Wednesday November 4 – 11:45AM-1:30 PM

T-P-LB-3766

Persicaria hydropipier (L.) Spach and its Flavonoid Components inhibit adipocyte differentiation in 3T3-L1 cells by activating the Wnt/β-catenin signaling pathway

Jiyong Shim *Seoul* -, Soung-Hoon Lee , KangYell Choi *Seoul no*

Background: Obesity, which is related to metabolic syndrome and is associated with liver disease, represents an epidemic problem demanding effective therapeutic strategies. Evidence shows that the Wnt/β_catenin pathway is closely associated with obesity and that small molecules regulating the Wnt/β_catenin pathway can potentially control adipogenesis related to obesity **Methods:** Eleven plant extracts activating the Wnt/β_catenin pathway were screened by using HEK 293_TOP cells retaining the Wnt/β_catenin signaling reporter gene. **Results:** An extract of Persicaria hydropiper (L.) Spach was found to activate Wnt/β_catenin signaling. The P. hydropiper extract inhibited the differentiation of adipocyte 3T3_L1 cells. Isoquercitrin and isorhamnetin, constituents of P. hydropiper, also activated Wnt/β_catenin signaling and suppressed the differentiation of 3T3_L1 cells.**Conclusions:** These results indicate that isoquercitrin in P. hydropiper suppresses the adipogenesis of 3T3_L1 cells via the inhibition of Wnt/β_catenin signaling. P. hydropiper and isoquercitrin may therefore be potential therapeutic agents for obesity and its associated disorders.

T-P-LB-3767

The small molecule Indirubin-3'-Oxime inhibits adipocyte differentiation via Wnt/β-catenin signaling pathway

Seolhwa Seo *Seoul* -, Olivia Choi *San Diego CA*, KangYell Choi *Seoul no*

Background: Activation of the Wnt/b-catenin signaling pathway inhibits adipogenesis by maintaining preadipocytes in an undifferentiated state. We investigated the effect of indirubin-3'-oxime (I3O), which was screened as an activator of the Wnt/bcatenin signaling, on inhibiting the preadipocyte differentiation in vitro and in vivo. **Methods:** 3T3L1 preadipocytes were differentiated with 0, 4 or 20mM of I3O, and the effect was observed by Oil-red-O staining. Activation of Wnt/b-catenin signaling in I3O-treated 3T3L1 cells was shown using immunocytochemical and immunoblotting analyses for b-catenin. For the in vivo study, mice were divided into five different dietary groups: chow diet, high-fat diet (HFD), HFD supplemented with I3O at 5, 25 and 100mgkg_1. After 8 weeks, adipose and liver tissues were excised from the mice and subject to morphometry, real-time RT-PCR, immunoblotting and histological or immunohistochemical analyses. In addition, adipokine and insulin concentrations in serum of the mice were accessed by enzyme-linked immunosorbent assay. **Results:** Using a cell-based approach to screen a library of pharmacologically active small molecules, we identified I3O as a Wnt/b-catenin pathway activator. I3O inhibited the differentiation of 3T3L1 cells into mature adipocytes and decreased the expression of adipocyte markers, CCAAT/enhancer-binding protein A and peroxisome proliferator-activated receptor G, at both mRNA and protein levels. In vivo, I3O inhibited the development of obesity in HFD-fed mice by attenuating HFD-induced body weight gain and visceral fat accumulation without showing any significant toxicity. Factors associated with metabolic disorders such as hyperlipidemia and hyperglycemia were also improved by treatment of I3O. **Conclusions:** Activation of the Wnt/b-catenin signaling pathway can be used as a therapeutic strategy for the treatment of obesity and metabolic syndrome and implicates I3O as a candidate anti-obesity agent.

T-P-LB-3768

Associated roles of elevated miR-146a and SFRP4 in adiposity and insulin resistance.

Attila Seyhan *Orlando Florida*, Gabriella Garufi *Orlando FL*, Yury Nunez Lopez *Orlando FL*, Magdalena Pasarica *Orlando Florida*

Background: miRNAs have recently emerged as key regulators of metabolism. Secreted frizzled-related protein 4 (SFRP4) is associated with obesity and insulin resistance, probably through its angiostatic effect. Current work explored relationships among miRNAs and SFRP4, as they relate to adipose tissue functions including lipolysis, glucose and glycerol turnover, and insulin sensitivity. **Methods:** Plasma and abdominal adipose tissue (abdAT) RNA was isolated from 17 obese and type 2 diabetes (T2DM) subjects. mRNA and miRNA levels were measured by qPCR. Insulin sensitivity was measured by the euglycemic hyperinsulinemic clamp. Osmium fixation and Coulter counting was used for adipocyte sizing. Data was analyzed using general linear models. **Results:** AbdAT miR-146a was elevated in obese (FDR=0.001) and T2DM (P=0.04) subjects and correlated positively with mean fat cell size (FCS) (r=0.89, FDR=0.02) and SFRP4 in the same tissue (r=0.88, FDR=0.006), and negatively with size of small adipocytes (r=-0.92, FDR=0.002). SFRP4 protein levels were elevated in the circulation (P=0.002) and mRNA levels marginally elevated in the abdAT (P=0.07) of the

obese subjects. Notably, circulating levels of SFRP4 protein were negatively correlated with insulin suppression of lipolysis (r=-0.77, FDR=0.005) and the glucose rate of appearance (r=-0.70, FDR=0.04). In addition, plasma miR-376a was elevated in obese (P=0.01) and T2DM (P=0.03) subjects as compared to lean and healthy matching controls, respectively. Circulating levels of miR-376a associated with blood insulin (r=0.77, FDR=0.001), HOMA IR (r=0.77, FDR=0.02), and mean FCS, r=0.92, FDR=1.0x10^-7). **Conclusions:** Our study uncovers a novel association between SFRP4 and miR-146a in the obesity context, and suggest that miR-146a may mediate, at least in part, insulin resistance-related effects of SFRP4 in adipose tissue. Thus, miR-376a and miR-146a show potential as biomarkers of adiposity and insulin resistance.

T-P-LB-3769

The Association of Weight Loss and Cardiometabolic Outcomes in Overweight and Obese Children: A Systematic Review and Meta-regression

Tamim Rajjo *Rochester MN*, Jehad Almasri *Rochester Minnesota*, Wigdan Farah *rochester mn minnesota*, Khaled Mohammed *Rochester MN*, Ahmed Ahmed *rochester Minnesota*, Mouaz Alsawas *rochester Minnesota*, Noor Asi *Rochester Mn*, Zhen Wang *Rochester MN*, Alaa Al Nofal *Sioux Falls SD*, Larry Prokop *Rochester MN*, M. Hassan Murad *Rochester MN*

Background: Excess body weight in children is associated with multiple immediate and long term medical comorbidities. We aimed to identify the degree of reduction in excess body weight associated with cardiometabolic changes (lipid panel, liver function tests, systolic (SBP), diastolic blood pressure (DBP), HgA1C and fasting blood glucose) in overweight and obese children. **Methods:** We included randomized controlled trials (RCTs) and cohort studies that evaluated interventions to treat pediatric obesity (medication, surgery, life style and community based interventions). Studies with less than 6 month follow up duration were excluded. We conducted a comprehensive search of several databases. Two independent reviewers screened and extracted data from eligible studies. We assessed the risk of bias of the included studies using Cochrane risk of bias tool and Newcastle Ottawa Scale. We used a random effects regression model to assess the association between BMI/weight and cardiometabolic changes. **Results:** We included 42 studies (37 RCTs and 5 cohorts) enrolling 3807 patients. Studies had overall moderate to low risk of bias. A one-unit decease in SBP was significantly associated with a decrease of 0.16 units (p=0.04) and 0.61 units (p=0.05) in BMI and weight, respectively. A one-unit increase in HDL was significantly associated with 0.74 units decrease in weight (p=0.02). A one-unit decrease in triglycerides was significantly associated with 0.1 unit decrease in weight (p=0.03). The remaining associations were not statistically significant. **Conclusions:** Weight reduction in children is associated with significant changes in several cardiometabolic outcomes, particularly HDL, SBP and triglycerides

T-P-LB-3770

Lack of LDL-C goal attainment in high-risk adults in the United States: an analysis according to BMI and waist circumference using National Health and Nutrition Examination Survey data (2003–2012)

Peter Toth *Sterling IL*, Karin Henriksson *Mölndal Sweden*, Michael Palmer *Wilmslow GB-CHS*

Background: Obese individuals are at greater risk of cardiovascular disease. We estimated LDL-C goal attainment according to BMI and waist circumference (WC) using National Health and Nutrition Examination Survey (NHANES) data extrapolated to the US adult population. **Methods:** The proportion of participants in 5 NHANES surveys (2003–2004 to 2011-2012) categorized as underweight, normal, overweight, obese, or morbidly obese (BMI 2, respectively) or as having abdominal obesity (WC >102 cm for men or >88 cm for women) was calculated. The proportion of each category at NCEP ATP III LDL-C goal was determined **Results:** From 2003–2004 to 2011–2012, mean BMI increased by 0.36 kg/m2. Mean WC increased by 0.49 cm for men and 1.66 cm for women. Estimated proportion of US adults categorized as overweight/obese/morbidly obese increased from 66% (135 M) to 69% (154 M). Proportion categorized as obese/morbidly obese increased from 32% (66 M) to 36% (80 M). Proportion with abdominal obesity also increased from 52% (108 M) to 55% (124 M). Across all surveys, the estimated proportion of underweight, normal, overweight, obese, and morbidly obese adults not at LDL-C goal was 6%, 15%, 26%, 30%, and 34%, respectively. The proportion of high-risk adults not at goal was 50%, 56%, 60%, 59% and 68% in underweight, normal, overweight, obese, and morbidly obese categories, respectively. In all risk groups, a greater proportion of adults with abdominal obesity were also not at goal, compared with those with normal WC.**Conclusions:** Most US adults are categorized as overweight or obese, and the number of US adults within this category increased from 2003 to 2012. Overall, ≥50% of high-risk adults in all BMI categories are not at LDL-C goal (approximately 21.3 M US adults), highlighting the need for more aggressive identification and treatment of individuals at risk.

T-P-LB-3771

Severe obesity is associated with increased risk of early complications and extended length of stay following coronary artery bypass graft surgery

Tasuku Terada *Edmonton Alberta*, Jeffrey Johnson *Edmonton Alberta*, Colleen Norris *Edmonton Alberta*, Weiyu Qiu *Edmonton Alberta*, Raj Padwal *Edmonton AB*, Arya Sharma *Edmonton Alberta*, Mary Forhan *Edmonton Alberta*

Background: A better understanding of the drivers of hospital costs is needed to provide quality and efficient care for patients with obesity. We examined the relationship of obesity with the incidence of early (30-day) adverse outcomes and in-hospital length of stay (LOS) following coronary artery bypass graft (CABG) surgery.**Methods:** Data from 7560 patients who underwent CABG were reviewed. Using normal body mass index (BMI; 18.5-24.9 kg/m2) as a reference, the association of four BMI categories: overweight (25.0-29.9 kg/m2), obese class I (30.0-34.9 kg/m2), obese class II (35.0-39.9 kg/m2), and obese class III (≥40.0 kg/m2) with rates of overall early complications, subgroups of early complications (i.e., infection, renal and pulmonary complications), and LOS were assessed while adjusting for clinical covariates.**Results:** Compared to patients in the normal BMI group, patients in the overweight and obese class I groups had a similar risk of overall early complications while patients in the obese class II and III groups were at higher risk (class II: adjusted hazard ratio [aHR] 1.35; 95% CI 1.11-1.63; class III: aHR 1.56; 95% CI 1.21-2.01). Subgroup analyses showed that patients in the obese class I, II and III groups were at higher risk of infection (class I: aHR 1.60; 95% CI 1.24-2.05; class II: aHR 2.34; 95% CI 1.73-3.17; and class III: aHR 3.29; 95% CI 2.30-4.71); however, BMI category was not a risk factor for renal or pulmonary complications. Patients with class III obesity spent an additional 2.1 (95% CI 0.31-3.87) days in hospital compared to patients with normal BMI. **Conclusions:** Class II and III obesity were independent risk factors for early complications, most likely driven by a higher risk of post-surgical infection. Early complications could contribute to an extended hospital stay for patients with class III obesity. Greater perioperative attention and consideration for patients with severe obesity undergoing CABG may improve patient outcomes and reduce health care cost.

T-P-LB-3772

Impact of Body Mass Index on In-hospital Outcomes in Patients Undergoing Percutaneous Coronary Intervention in Newfoundland and Labrador, Canada

Anne Gregory *St. Philip's Newfoundland*, Neil Pearce *St. John's Newfoundland And Labrador*, William Midodzi *St. John's Newfoundland*

Background: Obesity is associated with advanced cardiovascular disease requiring procedures such as percutaneous coronary intervention (PCI). Studies have inconsistently reported better outcomes in obese patients - “the obesity paradox” with these procedures. The relationship between in-hospital outcomes and BMI has not been examined in Newfoundland and Labrador (NL) which has the highest rate of obesity in Canada.**Methods:** The Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease database was used to obtain data on patients (n = 6473) who underwent PCI from May 2006 to December 2013 in NL. Patients were grouped by BMI: normal, BMI ≥ 18.5 and < 25.0 (n=1073); overweight, BMI ≥ 25.0 and < 30 (n=2608); and obese, BMI ≥ 30.0 (n=2792). The primary outcome was in-hospital complications occurring within 48 hours (vascular, in-lab and post-procedural).**Results:** The proportion of patients undergoing PCI considered obese increased from 2.9% in 2006 to 7.0 % in 2013. These subjects were younger, less likely to be male, and had a higher incidence of coronary risk factors such as diabetes, hypertension, and family history of cardiac disease (trends across BMI categories all significant $p < .001$). Normal weight subjects experienced a greater proportion of vascular complications: (normal, overweight, obese: 8.2%, 7.2%, 5.3%, $p = 0.001$). No significant differences were observed for non-vascular complications - in-lab (4.0%, 3.3%, 3.1%, $p = 0.386$) or post-procedural (1.0%, 0.8%, 0.9%, $p = 0.725$). **Conclusions:** Obese patients who underwent PCI were less likely to experience vascular complications; however, no differences were observed across BMI categories for non-vascular complications (in-lab or post-procedural).

T-P-LB-3773

Physical Characteristics Associated with Pooled Cohort Risk Equations: NHANES 1999-2006

Dwight Lewis *Tuscaloosa ALABAMA*

Background: In 2013, the American Heart Association and American College of Cardiology released guidelines that supports the use of pooled cohort risk equations to determine cardiovascular risk among diverse populations. Though the relationship between obesity and cardiovascular risk is well established, little is known regarding the associations that these risk scores have with dual energy x-ray absorptiometry (DXA) body fat and other anthropometric measures. The purpose of this analysis is to

examine the previously mentioned relationship. **Methods:** We used data from a nationally representative sample of 4,497 men and nonpregnant women (White: n=2,411; Black: n=1,063; Mexican American: n=1,023) aged 40-64 years from the 1999-2006 National Health and Nutrition Examination Surveys. Pooled cohort risk equations were calculated using objective measures of blood pressure, lipoproteins, glycohemoglobin, cotinine, as well as, self-reported smoking and diabetes status. Pooled cohort risk were categorized as < 7.5%, 7-5-19.9%, and ≥ 20%. SAS Proc Surveyreg was used to examine the association between calculated pooled risk score and participants' physical characteristics. Key covariates of interest included DXA total percent body fat (DXA-%BF), body mass index (BMI), and waist circumference. **Results:** DXA-%BF was not significantly different by pooled cohort risk groups among Black men, Black women, and Mexican American women. DXA-%BF was significantly different by pooled cohort risk groups among all other population groups. **Conclusions:** Body fat may not be able to differentiate cardiovascular risk among certain racial and ethnic groups. Evidence also suggests that some groups are able to be overfat, and display relatively low levels of cardiovascular risk.

T-P-LB-3774

Weight outcomes for obesity prevention among elementary children exposed to a low-dose clinical intervention

Lisa Bailey-davis *Danville Pennsylvania*, Xiaowei Yan *Danville PA*, Gregory Welk *Ames IA*, Jennifer Savage *University Park Pennsylvania*, Adam Cook *Danville PA*, Jacob Mowery *Danville PA*, Christina Yule *Danville PA*, Rebecca Stametz *Danville PA*, William Cochran *Danville PA*

Background: Evidence of effective prevention of obesity among children in clinical settings is limited and outcome measures are unclear. We examined the extent to which parent screening of home and environmental risk factors before (PS→) visits plus computerized clinical decision support (CDS) for pediatricians during well child visits (WCV) improved three child weight outcomes (BMI, BMI %, and BMI50) compared to usual care (UC) followed by parent screening (→PS). **Methods:** We conducted a cluster-randomized, 2-arm pragmatic trial, where primary care practice site was taken as cluster. We enrolled 685 children aged 6 to 9 years, regardless of BMI, from 13 primary care practices in Pennsylvania. Patients were followed up for 1 year. In 7 practices randomized to PS→CDS, parents completed the Family Nutrition and Physical Activity (FNPA) screening before their child's scheduled WCV. Pediatricians received FNPA screening results as part of a CDS tool to inform preventive counseling. In 6 practices randomized UC→PS, parents completed the FNPA screening after their child's WCV. **Results:** We obtained BMI from 302 children at baseline and 1 year. At baseline, children in the PS→CDS randomization arm were heavier (28% overweight or obese versus UC→PS 20%, p< 0.001) and by BMI50 (9.64 (19.68) versus UC→PS 5.23 (9.04), p< 0.05). At one year follow-up, there was no statistically significant difference between the groups, regardless of weight outcome measure (BMI, BMI %, or BMI50) however, mean negative BMI50 changes were observed among participants with a BMI% >70 at baseline (-0.259 to -0.962). **Conclusions:** We observed consistent findings with several outcome measures, however BMI50, a useful indicator of change for youth at the high end of the BMI distribution, allowed for identification of children who benefited most from prevention strategies. Low-dose parent screening and clinical decision support are feasible and effective strategies for obesity prevention for elementary age children.

T-P-LB-3775

Effectiveness of parent screening before or after well child visits in preventing childhood obesity among toddlers

Lisa Bailey-davis *Danville Pennsylvania*, Xiaowei Yan *Danville PA*, Gregory Welk *Ames IA*, Jennifer Savage *University Park Pennsylvania*, Adam Cook *Danville PA*, Jacob Mowery *Danville PA*, Christina Yule *Danville PA*, Rebecca Stametz *Danville PA*, William Cochran *Danville PA*

Background: Evidence of effective prevention of obesity among toddlers in clinical settings is limited. We aimed to examine the extent to which parent screening of home and environmental risk factors for obesity before (PS→) visits plus computerized clinical decision support (CDS) for pediatricians during well child visits (WCV) improved child body mass index (BMI) compared to usual care (UC) followed by parent screening (→PS). **Methods:** We conducted a cluster-randomized, 2-arm pragmatic trial, where primary care practice site was taken as cluster. We enrolled 1,671 children aged 2 to 5 years from 13 primary care practices in Pennsylvania. Patients were followed up for 1 year. In intent-to-treat analyses, we used linear mixed-effects models to account for clustering by practice and within each person. In 7 practices randomized to PS→CDS, parents completed the Family Nutrition and Physical Activity (FNPA) screening before their child's scheduled WCV. Pediatricians received FNPA screening results as part of a CDS tool to inform preventive counseling. In 6 practices randomized usual care, parents completed the FNPA screening after their child's WCV (UC→PS). Change in BMI % (defined as 100 log e (BMI/median BMI) at the 1-year follow-up was the primary outcome. **Results:** A total of 619 children (retention rate:

38% PS→CDS and 32% UC→PS) had 1-year follow-up BMI. At baseline, mean (SD) BMI % was 4.67 (9.99) for PS→CDS group and 1.16 (9.7) UC→PS group (p< 0.001). Regression analysis was used to control for baseline BMI, sex, race, and Medicaid status; compared with the UC→PS arm, BMI % increased more in children in the PS→CDS arm during 1 year, but no statistical difference was detected between groups (0.31 (SE =0.52), p= 0.50). **Conclusions:** Pragmatic trials in clinical settings may retain up to one third of pediatric participants at one year. These findings suggest that timing of parent exposure to the low-dose screening tool (before or after well child visits) does not impact child weight outcomes at one year.

T-P-LB-3776

Evidence for Dropping Distress from the Yale Food Addiction Scale (YFAS) Scoring Criteria

Gregory Petersen *Chicago Illinois*, Rachel Gabelman *State College PA*

Background: Recently, no significant relationship was found between YFAS scores and outcome in a weight loss study(Lent, Eichen, Goldbacher, Wadden and Foster,2014). We suggest that a low rate of distress being endorsed by participants having 3 or more symptoms of food addiction (FA) may be a potential confound. In our sample, 49 of 90 participants (54%) endorsed 3 or more symptoms of FA. Of those endorsing 3 or more symptoms, only 17 (19%) also endorsed experiencing distress. Using distress as part of the criteria, 32 of 49 participants (65%) endorsing significant symptoms of FA (3 or more) would be categorized as not addicted, producing the potential confound. **Methods:** Ninety participants completed the YFAS prior to undergoing bariatric surgery for weight loss. Participants were categorized as food addicted (FA) or not food addicted (NFA) using the YFAS. Distress was then removed from the criteia snd participants were recategorized. The % of total body weight loss (TBWL) is being assessed at 3 mo, 6 mo, 1 yr and 2 yrs post surgery. The TBWL of FA and NFA participants in each categorization are then compared using two sample t-test assuming unequal variance. **Results:** With distress; TBWL at 3 mo was 17.8% (FA, n=17) vs 17.0% (NFA, n=73) (p=.25). TBLW at 6 mo was 24.2% (FA, n=16) vs 24.5% (NFA, n=69) (p=.44). TBLW at 1yr was 29.0% (FA, n=13) vs 30.0% (NFA, n=61) (p=.31) Without distress; TBLW at 3 mo was 16.7% (FA, n=49) vs 17.8% (NFA, n=41) (p=.09). TBLW at 6 mo was 23.3% (FA, n=49) vs 25.9% (NFA, n=37) (p=.018). TBLW a 1 yr was 28.1% (FA, n=41) vs 32.7% (NFA, n=33) (p=.007) **Conclusions:** The YFAS as scored presently is categorizing patients with significant symptoms of addiction as not addicted, diminishing it's utility as a clinical tool. We propose dropping the requirement of distress for categorizing patients as addicted. Doing so resulted in significant predictive utility of the YFAS for weight loss following bariatric surgery. This predictive utility was lost when distress was included.

T-P-LB-3777

Effect of protein supplementation on lean mass, resting energy expenditure and nitrogen balance after bariatric surgery.

Violeta Moize *New York New York*, Xavier Pi-Sunyer *New York NY*, Josep Vidal *Barcelona Spain*, James McGinty *New York NY*, Eugenius Harvey *New York NY*, Yves Boirie *Clermont-Ferrand Auvergne*, Blandine Laferrere *New York NY*

Background: Protein supplementation (PS) after bariatric surgery (BS) is often recommended but its effect on lean body mass (LBM), resting energy expenditure (REE) and nitrogen balance (NB) is unknown. In this pilot study we assessed the feasibility and efficacy of a controlled PS in the early post-operative period. **Methods:** Body composition (Bod Pod and total body water), REE and a 5-day inpatient NB were measured in subjects prior to and 3 months after BS (RYGB or VSG), while on controlled PS. At surgery, participants were randomized to either high (HPS:1.2g /IBW/d) or standard (SPS: 0.8g/IBW/d) PS, given as protein powder (Unjury®) for 3 months. Calorie and protein intake were strictly controlled during the inpatient stay, and calorie content of stools and diet were analyzed by bomb calorimetry. **Results:** 6 women (BMI=47±5kg/m2, Age=27±6y) were studied. Body weight (126±13kg to 104±13 kg, p=.012) and calorie intake (2157±187kcal vs. 882±130kcal; p=.000) significantly decreased at 3 months. Daily total protein intake did not change after HPS (82.7±6g/d before surgery vs. 80.3±4.5g (n=3) (p=n.s) at 3 months), but decreased significantly after SPS group (-27.4 g/d n=2, p=0.037). As expected, LBM and REE decreased (61±4kg to 55±4kg, p=0.004; 1705±103 to 1466±30 kcal/d, p=.004). Stool N decreased after BS (1.6±0.2g to 0.6±0.3g/d, p=0.03), but not urine N (9.9±2g to 6.8±3g/d,p=ns). Percentage of total calorie intake recovered in stools was not different before and after BS. **Conclusions:** Our data show feasibility of a controlled 3 months PS after BS. PS at or above requirements may be needed to avoid a negative NB during the active period of weight loss. Follow up studies will determine if variable dose PS and surgery type impact NB and LBM differently 1 year after BS.

T-P-LB-3778

Effects of antipsychotic drugs on food intake in healthy volunteers: Quantitative assessments from the Healthy Volunteer Antipsychotic Trial (HVAT)

Laurel Mayer *New York New York*, Janet Schebendach *New York NY*, Jacob Ballon *Stanford California*, Utpal Pajvani *New York NY*, B. Timothy Walsh *New York NY*, Rudolph Leibel *ny ny*, Jeffrey Lieberman

Background: Antipsychotic drug (APD)-induced metabolic disease has complicated their use in clinical practice. The pathophysiology leading to weight gain and insulin resistance has not been well described. It is unknown whether APD-induced metabolic disturbances are primarily due to the medications or whether the drugs exacerbate underlying adverse metabolic phenotypes intrinsic to the illnesses they are used to treat. We designed a prospective clinical trial to determine mediators of APD-caused weight changes specifically in healthy volunteers. Our hypothesis is that APD-related changes in weight will be associated with measurable changes in food intake, with specifically changes on olanzapine greater than iloperidone greater than placebo. **Methods:** 23 medically and psychiatrically healthy volunteers (BMI 18-25 kg/m2, age 18-35 yrs.) were randomized to twice daily dosing of olanzapine (OLZ) 5mg, iloperidone (ILO) 6mg, or placebo (PBO) for 29 days. Weight was measured at baseline and then weekly for the duration of the 4 week study. Food intake (FI) was assessed via a standardized, laboratory lunch meal at baseline and day 29. Gram weight, kcal and macronutrient composition were calculated for all food consumed. The change in FI between the meals was calculated as intake at meal on Day 29 minus baseline. **Results:** No significant change in FI was observed in participants assigned to PBO (N=10)(mean FI change =-128+/-569 kcal, p=0.49) or ILO (N=6)(mean FI change =15+/-529 kcal, p=0.94), but the OLZ group (N=7) had a significant increase in overall FI (meal FI change =268+/-210 kcal, p=0.01). Calories consumed from carbohydrate and fat increased at the trend level (p=0.09) in the OLZ group only. The OLZ group gained significantly more weight than those randomized to ILO or PBO [3.2 kg vs. 0.7 vs. 0.3, respectively (p=.018)] over the 28 day study period. **Conclusions:** After only four weeks of antipsychotic use, clinically significant increases in food intake and weight occur in healthy volunteers exposed to OLZ.

T-P-LB-3779

Dietary fat intake in parents with overweight and obesity and their children: The influence of mom

Melissa Windover *Chicago Illinois*, Erin Lenz *Storrs Connecticut*, Alexis Wojtanowski *New York NY*, Gary Foster *New York NY*, Amy Gorin *Storrs CT*

Background: Strong familial obesity correlations exist, with parental obesity predicting child obesity through early childhood into adulthood. Identifying shared dietary risk factors between parents who are overweight or obese and their children may aid in the development of family-based weight management interventions. **Methods:** 23 heterosexual two-parent families (Mothers: 48.1 ±4.5 years, Body Mass Index (BMI) 33.4 ±4.3 kg/m2; Fathers: 49.0 ±5.7 years, BMI 32.6 ±4.1 kg/m2) with 34 children (58.8% male; 15.4 ±2.2 years, BMI percentile 69.2±21.0) were assessed at entry into an adult weight loss treatment (Weight Watchers) in which only one parent received treatment. All parents were overweight or obese; there was no BMI percentile cutoff for children. Percent energy from fat intake in both children and adults was measured with the National Cancer Institute (NCI) Percentage Energy from Fat (PFat) Screener. Objective height and weight, role as primary grocery shopper and food decision-maker were also assessed. **Results:** Child PFat (31.7 ±4.4%) was associated with maternal PFat (32.6 ±4.0%; b= .49, t(32)=2.7, p< .01) but not paternal PFat (33.6 ±2.9%); although paternal and maternal PFat were associated with each other (b=.767, t(32)=3.402, p **Conclusions:** We found some evidence of concordance between maternal and child dietary fat intake; a similar relationship was not observed in father-child diets. Mothers in this study played a more active role than fathers in their household's grocery shopping and food decisions, likely increasing their influence on child dietary habits. Future research is needed to test whether interventions that build healthy shopping and food preparation skills in parents can break the cycle of familial obesity.

T-P-LB-3780

The Effect of a Very Low Carbohydrate Diet on Triglycerides

Kelly O'Heron *wausau Wisconsin*, Timothy Logemann *Wausau WI*, David Murdock *Wausau WI*, John Grady *Wausau Wisconsin*

Background: The Ideal Protein Weight Loss Method (IPWLM) is a 4 phase, very low calorie, normal protein, ketogenic (low carbohydrate) diet protocol used for weight loss. Phase 1 of the IPWLM is a partial meal replacement protocol consisting of approximately 900 calories and 40 grams of carbohydrates daily (ketogenic). This phase is continued until target weight is achieved. We sought to quantify the effect on triglycerides after 12 weeks on the Phase 1 protocol. **Methods:** 752 patients enrolled in the IPWLM. Weekly meetings are encouraged with a health coach to review weight loss progress and compliance of following the protocol. Each patient consumes 3-5 Ideal Protein pre-packaged foods per day, vitamin and mineral supplements, 4 cups low glycemic-index vegetables and 8 ounces of lean protein. Daily

dietary intake is approximately 900 calories, 30 grams fat, 45 grams carbohydrates and 100 grams protein. Lipids were measured at baseline and 12 weeks after starting the program. A statistical paired t-test was performed on all data sets. **Results:** 752 completed at least 12 weeks of this diet with baseline and 12-week fasting lipid panel. Total cholesterol decreased from 185±37 to 163±36 mg/dl (p **Conclusions:** The IPWLM has powerful effect on lipid abnormalities and can significantly decrease triglycerides.

T-P-LB-3781

Maternal obesity is associated with gain in child BMI and waist circumference, but not overall dietary quality in African American and Dominican youth

Elizabeth Widen *New York New York*, Jeanine Genkinger *New York New York*, Lori Hoepner *New York NY*, Robin Whyatt , Judyth Ramirez-Carvey *New York NY*, Sharon Oberfield *New York New York*, Abeer Hassoun *New York NY*, Frederica Perera *New York NY*, Andrew Rundle *New York NY*

Background: Parental factors may contribute to the obesity and dietary habits in youth. We sought to examine the role of maternal obesity and weight change in childhood size and diet among low-income urban youth. **Methods:** African American and Dominican mothers from the Bronx and Northern Manhattan were enrolled in pregnancy and dyads were followed postpartum (n=327). Maternal weight and child BMIZ and waist circumference (WC) were measured at child age 7 and 9 y. At 8-12 y, the child's diet was assessed with the Block Hispanic Food Frequency Questionnaire from which Dietary Approaches to Stop Hypertension (DASH) components and score were derived. Linear regression was used to assess associations between maternal factors [obesity at 7 y, Δ weight from 7-9 y] and child outcomes [Δ BMIZ & ΔWC from 7-9 y; diet], controlling for covariates, including race, sex and child age, and for dietary models, caloric intake and BMIZ. **Results:** At child age 7 y, 41% of women were obese. Maternal obesity at 7 y was associated with a 0.26 unit (p0.1). Maternal obesity was associated with lower child vegetable intake (β -0.34 cups, p=0.01); but was not associated with continuous DASH-score (β -0.28, p=0.6), or intake of of sugar sweetened beverages (β 37.3 kcal/d, p=0.1)), fruit juice (β 0.11 cups, p=0.4) or whole fruits (β 0.15, p=0.5). **Conclusions:** Among low-income urban youth, maternal obesity was associated with increases in child BMIZ and WC from 7-9 y; however, concomitant changes in maternal weight did not predict child outcomes. Maternal obesity was associated with lower vegetable intake, but was not associated with adherence to the DASH diet or intake of sugar sweetened beverages, juice or fruit. Obesity prevention efforts in low-income urban youth need to be enhanced among children whose mothers are obese.

T-P-LB-3782

Use of real-life data coming from connected scales and wireless blood pressure monitors to assess the impact of weight loss on blood pressure

BENOIT BROUARD *ISSY-LES-MOULINEAUX Île-de-France*, Angela Chieh *Issy-les-Moulineaux IDF*, Rym El Hajji *Issy les moulineaux Ile de France*, Alexis Normand *Issy-les-Moulineaux FRANCE*, Nicolas Schmidt *Cambridge MA*, Marie-Emmanuelle Sirieix *Paris Ile de France*, Alain Simon *paris france*

Background: Overweight is a strong risk factor for hypertension. Studies have shown that even a modest weight loss could yield substantial benefits for health. Moreover, with the advent of connected-health devices, weight and blood pressure (BP) can now be easily tracked on a daily basis. Our purpose was to assess the impact of a decrease of body mass index (BMI) on BP by a cross-sectional and longitudinal multivariate study. **Methods:** We used an anonymous database from 27,000 adult owners of both a connected scale and a wireless BP monitor, in more than 100 countries. These devices measured the BMI and the systolic blood pressure (SBP) respectively. Analyses were adjusted on age, frequency of SBP measurements, and frequency of weight measurements. Multivariate linear regressions were used to study cross-sectional and longitudinal associations between BMI and SBP on the entire population. **Results:** The study cohort is characterized by a mean age of 50.7 ± 11.6 years old and a BMI of 28.6 ± 5.1 kg/m², and is composed of 86% of men and 14% of women. Cross-sectional analyses showed a positive association between SBP and BMI in both sexes (p<10-15). **Conclusions:** Epidemiological studies and the Framingham study have confirmed the positive relationship between overweight or obesity and high BP. Our study confirms these results using data measured in real life, using connected devices. Moreover, this study shows an objectively evaluated association between an exposure and an outcome in a longitudinal study.

T-P-LB-3783

Children exposure to advertising of food and beverages in the Mexican broadcast television and its relationship with the formation of eating habits

Liliana Bahena-Espina *Mexico Distrito Federal*, Lizbeth Tolentino-Mayo *Ciudad de México Distrito Federal*, Anabel Velasco *Cuernavaca Morelos*, Elizabeth Hernández-Zenil *Mexico Distrito Federal*, Simon Barquera *Cuernavaca Morelos*

Background: The National Health and Nutrition Surveys in Mexico show that between 1999 and 2012, the combined prevalence of overweight and obesity in children between 5-11 years of age, increased from 26.9% to 34.4%. We have identified several factors that may contribute to this increase. Advertising, as one of the factors, has potential implications in the development of socialization, emotional and cognitive behaviors, and it also intervenes in identity formation of children. **Methods:** 780 hours of broadcast television (TV) were recorded, between December 2014 and April 2015 of the four most popular channels in Mexican TV. Analysis and coding of recordings was performed to observe the advertising of food and beverages (F&B). During the same period, 115 surveys were applied to children to identify TV habits and its relationship to their knowledge and consumption of advertised products. **Results:** From the total recorded hours, 23.7% were of advertising. An average of 23.5 ads per hour, were of F&B. Most of the F&B ads were broadcasted during soap operas and movies. The top five advertised F&B categories were, dairy products with added sugar (8.6%), alcoholic beverages (8.5%), breakfast cereals (7.8%), pastries and cookies (7.4%), and sweet snacks (6.9%). Children showed a high knowledge of the characteristics of the advertised products, such as the relationship between character and product (70%), and slogan and product (90%). From the children that reported watching TV, 57.9% stated buying and consuming pastries and cookies. **Conclusions:** Children were highly exposed to F&B ads within their preferred TV channels, and the most advertised products were also those mostly consumed by children.

T-P-LB-3784

Friends, Temptations, Mood and Gender Influence Unhealthy Eating among BMI 30+ Young Adults

Gwen Alexander *Detroit Michigan*, Andrew Taylor *Detroit Michigan*, Ken Resnicow *ann arbor mi*, Margaret Rukstalis *Danville PA*

Background: Social environment and internal challenges influence unhealthy food habits in young adults, surrounded by "obesogenic" environments - large servings and high-calorie "junk" foods. We assessed gender and weight differences in food choices and confidence to choose "healthy". **Methods:** Young adults, aged 21-30 from 2 integrated health systems (urban MI and rural PA), enrolled in a 12-month online randomized dietary intervention, Making Effective Nutrition Choices (MENU GenY). Baseline weight, height, mean fruit (F), vegetables (V), sweet drinks, high-density foods, and self-efficacy against temptations, e.g confidence to eat healthy foods in several situations were compared using T-tests and Chi-square tests. **Results:** Of 1674 enrollees, no gender differences (women 69%, men 31%) emerged in mean F and V intake of 3.0 (SD 1.3) servings/day, or sweet drinks at 1.7 (SD 1.8) drinks/day. By BMI groups, 35 (16%), the heaviest reported less daily F & V (2.7, SD 1.3) than lower weight groups ($p < 0.001$). Mean sweet drinks were highest for BMI > 35 (2.3, SD 2.31) compared to other groups ($p < 0.001$). Per episode, BMI 30+ men ate more pizza (3+ slices) and chips (>2 cups) than BMI 30+ women (pizza: 33.9% men vs. 21.3%, $p< 0.01$; chips 38.3% men vs. 14.4%, p 30 BMI had little/no self-efficacy about healthy choices when tired, depressed, eating with friends or around junk food. **Conclusions:** Understudied busy, "on the go" young adults report challenges influenced by lifestyle. These future role models/parents require interventions that go beyond nutrition knowledge to include managing hunger, emotions and better sleep.

T-P-LB-3785

SWEETENED BEVERAGES INTAKE AND ASSOCIATION WITH METABOLIC SYNDROME COMPONENTS IN MEXICAN YOUNG ADULTS

Claudia Luevano-Contreras *Leon Guanajuato*, Monica Preciado-Puga *León Guanajuato*, Judith Rios-Lugo *San Luis Potosí San Luis Potosí*, Ana Gabriela Palos-Lucio *San Luis Potosí San Luis Potosi*, Olivia Gonzalez-Acevedo *SAN LUIS POTOSI SAN LUIS POTOSI*, Monica Acebo-Martínez *San Luis Potosi San Luis Potosi*

Background: Metabolic syndrome (MS) prevalence is increasing in Mexican young adults and some dietary factors could have a role in individual components of MS. Therefore, this study evaluate the association between sweetened beverages (SB) intake with components of MS and with uric acid levels. **Methods:** Healthy young adults 18 to 35 years old (n=110) (62% women) were recruited in North-Central Mexico for a cross-sectional study. MS was diagnosed if 3 components had higher cutoff values according to the harmonized criteria [waist circumference (men ≥90cm, women ≥80cm), blood pressure (BP), HDL-cholesterol, triglycerides and glucose]. Weight, height and body composition were evaluated by bioelectrical impedance analysis, and uric acid levels also were obtained. SB intake was measured with a validated food frequency questionnaire. ANOVA was used to compare mean values of MS by tertiles of SB intake and Spearman correlation used for the association between MS components and SB intake. **Results:** The prevalence for MS was 19.1% and the prevalence for altered components were 57.3%, 27.3%, 23.6%, 13.6% and 8.2% for waist circumference, triglycerides, HDL-cholesterol, glucose and blood pressure respectively, uric acid values were (5.45±1.6 mg/dL), and 20% of subjects had

hyperuricemia. SB intake was 284.4 [67-529] mL/day. A positive correlation between SB intake and waist circumference (0.3), uric acid (0.28), triglycerides (.26) and systolic BP (.22) was found ($p<0.05$). **Conclusions:** This study shows a significant association between SB with individual components of the MS, and with uric acid.

T-P-LB-3786

Improvement in children's dietary quality after the 2009 revision to the Supplemental Nutrition Program for Women, Infant, and Children (WIC): NHANES 2003-12

June Tester *Oakland California*, Cindy Leung *San Francisco CA*

Background: In October 2009, the federal Supplemental Nutrition Program for Women, Infant, and Children (WIC) food package was revised to include more fruits, vegetables, and whole grains, less juice, and preference for low-fat/skim milk. Recently-released data regarding WIC participation from the 2011-12 cycle of the National Health and Nutrition Examination Survey (NHANES) allows for an assessment of dietary quality in children who are the targets of that program. **Methods:** A total of 802 low-income (≤185% of poverty level) children (24-60 months) were studied from cycles before (NHANES 2003-4, 2005-6, 2007-8) and after (2011-12) the policy implementation. Healthy Eating Index (HEI)-2010 was calculated using the average of two 24-hour recalls. Linear regression was used to examine the association between WIC participation and HEI-2010, adjusting for child's age, gender, race/ethnicity, and weight status. **Results:** Prior to the changes, mean HEI-2010 for children receiving WIC (50.9, 53.9, 51.8) was no different from that of non-participants (45.2, 49.4, 50.1) in any given cycle (all $p>0.05$). In 2011-12, mean HEI-2010 was higher for WIC participants (57.2, SE 1.4) than for non-participants 50.1 (SE 1.9) ($p= 0.01$), and WIC participation was associated with +7.1 points in HEI-2010 in adjusted analysis (95% CI [2.8, 11.5]). The most notable increases in HEI sub-component scores were seen with greens and beans, whole fruit, whole grains, and fatty acids. **Conclusions:** After the WIC food package revisions, participation in WIC was associated with higher dietary quality for low-income children.

T-P-LB-3787

Mediterranean diet is protective against weight gain in postmenopausal women

Christopher Ford *Houston Texas*, Shine Chang *Houston TX*, Alexis Frazier-Wood *Houston TX*

Background: It is unclear which of the low-fat diet, the low-carbohydrate diet, the Mediterranean diet and the USDA Dietary Guidelines for Americans (DGA) diet is protective against weight gain in postmenopausal women. **Methods:** Four dietary patterns were characterized among postmenopausal women in the Women's Health Initiative Observational Study: 1) the low-fat diet; 2) the low-carb diet; the Mediterranean diet; and the USDA DGA. The discrete-time hazard for weight gain (≥10% from baseline) was compared among high-adherers of each diet pattern. The 2010 Healthy Eating Index (HEI) was used to ascertain adherence to the DGA. The Alternative Mediterranean Diet index (A-Med) was used to ascertain adherence to the Mediterranean diet. Quintiles were used to characterize the low-fat and low-carbohydrate diets, with those in the bottom quintile representing high-adherers. Likewise, those in the top quintiles of A-Med and HEI scores were considered high-adherers of the Mediterranean and DGA diets, respectively. All statistical models were adjusted for total energy intake. **Results:** The Mediterranean diet pattern (OR: 0.82; 95% CI: 0.72, 0.93) was most protective against weight gain, followed by the USDA DGA diet pattern (OR: 0.83; 95% CI: 0.72, 0.96) (compared to the low-fat diet pattern (referent)). The low-carb diet pattern was not related to weight gain (OR: 0.94; 95% CI: 0.83, 1.08). No single diet was protective against weight gain among those who were class II (BMI: ≥35.0 – 49.9 kg/m2) or III obese (BMI: ≥40.0 kg/m2) at baseline, although the Mediterranean diet pattern was protective against weight gain among those who were normal weight (OR: 0.81; 95% CI: 0.71, 0.93), overweight (OR: 0.80; 95% CI: 0.68, 0.94), and those who were obese class I (OR: 0.66; 95% CI: 0.49, 0.87) at baseline. **Conclusions:** These findings suggest that following a Mediterranean diet may be protective against weight gain independent of caloric intake, but only among those who are normal weight to obese class I at baseline.

T-P-LB-3788

Does milk portion size or energy density affect preschool children's intake at a meal?

Samantha Kling *University Park Pennsylvania*, Barbara Rolls *University Park Pennsylvania*, Liane Roe *University Park PA*

Background: Increasing the portion size and energy density (ED) of food has been shown to increase preschool children's energy intake; however, it is unknown whether variations in milk portion size and ED affect meal intake. **Methods:** Using a 2-by-2 crossover design, we investigated the influence of changes in milk portion size and ED on preschool children's intake at a meal. Lunch was served once a week for 4 weeks in childcare classrooms

and was consumed ad libitum by 125 children aged 3-5 y (67 boys and 58 girls). Across the 4 meals, milk was varied in portion size (9 or 6 fl. oz.) and ED (3.25% whole fat [0.61 kcal/g] or 1% low-fat [0.42]). The foods served at the meal (chicken, pasta, broccoli, and bananas) were not varied. **Results:** Serving the larger portion of milk increased milk energy intake by 20±3 kcal (27%; P **Conclusions:** Serving larger portions can be used as a strategy to promote intake of nutrient-dense beverages such as milk. Children's energy needs, however, should be considered when choosing the type of milk to serve, since the ability to adjust intake in response to variations in ED differs between children.

T-P-LB-3789

A Retrospective Analysis of the Impact of Weight Loss on Renal Function

Tiffany Schwasinger-Schmidt *Wichita Kansas*, Georges Elhomsy *Wichita KS*, Fanglong Dong *Wichita KS*, Georges Elhomsy *Wichita KS*

Background: Approximately 66% of Americans are overweight with half classified as obese. Obesity is an independent risk factor for the progression of chronic kidney disease and weight loss has been correlated with improved renal function and reduced obesity related glomerulonephropathy. This study investigated the effect of a medically supervised weight loss program on renal function among patients at baseline and following 12 weeks of therapy. **Methods:** This study was a retrospective analysis of adults voluntarily enrolled in a physician-directed community based weight management program. Patients consumed 800 kilocalories per day, attended weekly behavioral education classes, and expended at least 300 kilocalories per day in physical activity. The primary outcome of improved renal function was assessed by comparing weight loss and GFR. A sub analysis comparing renal function and weight loss in diabetic and non-diabetic patients was conducted. **Results:** A total of 71 patients with an average weight of 286 pounds, BMI of 53, and baseline GFR of 29 were included. Following 12 weeks of therapy, 80% improved in stage, 19% remained within the same stage, and 2% progressed to a higher stage. Analysis revealed a positive correlation of 0.29 between weight loss and GFR (p=0.0289). Non-diabetic patients lost 37 pounds and improved in GFR by 11. In contrast, diabetic patients lost 30 pounds and improved in GRF by 6. However, there was no statistically significant difference in weight loss and improved GFR between diabetic and non-diabetic patients. **Conclusions:** Organized weight loss programs are a viable treatment modality for prevention of co-morbid disease progression. This study indicated a positive correlation between weight loss and improved renal function, with the majority of patients exhibiting an improvement in chronic kidney disease stage. Further research needs to be conducted to determine the etiology of improved renal function associated with weight loss.

T-P-LB-3790

Effective intensive lifestyle therapy for people with obesity and type 2 diabetes can be provided in a worksite setting

Mihoko Yoshino *St. Louis Missouri*, Adam Bittel *St. Louis MO*, Daniel Bittel *St. Louis MO*, John Holloszy *ST LOUIS MO*, Dominic Reeds *st louis mo*, Richard Stein *St. Louis Missouri*, William Cade *Webster Groves Missouri*, David Sinacore *St Louis MO*, Bruce Patterson *Saint Louis MO*, Samuel Klein *St. Louis MO*

Background: Weight loss and exercise are recommended for people with type 2 diabetes (T2D). However, providing effective lifestyle therapy in a clinical setting is difficult because of lack of clinical expertise, patient inconvenience and non-adherence. **Methods:** We conducted an 8-month randomized controlled trial to determine whether an intense Lifestyle Intervention Program (LIP) delivered in a worksite setting can improve insulin sensitivity (assessed by hyperinsulinemic-euglycemic clamp with glucose tracer), cardiopulmonary fitness (peak oxygen consumption [VO2 peak]), and muscle strength (1-repetition maximum of 5 muscle groups) in employees with obesity and T2D. Subjects were randomly assigned to the LIP (n=5, BMI=36.9±7.1 kg/m2, HbA1c=6.7±0.6%) or standard care (SC) of exercise and diet advice alone (n=5, BMI=38.5±4.5 kg/m2, HbA1c=7.2±0.7%). The LIP involved a 1-h behavioral-diet education session and four 1-h supervised exercise training sessions every week, conducted immediately before or after work. The energy deficit diet provided a protein intake of 1.1 g/kg/d, achieved by consuming 8 eggs/wk and dairy foods. The SC group received dietary and physical activity instructions recommended by the American Diabetes Association, and were seen monthly to monitor body weight and medications. **Results:** LIP subjects' attendance at behavioral-diet education and exercise sessions were 96±5% and 87±6%, respectively. Compared with the SC group, LIP subjects had greater weight loss (-14.0±5.4% vs. +0.7±2.0%, P **Conclusions:** These data demonstrate that an intensive LIP conducted in a worksite setting markedly improves metabolic and physical function in people with obesity and T2D.

T-P-LB-3791

Non-Immersive Virtual Reality Gaming to Promote Weight Loss Management amongst African-American Women in the Diabetes Prevention Program

Adam Perzynski *Cleveland OH*, Roger Williams *Bedford OH*, Pamala Murphy *Bedford Ohio*, Rachel Stoneking *Cleveland OH*, Misty Harris *Morgantown West Virginia*, Adam Zehnder *Cleveland Ohio*, Linda McVey *Lorain OH*, Joslyn Coats , Christopher Hebert *Cleveland OH*

Background: Effective behavioral interventions for obesity have been impeded by poor adherence among racial and ethnic minorities. We conducted a pilot study combining the Diabetes Prevention Program (DPP) with a Non-Immersive Virtual Reality (VR/Avatar) exercise gaming system (video cameras and a motion sensor). Participants control the gaming console using body movement, and see a life like avatar moving in real-time during exercise. The aims of this pilot were to demonstrate feasibility of the VR/Avatar gaming approach and show preliminary efficacy in promoting adherence to DPP and promoting weight loss among African American adult women. **Methods:** We hypothesized that patients would enjoy exercising using the gaming console, have regular attendance at DPP, and lose weight by the end of 16 weeks of the core program. A total of 20 African American women deemed eligible by physicians have been enrolled. A gaming coach/technician visited homes to setup and demo the gaming system between weeks 6 and 8 of DPP. Attendance at DPP sessions, total exercise minutes, gaming exercise minutes, exercise self-efficacy and body weight were measured. **Results:** As of this writing the first cohort of 8 participants (aged 56-72) had completed 16 weeks of DPP with no attrition. Mean baseline BMI was 36.8. From weeks 9-16, subjects averaged 215 weekly exercise minutes, including 47 minutes of VR/Avatar gaming. All participants lost weight, mean weight loss was 9.8 lbs (SD=4.8), 4.5% body weight (SD=2.1). Focus group analysis indicated enthusiasm for VR/Avatar gaming as a way to ease into and continue exercising in the privacy of one's own home with "anytime" convenience. Participants reported increased confidence, and cognitive and stress reducing benefits from using the gaming system. **Conclusions:** In preliminary evidence, VR/Avatar fitness gaming is a feasible and efficacious method for promoting adherence to DPP, exercise and weight loss among older African American women.

T-P-LB-3792

Intention-to-Treat audit of the UK NHS Counterweight-Plus Weight Management Service

Elizabeth McCombie *Corby Northants*, Naomi Brosnahan *Glasgow Scotland*, Anna Bell - Higgs *Corby Northants*, Mike Lean *Glasgow Lanarkshire*

Background: Counterweight-Plus, developed under Scottish Government funding aims to achieve and maintain >15kg weight loss, to address national SIGN-Guidelines for adults with severe and complicated obesity (BMI>35kg/m2, or >30kg/m2 with secondary metabolic diseases). **Methods:** Counterweight-Plus, delivered in public and private-health services by trained dietitians uses behaviour-change techniques and supporting resources for 3 phases: Total-Diet-Replacement (nutritionally-complete formula of ~850kcal/day): normally 12weeks but up to 20weeks if necessary, Food-Reintroduction: 6-12 weeks, Weight-Loss-Maintenance: 12months. Outcomes to May 2015 are presented from a pre-planned ongoing audit of all patients entered into the rolling programme. **Results:** Baseline data: n=152 (26% men), mean age 47y, BMI=46kg/m2, 34% diabetes. From entry, at 3m, 77% lost >5kg, 50% >10kg, 24% >15kg; at 6m, 58% lost >5kg, 42% >10kg, 27% >15kg; at 12m, 37% maintained loss >5kg, 26% >10kg, 14% >15kg. These results are conservative, as the proportion of patients failing to provide data (included in the denominator for % results) rose from 10% at 3months, 33% at 6 months to 51% at 12months. Mean weight-change for those providing data at the end of each phase were: Total-Diet-Replacement -12.2kg (n=133); Food-Reintroduction -14.7kg (n=86;)Weight-Loss-Maintenance -13.3kg (n=56) Lower numbers at latter programme phases influenced by rolling recruitment as well as follow up rates. Outcomes for patients with type 2 diabetes were as good, or better, than for non diabetics at each time-point. **Conclusions:** Weight loss >15kg at 12months is achievable, using non-surgical methods, for a valuable proportion. Loss to follow-up is less than in comparable published specialist weight management services, but remains an issue. Audit of local follow-up rates is helping to identify and resolve causes of variation in follow up and outcomes.

T-P-LB-3793

Long term consumption of a very low carbohydrate diet does not adversely affect cognitive performance in individuals with type 2 diabetes

Jeannie Tay *Adelaide South Australia*, Ian Zajac *Adelaide South Australia*, Campbell Thompson *Adelaide SA*, Natalie Luscombe-Marsh *Adelaide SA*, Vanessa Danthiir *Adelaide South Australia*, Manny Noakes *Adelaide BC south Australia*, Jonathan Buckley *Adelaide South Australia*, Gary Wittert *Adelaide South Australia*, Grant Brinkworth *Adelaide South Australia*

Background: The type 2 diabetes (T2D) epidemic has increased the prevalence and use of very low carbohydrate (LC) diets as a treatment strategy. However there is limited data examining the long term effects of LC diets on cognitive function, particularly in individuals with T2D, who have increased risk of cognitive impairment and dementia. **Methods:** 115 adults with T2D (66 males, BMI:34.6±4.3kg/m2, age:58±7yrs, HbA1c:7.3±1.1%, diabetes duration:8±6yrs) were randomised to consume either a hypocaloric, very low carbohydrate, low saturated fat (LC) diet (14% energy as carbohydrate [CHO **Results:** Overall weight loss was (mean[95%CI];-9.3[-10.6,-8.0]kg) and improvement in HbA1c was (-1[-1.2,-0.8]%); no difference between groups (P≥0.18) . Over 52 weeks, scores for memory scanning, digit symbol substitution and reasoning speed improved (P≤0.03 time), and word endings and word list recall decreased (P≤0.005 time). All other cognitive scores remained unchanged (P≥0.07). There was no effect of diet composition on any of the cognitive constructs assessed (P≥0.24 time x diet). **Conclusions:** In adults with obesity and T2D, both LC and HC weight loss diets combined with exercise training had similar effects on cognitive performance. This confirms that there are no adverse effects of long term consumption of an LC diet on cognitive performance.

T-P-LB-3794

Rapid and reversible postprandial suppression of plasma adropin concentrations following a high carbohydrate meal in humans

Andrew Butler *Saint Louis Missouri*, Joseph Stevens *St. Louis MO*, Monica Kearney *St. Louis MO*, John Thyfault *Kansas City KS*

Background: Adropin is a small peptide hormone involved in metabolic and cardiovascular homeostasis. Studies in mice suggest diet composition affects plasma adropin concentrations, however the impact of feeding in humans has not been well studied. Here we report results from a pilot study showing a transient inhibitory response to a high carbohydrate meal in humans. **Methods:** Plasma adropin concentrations were measured at baseline (T=0) and then T=30, 60 and 90 minutes post-meal in nine sedentary individuals (3 males, 7 females) with type 2 diabetes (mean±SD; BMI 33.9±5.4 kg/m2; age 58.4±6.9 yr, HbA1c 6.8±0.4%, fasting glucose 128±32 mg/dL). A commercial EIA previously validated by our laboratory was used for this study (1). After an overnight fast, participants consumed a 403 kcal meal containing 59% energy as carbohydrate (~2/3 as simple sugars), 31% fat and 10% protein. The study had an exercise arm (7d program of walking on a treadmill or cycling on a recumbent bike for 1h/d at 60% at heart rate reserve). **Results:** Analysis by repeated measures indicated a significant meal effect (F3,14=6.177, P0.05) (mean±SE plasma adropin concentrations at T0, pre-exercise, 2.73±0.30 ng/ml; post-exercise, 2.94±0.30 ng/ml). Plasma adropin levels at T=30 and T=60 were 13% and 14% lower compared to baseline (mean±SE of the delta in plasma adropin concentrations in ng/ml at T=30, -0.37±0.13 ng/ml; at T=60, -0.41±0.19 ng/nl), returning to normal levels at T=120 (-0.01±0.22 ng/ml). **Conclusions:** These are the first results suggesting an acute response of plasma adropin to nutrient intake in humans. Studies in mice indicate specific responses to dietary macronutrients, with sucrose having an inhibitory effect. Further studies examining the postprandial response of plasma adropin concentrations in healthy volunteers to different macronutrients are clearly warranted.(1) Butler, A. A. et al. The Journal of Clinical Endocrinology and Metabolism 97, 3783-3791 (2012).

T-P-LB-3795

Des-acyl ghrelin inhibits estrogen production and the proliferation of breast cancer cells in 3D cultures, ex vivo and in vivo.

CheukMan Cherie Au *Clayton VIC*, Kara Britt *East Melbourne VIC*, John Furness *Parkville Vic*, Sari Makela *Turku* -, Kristy Brown *Clayton Victoria*

Background: In postmenopausal women, obesity is associated with an increased risk of estrogen receptor-positive (ER+) breast cancer. Aromatase converts androgens into estrogens and its expression in the breast adipose is a major driver of estrogen-dependent cancers in older women. Ghrelin, a gut-hormone involved in the regulation of appetite, is known to mediate its effects through its cognate receptor, GHSR1a. The unacylated form of ghrelin, des-acyl ghrelin (DAG), binds weakly to GHSR1a but has been shown to play an important role in regulating a number of physiological processes, including glucose homeostasis. We have recently demonstrated that DAG inhibits aromatase mRNA in primary human adipose stromal cells. The aim of the current study was to determine whether DAG also inhibits aromatase and breast cancer cell growth in vitro, ex vivo and in vivo. **Methods:** Effects of DAG on aromatase promoter and enzyme activity were measured in a humanized aromatase promoter reporter mouse and human ER+ breast cancer explants, respectively. Effects of DAG on human breast cancer cells (ER+: MCF7, ZR75; ER-: MDA-MB-231) were measured in 3D cultures and in xenografted nude mice, as well as in a syngeneic model of breast cancer (FVB/J110), by monitoring tumor growth and EdU incorporation. DAG was administered daily by s.c. injections. **Results:** DAG (10, 100pM) inhibits aromatase activity in ER+

human breast cancer explants and aromatase promoter activity in vivo, as well as the proliferation of human ER+ and ER- breast cancer cell lines in 3D cultures (n=3; P **Conclusions:** Our findings suggest that des-acyl ghrelin may be useful for the treatment and prevention of obesity-related breast cancer.

T-P-LB-3796

Real-World Evaluation of Weight Loss in Patients with Type 2 Diabetes Mellitus (T2DM) Treated with Canagliflozin (CANA) - an Electronic Health-Record (EHR)-Based Study

Patrick Lefebvre *Montreal Quebec*, Wing Chow *Raritan NJ*, Dominic Pilon *Montréal Québec*, Bruno Emond *Montreal Quebec*, Marie-Hélène Lafeuille *Montreal Quebec*, Michael Pfeifer *Raritan NJ*, Marcia Rupnow *Raritan NJ*, Mei Duh *Boston MA*

Background: Although weight management is an important component of T2DM management, it remains a challenging goal for most patients. CANA has been shown to improve glycemic control and weight in patients with T2DM. This study leveraged an EHR database to evaluate body weight at different time points among patients with T2DM receiving CANA in a real-world setting. **Methods:** Adult patients with ≥1 T2DM diagnosis and ≥12 months of clinical activity (baseline) before first CANA prescription (index) were identified in the Cegedim Strategic Data US EHR dataset. Body weight (BW) was assessed during baseline and at 3 and 12 months post-index. Pairwise comparisons were made to compare BW at baseline and each time point using paired t-tests. Proportions of patients with a weight loss ≥5% from baseline were reported overall and in a subset of patients with baseline BMI≥30 kg/m². **Results:** A total of 16,163 CANA users were identified (35% CANA 300 mg users, 48% female, mean age: 59 years, 76% white, mean Charlson Comorbidity Index: 1.4, mean Diabetes Complications Severity Index: 0.7). At baseline, 90% of patients used ≥1 antihyperglycemic agents and 35% of patients used insulin. Mean exposure to CANA was 155.6 days. Among patients evaluated at 3 months (N=6,811; mean baseline BW=102.9 kg), BW decreased from baseline by 1.8 kg (P **Conclusions:** Patients with T2DM treated with CANA in a real-world setting experienced statistically significant weight loss over time, in both the overall and in patients with BMI≥30 kg/m².

T-P-LB-3797

Voluntary exercise training improves metabolic symptoms and hypothalamus function in high fat diet treated mice

Hu Huang *Greenville North Carolina*, Brenton Laing *Greenville NC*, Khoa Do *Knightdale NC*

Background: Exercise training plays a critical role in the regulation of glucose homeostasis and body weight, especially under obesity conditions induced by western style food and lack of daily physical activity. However, the central nervous system's mediated mechanism of exercise training on metabolic function has not been fully understood. **Methods:** This study was conducted by using C57BL6 male mice for normal chow diet, high fat diet treatment and high fat diet along with voluntary running wheel exercise training for 12 weeks. Metabolic function was examined by using the Comprehensive Lab Animal Monitoring System and magnetic resonance imaging; phenotypic analysis included measurements of body weight, food intake, glucose and insulin tolerance tests, as well as insulin and leptin sensitivity studies. Immunohistochemistry was utilized to identify amount changes for phosphorylation of STAT3 and POMC neurons in the hypothalamus. **Results:** 3 months of voluntary exercise training partially reduces body weight gain and adiposity induced by a high fat diet. This is mainly done via increased energy expenditure despite normal energy intake. Local and systemic insulin sensitivity was also enhanced in the exercise training group verses the high fat diet group. Additionally, 3 months high fat diet completely disrupted leptin induced phosphorylation of STAT3 in the arcuate of the hypothalamus, a key area controlling energy balance, voluntary exercise training could partially reverse leptin induced phosphorylation of STAT3 in the arcuate of the hypothalamus. Furthermore, the POMC neuron number is significantly reduced in high fat diet treated mice, and this reduction is remarkably restored by exercise training compared with the high fat diet treatment alone. **Conclusions:** Taken together, our data suggests that voluntary exercise training improves metabolic symptoms induced by high fat diet, in part through enhanced hypothalamic function that regulates whole body energy hemostasis.

T-P-LB-3798

Ventilatory Responses during Submaximal Exercise in Children with Prader-Willi Syndrome

Alexandre Slowetzky Amaro *Fullerton CA*, Alexandre Slowetzy Amaro *São Paulo São Paulo*, Frank Chavoya *Fullerton CA*, Daniela Rubin *Fullerton CA*

Background: Prader-Willi Syndrome (PWS) is a genetic neurobehavioral disorder that can result in morbid obesity. Hypoventilation under hypercapnic and hypoxic conditions at rest and during sleep has been well documented in children with PWS but not during exercise. This study examined ventilatory responses in children with PWS during submaximal exercise. **Methods:**

Participants included eight children with PWS (age = 11.1 ± 0.8 y; height [H] = 147.8 ± 8.2 cm; body mass [BM] = 44.7 ± 11.7 kg; total body fat % [BF%] = 37.2 ± 11.4). Seven participants with PWS were on growth hormone replacement therapy. The controls were ten obese (OB) children (Age= 10.6 ± 1.1 y; H= 151.1 ± 9.6 cm; BM= 62.1 ± 14.6 kg; BF%= 44.5 ± 3.7) and nine lean (L) children (Age= 9.8 ± 2.0 y; H= 142.9 ± 20.5 cm; BM= 35.4 ± 11.3 kg; BF%= 22.2 ± 8.6). Participants completed three 5 min bouts on a treadmill at 2.0, 2.5 and 3.0 mph in a randomized order with a 6 min seated rest period in between. Expiratory gases for the last 2 min at each speed were analyzed for VE, VCO2, VO2, and respiratory rate (RR); heart rate (HR) was measured via telemetry. Statistical differences at $p<0.05$. **Results:** PWS had a greater HR and RR compared to OB and L in all trials. PWS had greater METs than OB at 2.0 and 3.0 mph but similar to lean. PWS had greater VE than L at 2.5 and 3.0 mph and same as OB for all trials. PWS had greater VCO2 than L at 3.0 mph only; no significant differences were found for VE/ VCO2. **Conclusions:** The exercise placed a greater metabolic cost in PWS and L than OB. The greater HR and ventilatory responses in PWS suggest a greater excitatory stimulus to the control centers. The increase in VE with increased workload and VCO2 suggest normal responses during submaximal exercise. GHRT might have played a role in these responses but our study was not powered to test this.

T-P-LB-3799

Preliminary Validation of the Yale Food Addiction Scale 2.0 in a Hispanic, bariatric surgery-seeking population

Jessica Lawson *Hoboken New Jersey*, Rachel Goldman *New York NY*, Rachel Rabinowitz *Bronx NY*

Background: The leading food addiction (FA) theory suggests that some diagnoses of obesity and disordered eating may be the result of an addictive response to palatable, processed foods. Acculturation level and ethnic identity play critical roles in eating behaviors, however, these factors are not yet fully understood in the context of food addiction. Our objective is to report on the early results of a cross-cultural longitudinal study assessing food addiction in a clinical Hispanic bariatric surgery-seeking population. **Methods:** Participants (n=157) were Hispanic adults presenting for bariatric surgery at Bellevue Hospital Center in New York, NY. Participants completed the Yale Food Addiction Scale [YFAS] 2.0, the Short Acculturation Scale for Hispanics, and a comprehensive demographic form. Our sample for this preliminary analysis is comprised of 84% women, (mean age = 38 years old, SD = 11.75; mean BMI = 42.83, SD = 6.69), of whom 51% are English speaking and 49% are Spanish speaking. The majority (80%) reported living in the U.S. for over 10 years, however 58% identified with lower U.S. acculturation. **Results:** Descriptive statistics revealed that 54.1% did not meet YFAS 2.0 criteria for food addiction and 5.1%, 5.7% and 28% met criteria for mild, moderate and severe food addiction, respectively. Missing data accounted for 7%. Independent samples t-test, conducted to compare BMI and acculturation level, revealed that more acculturated participants (M=45.52, SD = 7.42) had a significantly greater BMI compared to less acculturated participants (M=40.91, SD = 5.94), t=-4.08 (149) p = .000. **Conclusions:** Preliminary results suggest that food addiction may present differently by culture. Similar studies conducted with Caucasian participants reflect higher incidence of FA compared to the Hispanic sample in this study. We aim to attain a complete sample size of 440 and these preliminary findings will be updated to reflect more extensive, descriptive cross-cultural analyses within this clinical population.

T-P-LB-3800

Ethnic/Racial Differences in Visceral and Liver Fat Distribution in the Multiethnic Cohort Study

Unhee Lim *Honolulu Hawaii*, Kristine Monroe *Los Angeles California*, Thomas Ernst *Honolulu HI*, John Shepherd *San Francisco CA*, Lynne Wilkens *Honolulu HI*, Loic Le Marchand *Honolulu Hawaii*

Background: Ethnic minorities, compared to whites, experience a greater metabolic disease burden for a given level of excess adiposity. In the Multiethnic Cohort Study (MEC) of over 215,000 men and women since 1993, the BMI-associated cancer and diabetes risks vary across ethnicities. Thus, we compared body fat distribution among the five ethnic groups in the cohort. **Methods:** Healthy MEC participants aged 60-73 years were recruited from each sex and ethnic group (African American, Japanese American, Native Hawaiian, Latino, white; 30 per group, 300 in total) to undergo a whole-body DXA and abdominal MRI scan and anthropometric measurements. Recruitment was balanced across BMI levels (18.5-40 kg/m2) within each sex/ethnic **Results:** By study design, mean BMI (28kg/m2) was similar for men and women and across ethnicities (p=0.80). Total percent body fat was higher in women (40%) than in men (27%), and differed by ethnicity only in women (p=0.007). Visceral fat area at L3/L4 in men, adjusted for total body fat and age, was the largest among Japanese Americans (247cm2), followed by whites (207cm2), Latinos (198cm2), Native Hawaiians (194cm2) and African Americans (158cm2) (p-heterogeneity =0.0002). In women, differences were even greater among Japanese Americans

(183cm2), Native Hawaiians (149cm2), whites (134cm2), Latinas (120cm2) and African Americans (90cm2) (p-het. **Conclusions:** The substantial differences in body fat distribution observed among ethnic groups may in part explain their metabolic disease burdens.

T-P-LB-3801

Energy Imbalance Gap Explaining Obesity Trends in Adult Population in England

Saeideh Fallah-Fini *Pomona CA*, Hazhir Rahmandad *Cambridge Massachusetts*, Bruce Lee *Baltimore MD*

Background: The energy imbalance gap captures the average daily excess energy intake, defined as total intake minus total expenditure for some unit of time. It is a critical parameter in the energy system, governs the speed of change in body mass, provides intervention targets, and enables estimating contribution of different causes of obesity. We apply a novel population-level System Dynamics model, previously developed by the authors, to quantify the energy imbalance gap responsible for the England adult obesity epidemic. Thus, we explain obesity patterns across gender and race subpopulations over the past two decades. **Methods:** The System Dynamics model divides the England adult population into I subpopulations based on gender and race, and further into J BMI groups. Transition rates between BMI groups for each subpopulation are defined as a function of metabolic dynamics of individuals in these groups. The energy intake in group IJ at any time t is then estimated as a multiplication of the equilibrium energy intake of individuals in that group by an energy gap multiplier. The energy gap multiplier for each subpopulation is estimated (through calibration) by maximizing the match between simulated BMI distributions for each subpopulations against data from Health Survey for England using maximum likelihood estimation. **Results:** Our preliminary results for white adult females, as an example, suggest an increase in magnitude of the energy gap over the 1990s followed by a drop in energy gap over the past decade, with no negative value for energy gap suggesting that obesity epidemic continues to worsen, albeit at a slower rate. We have applied our method to other subpopulations observing different patterns in energy imbalance suggesting different trends in future obesity prevalence for different gender/races. **Conclusions:** We show how system dynamics models can be coupled with population data sets to develop useful tools that can support researchers and policy makers.

T-P-LB-3802

Biomarker Predictors of Body Fat Distribution in the Multiethnic Cohort Study

Unhee Lim *Honolulu Hawaii*, Adrian Franke *Honolulu Hawaii*, John Shepherd *San Francisco CA*, Thomas Ernst *Honolulu HI*, Lynne Wilkens *Honolulu HI*, Loic Le Marchand *Honolulu Hawaii*

Background: Abdominal fat, especially visceral fat, is associated with a high metabolic risk. To better understand the metabolic effects of body fat distribution, we examined various biochemical markers and identified best correlates of total and regional body fat. We also assessed whether the biomarkers contribute to estimating body fat depots beyond the approximation commonly provided by BMI and waist measures. **Methods:** Three hundred healthy Multiethnic Cohort participants, aged 60-73 years, were recruited evenly from 10 sex and ethnic groups (African American, Japanese American, Latino, Native Hawaiian, white) across a wide BMI range (18.5-40 kg/m2). They underwent a whole-body DXA and abdominal MRI scan, anthropometric measurements, and overnight fasting blood draw. Over 120 biomarkers (adipokines, cytokines, insulin and IGFs, lipids and lipid-soluble micronutrients, and steroid hormones) were analyzed and included, along with BMI, waist circumference (WC) and waist/hip ratio (WHR), in Random Forest models predicting total, abdominal, visceral and liver fat amounts. **Results:** The sample included a wide range of percent total fat (12%-53%), WHR (0.67-1.09), android/gynoid fat ratio (0.52-1.71), and percent liver fat (0.2%-24.5%) values. Prediction of total and abdominal fat prediction by BMI, WC, and WHR was not improved with the addition of the biomarkers. Prediction of visceral fat by anthropometry was improved slightly with the biomarkers, by 4% in men and 17% in women. Visceral fat area at L3L4 was best predicted by insulin and the lipid-soluble carotenoid beta-carotene in men and additionally by alpha-cryptoxanthin in women. The prediction of liver fat was substantially improved with the addition of biomarkers, by 39% in men and 282% in women. Percent liver fat was best predicted by triglycerides, insulin, beta-carotene, and alpha-cryptoxanthin. **Conclusions:** Biomarkers are useful in improving the prediction of visceral and liver fat from what was approximated by BMI and waist size.

T-P-LB-3803

Short-term Exposure to a High Fat High Sucrose Diet Results in Rapid Intramuscular Fat Deposition and an Altered Inflammatory Environment

Kelsey Collins *Calgary Alberta*, David Hart *Calgary Alberta*, Raylene Reimer *Calgary AB*, Walter Herzog *Calgary Alberta*

Background: Sarcopenia is observed in obese patients, but the influence of obesity on muscle loss is not well understood. The purpose of this study was to assess rapid changes in the vastus lateralis (VL) muscle of rats following short-term exposure to a high fat high sugar diet. **Methods:** 30 male rats were allocated to a high fat/high sucrose diet group (HFS, 40% fat 45% sucrose) and sacrificed after 3-days (3D), 1-week (1W), 2-weeks (2W), 4-weeks (4W) or to a control group (chow,13.5% fat). Animals were 14-16 weeks of age at sacrifice. Body fat (Dual Energy X-Ray Absorptiometry), and VL mass (g), VL intramuscular fat infiltration (Oil Red O) and molecular changes (RT-qPCR) were assessed. VL muscles were frozen, stained with Oil Red O, imaged and quantified (10x) using a custom MatLab program. Kruskal-Wallis tests were performed, where each group was compared to control at α=0.05. **Results:** 1W animals had more body fat than chow, whereas 2W and 4W had more body mass and body fat ($p<0.05$). **Conclusions:** VL Muscle composition and molecular changes are observed as early as 3-days on HFS diet. Fluctuating mRNA expression levels of oxidative stress, inflammatory, atrophy, and anabolic markers suggest that a muscular adaptation process occurs in response to metabolic challenge. Early intervention focusing on muscle may mitigate onset and progression of sarcopenia in obese individuals.

T-P-LB-3804

Adipose tissue stromal cells as predictors of metabolic disease and weight loss outcomes in obese bariatric surgery patients

Lindsey Muir *Ann Arbor MI*, Lynn Geletka *Ann Arbor Michigan*, Alice Brosius *Ann Arbor MI*, Nicki Baker , Christopher Neeley *Ann Arbor MI*, Alexandra Washabaugh *Ann Arbor MI*, Oliver Varban *Ann Arbor MI*, Jonathan Finks , Carey Lumeng , Robert O'Rourke *Ann Arbor Michigan*

Background: Predictors of metabolic disease risk and weight loss intervention outcomes remain elusive. The goal of this study was to determine if adipose tissue stromal cell frequencies in obese patients undergoing bariatric surgery correlate with diabetes and surgical outcomes. **Methods:** Visceral and subcutaneous adipose tissues (VAT, SAT) were collected from diabetic (DM) and non-diabetic (NDM) obese patients undergoing bariatric surgery. Adipose tissue macrophages (ATM) and preadipocytes (PA) frequencies was analyzed with flow cytometry. CD206+CD11c-, CD206-CD11c+, and CD206+CD11c+ATM, and CD31-CD34+ PA were studied, along with CD140a+ and CD140a- subpopulations within the CD31-CD34+ PA parent population. Cell frequencies were correlated with diabetes prevalence at the time of surgery and with percent excess and total weight loss (EWL/TWL) 6 months after surgery. **Results:** 26 DM and 38 NDM patients were studied (mean age: 48, mean BMI: 45, 58% female). Mean percent TWL and EWL at 6 months were 22% and 53% respectively. CD206+CD11c- ATM and CD31-CD34+ PA frequencies were increased in VAT but not SAT in DM subjects. Weight loss correlated with increased CD11c+ATM frequency in SAT and with increased PA frequency in VAT. No correlations between diabetes or weight loss were observed with CD206-CD11c+, and CD206+CD11c+ATM subpopulations in VAT or SAT. No differences in CD140a+ and CD140a- PA subpopulation frequencies in VAT or SAT were observed between DM and NDM subjects. **Conclusions:** Diabetes is associated with increased VAT CD206+ ATM and decreased VAT PA. Increased SAT CD11c+ ATM and VAT PA frequencies correlated with greater weight loss after bariatric surgery. Adipose tissue stromal cells have the potential to predict metabolic disease risk and weight loss responses and may contribute to variation in outcomes after bariatric surgery.

T-P-LB-3805

Effect of diet induced obesity on adipose tissue metabolism in sarcolipin knockout mice

Rebecca MacPherson *Guelph Ontario*, Daniel Gamu *Waterloo Ontario*, Laura Castellani *Guelph ON*, Russell Tupling *Waterloo Ontario*, David Wright *Gulpeh Ontario*

Background: Sarcolipin (SLN) regulates muscle-based non-shivering thermogenesis and is up-regulated with high-fat feeding. SLN-knockout mice develop greater diet-induced obesity and glucose intolerance and this is accompanied by increases in circulating catecholamines and fatty acids. Given the purported role of catecholamines and fatty acids in the pathology of adipose tissue inflammation we sought to investigate indices of adipose tissue inflammation in high fat fed SLN knockout mice. **Methods:** Mice (wild type and SLN KO) were fed a HFD (42% kcal from fat) for 8 weeks to induce obesity and glucose intolerance. **Results:** SLN KO mice displayed greater obesity and glucose intolerance. This was accompanied by higher circulating epinephrine (4.1±1.0 ng/ml KO vs 2.1±0.3 ng/ml WT; p **Conclusions:** High fat feeding of SLN KO mice results in adipose tissue inflammation and macrophage infiltration and polarization.

T-P-LB-3806

Effect of voluntary wheel running on lipopolysaccharide induced liver inflammation in C57BL/6J mice

Willem Peppler *Guelph Ontario*, Zachary Anderson *Guelph Ontario*, Laura MacRae *Guelph Ontario*, R. Scott Rector *Columbia MO*, David Wright *Gulpeh Ontario*

Background: Sepsis induces systemic inflammation and can lead to organ failure and death. As the prevalence of sepsis is higher in older adults, lifelong strategies that can prevent the deleterious effects need to be discovered. The purpose of this study is to determine if physical activity, via voluntary wheel running (VWR), can protect against endotoxin-induced liver inflammation in mice. **Methods:** C57BL/6J male mice (n=80, ~8 weeks of age) were subjected to VWR or cage control (Sed) for 10 weeks. To induce sepsis, we used an injection (2 mg/kg, i.p.) of lipopolysaccharide (LPS) or saline. Mice were euthanized at 6 and 12 hours after LPS exposure, which occurred immediately after a 20-minute insulin injection (0.5 U/kg). **Results:** VWR attenuated increases in body mass and epididymal adipose tissue mass, while also improving glucose tolerance. At 6 hours post-LPS, VWR tended to attenuate LPS-induced increases in liver inflammatory marker mRNA expression (e.g. iNOS, IL-1L-6, IL-10). However at the protein level, the induction of liver inflammatory markers (e.g. iNOS, pSTAT3, pJNK, and pSTAT1) after LPS was similar between Sed and VWR mice. At 12 hours post-LPS, VWR attenuated LPS-induced increases in the liver mRNA expression for IL-1β but not for other inflammatory makers; yet, there was a main effect of VWR for reducing TNFα and MCP-1. Likewise, VWR did not protect against LPS-induced increases in inflammatory markers at the protein level, despite a main effect of VWR for pSTAT3. Furthermore, LPS-induced increases in the liver injury markers aspartate aminotransferase and alanine aminotransferase were not attenuated with VWR. **Conclusions:** These results suggest that physical activity, via VWR, may offer mild protection against the inflammatory cascade induced by LPS in the liver.

T-P-LB-3807

Assessing the effects of voluntary wheel running against lipopolysaccharide induced inflammation in mouse skeletal muscle

Zac Anderson *Guelph Ontario*, Willem Peppler *Guelph Ontario*, Laura MacRae *Guelph Ontario*, David Wright *Gulpeh Ontario*

Background: Sepsis induces a whole-body inflammatory response that leads to marked changes in glucose metabolism. The purpose of this study is to determine if voluntary wheel running (VWR) as a model of physical activity, can protect against an endotoxic bout of sepsis in mice. **Methods:** Male C57BL/6J mice (n=40, ~8 weeks of age) were given access to a running wheel (VWR) or remained sedentary (SED) for 10 weeks. Mice were then treated with either lipopolysaccharide (LPS, 2 mg/kg, i.p.) or saline. Six hours following treatment, mice were injected with insulin (0.5 U/kg) and tissue harvested 20 minutes post. **Results:** Mice in the VWR group had increased food intake, and attenuated weight gain and epididymal adipose tissue mass. This was paralleled with an improvement in glucose tolerance. Insulin induced reductions in blood glucose were reduced in LPS treated mice regardless of physical activity. Assessment of pro-inflammatory proteins in the skeletal muscle revealed VWR prevented LPS-induced increases in p38, but not STAT3 phosphorylation. In contrast, ERK 1/2 phosphorylation was not different between all groups. At the mRNA level there was a main effect of VWR in reducing TNFα and IL-1β expression. **Conclusions:** In summary habitual physical activity through the provision of voluntary running wheels offers a moderate level of protection against LPS-induced markers of inflammation, though this does not track with differences in LPS-induced insulin resistance.

T-P-LB-3808

Exercise mediated IL-6 signaling occurs independent of inflammation and is amplified by training in mouse adipose tissue

Laura Castellani *Guelph ON*, Christopher Perry *Toronto ON*, Rebecca MacPherson *Guelph Ontario*, Jared Root-McCaig *Guelph Ontario*, Jason Huber , Alicia Arkell , Jeremy Simpson *Guelph Ontario*, David Wright *Gulpeh Ontario*

Background: The role of interleukin-6 (IL-6) in adipose tissue metabolism remains to be understood. Though traditionally considered a marker of inflammation, recent work has emerged to suggest an anti-inflammatory role for this cytokine. The current investigation aimed to examine the effect of exercise on IL-6 expression and signaling in adipose tissue and if this response was modified with training. **Methods:** Sedentary and trained male C57BL/6J mice were challenged with a single bout of exercise, (~50% of maximal running speed) and adipose tissue and plasma collected immediately or 4 hours post-exercise and analyzed for changes in interleukin 6 signaling, circulating interleukin 6, markers of adipose tissue inflammation and the expression/content of the interleukin 6 receptor and glycoprotein 130. **Results:** IL-6 mRNA increased immediately post-exercise and increases in markers of interleukin 6 signaling were elevated 4 hours post-exercise in epididymal, but not inguinal adipose tissue, in untrained mice. These changes occurred independent of changes in plasma IL-6 as well as markers of inflammation. Acute exercise increased the mRNA expression of IL-6 receptor alpha and

glycoprotein 130 while training increased the protein content of these receptor subunits. In trained mice exercise led to a more rapid increase in indices of interleukin 6 signaling in epididymal adipose tissue **Conclusions:** Our findings demonstrate a role for IL-6 signaling in epididymal but not inguinal adipose tissue following acute exercise and suggest an autocrine/paracrine regulation of this response, independent of changes in inflammation. This response is initiated more rapidly with exercise training, possibly due to changes in IL-6 receptor alpha and glycoprotein 130.

T-P-LB-3809

Bariatric Surgery and End-Organ Metabolic and Cardiovascular Complications among Obese Patients: A Retrospective Matched Cohort Study Using a US Claims Database

Elliott Fegelman *Cincinnati OH*, Gang Li *New Brunswick NJ*, Andrew Yoo *New Brunswick NJ*, Stacy Brethauer *Cleveland OH*

Background: Obese patients with metabolic syndrome are at higher risk for long term complications of cardiovascular (CV) disease, chronic kidney disease (CKD), and non-alcoholic fatty liver disease (NAFLD). There is increasing evidence that bariatric surgery is associated with improvement in metabolic comorbidities and may reduce the incidence of these end-organ complications **Methods:** This retrospective study assesses the impact of laparoscopic bariatric surgery, including gastric bypass (RYGB), sleeve gastrectomy (SG), and banding (BAND), in Optum Clinformatics (insurance claims database) from 2006-2013 on CVD (composite of MI and stroke), CKD, and NAFLD. The population included 4308 RYGB, 545 SG, and 4208 BAND patients, and 9061 matched medically-managed patients (CONTROL). Matching was performed for age, sex, obesity category, insurance type, metabolic comorbidities, and pre-baseline healthcare cost. Starting 2 months after the surgery date, two periods were established: 0-2yrs (POST1) and 2-5yrs (POST2). The incidence rates were analyzed using logistic regression adjusting for patient time-in-study **Results:** Surgery and CONTROL groups had comparable demographics: 88% of patient with a BMI>40 kg/m2; mean age of 46 yrs; T2DM (35%), dyslipidemia (51%), and hypertension (72%). RYGB appeared most effective among the 3 procedures in reducing disease progression. Compared to CONTROL, RYGB had a lower rate of CVD in POST2 (1.2% vs 2.1%, p=0.0083), CKD in both POST1 (0.7% vs 1.4%, p=0.0015) and POST2 (0.7% vs 2%, p **Conclusions:** Within five years of surgery, RYGB patients had lower rates of cardiovascular, renal, and liver disease than medically managed patients. The economic and clinical implications of decreased end-organ disease after bariatric surgery deserve further study.

T-P-LB-3810

Hypothalamic lipidome reveals a role of dietary linoleic acid and n-6 fatty acylester accumulation in the development of obesity and leptin resistance

Tomohiro Tanaka *Kyoto Japan*, Masafumi Inoue *Kyoto Japan*, Takuhiro Sonoyama *Kyoto-shi Kyoto-fu*, Megumi Hirayama *Fujisawa, Kanagawa Japan*, Yoshinori Satomi *Fujisawa, Kanagawa Japan*, Yohei Ogino *Kyoto Kyoto*, Tingting Guo *Kyoto Kyoto*, Kazuwa Nakao *Kyoto Kyoto*

Background: High fat diet (HFD) is an established cause of obesity in humans and rodents, but the underlying mechanism remains elusive. Under HFD, hypothalamic neurons become unresponsive to leptin, potentially contributing to the development of obesity. To explore the molecular pathology of the hypothalamus in obesity, we did lipidomics in microdissected hypothalamic nuclei in mice. We then manipulated dietary lipid composition to modify hypothalamic lipidome and studied metabolic outcomes. **Methods:** 1) Hypothalamic nuclei from male mice fed 60% HFD for 3days up to 16weeks, as well as from ob/ob mice were analyzed by LC/MS. 2) To experimentally reproduce an accumulation of n-6 fatty acyl groups observed in mice fed HFD, we prepared two diets with the same total fat (45%) but with distinct (1%: LLA or 18%: HLA) linoleic acid content. Linoleic acid is an essential fatty acid and the only source of n-6 fatty acids. **Results:** 1) Among ~600 lipids detected, acylglycerols and phospholipids containing n-6 acyl groups (linoleic / arachidonic) were increased in mice fed HFD as early as 3days after the start of HFD and persistent thereafter. The change was not observed in ob/ob mice. Hypothalamic lipidomes of HFD-fed and ob/ob mice also showed some similarities, including decreases in DAGs. 2) Compared with LLA, HLA led to a more pronounced increase in body weight and adiposity with comparable food intake, decreased VO2 and increased RQ. 1week HLA induced hypothalamic inflammation, while 8weeks of HLA attenuated hypothalamic Stat3 phosphorylation by leptin. Lipidomics showed increases in n-6 but a reciprocal decrease in n-3 groups by HLA. **Conclusions:** We identified hypothalamic accumulation of n-6 acylesters in mice fed HFD. Our linoleic acid-rich diet successfully mimicked n-6 accumulation in the hypothalamus and caused hypothalamic inflammation, leptin resistance and obesity. These data suggest a causal role of dietary linoleic acid and hypothalamic n-6 accumulation in the development of diet-induced obesity in mice.

T-P-LB-3811

A prediction equation for visceral adipose tissue volume via anthropometric measures in Japanese men

Kiyoji Tanaka *Tsukuba Ibaraki*, Rina So *Tsukuba Please Select*, Hiroyuki Sasai *Tsukuba Ibaraki*, Takehiko Tsujimoto *Tsukuba Ibaraki*, Miki Eto *Osaka Osaka*, Matsuo Tomoaki *Kawasaki, Kanagawa*,

Background: Compared with other conventional approaches, visceral adipose tissue (VAT) quantified using multiple-slice magnetic resonance imaging (MRI) may provide a better ability to classify metabolic risks. However, its cost, time constraints, and subject burden limit widespread application in clinical practice. This study aimed to develop and validate a prediction equation for estimating the VAT volume from anthropometric measures among Japanese men. **Methods:** Anthropometric measurements (body weight, chest circumference, waist circumference, hip circumference, mid-upper arm circumference, thigh circumference, sagittal abdominal diameter, triceps skinfold thickness, subscapular skinfold thickness, suprailiac skinfold thickness, abdominal skinfold thickness, and abdominal width) and VAT volume (via multiple-slice MRI) data were available for 245 middle-aged men (48.5 ± 9.3 years). Participants were randomly divided into development (n = 165) and validation (n = 80) samples with a 2:1 ratio. Prediction equations for VAT volume were established using stepwise regression analysis in the development sample, and then the equation was tested in the validation sample. **Results:** The model with the highest explanation was [163.60*sagittal abdominal diameter (cm) + 92.69*chest circumference (cm) + 40.95*age (years) -11034.37] (adjusted $R^2 = 0.57$). There was a significant correlation between estimated value and measured value ($r = 0.72$, $p < 0.001$) in the validation sample. Bland-Altman analysis showed a significant systematic error ($r = -0.36$, $p < 0.001$). **Conclusions:** The prediction equation developed using anthropometric measures tends to overestimate the VAT volume. However, the equation has potential for assessment of VAT in field and clinical settings where CT or MRI is not available.

T-P-LB-3812

A single universal equation for estimating ideal body weight and body weight at key BMI levels

Courtney Peterson *Baton Rouge Louisiana*, Diana Thomas *Montclair NJ*, George Blackburn *Boston Massachusetts*, Steven Heymsfield *Baton Rouge Louisiana*

Background: Ideal body weight (IBW) equations and body mass index (BMI) ranges have both been used to delineate healthy or normal weight ranges, despite the fact that these two different approaches are at odds with each other. In particular, past IBW equations do not recognize that there is a range of ideal body weights, nor do they scale with single BMI levels as a function of height. **Methods:** Here, for the first time, we merge the concepts of an IBW equation and of defining target body weights in terms of BMI. Using calculus and approximations, we derived an easy-to-use linear equation that can predict both ideal body weights and body weight at any BMI and height. **Results:** Unifying the concepts of BMI and IBW equations, we derive a simple linear equation that calculates body weight at key BMI levels: Wt (lbs) = 5 x BMI + (BMI/5) x (Ht - 60 in). Our linear equation allows one to estimate body weights without the need for a calculator with 0-1% accuracy for >90% of the adult population. We also provide the equation in metric units. **Conclusions:** Our linear equation increases the sophistication and rigor of the concept of an IBW by replacing it with a single universal equation that estimates both ideal body weights and body weights at any BMI level. Our equation allows body weights to be determined without a calculator, making it useful and appealing to both health practitioners and the general public.

T-P-LB-3813

Short-term follow up of "Gold Standard Body Analysis Surveillance" protocol: The role of surveillance in the efficacy of obesity intervention.

Flavio Cadegiani *Brasilia DF*

Background: The lack of body weight surveillance is one of the main reasons why obesity management has failed. Surveillance is proven to improve results. However, in attempt to optimize weight loss therapy, some effective actions are taken(like physical activity), but due to muscle mass loss prevention, weight loss speed does not increase, which discourages patients to continue this certain action, unless it is shown that fat loss speed did increase, which can be shown by accurate methods of body analysis. Joining surveillance and regular body analysis exams, to help elucidate which tissues are being affected by the weight loss,

can be an effective way to keep or boost clinical results. In this protocol, patients were monthly evaluated by the body analysis exams (Bod Pod, inBody770 and MyBodee). In this study, results from short-term follow up are shown. **Methods:** Patients refractory to diet, exercises, drugs and behavioral intervention (body weight loss **Results:** 118 patients were included, with an average follow-up of 3,3months, BW decreased (103.4kto 87.2; -16.2)kg, as well as WC (110.1 to 93.6; -16.5)cm. BWLS was 4.90kg/month. VF lowered (174.1 to 72.0; -102.1)cm2, BMI (35.9 to 30.3; -5.6)kg/m2, MW (37.0 to 35.4; -1.6)kg , FW (49.4 to 35.6; -13.8)kg and a FWLS of 4.19kg/month. 64 patients decreases obesity severity class (54.2%), 81 lost more than 10% (68,6%) and 110 lost more than 5% (93.2%) of BW **Conclusions:** Intensive surveillance with regular body analysis is a great tool to boost weight loss interventions, and may prevent further changes

T-P-LB-3815

Testing Beloranib in two Rodent Models of Severe Hypothalamic Obesity

Christian Roth *Seattle Western Australia*, Clinton Elfers *Seattle WA*

Background: Hypothalamic obesity (HO) due to hypothalamic lesions or deficient melanocortin (MC) signaling via MC4 receptor mutations are both striking examples of treatment resistant obesity. Beloranib (BEL) is a methionine aminopeptidase-2 inhibitor and anti-angiogenesis agent which has been identified as a novel potent drug for weight reduction. **Methods:** In our study we tested BEL in two obesity models of young adult male rats, one of which with combined medial hypothalamic lesions (CMHL), the other with MC4 receptor mutations, both leading to hyperphagia and excessive weight gain, on food intake, weight changes, locomotor activity and body temperature. **Results:** CMHL rats: Post-surgery excess weight gain could be significantly inhibited during 12 d of BEL treatment (between group comparisons, A: CMHL+vehicle 3.8±0.6 g/d; B: CMHL+BEL 0.2±0.7 g/d; C: sham-surgery+vehicle 2.5±0.2 g/d; p **Conclusions:** We conclude that BEL yielded a significant reduction in body weight gain and food intake in these two conditions of surgery-induced and genetic cause of HO. Therefore, BEL is a promising agent for treatment of severe treatment resistant obesity. Results on metabolites and mRNA levels in brain and liver are under investigation.

T-P-LB-3816 - moved to Oral presentation