as carbohydrate (2/3 as simple sugars), 31% fat and 10% protein. The study had an exercise arm (7d program of walking on a treadmill or cycling on a recumbent bike for 1h/d at 60% at heart rate reserve).

Results: Analysis by repeated measures indicated a significant meal effect (F3,14=6.177, P=0.05) (mean±SE plasma adropin concentrations at T0, pre-exercise, 2.73±0.30 ng/ml; post-exercise, 2.94±0.30 ng/ml). Plasma adropin levels at T=30 and T=60 were 13% and 14% lower compared to baseline (mean±SE of the delta in plasma adropin concentrations in ng/ml at T=30, -0.37±0.13 ng/ml; at T=60, -0.41±0.19 ng/ml, returning to normal levels at T=120 (~0.01±0.22 ng/ml). Conclusions: These are the first results suggesting an acute response of plasma adropin to nutrient intake in humans. Studies in mice indicate specific responses to dietary macronutrients, with sucrose having an inhibitory effect. Further studies examining the postprandial response of plasma adropin concentrations in healthy volunteers to different macronutrients are clearly warranted.

T-P-L-B-3795
Des-acyl ghrelin inhibits estrogen production and the proliferation of breast cancer cells in 3D cultures, ex vivo and in vivo.
CheukMan Cherie Au Clayton VIC, Kara Brit Melbourne VIC, John Furness Parkville Vic, Sari Makela Turku -, Kristy Brown Clayton Victoria

Background: In postmenopausal women, obesity is associated with an increased risk of estrogen receptor-positive (ER+) breast cancer. Aromatase converts androgens into estrogens and its expression in the breast adipose is a major driver of estrogen-dependent cancers in older women. Ghrelin, a gut-hormone involved in the regulation of appetite, is known to mediate its effects through its cognate receptor, GHSR1a. The unacylated form of ghrelin, des-acyl ghrelin (DAG), binds weakly to GHSR1a but has been shown to play an important role in regulating a number of physiological processes, including glucose homeostasis. We have recently demonstrated that DAG inhibits aromatase mRNA in primary human adipose stromal cells. The aim of the current study was to determine whether DAG also inhibits aromatase and breast cancer cell growth in vitro, ex vivo and in vivo. Methods: Effects of DAG on aromatase promoter and enzyme activity were measured in a humanized aromatase promoter reporter mouse and human ER+ breast cancer explants, respectively. Effects of DAG on human breast cancer cells (ER+: MCF7, ZR75; ER-: MDA-MB-231) were measured in 3D cultures and in xenografted nude mice, as well as in a syngeneic model of breast cancer (FVB/J110), by monitoring tumor growth and EdU incorporation. DAG was administered daily by s.c. injections.

Results: DAG (10, 100pM) inhibits aromatase activity in ER+...
Background: Although weight management is an important component of T2DM management, it remains a challenging goal for most patients. CANA has been shown to improve glycemic control and weight in patients with T2DM. This study leveraged an EHR database to evaluate body weight at different time points among patients with T2DM receiving CANA in a real-world setting. Methods: Adult patients with ≥1 T2DM diagnosis and ≥12 months of clinical activity (baseline) before first CANA prescription (index) were identified in the Cegedim Strategic Data US EHR dataset. Body weight (BW) was assessed during baseline and at 3 and 12 months post-index. Pairwise comparisons were made to compare BW at baseline and each time point using paired t-tests. Proportions of patients with a weight loss ≥5% from baseline were reported overall and in a subset of patients with baseline BMI≥30 kg/m². Results: A total of 16,163 CANA users were identified (35% CANA 300 mg users, 48% female, mean age: 59 years, 76% white, mean Charlson Comorbidity Index: 1.4, mean Diabetes Complications Severity Index: 0.7). At baseline, 90% of patients used ≥1 antihyperglycemic agents and 35% of patients used insulin. Mean exposure to CANA was 155.6 days. Among patients evaluated at 3 months (N=6,811; mean baseline BW=102.9 kg), BW decreased from baseline by 1.8 kg (P<0.001). Conclusions: Our findings suggest that des-acyl ghrelin may be useful for the treatment and prevention of obesity-related breast cancer.

T-P-L.B-3797

Voluntary exercise training improves metabolic symptoms and hypothalamus function in high fat diet treated mice

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Background: Exercise training plays a critical role in the regulation of glucose homeostasis and body weight, especially under obesity conditions induced by western style food and lack of daily physical activity. However, the central nervous system’s mediated mechanism of exercise training on metabolic function has not been fully understood. Methods: This study was conducted by using C57BL6 male mice for normal chow diet, high fat diet treatment and high fat diet along with voluntary running wheel exercise training for 12 weeks. Metabolic function was examined by using the Comprehensive Lab Animal Monitoring System and magnetic resonance imaging; phenotypic analysis included measurements of body weight, food intake, glucose and insulin tolerance tests, as well as insulin and leptin sensitivity studies. Immunohistochemistry was utilized to identify amount changes for phosphorylation of STAT3 and POMC neurons in the hypothalamus. Results: 3 months of voluntary exercise training partially reduces body weight gain and adiposity induced by a high fat diet. This is mainly done via increased energy expenditure despite normal energy intake. Local and systemic insulin sensitivity was also enhanced in the exercise training group verses the high fat diet group. Additionally, 3 months high fat diet completely disrupted leptin induced phosphorylation of STAT3 in the arcuate of the hypothalamus, a key area controlling energy balance, voluntary exercise training could partially reverse leptin induced phosphorylation of STAT3 in the arcuate of the hypothalamus. Furthermore, the POMC neuron number is significantly reduced in high fat diet treated mice, and this reduction is remarkably restored by exercise training compared with the high fat diet treatment alone. Conclusions: Taken together, our data suggests that voluntary exercise training improves metabolic symptoms induced by high fat diet, in part through enhanced hypothalamic function that regulates whole body energy hemostasis.

T-P-L.B-3798

Ventilatory Responses during Submaximal Exercise in Children with Prader-Willi Syndrome

Alexandre Slowetzky Amaro Fullerton CA, Alexandre Slowetzzy Amaro São Paulo São Paulo, Frank Chavoya Fullerton CA, Daniela Rubin Fullerton CA

Background: Prader-Willi Syndrome (PWS) is a genetic neurobehavioral disorder that can result in morbid obesity. Hypoventilation under hypercapnic and hypoxic conditions at rest and during sleep has been well documented in children with PWS but not during exercise. This study examined ventilatory responses in children with PWS during submaximal exercise. Methods:
Participants included eight children with PWS (age = 11.1 ± 0.8 y; height [H] = 147.8 ± 8.2 cm; body mass [BM] = 44.7 ± 11.7 kg; total body fat % [BF%] = 37.2 ± 11.4). Seven participants with PWS were on growth hormone replacement therapy. The controls were ten obese (OB) children (Age= 10.6 ± 1.1 y; H= 151.1 ± 9.6 cm; BM = 62.1 ± 14.6 kg; BF% = 44.5 ± 3.7) and nine lean (L) children (Age= 9.8 ± 2.0 y; H= 142.9 ± 20.5 cm; BM = 35.4 ± 11.3 kg; BF%= 22.2 ± 8.6). Participants completed three 5 min bouts on a treadmill at 2.0, 2.5 and 3.0 mph in a randomized order with a 6 min seated rest period in between. Expiratory gases for the last 2 min at each speed were analyzed for VE, VCO2, VO2, and respiratory rate (RR); heart rate (HR) was measured via telemetry. Statistical differences at p<0.05. **Results:** PWS had a greater HR and RR compared to OB and L in all trials. PWS had greater METs than OB at 2.0 and 3.0 mph but similar to lean. PWS had greater VE than L at 2.5 and 3.0 mph and same as OB for all trials. PWS had greater VCO2 than L at 3.0 mph only; no significant differences were found for VE/VCO2. **Conclusions:** The exercise placed a greater metabolic cost in PWS and L than OB. The greater HR and ventilatory responses in PWS suggest a greater excitatory stimulus to the control centers. The increase in VE with increased workload and VCO2 suggest normal responses during submaximal exercise. GHRT might have played a role in these responses but our study was not powered to test this.

**T-P-LB-3799**

**Preliminary Validation of the Yale Food Addiction Scale 2.0 in a Hispanic, bariatric surgery-seeking population**

Jessica Lawson Hoboken New Jersey, Rachel Goldman New York NY, Rachel Rabinowitz Bronx NY

**Background:** The leading food addiction (FA) theory suggests that some diagnoses of obesity and disordered eating may be the result of an addictive response to palatable, processed foods. Acculturation level and ethnic identity play critical roles in eating behaviors, however, these factors are not yet fully understood in the context of food addiction. Our objective is to report on the early results of a cross-cultural longitudinal study assessing food addiction in a clinical Hispanic bariatric surgery-seeking population. **Methods:** Participants (n=157) were Hispanic adults presenting for bariatric surgery at Bellevue Hospital Center in New York, NY. Participants completed the Yale Food Addiction Scale [YFAS] 2.0, the Short Acculturation Scale for Hispanics, and a comprehensive demographic form. Our sample for this preliminary analysis is comprised of 84% women, (mean age = 38 years old, SD = 11.75; mean BMI = 42.83, SD = 6.69), of whom 51% are English speaking and 49% are Spanish speaking. The majority (80%) reported living in the U.S. for over 10 years, however 58% identified with lower U.S. acculturation. **Results:** Descriptive statistics revealed that 54.1% did not meet YFAS 2.0 criteria for food addiction and 5.1%, 5.7% and 28% met criteria for mild, moderate and severe food addiction, respectively. Missing data accounted for 7%. Independent samples t-test, conducted to compare BMI and acculturation level, revealed that more acculturated participants (M=45.52, SD = 7.42) had a significantly greater BMI compared to less acculturated participants (M=40.91, SD = 5.94), t=-4.08 (149) p = .000. **Conclusions:** Preliminary results suggest that food addiction may present differently by culture. Similar studies conducted with Caucasian participants reflect higher incidence of FA compared to the Hispanic sample in this study. We aim to attain a complete sample size of 440 and these preliminary findings will be updated to reflect more extensive, descriptive cross-cultural analyses within this clinical population.

**T-P-LB-3800**

**Ethnic/Racial Differences in Visceral and Liver Fat Distribution in the Multiethnic Cohort Study**

Unhee Lim Honolulu Hawaii, Kristine Monroe Los Angeles California, Thomas Ernst Honolulu HI, John Shepherd San Francisco CA, Lynne Wilkens Honolulu HI, Loic Le Marchand Honolulu Hawaii

**Background:** Ethnic minorities, compared to whites, experience a greater metabolic disease burden for a given level of excess adiposity. In the Multiethnic Cohort Study (MEC) of over 215,000 men and women since 1993, the BMI-associated cancer and diabetes risks vary across ethnicities. Thus, we compared body fat distribution among the five ethnic groups in the cohort. **Methods:** Healthy MEC participants aged 60-73 years were recruited from each sex and ethnic group (African American, Japanese American, Native Hawaiian, Latino, white; 30 per group, 300 in total) to undergo a whole-body DXA and abdominal MRI scan and anthropometric measurements. Recruitment was balanced across BMI levels (18.5-40 kg/m2) within each sex/ethnic **Results:** By study design, mean BMI (28kg/m2) was similar for men and women and across ethnicities (p=0.80). Total percent body fat was higher in women (40%) than in men (27%), and differed by ethnicity only in women (p=0.007). Visceral fat area at L3/L4 in men, adjusted for total body fat and age, was the largest among Japanese Americans (247cm2), followed by whites (207cm2), Latinos (198cm2), Native Hawaiians (194cm2) and African Americans (158cm2) (p-heterogeneity =0.0002). In women, differences were even greater among Japanese Americans.
Methods: gender and race subpopulations over the past two decades.

Adult Obesity Epidemic. Thus, we explain obesity patterns across quantifying the energy imbalance gap responsible for the England System Dynamics model, previously developed by the authors, to Saeideh Fallah-Fini T-P-LB-3801 burdens.

Among ethnic groups may in part explain their metabolic disease differences in body fat distribution observed (120cm²) and African Americans (90cm²) (p-value.

(183cm²), Native Hawaiians (149cm²), whites (134cm²), Latinas (120cm²) and African Americans (90cm²) (p-het. Conclusions: The substantial differences in body fat distribution observed among ethnic groups may in part explain their metabolic disease burdens.


Background: The energy imbalance gap captures the average daily excess energy intake, defined as total intake minus total expenditure for some unit of time. It is a critical parameter in the energy system, governs the speed of change in body mass, provides intervention targets, and enables estimating contribution of different causes of obesity. We apply a novel population-level System Dynamics model, previously developed by the authors, to quantify the energy imbalance gap responsible for the England adult obesity epidemic. Thus, we explain obesity patterns across gender and race subpopulations over the past two decades.

Methods: The System Dynamics model divides the England adult population into 1 subpopulations based on gender and race, and further into J BMI groups. Transition rates between BMI groups for each subpopulation are defined as a function of metabolic dynamics of individuals in these groups. The energy intake in group IJ at any time t is then estimated as a multiplication of the equilibrium energy intake of individuals in that group by an energy gap multiplier. The energy gap multiplier for each subpopulation is estimated (through calibration) by maximizing the match between simulated BMI distributions for each subpopulations against data from Health Survey for England using maximum likelihood estimation. Results: Our preliminary results for white adult females, as an example, suggest an increase in magnitude of the energy gap over the 1990s followed by a drop in energy gap over the past decade, with no negative value for energy gap suggesting that obesity epidemic continues to worsen, albeit at a slower rate. We have applied our method to other subpopulations observing different patterns in energy imbalance suggesting different trends in future obesity prevalence for different gender/races.

Conclusions: We show how system dynamics models can be coupled with population data sets to develop useful tools that can support researchers and policy makers.

T-P-LB-3802 Biomarker Predictors of Body Fat Distribution in the Multiethnic Cohort Study Unhee Lim Honolulu Hawaii, Adrian Franke Honolulu Hawaii, John Shepherd San Francisco CA, Thomas Ernst Honolulu HI, Lynne Wilkens Honolulu HI, Loic Le Marchand Honolulu Hawaii

Background: Abdominal fat, especially visceral fat, is associated with a high metabolic risk. To better understand the metabolic effects of body fat distribution, we examined various biochemical markers and identified best correlates of total and regional body fat. We also assessed whether the biomarkers contribute to estimating body fat depots beyond the approximation commonly provided by BMI and waist measures. Methods: Three hundred healthy Multiethnic Cohort participants, aged 60-73 years, were recruited evenly from 10 sex and ethnic groups (African American, Japanese American, Latino, Native Hawaiian, white) across a wide BMI range (18.5-40 kg/m²). They underwent a whole-body DXA and abdominal MRI scan, anthropometric measurements, and overnight fasting blood draw. Over 120 biomarkers (adipokines, cytokines, insulin and IGFs, lipids and lipid-soluble micronutrients, and steroid hormones) were analyzed and included, along with BMI, waist circumference (WC) and waist/hip ratio (WHR), in Random Forest models predicting total, abdominal, visceral and liver fat amounts. Results: The sample included a wide range of percent total fat (12%-53%), WHR (0.67-1.09), android/gynoid fat ratio (0.52-1.71), and percent liver fat (0.2%-24.5%) values. Prediction of total and abdominal fat prediction by BMI, WC, and WHR was not improved with the addition of the biomarkers. Prediction of visceral fat by anthropometry was improved slightly with the biomarkers, by 4% in men and 17% in women. Visceral fat area at L3L4 was best predicted by insulin and the lipid-soluble carotenoid beta-carotene in men and additionally by alpha-cryptoxanthin in women. The prediction of liver fat was substantially improved with the addition of biomarkers, by 39% in men and 282% in women. Percent liver fat was best predicted by triglycerides, insulin, beta-carotene, and alpha-cryptoxanthin.

Conclusions: Biomarkers are useful in improving the prediction of visceral and liver fat from what was approximated by BMI and waist size.

T-P-LB-3803 Short-term Exposure to a High Fat High Sucrose Diet Results in Rapid Intramuscular Fat Deposition and an Altered Inflammatory Environment Kelsey Collins Calgary Alberta, David Hart Calgary Alberta, Raylene Reimer Calgary AB, Walter Herzog Calgary Alberta

Obesity 2015, The 33rd Annual Scientific Meeting of the Obesity Society
Background: Sarcopenia is observed in obese patients, but the influence of obesity on muscle loss is not well understood. The purpose of this study was to assess rapid changes in the vastus lateralis (VL) muscle of rats following short-term exposure to a high fat high sugar diet. Methods: 30 male rats were allocated to a high fat/high sucrose diet group (HFS, 40% fat 45% sucrose) and sacrificed after 3 days (3D), 1-week (1W), 2-weeks (2W), 4-weeks (4W) or to a control group (chow, 13.5% fat). Animals were 14-16 weeks of age at sacrifice. Body fat (Dual Energy X-Ray Absorptiometry), and VL mass (g), VL intramuscular fat infiltration (Oil Red O) and molecular changes (RT-qPCR) were assessed. VL muscles were frozen, stained with Oil Red O, imaged and quantified (10x) using a custom MatLab program. Kruskal-Wallis tests were performed, where each group was compared to control at α=0.05. Results: 1W animals had more body fat than chow, whereas 2W and 4W had more body mass and body fat (p<0.05). Conclusions: VL muscle composition and molecular changes are observed as early as 3 days on HFS diet. Fluctuating mRNA expression levels of oxidative stress, inflammatory, atrophy, and anabolic markers suggest that a muscular adaptation process occurs in response to metabolic challenge. Early intervention focusing on muscle may mitigate onset and progression of sarcopenia in obese individuals.

T-P-LB-3804

Adipose tissue stromal cells as predictors of metabolic disease and weight loss outcomes in obese bariatric surgery patients

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Background: Predictors of metabolic disease risk and weight loss intervention outcomes remain elusive. The goal of this study was to determine if adipose tissue stromal cell frequencies in obese patients undergoing bariatric surgery correlate with diabetes and surgical outcomes. Methods: Visceral and subcutaneous adipose tissues (VAT, SAT) were collected from diabetic (DM) and non-diabetic (NDM) obese patients undergoing bariatric surgery. Adipose tissue macrophages (ATM) and preadipocytes (PA) frequencies were analyzed with flow cytometry. CD206+CD11c-, CD206-CD11c+, and CD206+CD11c+ATM, and CD31-CD34+PA were studied, along with CD140a+ and CD140a- subpopulations within the CD31-CD34+PA parent population. Cell frequencies were correlated with diabetes prevalence at the time of surgery and with percent excess and total weight loss (EWL/TWL) 6 months after surgery. Results: 26 DM and 38 NDM patients were studied (mean age: 48, mean BMI: 45, 58% female). Mean percent TWL and EWL at 6 months were 22% and 53% respectively. CD206+CD11c- ATM and CD31-CD34+PA frequencies were increased in VAT but not SAT in DM subjects. Weight loss correlated with increased CD11c+ATM frequency in SAT and with increased PA frequency in VAT. No correlations between diabetes or weight loss were observed with CD206-CD11c+, and CD206+CD11c+ATM subpopulations in VAT or SAT. No differences in CD140a+ and CD140a-PA subpopulation frequencies in VAT or SAT were observed between DM and NDM subjects. Conclusions: Diabetes is associated with increased VAT CD206+ ATM and decreased VAT PA. Increased SAT CD11c+ ATM and VAT PA frequencies correlated with greater weight loss after bariatric surgery. Adipose tissue stromal cells have the potential to predict metabolic disease risk and weight loss responses and may contribute to variation in outcomes after bariatric surgery.

T-P-LB-3805

Effect of diet induced obesity on adipose tissue metabolism in sarcolipin knockout mice

Rebecca MacPherson Guelph Ontario, Daniel Gamu Waterloo Ontario, Laura Castellani Guelph ON, Russell Tupling Waterloo Ontario, David Wright Guelph Ontario

Background: Sarcolipin (SLN) regulates muscle-based non-shivering thermogenesis and is up-regulated with high-fat feeding. SLN-knockout mice develop greater diet-induced obesity and glucose intolerance and this is accompanied by increases in circulating catecholamines and fatty acids. Given the purported role of catecholamines and fatty acids in the pathology of adipose tissue inflammation we sought to investigate indices of adipose tissue inflammation in high fat fed SLN knockout mice. Methods: Mice (wild type and SLN KO) were fed a HFD (42% kcal from fat) for 8 weeks to induce obesity and glucose intolerance. Results: SLN KO mice displayed greater obesity and glucose intolerance. This was accompanied by higher circulating epinephrine (4.1±1.0 ng/ml KO vs 2.1±0.3 ng/ml WT; p

Conclusions: High fat feeding of SLN KO mice results in adipose tissue inflammation and macrophage infiltration and polarization.

T-P-LB-3806

Effect of voluntary wheel running on lipopolysaccharide induced liver inflammation in C57BL/6J mice
Background: Sepsis induces systemic inflammation and can lead to organ failure and death. As the prevalence of sepsis is higher in older adults, lifelong strategies that can prevent the deleterious effects need to be discovered. The purpose of this study is to determine if physical activity, via voluntary wheel running (VWR), can protect against endotoxin-induced liver inflammation in mice.

Methods: C57BL/6J male mice (n=80, ~8 weeks of age) were subjected to VWR or cage control (Sed) for 10 weeks. To induce sepsis, we used an injection (2 mg/kg, i.p.) of lipopolysaccharide (LPS) or saline. Mice were euthanized at 6 and 12 hours after LPS exposure, which occurred immediately after a 20-minute insulin injection (0.5 U/kg). Results: VWR attenuated increases in body mass and epididymal adipose tissue mass, while also improving glucose tolerance. At 6 hours post-LPS, VWR tended to attenuate LPS-induced increases in liver inflammatory marker mRNA expression (e.g. iNOS, IL-1L-6, IL-10). However at the protein level, the induction of liver inflammatory markers (e.g. iNOS, pSTAT3, pJNK, and pSTAT1) after LPS was similar between Sed and VWR mice. At 12 hours post-LPS, VWR attenuated LPS-induced increases in the liver mRNA expression for IL-1β but not for other inflammatory makers; yet, there was a main effect of VWR for reducing TNFα and MCP-1. Likewise, VWR did not protect against LPS-induced increases in inflammatory markers at the protein level, despite a main effect of VWR for pSTAT3. Furthermore, LPS-induced increases in the liver injury markers aspartate aminotransferase and alanine aminotransferase were not attenuated with VWR. Conclusions: These results suggest that physical activity, via VWR, may offer mild protection against the inflammatory cascade induced by LPS in the liver.
glycoprotein 130 while training increased the protein content of these receptor subunits. In trained mice exercise led to a more rapid increase in indices of interleukin 6 signaling in epididymal adipose tissue **Conclusions:** Our findings demonstrate a role for IL-6 signaling in epididymal but not inguinal adipose tissue following acute exercise and suggest an autocrine/paracrine regulation of this response, independent of changes in inflammation. This response is initiated more rapidly with exercise training, possibly due to changes in IL-6 receptor alpha and glycoprotein 130.

**T-P-LB-3809**
Bariatric Surgery and End-Organ Metabolic and Cardiovascular Complications among Obese Patients: A Retrospective Matched Cohort Study Using a US Claims Database
Elliotte Fegelman Cincinnati OH, Gang Li New Brunswick NJ, Andrew Yoo New Brunswick NJ, Stacy Brethauer Cleveland OH

**Background:** Obese patients with metabolic syndrome are at higher risk for long term complications of cardiovascular (CV) disease, chronic kidney disease (CKD), and non-alcoholic fatty liver disease (NAFLD). There is increasing evidence that bariatric surgery is associated with improvement in metabolic comorbidities and may reduce the incidence of these end-organ complications

**Methods:** This retrospective study assesses the impact of laparoscopic bariatric surgery, including gastric bypass (RYGB), sleeve gastrectomy (SG), and banding (BAND), in Optum Clinformatics (insurance claims database) from 2006-2013 on CVD (composite of MI and stroke), CKD, and NAFLD. The population included 4308 RYGB, 545 SG, and 4208 BAND patients, and 9061 matched medically-managed patients (CONTROL). Matching was performed for age, sex, obesity category, insurance type, metabolic comorbidities, and pre-baseline healthcare cost. Starting 2 months after the surgery date, two periods were established: 0-2yrs (POST1) and 2-5yrs (POST2). The incidence rates were analyzed using logistic regression adjusting for patient time-in-study

**Results:** Surgery and CONTROL groups had comparable demographics: 88% of patient with a BMI>40 kg/m2; mean age of 46 yrs; T2DM (35%), dyslipidemia (51%), and hypertension (72%). RYGB appeared most effective among the 3 procedures in reducing disease progression. Compared to CONTROL, RYGB had a lower rate of CVD in POST2 (1.2% vs 2.1%, \(p=0.0083\)), CKD in both POST1 (0.7% vs 1.4%, \(p=0.0015\)) and POST2 (0.7% vs 2%, \(p<0.01\)) and POST2 (0.7% vs 1.4%, \(p=0.0015\)) and POST2 (0.7% vs 2%, \(p<0.01\)).

**Conclusions:** Within five years of surgery, RYGB patients had lower rates of cardiovascular, renal, and liver disease than medically managed patients. The economic and clinical implications of decreased end-organ disease after bariatric surgery deserve further study.

**T-P-LB-3810**
Hypothalamic lipidome reveals a role of dietary linoleic acid and n-6 fatty acylester accumulation in the development of obesity and leptin resistance
Tomohiro Tanaka Kyoto Japan, Masafumi Inoue Kyoto Japan, Takuhiro Sonoyama Kyoto-shi Kyoto-fu, Megumi Hirayama Fujisawa, Kanagawa Japan, Yoshinori Satomi Fujisawa, Kanagawa Japan, Yohei Ogino Kyoto Kyoto, Tingting Guo Kyoto Kyoto, Kazuwa Nakao Kyoto Kyoto

**Background:** High fat diet (HFD) is an established cause of obesity in humans and rodents, but the underlying mechanism remains elusive. Under HFD, hypothalamic neurons become unresponsive to leptin, potentially contributing to the development of obesity. To explore the molecular pathology of the hypothalamic in obesity, we did lipidomics in microdissected hypothalamic nuclei in mice. We then manipulated dietary lipid composition to modify hypothalamic lipidome and studied metabolic outcomes. **Methods:** 1) Hypothalamic nuclei from male mice fed 60% HFD for 3days up to 16weeks, as well as from ob/ob mice were analyzed by LC/MS. 2) To experimentally reproduce an accumulation of n-6 fatty acyl groups observed in mice fed HFD, we prepared two diets with the same total fat (45%) but with distinct (1%: LLA or 18%: HLA) linoleic acid content. Linoleic acid is an essential fatty acid and the only source of n-6 fatty acids.

**Results:** 1) Among ~600 lipids detected, acylglycerols and phospholipids containing n-6 acyl groups (linoleic / arachidonic) were increased in mice fed HFD as early as 3days after the start of HFD and persistent thereafter. The change was not observed in ob/ob mice. Hypothalamic lipidomes of HFD-fed and ob/ob mice also showed some similarities, including decreases in DAGs. 2) Compared with LLA, HLA led to a more pronounced increase in body weight and adiposity with comparable food intake, decreased VO2 and increased RQ. 1week HLA induced hypothalamic inflammation, while 8weeks of HLA attenuated hypothalamic Stat3 phosphorylation by leptin. Lipidomics showed increases in n-6 but a reciprocal decrease in n-3 groups by HLA. **Conclusions:** We identified hypothalamic accumulation of n-6 acylesters in mice fed HFD. Our linoleic acid-rich diet successfully mimicked n-6 accumulation in the hypothalamus and caused hypothalamic inflammation, leptin resistance and obesity. These data suggest a causal role of dietary linoleic acid and hypothalamic n-6 accumulation in the development of diet-induced obesity in mice.
T-P-LB-3811
A prediction equation for visceral adipose tissue volume via anthropometric measures in Japanese men
Kiyoji Tanaka
Tsukuba Ibaraki, Rina So Tsukuba Please Select, Hiroyuki Sasai Tsukuba Ibaraki, Takehiko Tsujimoto Tsukuba Ibaraki, Miki Eto Osaka Osaka, Matsuo Tomoaki Kawasaki, Kanagawa,

Background: Compared with other conventional approaches, visceral adipose tissue (VAT) quantified using multiple-slice magnetic resonance imaging (MRI) may provide a better ability to classify metabolic risks. However, its cost, time constraints, and subject burden limit widespread application in clinical practice. This study aimed to develop and validate a prediction equation for estimating the VAT volume from anthropometric measures among Japanese men. Methods: Anthropometric measurements (body weight, chest circumference, waist circumference, hip circumference, mid-upper arm circumference, thigh circumference, sagittal abdominal diameter, triceps skinfold thickness, subscapular skinfold thickness, suprailiac skinfold thickness, abdominal skinfold thickness, and abdominal width) and VAT volume (via multiple-slice MRI) data were available for 245 middle-aged men (48.5 ± 9.3 years). Participants were randomly divided into development (n = 165) and validation (n = 80) samples with a 2:1 ratio. Prediction equations for VAT volume were established using stepwise regression analysis in the development sample, and then the equation was tested in the validation sample. Results: The model with the highest explanation was [163.60*sagittal abdominal diameter (cm) + 92.69*chest circumference (cm) + 40.95*age (years) -11034.37] (adjusted R² = 0.57). There was a significant correlation between estimated value and measured value (r = 0.72, p < 0.001) in the validation sample. Bland-Altman analysis showed a significant systematic error (r = -0.36, p < 0.001). Conclusions: The prediction equation developed using anthropometric measures tends to overestimate the VAT volume. However, the equation has potential for assessment of VAT in field and clinical settings where CT or MRI is not available.

T-P-LB-3812
A single universal equation for estimating ideal body weight and body weight at key BMI levels
Courtney Peterson Baton Rouge Louisiana, Diana Thomas Montclair NJ, George Blackburn Boston Massachusetts, Steven Heymsfield Baton Rouge Louisiana

Background: Ideal body weight (IBW) equations and body mass index (BMI) ranges have both been used to delineate healthy or normal weight ranges, despite the fact that these two different approaches are at odds with each other. In particular, past IBW equations do not recognize that there is a range of ideal body weights, nor do they scale with single BMI levels as a function of height. Methods: Here, for the first time, we merge the concepts of an IBW equation and of defining target body weights in terms of BMI. Using calculus and approximations, we derived an easy-to-use linear equation that can predict both ideal body weights and body weight at any BMI and height. Results: Unifying the concepts of BMI and IBW equations, we derive a simple linear equation that calculates body weight at key BMI levels: Wt (lbs) = 5 x BMI + (BMI/5) x (Ht - 60 in). Our linear equation allows one to estimate body weights without the need for a calculator with 0-1% accuracy for >90% of the adult population. We also provide the equation in metric units. Conclusions: Our linear equation increases the sophistication and rigor of the concept of an IBW by replacing it with a single universal equation that estimates both ideal body weights and body weights at any BMI level. Our equation allows body weights to be determined without a calculator, making it useful and appealing to both health practitioners and the general public.

T-P-LB-3813
Short-term follow up of “Gold Standard Body Analysis Surveillance” protocol: The role of surveillance in the efficacy of obesity intervention.
Flavio Cadegiani Brasilia DF

Background: The lack of body weight surveillance is one of the main reasons why obesity management has failed. Surveillance is proven to improve results. However, in attempt to optimize weight loss therapy, some effective actions are taken like physical activity), but due to muscle mass loss prevention, weight loss speed does not increase, which discourages patients to continue this certain action, unless it is shown that fat loss speed did increase, which can be shown by accurate methods of body analysis. Joining surveillance and regular body analysis exams, to help elucidate which tissues are being affected by the weight loss,
can be an effective way to keep or boost clinical results. In this protocol, patients were monthly evaluated by the body analysis exams (Bod Pod, inBody770 and MyBodye). In this study, results from short-term follow up are shown. **Methods:** Patients refractory to diet, exercises, drugs and behavioral intervention (body weight loss) **Results:** 118 patients were included, with an average follow-up of 3.3 months, BW decreased (103.4 to 87.2; -16.2)kg, as well as WC (110.1 to 93.6; -16.5)cm. BWLS was 4.90kg/month. VF lowered (174.1 to 72.0; -102.1)cm2, BMI (35.9 to 30.3; -5.6)kg/m2, MW (37.0 to 35.4; -1.6)kg. FW (49.4 to 35.6; -13.8)kg and a FWLS of 4.19kg/month. 64 patients decreases obesity severity class (54.2%), 81 lost more than 10% (68.6%) and 110 lost more than 5% (93.2%) of BW. **Conclusions:** Intensive surveillance with regular body analysis is a great tool to boost weight loss interventions, and may prevent further changes.

**T-P-LB-3815**

**Testing Beloranib in two Rodent Models of Severe Hypothalamic Obesity**

Christian Roth Seattle Western Australia, Clinton Elfers Seattle WA

**Background:** Hypothalamic obesity (HO) due to hypothalamic lesions or deficient melanocortin (MC) signaling via MC4 receptor mutations are both striking examples of treatment resistant obesity. Beloranib (BEL) is a methionine aminopeptidase-2 inhibitor and anti-angiogenesis agent which has been identified as a novel potent drug for weight reduction. **Methods:** In our study we tested BEL in two obesity models of young adult male rats, one of which with combined medial hypothalamic lesions (CMHL), the other with MC4 receptor mutations, both leading to hyperphagia and excessive weight gain, on food intake, weight changes, locomotor activity and body temperature. **Results:** CMHL rats: Post-surgery excess weight gain could be significantly inhibited during 12 d of BEL treatment (between group comparisons, A: CMHL+vehicle 3.8±0.6 g/d; B: CMHL+BEL 0.2±0.7 g/d; C: sham-surgery+vehicle 2.5±0.2 g/d; p<0.001). Conclusions: We conclude that BEL yielded a significant reduction in body weight gain and food intake in these two conditions of surgery-induced and genetic cause of HO. Therefore, BEL is a promising agent for treatment of severe treatment resistant obesity. Results on metabolites and mRNA levels in brain and liver are under investigation.

**T-P-LB-3816**

A comparative effectiveness study of Brighter Bites: a school-based food co-op to improve access to fruits and vegetables and nutrition education among low-income children and their families.

Shreela Sharma Houston Texas, Christine Markham Houston TX, Joanne Chow Houston Texas, Michael Pomeroy Houston TX, Margaret Raber Houston TX

**Background:** Brighter Bites (BB) is a 16-week school-based food co-op intervention comprising: 1) Weekly distribution of fresh produce (50 servings) from food banks distributed by engaging parent volunteers; 2) Nutrition education using Coordinated Approach To Child Health (CATCH) in schools, plus parent nutrition handbooks and recipe cards; and 3) Weekly healthy recipe tastings. We evaluated the effectiveness of BB to increase fruit and vegetable intake, and home nutrition environment among low-income 1st graders. **Methods:** In a non-randomized controlled comparative effectiveness trial (2013-2015), six schools received BB intervention (n=406 parent-child dyads); six schools implemented CATCH-only (n=310 parent-child dyads) in Houston, Texas. Data were collected at baseline, midpoint, and end of 16-week intervention. Measurements included child height, weight; and parent-reported socio-demographic, home nutrition environment surveys, and food frequency questionnaires. Growth curve modeling was used to evaluate change over the three time-points for fruit and vegetable intake and home nutrition environment adjusting for covariates. **Results:** At baseline, the sample was 71% Hispanic, 24% African American; 42.7% of 1st graders were overweight/obese. As compared to CATCH-only, results showed significant increases pre-to-post BB intervention for fruit servings (p<0.048), and from baseline to midpoint for vegetable servings (p<0.002) consumed by the child. Home environment showed significant increases in frequency of cooking (p=0.013), rules regarding limiting portion sizes (p=0.013) and sugary beverages (p<0.040), family dinners (p=0.012), serving fruits (p=0.003) and vegetables (p=0.025) at meals, and decreased frequency of serving sugary cereals (p<0.029). Parents reported increased understanding (p=0.006) and usage (p=0.030) of nutrition facts tables to make food purchases. **Conclusions:** By engaging local food banks, schools and parents, BB improves dietary behaviors and home environment of low-income children.

**T-P-LB-3817**

**Testing Beloranib in two Rodent Models of Severe Hypothalamic Obesity**

Christian Roth Seattle Western Australia, Clinton Elfers Seattle WA

**Background:** Hypothalamic obesity (HO) due to hypothalamic lesions or deficient melanocortin (MC) signaling via MC4 receptor mutations are both striking examples of treatment resistant obesity. Beloranib (BEL) is a methionine aminopeptidase-2 inhibitor and anti-angiogenesis agent which has been identified as a novel potent drug for weight reduction. **Methods:** In our study we tested BEL in two obesity models of young adult male rats, one of which with combined medial hypothalamic lesions (CMHL), the other with MC4 receptor mutations, both leading to hyperphagia and excessive weight gain, on food intake, weight changes, locomotor activity and body temperature. **Results:** CMHL rats: Post-surgery excess weight gain could be significantly inhibited during 12 d of BEL treatment (between group comparisons, A: CMHL+vehicle 3.8±0.6 g/d; B: CMHL+BEL 0.2±0.7 g/d; C: sham-surgery+vehicle 2.5±0.2 g/d; p<0.001). Conclusions: We conclude that BEL yielded a significant reduction in body weight gain and food intake in these two conditions of surgery-induced and genetic cause of HO. Therefore, BEL is a promising agent for treatment of severe treatment resistant obesity. Results on metabolites and mRNA levels in brain and liver are under investigation.

**T-P-LB-3815 - moved to Oral presentation**

**Thursday November 5 – 6:00PM-7:30PM**
Comparing methods of targeting obesity interventions in populations: an agent-based simulation
Rahmatollah Behesthi Baltimore Maryland, Mehdi Jalalpour Cleveland Ohio, Takeru Igusa Baltimore MD, Claudia Nau Baltimore Maryland, Thomas Glass Baltimore Maryland

Background: Policy makers and researchers wishing to test or deploy an obesity intervention face the challenge of where to focus resources. Traditional targeting strategies include random selection, at-risk communities, or at-risk individuals. We use an agent-based model (ABM) to simulate intervention effectiveness comparing these approaches to targeting based on social network structure. Methods: Using an ABM, we synthesize a population in two connected environments with low and high access to healthy food. Agents form scale-free social networks based on homophily and distance. Agent characteristics and networks follow NHANES, BRFSS and ADD HEALTH. Each agent has a threshold value (Q) for positive behavior change toward healthier eating based on a utility-maximization strategy that includes environmental factors and social influence. Four targeting strategies are evaluated; number of targets and intervention efficacy are held constant and based on literature. Network-based targeting selects subjects based on higher centrality or influence using influence maximization techniques. Results: We found that network-based targeting of interventions shows higher efficiency across a range of parameter values due to social multiplier effects. Traditional targeting approaches (vulnerable communities or high-risk individuals) do not maximize reach in the population and are less effective at diffusing the effects of the intervention. Environments modify the outcome of different targeting strategies and should be taken into account. Conclusions: Targeting influential individuals based on social network properties leads to greater intervention reach and effectiveness in a simulated population compared to traditional approaches. ABMs can provide useful guidance about how to deploy scarce intervention resources.

T-P-LB-3818
Did the Berkeley Sugar-Sweetened Beverage (SSB) Tax get passed down onto sugar sweetened beverage prices?
Shu Wen Ng Chapel Hill North Carolina, Lynn Silver Oakland CA, Suzanne Ryan-Ibarra Sacramento California, Barry Popkin chapel hill nc, Jennifer Poti Chapel Hill North Carolina, Cory Hamma SACRAMENTO CA

Background: The first sugar sweetened beverage (SSB) tax in the US became effective on March 1, 2015. We assessed whether the tax was passed through to SSB prices. Methods: Prices were collected across 26 supermarkets, corner stores, pharmacies and gas stations in Berkeley, CA in Dec 2014 and June 2015 for 68 beverages (751 prices in Dec 2014; 801 in June 2015), and store staff were surveyed. Price changes were not sales-weighted. A second study documented sales-weighted prices using retailer scanner data from Jan 2013-June 2015 of all transactions from a large chain’s stores in Berkeley, and 3 nearby cities. Data covered 71.9 million transactions, 9 million from beverages, with 6.9 million included here. Results: SSB price per ounce rose at large (+1.32₵) and small (+1.65₵) chain supermarkets, and chain gas stations (+2.71₵). In chain pharmacies, the SSB tax was partially passed-through to SSBs (+0.61₵), as well as untaxed beverages (+0.43₵). This did not occur in independent supermarkets or gas stations. Chain supermarkets’ staff were more likely to report receiving information about the tax from the city. Scanner data on 3,500 beverage products sold in 6.9 million transactions found pass-through started in Jan 2015 (+0.87₵), stopped, and then restarted in April 2015 (+0.52₵ April, +0.87₵ May, and +1.34₵ June 2015). The pass-through also occurred in neighboring cities. Real prices in C/oz of smaller package items were higher than larger ones, and the pass through was not uniform by size. Conclusions: Four months after the delayed implementation, the Berkeley SSB tax is being reflected in prices, but not uniformly across store types, beverage categories, or package sizes. Findings were consistent across the two studies. The tax passed through starting April 2015 and grew, with overshifting occurring by June 2015. This occurred beyond the Berkeley location suggesting regional pricing of chains. More outreach to independent stores is needed.

T-P-LB-3819
Lack of availability and marketing of healthy foods as obesity risk factors in stores
Kacie Blackman Los Angeles CA, Jimi Huh Los Angeles California, Yaneth Rodriguez Los Angeles California, Lourdes Baezconde-Garbanati Los Angeles CA, Mary Ann Pentz Los Angeles CA

Background: The majority of all deaths in California are related to obesity, diabetes, heart disease, cancer, and tobacco. One way that these deaths could be prevented is through healthy eating. However, food outlets needed to be examined to determine how healthy the food environment was, especially for low income families. The objective of this project was to determine if there was an association between store type (small market, chain convenience, supermarkets, discount) and availability and marketing of healthy and unhealthy food and beverages. Methods:
Local lead agency staff surveyed 470 stores (e.g., chain convenience, small market, supermarket, discount) located in Los Angeles and Orange Counties that were part of a larger statewide campaign, the Healthy Stores for a Healthy Community. The analysis compared the food/beverage environment between small markets and other store types. **Results:** Small markets were significantly more available and marketing of healthy/unhealthy foods and beverages.

T-P-LB-3820
**Mapping the unique food environment of Singapore**
Charoula Nikolaou *Singapore*, Michael Lean *GLASGOW SCOTLAND*

**Background:** Food environments can influence people’s food choices and nutritional status. Current food environments have been associated with driving unhealthy diets and energy overconsumption and obesity prevalence has been linked with the density of food and grocery shops. Singapore is a unique city-state where 60% of residents eat out-of-home at least 4 times/week. The aim of this study was to map the food environment of Singapore.

**Methods:** Information on the number and type of food catering outlets along with information on other aspects of healthful lifestyles were collected through the Singapore Government website (www.data.gov.sg). We validated the information with two ways; 1) by in-person visits to a number of the addresses where food shops/gyms/parks were located according to the government’s list and 2) by using Google maps. **Results:** Since 2000, there has been an increase of 39% (+6,090) in food shops and 2% (+293) in food stalls. In the same period there has been a reduction in the farms growing fruit and vegetables by 12% (-12).

Density of different amenities are; food shops=4.0/1,000 citizens, gyms=0.2/1,000 citizens and fruit&veg food stalls=3.6/1,000 citizens, parks=0.01/1,000 citizens, gyms

Conclusions: Singapore has a unique food environment offering many opportunities for interventions aiming at preventing weight gain and diabetes. It may have comparatively lower prevalence of obesity to other countries but its population is at a greater risk of metabolic complication such as diabetes, due to its ethnicity.

T-P-LB-3821
**Blood mercury concentration in relation to overweight or obese status among Korean children and adolescents:**
KNHANES 2010-2012
Kyung Hee Park *Anyang-Si, Gyeonggi-do N4*, So Young Park *Seoul N4, Hye Mi Noh Anyang-si Gyeonggi-do*

**Background:** Harmful effects of mercury on cardiovascular disease have been suggested in many epidemiologic studies. However, reports on harmful effect of mercury in relation to overweight or obesity among children and adolescents have shown inconsistent findings. **Methods:** The study subjects were 1,002 children and adolescents (10-18 years of age) from the Korean National Health and Nutrition Examination Survey (KNHANES) 2010-2012. Overweight or obese group was defined as over the 85th percentile of the age- and sex-specific BMI norms or BMI over 25. Subjects were categorized into four groups by age and gender specific blood mercury concentration. Multivariate logistic regression was performed to estimate the odd ratio (OR) and 95% confidence interval (CI) for investigate the association.

**Results:** The adjusted ORs comparing prevalence of overweight or obese group or obese group among children and adolescents in the highest quartile versus those in the lowest quartiles were 2.41 (95% CI: 1.43-4.07), 3.08 (95% CI: 1.56-6.10), respectively. After stratified by gender, the adjusted ORs of Q2, Q3, Q4 of blood mercury concentration compared to the lowest quartiles (Q1) were 1.26 (95% CI: 0.53-3.01), 1.62 (95% CI: 0.72-3.65), and 2.95 (95% CI: 1.36-6.36) in female, respectively. **Conclusions:** Increasing blood mercury concentration was associated with overweight or obesity among Korean children and adolescents. Further longitudinal studies in different age, gender, race will be needed to confirm these associations.

T-P-LB-3822
**Associations between dietary carbohydrates and carbohydrate sub-types and weight in the Diabetes Prevention Program (DPP)**
Background: Ideal diet composition for weight loss has not been determined. We evaluated whether carbohydrates (CHO), grains, fruits, vegetables and soda were associated with weight and predicted weight change in DPP participants randomized to placebo (PLBO), intensive lifestyle (ILS), or metformin (MET).

Methods: Baseline and year 1 diets were assessed by a modified Block food frequency questionnaire. Associations of diet with baseline weight, and change in diet with change in weight at year 1, were assessed by linear regression. Baseline models were adjusted for race/ethnicity, age, sex, calories (kcal) and physical activity (PA). Weight change models were further adjusted for baseline weight, change in kcal and change in PA, and stratified by activity (PA). Weight change models were further adjusted for race/ethnicity, age, sex, calories (kcal) and physical activity (PA). Weight change models were further adjusted for baseline weight, change in kcal and change in PA, and stratified by treatment. Results: Higher % calories from CHO was inversely associated with weight (β=-0.32±0.04 kg/%CHO p Conclusions: Our findings suggest that increasing the % of calories from CHO, and specifically increasing fruit and fiber, may promote weight loss, independent of changes in calorie intake.

T-P-LB-3823
Acceptance-based behavioral weight loss treatment improves outcomes for African-American participants

Background: Acceptance-based behavioral treatment is designed to improve outcomes for individuals who find weight loss in standard behavioral treatment challenging. African-American individuals are one such sub-group who typically lose less weight than average in behavioral treatment. Addressing this disparity is a key priority. Acceptance-based behavioral treatment aims to increase willingness to experience the discomfort that can accompany behavior change and enhance commitment to long-term goals through values clarity and mindful decision-making.

Methods: In the ENACT clinical trial, 284 overweight and obese adult participants (29% African American, 66% Caucasian) were recruited from the community and randomly assigned as follows: standard behavioral treatment (BT), BT with a focus on managing the food environment (BT+E), or an acceptance-based version of BT that also integrated some environmental strategies (BT+EA). Treatment was group-based and provided in 26 sessions over 12 months. Percent weight loss at 12 months was measured in the research clinic. Results: In a two-way ANCOVA, race significantly moderated the effect of condition on weight loss (p=.04), such that African American participants lost less weight than Caucasian participants in the BT (6.2% vs. 11.8%) and BT+E conditions (6.6% vs. 12.2%), but weight loss in these two groups was similar in the BT+EA condition (9.4% vs. 11.8%). Among African-Americans, a clinically significant weight loss (i.e., >5%) at treatment completion also was more likely in the BT+EA condition (80%) than in the BT (57%) or BT+E (48%) conditions (p=.04). Conclusions: This study further demonstrates the potential of acceptance-based behavioral treatment to increase weight loss among participants who typically would lose less weight than average in a standard behavioral treatment. Further research should identify the specific pathways through which African-American participants’ treatment outcomes are being improved.

T-P-LB-3824
Effect of inulin and whey protein consumed alone or in combination on appetite and gut microbiota in overweight and obese adults
Raylene Reimer Calgary AB, Holly Willis St. Paul MN, Jasmine Tunnicliffe Calgary Alberta, Adriana Soto-Vaca Golden Valley MN

Background: Combining protein and fiber may reduce appetite more so than individual consumption. Our objective was to determine the effect of inulin fiber and whey protein consumed alone or in combination on appetite, body composition and gut microbiota in overweight and obese adults. Methods: This was a 12 week, placebo-controlled, parallel-arm, double-blind study. Overweight and obese adults (n=125; BMI>25) were randomly assigned to receive isocaloric snack bars of: 1) control; 2) inulin (16 g/d); 3) protein (10 g/d); 4) inulin (16 g/d) + protein (10 g/d). Appetite (subjective ratings and ad libitum buffet), body composition (DXA), quality of life (SF-36) and gut microbiota (Illumina sequencing of fecal samples) were measured. Results: Hunger, desire to eat and prospective food consumption were all significantly lower in participants consuming the protein, inulin and combination bars compared to control bars at 12 week (P<0.05). Conclusions: Snack bars made with whey protein, inulin or the combination of both improve appetite regulation in overweight and obese adults as compared to bars without. No additive benefits of the combination were observed in this study. Bars containing inulin altered the gut microbial structure in participants over the 12 week study with an expected increase in Bifidobacterium abundance.

T-P-LB-3825
A continuous surveillance and follow-up can perpetuate weight loss after discontinuing drugs for obesity.
Flavio Cadegiani Brasilia DF
Background: Obesity requires a long-term follow-up, like any chronic disease, with a slowly decrease in drugs doses when these are prescribed, otherwise weight regain is certain. The lack of ability to deal with drug discontinuation is one of the main reasons why pharmacotherapy for obesity has not been successful in most cases. Taking into account that surveillance has shown to be an important part of a triumphal obesity intervention, in this protocol, a health professional surveillance becomes the main step after interrupting drugs for obesity. In this review, results over a one-year or more of follow up after pharmacotherapy ending are demonstrated. Methods: Included subjects were those who were treated with at least three anti-obesity drugs, on or off-label, and were discontinued for more than one year after a slow decrease in each drug doses, and whose total drug therapy period was more than 18 months. For inclusion, patients had to be seen at least four times by a dietician or a medical doctor in the last 12 months, with non-pharmacological actions if needed. Body weight loss (BWL), waist circumference loss (WCL) were evaluated for analyzing body weight regain (BWR) and waist circumference regain (WCR). Patients who restarted pharmacotherapy were excluded.

Results: A total of 51 patients were included. The mean BWL was 27.3kg and WCL was 25.7cm during the weight loss pharmacotherapy period. After one or more year after discontinuation of medications, mean BWR was 2.1kg, and a BWR more than 20% were seen in 2 patients(3.9%), whereas WCR was in average 3.2cm, and the same two subjects and one other (total of three) regained more than 20% of WC. Conclusions: For a long-term successful therapy against obesity, all aspects need to be considered. Here, a professional surveillance was shown to be an important foundation in the maintenance of weight loss, in patients considered. Here, a professional surveillance was shown to be an important foundation in the maintenance of weight loss, in patients considered.

T-P-LB-3826
Effect of a 12-week customized nutrition intervention on eating habits and body weight by the educational compliance among mild obese (25≤BMI)

Hyunjung Lim Yongin Yongin, Bo Hyung Kim

Background: Obesity prevalence is increasing worldwide including Asian countries. It has become a serious health problem in South Korea. We examined the effect of a 12-week customized nutrition intervention on eating habits and body weight by their educational compliance in Korean mild obese adults.

Methods: The subjects (n=87, 25≤BMI) Results: Weight, BMI and body fat (kg) using BIA are significantly different between high and low compliance groups. There were significantly decreased in high compliance group (p Conclusions: These results suggested that high compliance of nutrition intervention was effective not only for the improvement of eating behavior and lifestyle but also for weight reduction among mild obese adults in South Korea.

T-P-LB-3827
SmartMomsTM: a novel smartphone intervention is effective at reducing gestational weight gain in overweight and obese pregnant women


Background: Pregnancy is considered a teachable moment yet implementation of an intensive lifestyle intervention alongside an already burdensome prenatal care plan is unrealistic for most women. Given that gestational weight gain (GWG) is associated with childhood obesity and more than two-thirds of pregnant women exceed current guidelines, the need to develop scalable and cost-effective approaches to deliver intensive lifestyle programs in pregnancy is urgent. Methods: Fifty-four overweight (n=25) and obese (n=29) pregnant women were enrolled in this study to test whether an intensive lifestyle program delivered through a smartphone (SmartMoms-Phone) would be as successful as a traditional in-person program (SmartMoms-Clinic) and would reduce the proportion of women with excess gestational weight gain in comparison to a non-intervention group (Physician Directed-Control). SmartMoms is an interactive smartphone intervention that includes use of the IOM weight chart, goal setting and self-monitoring of weight and activity with digital scales and accelerometers against personalized weight/activity graphs, receipt of SmartTips© weekly in the second trimester and biweekly in the third trimester supported by personalized feedback from counsellors. Results: Study outcomes were assessed at clinic visits conducted ≤13 weeks and between weeks 35-36 of gestation. GWG in the physician directed group was 12.8±1.5 kg and 9.0±0.9 kg in the SmartMoms groups (p=0.05). According to the 2009 IOM guidelines, 84.6% of women in the physician directed group had excess GWG in comparison to only 56.8% of women receiving the SmartMoms intervention (p=0.01). Conclusions:
Intensive lifestyle interventions promoting a healthy GWG according to the 2009 IOM guidelines can be delivered through smartphones to control GWG with a high degree of efficacy and future studies are warranted.

T-P-LB-3828
Low-cost, scalable classroom-based approach to promoting physical activity in preschool children.
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Background: This study examined the impact of short activity breaks in preschool children. The hypotheses were that preschool children receiving to 3 five-minute activity breaks/day would increase (a) school time physical activity and (b) education scores compared to a control group. Methods: For 8 weeks, the Intervention Group (n=13) incorporated three 5-minute activity breaks into their classroom time while the Control Group (n=12) did not incorporate the activity breaks. Physical activity was measured using a triaxial accelerometer. Education was assessed using standardized techniques. Results: After 8 weeks, the preschool children in the Intervention Group increased their school time physical activity from 11,641 ± (SD) 1368 Acceleration Units (AU)/hour to 16,058 ± 2253 AU/hour (P Conclusion: Incorporation of three 5-minute activity breaks was associated with increased school time physical activity and improved learning.

-P-LB-3829
The Implementation and Acceptability of Social Media in the Medical Weight Management of Youth with Severe Obesity
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Background: Increased contact hours for weight management (WM) are associated with greater weight loss in youth with obesity. Social media (SM) use has increased in youth and could increase contact hours without the burden of in-person visits. Methods: A novel 12-week peer-based longitudinal pilot study in 13 youth with severe obesity (body mass index (BMI) ≥ 35 kg/m2) ages 14-21 enrolled from a medical WM program was conducted. The primary objective was to examine the feasibility and acceptability of using a private social media (SM) platform (Facebook™) to promote behavior change and self-efficacy through modeling and social support beyond that of a standard WM program. The intervention consisted of videos by specialists and youth about nutrition, exercise, and behavior modification posted 3 times a week. Youth were asked to like and/or comment on videos and posts. Posts were monitored by a facilitator. Youth were asked to track food intake and activity using MyFitnessPal© or paper and to post/inbox their goal progress to the facilitator and/or group. Results: Youth were 16 years old (mean age), 31% male, and 58% African-American. Based on a 10-item survey for acceptability, all participants indicated the intervention was enjoyable, helpful, and reinforced their WM program. Ninety-two % would recommend using SM to support other youth, and felt it motivated them to make progress. In-person contact was desired in addition to SM by 62%. Only 54% of youth felt a SM group alone would be helpful. Over the 12 weeks, youth had on average of 48 SM contacts and 4 in-person visits (2 individual clinic, and 2 group). Secondarily, youth lost weight (-1.01kg, BMI-1.25, BMI-z-0.03), and showed improved depression, quality of life, and perceived social support scores, although we were underpowered to detect significance. Conclusions: Social media use for WM is feasible and acceptable and increases points of contact in youth with severe obesity. WM programs should consider the inclusion of SM in their practice.

T-P-LB-3830
The association between cooking self-efficacy and cooking attitudes on dietary intake and health in a Hispanic youth population
Annie Markowitz Austin TX, Jaimie Davis Austin TX, Lauren Martinez Los Angeles CA, Nicole Gatto Loma Linda CA, Donna Spruijt-Metz Los Angeles California, Mackenzie Spaniol Farmers Branch TX

Background: Numerous interventions include cooking components, however few studies have examined associations between cooking attitudes (CA) and cooking self-efficacy (CSE) on dietary intake and health outcomes. This study assessed whether changes in CA and CSE were associated with changes in dietary intake and health outcomes after a 12-week gardening, cooking, and nutrition intervention (“LA Sprouts”). Methods: The LA Sprouts intervention was delivered to 3rd-5th graders during 2012-2014. Height, weight, body fat, waist circumference, systolic and diastolic blood pressure (SBP, DBP), and dietary intakes via the Block Screener were collected at baseline and post-intervention. ANCOVAs assessed the relationship between changes in CA and CSE (based on questionnaire; scores on scales categorized into tertiles) and changes in health outcomes and dietary intake in the intervention group only. A priori covariates included: baseline CA and CSE, ethnicity, sex, age, season, language spoken at home,
baseline energy intake, and change in energy intake. **Results:** 168 participants, 52% female, 88% Hispanic, and 48%
overweight/obese received the LA Sprouts intervention and had complete data. Students with the largest improvement in CA compared to those with the smallest improvement had the greatest increases in fruit (+0.27 vs. -0.56 cups/d; p < 0.05)

**Conclusions:** Future interventions may focus on improving CA and CSE as a way to improve dietary intake and blood pressure in high-risk children.

**T-P-LB-3831**  
A novel selective glucocorticoid/mineralocorticoid receptor modulator reduces diet-induced obesity and improves hepatic lipid metabolism  

**Background:** Metabolic syndrome is characterized by obesity, high blood pressure, glucose intolerance and non-alcoholic fatty liver disease (NAFLD). Corticoids have major metabolic effects and both glucocorticoid (GR) and mineralocorticoid receptor (MR) antagonism improves aspects of metabolic syndrome. In this study we tested the efficacy of CORT 118335 (C118335), a selective modulator type drug (exerting both agonism and antagonism) at GR, with antagonistic effects via MR. **Methods:** 10-week old C57BL/6J mice were fed a high-fat diet (HFD) for 3 weeks without or with C118335. Liver and white adipose tissue (WAT) were weighted and stained to determine macrophage (F4/80) and lipid content. Glucose tolerance was tested via ivGTT and expression of selected genes was evaluated with RT-qPCR.

**Results:** C118335 reduced body weight gain, WAT weight, and F4/80 staining (-41%, p < 0.001). **Conclusions:** C118335 reduces diet-induced obesity development and improves glucose metabolism. C118335 reduces hepatic steatosis and inflammation in liver and WAT, which may be due to GR agonism and/or MR antagonism. Selective modulation of the GR combined with MR may be a promising target for combating obesity and related disorders.

**T-P-LB-3832**  
The Bariatric Behavior Efficacy Measure (BB-EM) to inform post-bariatric surgery interventions  
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**Background:** Measures of bariatric surgery patient perceptions, beliefs and health behaviors are needed to develop robust post-bariatric surgery-specific interventions to optimize weight loss and its maintenance after bariatric surgery. The objectives of this study were to develop a measure to assess patient 1) perceptions regarding following recommended post-surgical eating behaviors and physical activity, 2) expectations of surgical outcomes, and 3) satisfaction with those outcomes. Using exploratory analysis, we then tested the relationships between measure domains and weight loss at 1-2 years post-surgery. **Methods:** Patient interviews (n = 70) and health behavior theory were used to develop a conceptual framework and questionnaire items of the bariatric behavior efficacy measure (BB-EM). The questionnaire underwent cognitive testing with 40 patients. Following revision, the questionnaire was tested for reliability and validity. Forty patients completed the questionnaire, twice, prior to surgery (test-retest reliability). Fourteen multi-disciplinary bariatric surgery clinicians assessed the questionnaire for content validity. Thirty patients completed the questionnaire pre- and one or more years post-surgery. **Results:** Internal reliability for the BB-EM domains yielded Cronbach alphas ranging from 0.70 to 0.91, and a Cohen kappa of 0.90 (p < 0.001). All domains, as well as the total score showed good to excellent agreement, with intraclass coefficients ranging from 0.66 to 0.90. The scale showed adequate content validity, with ratios greater than 0.51 for 33/44 items (p < 0.05). The scale showed adequate predictive validity: satisfaction with improvement in health outcomes, experience as a result of surgery, the ability to move around better, and improvements in appearance were associated with the amount of weight lost (r = 0.44 to 0.68, p < 0.001 to 0.05). **Conclusions:** The BB-EM is a valid measure, which can be used to inform post-bariatric surgery interventions and predict post-surgery outcomes.

**T-P-LB-3833**  
Associations of trimester-specific gestational weight gain with levels of hormones in cord blood at delivery  
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**Background:** Excessive gestational weight gain (GWG) during pregnancy is associated with adverse outcomes for mothers and offspring. Early, mid, and late pregnancy GWG have different associations with fetal growth, but associations with cord blood hormones, which might predict later health, are not well studied. **Methods:** In 988 pregnant women from the pre-birth Project Viva cohort, we calculated trimester specific GWG using clinically recorded weights. Outcomes were levels of umbilical cord blood hormones.
hormones. We used linear regression models adjusted for maternal race/ethnicity, pre-pregnancy BMI, parity, education, pregnancy smoking status and child sex; 2nd and 3rd trimester models were additionally adjusted for previous GWG. **Results:** Mean ± SD pre-pregnancy BMI was 24.9 ± 5.5 kg/m² and 1st, 2nd and 3rd trimester GWG rates were 0.22 ± 0.22, 0.49 ± 0.19 and 0.46 ± 0.22 kg/wk. Mean ± SD cord blood hormone levels were: insulin-like growth factor [IGF]-1 (56.5 ± 24.3 ng/mL), IGF-2 (408.8 ± 92.9 ng/mL), IGFBP-3 (1084 ± 318 ng/mL), insulin (6.5 ± 7.2 uU/mL), C-peptide (1.0 ± 0.6 ng/mL), leptin (9.0 ± 6.6 ng/mL) and adiponectin (28.8 ± 6.8 µg/mL). Greater 1st trimester GWG (kg/wk) was associated with higher insulin (2.4 uU/mL; 95% CI 0.4, 4.4) and c-peptide (0.3 ng/mL; 95% CI 0.1, 0.5) and lower adiponectin (-2.2 µg/mL; 95% CI -4.3, -0.1). Greater 2nd trimester GWG (kg/wk) was associated with higher IGF-1 (11.5 ng/mL; 95% CI 3.2, 19.8), IGF-2 (39.4 ng/mL; 95% CI 5.8, 72.8), IGFBP-3 (207.9 ng/mL; 95% CI 97.1, 318.8) and leptin (4.4 ng/mL; 1.9, 6.9). 3rd trimester GWG was not associated with cord blood hormones. **Conclusions:** 1st trimester weight gain matters more for cord blood hormones related to glucose regulation, whereas 2nd trimester gain matters more for those related to growth and adiposity. These findings suggest that to prevent adverse offspring outcomes related to excessive GWG, interventions to modulate GWG should start before pregnancy.

**T-P-LB-3834**

Evidence of bias against adoption of anti-obesity pharmacotherapies


**Background:** Just under half (46%) of adults in the US fit the criteria for use of anti-obesity pharmacotherapy (AOP), but only 2% of those receive such treatment. This is in sharp contrast to the 13% of adults in the US with diabetes, with 81% of those receiving anti-diabetes pharmacotherapy (ADP). Qsymia and Belviq were FDA-approved in 2012, Contrave in 2014, and phentermine in 1959. Invokana, Farxiga, and Jardiance are the first subtype 2 sodium-glucose transport protein inhibitors (SGLT2s) to be FDA-approved for type 2 diabetes, in 2013/2014. **Methods:** A retrospective analysis, from 2012-2015, of the IMS Health National Prescription Audit assessed the adoption rate of AOPs. This descriptively evaluated the change in mean prescriptions per month over the analysis period. The most commonly prescribed AOPs (Qsymia, Belviq, Contrave, phentermine) and the SGLT2s were included in the analysis. SGLT2s served as comparators due to their similarly timed commercial availability as the new AOPs and their mid-range placement in the AACE/ACE Glycemic Control Algorithm. **Results:** As of the latest observation, the entire ADP market, excluding insulin, was 13x the entire AOP market. SGLT2s comprised 4% of the ADP market, which was equivalent to over half of the entire AOP market. The relative AOP market share was: 75% phentermine, 6.9% Belviq, 5.9% Contrave, 5.3% Qsymia. The mean increase in prescriptions per month were: 34,151 for SGLT2s, 10,548 for new AOPs, and 2,100 for phentermine. Medical specialties prescribing the majority of each of the AOPs and the SGLT2s were Family and Internal Medicine. **Conclusions:** The adoption rate of SGLT2s has been nearly exponential, while the adoption rate of new AOPs have been linear. Considering the relative prevalence of obesity to diabetes and that obesity is a major cause of diabetes, these results are paradoxical and suggest bias against the prescribing of new AOPs. The under-prescribing of AOPs is widely acknowledged, but this is the first data to demonstrate its extent in the US.

**T-P-LB-3835**

Adenovirus-36 Antibody Status and Development of Childhood Obesity in The National Growth and Health Study

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**Background:** There are consistent cross-sectional associations between Adenovirus-36 (ADV36) infection and obesity in children; and cell and animal models of obesity demonstrate an ADV36 infection-obesity pathway via amplified adipogenesis, yet there is little prospective examination of ADV36 infection and obesity in children. **Methods:** In a random, convenience sample of 839 black and white girls in the National Growth and Health Study (NGHS), plasma concentration of ADV36 antibodies were measured by an enzyme-linked immunosorbent assay at year 3 and 7 (~age 12 and 16 years) to determine infection status at 2 time points in individuals. Participants were followed through year 10 (19 years age). Cross-sectional (logistic regression) and longitudinal (Cox regression) analyses were carried out to examine the association between ADV36 infection status (yes v. no) with overweight (≥ 85% of BMI for age and sex) and obese (≥95%) statuses accounting for demographic, socioeconomic, psychosocial, developmental, dietary and physical activity factors, and exposure status at alternate year. **Results:** Approximately 35% of girls were seropositive for ADV36 at year 3 and 7 respectively, and 215 were seropositive at both time points. There was no cross-sectional association between ADV36 infection status and
overweight or obesity at either time point. For example, the odds ratio (OR) and 95% confidence interval (CI) at year 7 of being obese according to a positive infection status was 0.94, 95% CI (0.62-1.43). Similarly, there was no prospective association between ADV36 infection status and incidence of overweight or obesity from either time point. For example, the hazard ratio and 95% CI for the incidence of obesity over 7 years of follow up according to being ADV36 seropositive at year 3 was HR=1.04, 95% CI (0.61-1.79). Conclusions: There was no association between ADV36 measured at two time points and cross-sectional or incident overweight and obesity in a sample of girls from the NGHS.

T-P-LB-3836
Gender Differences in Self-Rated Body Image: Implications for Weight Management Attempts and Healthy Lifestyle Practices
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Background: In 2013, 34.4% of college students were overweight/obese (American College Health Association, 2014). Research suggests that obese adults underestimate their own weight status and as a result are less likely to engage in physical activity or healthy lifestyle behaviors (Duncan, et al., 2011). The purpose of this study was to examine how college students’ perceptions of their weight status relate to their actual weight status, lifestyle behaviors and the perceived quality of those practices. Gender differences were explored. Methods: Participants included 681 students attending New Mexico State University. MEASUREMENT. The online survey administered included the Body Image Assessment (Thompson & Gray, 1995), the International Physical Activity Questionnaire (Craig et al., 2003), the Eating Behaviors Questionnaire (Greenwood, et al., 2008) and the Eating Disorders Examination (Fairburn & Beglin, 2008). Additionally, this survey also assessed demographics, Body Mass Index, perceived weight status and attempts at weight management. ANALYSES. Analyses included bivariate correlations, chi-square analyses, and MANOVAs. Results: Women were more accurate in their perceptions of their body image with heavier individuals rating heavier contour drawings. Their body image ratings correlated positively with weight/shape concerns, dieting practices, and sedentary lifestyle and correlated negatively with healthy eating practices (e.g., eating breakfast, number of snacks), engagement in vigorous physical activity, and physical health self-rankings. Men demonstrated much weaker relationships all around and reported less effort to lose weight when overweight or obese. Overweight/obese and normal weight individuals reported similar levels of physical activity and fruit/vegetable consumption but rated the quality of these practices differently. Conclusions: Findings suggest tailored overweight/obesity interventions are needed to increase awareness and healthier lifestyle among men.

T-P-LB-3837
Association between A1C Improvement and Sentiment in Diabetes Forum Posts
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Background: Diabetes online forums are hubs of the diabetes community, where people can find support and share experiences. These forums contain a vast amount of information, which provides a novel perspective to better understand the relationship between diabetes and individual’s social behaviors. Methods: The objective is to examine the association between improvement in glycated hemoglobin A1C and polarity (i.e., positive, negative, neutral) of the sentiment expressed in written posts. We collected 294310 posts from Tudiabetes forum between 6/1/2007 and 3/31/2014. We used pattern-based techniques to extract A1C values. Improvement in A1C was defined as (A1C_a-A1C_b)>0, where A1C_a and A1C_b are the A1C values extracted from user’s earliest and latest posts, respectively. Polarity of written text was determined using Stanford Sentiment Analysis. For each user, Sentiment Index was defined as nPos-nNeg, where nPos and nNeg refer to the number of positive and negative posts respectively. Larger Index values reflect more positive sentiment. Users were classified as Optimistic or Pessimistic based on their Sentiment Index. Pearson chi-square analysis was used to compare improvements in A1C values between groups. Results: Users with a Sentiment Index value > 0 were classified as Optimistic (n=118); users with Sentiment Index values ≤ 0 were classified as Pessimistic (n=783). Improvement in A1C values was achieved by 72% of forum users in the Optimistic group compared to 57% in the Pessimistic group, p=0.024. Conclusions: The results show a positive correlation between A1C improvement and sentiment. The implications of these findings are twofold. For individuals, they are suggested to be proactive to seek support and share experiences, which is likely to bring them positive effects in return. For forum organizers, they are suggested to highlight the successful experiences shared by users. The diffusion of helpful experiences and optimistic attitudes will benefit the community.
T-P-LB-3838
Smaller portions of an energy dense entree incentivize children ages 7-9 years to consume more vegetables
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Background: Offering children large portions of energy-dense entrees at meals promotes intake of those foods and may cause children to eat less of other foods at the meal including vegetables. Whether offering smaller portions and less energy from energy-dense entrees provides greater incentive for children to consume vegetables at meals is not known. Methods: A between subjects design was used to evaluate the effects of entree portion size on vegetable intake at meals among 102 children ages 7-9 years. Children were randomly assigned to 1 of 3 experimental conditions that varied in entree portion size (147 g, 220 g, 293 g, respectively) to manipulate total energy available at a dinner meal (50%, 75%, and 100% of optimal meal energy). Each child was seen in a control condition that provided 125% of optimal energy from dinner. Fixed amounts of peas (85 g) and corn (85 g) were provided in each condition. Meal energy intake was assessed using weighed food intake methods in conjunction with manufacturers’ nutritional information. Results: Children assigned to the 50% and 75% energy condition consumed less total energy at the meal compared to the children in the 100% condition (343.1 ± 71.0 vs 521.2 ± 170.0, p<0.01). Conclusions: The results of this study provide evidence that offering children smaller portions of energy dense entrées may increase the proportion of energy consumed at meals from vegetables.

T-P-LB-3839
Assess utility of advanced machine learning techniques to build sentiment classifiers and demonstrate its effectiveness in predicting sentiment identification of diabetes-related social media posts.
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Background: Recently, numerous diabetes-specific social networking sites and forums have been developed which offer the public a valuable resource for seeking and sharing information, advice and support. Developing tools that could collate this data will be of immense help to patients/doctors. Machine learning techniques such as sentiment analysis could be used to identify positive/negative sentiment expressed in a natural language text. This data could be used to develop tools that facilitate the analysis of diabetes patients’ online social behaviors and their impact on the patients’ biomarkers. The sentiment markers in the text could be used to design and build tools to recommend products that make patients’ lives easier. Methods: We developed a sentiment classifier using Amazon health product reviews to detect positive and negative sentiments from the Diabetessisters.org website forum posts. Specifically, we used 2000 reviews about health products posted on the Amazon website to classify 2500 diabetes forum posts. Results: The classification accuracy of our model is 78%. The analysis of sentiment bearing words revealed that terms such as "extremely high glucose", "sugar increase" and "fluctuating glucose" turned out to be negative whereas terms like "exercise", "healthier routine", "journaling" and "diabetic pumps" were positive. The hemoglobin A1c (HbA1c) values were posted 67% of the time. Posts of "a1c under 6" and "a1c under 7" were classified positive while posts including "a1c high", "a1c above 9", and "a1c shot" (indicating an increase in HbA1c) were associated with negative sentiment. The term "pods meetup" is associated with high positive sentiment indicating that forum users are interested in meeting with peers in their locality. Conclusions: We achieved good accuracy for sentiment prediction of diabetes forum social media posts. From sentiment analysis of text it is possible to develop tools to help patients and doctors better understand perceptions of diabetes.

T-P-LB-3840
Advertising as a cue to eat: a systematic review and meta-analysis of the effects of acute exposure to unhealthy food advertising on intake.
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Background: Several studies have assessed the effects of food and non-alcoholic beverage (hereafter collectively referred to as ‘food’) advertising on food consumption, but the results of these studies have been mixed. This lack of clarity may be impeding policy action. The aim of this study was to examine the evidence for a relationship between acute experimental unhealthy food advertising exposure and food consumption. Methods: This was a systematic review and meta-analysis of published studies in which advertising exposure (television or Internet) was experimentally
Food advertising and control conditions. Results: Twenty two papers were eligible for inclusion in this review. Data were available for eighteen papers to be included in the meta-analysis (providing twenty comparisons). With all available data included, analysis indicated a small to moderate effect size for advertising on food consumption, with participants eating more after exposure to food advertising compared to controls (SMD: 0.37, 95% confidence interval [CI]: 0.09, 0.65, I² = 98%). Sub-group analyses demonstrated that the experiments with adult participants showed no evidence of an effect of advertising on intake (SMD: 0.00, p = 1.00, 95% CI: -0.08, 0.08, I² = 8%) but a significant effect of moderate size was found for children, whereby food advertising exposure was associated with greater food intake (SMD: 0.56, p = 0.003, 95% CI: 0.18, 0.94, I² = 98%).

Conclusions: Evidence to date shows that acute food advertising exposure does increase food intake in children, but not adults. These data support public health policy action which seeks to reduce children’s exposure to unhealthy food advertising.

T-P-LB-3841
Obesity prevention in child care: Developing a tool to determine if centers’ written policies reflect current best practices for infant care

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Background: Little is known about how well child care centers’ written policies support best practices for obesity prevention among infants (< 1 year). Methhds: We developed and tested the Baby Child Care Policy Assessment Tool (BabyCCPAT), a 26-item coding instrument to assess child care center written policies related to infant care across six evidence-based domains: Nutrition Standards, Age Appropriate Foods/Beverages, Responsive Feeding, Infant Activity, Sleep, and Parent Communication. Adapting methodology from an existing tool developed to assess preschools (WellCCAT, Falbe et al), we coded policies from a statewide sample of n=36 centers serving infants in Massachusetts. Policies were scored and summarized on a scale of 0-100 based on comprehensiveness and strength using means and standard deviations (SD). We tested inter-rater reliability of 2 coders using intraclass correlation (ICC) and 95% confidence intervals (CI); internal consistency was assessed using Cronbach’s alpha.

Results: The BabyCCPAT demonstrated high inter-rater reliability for total scale comprehensiveness (ICC: 0.94, 95% CI 0.88 - 0.97) and total strength (ICC: 0.91, 95% CI 0.80-0.96), as well as across subscales (ICC range: 0.91-0.98). Items yielded acceptable internal validity (Cronbach’s alpha = 0.74). Total scores varied greatly across centers, but were generally low for both comprehensiveness (Mean: 16.6, SD: 10.9) and strength (Mean: 7.6, SD: 7.8). Overall, center policies demonstrated greater comprehensiveness in addressing Nutrition Standards (Mean 29.6, SD 20.8) compared with subscales measuring Sleep (Mean: 9.7, SD 13.1) and Infant Activity (Mean 10.6, SD 17). Despite current recommendations, fewer than 5% of policies addressed individualized infant feeding, screen time, daily tummy time or active play, or reduced noise/ light in sleeping areas. Conclusions: The BabyCCPAT is a novel and potentially useful resource to quantitatively assess policies related to infant nutrition, sleep, and activity in child care settings.

T-P-LB-3842
Current Practices of Obesity Pharmacotherapy, Bariatric Surgery Referral, and Coding by Health Care Providers


Background: Rates of obesity pharmacotherapy use, bariatric surgery referral, and intensive behavioral counseling have been extremely low. We surveyed HCP beliefs, practice and knowledge regarding obesity management. Methods: Data were collected in June 2015 using a web-based survey. The national sample included 1000 PCPs (465 family physicians, 535 internists), 250 OB/GYN physicians, and 251 nurse practitioners (NPs). Results: 22% of PCPs responded that they do not prescribe obesity pharmacotherapy, regardless of obesity status/class and comorbid conditions, and 5% of PCPs responded that they would not recommend bariatric surgery to any patient, regardless of obesity status or comorbid conditions. 47% of OB/GYN physicians and 50% of NPs do not prescribe obesity pharmacotherapy, and 14% of OB/GYN physicians and 30% of NPs would not recommend bariatric surgery. 47% of PCPs, 35% of OB-GYNs, and 31% of NPs use coding for general office visit (99213) when counseling for obesity. 9% of PCPs, 6% of OB-GYNs, and 8% of NPs use intensive behavioral counseling coding for obesity (G0447). 16% of PCPs, 32% of OB-GYNs, and 39% of NPs do not dedicate office visits for obesity counseling. Conclusions: Reported use of
obesity pharmacotherapy appears to be increasing among PCPs, likely related to the recent approval of 4 new medications. Use among OB-GYNs and NPs are much lower. Similarly, few PCPs are averse to bariatric surgery, but aversion among OB-GYNs and NPs is significantly higher. Together, these suggest that OB-GYNs and NPs are important targets for education about obesity management. Now 4 years since Medicare’s decision to cover behavioral therapy for obesity, few PCPs, OB-GYNs, or NPs use behavioral counseling for obesity. Better understanding of why this benefit is not being used will inform outreach to improve counseling rates.

T-P-LB-3843
Reduction in the risk of developing type 2 diabetes (T2D) with liraglutide 3.0 mg in people with prediabetes from the SCALE Obesity and Prediabetes randomized, double-blind, placebo-controlled trial
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Background: This 3-year trial investigated the effect of liraglutide 3.0 mg, as an adjunct to diet and exercise, in delaying the onset of T2D (primary endpoint) in adults with prediabetes and obesity (BMI ≥30 kg/m2) or overweight (≥27 kg/m2) with comorbidities. Methods: Participants were randomized 2:1 to once-daily subcutaneous liraglutide 3.0 mg or placebo; all were advised on a 500 kcal/day deficit diet and 150 min/week exercise. Efficacy data are observed means, with the last observation carried forward for missing values. Clinicaltrials.gov ID: NCT01272219. Sponsor: Novo Nordisk A/S.

Results: Of 2254 randomized individuals with prediabetes (age 47.5±11.7 years, 76.0% female, weight 107.6±21.6 kg, BMI 38.8±6.4 kg/m2, mean ±SD), 1128 completed 160 weeks (52.6% on liraglutide 3.0 mg, 45.0% on placebo). At week 160, mean weight loss was 6.1% with liraglutide 3.0 mg vs. 1.9% with placebo (estimated treatment difference 4.3% [95%CI -4.9; -3.7], p10% weight loss (OR 3.1 [2.3; 4.1]), both p

Conclusions: Liraglutide 3.0 mg, as an adjunct to diet and exercise, delayed the onset and reduced the risk of developing T2D over 3 years compared to placebo, provided greater sustained weight loss, and was generally well tolerated.

T-P-LB-3844

A new approach to the obese patient: An intensive and comprehensive therapy joining different modalities can bring significant results
Flavio Cadegiani Brasilia DF

Background: Clinical obesity therapies have traditionally been dissociated. A lack of comprehensive clinical management of obesity may be the main reason why clinical modalities have lost space to surgical ones. It was developed a different approach that used most of the clinical tools that were proven to be safe and effective. Multiple on and off label medications were prescribed for synergy action, together with an intensive surveillance, multiple phone calls, group therapy, often body analysis exams, visits to psychologist, dietician and/or personal trainer, and a strict long term follow up for preventing weight regain. In this study, it is described in which aspects it differed from the usual protocols and the clinical results it has shown so far. Methods: Included patients were those who were seen by at least two different health professionals for at least six months and were inside the protocol. Body weight (BW), fat weight (FW), muscle weight (MW), visceral fat (VF), waist circumference (WC) and BMI were evaluated. Two or more years of follow up subjects were evaluated for BW regain and normalization of AC was analyzed. For evaluation of muscle weight and visceral fat, bioimpedances inBody720 and inBody770 have been used. For the total and percentage fat loss, plethysmograph Bod Pod was chosen

Results: A total of 157 subjects were included in this study, with a mean follow-up of 18.3 months. Significant results were seen in BW (104.7kg to 84.9kg; -19.8kg), BMI (35.8kg/m2 to 29.0kg/m2; -6.8kg/m2), FW (58.6kg to 45.2kg; -14.4kg), VF (184cm2 to 75cm2; -109cm2), WC (114.4cm to 91.3cm; -23.1cm). MW did not decrease significantly and 85.3% achieved an AC

Conclusions: We demonstrated that when different modalities are used together, significant results can be seen, comparable to surgical outcomes, and this type of approach might be an effective option before bariatric surgery.

T-P-LB-3845
An aggressive clinical approach may prevent bariatric surgery
Flavio Cadegiani Brasilia DF

Background: Bariatric surgery is a safe an effective option for obesity when properly indicated, despite of surgical risks and further limitations. Last Obesity Society (TOS) guideline still recommends surgery after a period of unsuccessful clinical therapies. It was developed a protocol using an aggressive and intensive approach to obese patientas with formal indication to
bariatric surgery by Body Mass Index (BMI), comorbidities and prior clinical therapies. It includes multiple drug association, intense surveillance, private health host for phone and person-to-person contact anytime, and at least two other health providers among psychotherapist, personal trainer, coach medical professional and personal dietician, or all together, as an attempt to avoid the surgical treatment. In this study, results using in this professional and personal dietician, or all together, as an attempt to among psychotherapist, personal trainer, coach medical person contact anytime, and at least two other health providers intense surveillance, private health host for phone and person-to-person contact anytime, and at least two other health providers prior clinical therapies. It includes multiple drug association, Body Mass Index (BMI), obesity classification(OC), BMI, fat weight (FW), muscle weight (MW), waist circumference(WC), visceral fat (VF) and weight regain (WR) were evaluated. A successful therapy was considered when a BW loss >20%, an EW loss >50% o) was used, and for FW was evaluated by Bod Pod (plethysmograph). Results: 43 patients were included, with a mean follow up of 17.3 months. Important decreases in BW (121.6kg to 90.3kg; -31.3kg), BMI (43.08kg/m2 to 31.99kg/m2), BF (55.4kg to 29.7kg, -25.7kg); EW(45.2kg to 18.1kg), WC (131.2cm to 99.4cm; -23.1cm), VF (263.8cm2 to 101.0cm2; -152.8cm2) and MW (-2.9kg). 20 (46.5%) subjects achieved a WC5% in 43 (100%) and >10% in 38(88.4%) subjects. Three (7.0%) patients could not prevent surgery, but 40 (93.0%) were successful by protocol criteria. Three subjects presented a WR>20% (7.5%). Surgery avoidance was 82.3% by BMI criteria. Conclusions: An aggressive approach to obesity may prevent the necessity of bariatric surgery.

T-P-LB-3846
Metabolic outcomes of an intensive lifestyle, behavioral and pharmacological intervention protocol for preventing bariatric surgery
Flavio Cadegiani Brasilia DF, Gustavo Diniz Brasilia Distrito Federal, Gabriella Alves Brasilia DF

Background: Bariatric surgery brings several benefits, such as significant lipid and glucose metabolism normalization, which are seen in virtually all patients. These improvements lead to an overall risk reduction, which drives an enlargement of bariatric recommendations. However, new drugs that act both in metabolic profile and weight have been recently released, and these drugs, when associated, may achieve comparable changes to surgical option. Allying to an intensive surveillance, behavioral approaches, diet and exercise plan, results might be close to surgical outcomes, allowing a review in the strength of clinical therapies.

Methods: Patients with formal indication to bariatric surgery by Body Mass Index (BMI) that were in the intervention protocol were included. Triglycerides (TG), cholesterol LDL and HDL particles, ALP, GGT, HbA1c, basal insulin(BI), basal fasting glucose(FG), uric acid and CRP were dosed. Patients with specific medications for metabolic disorders were excluded.

Results: After inclusion and exclusion criteria, 30 subjects were selected, with a BMI 42,22kg/m2. Lower levels of TG (177.4 to 81.0, -96.4)mg/dL, LDL (118.1 to 98.8, -19.3)mg/dL, ALP (52.9 to 27.8, -25.1)U/L, GGT (47.8 to 15.2, -32.6)mg/dL, BI(23.1 to 7.9, -15.2)uUI/mL, FG(91.4 to 77.5, -13.9)mg/dL, HbA1c (5.87 to 5.15, -0.72%), uric acid (7.1 to 5.7, -1.4)mg/dL and CRP (0.73 to 0.39, -0.34)mg/L were observed after therapy. HDL did not change significantly.

Conclusions: An intensive obesity intervention with multiple modalities can achieve impressive results with resolution of most metabolic disorders, after one or more year of follow up. This type of approach may be an effective way to prevent bariatric surgery in many patients.

T-P-LB-3847
Metabolic syndrome, as a result from a intensive multimodal obesity intervention protocol
Flavio Cadegiani Brasilia DF, Gustavo Diniz Brasilia Distrito Federal, Gabriella Alves Brasilia DF

Background: Treat obesity is an effective way to promote primary prevention of several disorders, as obesity triggers several metabolic changes, such as dysglycaemia, sub-clinical inflammation and dyslipidemia. Early changes in blood biomarkers can be seen in most obese subjects. Therefore, improvement of metabolic outcomes is one of the main goals of obesity therapy. In the proposed protocol, an intensive care with diet, physical activity plan, psychotherapy and pharmacotherapy were offered for the obesity treatment. In this study, some metabolic markers results from patients under this protocol are shown.

Methods: Included patients were those followed up for at least one year and were regularly seen by at least two different professionals, and filled up criteria fro Metabolic Syndrome. Triglycerides (TG), cholesterol LDL and HDL particles, ALP, GGT, HbA1c, basal insulin(BI), basal fasting glucose(FG), uric acid and CRP were dosed. Patients with specific medications for metabolic disorders were excluded.

Results: After inclusion and exclusion criteria, 118 subjects were selected, with a BMI 42,22kg/m2. Lower levels of TG (138.1 to 74.6, -63.5), LDL (109.2 to 96.0, -13.2) mg/dL, ALP (45.6 to 24.9, -21.7)U/L, GGT (40.0 to 14.9, -25.1) mg/dL,HbA1c (5.66 to 5.09, -0.57%), BI(13.7 to 6.8, -6.9) uUI/mL, FG (86.8 to 76.0, -10.8) mg/dL, uric acid (5.9 to 4.9, -1.0) mg/dL and CRP (0.46 to 0.22, -0.24) were observed after therapy. HDL did not change significantly.

Conclusions: Metabolic syndrome, as a result from a
chronic exposure to a sub-clinical inflammation due to obesity, can be completely resolved by a multimodal therapy that targets excess weight loss, shown by significant inflammatory and metabolic markers reductions. A more intensive and comprehensive obesity therapy, addressing all aspects of obesity issues may be an effective way to improve outcomes.

T-P-LB-3848
A quadruple anti-diabetic association may present significant results in patients unresponsive to diet and exercise.
Flavio Cadegiani Brasilia DF, Gustavo Macedo BRASILIA DF

Background: Off-label therapies, if done with safe drugs, are acceptable for patients who do not respond or cannot use on label drugs. Once mechanisms of action are known, synergic associations may be a possibility to boost weight loss. In an obesity intervention that drugs are offered together with diet, exercise, surveillance and psychotherapy when needed, part of patients cannot be prescribed central action drugs, due to psychiatric or self-acceptance reasons. In these cases, peripherally targets when considering drugs should be considered. In this protocol, a quadruple combination of SGLT2 inhibitor (iSGLT2), GLP-1 analogue (aGLP-1), metformin (biguanide) and orlistat (lipase inhibitor, now considered an anti-diabetic drug), was offered to these patients, with they presented a BMI>27kg/m².

Methods: Patients who were refractory to diet and physical activity and started the quadruple combination with no other prescription, and follow up between six month and two year, were included. Body weight(BW), waist circumference (WC), visceral fat (VF), BMI, muscle weight (MW), fat weight (FW), HbA1c, basal insulin(BI), basal fasting glucose(FG), triglycerides (TG), LDL, ALP, GGT and CRP were evaluated. Validated bioimpedance (inBody770) and plyphysmograph (Bod Pod) were used for analysis.

Results: Analysis were made in 28 subjects. Lower levels were seen in BW (96.2 to 82.5; -14.7)kg, WC (106.8 to 90.4; -16.4)cm, VF (155.4 to 68.3; -87.1)cm2, BMI (33.1 to 28.4; -4.7)kg/m², MW (25.3 to 33.2; -2.1)kg, FW (58.6 to 45.2; -14.4)kg, HbA1c (5.57 to 4.71, -0.86)%, BI (19.7 to 7.2; -12.5)uUI/mL, FG (90.1 to 75.9, -14.1)mg/dL, TG (133.3 to 58.3, -75.0), LDL (108.4 to 92.7, -15.7)mg/dL, ALP (42.0 to 17.7, -24.3)U/L, GGT (34.1 to 16.7, -17.4)mg/dL and CRP (0.61 to 0.25, -0.36)mg/L.

Conclusions: Significant clinical and biochemical results were seen in these patients. Off-label therapies can boost obese patients and should be offered to patients who do not respond or cannot use other drugs.
recruited as a part of the Toronto Obesity Psychosocial Cohort database. Participants (N = 157) were selected from a larger prospective study based on these inclusion criteria: diagnosis of MDD or bipolar disorder (BD), age ≥18 years and ability to provide informed consent. Onset of obesity and MDD were collected using a standardized clinical interview during the pre-surgery assessment process. Data collected included demographic data and onset of obesity (BMI > 30) and initial depressive episode. Collected MDD course and severity outcomes included the number of psychiatric hospitalizations, major depressive episodes (MDE), current psychiatric medications, lifetime suicide attempts and current quality of life (SF36). Outcomes were compared between patients who initially developed depression (MDDI) and patients who initially developed obesity (OBESEI) using a Wilcoxon Rank Sum test for continuous variables and Fishers Exact test for categorical variables.

**Results:** 110/157 (n=70.6%) participants were OBESEI. Participants with MDDI were more likely to have an increased number of lifetime MDE (4.64 ± 8.47 vs. 2.63 ± 5.78, p<0.0001). MDDI had significantly higher number of lifetime MDE and prescribed psychiatric medications. Early intervention of MDD may change the clinical course for bariatric surgery candidates.

**T-P-LB-3851**

**Polyunsaturated fat diet induces obesity, but not insulin resistance or impaired access to muscle**

Josiane Broussard Boulder CO, Isaac Asare Bediako Los Angeles CA, Rebecca Paszkiewicz Los Angeles CA, Malini Iyer Los Angeles California, Richard Bergman Los Angeles CA, Cathryn Kolka Los Angeles California

**Background:** Diets high in saturated fat induce obesity and insulin resistance as well as impair insulin access to skeletal muscle. In contrast, diets supplemented with polyunsaturated fat (PUFA) improve insulin sensitivity and reduce the risk for type 2 diabetes. We therefore hypothesized that a diet high in PUFA will increase insulin sensitivity and improve insulin access to muscle in the canine. **Methods:** Hyperinsulinemic euglycemic clamps were conducted after 12 weeks of a high fat diet supplemented with 6g/kg of saturated fat (Lard, n=11) or salmon oil (PUFA, n=8) to assess insulin sensitivity and insulin access to skeletal muscle. Lymph was used as a measure of skeletal muscle interstitial fluid. **Results:** Lard and PUFA diets induced similar weight gain (+5%, Lard; +7%, PUFA). Insulin sensitivity was impaired in Lard dogs as compared to Lean controls (Lean, n=8, 11.1+1.0mg/min/kg; Lard 8.0+0.7, P=0.03) but not in the PUFA group (11.8+1.2). The Lard group displayed higher arterial plasma insulin levels at fasting (Lard 7.6+1.1 vs Lean 4.1+0.5μU/ml, P=0.05; PUFA 4.6+1.2μU/ml, ns) and during insulin infusion (Lean 75.5+6.4, Lard 95.7+5.4 P=0.03 vs Lean, PUFA 79.3+5.3μU/ml, ns). However, lymph insulin levels were not different (Lean 52.6+4.9, Lard 53.1+4.3, PUFA 57.5+4.2μU/ml), suggesting impaired insulin access with Lard feeding. Lard also impaired muscle tissue insulin sensitivity (Lean 3.4+0.4, Lard 2.2+0.3, p=0.03), which did not occur with PUFA (3.5+0.6). **Conclusions:** While both high-fat diets induced a similar amount of weight gain, only Lard led to a reduction in insulin sensitivity. In addition, hyperinsulinemia did not translate to an increase in interstitial insulin, suggesting reduced insulin access after Lard feeding. We conclude that obesity per se does not cause insulin resistance, and that a diet high in saturated fat impairs insulin access to muscle. Future studies are needed to determine whether PUFA supplementation in conjunction with a Lard diet may protect against insulin resistance.

**T-P-LB-3852**

**Rapid Changes in the Proteome of Gut Microbiota in Response to Short-Term Dietary Challenges in Baboons (P. hamadryas)**

Prahlaad Rao San Antonio Texas, Vicki Mattern SAN ANTONIO Texas, Kimberly Spradling-Reeves San Antonio Texas, Laura Cox San Antonio TX, Michael Olivier San Antonio TX, Anthony Comuzie San Antonio Texas

**Background:** Obesity is a complex multifactorial disease, and recent studies have shown that changes in gut microbiome composition are correlated with obesity-related traits in humans and mouse models. However, it is unclear how quickly the abundance of the various bacterial species changes in response to controlled diet changes. We explored whether a comprehensive analysis of proteins from fecal samples reveals functional and metabolic changes in gut microbes. **Methods:** Baboons normally fed a standard chow diet were given a high-saturated fat, high-simple carbohydrate diet (HFHS) for seven weeks. Fecal samples were collected at weeks 0 and 7. Fecal samples were analyzed using shot-gun proteomics, to identify individual proteins and species. Differences in protein abundance were quantified, and only species with at least 3 significantly altered proteins were included. **Results:** Our metaproteomic data show the most detected proteins from phylum Bacteroidetes (genus Prevotella), from phylum Firmicutes and from Actinobacteria. Short term exposure to a HFHS diet led to significant proteomic changes in multiple bacterial species. In Eubacterium bioforme, proteins involved in carbohydrate metabolism were decreased, but in Eubacterium hallii, these proteins were increased at least two fold indicating that
different bacterial species from the same genus react differently to the change in diet. Prevotella copri showed a decrease in carbohydrate metabolism proteins while proteins involved in nucleotide transport and protein synthesis machinery such as DNA-directed RNA polymerase and ribosomal proteins were increased in response to the HFHS diet in Prevotella copri and Collinsella aerofaciens. **Conclusions:** These unique responses of individual microbial species cannot be detected using traditional microbial metagenomic sequencing, and may help elucidate the underlying mechanisms mediating the impact on obesity, and potentially leading to perturbations in gut microbiome composition.

**T-P-LB-3853**
Long-term Western Style Diet (WSD) Blocks the Beneficial Metabolic Effects of Immediate Estradiol (E) Replacement in Older Surgically Menopausal Macaques
Cynthia Bethea Beaverton OR, Jonathan Purnell Portland Oregon

**Background:** Clinical trials of post-menopausal women showed that E replacement therapy (ERT) may prevent central obesity and lower diabetes risk, but definitive prospective data are lacking. We established a nonhuman primate model of human menopause and hypothesized that immediate ERT would ameliorate effects of WSD. **Methods:** Female rhesus macaques (17-20yrs) were placed on WSD and ovo-hysterectomized 6 weeks later. Empty Silastic capsules (placebo n=13-17) or capsules containing crystallized E (n=6-8) were implanted s.c. At baseline (prior to WSD) and at 6, 12 and 18 months (mo) after OVH±ERT, glucose tolerance tests (GTTs) and DEXA scans for fat mass (FM) were performed. Endpoints were compared with ANOVA. **Results:** Glucose and insulin excursions during GTT were the same between the groups prior to WSD. At 6 mo, glucose clearance was faster in the E-treated group than in the placebo group (p **Conclusions:** WSD reduced the beneficial effects of ERT on glucose metabolism and body composition with time past OVH.

**T-P-LB-3854**
Geometrical representation of the human body provides new insights into body fat distribution
Kateryna Mykhaylova Cedar Knolls New Jersey

**Background:** Visceral adiposity is a major risk for metabolic disease. While both abdominal adiposity and body shape indices correlate with visceral adiposity, how much of the variance in visceral adiposity is due to the separate independent effects of trunk size (total abdominal adiposity) versus trunk shape (apple versus pear-shapes) is unknown. To evaluate the role of trunk shape versus trunk size on visceral adipose tissue, we introduce two new indices of Trunk Size (TSZ) and Trunk Shape (TSH) based on a geometrical model that quantifies body roundness. **Methods:** To evaluate the role of TSZ and TSH on visceral adiposity, three separate databases containing MRI and DXA measured total percent body fat and total visceral adipose tissue were pooled. Our new indices were additionally compared against six previously established metrics: Hip Circumference (HC), Waist Circumference (WC), Waist Hip Ratio (WHR), Body Mass Index (BMI), Body Adiposity Index (BAI), A Body Shape Index (ABSI). Using the statistical software package in JMP® Pro 11.0.0, we developed eight regression models—one for each index—that predicts %VAT. Interaction terms and covariates were included in the models, and the overall adjusted R² and term specific p-values were calculated. **Results:** Linear regression modeling showed that a number of different covariates were statistically significant predictors of visceral adipose tissue. Analysis revealed that Trunk Size (TSZ) (R² = 0.48) explained much more of the variance in visceral adipose tissue than Trunk Shape (TSH) (R² = 0.33) Of the models examined, the linear regression model with TSH and TSZ and ethnicity, age and gender was the superior model for explaining differences in %VAT (R² = 0.62, P = 0.035) **Conclusions:** For the first time, we demonstrate that trunk size is far more important than trunk shape in explaining visceral adipose content. The new variables of TSH and TSZ represent important considerations for predicting visceral adipose tissue and likely also obesity-related co-morbidities

**Friday November 6 -12:00-1:00PM**

**T-P-LB-3855**
Costs and Outcomes of Offering Greater Access to Bariatric Surgery for Morbid Obesity. Cohort Study and Cost-Utility Analysis

**Background:** Bariatric surgery (BS) offers important benefits yet its role in obesity management remains controversial. Access to BS is often limited in publicly funded health care systems possibly due to perceptions of the costs of BS and the resources required to offer it more readily. We aimed to evaluate the costs and outcomes of
offering greater access to BS as a treatment for morbid obesity in adults. **Methods:** A cost-utility analysis was informed by a cohort study including electronic primary health records of 3,054 obese participants who received BS, and 259,006 participants who did not receive BS. Analyses estimated health outcomes and health care costs in relation to BMI category and morbidity. A probabilistic Markov model was employed to conduct a cost-utility analysis comparing discounted costs and quality adjusted life years (QALY) for BS against standard non-surgical management for obesity. **Results:** In persons with morbid obesity aged 20 to 74, BS was associated with increased total life years accumulated over a lifetime of 6.097 (95% range 6.022-6.171) per participant. Time lived with diabetes mellitus decreased by 8.320 (8.123-8.502) years per participant. Incremental costs associated with BS were £15,258 (£15,184-15,330), including costs of surgical procedures of £9,164 per participant. Incremental QALYs were 2.142 (2.031-2.256) per participant. The estimated cost per QALY gained was £7,129 (£6,775-£7,506). Net monetary benefits at £30,000 per QALY were £49,016 (£45,731-£52,412) per 1000 participants. Estimates were similar across gender, age and deprivation subgroups. BS was slightly more cost-effective in patients with morbid obesity and diabetes at £6,176 (£5,894-£6,457) per QALY, and slightly less cost-effective in severe obesity, £7,675 (£7,339-£8,037). **Conclusions:** BS is cost-effective relative to standard weight management across a wider range of BMI levels than currently recommended, and is more cost-effective in diabetes, with results robust to gender, age and deprivation differences.

T-P-LB-3856
Roux-en-Y gastric bypass improves glucose-responsive insulin release in the Wistar fatty rat
Keisuke Maruyama Kyoto Kyoto, Takashi Miyazawa Kyoto Kyoto, Kazuwa Nakao Kyoto Kyoto, Kenji Kangawa

**Background:** Roux-en-Y gastric bypass (RYGB) is an effective therapy for type 2 diabetes mellitus (T2DM) with obesity. Remarkably, it is possible that RYGB induces improvement of glycemic control independently of body weight loss. However, its mechanism remains unknown. **Methods:** To elucidate the mechanism of remission of diabetes mellitus after RYGB, we tried to establish RYGB model in the male Wistar fatty (WF) rat. The male WF rat is a genetic model of obesity and T2DM. The male WF rats were randomly assigned to three groups, RYGB-operated (RYGB), Sham-operated (Sham) and Sham-operated with pair-feeding (Sham-PF). In this study, approximately 80% of rats survived after surgery. We examined its blood glucose, body weight and food intake every week. At 7 weeks after surgery, we also measured blood glucose and insulin during an oral glucose tolerance test (OGTT). **Results:** Body weight of the RYGB group was reduced temporarily after surgery, and maintained approximately 90% of that of the Sham group. For 7 weeks after surgery, food intake of the RYGB group was lower than that of the Sham group. Blood glucose of the RYGB group exhibited lower level than that of the Sham group in ad libitum. To evaluate the insulin secretory capacity in our RYGB model rats, we performed OGTT after fasting. Both groups were given an oral injection of 50% glucose solution (2 g/kg). In the OGTT, blood glucose of the RYGB group maintained lower level than that of the Sham group. On the other hand, blood insulin during the OGTT was markedly higher the RYGB group compared with Sham group. Surprisingly, glucose levels were similar among the RYGB and Sham-PF groups, but insulin level of the Sham-PF was significantly lower than that of the RYGB group. **Conclusions:** These data suggest that our RYGB model improves glucose-responsive insulin release independently of body weight loss. Therefore, our RYGB model rat may be of use for elucidation of the mechanism of remission of diabetes mellitus after RYGB.

T-P-LB-3857
The effects on resting energy expenditure of long-term changes in body composition at the organ level following bariatric surgery

**Background:** Resting energy expenditure (REE) is reduced to a greater extent than expected after weight loss which may impact the failure to maintain weight loss. Whether this reduction in REE is sustained and whether REE changes may be explained by changes in body composition in the long-term remains unclear. **Methods:** Bariatric surgery patients were studied before (T0) and at 12 (T12), 24 (T24) and 60 (T60) months after surgery, including REE by indirect calorimetry, fat (FM) and fat free (FFM) masses by a 3C model, and the masses of high metabolic rate organ (HMRO) (liver, kidney, spleen) by whole-body MRI. Multivariate linear regression models predicted measured REE at each time using body composition components. Model 1 included FFM and FM as predictors and Model 2 included fat, FFM and HMRO. Differences in the structure of Model 2 between time was examined by comparing direct and crossed r2 values of each model.
at each time using Hotelling's t tests. **Results:** From T0 to T12, reductions occurred in body weight (mean±SEM; -41.9±3.1kg) (P<0.05). **Conclusions:** From pre-to-post bariatric surgery, high metabolic rate organ mass contributes to REE. The composition of weight change at the organ level is important for understanding REE during weight change.

**T-P-LB-3858**
Downregulation of mitophagy in beige adipocytes
David Taylor Los Angeles California, Roberta Gottlieb Los Angeles CA

**Background:** Mitochondria are subject to selective degradation via mitophagy. PINK1-parkin mediated mitophagy is the most well-characterized pathway, which targets senescent mitochondria for autophagic degradation based upon a decrease in mitochondrial membrane potential. Beige & brown adipocytes present a uniquely adapted mitochondrial environment whereby a decrease in membrane potential is functionally beneficial. Our objective was to identify how the mitophagic machinery is adapted in beiged adipocytes to prevent improper mitochondrial degradation.

**Methods:** Changes in expression of mitophagy proteins were monitored in fully differentiated 3T3-L1 adipocytes following treatment with rosiglitazone (Rosi) to induce a beige-like phenotype. Mitophagic activity was compared in Rosi treated cells following FCCP treatment. Mitophagic protein expression was also monitored in parkin & p62-deficient 3T3-L1 adipocytes subjected to Rosi treatment. Mitochondrial oxygen consumption was assessed using an XFp extracellular flux analyzer. **Results:** Parkin protein levels were decreased by day 2 of rosiglitazone treatment and remained suppressed. P62 expression was increased in Rosi treated cells, reflecting a decrease in mitophagy. Mitochondrial-associated parkin was also lower in Rosi treated cells. Stimulation of mitophagy via FCCP revealed a delayed clearance of numerous mitochondrial proteins in Rosi treated cells, suggesting a downregulation of mitophagic activity. Parkin & p62-deficient 3T3-L1 adipocytes had preserved ‘beiging’ responses, however basal mitochondrial protein expression was disturbed. Rates of oxygen consumption were suppressed in parkin-deficient adipocytes. **Conclusions:** These data indicate Parkin-mediated mitophagy is necessary for basal mitochondrial turnover in adipocytes. Beiging of adipocytes results in a downregulation of mitophagy activity.

**Aspartame contributes to compromised metabolic profile and body composition in rodent model of maternal obesity and their offspring**
Jodi Nettleton Calgary , Nicole Cho Calgary Alberta, Teja Klancic Calgary Canada, Jane Shearer Calgary AB, Stephanie Borgland Calgary AB, Raylene Reimer Calgary AB

**Background:** Artificial sweeteners are found in an increasing number of food products. Recent evidence suggests a possible link between consumption of these sweeteners and impaired fasting glucose and insulin sensitivity in lean and obese models. From a maternal health perspective, these findings may have implications for the development of gestational diabetes and programming of metabolic disease in offspring, as it has been well established that maternal nutrition has long lasting effects on offspring health. Our objective was to determine the effects of maternal aspartame or stevia intake on maternal and offspring metabolic health including adiposity, glucose tolerance and insulin sensitivity. **Methods:** Female diet-induced obese Sprague Dawley rats were randomized to one of three groups during pregnancy and lactation: 1) High fat/High sugar (HFS) diet + water (WTR); 2) HFS + Stevia (STV); 3) HFS + Aspartame (APM). A fourth lean reference group was maintained on AIN93-M diet and water. Rats were subjected to oral glucose tolerance tests (OGTT) and insulin tolerance tests (ITT) at baseline, gestation day 14 and lactation day 14; offspring underwent OGTT and ITT at 9 weeks of age. Body weight and body composition (DXA) were measured. **Results:** During gestation, APM dams gained significantly more weight compared to WTR and STV dams (p<0.05). Offspring from APM dams showed increased body weight and body fat mass at weaning and adulthood. APM offspring had reduced glucose tolerance and insulin sensitivity compared to WTR and STV offspring. **Conclusions:** Maternal consumption of APM during gestation and lactation may lead to a compromised metabolic profile alongside weight gain and altered body composition in both mom and offspring.

**T-P-LB-3860**
Maternal prebiotic intake improves metabolism of offspring exposed to maternal obesity and a lifelong obesogenic diet
Heather Paul Calgary Alberta, Stefan Urbanski , Raylene Reimer Calgary AB - Alberta

**Background:** Obesity-related conditions, such as non-alcoholic fatty liver disease (NAFLD), are increasing in parallel with the obesity epidemic. Of particular interest is the link between increased susceptibility to obesity and NAFLD in offspring exposed to an adverse early-life environment. In the context of obesity, intake of the prebiotic oligofructose is linked with reduced fat mass and improved glucose tolerance. Thus, the addition of oligofructose to a suboptimal maternal diet may mitigate adverse...
programming in offspring of obese dams. **Methods:** Diet-induced obese female Sprague-Dawley rats were randomized to either: 1) High-fat/sucrose ad libitum (HFS) or 2) High-fat/sucrose diet + 10% oligofructose (OFS) during pregnancy and lactation (n=16/group). A lean control (LC) group was fed a standard AIN-93 diet throughout the study. Upon weaning, pups were placed on the high-fat/sucrose diet, serving as a metabolic challenge to unmask programmed risk/protection. At 24 weeks, offspring glucose tolerance and insulin sensitivity was assessed via oral glucose and insulin tolerance tests (OGTTs and ITTs), and body composition was assessed via DXA. Histological scoring of livers for steatosis, inflammation, and fibrosis is being performed. **Results:** Maternal diet affected offspring glucose levels during both the OGTTs and ITTs (p

**Conclusions:** Maternal prebiotic intake in the context of maternal obesity may improve offspring metabolic parameters associated with obesity and its comorbidities.

**T-P-LB-3861**

**Do changes in circulating acylcarnitines co-vary with increases in shivering and non-shivering thermogenesis in the cold?**

François Haman, Mary-Ellen Harper, Ottawa Ontario

**Background:** During cold exposure, thermogenesis is increased involuntarily by the activation of non-shivering thermogenesis (NST) and/or shivering thermogenesis (ST). While cold-acclimated mice inhibit to a large extent ST by increasing the volume and activity of brown adipose tissue (BAT), ST in surface and deep muscles remains present even during mild cold exposure in humans (Blondin et al., 2015). Therefore, finding a whole body marker of changes in ST could help better understand factors that affect the relative contribution of both thermogenic processes.

**Methods:** Because shivering muscles are highly reliant on lipids for energy production, the purpose of this study was to explore whether changes in circulating acylcarnitine (AC) concentrations were related to changes in ST under three conditions: 1) during a 24 h cold acclimation in mice known to reduce substantially the contribution of ST (n=7, malewild-type), 2) during mild shivering in glycogen depleted (LOgly) and loaded healthy men (HIgly; n=5) and 3) during moderate shivering in healthy men with normal glycogen reserves (n=6). **Results:** In mice, results showed that while heat production was constant over 24 h at 4°C, total circulating AC decreased from 30.0±1.2 to 21.2±0.7 as ST subsided. In men, during mild shivering, AC were more than 2-fold in LOgly and HIgly at baseline and during the cold. However, only AC with chain length between 6 and 12C increased significantly during cold exposure in both LOgly (0.87±0.08 to 1.11±0.15) and HIgly (0.40±0.03 to 0.52±0.05). In contrast, when ST is intensified during moderate cold exposure in men with normal glycogen reserves, circulating levels of all AC increased by 1.3 to 1.5-fold (0.87±0.08 to 1.11±0.15). **Conclusions:** Together, this initial work indicates that while circulating of AC co-varies with changes in ST and lipid oxidation in mice and humans, much work remains to clearly establish whether these changes are sufficient to provide a good marker of ST activity under all cold exposure conditions.

**T-P-LB-3862**

**Eicosapentaenoic Acid (EPA) Supplementation Regulates Hepatic Carbohydrate and Lipid Metabolism**

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**Background:** Non-alcoholic fatty liver disease (NAFLD) is a rising epidemic and affects more than 70% of obese patients. Omega-3 polyunsaturated fatty acids, such as eicosapentaenoic acid (EPA), are potent hypotriglyceridemic and anti-inflammatory agents. Our laboratory has previously reported that EPA prevented and reversed high fat (HF) diet-induced obesity, insulin resistance, inflammation and hepatic steatosis. However, the mechanisms mediating the effects of omega-3 fatty acids in NAFLD are not completely understood. **Methods:** Liver isolated from C57BL/6J mice fed HF diet, either with EPA (HF-EPA) or without (HF) were used for analyses of gene and protein expression. Global miRNA profiling was performed to identify potential target miRNAs and genes influenced by EPA. Additionally, dose- and time-dependent studies of EPA effects were performed using a clonal liver cell line, human hepatoma HepG2 cells. **Results:** EPA significantly reduced expression of genes in fatty acid synthesis, gluconeogenesis, inflammation, and insulin signaling pathways and increased expression of genes in beta-oxidation. HepG2 cells treated with 50 μM EPA for 24 h showed similar outcomes in gene and protein expression analyses. Preliminary miRNA profiling showed 30 differentially expressed miRNAs in liver from HF-EPA compared to HF fed mice. Specific candidate miRNAs regulated by EPA were identified for further validation and include miR-21, 19 and 101 with previously documented roles in inflammation. **Conclusions:** Beneficial effects of EPA in NAFLD are mediated in part by alteration of fatty acid and carbohydrate metabolism in mouse liver. Additional studies are warranted on the candidate
miRNAs that we identified as potential mediators of EPA effects in NAFLD.

**T-P-LB-3863**

**Validation of the doubly-labeled water method using integrated cavity output spectroscopy**

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**Background:** The doubly-labeled water (DLW) method is the gold standard methodology for determination of free-living energy expenditure, a key component of energy balance and crucial for understanding the underlying etiology of obesity risk. Traditionally, isotope enrichments have been determined by isotope ratio mass spectrometry (IRMS). New technologies are emerging for determination of isotope enrichments including laser spectroscopy. We have previously shown that an alternative laser methodology (off-axis integrated cavity output spectroscopy: OA-ICOS) provides comparable data to IRMS in the analysis of standard waters over the same range of enrichments as used for DLW studies. Here we validated the use of OA-ICOS for measurement of energy demands by comparing estimates of carbon dioxide (CO2) production using the DLW method and OA-ICOS to simultaneous whole-room indirect calorimetry (IC) measurements over a period of 7 days. **Methods:** 12 subjects (5 male, 7 female; age=24 to 63 yrs.; body mass index=19.4 to 46.4 kg/m2) were studied for 7 consecutive days in the IC. Prior to entry on the first day, subjects consumed an oral dose of 0.25 g H218O (95% APE) and 0.14 g 2H2O (99.8% APE) per kg of total body water (estimated as 73% of fat free mass). Urine samples were obtained daily, and the samples on day 1 and 7 were used to measure average CO2 production using OA-ICOS. **Results:** Estimated CO2 production over the 7 days by IC averaged across all 12 subjects was 413.6 L/day (sd = 69.4). In comparison the average CO2 production by DLW-OA-ICOS (Schoeller equation A6, two point method and plateau technique) was 400.6 L/day (sd = 74.5). The absolute average discrepancy (accuracy) was 3.11% (sd = 7.79%) and the individual precision was 6.57% (sd = 4.91%). **Conclusions:** These levels of accuracy and precision are comparable to those achieved in previous validation studies using DLW-IRMS. Off-axis integrated cavity output spectroscopy provides a valid and viable alternative to IRMS for DLW studies in humans.

**T-P-LB-3864**

**A high-protein weight loss diet attenuates the weight loss-induced improvement in insulin sensitivity**

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**Background:** High-protein diets are often recommended during weight loss therapy to minimize the loss of lean body mass. The overall health benefit of high protein intake, however, is uncertain because increased plasma amino acid availability is associated with insulin resistance. **Methods:** We conducted a randomized controlled trial in 18 obese women (age: 57.6±1.0 y, BMI: 35.1±0.8 kg/m2; mean±SEM) to evaluate the effect of dietary protein intake on body composition and insulin sensitivity after moderate (~10%) diet-induced weight loss. Subjects were randomized to either a low-calorie (LC) diet containing 0.8 g protein/kg body weight/day (n=9) or a LC-high protein (HP) diet containing 1.2 g protein/kg body weight/day (n=9). Total body fat-free mass (FFM) was evaluated by using dual energy X-ray absorptiometry and insulin sensitivity was evaluated by using the hyperinsulinemic-euglycemic clamp technique before and after the intervention. **Results:** Compliance with the diet prescription was very good: protein intake (assessed by food record analysis) was 0.83±0.04 g/kg/d in the LC and 1.23±0.04 g/kg/d in the LC-HP groups and urinary nitrogen excretion rate was ~50% greater (p<0.05). **Conclusions:** A high-protein weight loss diet attenuates the weight loss-induced decline in FFM but eliminates the beneficial effect on insulin sensitivity. These data have important implications for appropriate macronutrient composition of diet therapy for insulin-resistant obese people.

**Eicosapentaenoic acid Increases Thermogenic Markers in Brown Adipose Tissue from High Fat Fed Mice and in Cultured Brown Adipocytes**

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**Background:** Brown adipose tissue (BAT) plays a key role in energy expenditure through its thermogenic function. Therefore, BAT activation may prevent and/or treat obesity. Interestingly, subcutaneous white adipose tissue (WAT) also has the ability to differentiate into brown-like adipocytes. Our laboratory has previously reported that eicosapentaenoic acid (EPA) reduces high fat (HF) diet-induced obesity and insulin resistance in mice,
independent of energy intake; however, EPA effects on BAT are still not clear. We hypothesize that these effects are mediated in part by BAT thermogenesis. **Methods:** BAT and WAT were harvested from C57BL/6J mice fed with HF supplemented with or without EPA, for 11 weeks. We also conducted in vitro studies using HIB 1B clonal brown fat cells were treated with EPA. Gene and protein expression were measured in BAT, WAT and HIB 1B cells via qPCR and immunoblotting, respectively. Extracellular flux analyzer (Seahorse) was used to determine glycolytic activity via extracellular acidification rate (ECAR). **Results:** BAT from HF-EPA mice expressed significantly higher levels of thermogenic genes such as PRDM16 and PGC1-alpha and higher protein levels of uncoupling protein 1, compared to HF mice. Similarly, HIB 1B cells treated with EPA showed significantly higher mRNA expression of thermogenic markers. In contrast, WAT expressed very low levels of these markers with no significant responses to EPA. Moreover, ECAR was significantly elevated in HIB 1B cells treated with EPA which suggests increased glucose metabolism. **Conclusions:** Our results demonstrate a novel role for EPA in preventing obesity via activation of BAT, adding to its known beneficial anti-inflammatory effects.

**T-P-LB-3866**

A review over evaluation methods of response to obesity therapies – Are scientific and medical communities too “weight-centered”?

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**Background:** Body weight (BW) has always been the main outcome in most studies that evaluate weight loss strategies, despite of the importance of other aspects of obesity for multiple risks, like abdominal circumference, neck circumference, total body fat percentage and visceral fat. In this review, a literature research for all obesity therapies was made to find out how many have opted for other outcomes than body weight as a way to evaluate obesity response to therapies. **Methods:** A research was made at PUBMED database by using exact expressions “obesity therapy”, “obesity intervention”, “weight loss intervention” and “obesity treatment”, from the begging of data until Aug. 13, 2,015. Beyond these expressions, combinations between “obesity” (always included in the search), “therapy”, “intervention” or “treatment” (one of these three), “body fat”, “visceral fat” and “circumference” (one of these three) were searched. Inclusion criteria were articles in English, clinical or surgical intervention evaluation in humans as the main goal, and clinical outcomes evaluated. Articles not fulfilling criteria were excluded. **Results:** 13,873 articles were found, 8,712 were doubled and 104 were not in English, remaining 5,057. From these, 1,356 were not clinical studies with humans (26.8%) and 1,989 (39.3%) did not evaluate clinical outcomes. It remained 1,712 studies. Weight loss was directly evaluated in 1,625 studies (94.9%) and indirectly evaluated by BMI reduction (997, 63.6%) and excess of weight loss (157; 9.2%). Other analyzed outcomes were waist circumference (273; 15.9%), visceral fat loss (75; 4.4%) and body fat loss (139; 8.1%). Only 17 studies did not evaluate BW direct or indirectly among the proposed outcomes. **Conclusions:** Chosen outcomes for evaluating response to obesity therapies need to be improved, once other aspects than BW are linked to risks, as WC, and also therapies may have been undervalued due to a lack of boosting weight loss, like physical exercise.

**T-P-LB-3867**

The Relationship of Internal and External Psychological Functioning with Self-Compassion in a Sample of Patients Seeking Bariatric Treatment

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**Background:** Obesity is a worldwide concern and the number of overweight individuals continues to rise. Bariatric surgery significantly and favorably impacts psychological functioning of many formerly obese individuals immediately following surgery and for many subsequent years. Pre-bariatric surgery patients routinely undergo psychological assessments to evaluate psychological functioning and enhance post-surgery outcomes. Individuals of larger size often experience weight stigmatization that may impact psychological functioning and self-perception. Self-compassion is a way of looking at distressing and disappointing events in a non-evaluative manner. Though self-compassion is linked to positive psychological outcomes, the construct embraces the awareness of both positive and negative psychological experiences. **Methods:** Archival data from one hundred and twenty pre-bariatric surgery patients from a psychologist's clinic was used in this study. The patients were referred to psychologist by bariatric surgeon in order to determine psychological readiness for bariatric surgery. The patients completed the Minnesota Multiphasic Personality Inventory (MMPI-2-RF), Self-Compassion Scale (SCS), and demographic information. These inventories were part of requirements for pre-bariatric psychological screening. **Results:** Multiple regression analyses were conducted to explore the linear relationship of psychological functioning (internal and external) with self-
The results indicated that self-compassion is a predictor of greater psychological functioning (R²=0.388; F(2,117)=37.141; p<0.001). **Conclusions:** This study found a relationship between psychological functioning and self-compassion. Identifying self-compassion as an indicator or predictor of mental health functioning among pre-bariatric patients may further the understanding of patients' psychological functioning as patients' journey towards health and wellness.

**T-P-LB-3868**  
**Endoscopic sleeve gastroplasty: results from a single center registry**  

**Background:** Endoscopic sleeve gastroplasty employs endoscopic suturing for gastric volume reduction. This procedure offers a potentially reversible and minimally invasive option for the treatment of obesity. **Methods:** This single center registry includes patients who underwent ESG by a single endoscopist and were followed by the Comprehensive Weight Control Center. All procedures were performed using the Apollo OverStitch and tissue helix (Apollo Endosurgery, Austin, TX). Guidelines for suturing were marked using argon plasma coagulation. Running sutures, with 6-12 stitches each, were placed to create a sleeve in the gastric body; the sutures started sequentially in the antrum to the fundus. Interrupted stitches were then placed to ensure complete closure and to reinforce the sleeve. Patients received dietary and lifestyle counseling after the procedure; medications were added at weight plateau at the discretion of the physician. **Results:** A total of 56 patients (mean age 42.9 yrs, 70% female) underwent ESG, the majority were Caucasian (41.1%). A median of 10 running sutures, each with 4-8 tissue stitches, was used per procedure. There was one significant adverse event (leak leading to fluid collection, managed by IR drainage). Mean weight loss was 8.4%, 15%, 16.4%, and 18.7% at 1, 3, 6, and 12 months respectively (p<0.001). A median of 10 running sutures, each with 4-8 tissue stitches, was used per procedure. There was one significant adverse event (leak leading to fluid collection, managed by IR drainage). Mean weight loss was 8.4%, 15%, 16.4%, and 18.7% at 1, 3, 6, and 12 months respectively (p<0.001). A median of 10 running sutures, each with 4-8 tissue stitches, was used per procedure. **Conclusion:** The initial data illustrates biometric differences at the beginning and end outcomes of a PNP and RD intensive educational and medical intervention for childhood obesity. The data continues to be analyzed. This data may support utilizing a PNP and RD focusing on a medical and educational approach in a community or primary health care setting on a wider scale to impact more children with obesity.

**T-P-LB-3870**  
**Reduced quantity and quality of skeletal muscle mass in children with Prader-Willi Syndrome: a congenital model of sarcopenia.**  
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Background: Prader-Willi Syndrome (PWS) is a genetic syndrome associated with unfavorable alterations in body composition such as reduced lean mass and increased adipose tissue. However, detailed analysis of adipose tissue distribution (subcutaneous, visceral and intermuscular) and skeletal muscle mass in PWS children has not been conducted. The aim of this study was to describe adipose tissue distribution and skeletal muscle mass in PWS children. Methods: Abdominal T1-weighted magnetic resonance imaging (MRI) was performed, and images were analyzed using Slice-O-Matic. Subcutaneous adipose tissue (SAT) was identified using the “watershed” tool. Visceral adipose tissue (VAT), intermuscular adipose tissue (IMAT), and skeletal muscle mass (SM) were identified using a threshold technique. IMAT was manually identified. Volume (cm³) of each tissue was automatically computed, and then converted to liters. Total adipose tissue volume (TAT) was calculated as a sum of SAT+VAT+IMAT volumes. Results: PWS group (N=10) and controls (N=10) had similar age (11.18±4.1 years and 13.7±3.0 years, respectively) and BMI z-scores (0.58±0.8; 0.80±0.6; p=0.105). TAT was significantly higher in PWS group (PWS=2.34±0.9; Control=1.48±0.7; p=0.022). IMAT/SM was also significantly higher in PWS group (PWS=0.38±0.1; Control=0.47±0.1; p=0.001). VAT/SAT was similar between groups (PWS=0.38±0.1; Control=0.47±0.1; p=0.001). Conclusions: PWS children presented with reduced SM compared with controls, but similar abdominal TAT volume. The greater IMAT/SAT ratio found in PWS could relate to a poorer quality of SM, indicating myoesteatosis. This body composition phenotype suggests a unique congenital model of sarcopenia.

T-P-LB-3871
Feasibility of a hybrid in-person/virtual group visit model in weight management for adolescents
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Background: Pediatric multidisciplinary weight management group programs typically require frequent in-person visits. This presents a barrier to participation for families. Video conferencing offers the possibility of interacting with groups without the need for in-person clinic attendance. Little is known regarding the feasibility of a hybrid in-person/virtual group visit model in weight management for adolescents. Methods: In March 2015 the MPOWER CONNECT program was launched. Based on the in-person, Michigan Pediatric Outpatient Weight Evaluation and Reduction (MPOWER) program, if was designed to deliver content via online video conferencing. Feasibility was assessed by feedback from providers and participants. Results: Participants (n=40) ranged in age from 13 – 18 years old. All were above the 95th percentile for BMI and privately insured. Change in weight: Mean change in weight to date is -3.45 lbs. Technology Challenges: The most familiar video conferencing platforms to participants were not HIPAA compliant or did not allow group video conference calls. HIPAA compliant platforms that allowed groups only resulted in acceptable video quality if the groups were limited to 5 participants/computers or fewer. Participant/Provider Feedback: Families appreciated that participation only required in-person visits on a monthly basis and opportunities to interact with providers online. However, a significant minority of patients struggled to interact with the technology utilized in the program (the video conferencing and goal setting platform, the mobile activity and food monitoring app, the social media site, and the program specific website with online videos). Conclusions: A hybrid in person/virtual group visit model has the potential to promote weight loss among adolescents, while decreasing the burden for frequent clinic visits. However, technological challenges and the nuances of virtual group interactions should be explored further.

T-P-LB-3872
Establishing School Day Pedometer Step Count Cut-points using ROC Curves in At-Risk Children
Timothy Brusseau Salt Lake City Utah, Ryan Burns Salt Lake City Utah, James Hannon Morgantown WV

Background: Pedometers are more feasible than accelerometers for physical activity assessment in large samples of school-aged children. No research has established pedometer step count cut-points that discriminate children that meet optimal physical activity during school hours. The purpose of this study was to determine cut-points that associate with 30 minutes of school day physical activity in large samples of school-aged children. Methods: Participants included 1,053 school-aged children (Mean age = 8.4 (1.8 years)) recruited from three Title I elementary schools. Physical activity was assessed using Yamax DigiWalker CW600 pedometers and ActiGraph wGT3X-BT triaxial accelerometers that were concurrently worn during school hours. Receiver operating characteristic curves were used to determine pedometer step count cut-points that associated with accelerometer-measured 30 minutes of MVPA during school hours.
hours. Overall step count diagnostic ability was estimated using the area under the curve (AUC). Cut-points were determined for the total sample and within sex and age groups using the maximum Youden’s J statistic (J max). Results: For the total sample, the AUC was 0.77 (P < 0.001) with a cut-point of 5,505 steps (J max = 0.46, Sensitivity = 63%, Specificity = 84%). Step counts showed greater diagnostic ability in girls (AUC = 0.81, P < 0.001; Cut-point = 5,306 steps) compared to boys (AUC = 0.72, P < 0.01; Cut-point = 5,786 steps). Conclusions: Pedometer step counts showed good diagnostic ability in girls and fair diagnostic ability in boys for discriminating children that met 30 minutes of MVPA during school hours.

T-P-LB-3873
Physical Activity Mediates the Relationship between BMI and Cognitive Function, and Sedentary Time and Cognitive function: Cross-Sectional Analysis of the Canadian Community Health Survey
Alina Cohen Toronto, Chris Ardern Toronto Ontario, Joe Baker Toronto ON

Background: Engagement in physical activity (PA) is protective against cognitive decline whereas, obesity and increased sedentary time are associated with impairments in cognitive functioning. To date, little is known about how these relationships may vary across the life course. The aim of this study was to investigate the inter-relationships among PA levels, sedentary time, obesity, and cognitive functioning scores in younger (30-59y) and older (60-80+y) Canadian adults. Methods: Cross-sectional data of 48,041 participants (≥ 30y) were examined from the 2012 Canadian Community Health Survey. Cognitive functioning was measured using the cognitive attribute of the Health Utilities Index. PA level was assessed using the Physical Activity Index and BMI was calculated as weight (kg) per height (m2). Sedentary time was approximated as the total number of hours per week engaging in sedentary activities, with categories ranging from less than 5 hours to 45 or more hours per week. All measures were self-reported. To assess the inter-relationship between PA, sedentary time, BMI and age on cognitive functioning, general linear models and mediation analyses were used. Results: Increased BMI, greater sedentary time, and decreased PA were related to lower cognitive functioning scores (p Conclusion: Higher levels of PA act to preserve cognitive functioning both independently and by way of reducing BMI and sedentary time.

T-P-LB-3874
Impact of Active School Design on School-Time Sedentary Behavior: A Longitudinal Study
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Background: While patterns of sedentary accumulation have been associated with key health indicators, few longitudinal studies have addressed school built environments’ relationships to students’ sedentary behavior. Methods: This natural experiment determined whether an elementary school environment, holistically designed to promote physical activity, had impact on students’ school-time sedentary behaviors. The intervention group in Virginia wore accelerometers prior to and 14 months after moving to the newly designed school. Measures from a socio-demographically similar group at New York State schools served for comparison. To address maturation effects, a distinct same-grade group wore accelerometers at the follow-up time point at the intervention school. Results: Adjusting for gender and race/ethnicity, results included a non-significant downward trend (p=0.3056) in intervention group daily sedentary time, compared to an increase in the comparison group (p Conclusions: Active classroom design strategies were effective in nudging children to move more during the school day.

T-P-LB-3875
Reallocation of time from prolonged sedentary activity to non-prolonged sedentary, non-locomotive, or locomotive activity is associated with beneficial effects on metabolic risk factors in overweight/obese Japanese adults
Hiroyuki Sasai Tsukuba Ibaraki, Yoshio Nakata Tsukuba Ibaraki, Kiyoli Tanaka Tsukuba Ibaraki

Background: Although the detrimental effects of sedentary time on metabolic risk factors are well known, whether shifting from sedentary activity to other activity types provides health benefits remains unclear. Therefore, this study aimed to examine the cross-sectional associations between the reallocation of time from prolonged sedentary activity to non-prolonged sedentary, non-locomotive (lifestyle), or locomotive activity and metabolic risk factors in overweight/obese Japanese adults. Methods: Overweight/obese Japanese adults (n = 440, 114 men, 52.7 ± 6.7 years) who underwent baseline measurements in one of three weight-loss randomized trials (UMIN000001259; UMIN000010505; UMIN000014428) wore a tri-axial...
increased awareness of possible environmental and biomechanical
limitations for performing certain movements; and empathy
towards obese individuals, particularly related to physical activity.
Reflecting upon the overall experience, one student stated, “I feel
like I now can physically make exercise and atmospheres more
comfortable for those of larger size.” Conclusions: OESs have the
talent to positively impact pre-health professionals’ future
interactions with obese persons in physical activity contexts, but
educators must carefully consider student readiness and
receptivity; and frame the activity to elicit professional, respectful
behavior, while minimizing overgeneralizations to all persons with
obesity.

T-P-LB-3877
How are Teacher Characteristics, Structured Activity Time
and Child MVPA in Early Care and Education Centers
Related?
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Background: Physical activity (PA) at early care and education
(ECE) centers is important for preschoolers’ development. ECE
teachers can facilitate PA through structured (teacher-led) PA. The
effect of structured PA on moderate to vigorous PA (MVPA) is
unclear. This analysis explored relationships of structured PA with
teacher factors and child MVPA. Methods: Trained staff
conducted the Environment and Policy Assessment and
Observation (EPAO) for 4 days in 3-5 year old classrooms in 50
ECE centers in NC. Daily minutes of indoor and outdoor
structured PA were calculated, and quartiles calculated for each.
Teacher PA training was categorized as never, >1 year ago, or ≤1
year ago. Teachers reported confidence in promoting PA (4 items),
height, weight, age, race/ethnicity, and years of ECE experience.
PA confidence score (sum of items) and BMI were calculated.
Related PA cutpoints derived MVPA minutes/day. ANOVAs evaluated
differences in teacher characteristics between structured PA
quartiles. GLMs estimated associations between structured PA and
MVPA, controlling for wear time and teacher BMI.

Results: Between outdoor structured PA quartiles, differences
existed for PA confidence and training. PA confidence increased
for the first 3 quartiles, but decreased between the 3rd and 4th
(F=4.40, p

Conclusions: These data highlight important but
counterintuitive differences of PA confidence and training between
outdoor structured PA quartiles. Future studies should investigate
these factors, their influence on children’s PA levels and what
training or interventions are effective to support teachers.

T-P-LB-3876
An experiential learning activity for pre-health professional
students utilizing “obesity empathy suits” in a physical activity
context
Lori Klos Milwaukee WI, Christy Greenleaf Milwaukee WI, Tracy
Oles-Fairchild Milwaukee WI, Maria Fernanda Laus Milwaukee WI

Background: Pre-health professional training programs may
benefit from the integration of experiential learning opportunities
addressing how larger bodies move in physical activity contexts,
along with possible modifications to exercises and physical activity
environments to improve the quality of care provided to
patients/clients who are obese. Methods: As part of a 16-week
obesity and weight management course, pre-health professional
university students (n=53; predominantly kinesiology majors)
participated in a learning workshop led by a faculty
member/fitness professional with experience working with obese
clients. Two students wore gender-specific, weighted, obesity
empathy suits (OES; http://www.empathysuit.com), and engaged
in a series of activities relevant to a physical activity context (e.g.,
sit-ups, treadmill walking) while speaking aloud about their
movement experience. The other students discussed their
observations and alternative movements were presented. Students
responded (in writing) to a series of open-ended questions about
the learning experience, and their papers were analyzed for themes.

Results: Students considered the OESs to be a “reasonably”
realistic simulation of an obese person’s body and movements,
although several limitations were noted. Students expressed
increased awareness of possible environmental and biomechanical
accelerometer at their waist for 2 weeks. The accelerometer is
capable of accurately classifying sedentary, non-locomotive, and
locomotive activities. Time spent in sedentary activity was further
segregated into prolonged (accumulated in bouts ≥30 min) and
non-prolonged (accumulated in bouts Results: Independent of
potential confounders, substituting 30 min/day of prolonged
sedentary time with an equal amount of non-prolonged sedentary
time was associated with lower waist circumference (β = −0.55,
95% confidence interval [CI]: −0.94, −0.16 cm). Reallocation of
time to non-locomotive and locomotive activities was beneficially
associated with lower diastolic blood pressure (β = −0.41, 95% CI:
−0.81, −0.02 mm Hg) and higher HDL cholesterol (β = 1.47, 95%
CI: 0.32, 2.63 mg/dL). Conclusions: Substituting time spent in
prolonged sedentary activity with other less-sedentary activities
was favorably associated with metabolic risk factors. Interventions
targeting a small shift in activity types may be feasible and
beneficial for sedentary overweight/obese adults.
T-P-LB-3878

E-Mechanic: Results of a randomized controlled trial to identify the mechanisms of exercise-induced weight compensation


Background: Exercise results in less weight loss than expected based on the increase in energy expenditure. This is termed compensation and its mechanisms are unclear. This is among the first studies designed to test for compensation with 2 doses of exercise and determine if exercise changes energy intake and metabolism. Methods: We randomized 198 overweight and obese adults (74% female) to a no-exercise control or one of 2 exercise groups for 6 months: a) 8 kcal/kg of body weight/week (KKW), which results in about 700 kcal of exercise/week, or b) 20 KKW or about 1,800 kcal of exercise/week. Exercise was supervised with superb compliance and no suggestions were made to modify other behaviors (e.g., food intake). Energy intake and expenditure were quantified at month 0 and 6 with doubly labeled water (DLW). Actual weight change was also measured and the amount of weight loss expected from exercise was quantified with the 3,500 kcal/lb rule. Resting metabolic rate (RMR) was measured by indirect calorimetry. Results: Mean (SD) baseline weight, body mass index, and age were 88.9 (16.3) kg, 31.7 (4.6) kg/m2, and 47.6 (11.9) years, respectively. Expected weight loss was 0.0, 2.2 and 4.9 kg in the control, 8, and 20 KKW groups, yet mean (SEM) actual weight loss was 0.3 (0.4), 0.5 (0.4), and 1.8 (0.4) kg, respectively. Significant compensation (expected minus actual weight loss) occurred in the 8 and 20 KKW groups (p’s

Conclusions: Exercise resulted in only 23% to 37% of expected weight loss as energy intake increased significantly (RMR did not change). Compensation appears to be primarily due to increased energy intake. The findings provide intervention targets to increase weight loss with exercise and inform future exercise recommendations.

T-P-LB-3879

Effect of Obesity on Emotional and Cardiovascular Response to Acute Psychological Stress

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Background: There are well-known associations among obesity, cardiovascular disease and stress. However, the underlying mechanisms remain unclear. The aim of current study is to address whether obesity generates a greater risk for cardiovascular disease by increasing sensitivity to acute psychological stress.

Methods: Non-obese (BMI Results: Compared with the non-obese group, subjects in obese group had a significantly higher DBP response to the TSST, but not the SBP, MAP and HR responses. Individuals with obesity showed lower levels of cortisol during the TSST. Leptin levels, not adiponectin levels, were significantly elevated in the obese group. Conclusions: Our findings suggest that greater BMI is associated with increased emotional and physiological responses to acute psychological stress, which are not caused by cortisol secretion during the TSST, indicating that other acute response elements may contribute to it. Individuals with obesity at a greater risk for cardiovascular disease may be due in part to increased acute stress response.

T-P-LB-3880

Oligofructose supplementation is associated with decreased lipopolysaccharide and plasminogen activator inhibitor-1 in overweight and obese adults

Teja Klancic Calgary Alberta, Jill Parnell Calgary AB, Raylene Reimer Calgary AB

Background: Metabolic endotoxemia is a pro-inflammatory and oxidative state that may contribute to the development of cardiometabolic disease in obesity. Systemic elevations of gut-derived endotoxin (lipopolysaccharide, LPS) can initiate a pro-inflammatory signalling cascade contributing to insulin resistance and metabolic syndrome. In animals, the prebiotic fiber oligofructose (OFS) lowers plasma LPS and inflammatory cytokines. In a clinical trial we previously showed that OFS supplementation reduces body fat and improves glucose control in overweight/obese adults via changes in satiety hormone concentrations. Our objective was to perform new analysis on stored plasma samples from this trial to investigate the effect of OFS on metabolic endotoxemia and inflammation. Methods: The study was a randomized, double-blind, placebo-controlled trial. Forty-eight overweight and obese adults were randomly assigned to receive 21g/d of OFS or placebo (maltodextrin) for 12 weeks.

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Plasma metabolic (resistin, adiponectin, PAI-1) and inflammatory (LPS, IL-6, IL-1β, TNF-α, MCP-1) markers were measured using Luminex assays (LAL assay for LPS). **Results:** Plasma LPS concentrations were reduced by 40% in the OFS group over 12 weeks compared to a 48% increase in the placebo group (P=0.04). Plasma plasminogen activator inhibitor-1 (PAI-1), a risk factor for thrombosis, was reduced to a greater extent in the OFS group (-17303±2569 pg/mL) compared to the placebo group (-9718±1779 pg/mL; P=0.03). There was no effect of OFS on IL-6, IL-1β, TNF-α, MCP-1, adiponectin or resistin. TNF-α levels positively correlated with IL-6 (R = 0.412, P = 0.01) and MCP-1 (R = 0.601, P = 0.01).

**Conclusions:** OFS supplementation, independent of any other lifestyle changes, reduced LPS and PAI-1 levels in overweight and obese adults. Because higher PAI-1 and LPS levels contribute to the complications of obesity, increased OFS intake may help to delay/prevent comorbidities associated with obesity.

**T-P-LB-3881**

**Patterns of Moderate to Vigorous Physical Activities in Physical Education Classes Between Groups of BMI**


**Background:** The current guidelines for physical activity (PA), in school-aged youngsters’, advocate 60 minutes of daily moderate to vigorous PA (MVPA). School-based Physical Education (PE) is the most widely available source to promote physical activities among young people and the guidelines recommend that at least 50% of class time should be spent in MVPA. Aim of this study was to analyze, comparatively, PA levels in PE classes between groups of Body Mass Index (BMI). **Methods:** The sample comprised 455 young volunteers aged between 10 and 18 years (14.23 ± 2.64), composed by 200 boys and 255 girls. PA was assessed using Actigraph GT3Xs accelerometer. Data were analyzed with specific software and activity determined according to Evenson et al. (2008). T-test and general linear model were used to assess differences in PA levels in PE classes between groups of BMI (normal weight and overweight), adjusting for possible confounders. **Results:** On average, normal weight participants present higher percentages of time in MVPA (32%) when compared to overweight/obese subjects (26.7%), even when adjusting for possible confounders, such as gender, type of sports present in PE lessons and age. Only 11.4% of normal weight students meet the recommendation for 50% of classes’ time spent in MVPA when compared to only 3.1% from the overweight/obese subjects (P < 0.05). **Conclusions:** Overweight/obese students are less active that their normal weight counterparts in PE lessons, particularly in MVPA intensities. Only a small percentage of PE students accomplish the 50% recommendations in MVPA, and therefore strategies should be implemented in order to use the few options that students have in school to be active, and adapt new approaches in PE that will increase their participation in MVPA during PE lessons Supported by Project: PTDC/DTP-DES/1328/2012 (FCOMP-01-0124-FEDER-028619); and Research Center supported by: PEst-OE/SAU/UI0617/2011.

**T-P-LB-3882**

**Body fat percentage and nutritional and physical activity knowledge in Adolescents**

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**Background:** Knowledge enhancement has been referred as a mean to improve nutrition and physical activity, and reduce obesity. The objective of this work was to identify the difference of nutrition and physical activity knowledge according body fat and physical activity levels in adolescents. **Methods:** A cross sectional study with 734 adolescents was designed. Body fat was measured using electric bioimpedance, physical activity data were objectively measured by accelerometer. Adolescents were divided in 2 physical activity groups: high and low physical activity; 2 body fat groups: normal fat and overweight and 4 groups resulted from the combination of body fat and physical activity. Nutrition and physical activity knowledge were assessed by questionnaires. **Results:** Body fat percentage revealed that 30.8 % of adolescents were overweight or obese, and daily moderate to vigorous physical activity was in average 47.9 (SD=27.49) minutes minutes. High physical activity adolescents presented higher physical activity knowledge (p=0.044) and the overweight/low physical activity group scored the worse on experts’ nutritional recommendations knowledge. **Conclusions:** Knowledge is not the single factor in the obesity equation, but it seems essential to reduce overweight and obesity. Interventions that address several nutrition and physical activity determinants should be designed. Supported by Project: PTDC/DTP-DES/1328/2012 (FCOMP-01-0124-FEDER-028619); and Research Center supported by: PEst-OE/SAU/UI0617/2011.

**T-P-LB-3883**

**Obesity and nutrient intake associated with Big Five personality traits**
Background: The overweight rate followed by overnutrition is increasing rapidly throughout all over the world particularly in developed countries, which led to the increased prevalence of non-communicable diseases such as obesity. Healthy diet habit plays a key role in the prevention and treatment of obesity, which is thought to get influence by personality traits. A large population in Korea was studied to find this complex correlation between obesity, nutrient intake and personality traits.

Methods: Big Five personality model consisted with Neuroticism, Extraversion, Openness to experience, Agreeableness, and Conscientiousness was investigated in the relation of nutrient intake and BMI level. A Korean healthy population with total 3,606 including men (n=940; mean age 39.9±9.2) and women (n=2666; mean age 34.5±6.1) from the Kangbuk Samsung Hospital Cohort Study datasets was used for this study. NEO PI-R for personality and FFQ for nutrient intake were assessed. Results: High conscientiousness was associated with lower total calorie intake, which was correlated with lower BMI especially in women. High extraversion was significantly associated with high BMI in men and women, which was the predictor of high calorie intake in men. In addition, extraversion had the positive relation with sodium intake in men and women. In women, however, the predictor for high calorie intake was not extraversion, but neuroticism and openness to experience with no association with BMI. The high extraversion women were related with higher protein intake, which could be connected to the positive correlation between BMI and protein in women, while BMI was positively correlated with fat consumption in men. Conclusions: The findings indicate that the distinct patterns of nutrient intake influenced by personality traits existed clearly in different gender population, which was correlated with obesity risk. It may need to consider psychological aspects for the nutritional policy, which might contribute to the prevention of obesity.

T-P-LB-3884

Divergence of Patient and Clinician Perceptions of Obesity and Weight Management

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Background: Obesity is a chronic disease associated with significant morbidity, for which few affected individuals receive adequate medical care. The ACTION (Awareness, Care & Treatment In Obesity MaNagement) study was designed to identify barriers reported by people with obesity (PWO) and clinicians that may hinder the initiation of such care. Methods: Focus groups including 43 PWO (class I: N=14; class II: N=13; class III: N=16) and individual interviews with 24 clinicians (12 primary care providers and 12 obesity specialists) were conducted, transcribed, and coded thematically. Results: 75% of PWO perceived themselves as ‘healthy,’ although nearly three-quarters had obesity-related comorbidities. While PWO and clinicians considered obesity a combination of disease and lifestyle, their primary emphases differed widely: 65% of PWO considered obesity primarily a lifestyle issue, and 88% of clinicians considered it a disease. Motivation was perceived as a key barrier to weight loss by both PWO and clinicians (77% vs. 75%, respectively); limited patient understanding of their condition less so (35% vs. 42%). Relative to clinicians, PWO more often cited barriers of food habits (88% vs. 38%), social relationships (79% vs. 38%) and feeling deprived while dieting (56% vs. 8%), and less often cited limited patient understanding of how to lose weight (9% vs. 58%). Importantly, PWO indicated that developing health complications or receiving a "wake-up call" in relation to their health would motivate them to address their obesity. Conclusions: Perceptions of obesity appear to vary between PWO and clinicians. This discordance may be a barrier to effective communication and treatment, and thus contribute to suboptimal patient-clinician interactions. This qualitative association provides the basis for quantitative examination of these perceptions and their causes, the understanding of which could enhance patient-clinician collaboration in the treatment of obesity.

T-P-LB-3885

Maternal feeding practices and fussy eating in toddlerhood: a discordant twin analysis


Background: Parental feeding practices are thought to play a causal role in shaping a child’s fussiness; however, a child-responsive model suggests that feeding practices may develop in response to a child’s emerging appetitive characteristics. We used a novel twin study design to test the hypothesis that mothers vary their feeding practices for twin children who differ in their food fussiness, in support of a child-responsive model. Methods:
Participants were mothers and their 16 month old twin children (n=2026) from Gemini, a UK twin birth cohort of children born in 2007. Standardized psychometric measures of maternal ‘pressure to eat’, ‘restriction’ and ‘instrumental feeding’ as well as child ‘food fussiness’ were completed by mothers. Between-family analyses used Complex Samples General Linear Models to examine associations between feeding practices and ‘food fussiness’. Within-family analyses examined if twin-pair differences in ‘food fussiness’ were associated with differences in maternal feeding practices using linear regression models.

Results: Between-family analyses indicated that ‘pressure to eat’ and ‘instrumental feeding’ were positively associated with ‘food fussiness’, while ‘restriction’ was negatively associated with ‘food fussiness’ (all p values. Conclusions: Mothers appear to adjust their feeding practices according to their toddler’s emerging characteristics, suggesting a bidirectional responsive relationship between parental feeding practices and fussy eating. Specifically, the fussier toddler is pressured more than their less fussy co-twin, and is more likely to be offered food rewards.

T-P-LB-3886
Grandma Knows Best: Maternal perceptions of grandparents’ influence on child snacking and parental feeding authority

Background: While parents have central influence on children’s eating behaviors, an increasing number of grandparents participate in child feeding. The manner in which grandparents approach feeding young children as well as how that role is negotiated with parents is unclear. The purpose of the study was to explore maternal perceptions of grandparents’ influence on preschool aged children’s snacking and parental authority in child feeding.

Methods: Participants were 55 ethnically-diverse, low-income mothers of preschool aged children 3 to 5 years of age. A qualitative design was employed where semi-structured interviews were used to examine mothers’ schemas around child snacks and the context of snacking. Interviews were recorded and transcribed verbatim. Analyses used NVivo 10 to identify major themes using a grounded-theory approach. Participant demographics and household food security were assessed by self-report. Results: Three major themes emerged regarding mothers' perceptions of grandparents. First, many mothers described supportive or positive aspects of grandparents’ involvement in child feeding: 1) building bonds with grandchildren, 2) providing healthy foods, and 3) setting limits. Second, grandparents were perceived as being unsupportive in: 1) offering “junk foods” and 2) being permissive regarding the types, frequency, and portion sizes of snacks offered to children. Third, these perceptions were juxtaposed with the perception that grandmothers often challenged mothers’ authority in child feeding. Conclusions: Findings suggest that grandparents may have important roles in family dynamics around feeding among low-income families with young children.

T-P-LB-3887
Indications for bariatric surgery – Are some doctors going too far?
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Background: Studies have consistently tried to enlarge indications for bariatric surgery toward lower Body Mass Index (BMI) and diabetes correction regardless of BMI. However, not the same effort has been made on clinical modalities. A lack of attempt to optimize clinical therapies, by associating different safe and effective drugs, promotion of an intensive surveillance and multidisciplinary clinical approach, might be an important reason why surgical option has increased. The last Obesity Society (TOS) guideline recommends that surgery should be offered to patients with a BMI > 40kg/m2 or >35kg/m2 with comorbidities, and refractory to other therapies. However, many patients have been recommended bariatric surgery not fulfilling criteria. In this study, we analyze whether indications for surgery were properly made to patients who visited an obesity center. Methods: Patients recommended bariatric surgery by a bariatric surgeon or an endocrinologist were included. Questions about diet plan, psychotherapy or medications for obesity prior to the bariatric indication, awareness of benefits, risks and limitations and motivation for surgery were developed and done. BMI, age, gender, comorbidities and psychiatric disorders were also evaluated. Results: A total of 53 patients who were recommended surgery searched the clinic. After exclusion criteria, 44 subjects were included. From these, 19 had a BMI Conclusions: It was demonstrated that bariatric surgery may be over and prematurely indicated, possibly because it became an easier, more profitable and definitive option, as obesity clinical approach can be complex and strenuous. Formal indications for an aggressive option like bariatric surgery should be strictly followed.
Methods: an additional factor determining A1C levels after RYGB. RYGB differ amongst various ethnic groups. We identified race as loss outcomes, it is not known how A1C levels achieved after Although it is recognized that racial disparities influence weight duration of disease, age, baseline HbA1c, and weight loss. Other bariatric surgeries. Factors influencing its success are reversing adverse metabolic consequences associated with obesity, in particular Type 2 Diabetes (T2DM). Roux-en-Y gastric bypass (RYGB) is more effective at improving HbA1c, when compared to other bariatric surgeries. A retrospective analysis of data obtained from 919 ethnically diverse subjects undergoing RYGB at Boston Medical Center between 2004 and 2009 was carried out. Changes in HbA1c levels up to 2 years post RYGB among Caucasian Americans (CA), African Americans and Hispanic Americans (HA) were assessed by linear mixed model analyses. Results: HbA1c levels significantly decreased equally in all racial groups. However, only AA subjects had a significant increase in their A1c levels, which returned to near baseline levels 2 years after RYGB. This increase was independent of the amount of weight lost and did not relate to any detectable weight regain among AA subjects. Conclusions: AA may not achieve the same HbA1c lowering benefit of RYGB surgery as other racial groups. This finding may be important when making decisions about recommending RYGB in this ethnic population.

T-P-LB-3889 Self-Reported Opioid and Marijuana Use and Pain in the Year Following Recreational Marijuana in New Patients to Weight Management

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Background: We have previously shown that opioid use increases following bariatric surgery, especially following RYGBs and in those chronically using opioids. The reason is unknown but could be related to preoperative pain. The effect of bariatric surgery on marijuana (MJA) use is not known. Medical (MED) MJA has been available in Colorado for over a decade, recreational (REC) MJA has been legal in only the last year. In order to begin to understand the effect of MJA in the bariatric population, we sought to evaluate the change in MJA use and reason, changes in opioid use, and changes in pain in new patients coming to an obesity clinic between summer 2014 and summer 2015. Our hypothesis was that there will be a higher proportion of patients using REC MJA in June 2015 than August 2014. Methods: All new patients to Kaiser Permanente CO Weight Management meeting criteria for bariatric surgery and seen in August 2014 or June 2015 were evaluated. Measures included age, sex, BMI, presence of weight related comorbidities or a pain diagnosis, pain score, current opioids use, MJA use and reason (MED or REC), and alcohol use. Results: There were 137 patients meeting criteria seen in August 2014 and 128 in June 2015. No differences were seen in age, sex, presence of weight related comorbidities, pain diagnoses, or alcohol use. Current opioid use was seen in 12% in 2014 and 15% in 2015 (p=0.47), MJA use was seen in 9% in 2014 and 7% in 2015 (p=0.55) with 50% REC use in 2014 67% REC use in 2015 (p=0.34). BMI was less in 2015 than 2014 (46 + 8 vs 43 + 8 kg/m2, p=0.009) and self-reported pain at the visit was also less in 2015 vs 2014 (1.8 + 2.8 vs 1.3 + 2.5, p=0.05). Conclusions: Self-reported use of MJA and specifically REC use did not increase following REC MJA legalization in new patients seeking weight loss management and meeting criteria for bariatric surgery. The effect of REC MJA on subsequent MJA use following bariatric surgery, and on metabolic and surgical outcomes in this population remains to be determined.

T-P-LB-3890 Bariatric Surgery and Type 1 Diabetes Mellitus: a Systematic Review and Meta-Analysis


Background: Type 1 Diabetes Mellitus (T1DM) has a rising global prevalence. Although it is vastly outnumbered by Type 2 Diabetes Mellitus rates, it remains a persistent worldwide source of morbidity and mortality. Increasingly its sufferers are afflicted by obesity and its complications. Our objective was to quantify the effects of bariatric surgery on T1DM by appraising the primary outcomes of glycosylated haemoglobin(HbA1c), insulin requirements and body mass index (BMI). Secondary outcomes included blood pressure, triglycerides and cholesterol biochemistry. Methods: A systematic review of studies reporting pre-operative and post-operative outcomes in T1DM patients undergoing bariatric surgery. Data were meta-analysed using...
random effects modeling. Subgroup analysis and quality scoring were assessed. Results: Bariatric surgery in obese T1DM patients is associated with a significant reduction in insulin requirement (-48.95 units, 95%CI of -56.27, -41.62), insulin requirement/Kg (-0.391, 95%CI of -0.51, -0.27), HbA1c (-0.933%, 95%CI of -1.604, -0.262) and BMI (-11.04Kg/m², 95%CI of -13.49, -8.59). Surgery is also associated with a statistically significant reduction in systolic and diastolic blood pressure and a significant beneficial rise in HDL. Heterogeneity in these results was high and study quality was low overall. Conclusions: Bariatric surgery in obese T1DM patients is associated with a significant improvement in insulin requirement, and a significant though modest effect on HbA1c. These early results require further substantiation with future studies focusing on higher levels of evidence. This may offer a deeper understanding of diabteogenesis and can contribute to better selection and stratification of diabetic patients for metabolic surgery and future metabolic treatment strategies.

**T-P-LB-3891**

**Weight Loss after Roux-En Y Gastric Bypass Surgery Reveals Novel Skeletal Muscle Promoter-Specific DNA Methylation Changes in Obese Patients**

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**Background:** The mechanisms of weight loss and metabolic improvements following roux-en Y gastric bypass (RYGB) surgery are incompletely understood but epigenetic modifications are likely to contribute. The aim of our study was to investigate skeletal muscle DNA methylation after weight loss induced by bariatric surgery. **Methods:** Muscle biopsies were obtained basally from seven insulin-resistant morbidly obese (BMI >40 kg/m²) female subjects (45.1 ±3.6 years) pre and 3 months post-RYGB with euglycemic hyperinsulinemic clamps to assess insulin sensitivity. We performed reduced representation bisulfite sequencing next generation methylation and microarray analyses on DNA and RNA isolated from vastus lateralis muscle biopsies. **Results:** Significant improvements in fasting plasma glucose: 104.2 ±7.8 vs. 86.7 ±3.1 mg/dl and BMI: 42.1 ±2.2 vs. 35.3 ±1.8 kg/m² were demonstrated in the pre vs. post-RYGB, both P. **Conclusions:** These results demonstrate that weight loss after RYGB alters the epigenome through DNA methylation, and highlights novel transcriptomic changes in skeletal muscle genes that may contribute to the metabolic improvements observed post-RYGB.

**T-P-LB-3892**

**Effectiveness of Supplementation using Ferrous Sulfate for Normalization of Iron Status in Patients Following Gastric Bypass, A Pilot Study.**

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**Background:** Iron deficiency resulting in anemia, fatigue and pica is common after Roux-en-Y gastric bypass (RYGB). Oral supplementation using ferrous sulfate is the first line of treatment, but its effectiveness is controversial. The objective is a pilot study to evaluate the efficacy, safety and tolerability of ferrous sulfate for treatment of iron deficiency and associated symptoms. **Methods:** Women who had RYGB and are iron-deficient receive ferrous sulfate (65 mg t.i.d.) for 8 weeks. Iron status including blood concentrations of ferritin, total iron binding capacity (TIBC), soluble transferrin receptor (sTfR), and hemoglobin are determined at baseline and 2, 4, and 8 weeks. Measures of fatigue and quality of life are assessed using SF36 and Multidimensional Fatigue Inventory questionnaires. Compliance and gastrointestinal symptoms are tracked. Power analysis suggests that N=16 is required. Means of data are presented. **Results:** Of RYGB patients who were screened, 43% were found to be iron deficient. To date, 4 participants who were iron deficient have completed the study. A significant improvement in iron status was observed: ferritin (5.1 to 21.4 mcg/L, p = 0.068); TIBC (420.5 to 346.8 mcg/dL, p Conclusion:** Early data demonstrate that supplementation of ferrous sulfate is efficacious for resolution of iron deficiency and associated anemia that occurs following RYGB, but low tolerability may limit effectiveness.

**T-P-LB-3893**

**A Provocative Signal of Alcohol Use From the Teen-Longitudinal Assessment of Bariatric Surgery (Teen-LABS) Study**

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**Background:** Emerging evidence indicates bariatric surgery, specifically Roux-en-Y gastric bypass, results in increased alcohol sensitivity and risk for alcohol use disorder (AUD) post-
operatively in adults. The present data are the first to characterize adolescent patient alcohol use behaviors pre-post weight loss surgery (WLS). **Methods:** Teen-LABS is a multi-site prospective cohort study of adolescents who underwent WLS. Of 242 participants, 180 (WLS: 76.1% female; 62.2% White; Mage = 17.1±1.5 years; MBMI=52.6±9.0 kg/m2) completed the Alcohol Use Disorders Identification Test pre- and 1 and 2 years postoperatively. Results were compared to a cohort of 66 adolescents with severe obesity not undergoing WLS (Control: 80.3% female, 53.0% White; Mage = 16.2±1.3 years; MBMI=46.3±5.0 kg/m2). **Results:** Over 90% of participants reported no alcohol consumption in the year prior to surgery/baseline. Rates of those who subsequently consumed alcohol within the prior year increased over time (i.e., 24 months: 29.4%WLS; 25.8%Control). However, of WLS group who drank during the second post-operative year, 36% reported consuming 3+ drinks on a typical drinking day, with 41.5% consuming 6+ drinks on at least one occasion, with rates similar to Controls. Prevalence of AUD was low for both groups at 24 months. (8.9%WLS vs. 9.1%Control). **Conclusions:** Broader epidemiological surveillance demonstrates that alcohol use behaviors typically onset and increase across the adolescent and young adult period, with binge drinking common along with increased risk of alcohol-related harm (e.g., injury, death). In light of the emerging concerns from the adult WLS literature, the present data provide a provocative signal with clinical and safety implications for adolescents undergoing WLS, which warrants thorough examinations and within a developmental context.

**T-P-LB-3894**

Comparison of the changes in gut microbiome after medical weight loss versus bariatric surgery in a randomized trial

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**Background:** Emerging evidence suggests a role of gut microbiome in human obesity and diabetes. Bariatric surgery, especially Roux-en-Y gastric bypass (RYGB), is highly effective in improving obesity and diabetes compared to medical weight loss (MWL). We hypothesized this may be partly related to the change in gut microbiome after surgery. **Methods:** We performed 16S rRNA sequencing to identify the gut microbial composition at baseline and at 10% weight loss in 12 subjects with type 2 diabetes who were randomized (1:1:1) to one of three weight loss interventions: MWL, adjustable gastric banding (AGB), or RYGB. Metastats Qnine was used to calculate taxonomic profiles from 16S rRNA reads. Metastats was then applied to analyze change in relative abundance of taxa across arms, and to calculate Bacteroidetes to Firmicutes (B/F) ratio. **Results:** All subjects were female, 75% black race with mean age of 51 and approximately 10% weight loss (6.12-9.97%). Mean hemoglobin (Hb) A1c decreased in all three arms and did not vary significantly by arm. At follow-up, subjects who underwent RYGB or AGB had increased abundance of Proteobacteria and Actinobacteria compared to MWL subjects, but there was no pattern in the change in potentially beneficial bacteria (e.g. Faecalibacterium prausnitzii or Akkermansia muciniphila) across arms. The change in B/F ratio did not differ by arm. There was no association between the change in B/F ratio and change in weight or Hb A1C.

**Conclusions:** This is the first randomized study on the change in human gut microbiome after surgical versus MWL. At a similar weight loss amount (~10%) and HbA1C improvement, our results suggest that there is a difference in the gut microbial composition change after surgical versus medical weight loss. The change in B/F ratio or potentially beneficial bacteria, however, did not show a pattern across arms. Larger and longer follow-up studies are needed to further explore the mechanisms of differential improvement in weight and glucose.

**T-P-LB-3895**

Primate fetal hepatic response to maternal obesity: Impact on WNT/β catenin signaling and lipid metabolism.

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**Background:** The fetal origins of disease hypothesis in humans and animals states that the intrauterine environment is a determinant of adult disease and health. Maternal obesity (MO) increases the risk for offspring cardiovascular disease, diabetes and obesity. Programming of fetal liver development is an important metabolic target for adverse maternal nutrition. **Methods:** We developed cohorts of baboon offspring from normal weight and MO mothers. Gene expression data were analyzed using GeneSifter software. Significant differentially expressed genes were overlaid onto KEGG pathways. Fetal liver lipid content was quantified using Oil Red O staining and the Computer Assisted Stereology Toolbox (CAST). **Results:** We hypothesized that MO influences hepatic metabolic pathways during fetal development.
Analysis of global gene expression at 0.9 gestation (G) showed 875 differentially expressed genes between MO and control fetuses, with 350 genes up-regulated and 583 down-regulated. Gene expression differed by sex. Overlaying differentially expressed genes onto KEGG pathways revealed that the Wnt/β catenin signaling pathway, which is involved with hepatic lipid metabolism in obese rats, was up-regulated in MO versus control fetuses suggesting that MO influences fetal hepatic lipid metabolism. Of three differentially expressed genes related to Wnt/β catenin signaling pathway in our dataset, frizzled homolog 5 and peroxisome proliferator-activated delta were both up-regulated and SMAD family member 4 was down-regulated. Hepatic lipid quantification of lipid by Oil Red O showed increased lipid in MO fetal livers. The MO fetal livers showed 2-fold more lipid accumulation than the control fetal livers (p = 0.048).

**Conclusions:** Our findings suggest dysregulation of lipid metabolism via Wnt/B signaling in MO fetal livers as early as 0.9 G will result in impaired adult offspring metabolic health.