Conclusions: Adipocytes cells treated with EPA, exposed to conditioned media from 3T3L1 preadipocytes and acidification rate was significantly reduced in MCF7 cells and monocyte chemoattractant protein-1 (MCP-1) secretion.

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 preadipocytes and adipocytes cells 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-3254
Adipocyte-Breast Cancer Cell Interactions: Preventive Effects of Omega-3 Fatty Acids
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Background: Postmenopausal obesity is associated with a higher risk of developing breast cancer. There is evidence of breast cancer adipocytokines, cytokines and chemokines secreted by adipocytes, thereby promoting breast cancer cell growth and metastasis.

Methods: To test this hypothesis, we tested the effects of conditioned media from 3T3L1 adipocytes on breast cancer cell lines and human mesenchymal stem cells (HMSC). Additionally, conditioned media from HMSC significantly increased IL-6 and MCP-1 secretion from MCF7 cells. Glycolytic activity was measured using the XFe24 Seahorse extracellular flux analyzer.

Results: Conditioned medium from HMSC significantly increased IL-6 and MCP-1 secretion from MCF7 cells. Glycolytic activity as estimated by extracellular acidification rate was significantly reduced in MCF7 cells exposed to conditioned media from 3T3L1 preadipocytes and adipocytes cells 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
Rechey Thomas Kuwait Kuwait, Sardar Sindhu Dasman Kuwait City, Rasheed Ahmad Kuwait Kuwait

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-α, MCP-1), anti-inflammatory (CD163), and general (CD11b, CD68) markers. Notably, circulating 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, IL-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 was positively correlated 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 6R/6-6 expression in the adipose tissue which might be a contributory mechanism of metabolic inflammation.
**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). Loss of E2 or its receptors results in obesity, insulin resistance and metabolic dysfunction. In our study, we examined the role of GPER activation in adiposity, metabolism and adipose tissue-specific inflammatory gene expression in ovariectomized mice.

**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 (HIF-1α) 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**  
Sooho Park Bucheon, Jae-Hwan Nam Bucheon Gyeonggi

**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 hrelin 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-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 monocyt/macrophage infiltration of the adipose tissue. MCP-1 is a key regulator of monocyt/macrophage 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-defMyD 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-induced MCP-1 production. Furthermore, MCP-1 production in MyD88-/- cells was completely attenuated. However, 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, IkB-alpha/beta and NF-kB. Pre-treatment of THP-1 cells with inhibitors of JNK (SP600125), MEK/ERK (U0126; PD98056; XMD 8-92), NF-Xb (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 locating chromosomal quantitative 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 LeprStefa,) 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 urine volume, urinary albumin excretion, urine creatinine, and albumin to creatinine ratio (ACR). Renal pelvis samples were cultured to identify presence or absence of bacteria which were classified into one of 10 species. 341 proteins were identified by proteomics of Zucker rat urine.

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: Lactobacillus (12 times), E. coli (11 times), and Staphylococcus (7 times). We observed equal likelihood of infection from any species of bacteria in males and females, and in lean and fatty Zucker rats. 12 out of 45 congenics (27%) were infected while 38 out of 72 (52%) of Zuckers were infected (p=0.008). Contingency table analysis revealed a significant effect of any infection to increase urine volume and ACR in fatty animals homozogous for LeprStefa. Urine proteomics identified 3 bacterial defense peptides that may contribute to the congenic effect.

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 (LeptTg) with ob/+ mice to generate LeptTg:ob/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 LeptTg (21g) and LeptTg:ob/ob (22g) weighed less than +/-: On HFD, BW further increased in ob/ob mice (53g). In LeptTg:ob/ob, BW was significantly lowered down to 30g and was comparable to LeptTg (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, remain 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 isoform 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 adipogenic 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  
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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 (genus 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 and decreased the phyla Firmicutes (genus Roseburia). GT and BT treatment were of great importance 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.
Fasting Induces Differential Expression in the Transcriptome of the Hypothalamic Arcuate Nucleus of the Rat

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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 were downregulated. 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 were downregulated.

Conclusions: Amplified RNA from the LCM was used for cDNA synthesis and library sequencing. The global gene expression changes following food deprivation were analyzed using RNA-seq. Key genes involved in food intake, including NPY, AgRP, and POMC, were differentially regulated. This study provides insights into the neural pathways involved in food intake regulation following fasting.

Global Analysis of Hypothalamic Arcuate Nucleus Specific Gene Expression Changes Following Roux-en-Y Gastric Bypass

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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.

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.

Liver Insulin Clearance is More Accurately Estimated During a FSIGT vs the Euglycemic Clamp

T-P-3272
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) x M], where M is slope of ins infusion vs conc 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 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-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±SEnormal 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 BPs are characteristic of human obesity-linked hypertension. In addition, preventing excess weight gain prevented hypertension in NHPs.
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—1 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 3.3(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-3277
Adipose Tissue Diacylglycerol Acyltransferase (DGAT) Activity: Does it Explain the Differences in Body Fat Distribution?
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Background: We are interested in the regulatory steps involved in adipose tissue (AT) free fatty acid (FFA) storage because of the potential for this pathway to contribute to differences in body fat distribution, especially at the extremes of upper body (UBO) and lower body obesity (LBO). Important factors in FFA storage include acyl-CoA synthetase (ACS) and diacylglycerol acetyltransferase (DGAT). In previous studies, differences in activity of these enzymes correlated with differences in regional FFA storage rates.

Methods: 8 UBO and 8 LBO premenopausal women participated in this study. We measured direct FFA storage rates in abdominal and thigh AT in the presence of low (insulin infusion) and high (somatostatin + epinephrine) FFA concentrations. Palmitate storage rates were measured using a bolus biopsy technique. Palmitate storage rates, ACS and DGAT activities were measured on both study days.

Results: Abdominal adipocyte size was less in LBO than UBO (0.63±0.13 vs 0.94±0.34 µg lipid/cell, P=0.02), but thigh adipocyte size was not (p=0.19). On both study days and in both abdominal and femoral AT DGAT activity (pmol/mg tissue/min) was ~ twice as great in LBO as UBO (all P<0.01). Abdominal AT DGAT activity in UBO, but not LBO, was inversely proportional to abdominal fat cell size (r=0.63, P<0.05). There were no differences in AT ACS activity between groups. Despite the differences in DGAT activity, under both low (20±8) and high (350±51 µmol/L) FFA concentrations, palmitate storage rates (µmol/kg/min) were virtually identical in UBO and LBO women in abdominal and thigh AT.

Conclusions: We found no difference in FFA storage at either low or high concentrations in abdomen or thigh AT between UBO and LBO despite much greater DGAT activity in LBO. These data suggest that, even in adults with different fat distributions and different DGAT activities, DGAT does not drive greater FFA storage. Factors other than DGAT likely contribute to differences in body fat distribution.

T-P-3278

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**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 Leprmdy/Lepmdy 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 Leprmdy/Lepmdy 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 increased Fsp27 expression in both ob/ob mice and Leprmdy/Lepmdy rats. A-ZIP/F-1 mice and SKO rats had no examineable WAT. Furthermore, TZDs improved insulin sensitivity in ob/ob mice, A-ZIP/F-1 mice and Leprmdy/Lepmdy 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:** Fibroblast growth factor 21 (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 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-hour 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:** 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-hour 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.
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 CD 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 (RYGBP) 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-RYGBP (n=12, 60±10.2 months post- RYGBP, 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 (μU/min/ml) was different between RYGBP (8741±1670) and Obese (4010±737), (P<0.03) and between RYGBP and non-obese (3024±894), (P=0.03). AIRmax (μU/ml) was not statistically different between groups (P=0.47); mean AIRmax for RYGBP (191±32), obese (202±31), and non-obese (143±36).

**Conclusions:** These results do not provide evidence for greater beta-cell mass after RYGBP 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 RYGBP.

**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 (BMID 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 11874.1 ± 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; P=0.08, 108.8 ± 41.8pg/ml; OC 13624.8 ± 10018.8pg/ml; OPN 17874.8 ± 15350.9pg/ml; SOST 25424.2 ± 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 SOST. 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.
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-IsoPs and metabolites by gas chromatography-mass spectrometry, and body composition by DXA. We assessed whether urinary F2-IsoPs were predictive of insulin sensitivity or related to other metabolic parameters.

Results: No correlations were found between urinary F2-IsoPs 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<0.001; r=-0.360, p=0.006). In addition, urinary F2-IsoPs 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-IsoPs and metabolites are not associated with insulin sensitivity. 2) The lipid oxidation process that produces F2-IsoPs does not reflect oxidative stress reactions operative in insulin resistance. 3) Urinary F2-IsoPs 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-IsoPs in cardiometabolic disease should be scrutinized pending further study.

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±5.0 kg/m2) and 25 obese (BMI 36.9±0.7 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 meal. Anchors were “greatest imaginable fullness” at 0 and “greatest imaginable hunger” at 100. Blood was collected over 120 minutes for measurement of active ghrelin.

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 the groups. Lean women rated hunger after breakfast the same on both days (27.8±1.9 vs 30.3±2.4), 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.
Food intake reduction by GLP-1 receptor signaling in the macronutrient-specific problematic eating patterns that YFAS may be useful in identifying individuals with

**Conclusions:**

**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-3287**

**Preliminary Assessment of Sugar-Rich and Fat-Rich Versions of the Yale Food Addiction Scales in a College Sample**


**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 medial 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 neuronal 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.

**T-P-3289**

**Obesity: A Mental Disorder?**

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**Background:** When the Obesity Society debated whether or not obesity should be included in the American Psychiatric Association’s (APA, 2013) new Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) as a mental disorder, several biological theories were presented. The primary reason for this consideration was the suggested dysregulated reward circuitry in the brain that underlies behaviors leading to obesity. In considering a neurobiological understanding of eating patterns, it is suggested that the reward from food and eating may over-activate memory and reward systems; thereby, inhibiting cognitive control and leading to overconsumption and an inability to self-regulate eating. Neuroimaging studies conducted to substantiate this theory are inconsistent in findings, samples, and operational definitions.

**Methods:** Literature review

**Results:** An addiction model of obesity suggests that the same reward neural pathways, like dopamine pathways that activate during substance addiction cycles, are triggered when certain foods are desired or consumed. A limitation of this theory is that food, unlike substances, is necessary for survival and has no known withdrawal symptoms. Given the limitations with neuroimaging studies and biological theories of obesity, other factors including environmental influences were considered for the possible inclusion of obesity in the DSM-5.

**Conclusions:** Changes in the types of foods consumed since technological advances in the 18th century led to changes in the genetics of future generations, with 25-40% of variance in body mass indices due to genes. Genes affect metabolic rate, weight gain due to overconsumption, and location of excess fat storage on the body. Additionally, dopemnergic pathways reinforce food as a reward in all individuals, however, obese individuals receive higher reinforcement levels toward food are found to consume more food than those who are less motivated
to eat, indicating a neurobiological risk factor in developing obesity.

**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

**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-I, 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 NDP-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 precentral 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 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 reductions (p<0.05) 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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Obesity 2015 The 33rd Annual Scientific Meeting of the Obesity Society
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) delayed control (CON). SR 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 = -9.5 kg; p<.001) and SR groups (-8.0 kg; p=.05) lost weight over 3 months, with no change in the CON group (-2.5 kg; p=.77). Estimated effect sizes were medium for differences with the CON group (Cohen’s d=0.44-.058).

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.

Results: The sample was predominantly female (87.50%) and White (84.38%) with a mean body mass index of 38.18 (4.05) kg/m2. At 6 weeks, % weight change (mean±SD) via self-report was as follows: Group 1: -2.8±1.9; Group 2: -2.9±2.3; and Group 3: -4.0±2.8.

Conclusions: Final assessments will be conducted at week 12. Preliminary results suggest that combination treatment yielded the best weight loss at 6 weeks; however, we observed good weight loss in all three groups at 6 weeks. These findings suggest that self-directed weight management with a commercial SM program with and without FB show promise.

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-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 greater weight loss (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 ability to delay reward) was assessed at baseline.

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 W3sweight Management in a Community Health Group Setting Cannon S1, Lawry K1, Brudell M1, Rees R1, Bisset L1, 2, Wenke R1 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, Marce 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 a 4-week group based multidisciplinary behaviour management for weight loss in the community health setting.

Methods: A quasi-experimental study design was employed recruiting patients referred to two Community Health Centres. Participants completed a 4-week Appetite for Change program, comprising four 2-hour group sessions co-facilitated by a multidisciplinary team. The Mindfulness Self Efficacy Scale (MSES), Quality of Life Scale (QoL), and self-reported knowledge and stages of change were measured pre-treatment, immediately post treatment and, 6 and 12 months post intervention. Weight and waist circumference were additionally measured at baseline and 6 and 12 months post treatment.

Results: Forty-nine participants with a mean age 64.9 years (SD= 10.5) comprising of 74% women consented to participate. Statistically significant improvements (p=<0.01) from pre-treatment were found at both 6 and 12 months for weight, waist circumference, QoL, and MSES, with a clinically significant mean percentage of weight loss of approximately 4%, and mean improvement on QoL of 8.5 point (CI= 2.9 to 14.1) change at 12 months following the program. Self-reported improvements to stages of change and knowledge were also maintained at 12 months.

Conclusions: Appetite for Change has demonstrated clinically significant long term change following a multidisciplinary brief intervention program for adults in the community health setting. The promising results following the program warrant further controlled investigation.

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 20% reduction adjustment (Vesco et al., 2012). Data visualization/simulation using dynamical modeling
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 visit (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; Runolfsdottir 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 fourth quarter.

Conclusions: Findings suggest that childhood 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.

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 307 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**

Dennis LAI Hong Kong Hong Kong, Thomas Wong Kowloon Hong Kong, Wan-chaw Shae Hong Kong Hong Kong (SAR)

**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 visit study.

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 participants with complete HbA1c and FPG data, 6 (18%) met values in the diabetic range (>126 mg/dl). Among the 34 participants with complete HbA1c and FPG data, 6 (18%) met values in the diabetic range (>126 mg/dl). Among the 34 participants with complete HbA1c and FPG data, 6 (18%) met values in the diabetic range (>126 mg/dl).

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 – R101DK099277.

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%. 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. 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 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

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 +/-6.5 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 +/-3.7kg, 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 – R101DK099277.

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<.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 and males had a greater increase in %BF than male children (p=0.03); and children 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**

**Douglas Sutton Flagstaff Arizona**

**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 relationship between higher BMI scores and HRQOL. 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<.001) as measured by the IWQOL questionnaire. The prevalence of anxiety (62.4%) and depression (54.9%) as measured by the HADS was significantly 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 provider management strategy that will result in improved clinical outcomes.

**T-P-3314**

**Environmental Predictors of Who’s Most Likely to Lose Weight**

**Anna-Leena Vuorinen Ithaca New York, Brian Wansink Ithaca NY, Megan Zhou Ithaca CT, Janey Peterson New York New York**

**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 of 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 top 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.
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-3317

Evolutionary Design: Using Silicon Valley Methodologies to Develop an Intervention for Weight-Loss Under Economic Constraints
Victor Villalobos Berkeley CA, Ismael Campos Cuernavaca Morelos

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 be 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-3318

Examining the Quality of Motivation Participants Experience in Commercial Weight Loss Programs
Helena Boersma Pittsford New York

Background: The commercial weight loss industry follows a behavioral approach to weight loss that focuses on changing lifestyle, such as diet and physical activity, to promote changes in body weight. This approach has been effective but limited, helping approximately 20 percent of individuals seeking to lose weight. A new idea was to add an understanding of motivation, as outlined by self-determination theory, to existing weight loss program models.

Methods: This quantitative, cross-sectional study utilized the Treatment Self-Regulation Questionnaire and Health Care Climate Questionnaire, which were disseminated online in the United States to adults who were enrolled in one of three commercial weight loss programs that offered a counseling or support component: Weight Watchers, Jenny Craig, Nutrisystems. Participants were 127 adults (F=117, M=10).
Results: The relationship between the quality of motivation and perceived autonomy support by providers showed a strong correlation at 12-14 weeks (R = .808, p < .001) and moderate at 20-22 weeks (R = .377, p < .05). A multiple regression analysis indicated a predictive effect of demographic variables on weight loss F(6, 116) = 10.748, p < .001. A stepwise regression analysis showed BMI had the greatest impact on weight loss accounting for 20% of the variance (R2 = .20), with the autonomous and controlled subscales accounting for an additional 10.6% (R2 = .27) and (R2 = .306) and HCCQ for additional 2.3% (R2 = .356).

Conclusions: This is the first research known to address the impact of autonomy support on commercial, non-medicalized weight loss programs. Overall implications of the study suggested that individuals who were more autonomous in their quality of motivation lost more weight than those who had a higher controlled quality of motivation. Importantly, those who perceived their weight loss providers as autonomy supportive lost more weight independent of their quality of motivation.

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 27kg/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-based support is both feasible and effective for weight loss in overweight and obese patients with breast cancer.

T-P-3320
Food Addiction and Treatment Outcomes in Patients with Obesity and Binge Eating Disorder
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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=11/186) 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-3321
Frequency of Use and Perceived Helpfulness of Cognitive and Behavioral Coping Strategies in a Weight-Loss Intervention Study
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Background: Weight-related coping strategies implemented during tempting situations can help individuals maintain long-term weight loss (Shiffman, 1984; Grilo, Shiffman & Wing, 1989; Carels, et al., 2004). Thus, greater understanding of weight-related coping strategies can help inform the clinical treatment of obesity. The present study explored the frequency of use and perceived helpfulness of cognitive and behavioral coping strategies in a weight-loss intervention study.

Methods: Participants (n=372) were part of a larger RCT (Wylie-Rosett et.al., 2001). The sample was primarily white, married, and well-educated women classified as obese.
Spearman correlations assessed the frequency and perceived helpfulness of coping strategies and BMI. Multiple linear regressions were performed to determine if coping strategies reported at baseline predicted weight-loss at 12 months.

**Results:** Self-Motivation was the most frequently used and most helpful cognitive coping strategy while Social Consequences was the least frequently used and least helpful cognitive coping strategy. Alternate Activities was considered the most helpful behavioral coping strategy, but was used the least. The frequency of using strategies emphasizing Disappointing Expectations (OR=1.42, 95% CI [1.01, 2.00], p<0.05) 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.

**T-P-3322**

**Health E-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-mcgrievy Columbia South Carolina, Beth Sundstrom Charleston South Carolina, Karen Magradey 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 from 12 to 24 students providing data. Scales were used by 76%, with some reports of difficulty initializing on the campus internet. 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**

Joanna Buscemi Chicago Illinois, Tiffany Rybak Memphis Tennessee, Kristoffer Berlin Memphis TN, James Murphy Memphis TN, Hollie Raynor Knoxville Tennessee

**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 -.21±5.9%, -5.1±7.4%, and -6.4±6.0%, respectively (repeated measures: time p<0.001, groupXtime p=0.107; Greenhouse-Geisser corrected groupXtime for SC vs. TECH and TECH+INT p=0.039). At 6 months, 28% of SC, 62% of TECH, and 50% of TECH+INT participants experienced clinically significant ≥5% weight losses, p=0.100 (SC vs. TECH and TECH+INT p=0.046).

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
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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, Vegathon. 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 Vegathon easy to use” and “I would recommend Vegathon 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
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. The effect persisted with failure redefined as >2% weight gain. PSMF results in significant short-term weight loss 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.

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.

Background: Hispanic women are at increased cardiometabolic risk in part due to the high prevalence of overweight/obesity and metabolic risk factors. Del Per 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 [FrGlucose], 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 FrGlucose (154±46 vs. 110±14 mg/dL, p<0.0001). Participants with DM had significantly higher HbA1c and FrGlucose 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 FrGlucose 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
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Background: The acceptability and value of multi-cultural pro-social values as part of behavioral weight loss programs is largely unevaluated. 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 Healthy Workplaces Toolkit.

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 weight was negatively correlated to change in time spent in light (R² = 0.63, P = 0.018) and vigorous (R² = 0.57, P = 0.03) PA and positively correlated to change in sedentary time (R² = 0.62, P = 0.02). Change in waist circumference was negatively correlated with increased time spent in moderate (R² = 0.71, P = 0.018), light + moderate (R² = 0.72, P = 0.016), and moderate + vigorous (R² = 0.77, P = 0.001) PA and was positively correlated with increased sedentary activity (R² = 0.69, P = 0.02).

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
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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
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 index 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, $\beta = .331$, $p < .05$; however, after controlling for depressive symptoms, such overvaluation was no longer significant, $\beta = .110$, $p = .49$. 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, $\beta = -.263$, $p < .05$, 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
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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-3337
Participation in Online- and In-Person Social Networking Activities for Physical Activity among Sedentary Adults in a Randomized Clinical Trial
Background: Social networks can substantively influence physical activity and other risk behaviors associated with overweight and obesity. Little research has explored the feasibility of engaging sedentary adults in diverse types of online- and in-person social networking activities to build their networks for physical activity.

Methods: As part of a randomized clinical trial among sedentary adults living in the same neighborhoods, 104 adults were assigned to a 12-week social networking condition with access to an online social networking site (Ning or Facebook) and weekly emailed prompts to engage in social networking activities. Program staff tracked participation rates for online- and in-person social networking activities based on weekly coding of participants’ activities on the program’s social media site, and participants’ self-monitoring records. Moderate-vigorous physical activity (MVPA) was assessed via accelerometry at baseline, and at 3 and 9 months post-baseline.

Results: Participants had a mean age of 50.5 and were 39.4% male and 84% overweight/obese. Among participants’ online networking activities, 75% posted an online profile, 64% contributed to online discussions, 16% posted a walking event, and 11% joined a participant-led walking event. Among participants’ in-person networking activities, 73% asked friends or family members to walk, 50% attended a staff-led “meet-the-group” walk, 18% joined a gym or fitness class, 14% joined a walk/run for a cause, 12% joined a community walking group, and 10% led a walk in their community. Participation in social networking activities during the intervention was positively associated with MVPA at 3 months (r = .34, p = .001), but not at 9 months.

Conclusions: Networking strategies capitalizing on existing social networks resulted in greater participation than strategies involving contact with new networks. Future interventions may benefit from targeting increased physical activity in existing networks.

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 fe 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 (r=-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 .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 (χ2(1)=5.22, p=.03). Variables of highest importance included younger age, lower mindful awareness, and greater 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.
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 psychological 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 treatment efficacy, anxiety, and perceived provider support for weight autonomy. 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 underrepresented 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.

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.

Promoting Weight Maintenance with Electronic Health Record Tools in a Primary Care Setting: Baseline Results from the Maintaon-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
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 Weighs (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 calorie 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 HbgA1c was -0.8% (8.3% to 7.5%). At the end of weight loss, 70% (7/10) of pts who entered on 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 lost control over my eating” (r=0.53, p=0.005), “was bored” (r=0.51, p=0.01), and “ate about the same as at home” (r=0.58, p=0.001) and “lost control over my eating” (r=0.47, p=0.02). Disinhibition associated with eating because “the food was free” (r=0.44, p=0.03), “ate about the same as at home” (r=0.44, p=0.03) and “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 “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.
**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 (SDPI-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?

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 (Fullerkson 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 =-.33, 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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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 gained in excess of 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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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 high 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 at 3 months.

Results: 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 (BMI= 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=.399, p=.010), but not CortSD. ΔCortSD predicted attendance (β=.01, p=.089) and diary use (β=.02, p=.015), and attendance and diary use predicted percent weight loss (β=.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 accelerometry 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±5.9kg/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: 90.8±132.3, Y1: 92.5±153.0, Y4: 77.4±152.6 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
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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 comorbid 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
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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<0.02) 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 groups, with no significant differences between groups. All three groups showed significant (p’s=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=537) 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 (F2=10.79, df=4, 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 regulation failure. Inherent in self-regulation is a balance attempting weight loss, such decisions can be deemed a self-momentary decisions to consume high-calorie foods. For those modeled onto control- and automaticity-dominated naturalistic responses towards palatable food. Error rates were processes, error rates on the IAT can be used as a proxy for

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
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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
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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 were most common (71% of trials), followed by text messaging (21%), mobile applications (14%), wearable devices (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.
T-P-3364-DT
Very Early Responders, Program Participation, and Weight-Reduction Success with MOVE!®
Jane Garvin , Karen Cota Augusta GA

Background: For weight reduction, 14 or more sessions within 6 months is recommended for persons with a body mass index ≥ 30 or ≥ 27 with comorbidity. Prior analysis revealed that 14 or more sessions with the behavioral weight reduction program, MOVE!®, was a predictor of ≥ 5% weight reduction at 6 months. It is not known if very-early response to the program predicts continued participation or weight reduction. The purpose of this study was to examine the effect of very-early weight reduction success with the behavioral weight reduction program, MOVE!®, available at Veterans Administration Medical Centers, on a) participation in 14 or more sessions within 6 months and b) weight-reduction goal achievement at 6 months.

Methods: Using longitudinal clinical data from electronic health records of 216 MOVE!® program participants, MOVE!® sessions and weight reduction were examined in this secondary data analysis. Attending 14 or more sessions within the first 6 months was selected as the cut point based on the 2013 guidelines for overweight and obesity management. Very-early response was based on at least 0.5% weight reduction from baseline at week two. Weight-reduction success at 6-months was based on at least 5% reduction from baseline.

Results: Very-early responders were more than five times as likely to achieve at least the 5% weight reduction goal at 6 months compared to those participants who were not very-early responders, while controlling for age, gender, and race (OR = 5.59; CI 1.76, 17.80; p < .01). Very-early responders were no more likely to participate in 14 or more MOVE!® sessions within 6 months than participants who were not very-early responders (OR = .66; CI 1.5, 2.83; p = .57).

Conclusions: This research supports very-early response as a significant predictor of ≥ 5% weight-reduction goal achievement at 6 months. However, very-early response was not a predictor of ongoing participation reaching 14 sessions in 6 months.

T-P-3365
Weight Gains During the Weight Loss Phase of Behavioral Weight Loss Treatment: How Common are They and How Much Do They Matter?

Background: Behavioral weight loss (BWL) programs posit that weight lapses (i.e., gains) are normative during treatment. However, little is known about how frequently individuals experience lapses during the active weight loss phase of treatment, or how such lapses relate to later weight loss success. Clinicians and participants may be more apt to dismiss small (e.g., 1 lb) lapses to factors like fluid retention due to this uncertainty about how much lapses should be cause for concern. This study examined the frequency of weight lapses during the first 6 months of a BWL program, and the relationship between lapse frequency and 6-month weight loss.

Methods: Participants were 285 overweight and obese adults enrolled in a 12-month BWL program (M BMI=35.1 kg/m2; M age=53.2, 78.9% female, 65.6% Caucasian). Frequency of 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.

T-P-3366
Weight Loss Success of the Food Insecure
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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 was associated with the perceived confidence and challenge to lose weight lapses in the future.

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 more likely to skip meals (p=.063) and eat less (p=.036) when not in the presence of food assistance. The inclusion of food assistance affected the perceived confidence and challenge to lose weight in the future.

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.
T-P-3367
Weight Loss, Body Mass Index (BMI), and Body Composition 24 Months after a Behavioral Intervention including Wearable Technology in Young Adults: The IDEA Study
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Background: Behavioral interventions are effective for short-term weight management, but there is a need for interventions to improve long-term weight loss. This clinical trial examined whether adding wearable technology to a behavioral lifestyle intervention would enhance 24 month weight loss in young adults classified as overweight or obese.

Methods: Participants (N=471; median age: 30.9 [25th-75th%-ile: 27.8, 33.7] years); median BMI: 31.2 [25th-75th%-ile: 28.4, 34.3] kg/m²) were randomized to a standard behavioral weight loss program (SBWP) or an enhanced SBWP that included wearable technology (EWLI). SBWP and EBWI were received weekly in-person sessions for 6 months. From months 7-24, all participants had monthly sessions and telephone calls, received 1-2 text messages per week, and had access to materials on a study website. SBWP were instructed to use the website to self-monitor calorie intake, activity, and weight from months 7-24, while EWLI was provided a wearable device that provided feedback on energy expenditure and physical activity, with a web interface to self-monitor dietary intake and weight. Weight, BMI, and percent body fat were assessed at 0, 6, 12, 18 and 24 months.

Results: Weight change (kg) [least square means (95% CI)] at 6, 12, 18 and 24 months was -8.5 (-10.9, -6.0), -7.8 (-10.4, -5.2), and -5.8 (-8.4, -3.2) in SBWP and -8.0 (-10.5, -5.6), -6.8 (-9.4, -4.3), -5.9 (-8.5, -3.3), and -3.8 (-6.4, -1.3) in EWLI. Weight changed significantly over time (p<0.0001), but the change was not significantly different between groups (group X time interaction p=0.78). Similar results were observed for change in BMI and percent body fat.

Conclusions: This trial showed that a lifestyle intervention reduced weight and body fat over a 24-month period in young adults. However, the addition of a wearable device to provide frequent ongoing feedback on progress did not improve long-term outcomes. Supported by: NIH (U01 HL069770)

T-P-3368
Weight loss, reoperations and reflux: 10 year results of lap. Sleeve Gastrectomy
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Background: Beside gastric bypass, laparoscopic sleeve gastrectomy (LSG) is the most commonly performed bariatric procedure in Austria. For the long-term follow-up, the durability of the weight loss success and the incidence of clinically relevant gastro-oesophageal reflux are still under discussion.

Methods: In this retrospective study, patients from three bariatric centres (Medicine University Vienna, Hospital Klotersteinburg and Hospital Rudolfstiftung Vienna) with a 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 to 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-3369-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% dropout, 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 tended to decreased weight loss (p=0.0642). Using the binomial 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 effective 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)

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 program 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 (WBBSI 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. 0.32, 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 ng/dl, p=.08), particularly among girls with moderate DepSx (17 v. -4 ng/dl, p=.01).

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. Long-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 four 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.

T-P-3372
Building a Remotely-Delivered Responsive Parenting Intervention to Prevent Pediatric Obesity among Low-Income Families
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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 components with low feasibility and acceptability. A post-intervention survey and phone call provided information on participant acceptability.

Results: Both depressed (n=45) and non-depressed (n=62) low-income mothers participated in a one-month responsive parenting intervention. Retention rates did not differ by

Obesity, 2015 The 33rd Annual Scientific Meeting of the Obesity Society
depression status. All components had good user acceptability except social support; only 18% (of those randomized) complied. Feeding diaries were successfully used to provide personalized guidance on feeding routines. 85% of mothers who received portion plates reported using them 2 or more times per week. 22% of mothers opted to receive video messages via email instead of text; 33% requested hardcopy surveys instead of completing them online.

**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. Remotely-delivered responsive feeding intervention strategies are feasible and acceptable among low-income mothers, even those who were above cutoff for depression; more research is needed on social support as an intervention strategy.

**T-P-3373-DT**

**Changes in Dietary Behaviors and Anthropometrics Following Lifestyle Intervention Among Obese Latino Youth with Prediabetes**

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**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±11.1%) 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%. Saturated fat intake decreased by 25% (from 16.6±4.5 to 12.5±3.9 grams/day, p=0.04) however, the percent of kilocalories coming from saturated fat did not change (35.6%).

**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.

**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) or 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 (LDL-Cp=0.016) 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 salivary cortisol. 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=.29) or PSS (24.5±6.6 to 27.2±6.0, p=.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=.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 internalizing, externalizing, 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 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<0.0001) 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). 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

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 Sloyness 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 Sloyness 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=0.89). Initially, 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 Aerobic 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
Jung Won Min Buffalo NY, Hyunjung Lim Yongin Yongin, Gilsook Kim Seoul, Charles Lloyd Houston Texas, Youfa Wang Buffalo NY, Nubia Carvajal Houston Texas

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
Yumi Yaegashi Shiwa-gun Iwate, Kiyou Sakata Yahaba-cho

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
Olga Gupta Dallas TX, Poonam Patel Dallas Texas, Preethy Varghese Dallas TX, Deborah Shenkman Dallas Texas

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% 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 habits. The intervention effect at age 3 after two years of intervention on child BMI SDS (body mass index standard deviation score), WC (waist circumference) and overweight/obesity rate (IOTF criteria) was evaluated in multivariate linear and logistic regression analyses.

Results: Child anthropometrics were available for 122 children at age 3; this population did not differ significantly from the whole randomized population in any child baseline anthropometric measure. The intervention parents received 0-9 (median 6) coaching sessions between age 1 and 3. At age 3 the intervention children had a significantly lower BMI SDS (-0.17 vs 0.26; p<0.05), WC (49.9 cm vs 52.2 cm) and overweight/obesity rate (8% vs 24%) compared to control children. When adjusting for baseline BMI SDS and parental BMI, no significant intervention effect on BMI SDS (β = -0.08; p = 0.31) or on overweight/obesity rate (adjusted OR=0.39; 95% CI 0.10 – 1.34) was seen. A significant effect on WC was identified (β = -0.21; p<0.05), adjusting for baseline WC and parental BMI.

Conclusions: Two years of low-intensive multifacted preventive intervention targeting overweight/obese parents showed a weak effect on children’s WC, but not on relative weight or overweight/obesity rate. Preventive interventions should follow children after three years of age.

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 Omaha children 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 (+0.30”, 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.
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 (IE = .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
Ana Dâmaso SÃO PAULO SÃO PAULO, Flavia Corgosinho Sao Paulo Sao Paulo, Lian Tock SAO PAULO SAO PAULO

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
Cristina Fernandez Omaha Nebraska, Jessica Najaran Omaha Nebraska, Meghan Stumpf Omaha Nebraska, Denise Bryson Omaha NE, Camilo Zapata Omaha Nebraska, Liz Lyons Omaha NE, Lauren Kurtz Omaha NE, Shana Romero Omaha NE

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.
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 (kcals), 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 kcals/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-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 program 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

Nobuko Hongu Tucson Arizona, Benjamin Pope Tucson AZ, Cathy Martinez Casa Grande AZ

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 experimental 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 =-0.64; MBMIz=-0.99; 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=-0.0.06, p=.016), and the interaction between praise and monitoring significantly predicted increased weight loss (β=-.002, p=.007). High monitoring and praise predicted better outcomes (ΔBMIz = -0.29) than high monitoring and low praise (ΔBMIz = .03).

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.

T-P-3395
Prediction of Weight Related Quality of Life by Obesity Class
William Black Kansas City Mo, Kelsey Borner Lawrence KS, Meredith Dreyer Gillette Kansas City Missouri, Ann Davis Kansas City Kansas, Brooke Sweeney Kansas City MO, Sarah Hampk Kansas City Missouri

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; MBMIz=-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=75.27; p<.001) 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 (Fchange = 7.543, p=.006). The addition of obesity classes accounted for an additional 3.4% of the variance in HRQOL (Fchange = 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.

T-P-3396
Predictors of Success in a Low Intensity, Multidisciplinary Treatment Program for Obese Adolescents
Amelia Jazwa Atlanta GA, Amy Hawes Atlanta Georgia, Tamara Tanner Atlanta GA, stephanie Walsh Atlanta GA, Sheethal Reddy Atlanta GA, Jean Welsh Atlanta Georgia

Background: Parenting Styles, Ethnicity, and Pediatric Obesity Intervention Outcomes
William Black Kansas City Mo, Kelsey Borner Lawrence KS, Meredith Dreyer Gillette Kansas City Missouri, Ann Davis Kansas City Kansas, Brooke Sweeney Kansas City MO, Sarah Hampk Kansas City Missouri

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Predictors of Success in a Low Intensity, Multidisciplinary Treatment Program for Obese Adolescents
Amelia Jazwa Atlanta GA, Amy Hawes Atlanta Georgia, Tamara Tanner Atlanta GA, stephanie Walsh Atlanta GA, Sheethal Reddy Atlanta GA, Jean Welsh Atlanta Georgia
**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, prediabetes, 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.

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**T-P-3397**

**Reducing Sugar-Sweetened Beverage Consumption in Preschool Children: A Randomized Trial of the Smart Moms mHealth Program**

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**Background:** Sugar-sweetened beverage (SSB) consumption is one of the primary drivers of child obesity, but interventions targeting SSB reduction in children have had limited success. This study examined the efficacy of an innovative smartphone-based intervention to reduce SSBs in preschool-aged children using mothers as the agent of change.

**Methods:** Overweight mothers (N = 51; BMI = 32.6 ± 5.3) and their children ages 3-5 (4.5 ± 0.8 years) were randomized to either the Smart Moms intervention group or a waitlist control group. The 6-month Smart Moms program used a low-intensity approach that included one face-to-face group session, mobile-optimized website lessons, and text messages. The primary goal was a reduction in child SSBs; a secondary goal was modest weight loss among mothers. Participants self-monitored child SSBs and maternal weight, SSBs and “red” (high calorie) foods, which they submitted via weekly text message and then received feedback. The current study examined changes in child SSBs and maternal weight from baseline to 3 months. SSB consumption was measured in fluid ounces using one 24-hour dietary recall. Weight and height were objectively measured.

**Results:** Retention was 86% at 3 months (including 3 medical withdrawals). Children in the Smart Moms group had a greater reduction in SSB fluid ounces than children in the control group (-8.9 ± 9.7 vs. -2.7 ± 7.6; p < .05). Mothers in the Smart Moms group lost more weight than mothers in the control group (-2.0 ± 3.8 kg vs. 0.9 ± 2.3; p < .01). Participants submitted an average of 11.3 (±1.2) of 12 weeks of self-monitoring data.

**Conclusions:** This study suggests that a low-intensity mHealth intervention that targets both maternal and child behavior can be effective in engaging mothers to participate, reducing child SSB and maternal weight losses. Similar low-intensity interventions could be an effective way to change weight-related behaviors in preschool-aged children and their parents.

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**T-P-3398**

**Relative changes PY hormone levels in adolescent obese may reduce in binge eating and body mass index**


**Background:** Research regulate appetite hormones such as PY may provide valuable information about the underlying mechanisms responsible for the development of obesity conditioned the increasing prevalence of overweight in Brazil. Overeating (e.g. binge eating) may be a manifestation of disordered coping behavior but may also be due to defects in neural and hormonal control of appetite and satiety. The aim of this study is to analyze the relationships among circulating levels fasting PY (3-3) and relative behaviors with cognitive restraint emotional power and binge eating and anthropometric characteristics in obese teenager patients during one year of treatment for obesity.

**Methods:** A prospective clinical study was conducted on 51 obese adolescent (22 boys) age mean ±12 (11-13), pubertal stage 3 and 4. It was applied the Three Factor Eating Questionnaire and BMI % fat mass, abdominal circumference and serial blood samples were collected in three different times (start, 6 months and 12 months).

**Results:** Associations of PY (3-36) hormone levels according the study variables, only significant association between changes in BMI and the start PY for the 12 months (r = -0.421:p = 0.002). Patients who increased hormone levels were most decreased BMI from the 1st to the 3rd time of the study. There was an association only in the variation of the times 1 and 3 in binge behaviors with the percentage of fat mass (r = 0.278p = 0.048).

**Conclusions:** It is understood how the appetite and satiety are controlled offers promising inroads toward new therapies for obesity. Increasing PY may contribute in part to the reduction in binge eating and BMI. Additional studies are needed to better understand the role of higher PY in adolescent.

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**T-P-3399**

**Remission of Loss of Control (LOC) Eating is Associated with Improvements in Low-Density Lipoprotein Cholesterol (LDL-C) and High-Density Lipoprotein Cholesterol (HDL-C) in Adolescent Girls**

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**Background:** It is understood how the appetite and satiety are conditioned the increasing prevalence of overweight in Brazil. Overeating (e.g. binge eating) may be a manifestation of disordered coping behavior but may also be due to defects in neural and hormonal control of appetite and satiety. The aim of this study is to analyze the relationships among circulating levels fasting PY (3-3) and relative behaviors with cognitive restraint emotional power and binge eating and anthropometric characteristics in obese teenager patients during one year of treatment for obesity.
Background: LOC eating predicts worsening of components of the metabolic syndrome in children, independent of adiposity. However, it is unknown if LOC remission improves metabolic function. We hypothesized that adolescent girls whose LOC eating subsided following either a 12-wk interpersonal psychotherapy (IPT) or a standard-of-care health education (HE) program, would have greater improvements in metabolic outcomes compared to girls whose LOC eating persisted.

Methods: 113 girls (12-17y) at high-risk for excess weight gain due to a 75th-97th BMI %ile and reports of recent LOC eating were randomized to IPT or HE. LOC eating was assessed at baseline and at the end of the program. BMI, waist circumference, lipids (triglycerides, LDL-C, and HDL-C), glucose, and insulin were assessed at baseline and 6-m follow-up. The effects of LOC status (remission vs. persistence at the end of the programs), group (IPT vs. HE), and LOC status x group interaction on Δ metabolic outcomes was evaluated at 6-m using MANCOVA. Baseline BMI, ΔBMI, age, and race were included as covariates.

Results: 84 girls were assessed at 6-m. BMI was not significantly different between IPT and HE participants. There were no significant group (p=.81) or LOC status x group (p=.33) effects on metabolic outcomes. However, there was a main effect of LOC status at 6-m (p=.05). Youth whose LOC remitted by 12-wk had greater decreases in LDL-C (-7.0±4.1 vs. -3.7±3.3 mg/dL, p=.02) and increased HDL-C (+1.6±1.3 vs. +2.7±1.0 mg/dL, p=.01) compared to persistent LOC. No significant difference based on LOC status was found for other Δ in metabolic variables.

Conclusions: We observed that adolescent girls at high-risk for excess weight gain showed greater improvements in LDL-C and HDL-C over a 6-m period when LOC eating remitted. Should these findings be replicated, they may provide additional support for programs that decrease LOC eating. We observed that adolescent girls at high-risk for excess weight gain showed greater improvements in LDL-C and HDL-C over a 6-m period when LOC eating remitted. Should these findings be replicated, they may provide additional support for programs that decrease LOC eating. They may also support the notion that targeting LOC in youth may have a beneficial impact on metabolic parameters.

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.
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- and 3-yr 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-yr follow-up. Baseline anxiety was tested as a moderator of group effect.

Results: 67 girls (59% retention) were re-assessed at 3-yr. The group effect on ∆BMI metrics or LOC episodes was non-significant at 3-yr. 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 ∆BMIz and ∆%overweight (p<0.04). Baseline anxiety did not serve as a moderator for 3-yr ∆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-yr 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-3403
The 3-Minute Step Test as a Measure of Improved Fitness in a Pediatric Weight Management Program
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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
Dianne Ward Chapel Hill North Carolina, Amber Vaughn Chapel Hill NC, Deborah Jones Chapel Hill NC, June Stevens Chapel Hill North Carolina, Shrikant Bangdiwala Chapel Hill NC, Abigail Panter Chapel Hill NC, Myles Faith Chapel Hill North Carolina

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-h recalls), physical activity (7-day accelerometry), 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 (kcals 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.

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
Anthony Wang Urbana Illinois, Kristen Harrison Ann Arbor Michigan, Sharon Donovan Urbana IL, Margarita Teran-Garcia Urbana Illinois

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 be signaling molecules effecting expression of gut hormones.

Methods: This study investigated the cumulative association of single nucleotide polymorphisms (SNP) of genes involved 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, 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 established using β-estimates from general linear models. A weighted genetic risk score (GRS) was generated by summing the ten β-estimates.

Results: The GRS was significantly associated with BMI Z-
Methods:

Concentrations of air pollution with offspring growth and the risk of childhood obesity remains unknown. We aimed to evaluate associations of air pollutants with offspring BMI and the risk of childhood obesity during early life.

Background:

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 1.3) 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.

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.

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.

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Mean PM2.5 concentrations during pregnancy was 14.5 μg/m3 (SD 1.3) 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.

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.

T-P-3410-DT

Associations of child appetite and weight with dietary excess 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
Erika Cheng Boston Massachusetts, Summer Hawkins Chestnut Hill MA, Sheryl Rifas-Shiman Boston MA, Matthew Gillman Boston MA, Elsie Taveras Boston MA

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 of 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
Camille Schneider Birmingham Alabama, Paula Chandler-Laney Birmingham Alabama

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 cord 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 obesity. 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 dysfuntion. 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.

T-P-3414-DT
Birth Weight Moderates the Relationship between Maternal Pregnancy Weight and Inflammation in Black Adolescent Females

Background: Associations between maternal pregnancy weight (MPW), offspring birthweight (BW) and acute inflammatory responses in early life are well established. Chronic systemic inflammation during adolescence tracks into adulthood and is linked to cardiometabolic disease. We examined whether BW versus current weight status, [Body Mass Index for gender-age-z-score (zBMI); or waist circumference (WC)] modified the effect between MPW and inflammatory biomarkers in black adolescent females.

Methods: Healthy (zBMI)=1.91± 0.89; no systemic illness], black adolescent females (N=66; age=16.03±1.95) were recruited via schools, churches, clinics, and media outlets throughout New Orleans (LA). Mothers’ highest pregnancy weight ([MPW]=92.93 kg±20.17) and offspring BW (3.23 kg ±0.57) were self-reported. Tanner Stage (≥3), zBMI, WC and specimens were obtained by research physician/nurses; inflammatory markers were measured in serum by Milliplex [Interleukin (IL)-6, IL8, Tumor necrosis factor (TNF)-Alpha, C-reactive protein (CRP), Resistin, Adiponectin, and Leptin]. Moderating effects of BW, zBMI, or WC were assessed via regression models including the interaction term with MPW, and the inflammatory biomarkers as outcomes.

Results: Initially, MPW was unrelated to offspring inflammatory biomarkers; results remained non-significant after considering the moderating effects of zBMI or WC. However, after assessing the moderating effect of offspring BW and MPW on inflammation, results achieved statistical significance for IL8 (p=0.04), CRP (p=0.03), and Leptin (p=0.01).

Conclusions: Unexpectedly, BW, but not zBMI or WC, modified the effect between MPW and IL8, CRP, and Leptin in black adolescent females. Findings underscore the influence of fetal programming when examining relationships between maternal weight-related behaviors and long-term health of offspring. Thus, maintenance of a healthy weight into adulthood and throughout childbearing years may prevent inflammation-related cardiometabolic disease in future offspring.

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
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 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 recommend limit of 10-15% of total energy. Mean intake of sodium was 2173mg (34.0), which approaches the recommended limit of 2300mg. Among all children <5y, 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 exceeded recommended limits for children age 2-<5y.

T-P.3418

Differences in gestational weight gain across the normal BMI range


Background: 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=0.018). Using pairwise comparisons, no between group differences were found for any groups <21.9 (mean=13.8±14.6 kg) or groups >22.0 (mean=15.2±16.3 kg). In general, all groups >22.0 gained more weight than any group <21.9 (p<0.05; see table). Groups were collapsed to low normal (<21.9; LN) or high normal (<22.0; HN). Differences were found for the proportion of women gaining excessively and mean weight gained (see Table 1). Table 1: Proportion and mean gestational weight gain for women gaining excessively only. Group (sample size) Proportion gaining excessively (%) Weight gained (kg) (mean ± SD)18.5-19.9 kg/m² (39) 49 13.9 ± 4.3a 17.8 ± 2.3a 20-20.9 kg/m² (34) 50 14.6 ± 4.3a 21-21.9 kg/m² (43) 49 13.8 ± 4.3a 22-22.9 kg/m² (37) 71 16.3 ± 4.3b,c 19.5 ± 2.3b23-23.9 kg/m² (30) 50 15.2 ± 4.3a,c 24-24.9 kg/m² (25) 64 16.1 ± 4.3b,c If a letter is different, significant between group differences were detected (p<0.05).

Conclusions: Weight gains in the LN BMI range are lower than in the HN BMI range. Normal weight women represent a group that could benefit from counselling to gain appropriately and should be encouraged to lose weight gained to avoid entering subsequent pregnancies at a higher weight and BMI category.

T-P.3419

Direct and Moderating Effects of Toddler Inhibitory Control on Weight Status at Age 4

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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.

**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 breastmilk 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. PP 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:** 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, socioeconomic characteristics, 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 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 homebox 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-AA 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 modeling (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
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 height 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 FM [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 FM [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%).

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 (63%); Other=5 (10%); Overweight=29 (77%)] and their mothers participated in a study to examine relationships between weight status and nutritional intake. Research nurses measured offspring weight/height, and mothers self-reported current weight/height. Trained staff administered 24-hour dietary recalls to adolescents using the Nutrition Data System for Research software [NDSR].

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-3428 Maternal Excess Gestational Weight Gain and Infant Waist Circumference: A 2 Year Observational Study
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Poster Abstracts Thursday November 5, 2015
Background: Excess gestational weight gain (GWG) increases infant birth weight and may predispose them to obesity in later life. The preponderance of the evidence suggests that formulated infants and maternal dietary protein intake increases the rate of infants’ weight gain up to the first year of life. However, data describing the association between GWG with maternal postnatal dietary composition and infant feeding practices (breast vs. formula) on infant growth rate and adiposity up to 24mo of age are lacking. Therefore we examined the effects of GWG and maternal and infant feeding practices on infant abdominal and subcutaneous anthropometrics in 6 to 24mo old infants.

Methods: Forty mother-infant pairs were recruited by convenience sampling after delivery and followed until 24mo postpartum. GWG was calculated as pre-pregnancy weight (measured at 8-13wks from medical record) subtracted from weight at delivery. Appropriate versus excess GWG was categorized using 2009 IOM guidelines. Infant weight velocity was calculated as the change in weight between consecutive visits divided by the intervening time. Mothers’ self-reported caloric intake was measured using a food frequency questionnaire, infant feeding practices by interview and infant growth by standard anthropometry between 6 and 24mo of age.

Results: Infants born to mothers with excess GWG were heavier at birth (3521±91 vs. 3196±97g, p=0.02) and had an average 2.4±1.1cm (p=0.03) greater waist circumference throughout the 24mo compared with infants born to mothers with appropriate GWG. Postnatal maternal dietary characteristics or infant feeding practices did not impact infant growth or weight velocity at any time point.

Conclusions: Excess GWG not only increased infant birth weight but also waist circumference up to 2years of age. Maternal dietary intake and infant feeding practices did not appear to modify these results. Strategies to control maternal excess GWG and the outcome on infant weight, adiposity and waist circumference should be evaluated.

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: Macrosomic 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
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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 measurements (SFTM); 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 supra iliac 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
Relation 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 fatness 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.

Methods: A search was conducted in PubMed database. Prospective studies published from January 1st 2002 to April 30th 2015 were included. The country, population, age of AR, age of follow-up, BMI, BMI z score, type 2 diabetes at follow-up were recorded.

Results: Twelve published studies met the selection criteria. Follow-up ranged from 12 to 21 yo. BMI was significantly higher among those with AR between 3 and 5 years old. Three from twelve studies showed higher incidence of Type 2 diabetes.

Conclusions: An earlier adiposity rebound (< 5 years of age) was associated with a higher BMI and higher incidence of Type 2 diabetes. Surveillance of weight and height early in life may be useful to prevent early AR.

T-P-3434-DT
Soda Consumption Linked to Substantial Postpartum Weight Retention in Women with GDM During Pregnancy
Jaimie Davis, Austin Texas, Xia 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 (pregravid 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 pregravid weight). The following a priori covariates were included: ethnicity, breastfeeding duration, birth weight, gestational weight gain, pregravid 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.

**T-P.3436**

**The Roles of Maternal Obesity in the U.S. Obesity Epidemic: Propagation Across Generation**

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**Background:** A lot of genes that are related to the progression of obesity have been identified, which are inheritable from mother to offspring. Meanwhile, part of the mechanisms has been revealed that obesity is transmissible across generation beyond those genes. However, there are only limited trials to quantify the effects of such mechanism on changing BMI distribution or obesity prevalence across generation.

**Methods:** I attempted to quantify both genetic and phenotypic obesity transmission from mother to offspring, and predict future obesity prevalence in the United States. First, to make the model simple, we divided the population into two subpopulations: obese and non-obese, and built the mathematical model depicting the dynamics of each subpopulation parameterizing the birth-death and reproduction process. Second, combining the observed data (The U.S. Census Bureau and NHANES) and the mathematical model, we estimated the parameters in the model. Finally, we obtained the predicted value of future obesity prevalence in United States.

**Results:** We found that 39% of descendants from obese mothers develop obesity in their childhood (and 14% from non-obese mothers). Computing the model with estimated parameters, the obesity prevalence in the United States is expected to attain and saturate at 51.4%. Through the sensitivity analysis, we found that it can potentially be suppressed by 14.6% in case we can perfectly inhibit the phenotypic transmission.

**Conclusions:** We successfully quantified the both genetic and phenotypic transmission coupling the mathematical model and 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. 83% of children met AAP guidelines for <35% of calories from fat, only 37% 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
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
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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 calorie, 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
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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
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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%
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-3443-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
Irritable Bowel Syndrome in Patients with Morbid Obesity
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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 (388/6482; 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 tailoring behavioral counseling recommendations.

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).
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: 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 score 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-3451-DT
Pregnant and Postpartum Women’s Knowledge and Healthcare Experiences Regarding Gestational Weight Gain
Sara Lindberg Madison Wisconsin, Laura Kwitek Fitchburg WI, Cynthia Anderson Madison Wisconsin

Background: Pregnancy is a critical period determining future obesity risk for both mother and child. Yet the opportunity for obesity prevention at this critical juncture is often missed. Of the four million women who give birth in the US each year, two million gain excess weight in pregnancy, which puts themselves and their babies at risk for long-term obesity, cardiovascular disease, and diabetes. Inappropriate gestational weight gain disproportionately affects low-income and minority women, contributing to maternal and child health disparities.

Methods: Pregnant and postpartum patients visiting several community clinics in Dane County, WI, were invited to participate in this cross-sectional study. Participants (n=246) completed anonymous, self-administered paper surveys assessing their knowledge and healthcare experiences regarding gestational weight gain (response rate: 74%).

Results: Most participants reported that a healthcare provider counseled them about weight gain management (84.9%), healthy nutrition in pregnancy (94.7%), and the importance of physical activity in pregnancy (90.2%). Participants demonstrated correspondingly high levels of knowledge about
gestational weight gain and its potential impact on maternal and fetal outcomes. However, univariate and multivariate analyses revealed socioeconomic disparities, such that low-income women were less knowledgeable about gestational weight gain than high-income women, despite more healthcare provider counseling directed at low-income women.

Conclusions: Contrary to previous reports that few women are appropriately counseled about gestational weight gain, participants in this study reported that their healthcare providers explicitly supported weight gain management, healthy diet, and physical activity in pregnancy. Yet findings also highlight socioeconomic disparities in women’s knowledge, suggesting the need for targeted interventions that more effectively promote healthy weight gain in low-income women.

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 < 0.001); three times as many NHWs and twice as many Hispanics compared to NHBs perceived themselves as underweight (43.6%, 30.8%, respectively, vs. 15.4%; p < 0.001). NHWs were more likely than NHBs and Hispanics to use healthy WL methods (diet and exercise) (p < 0.001), 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=27.5) compared to NHBs (mean=22.3) and Hispanics (mean=16.8) (p < .01), and these associations persisted after adjusting for age, educational attainment level, annual household income and federal 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:** Race, 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.
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
Kate Zemek Scottsdale Arizona, Colleen Keller Phoenix AZ, Tayna Benitez Phoenix AZ, Natasha Tasevska Phoenix AZ

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 population.

Methods: Baseline data were collected in 2012 as part of the Texas Childhood Obesity Research Demonstration (TX CORD) multicomponent obesity prevention study in Houston and Austin, TX. Self-administered surveys were used to collect socio-demographic data (race/ethnicity, birthplace, language, gender, child age, and household income) from parents of children aged 2 to 12 years (n=1561). Parents reported frequency of shopping for food at types of food stores: Large-chain grocery stores, natural/organic stores, warehouse/club stores, ethnic markets, farmers market/coops, food bank/pantries, and gardens were summed and coded as “more healthy”; and local/corner stores, convenience stores, and discount superstores were summed and coded as “less healthy.”

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 superstores (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), were not Hispanic (p<.001), and had lower household incomes (p<.001) were positively associated with shopping at “less healthy” food stores.

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-3460
The High Prevalence of Hypertension Among Low-Educated Adult Americans May be Attributed to Differences in the Rates of Obesity, Abdominal Obesity, Smoking, Income, and Ethnicity: NHANES 2003-2010.
David Gee Ellensburg WA, Priska Baker Ellensburg WA, Daniel Williams La Verne CA, Susan Hawk Ellensburg WA

Background: Individuals with low educational attainment have a shorter life expectancy and higher prevalence of numerous chronic diseases including cardiovascular diseases. The purpose of this study was to explore if educational attainment was an independent risk factor for hypertension after adjusting for other risk factors related to hypertension.

Methods: Data from the 2003-2010 National Health and Nutrition Examination Survey (NHANES) were used. Participants were of both genders, > 20 years old, and participated in both the in-person interview and the physical examination component of the NHANES survey (n=18,613). Chi-square tests, simple and multiple logistic regressions were conducted using SAS 9.2.

Results: The age-adjusted prevalence of hypertension was 43.9% in those with < 9th grade education, 35.2% in those with some high school education, 35.2% in those with a high school diploma, 29.4% in those with some college education, and 25.7% in those with a college degree. Simple logistic regression analysis revealed that compared to those with < 9th grade education, all educational attainment categories > 10th grade had significantly lower odds of having hypertension. Multiple logistic regression revealed that gender, ethnicity, age, weight, abdominal obesity, smoking, and income, but neither educational attainment nor nutrient intake of sodium, potassium, and calcium were independent risk factors for hypertension.
hypertension. Compared to those with < 9th grade education, the odds ratio (95% CI) for hypertension was 0.91 (0.71-1.16) with some high school education, 0.87 (0.61-1.04) with a high school diploma, 0.84 (0.69-1.09) with some college, and 0.79 (0.65-1.09) for those with a college degree.

Conclusions: Although educational attainment may play a role in the prevalence of hypertension disparities, a focus on other risk factors such as male gender, older age, black ethnicity, heavier body weight, higher waist circumference, lower incomes, and smoking should be emphasized.

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
Joshua Brown Charleston South Carolina, Tonya Turner Charleston SC, David Sword , Kelly Holes-Lewis Charleston South Carolina, Patrick O'Neil Charleston SC

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 of 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 deliver obesity treatment and delivering 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(1,81)=32.96, p<.001) and Attitudes (F(1,81)=19.36, p<.001). As for patients, program completers lost a significant amount of weight (M=1.94 kg, SD=3.6 kg), (F(1,16)=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-3463
Are Physician Effectively Trained to Counsel Obese Patients for Weight Management? Adarsh Gupta Stratford New Jersey, Marlena Klein Voorhees NJ

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 responses. 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-3464**

**CME Can Improve Physician Performance Related to Guideline-based Obesity Management**

Amy Larkin Lexington Kentucky, Stacey Hughes New York NY, Karen Badal New York NY

**Background:** Obesity is a major public health crisis that touches healthcare professionals in every specialty. Despite the increasing prevalence, availability of treatment guidelines, and recognition as a disease, obesity remains undertreated. We sought to determine if continuing medical education (CME) can improve physician knowledge and performance related to guideline-based management of obesity.

**Methods:** The education consisted of an online, interactive, case-based text CME activity that challenged clinicians to apply evidence-based recommendations. The educational effects were assessed using a 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 <.05 are statistically significant. Cramer’s V was used to calculate the effect size. The activity launched online on July 30, 2014 and data were collected for 3 months.

**Results:** Significant improvement were demonstrated by PCPs (n = 697; P <.001) regarding weight management strategies. The effect of the education immediately after participation (pre-/post-assessment) was borderline robust (V = 0.266): 10% of PCPs answered all questions correctly on the pre-assessment compared with 56% on the post-assessment. On follow-up, 31% of PCPs answered all 4 questions correctly, demonstrating high retention rates and improved performance compared to pre-education. Analysis indicates future educational need concerning strategies for long-term weight management in obese patients, addressing patient concerns about weight management pharmacotherapy, and appropriate application of lifestyle changes and weight loss pharmacotherapy.

**Conclusions:** This study demonstrates the success of a targeted educational intervention with access to the right physician audience (PCPs at the forefront of obesity management) on improving clinical performance regarding guideline-based treatment of obesity.

**T-P-3465**

**Estimated Long Term Costs Associated with Care of Children and Adults with Prader-Willi Syndrome (PWS)**

Ann Scheiman Baltimore Maryland, James 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 diet plan. Development of obesity if felt to play a significant role in the life expectancy for children and adults with Prader-willi syndrome. To date, there is a paucity of data on the costs associated with long term care of individuals with the disorder in addition to the impact of obesity upon health care costs.

**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 57,620 to 202,053 per year 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**

Timothy Barnes Minneapolis Massachusetts, Jennifer E. Pelletier Minneapolis MN, Darin Erickson Minneapolis MN, Caitlin Caspi Minneapolis MN, Lisa Harnack Minneapolis MN, Melissa Laska Minneapolis Minnesota

**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 interior 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**  
Cristina Fernandez Omaha NE, Carly Frost Omaha NE, Denise Bryson Omaha NE, Mary Jane Hawkins Omaha NE, Monica Klahn Omaha NE, Peg Miller Evans Omaha NE, Shana Romero Omaha NE

**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**  
Cristina Fernandez Omaha Nebraska, Tabitha Weller Carter Lake IA, Chris Mathews Omaha NE, Ashley Nelson Omaha NE, Kartany McCauley Omaha NE, Shana Romero Omaha NE, Peg Miller Evans Omaha NE, Carly Frost Omaha NE, Camilo Zapata Omaha Nebraska, Russell Hopp Omaha NE

**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.**  
Marlen Gómez Muñoz Cuernavaca, Morelos. Morelos, Lizbeth Tolentino-Mayo Ciudad de México Distrito Federal,
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 (92 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%, 8.80g/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
Meryam Shikara

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 bioelectrical 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
Marissa Stroo Durham NC, Julie Joyner Durham NC, Truls Ostbye Durham NC

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 (WNESC) 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 WNESC 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
Haley Garbus Wilton Connecticut, Julio Murillo Waterbury CT, Julia Werth Reading MA, Kate Boudreau Madison CT, Sanne Wortel Storrs CT, Katelyn Gettens Storrs Connecticut, Amy Gorin Storrs Connecticut

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 school spirit with health facts condition or the school spirit without health facts condition.

**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**  
Allison Doub State College Pennsylvania, Meg Small University Park PA, Leann Birch Athens GA - Georgia

**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., casserole; 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 obesity prevention, but more research is needed to understand how food blogs influence child feeding practices and home food environments.

**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 grader; 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 determinants-identified as gaps at baseline- within the 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±662.63 vs. -133.91±680.37 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 indicated a desire for healthier options, and price was the deciding factor in purchasing behaviors.

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 remained 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.b=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.
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.

Evaluation of mother’s perception of obesity in their sons

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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 was 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 categorized in normal (BMI 20 to 24.99 kg/m2) and obese (that includes obese and overweight BMI ≥ 25 kg/m2). Mothers were asked to report how they perceive their own weight (normal, overweight or obese) and how they perceive the weight of their sons (normal, overweight or obese). With these results we calculate sensitivity (Sn), specificity (Sp) positive and negative predictive value (PPV, NPV) and likelihood ratio (Lk+) of mother’s perception to identify obesity in their sons.

Results: We studied 1209 mothers and children pairs. Prevalence of overweight and obesity in children according to BMI and mother perception were 46.7% and 24% (p<0.05) respectively. Sn, Sp, PPV, NPV and Lk+ were: 51.4%, 2.8%, PPV 31.6%, NPV 6.2%, Lk+ 0.53

Conclusions: Mother’s ability to identify actual weight status in their own sons is very low. It’s necessary to increase mother’s knowledge of how to identify obesity at home to avoid delays in medical evaluation.

Factors associated with change in body mass index and body fat percentage in manufacturing workers across different age groups.

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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 was education: not having a college education was significantly associated with decreased BMI at the second compared to the first time point in the <45 year age group. Also in the <45 year age group, having elder care responsibilities was significantly associated with increased BMI. Significant increases in BFP were observed among workers in the 45-55 year age group with low job satisfaction, working >24 hours per month overtime and low job demands. There were no significant factors associated with change in BFP among participants in the >55 age group.

Conclusions: Effective interventions should consider a full range of individual, health-related, and work-related factors. More work must be done to identify factors that can predict changes in BMI and BFP over time.

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
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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-P-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
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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-P-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-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 mid-west 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 entrée. 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. Wees 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 selections (p=0.025). There was no change in participants selections of cooked vegetables, pizza, chicken or select healthy entrées.

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.
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. As for the classification of advertisements by type of food or beverage, we found that sugary drinks were 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 limit 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
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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’ meal offerings (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 excess 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 obese 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.
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 item 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<.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 "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 55g; in products directed at parents: 26.5g, 35.4g and 148.5g; for the general audience: 13.1g, 65.2g and 143.3g respectively.

Conclusions: Marketing strategies for products that are intended for child consumption, utilize combinations of "tags" on package that attract the attention not only of children but also of parents.

T-P.3497
Table Tents Decrease School Cafeteria Food Waste
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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 and milk). Unrelated to the purpose of our study, pilot study NSLP participation increased by an average of 4% (p = .02).

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
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 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, India, 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.

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.
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, $6312). 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?
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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
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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.3506-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. Concentrations of AAP were assigned by spatial AIRg. 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 glycaemia, 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.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 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 one any size or number of providers.

T-P-3508

**Evaluation of Two Implementation Stages of the School Context Action Program (PACE, According to its Initials in Spanish) in Mexico**

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**Background:** In Mexico, since 2010 a series of strategies to prevent overweight and obesity have been developed. As part of these efforts, the Ministry of Education, implemented PACE in elementary schools as a strategy to promote children's health.

**Objective:** To evaluate two implementation stages of two components of PACE: accessibility and availability of healthy foods and beverages and regular physical activity.

**Methods:** A quasi-experimental study was conducted in 20 schools in the Federal District, in each school; inventories were carried out to evaluate the sale of food and beverages at recess, as well as the school facilities and equipment for physical education. Principals, teachers, vendors and parents were also interviewed. The study was conducted at the beginning and end of the school year during both 2011-2012 and 2013-2014.

**Results:** Between the two periods of study, we observed: a reduction in the sodium content of prepared foods sold during recess from 248.7-204.4mg/portion and a reduction in the Kcal content of salty snacks from 116.7 to 43.6Kcal/100g. With regard to the availability of food at recess time, it was found that 80% of schools sold vegetables and fruits between 4 to 5 days a week.

**Conclusions:** Although changes to improve the school environment were observed, there are still challenges such as the need for greater awareness of the benefits for physical activity at different times of the day, the elimination of the sale of sweet and savory snacks, and greater availability to water through water fountains and the promotion of water consumption.