Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Skeletal Muscle Exercise

T-112-P
The Role of Prenyl Diphosphate Synthase Subunit 1 in Cellular Bioenergetics and Its Implications in Obesity

Ghadi Antoun, Alexandre Blais, Robert Dent, Ruth McPherson, Mary-Ellen Harper *Ottawa, Canada*

Background: It has been previously reported that Coenzyme Q10 (CoQ10) deficiencies are linked to obesity and cardiovascular diseases (Quinzii 2007), however the mechanistic implications to cellular bioenergetics have not been well characterized. In the mitochondrial inner membrane, CoQ10 carries electrons from complexes I and II to complex III of the electron transport chain and plays a role in controlling reactive oxygen species levels. Mollet et al. (2007) demonstrated that mutations in the prenyl diphosphate synthase subunit 1 (PDSS1) gene, which codes for an important enzyme in CoQ10 biosynthesis, led to CoQ10 deficiencies. Our genome-wide associations studies (GWAS) in clinical populations of obese individuals have also identified PDSS1 as an important locus bearing significance to obesity and rate of weight loss ($p<5X10^{-6}$). **Methods:** The goal of this project was to extend our GWAS observations and evaluate the role of PDSS1 in mitochondrial bioenergetics, linking expression of PDSS1 to cellular energy expenditure and oxidative stress. An in vitro siRNA knockdown approach was used in mouse C2C12 myoblasts followed by bioenergetic determinations using an extracellular flux analyser. **Results:** Following reduction of PDSS1 protein levels by 20 to 90%, a decrease of 30% in basal and maximal oxygen consumption was observed. In addition, state 4o respiration (proton leak) showed a two-fold increase. **Conclusions:** We expect a reduction in CoQ10 levels in the paucity of PDSS1. Bioenergetic outcomes should be reversible by CoQ10 supplementation. Our GWAS findings have identified PDSS1 as a gene of interest. Knockdown of PDSS1 in myocytes was shown to significantly impair mitochondrial bioenergetics. Findings should enhance the understanding of the variability in the control and efficiency of energy metabolism in relation to obesity and associated conditions.

T-113-P
This abstract has been withdrawn.

T-114-P
Effects of 12-Weeks of Aerobic Exercise Training on Skeletal Muscle Mitochondrial Function and Insulin Sensitivity in Premenopausal Women: Preliminary Findings from the INTENSITY Study

Gordon Fisher, Barbara A. Gower, Douglas R. Moellering, Fernando Ovalle, Gary Hunter *Birmingham, AL*

Background: Background: While it is well known that aerobic exercise can improve skeletal muscle insulin sensitivity (SI) and the majority of studies demonstrate an improvement in mitochondrial bioenergetics, whether or not these improvements occurs independent of negative energy balance (EB) remains to be determined. Purpose: To assess SI and skeletal muscle fatty acid and carbohydrate utilization in permeabilized muscle fibers under rigorously controlled EB conditions pre- and 12-weeks post aerobic exercise training (AET) in premenopausal women. **Methods:** Methods: 18 women (age = 31±5; weight = 76±12kg; BMI = 28kg/m2) were assessed at baseline and 12-wks post- AET. Room calorimetry was used for 24-hrs to determine energy expenditure (EE), and to insure EB prior to euglycemic hyperinsulinemic clamp measures for SI. Muscle biopsies were obtained, and in situ mitochondrial function was determined in permeabilized muscle fibers using high-resolution respirometry. **Results:** Results: Significant increases were observed for State 2 (63%), 3 (87%), 4 (56%), and maximum uncoupled respiration (95%) rates using malate and palmitoyl-carnitine as substrates following AET (P < 0.05). No significant changes in respiration were observed for either carbohydrate driven protocols. A significant improvement in SI occurred following AET (baseline SI clamp = 8.2 ± 3.9; 12wks-post = 10.3 ± 4.3; P < 0.05). Importantly there were no significant differences between 24-hr energy intake and EE at baseline compared to 12-wks post AET. **Conclusions:** Conclusion: These preliminary data demonstrate an enhanced mitochondrial fatty

acid metabolism and increase in SI following 12-weeks of AET even when changes in EB do not occur.

T-115-P
Timing of Exercise Relative to Meal Ingestion Affects 24 Hours Fat Oxidation

Kaito Iwayama, Insung Park, Ryosuke Kawabuchi, Reiko Kurihara, Masashi Kobayashi *Ibaraki, Japan*; Masanobu Hibi, Sachiko Yamaguchi *Tokyo, Japan*; Yoshiharu Nabekura, Hitomi Ogata, Naomi Omi, Kumpei Tokuyama *Ibaraki, Japan*

Background: Consensus among literatures suggest that moderate doses of exercise doesn't significantly increase 24 h fat oxidation, when energy balance over 24 h is achieved (Exer Sports Sci Rev. 37:93, 2009). However we recently found that exercise performed before breakfast oxidized more fat than that performed after breakfast during the 24 h period (Metabolism. 62:793,2013). The aim of this study was to determine whether 24 h fat oxidation was affected by timing of exercise relative to meals. **Methods:** Healthy young male and female were recruited to this study. Energy metabolism was measured with a room-size metabolic chamber. Subjects stayed in the chamber for 3 days including an exercise (60 min @50% Vo2 max, 100 min @65% Vo2 max, or 2x50 min @65% Vo2 max performed before breakfast, after lunch or after supper) or non-exercise control trial on day 2. 24 hours energy metabolism was evaluated from 0600h of day 2 to 0600h of day 3. Time courses of apparent energy and nutrient balance were estimated as difference between the input and output. **Results:** Energy expenditure during exercise and over 24 h were not affected by time when exercise was performed. Fat oxidation during exercise decreased when exercise was performed later on the day. 24 h fat oxidation increased only when exercise was performed before breakfast, compared with that of the other exercise session and non-exercise control. **Conclusions:** 24 hours fat oxidation was affected by timing of exercise relative to meals, and exercise before breakfast, a common practice among athletes and recreational runners, seems to be beneficial to reduce body fat. An exercise induced temporary energy deficit seemed to augment 24 h fat oxidation. Chronic effect of exercise performed before breakfast on body fat and appetite control remain to be studied.

T-116-P
Improvement in Physical Endurance by an Amino Acid Based hGH-Secretagogue: A Pilot Study

Amy L. Heaton *Baton Rouge, LA*; Colleen Kelly *Salt Lake City, UT*; Frank L. Greenway *Baton Rouge, LA*

Background: The ability of an oral optimized amino acid supplement (SeroVital™) to increase serum growth hormone (hGH) levels 120 minutes after oral administration in both men and women has now been demonstrated, but evidence bridging repeated daily administration of the supplement to known benefits of hGH injections has not yet been established. **Methods:** This pilot study included 12 [7 male, 5 female; age = 31±6 years; BMI= 25.7±3.8] healthy subjects. The supplement, a 2.9g/dose blend of l-lysine HCl, l-arginine HCl, oxo-proline, N-acetyl-l-cysteine, l-glutamine, and schizonepeta (aerial parts) powder, was taken orally on an empty stomach prior to bedtime every night for two-weeks with no other lifestyle changes. Before and after the 2 week period, a standard maximal aerobic fitness test of graded exercise using a metabolic cart was performed during morning hours in a post-absorptive state. Before and after study VO2max values were compared with a paired t-test. **Results:** After 2 weeks of supplementation, mean VO2max increased by 6% from 44.9 ± 8.1 at baseline to 47.7 ± 9.2mL/kg/min (3.69 ± 0.96 to 3.91 ± 1.02L/min), demonstrating a statistically significant improvement from baseline (P=0.02). **Conclusions:** Increased measures of endurance are a well-established outcome of synthetic hGH-injections in adults. Here we show that two weeks of daily supplementation with the orally-administered amino-acid based hGH-secretagogue significantly increased VO2max compared to baseline with no other lifestyle changes. A larger multi-center study is being planned.

T-117-P

Effects of Low Protein Diets on Food Intake, Energy Expenditure and Body Composition in Obesity Prone Rats

Adel Pezeshki, Nicholas J. Yee, Prasanth K. Chelikani *Calgary, Canada*

Background: Moderately low-protein diets increase food intake (FI) and very low-protein diets decrease FI. However, little is known of the effects of low-protein diets on energy expenditure (EE) and body composition (BC). **Methods:** Obesity-prone Sprague Dawley rats (n=48) were allocated to 4 isocaloric diets with egg albumin contributing to either 14% (control; CON), 10% (moderately low-protein, MLP), 5% (low-protein, LP) or 0% (very low-protein, VLP) of total calories for 2 weeks (wks). FI and EE were monitored by a CLAMS system and BC recorded by an MRI system. **Results:** Compared to CON, MLP increased FI by 15-26% for 2 wks with the increase occurring during both the dark and light periods. The LP-induced hyperphagia (9-26%) was transient lasting a wk and was primarily due to an increase in dark period intake. VLP diet decreased FI by 20-50% during 2 wk with a reduction of both dark and light period intakes. With LP and VLP diets, EE during the dark and light periods were decreased (28 and 43% for LP, and 83 and 84% for VLP, on day 14, respectively); MLP did not affect EE. At 2 wks, VLP diets decreased weight, fat and lean mass by 37, 42 and 33%, and LP diets decreased weight and lean mass by 14 and 15%; MLP neither affected fat nor lean mass. **Conclusions:** Dietary protein deficiency appears to produce divergent effects on energy balance parameters: very low-protein diets decrease intake, energy expenditure and fat mass, whereas moderately low-protein diets are hyperphagic but without altering energy expenditure or body composition. *Funding:* ALMA, AI-Bio, AM, NSERC, CFI

T-118-P

Effects of Dietary Casein and Whey Protein on Energy Balance, Body Composition and Glucose Tolerance in Diet Induced Obese Rats

Adel Pezeshki, Andrew Fahim, Nicholas J. Yee, Prasanth K. Chelikani *Calgary, Canada*

Background: The major milk proteins -casein and whey- are reported to decrease food intake (FI), however, little is known of the relative efficacies of these proteins in improving energy balance and diabetic control. **Methods:** Obesity-prone diet-induced obese Sprague Dawley rats (n=48) were randomized to 4 isocaloric dietary groups: 1) control high fat (CON; calories: 33% fat, 14% egg albumin); 2) casein (40% casein; CAS), 3) whey (40% whey protein isolate; WPI) or 4) combination of casein and whey (20% WPI + 20% CAS; WPCA) and continued for 6 weeks (wk). FI and energy expenditure (EE) were monitored by a CLAMS system and body composition recorded by an MRI system. **Results:** WPI, CAS and WPCA groups reduced FI during first 10 days (d) by about 19%. On d 2 - 4, FI was reduced by 35 - 37% with WPI, by 17 - 25% with CAS and by 18 – 27% with WPCA. Despite a reduction in FI, the EE was similar among groups. From d 8 onwards, WPI and CAS decreased BW by 11% and 10% and WPCA tended to decrease BW by 6%. At 4 wk, WPI, CAS and WPCA decreased body fat (WPI, CAS and WPCA vs. CON; 15, 15, 16 vs. 18%) and increased body lean (WPI, CAS and WPCA vs. CON; 80, 80, 79 vs. 77%). WPI, CAS and WPCA improved glucose tolerance (28, 18 and 9%, respectively). **Conclusions:** Dietary whey and casein proteins decrease food intake and body weight and improve glucose tolerance, with whey being particularly more effective. *Funding:* ALMA, AI-Bio, AM, NSERC, CFI.

T-119-P

Six Weeks High Fat Diet Does Not Reduce Access of Insulin to Skeletal Muscle

Josiane Broussard, Ana Valeria B. Castro, Richard N. Bergman, Cathryn M. Kolka *Los Angeles, CA*

Background: Insulin access to skeletal muscle is impaired in models of obesity, and we have shown that diet-induced insulin resistance reduces dispersion of insulin through skeletal muscle. Thus, we expected that a reduced amount of insulin would be detected in the interstitial fluid of the diet-induced obese canine. **Methods:** Dogs were fed either control diet, or six weeks of a high fat diet. Anesthetized dogs were exposed to basal insulin levels for 180min followed by hyperinsulinemia (1mU/min/kg); glucose was infused at a variable rate to maintain euglycemia. Samples were taken from femoral artery, vein, and lymph vessels. **Results:** Fat feeding reduced the glucose infusion rate (lean 11.7+1.1mg/min/kg, vs obese 8.1+0.8mg/min/kg, P=0.02), and leg glucose uptake (38.0+11.0 vs 26.4+6.0mg/min/kg in lean and obese, respectively), indicating insulin resistance. At the end of the clamp, arterial levels were 80.6+10.4mU/L in lean animals, compared to 93.0+5.0 in obese animals (n=8 per group), while lymph (interstitial) insulin concentrations were 63.4+11.5 and 55.0+4.4mU/L in lean and obese respectively. Thus, at steady state, the ratio of lymph:plasma insulin was 0.58+0.02 in lean, 0.59+0.03 in obese animals, suggesting no significant impairment in insulin access to the interstitial space after six weeks of fat feeding, yet cellular insulin sensitivity was decreased (SIcellular = ΔGINF/(Δlymph insulin x Glucose) (lean 2.76+0.44, vs obese 1.62+0.18 dl/min/kg per µU/ml, P=0.02). **Conclusions:** Therefore we conclude that insulin resistance induced by six weeks of a high fat diet is likely due to cellular insulin resistance, rather than a defect in insulin access. Further experiments are required to assess insulin access under lower insulin concentrations, or in animals with more severe insulin resistance.

T-120-P

Both Temperature Perturbations and Genetic Ancestry Regulate Mitochondria Function Differentially in Populations Divergent in Energy-Expenditure Traits

Tonia S. Schwartz *Birmingham, AL*; Zebulun W. Arendsee, Anne M. Bronikowski *Ames, IA*

Background: Mitochondrial bioenergetics is intimately related to metabolic rate, energy expenditure, growth and adiposity. Individual differences in mitochondrial function both in static conditions and in response to environmental perturbations, such as changes in ambient temperature, may contribute to variations in these traits. The causes of variation in mitochondrial function across populations are incompletely known. To address this we use a non-model organism from natural populations that offers a unique window into response to temperature variations. **Methods:** We use closely-related populations of garter snakes (Thamnophis elegans) that are adapted to disparate habitats and represent slow-lived and fast-lived phenotypes characterized by their divergence in growth rate, body shape, reproductive output, and longevity. We measured mitochondrial genetic variation, and liver mitochondrial respiration and transcription under control and heat stress. **Results:** We found significant stress, phenotype, and phenotype-by-stress effects. A 2-hour organismal heat stress increases (i) mitochondrial respiration during production of ATP at 27C, and (ii) the expression of mitochondrial rRNAs. Between phenotypes mitochondrial function diverged in both resting mitochondrial respiration and mitochondrial sequences with non-synonymous changes. Interactions between stress and phenotype suggest the slow-lived phenotype maintains a high level of metabolic capacity across treatments, whereas the fast-lived phenotype increases mitochondrial respiration and gene expression to meet energetic demands of the stress. **Conclusions:** These results demonstrate the contribution of environmental perturbations, genetic ancestry, and their interactions in regulating mitochondria function; and support the association between mitochondrial bioenergetics and energy-expenditure traits across populations.

T-121-P

Possibility of Plasma Free Amino Acid Profiling as a Versatile Surrogate Indicator for Metabolic Syndrome in Japanese Subjects

Akira Imaizumi, Kenji Nagao, Takayuki Tanaka *Kawasaki, Japan*; Yuko Ishizaka, Mizuki Tani, Akiko Toda, Ei-ichiro Toda *Tokyo, Japan*; HIroshi Miyano, Hiroshi Yamamoto, Yasushi Noguchi *Kawasaki, Japan*; Minoru Yamakado *Tokyo, Japan*

Background: Metabolic complications associated with obesity are prevailing among Japanese subjects. As well as visceral fat accumulation, insulin resistance is also pivotal in many cases considering the development of metabolic syndrome and consequent atherosclerosis risk. However, it is still uncertain whether visceral fat accumulation and insulin resistance are independent factors for development of metabolic syndrome. We have previously reported that plasma free amino acid (PFAA) levels were associated with visceral fat accumulation in Japanese subjects whose visceral fat area (VFA) was determined using computed tomography (CT) imaging (Clinical Obesity 2012;2:29-40). **Methods:** In this study, we analyzed the relationship between visceral fat accumulation and insulin resistance from the aspect of PFAA profiles statistically using 1190 healthy Japanese subjects (826 males and 364 fe-

males) who had undergone VFA measurement using CT imaging and/or oral glucose tolerance test (OGTT). PFAA concentration was measured using HPLC–ESI–MS, followed by precolumn derivatization. **Results:** Hierarchical cluster analysis using those correlation coefficients matrix showed interesting features, which strongly suggested that both insulin resistance and some PFAA profiles were closely associated with visceral fat accumulation. Then we performed multivariate linear regression analysis for VFA estimation using PFAA profiles as explanatory variables. We obtained the formula which showed highly significant correlation with VFA ($r>0.55$). Interestingly, the obtained formula also significantly correlated with several indices for insulin resistance, hyperinsulinemia, pre-diabetes, and diabetes. **Conclusions:** These results strongly suggest that PFAA profiling is a versatile surrogate indicator for metabolic syndrome in Japanese adults.

T-122-P
Dietary BCAA Intake Is Inversely Correlated with Insulin Resistance in the Newfoundland Population

Danny Wadden, Alecia Rideout, Farrell Cahill, Peyvand Amini, Sangeetha Vidyasankar, Edward W. Randell, Wayne Gulliver, Guang Sun *St. John's, NL, Canada*

Background: Branched-chained amino acids are essential to human health. Our laboratory and others have documented an inverse relationship between dietary BCAA intake and adiposity at the population level. However, whether this beneficial relationship can be translated to insulin resistance, a common obesity-associated condition, is unclear. Our objective was to assess the relationship between dietary BCAA intake and markers of insulin resistance in the Newfoundland population. **Methods:** A total of 2291 subjects of Newfoundland descent were recruited from the ongoing population-based CODING Study. Serum glucose and insulin were measured, and the homeostatic model assessment was used to evaluate insulin resistance (HOMA-IR) and beta-cell function (HOMA-β). Dietary BCAA intake was computed using the Willett Food Frequency Questionnaire (FFQ) and Nutribase 9. Body composition was assessed by Dual-energy X-ray absorptiometry. **Results:** Partial correlation analysis controlling for age and caloric intake showed that in the entire cohort, dietary BCAA intake (g intake/kg b.w./day) was inversely correlated with HOMA-IR, HOMA- β, and fasting insulin and glucose (range of r= -0.12 to -0.22; $P<0.001$). When the cohort was grouped based on gender, all aforementioned relationships remained significant in women. However in men, dietary BCAA intake was correlated only with HOMA-IR, HOMA-β, and fasting insulin concentration. Additionally ANCOVA controlling for age, gender and caloric intake, found that the high HOMA-IR tertile consumed less BCAAs as compared to the low HOMA-IR tertile. **Conclusions:** Our results suggest that higher dietary BCAA intake is associated with lower insulin resistance at the population level.

T-123-P
Branched-Chain Amino Acid-Related Signature of Visceral Obesity and Cardiometabolic Risk Factors

Marie M. Boulet, Mélissa Pelletier, André Marette *Québec, Canada*; Julia Scarpa, Cornelia Prehn, Jerzy Adamski *Neuherberg, Germany*; Andre Tchernof *Québec, Canada*

Background: Metabolomic profiling of obese individuals revealed high blood levels of branched-chain and aromatic amino acids. C3 and C5 acylcarnitine concentrations are also raised. Whether this signature applies to visceral obesity is unknown. We tested the hypothesis that some markers of the amino acid signature of obesity relate closely to visceral obesity and cardiometabolic risk factors. **Methods:** Blood samples were obtained from 59 women (BMI 20-41 kg/m^2) who were characterized for adiposity and cardiometabolic risk factors. The Biocrates AbsoluteIDQTM p180 kit was used for metabolite quantification. **Results:** Obese women (BMI≥30 kg/m^2) had significantly higher blood levels of glutamate, isoleucine, leucine, tyrosine and valine compared to lean or overweight women ($p<0.05$ for all). In univariate analyses, concentrations of alanine, glutamate, isoleucine, leucine, tyrosine, valine and C3-C5 acylcarnitines were positively correlated with computed tomography-measured visceral adipose tissue area ($p<0.05$ for all). Among analytes altered in obesity, glutamate level was the strongest independent predictor of visceral adipose tissue area (21.3% variance explained, $p<0.0005$). Concentrations of glutamate and C5 acylcarnitine were the analytes most consistently related to fasting triglyceride, HDL-cholesterol and insulin concentrations, HOMA index and cholesterol/HDL-cholesterol ratio.

Most of these associations were no longer significant after statistical adjustment for total body fat mass or visceral adipose tissue area. **Conclusions:** Among the blood amino acids altered in obesity, glutamate concentration was the best marker of visceral obesity. Associations between glutamate or C5 acylcarnitine concentrations and cardiometabolic risk factors were greatly attenuated when adjusting for either total or visceral adiposity level.

T-124-P[DT]
Metabolite Differences in Countries Spanning the Epidemiologic Transition; A Risk for Type 2 Diabetes?

Lara R. Dugas *Maywood, IL*; Elin Chorell *Umea, Sweden*; Amy Luke *Maywood, IL*; Tommy Olsson *Umea, Sweden*; Jacob Plange-Rhule *Kumasi, Ghana*; Julia H. Goedecke *Cape Town, South Africa*

Background: The worldwide prevalence of type 2 diabetes (T2D) differs according to a country's economic status. In developing countries, the 20 year projected increase in T2D is estimated to be 69% vs. only 20% in developed countries. Using metabolomics, we sought to characterize metabolites associated with obesity and T2D. **Methods:** The Modeling the Epidemiologic Transition Study (METS) is a longitudinal study, in 5 countries spanning the epidemiologic transition. METS is exploring obesity and T2D risk in populations of African origin: Ghana (GH), South Africa (SA), Seychelles (SEY), Jamaica (JA) and the US. Mass spectrometry based metabolomics were performed on a representative sub-sample of 80 women from 2 sites, GH and US. Participants were matched using a space filling design in a multivariate space calculated from baseline descriptors (BMI, age, body fat %). **Results:** We found clear metabolic site-differences, as well as individual responses, with 2 women from GH displaying similar metabolic profile to those of the US. Analyses of the 2 subjects indicate that their diets differed from the remaining GH women. Overall, site differences in the metabolic profile were related to higher fatty acids, in particular arachidonic acid, docosahexaenoic acid and linoleic acid, in GH women, who also had higher levels of myo-inositol, a secondary messenger of insulin signaling, and lower levels of cholesterol and gamma-tocopherol, a vitamin E isomer and food additive in the US. Measures of PA, adiposity and circulating glucose levels were inversely related to amino acids, specifically branch chain and aromatic amino acids. **Conclusions:** This study highlights differences in amino acids, lipids and other dietary-related metabolites in populations spanning the epidemiological transition and which may contribute to a greater increase of T2D in developing countries.

T-125-P[DT]
Minimal Model of Postprandial Glucose and Free Fatty Acid Kinetics in Obese African American and Caucasian Women

Yanjun Li, Bernard V. Miller, Vipul Periwal, Anne E. Sumner *Bethesda, MD*

Background: Minimal models of glucose and FFA kinetics are likely improved by adding postprandial glucose and free fatty acid (FFA) responses. We have shown that a higher acute insulin response to glucose (AIR$_g$) is important to greater FFA clearance in African American (AA) women after intravenous glucose. Whether ethnic differences in glucose or FFA flux are present after a mixed meal (MM) is unknown. **Methods:** We measured plasma glucose, FFA and insulin concentrations during a 3h insulin-modified frequently-sampled intravenous glucose tolerance test and 6h after a MM in 13 AA and 15 Caucasian (CC) obese premenopausal women. Glucose and FFA kinetics were determined using mathematical modeling. S_I, insulin sensitivity index and σ_G, a glucose curve shape parameter during MM were determined with the model. The acute insulin response to MM (AIR$_m$) was the insulin AUC 0-30 min. Maximal FFA suppression was FFA AUC 30-90 min. Relationships among model parameters and variables of interest were examined using ANCOVA and partial correlation analyses. **Results:** S_I was lower in AA=3.1±0.4x10^{-4} than CC=4.8±0.7x10^{-4}min^{-1}/μU/mL, P=0.06 women. σ_G was lower in AA=0.67±0.08 than CC=1.12±0.15, P=0.02 women reflecting lower peak glucose concentration (AA=106±3, CC=121±4mg/dL, P=0.01) and excursion from baseline (AA=19±3, CC=30±2mg/dL, P=0.01). AIR$_m$ was AA=581±121 and CC=351±63min-μU/mL P=0.13. Race predicted σ_G (β=0.57, p=0.03). AIR$_m$ predicted FFA AUC 30-90 min (β=10.7, p=0.03). Partial correlation analyses showed that σ_G was related to AIR$_m$ (r=0.47, p=0.01) controlled for race; but controlled for AIR$_m$ race was not related to σ_G (r=0.20, p=0.32). Race (r=0.39, p=0.04) and AIR$_m$ (r=0.40, p=0.04) were related to FFA AUC 30-90 min. **Conclusions:** Our data demonstrate that

postprandial glucose and FFA metabolism differ in AA and CC women independent of insulin secretion.

T-126-P
Physical Training Prevents Type 2 Diabetes Through the Activation of AMPK in the White Adipose Tissue

Talita S. Higa, Miriam H. Fonseca-Alaniz, Fabiana S. Evangelista *Sao Paulo, Brazil*

Background: Obesity increases the risk of development of type 2 diabetes. (T2DM). Considering that AMPK stimulates lipid oxidation and prevents the expression of lipogenic markers, we investigated whether the prevention of T2DM by physical training (PT) is mediated by AMPK activation in WAT. **Methods:** Male C57BL6/J mice were assigned into chow-fed controls (C, n=15), cafeteria diet (CAF, n=15), chow-fed trained (TR, n=18), and cafeteria diet plus trained (CAF-TR, n=18). PT was performed simultaneously with diet and consisted of 8-wk running session of 60 min at 60% of maximal speed, 5 days/wk. **Results:** CAF increased subcutaneous fat pad weight compared to TR and CAF-TR and increased visceral fat pads weight compared to C, TR and CAF-TR groups (p<0.05). CAF showed hyperglycemia compared to C and TR, hyperinsulinemia and insulin resistance compared to others groups (p<0.05). CAF showed higher adipocyte diameter, increased leptin levels and decreased adiponectin levels compared to others groups (p<0.05). After PT, TR and CAF-TR increased adiponectin levels compared to C and CAF groups (p<0.05). Lipolytic activity increased in CAF, TR and CAF-TR group compared to C. CAF showed reduced FAS activity compared to C and TR groups and increased in the content of DGAT2 protein compared to others groups (p<0.05). Citrate synthase activity was reduced in CAF group, which was counteracted by PT in CAF-TR (p<0.05). CAF had lower expression of AMPK and p-AMPK (Thr 172) compared to others groups. ACC and p-ACC expression was lower in CAF than others groups (p<0.05). **Conclusions:** The activation of AMPK in the WAT induced by PT improved fatty acid availability for oxidation, prevented the impairment of oxidative capacity and the increment in fatty acid esterefication, reducing adiposity and protecting against the development of T2DM.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Insulin Signaling

T-127-P
Proteinase 3 and Insulin-Like Growth Factor Binding Protein-3 Proteolysis Are Associated with Insulin Resistance in Adolescents with Obesity

Edmond P. Wickham, Trang Le, Qing Cai, Youngman Oh *Richmond, VA*

Background: Obesity is associated with increased proteolysis of a specific insulin-like growth factor binding protein (IGFBP-3); however, the mechanisms responsible for this degradation are unclear. Intact IGFBP-3 improves insulin signaling through activation of a dedicated receptor; therefore, we propose that obesity-associated reductions in IGFBP-3 contribute to insulin resistance. Moreover, we propose that neutrophil serine proteases, including proteinase 3 (PR3), are associated with IGBP3-proteolysis. Therefore, we investigated the relationships between PR3, IGFBP-3 proteolysis, and estimates of insulin resistance among obese adolescents. **Methods:** Serum PR3 levels and IGFBP-3 proteolysis were determined via Western immunoblot analysis in 9 obese (body mass index [BMI] ≥95th percentile) adolescent males and females, ages 11-18 years, after an overnight fast. Subjects also underwent a standard 75-gm 2-hour oral glucose tolerance test, and insulin sensitivity was estimated using the whole body insulin sensitivity index (WBISI). **Results:** Insulin-resistant adolescents (WBISI <2) with obesity (n=5) demonstrated increased PR3 levels and IGFBP-3 fragments compared with insulin-sensitive adolescents (WBISI >5) with obesity (n=4). Considering all subjects (n=9), PR3 correlated positively with IGFBP-3 proteolysis (r=0.835, P<0.01). Moreover, both PR3 levels (r=-0.688, P<0.05) and IGFBP-3 proteolysis (r=-0.702, P<0.05) negatively correlated with WBISI. **Conclusions:** Increased PR3 and IGFBP-3 proteolysis are associated with worsening insulin resistance in adolescents with obesity. Additional mechanistic studies are warranted to determine if increased neutrophil serine pro-

tease activity contributes to the pathophysiology of obesity-induced insulin resistance via the degradation of intact IGFBP-3.

T-128-P
Higher Morning Cortisol Is Associated with Disordered Glucose Metabolism in Middle Age Men and Women the Framingham Offspring Study

Nicole L. Glazer, Susan Hwang, Melanie M. Mott, Vasan S. Ramachandran, George T. O'Connor, Andrea D. Coviello *Boston, MA*

Background: Cushing's syndrome (hypercortisolism) is associated with obesity, metabolic syndrome, hypertension, and type 2 diabetes (T2D). The role of lesser degrees of hypercortisolism in metabolic disease, particularly T2D, is controversial. Our objective was to determine if higher morning cortisol levels are associated with impaired fasting glucose (IFG) and T2D in community dwelling men and women in the Framingham Offspring Study (FOS). **Methods:** Fasting morning serum cortisol (7:30-9:30 AM) and fasting plasma glucose (FPG) were measured in 830 men and women participants at FOS exam 5 or 6 who were not taking exogenous glucocorticoids (mean age 58 years, 52% female). Cross-sectional associations between morning cortisol levels and prevalent IFG (FPG 100-125 mg/dl) and T2D (FPG ≥ 126 mg/dl or use of medications) were determined with multivariable logistic regression adjusting for age, sex, BMI, current smoking, and alcohol use. **Results:** IFG prevalence was 23% (men 30%, women 17%) and T2D 8% (men 11%, women 6%). Morning serum cortisol levels were higher in those with IFG compared to those with normal FPG (15.8±7.2 vs 13.915.0±6.0 mcg/dl, respectively) and in those with T2D compared to those without T2D (17.6±8.5 vs 15.0±6.5 mcg/dl, respectively). A 1 mcg/dl increase in cortisol was associated with 3% higher odds of IFG (OR 1.03,95%CI 1.01, 1.06; p=0.01) and 7% higher odds of T2D (OR 1.07, 95%CI 1.03, 1.11; p=0.001) adjusting for the above risk factors. There was no evidence of effect modification by sex (Interaction p-value=0.5 for IFG, =0.8 for T2D). **Conclusions:** Higher morning serum cortisol was associated with prevalent IFG and T2D in middle age community dwelling men and women. Targeting interventions to factors known to dysregulate cortisol metabolism such as stress, depression, and poor sleep may improve obesity and glucose metabolism and prevent T2D.

T-129-P
A Pilot Study of the Association of Inflammation with Anxiety, Depression and Exercise Responses Across Depression and Obesity Status in the Training Interventions and Genetics of Exercise Response (TIGER) Study

Matthew P. Herring, Richard C. Shelton, Barbara A. Gower, Molly S. Bray *Birmingham, AL*

Background: The hypothesis linking exercise to improved anxiety, depression, and energy balance via altered inflammation is understudied. We examined the association of inflammation with anxiety, depression, and obesity status prior to and following aerobic exercise training. **Methods:** Data from 48 age- and gender-matched TIGER Study participants were selected to create four groups based on baseline obesity and depression status (obese/depressed [O/D;n=12]; non-obese/depressed [NO/D;n=13]; obese/non-depressed [O/ND;n=11]; non-obese/non-depressed [NO/ND;n=12]). Anxiety and depression were measured and plasma samples were obtained before and after a 15-week standardized exercise intervention. Regression models examined the association of group status with outcomes at baseline and post-intervention. Models stratified by group examined relations of cytokines with baseline anxiety and depression and change in response to exercise. Change models were adjusted for baseline values. **Results:** Group status was significantly associated with anxiety, CRP, IFN-γ, IL-1β, IL-6, and IL-8 (all p<.05) at baseline and with CRP, IFN-γ, and IL-6 post-intervention (all p<.02). Compared to NO/D, baseline CRP levels and post-intervention IL-6 levels were significantly higher among O/D (all p≤.02). IL-12p70 was significantly associated with baseline anxiety among O/D (p<.05), but was not associated with changes in anxiety or depression. Among NO/D, baseline IL-10 was predictive of change in depression (p=.02) and anxiety (p<.04), and increased IL-10 and decreased IL-6 were associated with improved depression and anxiety (all p≤.04). **Conclusions:** Preliminary findings support the link between inflammation and aerobic exercise in influ-

encing depression and anxiety; differential interrelations and responses to exercise among these factors based on obesity status were observed.

T-130-P
Measures of Perseveration Predict Ad Libitum Energy Intake and Augment the Effects of Cognitive Restraint in Adults Seeking Weight Loss

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Background: Studies have reported associations between performance on tests of executive function and obesity or maladaptive eating behaviors. Our aim was to determine whether executive function is associated with *ad libitum* energy intake (EI). **Methods:** Subjects were obese, healthy individuals (40F/38M; age 36±10y; BMI 37.8±7.2 kg/m^2; %fat 43.0±7.6%) enrolled in weight loss studies which included a baseline measure of *ad libitum* EI over 3-days using a validated vending paradigm. Participants completed the Iowa Gambling Task to evaluate decision making, the Stroop Word Color Task to assess attention, the Wisconsin Card Sorting Task (WCST) to measure perseverative errors (PE), and the Three Factor Eating Questionnaire (TFEQ) to measure disinhibition and cognitive restraint (CR). **Results:** Only results from the WCST and the TFEQ associated with EI. When expressed as a percentage of an individual's calculated weight maintaining energy needs (%WMEN; [mean daily energy consumed/WMEN]*100), EI correlated positively with number of PE (r=0.24, p=0.03) and negatively with CR (r= -0.51, p<0.0001). In a regression model of EI (r^2=0.59, F=11.0, p<0.0001) including age, sex, race, disinhibition, CR, and PE T-score, an interaction between PE and CR was observed (p=0.05). Increased PE intensified the effect of CR such that subjects with high CR and high PE ate the least (median=70% WMEN), while those with low CR and high PE ate the most (130% WMEN). Subjects with low PE and high versus low CR ate a median of 84% and 112% WMEN respectively. **Conclusions:** In obese subjects seeking weight loss, perseveration augments the effects of dietary restraint which may contribute to the increased EI exhibited by some subjects if self-control is undermined. This interaction may explain difficulties some individuals encounter in maintaining effective long-term lifestyle changes.

T-131-P
Does Body Composition Influence Physical Fitness and Pain Reports in Adolescents?

Stacy C. Stolzman, Katherine Hoffmeister, Melissa Coate, Paula E. Papanek, Amy Drendel, Marie Hoeger Bement *Milwaukee, WI*

Background: To examine pain reports, physical fitness, and body composition in adolescents of normal and overweight/obese status. **Methods:** 20 adolescents (10 male, 10 female; 15.0 ± 2.0 years) completed three sessions: one familiarization and two counterbalanced experimental [treadmill (TM) and DEXA]. The TM session involved measurement of pressure pain thresholds (PPTs) using a computerized algometer at the nailbed, lateral deltoid muscle, and quadriceps muscle before and after a maximal aerobic capacity treadmill test (VO2Max). During the DEXA session, total, android, and gynoid body fat percentage was measured. Physical fitness testing was also performed for grip strength, FitnessGram curl-ups, push-ups, and sit and reach. BMI was calculated from height and weight measurements and plotted on the gender specific CDC BMI-for-age growth charts to obtain a percentile ranking. Pain intensity using a numerical rating scale (0-10) was measured during the treadmill and physical fitness testing. **Results:** BMI and VO2Max values were significantly different between normal weight (NW, n= 13) and the overweight/obese (OW, n=7). The DEXA scan revealed significant differences between total body fat percentage, android fat percentage, and gynoid fat percentage. Gynoid fat percentage was negatively correlated with grip strength (p=.003), curl-ups (p=.026), push-ups (p<.001), and pain intensity with sit and reach (p=.008). PPTs significantly increased following the VO2Max test at the quadriceps, but not the deltoid or nailbed. PPT values were similar between the NW and OW groups. **Conclusions:** The distribution of body fat (gynoid vs. android) can significantly influence adolescents' physical fitness values and pain intensity during flexibility testing. Pain decreases following a maximal aerobic exercise test only at the exercising muscle independent of weight status.

T-132-P
Abdominal Redistribution of Fat as a Potential Etiology of Disrupted Glucose Homeostasis in Non-Diabetic Schizophrenic Patients Treated with Atypical Antipsychotics

Mamta Sapra, Donna M. Lawson, Ali Iranmanesh *Salem, VA*

Background: Use of atypical antipsychotics has been associated with weight gain and its metabolic consequences. In this study, effects of typical and atypical antipsychotics therapy on body weight/body composition, insulin sensitivity, and circulating adipokines, inflammatory markers and cytokines were assessed. **Methods:** Study was conducted in 2 groups of men, G1 (#5, age: 57-64 yrs) and G2 (#9, age: 42-62 yrs), respectively treated with typical and atypical antipsychotics. Excluded were men with active substance abuse, DM and thyroid disorders. In addition to neuropsychiatric evaluation and anthropometric measurements, blood samples were collected in the morning after an overnight fast in each subject for the measurements of glucose, insulin, leptin, adiponectin, CRP, and TNF-α. Body composition was determined by DXA. Fat mass index (FMI), trunk fat mass index (tFMI), and waist/height ratio were calculated. Student's t-test was used for statistical analysis. **Results:** Percentage body fat and FMI were not significantly different in the 2 groups (G1/G2). Of contrast were significantly increased waist/height ratio (0.55±0.02 v 0.62±0.02: P=0.04) and tFMI (3.3±0.5 v 5.3±0.6: P=0.04, associated with increased peripheral insulin resistance (HOMA-IR: 1.5±0.3 v 4.0±0.7: P=0.02) in men treated with atypical antipsychotics. Measures of leptin, adiponectin, CRP, and TNF-α were comparable in the 2 groups. **Conclusions:** Increased waist/height ratio and tFMI in the presence of comparable percentage body and FMI are suggestive of abdominal obesity as the underlying mechanism for peripheral insulin resistance associated with the use of atypical antipsychotics. Future studies involving larger number of subjects are warranted to verify the present findings. Support & Funding: Salem Veteran Affairs Medical Center/Salem Research Institute

T-133-P
Hormonal, Metabolic and Dietary Characteristics in Food Addicted Obese

Pardis Pedram, Peyvand Amini, Danny Wadden, Farrell Cahill, Wayne Gulliver, Guangju Zhai, Guang Sun *St. John's, Canada*

Background: Obesity is a complex disease with heterogeneous etiology. Results from our general Newfoundland (NL) population revealed that food addiction contributes to obesity and represents a subset of the obese subjects. What makes obese with food addiction different from obese without food addiction? The objectives are to detect characteristic biomarkers in obese with food addiction. **Methods:** Among a total of 652 adult subjects recruited from the NL population, 17 food addicted obese (FAO) and 17 non-food addicted obese (NFO) matched by age, gender, BMI and physical activity level were selected. Neuropeptides (α-MSH, β-endorphin, cortisol, melatonin, Neurotensin, Orexin-A, Oxytocin and Substance P), metabolism regulating hormones (amylin, C-Peptide, ghrelin, GIP, GLP-1, glucagon, IL-6, insulin, leptin, MCP-1, PP, PYY and TNFα) were measured using fasting morning serum. Obesity was measured using dual-energy X-ray absorptiometry and BMI. Food addiction was diagnosed using the Yale Food Addiction Scale (YFAS). The intakes of macro- and micro-nutrients were computed from the Willet Food Frequency Questionnaire. **Results:** FAO had significantly lower levels of glucagon, TNFα and cortisol than NFO (p<0.05). A negative correlation between BMI and glucagon was found in FAO. No significant difference was seen in serum glucose and lipids between the two groups. FAO individuals consumed more calories from fat, and greater amount of dietary lactose, calcium, vitamin D and vitamin B12, however lower amount of dietary glucose, fructose, trans monounsaturated fat and Vitamin K1 as compared to NFO. **Conclusions:** This is the first study reported that obese individuals with food addiction may differ from other obese individuals in endocrine and dietary factors.

T-134-P

A Community-Based Weight Loss Intervention in Obese Adults Improves Adipose Tissue Circulating Factors Independently of Baseline Glucose Tolerance

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Background: Obesity is associated with metabolic dysfunctions, which may be mediated by changes in adipose tissue signaling factors. These molecules are denoted as Adipose Tissue Generated Mediators of CardioVascular Risk (ATGMCVR) in this study, and include leptin, adiponectin, C-reactive protein (CRP), interleukin 6 (IL-6), tumor necrosis factor alpha (TNFa), and plasminogen activator inhibitor 1 (PAI-1). We studied the response of ATGMCVR in obese adults with prediabetes in a random subset of subjects in the Healthy Living Partnerships to Prevent Diabetes trial. **Methods:** Subjects were randomized to a usual care (UC; n=15) or a lifestyle weight loss group (LWL; n=15). LWL was a community-based weight loss intervention to promote physical activity and healthy eating. ATGMCVR at 1-yr were compared between groups by analysis of covariance; baseline value of the mediator was the covariate. Baseline means for ATGMCVR were compared between those with (n=21) and without (n=9) metabolic syndrome (MetS). **Results:** At baseline, subjects were 58±9 (SD) yrs, 70% female, with a BMI of 34±4 kg/m2. Weight loss (%) at 1-yr was 7.8±6.0% for LWL and 1.7±4.5% for UC. Group differences at 1-yr were noted (adjusted means±[95%CI] for UC and LWL, respectively; p<0.05) for log adiponectin (8526.3 [7397.7,9827]; 10870.9 [9432.0,12529.3] ng/ml), leptin (30.4 [26.1,35.4]; 23.7 [20.3,27.5] pg/ml), IL-6 (0.4 [0.3,0.5]; 0.2 [0.1,0.2] pg/ml), and PAI-1 (50 [42.7,58.7]; 36.2 [30.8,42.4] pg/ml) with trends for group differences for CRP (0.2 [0.2,0.3]; 0.2 [0.1,0.2] mg/dl; p=0.17) and TNFa (10.6 [8.7,12.8]; 13.5 [11.1,16.3] pg/ml; p=0.08). No differences in baseline ATGMCVR were seen between subjects with and without MetS. **Conclusions:** These findings suggest that ATGMCVR can be improved with weight loss; further studies are needed to determine if metabolic dysfunction is also improved.

T-135-P

Body Fat and Central Adiposity Are Similarly Affected by Four Types of Sugars When Consumed as Part of a Usual Diet

Nan Lu, Joshua Lowndes, Stephanie Sinnett, James Rippe *Celebration, FL*

Background: It has been argued that because fructose is metabolized in the liver differently than glucose, the consumption of fructose may cause a number of adverse health consequences, such as adiposity, particularly in the abdominal region. Of particular importance, some investigators have further suggested that when fructose is consumed together with glucose as in sucrose and high fructose corn syrup (HFCS), the above mentioned adverse health consequences may also be observed. However, prospective studies are lacking on the effects of fructose, glucose, sucrose, and HFCS on body composition and trunk fat. Therefore, this study was conducted to address this gap. **Methods:** As part of a ten-week eucaloric diet, 123 adults aged 20-60 years old were randomly assigned to consume 1% fat milk sweetened with either fructose (9%), glucose (9%), sucrose(18%), or HFCS(18%) of total calories, respectively. These levels represent the 50th percentile population consumption level of fructose in the American diet. Body fat mass, fat free mass, and abdominal (trunk) fat were measured using iDEXA (GE). **Results:** Although adults in all four groups experienced slight increases in body mass, body fat, abdominal (trunk) fat, and waist circumference, none of these measures were influenced by the type of added sugar consumed and no group experienced significant increases in body fat or central adiposity. Total energy intake and fat free mass were unchanged in any group. **Conclusions:** Consumption of fructose, glucose, sucrose, and HFCS when consumed at 50th percentile population did not produce any sugar specific (mono or di saccharide) response.

T-136-P

Obesity and Overfeeding Effects on Oscillatory Secretion of Insulin and Glucagon: Disruption of β-cell Function by Rapid Weight Gain Prior to Impaired Glucose Tolerance

Yanhua Peng, Cassandra M. Nicotra, William Leeds, Barbara C. Hansen *Tampa, FL*

Background: In obesity, one of the hallmarks of islet secretory function is the exaggerated release of insulin into the circulation in a sinusoidal wave pattern with a dominant frequency normally between 8 and 12 minutes per cycle in both humans and nonhuman primates. We sought to determine the effects of obesity and of overfeeding on the oscillatory pattern of production and release of insulin and glucagon and the role of glucose in the ultimate disruption of this key indicator of pancreatic function. **Methods:** In the present study, 28 obese and normal weight rhesus monkeys were studied at baseline and additionally 9 normal weight healthy male monkeys were studied at increasing levels of forced overfeeding (OF) (100 to 175% of baseline intakes) for up to 14 weeks, thus producing rapid weight gains of 20 to 80% depending upon duration and magnitude of OF. Patterns of glucose, insulin and glucagon were analyzed by spectral analysis and cross-correlation. **Results:** At increasing levels of OF, the oscillatory secretory function of β cells and of α cells became exaggerated (insulin baseline 86.1±29.6 vs OF 233±166.1 μU/ml, X±SD) without change in period (glucose 10.6 min, insulin 9.9 min, and glucagon 10.6 min with mean half amplitudes 4.0, 35 and 15%). OF disrupted these despite sustained hyperinsulinemia (periods n.s.) with no effect on glucose tolerance **Conclusions:** Pancreatic function suffers major disruption with deterioration of oscillatory secretory patterns during overfeeding, despite secretory levels being exaggerated in obesity. This endocrine dysfunction occurs well before impaired glucose tolerance and before any early signs of diabetes, and constitutes one of the earliest markers of preDM, dysmetabolism and pancreatic dysfunction.

T-137-P

Can Meal Composition Alter Overnight Glucose and Insulin Responses in Obese Individuals with Impaired Fasting Glucose Levels?

Jill Kanaley, Youngmin Park, Ying Liu, Lauryn Nyhoff, Nathan Winn, Jason McCleery, Tim Heden *Columbia, MO*

Background: The purpose of this study was to examine how the dinner meal composition alters the postprandial, overnight, and fasting morning glucose and insulin response in prediabetic/diabetic obese individuals with impaired fasting glucose levels. **Methods:** Subjects (n=6) were studied on two occasions: dinner meal (800 kcal) either high carbohydrate (20% protein, 60% CHO-2 g fructose, 20% fat) or a high fat/high fructose meal (10% protein, 50% CHO-48 g fructose, 40% Fat) at 1800 h. Blood samples were drawn every 15 min from 1730 h until 0700 h, and analyzed for glucose, insulin, and c-peptide levels. **Results:** Subjects were 48.3±2.5 y, BMI 35.8±1.1 kg/m^2 and fasting blood glucose of 144.9±15.7 mg/dL. Total glucose area under the curve for the 14 h (tAUC) was not different between meal conditions but insulin tAUC was significantly greater with the CHO meal than the HF meal (insulin: 1,078,527±172,458 vs 965,189±198,803 pg/mL*min (14 h), P=0.02). Insulin tAUC was greater from 2300-0300 than 0300-0700 h (p=0.02); this was not different between meal conditions. Glucose concentrations demonstrated a 13% increase (p=0.05) between 0300 vs 0700 h, while insulin levels showed a 33% decrease (P=0.05). Hepatic extraction of insulin (%) was lowest 2 h postprandial (68%±4) and increased by 2300 h and continued to increase throughout the night with the highest extraction at 0700 h (81±3%, p=0.000), regardless of meal composition. **Conclusions:** In conclusion, the glucose response to the meal was similar for a high fat/high fructose and CHO dinner, while the insulin response was greater with the CHO meal. The dawn phenomena was observed under both meal conditions with glucose levels rising and insulin levels declining, which appears to be due to an increase in hepatic insulin extraction in the overnight period.

T-138-P

Hyperinsulinemia: The Common Factor in the Metabolic Syndrome

Christopher T. Kelly, G. Lynis Dohm, William Chapman, John R. Pender, Walter J. Pories *Greenville, NC*

Background: Previous documentation of hyperinsulinemia in type 2 diabetes led us to question if elevated serum insulin levels is a common factor in the multiple disorders of the metabolic syndrome. **Methods:** A meta-analysis was performed to determine if hyperinsulinemia was present in the various metabolic syndrome components. Manuscripts were identified through MEDLINE via PubMed and Google Scholar and by searching reference lists of relevant papers and reviews. A pre-determined criterion was used to select manuscripts that examined metabolic syndrome disorders and included documentation of either serum insulin levels or C-peptide concentrations in human subjects. **Results:** A total of 357 abstracts were reviewed. Fifty-four

of these articles were selected due to appropriate documentation of insulin measurements. Comparisons were made based on if the studies reported patients as having elevated insulin levels (+) versus normal insulin levels (-) for each metabolic disorder: central obesity (2+ vs. 0-), diabetes (4+ vs. 0-), hypertension (7+ vs. 1-), dyslipidemia (2+ vs. 0-), renal failure (4+ vs. 0-), non-alcoholic fatty liver disease (4+ vs. 0-), polycystic ovary syndrome (6+ vs. 1-), atherosclerosis (4+ vs. 0-), sleep apnea (5+ vs. 0-), certain cancers (3+ vs. 1-), and cardiovascular disease (7+ vs. 0-). Three articles were selected that examined the metabolic syndrome as a whole (3+ vs. 0-). **Conclusions:** Hyperinsulinemia is a common factor found in the multiple medical disorders of the metabolic syndrome. Checking serum insulin levels in a primary care setting may prove to be an essential tool for early diagnosis and preventative care.

T-139-P

A High Energy Diet Potentiates Epinephrine-Induced Increases in Blood Glucose Concentrations in Male Rats

Amy P. Ross, Jenna N. Darling, Marise B. Parent *Atlanta, GA*

Background: In humans, non-alcoholic fatty liver disease (steatosis) is characterized by an accumulation of liver lipids. In rodents, steatosis has severe consequences, including oxidative stress and hepatic insulin resistance. It is well established that epinephrine stimulates hepatic glucose release during a stress response. The present experiment tested whether hepatic steatosis compromises this critical effect of epinephrine. **Methods:** Adult male Sprague-Dawley rats were fed a high-energy cafeteria-style diet (HED). Weight gain during the first 5 days on the diet was used to divide the rats into a HED-Lean group (bottom 33%) and HED-Obese group (top 33%). After 9 weeks, the rats were injected with epinephrine (0.1 mg/kg sc), and blood glucose concentrations were measured. **Results:** Compared to control rats, HED-Obese rats gained a significant amount of body mass, developed steatosis, insulin resistance and elevated basal glucose concentrations. HED-Lean and control rats did not differ on these measures. Interestingly, epinephrine produced remarkably larger increases in blood glucose concentrations in HED-Obese rats than in control rats. A smaller potentiation was observed in HED-Lean rats. To test whether these effects could be reversed, the high-energy components of the diet were removed for 4 weeks and the epinephrine injections were repeated. The diet intervention did not reverse the effects of the HED on body mass, baseline blood glucose concentrations, or steatosis, but did reverse the insulin resistance and attenuated the potentiated effects of epinephrine on glucose release. **Conclusions:** Collectively, these results suggest that insulin resistance, but not steatosis, is associated with a heightened glycemic response to stress.

T-140-P

Plin2 Inhibits Cellular Glucose Uptake Through Interactions with SNARE Protein SNAP23

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Background: Although a link between excess lipid storage and aberrant glucose metabolism has been recognized for many years, little is known what role lipid storage droplets and associated proteins such as perilipin 2 (Plin2) play in managing cellular glucose levels. **Methods:** The role of Plin2 in regulating glucose levels was examined using confocal microscopy, radioligand assays, co-immunoprecipitation, and FRET techniques. **Results:** The influence of Plin2 on glucose uptake was examined using 2-NBD-Glucose and [3H]-2-deoxyglucose to show that insulin-mediated glucose uptake was decreased 1.7- and 1.8-fold, respectively in L cell fibroblasts overexpressing Plin2. Conversely, suppression of Plin2 levels by RNAi-mediated knockdown increased 2-NBD-Glucose uptake several fold in transfected L cells and differentiated 3T3-L1 cells. The effect of Plin2 expression on proteins involved in glucose uptake and transport was also examined. Expression of the SNARE protein SNAP23 was increased 1.6-fold while levels of syntaxin-5 were decreased 1.7-fold in Plin2 overexpression cells with no significant changes observed in lipid droplet associated proteins Plin1 or FSP27 or with the insulin receptor, GLUT1, or VAMP4. FRET experiments revealed a close proximity of Plin2 to SNAP23 on lipid droplets to within an intramolecular distance of 51 Å. The extent of targeting of SNAP23 to lipid droplets was determined by co-localization and co-immunoprecipitation experiments to show increased partitioning of SNAP23 to lipid droplets when Plin2 was overexpressed. **Conclusions:** Taken together, these results suggest that Plin2

inhibits glucose uptake by interacting with, and regulating cellular targeting of SNAP23 to lipid droplets. In summary, the current study for the first time provides direct evidence for the role of Plin2 in mediating cellular glucose uptake.

T-141-P

Transient Receptor Potential Membrane-5 (Trpm5)-Deficient Mice Exhibit Modestly Attenuated Obesity on High-Fat Diet

Cheryl Spence, Christopher Brain, John Hadcock, James Trevaskis *Cambridge, MA*

Background: TRPM5 is a calcium-dependent ion channel with a proposed role in the regulation of metabolism. Trpm5¬-deficient (Trpm5KO) mice were reported to exhibit impaired glycemic control, however the role of Trpm5 in body weight regulation is unknown. **Methods:** We compared male and female wildtype (WT) and Trpm5KO mice (n=7-12/group) on chow or high-fat diet (HFD; 60% kcal/fat). To further interrogate the role of Trpm5 in obesity, we generated double mutant Trpm5KO Lepob/Lepob mice. **Results:** At 22 weeks of age on chow diet there was no effect of genotype on body weight, fat or lean mass, liver weight, liver lipid content, blood glucose, plasma insulin or gut hormone concentrations. On HFD Trpm5KO mice were significantly protected from weight gain (by 19%; body weight of WT 42.2 ± 1.8 g vs. Trpm5KO 34.2 ± 1.6 g, p<0.001), but there was no difference in fat or lean mass. Trpm5KO mice on HFD were protected from the development of hepatomegaly and steatosis relative to WT mice. There were no genotype-dependent changes in blood glucose, plasma insulin or gut hormone levels. Indirect calorimetry performed after 10 weeks on HFD revealed no difference in oxygen consumption when expressed relative to lean mass, or in substrate utilization, food intake or physical activity levels. Male double mutant mice exhibited equal body weight to Lepob/Lepob mice but exhibited a small but significant reduction in percent lean mass and an increase in fat mass. Female Trpm5KO Lepob/Lepob mice were protected from obesity (~14% lower body weight vs. Lepob/Lepob mice, p<0.001), but demonstrated similar body composition changes as male mice, as well lower liver weight, but higher fed glucose levels. **Conclusions:** These data suggest that Trpm5 may have complex but only subtle effects on metabolism and the regulation of body weight.

T-142-P

Liraglutide-Induced Lowering of Food Intake Is Attenuated with Central but Not Peripheral Administration of the GLP-1 Receptor Antagonist Exendin(9-39)

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Background: Liraglutide is approved for the treatment of type 2 diabetes, and is in clinical development for the treatment of obesity. The present study aims to address whether the effects of liraglutide on energy homeostasis is mediated by peripheral or central GLP-1 receptors. **Methods:** The chronic effect of peripheral or central administration of the GLP-1 receptor antagonist exendin(9-39) (Ex9-39, 200 μg/kg/day) was evaluated in male SPD rats alone (chronic infusion via subcutaneously implanted minipumps) or combined with liraglutide (LIRA, 200μg/kg, SC, b.i.d). Consequently, osmotic minipumps were coupled to bilateral cannulae directed against the hypothalamic arcuate (ARC) or paraventricular nucleus (PVN). **Results:** Intracerebroventricular (ICV) but not peripheral SC administration of Ex9-39 led to an increase in food intake and body weight versus vehicle (390.7±6.3 Ex9-39 ICV and 382.0±8.8 Ex9-39 SC versus 370.2±10.7 VEH ICV/SC,) and attenuated the effect of liraglutide (368.5±10.0 Ex9-39 ICV/LIRA SC versus 344.7±6.1 LIRA SC), hereby highlighting the importance of the central GLP-1 system in energy homeostasis. In the ARC and PVN, Ex9-39 alone (chronic infusion of 5 μg/kg/side/day) led to an increased body weight in both experimental groups (ARC: 346.1±6.5 Ex9-39 versus 333.2±6.0 VEH, PVN: 366.0±5.8 Ex9-39 versus 334.5±8.3 VEH), whereas the effect of liraglutide was attenuated in the ARC of Ex9-39 dosed rats only (ARC: 329.7±6.3 Ex9-39/LIRA versus 317.5±6.6 LIRA, PVN: 326.4±13.1 Ex9-39/LIRA versus 319.4±8.7 LIRA). **Conclusions:** In conclusion, the food intake suppression and body weight reducing effect of liraglutide appears to be mediated at least partly by activation of GLP-1 receptors in the arcuate nucleus.

T-143-P

Liraglutide Causes Significant, Although Variable, Weight Loss in Obese Rhesus Macaques Maintained on a High Fat Diet (HFD)

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Background: GLP-1 analogs, such as liraglutide, are used as a treatment of diabetes due to their ability to improve glucose stimulated insulin secretion (GSIS) and lower glucagon levels which are in-appropriately high in diabetes. However, clinical studies have shown that liraglutide can also cause significant weight loss, and liraglutide is currently in phase 3 clinical development. **Methods:** The purpose of this study was to determine the efficacy of liraglutide for weight loss in obese monkeys (n=7) chronically maintained on a HFD. These studies used a variable maximally tolerated dose design, whereby each animal received weekly escalated dosing starting at 5 µg/kg, with final doses ranging from 10 µg/kg to 25 µg/kg for a total treatment period of 12 weeks. **Results:** Food intake was transiently affected by liraglutide, with a peak reduction of 56% and a 30% reduction at the 12-week time point. Consistent with clinical studies, animals reduced bodyweight by 10% on average, although this was highly variable, with peak weight loss ranging from 0% to 15%. The weight loss was solely due to loss of fat mass. Not surprisingly, liraglutide also increased GSIS during the first two months of treatment, with an average peak increase of 82% while improving HbA1c levels significantly. However, by the end of the treatment period, GSIS was at levels similar to pre-treatment. This transient effect is likely secondary to the improved insulin sensitivity as GSIS dropped to 38% below pre-treatment levels after cessation of liraglutide treatment. **Conclusions:** These studies suggest that liraglutide has beneficial effects on weight loss, primarily through inhibition of food intake, even in animals consuming palatable and calorically dense food.

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Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

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Genome Studies

T-144-P

Genome-Wide Association Study to Identify Variants Influencing Energy Expenditure and Predicting Body Weight Change in American Indians

Paolo Piaggi, Alex Gale, Ke Huang, Marie S. Thearle, Jonathan Krakoff, Clifton Bogardus, Leslie J. Baier *Phoenix, AZ*

Background: Lower rates of energy expenditure (EE) have been associated with future weight and fat mass gain. Prior studies have shown that BMI has a heritable component but the specific genes that affect EE remain to be elucidated. **Methods:** Genotypic information on 435,148 SNPs from a prior genome-wide association study was available for 291 healthy American Indians (160M, age: 28±6 y, BMI: 34±8 kg/m2, body fat: 33±8%) who had a measure of RMR obtained with indirect calorimetry (ventilated hood system), and also for 185 subjects (116M, age: 27±7 y, BMI: 34±8 kg/m2, body fat: 32±8%) with measures of 24h EE in a whole room calorimeter. Longitudinal data for weight in the two groups were available after a median follow-up time of 7.8 and 7.4 years, respectively. The association of genotypes with the residual variance of RMR and 24h EE after adjusting for known physiologic covariates, and with the rate of weight change (RoWC) was assessed by linear regression analysis. **Results:** Two variants (rs10507100 and rs17087518) were identified that had nominal associations with both adjusted EE measures and RoWC in opposing directions (all P<0.05), but only rs17087518 remained associated with maximum BMI recorded from a non-diabetic exam in a larger sample of 937 subjects (37.8, 36.3 and 32.1 kg/m2 for G/G, G/C and C/C, respectively, P=0.02). Subjects homozygous for the risk allele of rs17087518 had a lower residual RMR (−9±201 kcal/day, N=258 vs. 89±192 kcal/day, N=32, P=0.009) and 24h EE (−29±160 kcal/day, N=164 vs. 52±135 kcal/day, N=20, P=0.03) and higher RoWC (0.9±1.2 vs. 0.2±1.3% wt/year, P=0.004) as compared to the other genotypic groups (heterozygous and homozygous for the non-risk allele combined). **Conclusions:** These findings indicate rs17087518 may have a role in a relatively reduced EE resulting in weight gain.

T-145-P

Evaluation of Genomic-Enable Predicting Models for Type 2 Diabetes Mellitus

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Background: Type 2 Diabetes Mellitus (T2DM) is the fastest growing chronic disease in the world. Lifestyle and genetics play a large role in the development of T2DM. Despite of the important role that genetic plays in predisposition to T2DM, currently, genetic information is not incorporated for the assessment of risk to T2DM. We used Whole Genome Regression methods to predict diabetes status of 5,245 subjects from the Framingham Study. **Methods:** We considered various types of Bayesian methods, some of which incorporate prior information from previous GWAS studies (the DIAGRAM consortium). The baseline model (BM) included non-genetic covariates only. This model was first extended by adding 2 marker-derived principal components (M-65SNPs). Subsequently, this model was extended by adding the top-10% SNPs, ranked based on GWAS p-values, of a ~500,000 SNP array. These markers were included using: models BayesA, BayesC or the Bayesian LASSO (BL). Finally, we considered extending M-65SNPs by adding all the markers available (500,568) using a standard G-BLUP or a modified version of it that weighted the markers based on association p-values (wG-BLUP). Models were compared based on prediction R2 estimated in a 10-fold between-family validation. **Results:** The prediction R2 were: BM:5.4%, M-65SNPs:6.1%, BayesA:7.2%, BayesC:7.9%, B-LASSO:8.0%, G-BLUP:5.0% and wG-BLUP:9.0%. **Conclusions:** We conclude that: (a) adding large numbers of small-effect markers, even some that are not 'GWAS-significant', increase prediction accuracy, (b) models that perform differential shrinkage of estimates of effects (e.g, B-LASSO), or variable selection (e.g., BayesC), outperformed those inducing homogenous shrinkage of estimates (G-BLUP) and that (c) adding prior information from previous GWAS studies (e.g., wG-BLUP) resulted in increased predictive ability.

T-146-P

Genome-Wide Leukocyte DNA Methylation Profiles in Healthy White and Japanese American Women Identifies Ethnic Differences in Energy Metabolism Loci

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Background: We previously found significant differences in abdominal, visceral and liver fat distribution between white (EA) and Japanese American (JA) women of comparable total adiposity. We have now examined their genome-wide blood leukocyte methylation. **Methods:** Sixty healthy EA or JA women, aged 60-65, underwent dual energy X-ray absorptiometry (DXA) for estimation of total fat (TF) and regional fat and provided a fasting blood sample; 46 of them also underwent abdominal magnetic resonance imaging (MRI) for visceral, subcutaneous, and liver fat estimation. Leukocyte DNA samples were analyzed with the Illumina HumanMethylation450K BeadChip, and methylation differences between JA (N=30) and EA (N=28) were evaluated using a multivariable analysis, adjusted for age, assay batch and TF. **Results:** We found 293 significantly differentially methylated (DM) loci comparing JA vs. EA (p<1.27E-07). Of these, 20 DM loci (11 hypermethylated in JA, 9 hypermethylated in EA) showed ≥ 20% differences (median delta-beta ≥ l0.2l). The top DM loci were located within genes (n=12 loci in 11 genes) or in intergenic regions (n=8). In Ingenuity Pathway analysis, the 11 genes were most associated with the network function of energy production and endocrine system (score or –log(p) of 33), including 5 genes involved in lipid and/or carbohydrate metabolism (CACA1A, DECR2, SLC27A1, UGT2B15, UGT2B17). The DM locus in SLC27A1 was associated with subcutaneous fat (r=-0.47, p=0.009) in EA only. **Conclusions:** Our findings suggest that leukocyte DNA methylation profiles may differ by ethnicity. In our comparison of EA and JA women, the differences found were in loci involved in energy metabolism.

T-147-P

Simplified WBC Type-Specific Isolation for Epigenetics on Obesity

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Background: Epigenetic reprogramming is proposed to account for many of the long-term negative health related conditions associated with obesity. The majority of the published information on the epigenetic changes associated with obesity comes from studies using tissues containing a mixture of cell types. However, utilizing single cell types for these epigenetic studies is crucial because each cell type is anticipated to have different and contrasting DNA cytosine methylation patterns. Blood leukocytes are a good source of DNA to study epigenetic changes that are associated with obesity, yet the total white blood cells are comprised of seven major cell types that differ in the methylation of 8% to 40% of the 485,000 methyl C residues examined. **Methods:** Combining several common approaches we developed simplified protocols using magnetic beads to isolate a few to all of the seven different white blood cell types from fresh whole blood with and without the use of a red blood cell lysis, respectively. **Results:** From fresh or frozen whole blood without red blood cell lysis CD4+ T cells, CD8+ T cells and CD14+ Monocytes may be isolated in a few hours. From fresh whole blood following red blood cell lysis (CD4+ T cells, CD8+ T cells, CD14+ monocytes, CD16+ neutrophils, CD19+B cells, CD56+ Natural Killer cells and Siglec-8+ eosinophils) all seven cell types may be successfully isolated. Working with frozen cells is especially helpful in obtaining samples from a variety of clinics regardless of the distance, including rural areas, to the laboratory. Attempts to isolate each white cell types after storage in formaldehyde have not yet been successful. **Conclusions:** Initial results suggest that cytosine methylation patterns in bisulfite treated DNA from these cells may be examined directly by a nested PCR sequencing protocol.

T-148-P

Association of BMI, 8 SNPs Reported to Be Related to Gout Phenotype and Their Interaction in Gout Incidence in Framingham Heart Study

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Background: We aim to assess the association of 8 serum urate SNPs and BMI and their interactions with incident gout in a population-based cohort study. **Methods:** We used the Framingham Study including subject from the Original and the Offspring cohort (N=4,967). We assessed the effect of 8 SNPs in the recently described genetic urate score on incident gout. Subjects were genotyped with Affy500K platform, and two of the SNPs associated to gout rs1165196 and rs1106766 were present in that platform. The SNPs rs1967017, rs780093, rs13129697, rs2199936, rs675209 and rs2078267 were not present in the Affy SNP array, thus we imputed them with IMPUTE2. BMI was taken at the time of gout or, at the time of censoring if the subject is healthy or died without gout. We fitted logistic regression models to assess the associations. Estimated effects in the liability scale, odd ratios, and p-values are reported for all SNPs, covariates, and interactions. 408 patients had incident gout (74% males), with 169 from the FHS original cohort and 293 from the Offspring cohort. **Results:** In a model with main effects of BMI and SNPs, three of eight SNPs and BMI were significantly associated with incident gout (p<=0.008 for all). Zero SNPs showed significant main effects on gout in the model that adjusted for all BMI*SNP interaction terms. However, BMI remained significant (p=0.003) and the rs2199936*BMI interaction was nearly significant (p=0.06). Gender and duration of follow-up were also significant predictors (p<=0.009) in all models. **Conclusions:** SNPs known to predict urate levels moderated the association of BMI with gout, suggesting the possibility that the extent to which BMI increases the risk for got may depend on a person's a priori genetic risk for high urate levels.

T-149-P

Mouse Niemann-Pick C1 Haploinsufficiency Responsible for Obesity or Diabetes Depends on Genetic Background

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Background: A number of genome-wide association studies have shown that the Niemann-Pick C1 (*NPC1*) gene is associated with obesity in various pop-

ulations. It has also been reported that the *NPC1* gene is associated with type 2 diabetes independent of body weight. These seemingly contradictory reports suggest that the *NPC1* gene may interact with undefined modifying genes and certain environmental factors to manifest these disparate metabolic diseases. We previously performed growth studies using BALB/cJ *Npc1* normal (*Npc1+/+*) and *Npc1* heterozygous (*Npc1+/-*) mice and confirmed that decreased *Npc1* gene dosage and protein function interacts with a high-fat diet to promote weight gain and adiposity. Importantly, the follow up studies performed using hybrid BALB/cJ and C57BL/6J mice confirmed the weight gain but also metabolic features associated with type 2 diabetes. **Methods:** We have now performed additional studies using a novel C57BL/6J Npc1mouse model produced by backcrossing the BALB/cJ null mutant into the C57BL/6J background for over 20 generations. **Results:** The results indicate that C57BL/6J *Npc1+/-* mice, but not BALB/cJ *Npc1+/+* mice, have impaired glucose tolerance when fed a low-fat diet and independent of body weight. When fed a high-fat diet, the C57BL/6J *Npc1+/-* mice did not show any difference from *Npc1+/+* in regards of weight gain or diabetes, likely due to a masking effect of susceptibility due to this genetic background strain developing obesity and diabetes. **Conclusions:** Therefore, decreased *Npc1* gene dosage among two different mouse genetic backgrounds interacts with undefined modifying genes to manifest disparate yet often related metabolic diseases.

T-150-P

Insulin Resistance as an Independent Predictor of Abnormal Cardiac Structure and Function in Severely Obese Adolescents

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Background: We follow a population of severely obese adolescents seeking bariatric surgery who demonstrate increased rates of insulin resistance, prediabetes, dyslipidemia, and hypertension. We hypothesized that insulin resistance in this population would be associated with abnormal cardiac structure independent of weight status. **Methods:** We conducted a cross-sectional study of 66 patients enrolled from 2007 to 2012 in an FDA-approved study of the LAP-BAND®. At study entry we obtained anthropometric measures, blood pressures, metabolic lab studies, and echocardiogram parameters of left ventricular mass (LVM), left ventricular posterior wall dimension (LPWD), left ventricular internal dimension (LVID), and shortening fraction (FS). We adjusted for adiposity by indexing LVM by BSA (LVM-BSA) and calculating relative wall thickness [RWT = (LPWD+LPWD)/LVID]. Linear regression analyses were performed to determine if blood pressures or metabolic lab values predicted echo values, controlling for BMI. **Results:** The majority of our cohort was female (88%) and Caucasian (59%) with mean age of 16 years and mean BMI of 50.3 kg/m2 (SD 7.3). 21.9% of patients had an abnormal LVM-BSA, RWT, or FS. Results of the regression indicated that only HOMA-IR significantly predicted LVM-BSA [F(58,5) = 2.71, p < 0.05, adjusted R2=0.119, β=0.40] and RWT [F(60,5) = 3.11, p < 0.05, adjusted R=0.140, β=0.29]. HOMA-IR was also the only significant negative predictor of FS [F(59,5) = 3.042, p < 0.05, adjusted R2=0.138, β=-0.36]. **Conclusions:** Cardiac structure and function abnormalities, which are precursors to heart failure, were present in nearly a quarter of severely obese adolescents in our study and were associated with insulin resistance independent of weight status and other cardiovascular risk factors.

T-151-P

Effect of Lycopene and Exercise in Cardiovascular Parameters in Obese Hypoestrogenic Wistar Rats

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Background: Hormone deficiency causes physiological alterations exacerbating problems caused by obesity in the cardiovascular system. Exercise improves cardiovascular function and reduces body weight. In this study we test the effect of lycopene-rich tomato extract with antioxidant activity and exercise in cardiovascular parameters in obese Wistar rats with hypoestrogenism. **Methods:** Female Wistar rats were randomized in 4 groups (n=8) and were subject to bilateral ovariectomy. The animals were given hypercaloric diet (30% sucrose in drinking water) and standard laboratory chow ad libitum for 32 weeks. After this period, treatment with lycopene-rich extract (5 mg/kg/day) or vehicle (corn oil) was performed; animals were subject to exercise regimen on a treadmill at speed of 10 cm/s for 20 min with speed in-

crease each week up to 30 cm/s for 4 weeks. Mean arterial pressure (MAP) was measured, the animals were sacrificed, organs were excised and blood was sampled to perform biochemical and oxidative stress assays. **Results:** Administration of the extract significantly increased body weight of animals while exercise significantly reduced it. MAP was significantly higher for vehicle group compared lycopene and exercise. There was a significant increase in HDLc for the exercise and lycopene-exercise groups, and only a trend in decrease of LDLc was observed for the lycopene-exercise group. Nitrite levels were significantly increased in vehicle group, treatment with extract significantly reduced them as well as exercise. Lipid peroxidation was significantly higher in vehicle groups and was significantly reduced in treated and exercise groups. **Conclusions:** Our data shows the beneficial effect of exercise in improving cardiovascular health. Consumption of natural antioxidants in the diet can enhance this effect hereby reducing the risk of developing cardiovascular disease.

T-152-P

Differential Response in Aortic Stiffness to Acute Exercise Is Not Influenced by Central Blood Pressure in Obese Versus Normal Weight Individuals

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Background: Obesity is sometimes, but not always, associated with altered resting blood pressure (BP) and arterial function. Acute exercise hemodynamics are also altered in obesity. BP affects many components of arterial function and little data exists on the effects of acute exercise on arterial function for obese persons. **Purpose:** To determine the effects of an acute bout of exercise on arterial function in obese versus healthy weight individuals. **Methods:** Young (23 yr), lean (n=38, BMI=22.3 kg/m2) and obese (n=20, BMI=34.0 kg/m2) individuals had arterial measurements obtained at rest, and 15 and 30 min following a maximal bout of aerobic exercise. An arterial tonometer was used to obtain aortic BP, as well as measures of arterial stiffness (augmentation index (AIx75), central and peripheral pulse wave velocity (PWV). **Results:** The obese group had higher resting diastolic BP(68 vs. 75 mm Hg), but systolic and mean BP were similar between groups. Central arterial stiffness (cPWV and AIx75) increased following exercise in the obese(cPWV: rest 5.84, 15-min post-ex-6.11, 30-min post-ex 6.16 m/s; AIx75: rest 1.23, 15-min post-ex -0.61, 30-min post-ex 5.72%), with no change in the lean (cPWV: 5.67, 15-min post-ex 5.46, 30-min post-ex 5.35 m/s; AIx75: rest -0.08, 15-min post-ex -.078, 30-min post-ex -6.17%) . Peripheral stiffness was not affected by obesity. **Conclusions:** In this young cohort, obesity was associated with increased central arterial stiffness, independent of BP. This pressure independent increase in arterial stiffness in response to physical stress in obese individuals may be a function of oxidative stress and decreased nitric oxide bioavailability. Future work is needed for clarification.

T-153-P

No Effects of Postprandial Increase in Plasma Lipids on Flow-Mediated Vasodilation in Healthy Young or Older Subjects

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Background: Ingestion of a high-fat meal has been shown to impair endothelial vascular function, a response linked to an increased risk for cardiovascular events. This postprandial impairment in the endothelial vascular function has been attributed to increases in plasma lipids, particularly triglycerides (TG) and free fatty acids (FFA). **Methods:** We assessed endothelial vascular function by flow-mediated dilation in 7 young (age: 23 ± 1 yrs, body fat: 18 ± 2 %, mean ± SE) and 6 older (age: 67 ± 1 yrs, body fat: 27 ± 1 %) apparently healthy subjects in the postabsorptive state and 4 hours after ingestion of whipping cream (0.7 g fat/kg body weight). Peak forearm blood flow (PFBF) response was determined 15 sec after 5-min arterial occlusion using venous occlusion strain-gauge plethysmography. **Results:** Plasma TG and FFA concentrations increased throughout the 4-hour postprandial period in both groups (P <0.05), with no differences in the overall response between the young and older subjects (P >0.05). ANOVA indicated no main effect for whipping cream ingestion on PFBF (P <0.05). There was a main effect for age on PFBF. Older subjects had significantly lower PFBF (ml/100ml/min) compared to the young subjects in the basal period (7.4 ± 0.9 vs 10.7 ± 0.7; P

<0.05), but not in the postprandial period (9.3 ± 1.7 vs 11.2 ± 1.7; P >0.05). PFBF in the postabsorptive state across subjects was inversely correlated with the percent body fat (r = -0.604; P <0.05), but not with the concentrations of plasma lipids (P >0.05). **Conclusions:** We conclude that postprandial increases in TG and FFA, per se, do not impair flow-mediated dilation in either young or older individuals. When considered across individuals, percent body fat correlates with flow-mediated dilation in the fasting state.

T-154-P

Obesity with Metabolic Dysfunction Demonstrates Early Signs of Nephropathy in Nonhuman Primates

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Background: The complication of obesity that is least likely to be cited and recognized is nephropathy or glomerulosclerosis, possibly due to its usual attribution to diabetes. In the present study we extended our prior identification of early histopathological changes in obese-prediabetic monkey kidneys with an investigation of the physiological biomarkers of obesity-related nephropathy. **Methods:** Obese monkeys that were metabolically normal (OB-Norm; 13.4±0.6 kg, N=22) were compared to similarly overweight obese dysmetabolic monkeys (with metabolic syndrome)(OB-Dysmet; 14.3±0.5kg, N= 29). Renal function measurements included albumin excretion rate (AER), glomerular filtration rate (GFR), and the blood urea nitrogen/creatinine ratio (BUN/Cr) together with a range of new exploratory biomarkers of early nephropathy. **Results:** The OB-Dysmet group had a significantly higher AER than the OB-Norm group (63.6±19.8 vs 1.1±0.4, p=.002), and a significantly higher BUN/Cr ratio (23.2±2.0 vs 15.2±0.8, p=.00016). Furthermore, the GFR in the OB-Dysmet group was significantly higher than in the OB-Norm group (80.2±6.2 vs 66.5±4.5,p=0.042), indicating early hyper filtration presumably preceding the decline in GFR seen in type 2 diabetes. Fasting plasma glucose was significantly elevated in the OB-Dysmet group relative to the OB-Norm (74.7±3.5 vs 63.9±2.2, p=0.008), although still normal. **Conclusions:** This study of renal physiology in obesity, indicates that early signs of developing glomerulosclerosis can be identified clinically in the subgroup of the obese who show the features of the metabolic syndrome. Thus, nephropathy should be considered a common complication of obesity. The presence of hyper filtration observed in the obese dysmetabolic group identified a target population for further investigation of the range of new urinary biomarkers

T-155-P

Metabolic Effects of Overexpression vs. Inactivation of Adipose Tissue Angiotensinogen

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Background: The adipose tissue Renin Angiotensin System (RAS) has been linked to the pathogenesis of metabolic syndrome. We have previously shown that overexpression of the RAS precursor, Angiotensinogen (Agt) in mouse adipose tissue (Agt-TG) increased insulin resistance and adipose and systemic inflammation. In order to further understand the role of adipose Agt in metabolic disorders, we generated adipose specific Agt knockout (Agt-KO) mice, using the cre-LoxP system. **Methods:** Agt-KO and control littermates were fed either a low-fat (LF) or high-fat (HF) diet to assess metabolic differences. Agt expression was specifically knocked down by 80% in both white and brown adipose tissue (WAT, BAT) of the Agt-KO mice. **Results:** Transgenic Agt-TG mice fed a LF diet exhibited obesity, insulin resistance and glucose intolerance. By contrast, most metabolic parameters (body weight, glucose and insulin tolerance) were comparable between the wild type (WT) and Agt-KO littermates in both LF and HF diet-fed groups. Preliminary gene expression results indicated alterations in angiogenesis and insulin signaling in the Agt-KO mice fed LF diets when compared to the WT mice. Furthermore, MCP1 gene expression was downregulated in the Agt-KO vs. the WT littermates. **Conclusions:** In conclusion, despite the lack of an obvious phenotype in adipose Agt deficient mice, these cellular and molecular changes are consistent with previously reported functions of RAS in insulin resistance, angiogenesis and inflammation.

T-156-P

Evaluation of Neurogenic and Humoral Factors in Rats with Diet-Induced Obesity

Anna Laura V. Américo, Ana Paula D. Leite, Cynthia R. Muller, Vera Farah, Patricia Fiorino *Sao Paulo, Brazil*

Background: The obesity and hypertension have been considered risk factors for cardiovascular disease. Therefore, it is very important to study the mechanisms regulating blood pressure. The aim of this study was to evaluate the neurogenic, sympathetic nervous system (SNS), and humoral, angiotensin II (ANG II), nitric oxide (NO), factors in the control of the blood pressure (BP) in obesity rats. **Methods:** Male Wistar rats were separated in groups control (C, n=8) fed with normocaloric diet and high-fat diet (HF, n=8) with increased lipids in 30% during 8 weeks, with starts immediately after weaning. The animals were instrumented with arterial and venous catheters to assess blood pressure (BP) and heart rate (HR) signals. BP was recorded by 15 minutes and after inhibition pharmacological of ANGII (Losartan,10mg/kg), NO (L-NAME, 10mg/kg) and the SNS (Hexamethonium, 40mg/kg). **Results:** The basal BP was increase in HF (118 ± 2, mmHg), when compared with C (105 ± 3, mmHg), without changes in HR. The BP variation was significant decreased after Losartan in HF (-10 ± 3 mmhg) when compared with C (-4 ± 3 mmHg), and Hexamethonium in HF (-47 ± 2 mmHg) when compared with C (-31 ± 5 mmhg), but significant increase after L-NAME in HF (70 ± 8 mmhg) when compared with C (35 ± 9 mmHg). **Conclusions:** Our results suggest that neurogenic and hormonal alterations are contributing to increase the BP in an obesity model induced by chronic administration of a high-fat diet, after weaning.

T-157-P

Autonomic and Metabolic Dysfunction in Short-Term Experimental Obesity

Cynthia R. Muller, Ana Paula D. Leite, Talita S. Higa, Fabiana S. Evangelista, Vera Farah, Patricia Fiorino *Sao Paulo, Brazil*

Background: Obesity and the dyslipidemia have been associated with metabolic dysfunction and cardiovascular disease.The aim of this study was to evaluate the autonomic and metabolic functions in adult rats subjected to a high-fat diet. **Methods:** Adult male Wistar rats were separated in groups(n=8), control (C) fed with normocaloric diet and high-fat diet (HF) with increased lipids in 30%, followed by 21 days. Glucose tolerance test (GTT) was determinate after glucose load injection(1.5g/kg i.p.). Blood Pressure (BP) and Heart Rate (HR) were directly recorded using Windaq. Cardiac autonomic activity was evaluated using pharmacological blockade (Atenolol,Atropine). Baroreflex sensitivity was assessed by HR responses to phenylephrine and sodium nitroprusside injections. Animals were euthanized through anaesthetic Sodium Pentobarbital. The blood was collected to evaluate the triglycerides (TG) through kits (Labtest, BR), and insulin and leptin were evaluated by RIA(Linco Research). The Retroperitoneal fat pads were collected and weighted. **Results:** There was no difference in the body weight in between groups.The TG level was higher in HF(79±5mg/dL) then C(40±4mg/dL).There was glucose intolerance in HF(226±12AUC) when compared to C(169±16AUC).Insulin and leptin were 26% and 364% augmented in HF compared to C, respectively.The retroperitoneal fat pad was increased in HF(19±2g/Kg) compared to C(5±0.5g/Kg).The obesity did not change resting BP and HR but reduced bradycardic in HF(C:1.6±0.3;HF:0.9±0.1).Sympathetic tonus was increased in HF(65±9bpm) compared to C(37±13 bpm), but vagal tonus did not change between groups. **Conclusions:** In conclusion, our data provide evidences that short-term administration of HF diet was able to promote cardiovascular autonomic dysfunction associated with metabolic damage in rats, which can contributes to increase cardiovascular disease risk.

T-158-P

Timed Fat Feeding in Rats Induce Diurnal Variation in Vascular Function

Israel Orta, LaShanni L. Butler, Joyce M. Richey *Los Angeles, CA*

Background: Recent evidence in mice, demonstrates that fat feeding restricted to 8 hours during the night, prevents obesity and its associated abnormalities. In light of these findings, we undertook the current study to examine the effects of restricted timed fat feeding on vascular function. **Methods:** Towards this end, male Wistar rats (n=10) with initial weights of 262± 6.2 g

were fed control (C, n=3) or 60% high fat (HF, n=2) diets either during the day (D) from 7am-7pm, (lights on) or during the night (N) from 7pm-7am, (ights off) for a period of 3 weeks (w). Body weight (BW) and food intake were measured bi-weekly and daily, respectively. For assessment of vascular function, thoracic aortae were isolated and cut into 3 mm rings and suspended in tissue baths with an optimal passive tension of 3 g for measurement of isometric tension. **Results:** Total caloric intake over the 3 w was 11% less in HF-D rats compared to HF-N, 1313 vs. 1166 kilocalories (p<0.001). BW increased significantly in all groups, but did not differ among groups, average weight at time of sacrifice (361 ± 23.4g, p<.05 vs initial wt). Interestingly, 3 w of timed fat diet resulted in differential vascular responses to the vasoconstrictor phenylephrine, whereas the maximal contractile responses to cumulative doses of PE were significantly reduced in HF-D rats, reaching only 28% of baseline compared to Con (>80% for both D and N) and HF-N (50%) (p<.05 HF-D vs. Con) **Conclusions:** These data demonstrate evidence for development of vascular dysfunction prior to significant weight gain during fat loading. These data also show that fat feeding restricted to the day when rats are inactive, may have a more deleterious effect on vascular function.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Intervention Studies - Behavioral-Pediatric

T-159-P

Using Technology to Deliver a Responsive Parenting Intervention to Promote Healthy Weight Gain in Toddlers: Which Components Seem Reasonable for Low-Income Mothers Participating in WIC?

Jennifer S. Savage, Kari C. Kugler, Leann L. Birch *University Park, PA*

Background: Without effective interventions, half of US children may be obese by 2030. Most interventions take the "kitchen sink" approach, including a combination of intervention components; however, it is unclear what combinations of components are optimal. This study examines the feasibility of delivering different types of intervention components, varying in content and mode of delivery, among a high-risk population enrolled in the Women Infant and Children (WIC) program. **Methods:** An initial pilot intervention included 122 mothers with toddlers enrolled in the WIC program who were randomized to one of three responsive feeding conditions: brochure, home visits, home visits plus mobile technology. Based on pilot findings, a feasibility study (N=100 dyads) was conducted using the multiphase optimization strategy (MOST). Mothers were randomized to receive 1 to 8 interventions components (e.g., feeding practices, meal/snack frequency, responsive parenting, goal setting, tailored messages, etc.) blocking on maternal depression. Assessments occurred at 1 and 6 months post intervention. **Results:** Nearly two-thirds of mothers viewed the video messages and 84% intended to use the information. Mothers who received video messages were significantly less likely to use food to soothe or manage behavior and a forceful feeding style than those receiving handouts only. Data on the feasibility of delivering different combinations of components, based on participant and staff satisfaction, will also be presented. **Conclusions:** Results from the initial pilot study show promise, suggesting that technology can be used effectively to change parent feeding behavior among this low-income population. The merits of using a more efficient experimental design that includes technology with hard-to-reach populations will also be discussed.

T-160-P

Cost Effectiveness of Family-Based Treatment for Child and Parental Obesity

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Background: Obesity runs in families, and family-based treatment (FBT) is associated with significant weight loss in obese children and their parents. Yet, many pediatric obesity treatments focus on the child, either by intervening directly on the child, or by teaching the parent to be the agent of change. FBT may offer cost-savings as one treatment creates effects in both child and parent, eliminating the need for separate treatments. The objective of the present study was to compare the cost-effectiveness of FBT compared to

treating the obese parent and child separately. **Methods:** Fifty overweight/obese 8–12 year-old children with overweight/obese parents were randomly assigned to a 12 month FBT or a similar treatment program that separately treated parents and children (PC). Between group differences in payer costs, participant costs, and societal costs were used to compare cost effectiveness between groups using one-way analysis of variance. **Results:** Intent to treat analysis showed significantly lower costs per family were observed for FBT than PC for payer costs ($842.78 + 146.31 vs $1005.94 + 140.27; $F(1,47) = 15.86$, p < 0.001), participant costs ($610.49 + 238.25 vs $1254.65 + 338.89; $F(1,47) = 59.65$, p < 0.001) and societal cost per family ($1,453 for FBT and $2,261 for PC, p < 0.001). At 12 months, FBT parents lost 12.7 lbs. and FBT children lost 7.5 percent overBMI units. PC parents lost 7.7 lbs. and PC children lost 3.7 percent overBMI units. **Conclusions:** The data suggest that FBT is a more cost effective treatment for families with overweight children and parents. Given the high rates of obesity in both adults and children, FBT may provide a promising platform for obesity intervention that can treat children and parents simultaneously, facilitating effective resources utilization and significant impact.

T-161-P[DT]

Participants in the MATCH Wellness Intervention Demonstrate Improved Weight Status After 4 Years

Suzanne Lazorick, Xiangming Fang, Yancey Crawford, Lauren Needell, Alexis T. Barnett, George T. Hardison *Greenville, NC*

Background: Motivating Adolescents with Technology to Choose Health (MATCH) has been provided in select low-resource, high-obesity, rural NC schools for 7 years. In 2009, MATCH was expanded in two intervention schools compared to one control school. We report 4 year results. **Methods:** In spring 2009, 7th grade teachers in 2 schools were trained and delivered the MATCH curriculum, while 1 school served as control. In 2013 students still enrolled in the district(s) were recruited for re-measure. Outcomes include: BMI Z-score, BMI %ile for age/gender and weight category. Wilcoxon rank test was used to compare measures at each follow-up between the MATCH and Control groups and linear mixed models were adopted to compare the overall trend in time between groups. **Results:** Participants were 68% black, 23% white, and over half were either overweight (OW) or obese (OB) at baseline. Of original participants, 104/189 (55%) MATCH and 117/173 (68%) control were re-measured, with no differences in gender, age or weight status of those retained. Among the all overweight (combined OW + OB) group at baseline and comparing control (C) to MATCH (M), respectively, the change in BMI Z score (C= 0.02, M = -0.07) and BMI %ile (C= -1.3, M= -5.2) decreased more in the M group. In mixed models for both BMI Z score (p=0.0076) and BMI %ile (p<0.001), the MATCH group had a significantly downward trend that was significantly different than control. For changes in weight category: in C after 4 years, % Healthy Weight (HW) decreased (53% to 48%), % OW increased (17 to 18%), and % OB increased (29 to 34%); in the MATCH group the % HW increased (40% to 46%); % OW decreased (23 to 18%), and % OB decreased (37 to 31%). **Conclusions:** School-based wellness education integrated within standard curriculum in high risk adolescents can result in improved weight status and should be further explored.

T-162-P

Weight Status and Temperament: Among Toddlers Enrolled in WIC, Higher Weight Status Is Associated with Lower Effortful Control and Lower Surgency

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Background: Prior research has revealed that aspects of temperament, defined as individual differences in regulation and reactivity, are related to child weight status. However, very little research to date has examined these associations among high-risk populations, which is the aim of this study. **Methods:** 236 mothers with children 12-36 months old participating in the Pennsylvania Women Infants and Children (WIC) Program completed demographic information and the very short Early Childhood Behavior Questionnaire (ECBQ), which identifies three higher-order factors of temperament, surgency (SUR), negativity (NEG), and effortful control (ORC). Multiple imputation was used to address missing data. Maternal BMI and child weight and length were collected, and relations between temperament factors and child weight status were assessed. **Results:** Mothers were primarily white (71%) and overweight (mean BMI 29). 37% of toddlers were above the 85th

percentile on WHO weight for length measurements. Confirmatory factor analysis of the very short ECBQ revealed a poor fit. A revised three factor model demonstrated acceptable fit indices after removing 15 items that did not load on any factor (SUR r = 0.73, NEG r = 0.71, ORC r = 0.66). Higher levels of toddler surgency and effortful control were significantly associated with lower toddler weight for length after controlling for maternal BMI. **Conclusions:** The ECBQ may serve as an acceptable measure of temperament in toddlers as young as 12 months. Associations between toddler weight status and temperament in this WIC sample are consistent with findings from lower risk samples, which points toward its potential use as a universal tool in identifying an early risk factor for childhood obesity.

T-163-P

Impact of the Prenatal Maternal Diet on Children's Liking and Intake of Vegetables at 4-6 Years

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Background: Flavors from a mother's diet during pregnancy are transmitted to her developing fetus. Prenatal maternal dietary habits may influence her child's subsequent liking and intake of foods with similar flavor characteristics. Such foods might include bitter (e.g. broccoli) and sweet (e.g. carrots) vegetables. **Methods:** Secondary data analysis of 81 ethnically diverse children (mean ± SD age = 5.04 ± 0.77 y., BMI z-score = 1.0 ± 1.02) was used to explore the relationships between mothers' reported intake of vegetables during pregnancy and children's liking and intake of vegetables at 4-6 years. Children's intake of vegetables was assessed with a parent-reported questionnaire and a laboratory mixed test-meal. Children's liking of vegetables was measured using a 5-pt. Likert scale. BMI z-scores were calculated from children's weight and height measured prior to the meal. Data were analyzed using bivariate correlations with and without controlling for parent-reported frequency of children's vegetable intake at home. **Results:** Mothers' reported intake of bitter vegetables positively correlated with children's liking (r = 0.25, p < 0.04) and intake (r = 0.25, p < 0.03) of bitter vegetables. After controlling for children's bitter vegetable intake at home, the association between mothers' and children's bitter vegetable intake remained significant (r = 0.24, p < 0.05). There were no significant associations between mothers' reported intake of sweet vegetables and children's liking (p = 0.26) or intake (p = 0.51) of sweet vegetables. **Conclusions:** The prenatal maternal diet may impact children's liking and intake of vegetables, particularly vegetables with bitter flavors. This association may exist independently of children's usual intake of bitter vegetables at home. These findings may be helpful for developing dietary interventions for children and their families.

T-164-P

Motivational Interviewing and Adherence to Pediatric Obesity Treatment: Results from the MI Values Randomized Controlled Trial

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Background: Poor treatment adherence and high attrition are notorious challenges in obesity treatments. Motivational interviewing (MI) may help address these concerns. MI Values is a randomized controlled trial of MI implemented as an adjunct to a multidisciplinary adolescent obesity treatment program (TEENS). We examined the effects of MI Values on TEENS attrition and adherence. **Methods:** TEENS participants who consented to MI Values (82%) were randomized to MI (n=58) or control (n=41). At weeks 1 and 10 of TEENS, MI participants engaged in 30-minute, individual MI sessions; control participants viewed health education videos. All participants continued with TEENS per protocol, which involved biweekly dietitian and behavioral support visits plus 3x/week of supervised physical activity. TEENS attrition and adherence were monitored and assessments completed at 3 and 6-months. T-tests and chi-square analyses examined group differences in attrition and TEENS protocol adherence. **Results:** Adolescents (N=99) were primarily African American (AA; 73%) and female (74%) with a mean age of 13.8 years. Mean body mass index percentile was 98.0. Compared to controls, MI participants had greater 3 month adherence to dietitian (91% vs. 84%; p=0.046) and behavior support (93% vs. 85%; p=0.041) visits, and greater 6-month adherence to behavioral support visits (88% vs. 79%,

p=0.011). There were no group differences in gym attendance. Further, MI participants remained in TEENS ~8 weeks longer than controls. **Conclusions:** MI can be an effective adjunct to pediatric obesity interventions, contributing to greater program adherence and reduced attrition. MI Values is the first study to examine the impact of MI on these treatment issues among obese, primarily AA adolescents. Discussion will focus on strategies to integrate MI into obesity treatments targeting underserved adolescents.

T-165-P
Parent Behavior Change in Childhood Obesity Treatment

Abby Braden, David R. Strong, Kerri N. Boutelle *La Jolla, CA*

Background: During family-based treatment (FBT) for childhood obesity, parents learn a variety of weight management strategies including diet modification, physical activity, stimulus control, self-monitoring, and to engage in program related behaviors with their child. The current study evaluated changes in recommended behaviors by parents and parent BMI following FBT. **Methods:** Participants included 52 overweight or obese 8-12 year old children and their parents who completed a 5-month weekly FBT program as part of a randomized study evaluating a parent-only treatment. Parent behaviors promoted by FBT (diet, physical activity, stimulus control, self-monitoring, parent involvement with child) were assessed at baseline and post-treatment by self-report. McNamar test evaluated significant differences in parent behaviors pre to post-treatment, and a linear regression evaluated impact on BMI. **Results:** After treatment, parents were significantly more likely to report changes in self-weighing (61.5%to 92.3%;p<.001), counting calories (31.4% to 74.5%;p<.001), self-monitoring (26.9% to 82.7%;p<.001), decreased availability of chocolate candy in the home (1.9% to 15.4%;p<.01), decreased availability of cookies/cake in the home (3.8% to 21.2%;p<.01); eating a certain amount of calories (21.2%-61.5%;p<.05); engaging in physical activity with my child (40.8% to 65.3%; p<.01). Scales were created based on the groups of parent behaviors. In a final model controlling for baseline BMI and treatment group, parent involvement and self-monitoring were both significant predictors of parent BMI post-treatment. **Conclusions:** Results show that some parent weight control behaviors targeted in FBT change after treatment and impact parent BMI. Although FBT targets child obesity, parents may also experience direct benefit from participation, including practicing weight loss behaviors.

T-166-P
Child Motivations for Weight Loss: Influence of the Family

Abby Braden *La Jolla, CA*; Scott J. Crow *Minneapolis, MN*; Kerri N. Boutelle *La Jolla, CA*

Background: The impact of child motivation on treatment outcome among children enrolled in family-based treatment (FBT) for obesity has not yet been investigated. The current study evaluated weight loss motives among treatment-seeking, overweight children, and their relationship to treatment completion and outcome. **Methods:** Participants included 77 overweight children, aged 8-12, who were enrolled in a 5-month weekly FBT program as part of a randomized study evaluating a parent-only treatment. Motivation was assessed at baseline, and BMI was assessed at baseline, post-treatment, and 6-months post-treatment. Motivation of the child was assessed using a check-list of weight loss motives that were divided into two scales reflecting personal ("I want to do better at sports," "I am tired of my weight," "I feel bad about myself," "I want to look better," "I want to fit into different clothes," "it was too difficult for me to get around," and "I want to have better health") and social/familial reasons ("Parent said I should," "I saw a friend or family member lose weight," and "my family teases me about my weight"). **Results:** The most frequent motivations endorsed by the children were "I want to look better" (84.4%) and "I want to have better health" (81.8%). Logistic and multiple regression analyses were calculated to examine the impact of motives on treatment completion and outcome. A greater number of social/familial motives was associated with treatment completion (p=.04) and a lower child BMI at 6-months post-treatment (p=.05). **Conclusions:** Findings highlight the importance of involving families in child obesity treatment. Children who report motivations to lose weight because of social/familial influences may be more engaged in treatment and have better long-term weight loss, as compared to children who are less motivated by family/social reasons.

T-167-P^{DT}
Developing and Piloting a Novel Culturally-Tailored Group Intervention for Multi-Ethnic Obese Adolescent Girls

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Background: Obesity is common among adolescents and disproportionately affects Hispanic and African-American youth. Adolescent obesity is known to be difficult to treat, in part due to low patient engagement and high attrition rates. However, less is known about culturally appropriate treatments for obese youth. **Methods:** We conducted 3 focus groups of 12 overweight/obese males and females (ages 13-20) recruited from an urban adolescent primary care clinic. The semi-structured focus groups were designed to elicit ideas about the optimal obesity treatment approach. We then developed and piloted a group intervention among 5 adolescent females (ages 14-22; Mean BMI=48.9, SD=13.2) recruited from the PREP obesity program in the Division of Adolescent/Young Adult Medicine at Boston Children's Hospital. **Results:** Guided by focus group feedback for an interactive, single-sex group intervention run by non-medical providers, we designed a 6-week group intervention co-led by nutrition and psychology. The intervention was informed by motivational interviewing, mindfulness, and cognitive behavioral therapy techniques. Sessions included lessons about food quantity and quality, media literacy, hunger, mindful eating, weight-based stigma, body image, emotional eating, and coping with stress. Five female adolescents (3 Non-Hispanic Black, 1 Hispanic, 1 Non-Hispanic White) completed the interactive groups, which were well-received (4.9/5 satisfaction rating), well-attended (96% attendance), and resulted in weight loss (mean=-3.3kg, SD=6.6). **Conclusions:** Our interactive group intervention piloted among a multi-ethnic group of obese adolescent girls was highly acceptable, resulted in minimal attrition, and produced favorable changes in weight. Results underscore the importance of involving adolescents in the development of adolescent-targeted interventions.

T-168-P^{DT}
Obesity, Dietary Intakes and Physical Activity Differ by Income Status in 5th Graders Participating in 5th Gear Kids

Michelle Cardel, Thrudur Gunnarsdottir, Jimikaye Beck, John C. Peters, James Hill *Denver, CO*

Background: Low income children may be at greater risk for obesity, and the factors that influence this relationship remain unclear. **Methods:** We examined baseline health-related behaviors and perceptions by income status in children participating in 5th Gear Kids (5GK), a multi-level childhood obesity prevention program in 5th Graders. Participants included children from two school districts in Colorado (n= 6679; mean age 10.07). Anthropometrics were measured and health-related behaviors and perceptions were reported with a validated questionnaire in a sub-sample of children (n=3023). Free/reduced lunch (FRL) prevalence in each school was used to group schools into income levels (HIGH <33% FRL; MED 33-66% FRL; and LOW >66% FRL). **Results:** Overweight was significantly more prevalent in LOW when compared to HIGH (21% vs. 11.6%). Obesity rates, however, were significantly lower in LOW relative to HIGH (0.82% vs. 2.60%). Over 90% of the total sample reported eating healthy was important to them and no differences in fruit/vegetable intakes were observed. However, children from LOW consumed more fast food and sugar-sweetened beverages, and reported that even when they knew what the healthiest food was, they would pick it less when compared to HIGH (p<0.05). HIGH were more likely to report that physical activity (PA) was important to them and reported higher PA relative to LOW (p<0.05). Nevertheless, HIGH reported walking/biking to school significantly less than LOW and were more likely to perceive walking/biking to school as dangerous. **Conclusions:** Children from LOW were more likely than HIGH to be overweight but not obese. Overall, LOW reported a higher prevalence of many diet and PA behaviors typically associated with obesity, but differed in their perceptions of PA-related behavior, including perceived safety of walking/biking to school.

T-169-P

Acceptability and Feasibility of the Feeding, Families and Fun Intervention for Reducing Solid Fat and Added Sugar Intakes among Low-Income Preschoolers

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Background: Solid fats and added sugar (SoFAS) intakes among preschoolers well-exceed recommendations and contribute to child obesity, but have not been explicitly targeted in prevention efforts, particularly in high-risk populations. The objectives were to evaluate the feasibility and acceptability of Feeding, Fun, and Families (FFF), a behavioral and nutrition intervention for low-income mothers of preschoolers aimed at reducing SoFAS intakes by emphasizing portion size and authoritative child feeding strategies. **Methods:** FFF was pilot tested in a single-arm, 12 wk group intervention emphasizing facilitated discussion via a trained moderator. Behavioral change principles (e.g. problem solving, goal setting) were used to address child feeding (i.e. structure, limit setting) and nutritional targets relevant to child SoFAS intake (e.g. snacking, portion size). Participants were 9 predominately African American mothers of preschoolers recruited through Women, Infant, and Children offices. Program acceptability/feasibility were assessed by maternal self-report and by the completion of pre-/post-intervention measures: child SoFAS intakes (3, 24 hr dietary recalls), measured height/weight, and mother-child meal observations. **Results:** Of 9 dyads, 8 mothers and 3 children were either overweight or obese. Attendance was high (7 of 9 mothers attended ¾ of sessions) and program targets appeared feasible (7 of 9 mothers reported no difficulty making changes). Approximately 60% of dietary recalls were completed and 8/9 mothers completed pre-/post- questionnaires, observational, and anthropometric assessments. Program acceptability was high (8 of 9 mothers rated as very/extremely helpful). **Conclusions:** Results provide initial evidence of feasibility and acceptability of FFF to reduce child SoFAS intakes through authoritative approaches to child feeding.

T-170-P

Effectiveness of a Family-Based Group Treatment: Two Year Outcomes of PHIT Kids

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Background: Comprehensive and multidisciplinary programs are recommended for pediatric weight management (Barlow and the Expert Committee, 2007). While the short-term effects of such programs have been closely examined, additional investigation of long-term outcomes is needed. **Methods:** 155 youth aged 9 to 18 years with a BMI over the 95th percentile enrolled in PHIT Kids, a multidisciplinary weight management program at a Midwest children's hospital. The program targets family-based lifestyle changes in an ethnically diverse, primarily inner city population through classes offered in English and Spanish. Active treatment consists of 24 weekly sessions, followed by monthly maintenance visits for a total of 2 years. Child anthropometric data were measured at 6 time points throughout active treatment and maintenance, and children eligible to have completed all time points were included in a multi-level model analysis examining change over time in BMI z-scores. **Results:** Reductions in BMI z-scores were seen over the course of treatment (t = - 6.98, p < .001), and average BMI z-score decreased from 2.36 (SD = .33) at baseline to 2.31 (SD = .34) at post-treatment (24 weeks). No significant change in BMI z-score was found between post-active treatment and 24 months (t = - .11, p = .92; M = 2.24, SD = .44). However, only 35% of children completed both treatment and 24 month follow-up. **Conclusions:** Children attending PHIT Kids showed reductions in BMI z-scores during active treatment participation and maintained these changes at 24 months, suggesting that hospital-based multidisciplinary pediatric weight management programs may have long-term effects on child health. However, the ability to understand long-term outcomes is hampered by attrition in long-term follow-up studies. Future efforts should focus on increasing long-term enrollment in treatment outcomes studies.

T-171-P

Recruitment Response Rates for a Parent-Based Healthy Lifestyle Intervention for Head Start Preschoolers

Bethany J. Gaffka, Jennifer Hahm, Julie C. Lumeng, Niko Kaciroti, Karen E. Peterson *Ann Arbor, MI*

Background: Little is known about recruitment for parent-based preschool obesity intervention & prevention programs. The objective of this study was to examine response rates, by child weight status, to a recruitment flyer distributed to Head Start parents advertising the opportunity to participate in a group program to develop healthy eating & activity habits for their child. **Methods:** Parents of 850 Head Start preschoolers were invited via recruitment flyers to participate in a 10-week parent group to learn how to develop healthy eating & activity habits for their young children. Parents provided consent to release height & weight collected by Head Start at the beginning of the school year to determine eligibility. Weight status was determined using CDC guidelines based on sex- and age-specific reference data. Chi square statistics were calculated to assess differences in response rate for parents of obese/overweight vs. normal weight children. **Results:** Weight status of the 850 children who received recruitment flyers is as follows: 18% obese, 16% overweight, 61% normal weight, and 5% underweight. 22% of parents consented to be screened for eligibility and the weight status of these children is as follows: 17% obese, 16% overweight, 66% normal weight, and 5% underweight. There were no significant differences in response rates for parents of obese/overweight vs. normal weight children (p=.63). **Conclusions:** Similar response rates to a flyer recruiting parents to participate in a parent-based group for developing healthy eating and activity habits were observed for parents of obese, overweight, and normal weight children. Given that low-income children are at higher risk for obesity, the rate of interest across weight status groups is encouraging and may represent a group of parents who may benefit from an obesity prevention or intervention program.

T-172-P

Exploring the Role of Parents in Pediatric Weight Management Treatment: Parent and Youth Perspectives

Bethany J. Gaffka, Susan J. Woolford *Ann Arbor, MI*

Background: It is widely accepted that parental involvement in pediatric weight management programs leads to greater improvements in child weight status compared to treatment programs that do not have parental participation. The objective of this study was to better understand parent and youth perceptions of the role of parents in youth weight management efforts. **Methods:** Obese youth and their parent were invited to participate separately in a 30-minute telephone interview within 2 weeks of their initial visit to a multidisciplinary weight management center. One of the interview questions asked parents and youth to describe the specific types of things parents should be primarily responsible for doing to help their child achieve a healthy weight. Interviews were recorded and transcribed verbatim, and 7 major themes were identified. Kappas were calculated to assess for parent-child agreement for discussing the same themes. **Results:** Twenty-eight parent-child dyads completed the interview. The majority of youth (mean age = 12.7 ± 2.4 years; mean BMI = 37.6 ± 7.5) interviewed were female (61%) and covered by commercial insurance (60%). The top 3 themes parents described needing to take primary responsibility for were: grocery shopping (71%), encouragement to exercise (70%), and portion control (36%). The top 3 themes youth wanted their parents to take responsibility for were: grocery shopping (57%), encouragement to exercise (36%), and assistance with dining out (32%). Agreement for parent-child dyads was non-significant for all 7 major themes. There were no age or gender differences. **Conclusions:** These results suggest that within dyads there is significant disagreement about what types of things parents should do to assist their child with achieving a healthy weight.

T-173-P

A Culturally Adapted Family-Based Treatment Program for Overweight and Obese Mexican-American Children

Stephanie Knatz, Alfonso Robles, Kay Rhee, Kerri N. Boutelle *San Diego, CA*

Background: Latinos and their children have been disproportionately affected by the high prevalence of overweight and obesity in youth. Recent studies suggest that 42% of Latino children aged 6-19 are overweight or

obese. Cultural differences and responses to traditional family-based behavioral treatment (BFT) suggest the need for interventions designed specifically for Latino families. **Methods:** We developed and pilot-tested a culturally-sensitive FBT program for Latino families. Focus groups were conducted with 41 Latino families in the developmental stages of treatment formation to obtain qualitative information on how behavioral weight loss techniques could be tailored to be more culturally suitable. Based on this information and existing literature, a 12-session treatment protocol was developed by adapting traditional FBT. Adaptations included Spanish translation, culturally-tailored activities, and diet modifications.Three waves of treatment were conducted with a total of 22 families using an iterative treatment approach, with adaptations made at each wave based on interventionist and participant feedback. **Results:** Twenty-two 8-12 year old overweight and obese children [59% female; age = 10 (1.35); BMI% = 97.3 (1.9)] and their parents (91% female; BMI=30.5 (6.3); 52% work in home) participated in treatment. Parents reported high acceptability and liking of the treatment program and its primary components (i.e. 86% parents "liked a lot" or "loved" it; 95% would recommend to other families; 85% felt program helped child have more control over eating). Pre-post changes in child BMI-Z and parent BMI scores approached significance (child BMI-Z change = -.07, p < .10; parent BMI change = -.4, p < .09). **Conclusions:** Culturally-adapted FBT is a feasible and well accepted treatment for Latino children, with the potential to improve weight loss outcomes.

T-174-P

Impact of a Psychological Diagnosis on Changes in Health Indicators in a Clinical Pediatric Weight Management Program

William Stratbucker, Jared Tucker, Kyle E. Culver, Adelle M. Cadieux *Grand Rapids, MI*

Background: Research evaluating the impact of psychological diagnoses on pediatric obesity treatment outcomes is limited. There is some evidence to suggest that youth who are referred to a weight management program are more likely to have psychopathology. This research examines the relationship between diagnosed psychological disorders and changes in health indicators during pediatric weight management treatment. **Methods:** Participants included obese youth ($\geq$95th percentile for BMI) who completed a 9-month multidisciplinary weight management program. Anthropometry and fitness measures were assessed at the beginning and end of the treatment course. Evidence of having been diagnosed with a psychological disorder prior to initiating treatment was assessed from medical records or a psychology consult. **Results:** A total of 80 participants with a mean ($\pm$SD) age of 12.6$\pm$2.7 years completed treatment. Upon completion, participants with no psychological diagnosis had a significantly greater reduction in percent body fat (p=0.0433) and waist circumference (p=0.0445) than participants with a psychological diagnosis. In addition, patients with no diagnosed psychological disorder had greater increases in fat-free mass (p=0.0039), and handgrip strength (p=0.0160) than patients with a psychological disorder. **Conclusions:** Obese youth with no history of a psychological diagnosis have greater improvements in body composition than patients with a previous psychological diagnosis. Having a psychological diagnosis may contribute to differences in weight management outcomes and may require specialized treatment to address comorbidities and mental health issues prior to obesity treatment. However, future research is needed to determine the degree to which these psychological diagnoses are well-controlled, and how this impacts the success of obesity treatment.

T-175-P

Relationship among Psychological Disorders, Body Composition and Aerobic Fitness in Obese Youth

Jared Tucker, Adelle M. Cadieux, Kyle E. Culver, William Stratbucker *Grand Rapids, MI*

Background: Childhood obesity increases the risk of adverse psychological and physical wellbeing. However, the relationship between psychological disorders, health indicators, and health behaviors among obese youth is not well understood. The purpose of the current study was to assess differences in anthropometry, physical activity, and aerobic fitness among obese children either with or without a diagnosed psychological disorder. **Methods:** Participants included obese youth ($\geq$95th percentile for BMI) who were to be enrolled in a multidisciplinary weight management program. Anthropometric measures included height, weight, body composition, and waist circumfer-

ence. Aerobic fitness was assessed using a maximal treadmill exercise test and moderate to vigorous physical activity (MVPA) was measured via self-report. Evidence of having been diagnosed with a psychological disorder was assessed from medical records. **Results:** A total of 56 of 80 (70%) obese youth (12.6$\pm$2.7 years old) had been diagnosed with a psychological disorder. Participants with a psychological diagnosis had a higher BMI (p=0.0058), BMI z-score (p=0.0360), percent body fat (p=0.0042), and fat mass (p=0.0073) when compared to participants with no diagnosis. In addition, participants with a psychological disorder had lower levels of MVPA (p=0.0261) and a lower VO2max (p=0.0005) compared to participants without a diagnosed disorder. **Conclusions:** Results showed that body weight and body fat estimates for those with a psychological diagnosis were even greater than in obese youth without a psychological diagnosis. Future research is needed to determine what specific psychological-related factors are impacting obesity, and whether these factors can be reduced or eliminated if psychological disorders are well-controlled.

T-176-P

A Pilot Study of the Efficacy and Program Cost-Effectiveness of Prevention Plus for Childhood Obesity

Shannon Looney, Hollie Raynor *Knoxville, TN*

Background: In 2007 recommendations for the treatment of childhood obesity in the primary care setting, using a staged-approach, were published. Limited research has evaluated the efficacy of these recommendations. Thus, this pilot study tested the efficacy of components of Prevention Plus (stage 1), using a tiered approach, for the treatment of childhood overweight and obesity in a primary care setting. Cost-effectiveness was also evaluated. **Methods:** Twenty-two overweight/obese children (8.0 $\pm$ 1.8 years; 2.34 $\pm$ 0.48 z-BMI; 68.2% female, 72.7% White, 90.9% non-Hispanic) were randomized to one of three, 6-month conditions: 1) newsletter (N); 2) newsletter and growth monitoring (N+GM); 3) newsletter and growth monitoring plus family-based behavior counseling (N+GM+BC). Primary outcomes were z-BMI and program cost-effectiveness for different medical professionals that may deliver the intervention in the primary care setting. Outcomes were analyzed using linear mixed-factor analysis of variance (ANOVAs) and one way ANOVAs using the intent-to-treat principle. **Results:** There was a significant (p<0.05) main effect of time for z-BMI (ΔN+GM+BC: -0.16 $\pm$ 0.22, ΔN+GM: -0.08 $\pm$ 0.15, ΔN: -0.06 $\pm$ 0.24). Cost-effectiveness was significantly (p<0.001) different between conditions. The N condition had the smallest decrease in z-BMI, but was least costly condition due to minimal personnel costs, so appeared to be most cost-effective. While the N+GM+BC condition had the greatest decrease in z-BMI and was the most expensive due to high personnel costs, it was more cost-effective than the N+GM condition. **Conclusions:** N+GM+BC promoted the greatest change in z-BMI, but personnel costs should be considered during implementation.

T-177-P[DT]

A Feasibility Study of Group Parent Training for the Prevention of Obesity (GPT-O) in Low-Income African Americans at a Community Clinic

Camden Elliott, Marian Tanofsky-Kraff *Bethesda, MD*; Nancy Zucker *Durham, NC*

Background: Obesity prevention is a priority among young, African-American (AA) children. We therefore conducted a pilot study of an 8-week group parent training for obesity prevention program (GPT-O) within a community setting serving primarily low-income, AA families. GPT-O targets parent self-efficacy via instruction in general parenting skills (behavior modification, establishing routines), stress management, and nutrition education. **Methods:** Twenty parents/guardians of primarily obese (BMIz 2.5$\pm$.9), AA youth (4.1y$\pm$1.5, 70% female) were assigned to an open-trial of GPT-O. Parents completed questionnaire assessment of parenting and child eating behavior at baseline and post-intervention, and feasibility/acceptability questionnaires at post-intervention. Children's height and weight were collected at baseline, post-intervention, and 3-month follow-up. **Results:** Retention through post-intervention was 75%. Of these participants, average attendance was 5.1$\pm$2.1 of 8 sessions. Parents reported enjoying the program (100%), and found it to be helpful (87%) and feasible (79%). At post-intervention, parents reported less authoritarian (p=.02) and permissive (p=.03) parenting, improved feeding practices (p=.03), and a reduction in youth's eating-related problem behaviors (p=.01). Parent report of youth's daily caloric

intake decreased from baseline to post-intervention (p=.04), with less calories consumed from saturated fat (p=.04) and added sugars (p=.06). Child BMIz was unchanged from baseline to post-intervention (p=.70), but decreased by 3-month follow-up (p=.02). **Conclusions:** GPT-O is feasible and acceptable to AA families. Preliminary results suggest that GPT-O may improve parent and child behavior and prevent excess pediatric weight gain. An adequately powered and controlled trial is warranted to evaluate the efficacy and potential change mechanisms of GPT-O.

T-178-P
Compulsive Eating/Food Addiction Intervention for Obesity, Implemented as a Smartphone App: A Pilot Study
Robert Pretlow *Seattle, WA*

Background: It was hypothesized that obesity is due to a confluence of: 1) uncontrollable eating of highly pleasurable foods, mostly as mindless self-medication for emotional pain (comfort eating), characterized by cravings for specific foods and dependence (addiction) involving food sensations; and 2) stress-induced compulsive eating, a form of displacement behavior (akin to nail biting), involving the mechanics of eating, characterized by urges to eat nonspecific foods, and manifested by snacking/grazing and consumption of excessive food amounts. **Methods:** An intervention was developed to address the hypothesis and implemented as a smartphone app. A six month pilot study was conducted with 44 obese youth (mean BMI: 39.2), ages 10-21, 19 males, 25 females, in two phases: Phase 1, problem food withdrawal/abstinence aimed at food addictions; and Phase 2, displacement behavior intervention with urge/trigger control, alternate behaviors, and stress management, aimed at snacking/grazing elimination and food amounts reduction. **Results:** Phase 1 was associated with 2.5% initial body weight loss. Phase 2 was associated with weight regain, with net 1.5% initial body weight loss for the study. Mean snacking level of subjects at the start of the study was 3.6 (scale 1-5, 5 greatest) vs. 2.3 at the end (n=31). Unexpectedly, excessive mealtime food amounts constituted the main obstacle to weight loss. Furthermore, life traumas resulted in re-consumption of problem foods. **Conclusions:** Problem food withdrawal/abstinence resonated with the youth in this study and was effective for modest weight loss. Displacement behavior intervention was successful for curbing snacking/grazing, however, further research is needed for reducing large food amounts in this population. Treating emotional distress (basis of compulsive eating) is necessary for sustainability.

T-179-P
Food Log 2.0: Benefits of using "Photologs" to Increase Compliance with USDA MyPlate Recommendations among Adolescents
Sheethal Reddy, Cristiana Milone *Atlanta, GA*

Background: Food monitoring is associated with increased awareness of food choices and caloric intake. Among successful "losers", food monitoring is associated with greater and more sustained weight loss (Wing & Hill, 2001). Common barriers to monitoring include time, shame/guilt associated with unhealthy food choices, and difficulty estimating portion sizes (Reyes et al., 2012). Also, there is a concern that food logs may create hypervigilance around caloric intake and instill a "diet mentality"for some children (Allen, Byrne, La Puma, McLean, & Davis, 2008). Most pediatric weight management programs emphasize a balanced plate approach based on current USDA recommendations (MyPlate). Given that MyPlate emphasizes a simpler visual, the use of a visual food log may be useful and appealing to adolescents. **Methods:** We implemented the "photo log" with a 17-year old male patient at Health4Life, an interdisciplinary childhood obesity program. Patient was seen 5 times over the course of 9 months. **Results:** After 4 months, BMI had increased from 51 to 54. Patient was then asked to send pictures of his meals on a weekly basis and received feedback from the nutritionist. Early photos revealed an irregular eating pattern, no fruits and vegetables, large carbohydrate consumption, and multiple servings at dinner. Photos gradually became more consistent with the plate method. Patient reported that the "photolog" was relatively easy to maintain and was easy to follow. **Conclusions:** Benefits include the ease of taking photos and more accurate portion size information. Future research will determine individual predictors of use and its direct effects on weight stabilization/loss.

T-180-P
Comparing Teen Mentors to Teachers on Changing Child Lifestyle Behaviors and Health Outcomes in Appalachia
Laureen H. Smith, Christopher Holloman *Columbus, OH*

Background: Childhood obesity prevalence rates in the United States are the highest in the rural Appalachian areas, exceeding the national averages by as much as double. **Methods:** This randomized controlled trial compared the effects of two curriculum delivery methods and assessed the mediating effects of the number of sessions attended on the outcomes. The control group (n =88) received the curriculum via an adult teacher in a classroom and the experimental group received the same curriculum via teen mentoring (n = 72). Data collected at baseline and post-intervention were analyzed using multilevel linear models. Each of the outcomes (e.g., BMI, blood pressure, current lifestyle behaviors) were modeled separately. **Results:** Only the mentored group showed a greater increase in physical activity behavior (p = 0.04) and a marginal decrease in BMI (p = .06). A medium effect size (ES) was found for current eating behavior (ES = .57) and improved diastolic blood pressure (ES = .56) in the mentored group. The mentored group had a greater positive change in intention than the adult teacher group (p = 0.04). **Conclusions:** Teen mentoring was an effective approach to impact the lifestyle patterns and health outcomes of children. Although an improvement in body mass index was not expected, the change may be the result of increased physical activity in the mentored group. Perhaps, the teens were more effective role models for physical activity or more supportive of children engaging in activities and play.

T-181-P
Skill Change Assessment and Perceived Utility of Motivational Interviewing Training for Adolescent Obesity Management
Beth H. Garland *Houston, TX*

Background: Research supports the importance of Motivational Interviewing (MI) techniques for all health professionals (RD, MD, NP, mental health providers) treating obesity. The MI spirit supports collaboration, evocation, and patient autonomy. These techniques consistently demonstrate benefits for outcomes for both adult and pediatric care. Given curriculum demands, the instruction of MI often falls to informal teaching by mentor/attending physician or as a seminar during training. This study assessed the perceived importance and utility of MI, knowledge changes during an intensive seminar of MI, including practice opportunities, as well as observed difference in practice changes by using standardized patient experiences. **Methods:** Fifty-four trainees (medical students, interns, residents) participated in a practice-oriented seminar on MI for management of adolescent obesity. Participants completed pre and post knowledge questionnaires as well as post measures on the perceive utility and importance of these skills. A subsample of the participants (n=8) also completed a pre and post standardized patient encounter focused on the use of MI with a caretaker of an adolescent with obesity and related comorbidities. **Results:** Knowledge of MI improved between 6-40% for various skills. Participants also ranked the use of MI skills as applicable and relevant. Resident responses indicated perceived improvement in the MI spirit, especially evocation. Standardized patient debriefing interviews indicated improvements in evocation and collaboration. Blind coding of videos will also be presented to demonstrate objective ratings of change over time. **Conclusions:** These results support the continued education of MI during medical training, especially in the context of pediatric obesity. Standardized patient experiences offer practical experience and comfort with new skills.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Intervention Studies - Diet and/or Physical Activity-Pediatric

T-182-P[DT]
Exercise Benefits on Cognition Vary by COMT Genotype and Sex in Overweight Children

Cynthia Krafft *Athens, GA*; Jennifer L. Waller, Haidong Zhu, Norman K. Pollock, Jacob Looney, Celestine Williams *Augusta, GA*; Jennifer McDowell *Athens, GA*; Catherine L. Davis *Augusta, GA*

Background: Aerobic fitness is associated with better cognition, and exercise interventions have shown cognitive benefits in children. The Met-Met genotype for catechol-O-methyltransferase (COMT) enzyme activity (rs4680) is linked with better cognition, and also with obesity. **Methods:** We conducted a randomized, controlled trial of 8 mo of a daily after school aerobic exercise program (59% attendance, heart rate during exercise = 161 ± 7 bpm) vs a sedentary program, to isolate the effect of physical exercise, in 175 overweight children (8-11 yrs, 87% Black, 61% female, 73% obese). Intent-to-treat mixed models tested effects on cognition (Cognitive Assessment System), % body fat (DXA), and VO_2 peak, measured at baseline and posttest. Group by time interactions and moderation by sex and COMT genotype were tested. **Results:** The exercise group showed reduced body fat and improved VO_2 compared to the control group (adjusted mean difference in change -1.0%, 1.4 ml/kg/min, respectively, both p=.04). There was no group by time effect on cognition. However, there was an interaction such that only the Met-Met COMT genotype showed a significant benefit of exercise on cognition (p<.01). Boys, but not girls, showed an exercise benefit on cognition. **Conclusions:** 8 mo aerobic training in overweight, mostly Black children resulted in improved fitness and reduced fat. Cognitive benefits were limited to those with the Met-Met COMT genotype, and boys. The Met allele is far more common in Whites than Blacks, and associated with sexual dimorphism. Thus, exercise may provide more cognitive benefits for White males than other populations. Prior studies with non-intervention control groups may have confounded program elements like adult attention with physical exercise.

T-183-P
Two Year Outcomes Following Community-Based Management of Childhood Obesity: The MEND Program

Duncan Radley, Catherine Gammon *Bromley, United Kingdom*; Paul Chadwick *London, United Kingdom*; Maria Kolotourou, Lindsey Smith *Bromley, United Kingdom*; Tim J. Cole, Paul M. Sacher *London, United Kingdom*

Background: MEND (Mind, Exercise, Nutrition… Do it!) is an internationally disseminated, community-based, multi-component, child weight management intervention (www.mendcentral.org). Previous data have demonstrated positive effects on a wide range of outcomes at 6 and 12 months post-intervention (Sacher PM et al. Obesity, 2010). Here we present 2 year longitudinal data for overweight and obese 7-13 year old children participating in a UK MEND program. **Methods:** Fifty-three MEND programs were conducted in community settings in London during 2009, and half were randomly selected for inclusion in the study. Of the 423 participants (with baseline BMI data) invited to participate, 286 families (68%) still had valid contact details. Measures included anthropometry, self-reported physical and sedentary activity levels, eating habits, self-esteem, parental perception of emotional distress and body esteem. **Results:** One hundred and sixty-five children (53% boys; mean age 12.7) agreed to participate. Mean duration between baseline and follow-up measurements was 2.4 years (SD ±0.3, range 1.8 to 2.8). In boys, 65% had reduced BMI z-scores, while mean BMI and waist circumference z-scores fell by 0.17 and 0.40 units respectively (both p<0.001) and eating habits, self-esteem, emotional distress, body esteem (all p<0.001) and physical activity (p<0.05) all improved. In girls, 42% had reduced BMI z-scores and eating habits and body esteem scores improved (both p<0.05). Other outcomes did not change significantly. Group by time interaction revealed a differential treatment effect on BMI z-scores between genders (p<0.001). **Conclusions:** Despite the absence of a control group, improvements in a number of health-related outcomes more than two years after

program completion are encouraging and warrant further investigation, particularly in regard to the observed differences by gender.

T-184-P
Fitness, Functionality and Physical Activity – Effects of a 12 Week Exercise Program on Obese Adolescents Participating in the RESIST Study

Megan Gow, Nancy van Doorn, Mandy Ho, Carolyn Broderick, Louise A. Baur, Chris Cowell, Sarah P. Garnett *Sydney, Australia*

Background: Adolescent obesity is associated with poor fitness and decreased capacity to perform functional tasks. This study examined the effect of a structured exercise program as part of a lifestyle intervention on physical activity, screen time, fitness and functionality. **Methods:** 111 obese adolescents (13.2 ± 1.9 years) with insulin resistance were recruited to a 12 month RCT, RESIST, with the primary aim to determine the optimal dietary macronutrient content to improve insulin sensitivity. Between 3 and 6 months of the RCT, 99 adolescents participated in two supervised exercise sessions per week. Physical activity and screen time were measured by the CLASS questionnaire, peak aerobic fitness by gas analysis during the Bruce treadmill protocol and body composition by DXA. **Results:** Peak oxygen uptake at baseline was low with mean (±SD) $VO_2max = 23.9(\pm5.4)$mL/kg/min. Between baseline and 6 months mean peak oxygen uptake improved by 6.2% (95%CI = 1.8 to 10.6; P=0.006), exercise time by 8.6% (95%CI = 4.6 to 12.5; P<0.0001) and time to reach the anaerobic threshold by 19.7% (95%CI = 10 to 29.4; P<0.0001). Changes were maintained at 12 months. Between baseline and 6 months, daily non-educational screen time decreased by 48 minutes (95%CI = 17 to 78; P=0.002) and physical activity increased by 21 minutes (95%CI = 7 to 35; P=0.005), but had returned to baseline levels by 12 months. A decrease in %body fat was associated with increased exercise time (r= -0.295, P=0.008) and relative peak oxygen uptake (r= -0.241, P=0.032). **Conclusions:** A structured exercise program can lead to sustainable improved aerobic fitness, including better exercise tolerance, facilitating functional task performance. However, as fitness levels remained low, further investigation into optimal exercise interventions and strategies to improve physical activity and screen time long-term are required.

T-185-P
Changes in Body Composition and Insulin Sensitivity in Adolescents with Pre-Diabetes After a 12 Month Lifestyle Intervention; RESIST a randomized control trial. ACTRN 12608000416392

Sarah P. Garnett, Megan Gow, Mandy Ho, Louise A. Baur, Helen J. Woodhead, Kerryn Chisholm, Jocelyn Halim, Kate Steinbeck *Sydney, Australia*; Manny Noakes *Adelaide, Australia*; Chris Cowell *Sydney, Australia*

Background: Pre-diabetes and insulin resistance in adolescents are rapidly emerging clinical problems with serious health outcomes. The aim of this study was to determine the efficacy of two structured lifestyle interventions, differing in diet macronutrient composition, on body composition and insulin sensitivity. **Methods:** A 12 month RCT, in Sydney, Australia. A total of 111 (66 girls), obese adolescents with either pre-diabetes and/or clinical features of insulin resistance were prescribed metformin and randomized to a structured diet, which was either high carbohydrate or moderate carbohydrate with increased protein. All adolescents participated in a 3 month, gym based program. Body composition was measured by DXA and whole body insulin sensitivity (ISI) was derived from an oral glucose tolerance test. **Results:** Eighty five (77%) adolescents, median age 13.1 [10 to 17 years], completed the 12 month intervention. Overall, the intention-to-treat analysis indicated there was a significant (P<0.001) decrease in BMI expressed as a %95th centile (133% to 126%) and body fat% (48% to 46%) and a significant increase in ISI (1.3 to 1.5). Change in body fat% explained ~15 % of the variation in change of ISI (Change ISI=0.09-0.06 change body fat%). There were no significant differences in outcomes between diet groups at any time point. **Conclusions:** In contrast to our hypothesis, obese adolescents at high risk of developing type 2 diabetes prescribed metformin, achieved a modest decrease in total fat and an increase in insulin sensitivity irrespective of the macronutrient content of the diet. Further strategies are required to better address pre-diabetes and clinical features of insulin resistance in adolescents.

T-186-P
Improvement in BMI Z-Score among Obese Youth Attending a 6-Day Overnight Summer Camp Did Not Predict Post-Camp Success in a Pediatric Weight Management Program

Shelley Kirk, Jessica G. Woo, Barbara Lattin, Marysusan Sewell, Michelle Frank, Christopher Kist, Robert M. Siegel *Cincinnati, OH*

Background: A summer camp for obese children can provide a healthy lifestyle immersion experience. Our aim was to determine the impact of an overnight camp to improve weight (WT) status of obese children in a pediatric WT management program and whether improved WT status after camp was predictive of WT status change up to 6-months post-camp. **Methods:** A 6-day camp program was developed for obese children (ages 9-13) in a pediatric WT management program. The camp menu followed a reduced glycemic load diet. Age-appropriate portions were selected by campers using measuring cups at meals. Camp offered daily non-competitive physical activities. Height (HT) and WT were measured the first morning of camp, with WTs repeated at the end of camp. Follow-up HTs and WTs were obtained at clinic visits up to 6-months post-camp. **Results:** Fifty-three (82%) of 65 children attending camp enrolled in the study. Subjects were 27 (52%) African-American, 25 (48%) Caucasian, and 19 (36%) male with median age = 11.4 years, BMI = 30.5 kg/m2, and BMI z-score = 2.35. Subjects were grouped by their success as measured by median improvement in BMI z-score (low: -0.01; medium: -0.03; high: -0.05; all p<0.05) at end of camp. Thirty-one (58%) of subjects completed follow-up measurements with a significantly greater proportion (p=0.025) of the high success group [low: 6 (35%); medium: 11 (65%); high: 14 (82%)]. Comparing end of camp and final follow-up measurements, only the high success group had a significant increase in BMI z-score at follow-up (median change = +0.04; p=0.03). Comparing change in median BMI z-score from baseline to final follow-up, there was no significant difference in any group and no association between time of final follow-up and WT status change. **Conclusions:** Improvement in WT status among obese children attending camp was not predictive of longer-term WT status outcomes.

T-187-P
Understanding Health Perceptions and Food Behaviors among Low-Income, Urban African American Youth to Reduce Risk for Obesity

Yeeli Mui, Bernice Chu, Neha Trivedi, Joel Gittelsohn *Baltimore, MD*

Background: Urban low-income African American youth are less likely to meet dietary recommendations and are at higher risk for obesity. Youth in this setting are heavily exposed to energy-dense, high fat foods in an obesogenic environment, but little work has been done to identify potential exposures to healthy foods in this setting. We sought to identify the most influential sources of information about healthy food behaviors, particularly urban farming and gardening, as well as the preparation of fresh foods. **Methods:** In-depth interviews (n=24) with African American children aged 10-14 years from underserved neighborhoods of Baltimore City. Questions to identify salient sources of information about healthy foods, and influence of each source on youth's perception of fresh foods and healthy food behaviors. **Results:** Family members and school programs were most influential. The role of mothers in youths' exposure to healthy foods and healthy food behaviors was mentioned most frequently, followed by grandmothers and school programs. Youth highly valued their level of independence from peer influences, resulting in peers having little reported influence on youth food decision-making, especially if peers' choices were perceived to be unfavorable. **Conclusions:** Building on the female caregiver-youth relationship may be a more sustainable way of promoting healthy food behaviors among youth in low-income urban settings. These data will contribute to a systems science model to intervene at multiple levels for improving the Baltimore City food environment and reduce childhood obesity.

T-188-P
The Role of Children's Perceived Parental Support in an Obesity Intervention Targeting Low-Income Rural Schools and Communities

Stephanie Anzman-Frasca, Raymond R. Hyatt *Boston, MA*; Vivica I. Kraak *Burwood, Australia*; Christina D. Economos *Boston, MA*

Background: Parent support is an important influence on the success of school-based obesity interventions. We examined children's perceptions of parental support in the CHANGE Study, a two-year obesity prevention intervention implemented in eight, rural elementary schools and low-income communities in four states (CA, KY, MS, SC). **Methods:** Ethnically and racially diverse school-aged children enrolled in the CHANGE Study were assessed at three time points between 2008 and 2009. Children who provided data on perceived parental support (PPS) at baseline and at least one other time point were included (n=463). At each time point, children completed three survey items assessing PPS for physical activity and fruit and vegetable consumption. Heights and weights were measured, and children's BMI z-scores were calculated using CDC growth charts. The PPS items were significantly correlated and were aggregated into a composite measure (range: 1-4). Mixed models tested whether baseline PPS moderated the intervention's impact on PPS change, and whether final PPS was associated with concurrent weight status among children with BMI z-scores available at the third time point (n=322). Models were adjusted for child age, sex, and race/ethnicity and parent education. **Results:** There was an interaction between intervention group and baseline PPS predicting change in PPS ($F_{(1, 441)}=4.28$, p<.05): for those low on baseline PPS, the intervention increased PPS, while for those high on baseline PPS, the intervention had no effect. There was an inverse association between PPS and children's BMI z-scores at the third time point, such that higher PPS was associated with a lower weight status (p<.05). **Conclusions:** Children's perceptions of parental support may play a role in the efficacy of childhood obesity prevention efforts in low-income rural communities.

T-189-P[DT]
Feasibility and Impact of a Clinic-Based Intervention to Prevent Obesity in Preschool Children: A Pilot, Cluster-Randomized Trial in Primary Care Clinics in Mexico City

Gloria Oliva Martinez Andrade *Mexico City, Mexico*; Elizabeth Cespedes, Sheryl L. Rifas-Shiman *Boston, MA*; Guillermina Romero Quechol *Mexico City, Mexico*; Jess Haines *Guelph, Canada*; Elsie M. Taveras *Boston, MA*; Ricardo Pérez Cuevas *Mexico City, Mexico*; Matthew W. Gillman *Boston, MA*

Background: In Mexico, overweight prevalence in children <5 years is approximately 10%. Creciendo Sanos is the first project to prevent overweight in Mexican preschool children in clinics of the Instituto Mexicano del Seguro Social (IMSS), which insures 47 million Mexicans. **Methods:** We randomized 4 IMSS primary care clinics to either 6 weekly group educational sessions promoting healthful nutrition and physical activity or to usual care. We recruited 306 parents of children 2-4 years old with BMI z-score 0-3 (intervention Ix n=168; usual care UC n=138). We measured child's height and weight and parents reported the child's diet and physical activity behaviors at baseline and 3 and 6 month follow-up. **Results:** 65% of families (Ix n=99; UC n=99) completed 3 month follow-up and 68% of families (Ix n=109; UC n=99) completed 6 month follow-up. At 3 months, Ix compared to UC children decreased intake of dairy with added sugar by -2.8 servings/week (95% CI, -5.3,-0.4) and increased vegetable intake by 8.5 servings/week (95% CI, 2.5, 14.4) adjusted for child sex, baseline BMI z, age, change in age, and maternal education and employment. We did not observe intervention effects on other behaviors. We observed smaller effects at 6 months. We did not detect changes in BMI at 3 or 6 months. For Ix families, round-trip transportation time was 27.6 (15.9) minutes and travel expenses were $1.27 (15.3). 88 Ix families attended >1 educational session; among the 69 families who completed a process survey, 90% were very satisfied with the intervention. **Conclusions:** In this Mexican pilot RCT of preschool obesity prevention, we found few intervention effects on diet and activity behaviors. Although satisfaction among completers was high, barriers to intervention participation and retention included participant transportation cost and time.

T-190-P

Sustained Reduction in the Levels of Gamma Prime Fibrinogen and Other Coagulation and Inflammation Factors in Obese Children: A 1-Year Randomized Controlled Family-Based Lifestyle Intervention

Rehana Lovely *Fort Worth, TX*; Amanda S. Lochrie *Jacksonville, FL*; Mustafa T. Khan *Fort Worth, TX*; David H. Farrell *Portland, OR*; Prabhakaran (Babu) Balagopal *Jacksonville, FL*

Background: Coagulation & inflammation are two critical pathophysiological processes involved in the development of cardiovascular disease (CVD). Obesity-related alterations in these processes are evident at an early age in children. Gamma' (γ') fibrinogen, an isoform of fibrinogen forms more fibrinolysis-resistant clots and has been implicated as an independent risk factor for CVD, myocardial infarction and stroke in adults. Its elevated levels have been recently reported in obese adolescents. The current study aimed to determine the effect of a Family Based Intervention (FBI)-program on γ' fibrinogen and other coagulation and inflammation factors in obese children. **Methods:** A total of 130 children (age-adjusted BMI≥85%ile) were recruited for a 1-year randomized controlled outpatient FBI-program that included enhanced physical activity, dietary counseling and behavior modifications. Anthropometry, OGTT, γ' fibrinogen, total (T)-fibrinogen, CRP, IL-6 and PAI-1were measured at baseline, 6-months & 12-months. **Results:** 115 participants (age: 9.9≥1.1 yrs;BMI%ile: 97.7≥2.3;63% female) completed the studies (baseline, 6 & 12-months). The concentration of γ' fibrinogen, T-fibrinogen, IL-6 ($p<0.05$ for all) and CRP ($p=0.07$) decreased in the intervention group. zBMI scores also showed a decrease ($p<0.05$) at 6-months and persisted after 12-months. A steady increase in the levels of these parameters was noted in the control group. **Conclusions:** Because γ' fibrinogen increases the propensity for thrombosis and stroke at an early age in the clinical course of obesity, the sustained reduction in its elevated levels by the FBI-program is important. The coordinated decrease in γ' fibrinogen, other coagulation and inflammation factors along with zBMI scores in obese children over one year suggest the sustainability of cardiovascular benefits by this intervention in obese children.

T-191-P

Change in Resting Energy Expenditure and Step Test Recovery Heart Rate among Children and Adolescents Who Are Overweight or Obese Following a Weight Loss Intervention

Naveen K. Uli, Carolyn Ievers-Landis, Darryl Knight, Ginger Fiscella, Sumana Narasimhan, MaryAnn O'Riordan, Leona Cuttler *Cleveland, OH*

Background: While resting energy expenditure (REE) and step test recovery heart rate (RHR) have been studied independently as metabolic and fitness tests in children and adolescents who are overweight or obese, the relationship between REE and RHR and changes following a weight loss intervention have not been examined. Our objective was to evaluate the relationship between REE and RHR and post-intervention changes among participants in Healthy Kids, Healthy Weight, a 12-week, multi-disciplinary weight loss program. **Methods:** Resting metabolic rate expressed as REE (kcal/day) was measured by indirect calorimetry. Aerobic fitness was assessed by a 3-minute step test using RHR (bpm). Measures were obtained at baseline and at post-intervention for a subsample. **Results:** At baseline: N=179, age mean 11.4 years (±2.8), range 5-17 years; 60% female; 42% non-White; all had BMI-for-age at or above 85th percentile. REE mean 1741.3 (±548.8); RHR mean 106.3 (±16.1). In a multiple regression, higher BMIz, older age, and male sex were significant predictors of REE; RHR was not a significant predictor. At post-intervention: N=24, age mean 11.9 years (±2.0), range 9-15 years; 88% female; 72% non-White. REE increased in 15/24 (63%), RHR declined in 16/24 (67%). Changes in REE and RHR were not significantly related, but change in REE was significantly correlated with baseline RHR (r=0.43, p=0.04). **Conclusions:** Among children and adolescents who are overweight or obese, being evaluated for a weight loss program, baseline resting metabolic rate was predicted by degree of obesity, age and sex but not by fitness level. In a subsample, the majority experienced post-intervention improvements in their metabolism and fitness levels. Greater increases in metabolic rate related to baseline lower fitness levels.

T-192-P

Interventions with Children and Parents to Improve Physical Activity and Body Mass Index: A Meta-Analysis

Portia Johnson, Jane C. Dellert *South Orange, NJ*

Background: The purpose of this meta-analysis was to examine the overall effect on children's physical activity and body mass index of interventions with parents and children. **Methods:** Data Source. Computerized searches for intervention studies published between 1990 and 2011 used multiple ProQuest databases, including unpublished dissertations and theses to minimize publication bias. Study Inclusion and Exclusion Criteria. English-language, intervention-testing studies of children, parents, or families with outcomes of physical activity or body mass index were retrieved from peer-reviewed journals, dissertations and theses. Eliminated studies had no control or comparison group; no continuous outcome variable; physical activity/exercise and/or body mass index not outcomes; or incomplete statistics necessary for meta-analysis (means, standard deviations or confidence intervals). Data Extraction. Twenty-one studies met inclusion criteria. Quality criteria were control group, objective outcome variable measure, clarity of variable definitions, and number and reason for subject withdrawal. **Results:** Results. MWES for interventions with parents and children on physical activity (Z = 2.92; CI =.09, .48; p = 0.002) and on body mass index (BMI) for interventions with children alone (Z = -2.10; CI= -.16, -.01; p = .02) were significant. **Conclusions:** Conclusions. A significant effect on physical activity but not on body mass index was found when interventions included both parents and their children.

T-193-P

Effects on Body Composition, Physical Fitness and Psychological Well-Being After a 6-Month Soccer Intervention Program in Overweight Children

Andre Seabra, Ana Seabra, Susana Vale, António Rebelo, Jorge Mota, João Brito, Carla Rêgo *Porto, Portugal*

Background: This study examined the effects of an intervention program of 6-months of soccer instruction and practice on the body composition (BC), physical fitness (PF) and psychological well-being (PWB) of overweight children. **Methods:** Twenty overweight children (8-12 years old) participated in the prospective observational cohort study: 10 were assigned to a soccer program (SG) and 10 were assigned as a control group (CG). The soccer program involved sessions 60–90 min, 4 times/week; average intensity >80%HRmax. CG participated only in the compulsory physical education classes at school (45–90 min, 2 times/week). BC (%body fat, lean body mass, whole-body and lumbar spine bone mineral density (BMD) and bone mineral content (BMC)) was estimated with dual-energy X-ray absorptiometry. PF tests included 5- and 30-m sprints, countermovement jump (CMJ), and Yo-Yo intermittent endurance test level 2 (Yo-Yo IE2). PWB indicators included attraction to participate in PA, perceived physical competence, self-esteem and body image; standardized questionnaires were used. Statistical procedures included unpaired t tests and repeated measures ANOVA models. **Results:** From baseline to after 6 months, SG demonstrated greater increases in attraction to PA, perceived physical competence, self-esteem, body image, lumbar spine BMD and CMJ compared to CG ($p<0.05$). For the other BC components and PF tests, although SG have shown a higher increase in mean values across intervention, no significant differences were found between both groups ($p>0.05$). **Conclusions:** These findings provide preliminary evidence that a 6-month soccer intervention in overweight boys was effective in improving lumbar spine BMD, muscle strength and PWB, but did not result in significant changes in others BC and PF variables.

T-194-P

A Diet Lower in Energy Density is Related to Higher Diet Quality in Overweight Young Children

Seletha Poole *Knoxville, TN*; Chantelle N. Hart, Elissa Jelalian *Providence, RI*; Hollie Raynor *Knoxville, TN*

Background: Consuming a diet lower in energy density [ED] may help with improving diet nutrient quality. This secondary data analysis examined self-reported energy, macronutrient, and food group intake of overweight children consuming diets differing in ED. **Methods:** This cross-sectional analysis included baseline data from children participating in one of two, 6-month, family-based, obesity intervention trials. Participants were 156 overweight/obese

(>85th percentile for body mass index [BMI]) children aged 4 to 9 yrs (61.5% female, 84.6% white, 16% Hispanic), with complete dietary, anthropometric, and demographic data at baseline. ED values were calculated from 3-day food records. Participants were classified as consuming a low-ED (<1.05 kcal/g) [LOW], medium-ED (1.06-1.27 kcal/g) [MED], or high-ED (>1.28 kcal/g) [HIGH] diet using tertile cut-offs. Analyses of covariance, with sex controlled due to group differences, examined self-reported energy, macronutrient, and daily food group servings consumed. **Results:** In comparison to HIGH (ED=1.49 +/- 0.20 kcal/g), LOW (ED=0.91 +/- 0.12 kcal/g) and MED (ED=1.16 +/- 0.7 kcal/g) consumed less energy (p<0.05). LOW also consumed less energy from fat (p<0.05) than MED and HIGH. LOW consumed more energy from carbohydrate (p<0.01) than HIGH. No differences were found in energy consumed from protein. In comparison to HIGH, LOW consumed fewer daily servings of whole and reduced-fat dairy (p< 0.01), grains (p<0.01), added fat and sugars (p<0.05), and nuts and seeds (p<0.05), and more daily servings of fruits and vegetables (F&V) (p<0.05). **Conclusions:** Consumption of a lower-ED diet is related to consumption of less energy, fat, higher-fat food groups, and greater intake of F&V in overweight young children. This speaks to the potential utility of targeting ED within pediatric obesity treatment.

T-195-P
A Parent-Targeted Mobile Phone Intervention to Increase Physical Activity in Sedentary Children

Arwen M. Marker, Ryan J. Machtmes, William D. Johnson, Catrine Tudor-Locke, Stephanie Broyles, Timothy Church, Robert L. Newton *Baton Rouge, LA*

Background: To investigate the efficacy of a 12-week mobile phone-based intervention on physical activity levels in children. **Methods:** Sedentary (<9,500 steps/day for girls, < 12,500 for boys) children aged 6-10 years were randomly assigned to an intensive intervention or minimal intervention. All intervention aspects were delivered via mobile phone. Parents in both groups were given a goal to increase their child's activity by 6000 steps/day above baseline and monitored steps daily. Parents in the intensive intervention group received behavioral strategies and text messages designed to promote their child's physical activity, whereas the minimal intervention parents received no behavioral strategies. Anthropometrics, body composition, mood, sedentary behavior, and enjoyment of physical activity were measured. **Results:** 20 children (Mean age = 8 yrs; 50% Female; 45% White; BMI z-score = 1.36; BMI percentile = 83) completed the study. At baseline, girls achieved 7377 steps/day and boys 9589 steps/day. Children in the intensive and minimal intervention groups significantly increased their activity by 2984 and 2158 steps/day, respectively (p < .002), but between group differences were not significant (p > .05). Regardless of study group, children who significantly increased their physical activity reported greater increases in physical activity enjoyment (p < .003). Changes in steps/day were unrelated to changes in body composition, mood, or sedentary behaviors. **Conclusions:** Children of parents who self-monitored steps daily and were given a specific steps/day goal increased their activity, approximating a 20-30 minute increase in moderate daily activity. This suggests that family-based mobile phone interventions have promise, yet more intense interventions are needed to help sedentary children increase their physical activity to the recommended 60 minutes per day.

T-196-P
Predictors of Success in a Community-Based, Multidisciplinary, Weight Management Program for Inner-City, Minority Adolescents

Unab Khan *Bronx, NY*; Lauren Connell *University Park, PA*; Jessica Rieder *Bronx, NY*

Background: There is limited understanding of factors predicting successful weight outcomes, especially outside of research settings. We sought to identify baseline predictors that increased the likelihood of success in obese, minority adolescents attending a community-based, weight management program. Success outcomes included: weight loss (% BMI change), sedentary activity (SA) < 3 hrs/day, fruit or vegetable intake >4 servings/day, physical activity (PA) >9hrs/2 weeks at 9 months. **Methods:** From 2007-2012, of 538 participants, 179 completed the program. Mean age: 14.85 ± 2.04; 57 % females; 50% Hispanics; 45 % black. Regression models for each success outcome were adjusted for age, sex, ethnicity, motivation, compulsive eating, self-esteem, baseline BMI and baseline predictor behaviors (SA, fruit and

vegetable intake, and PA). **Results:** Older age (β: -0.007; p: 0.007) and more baseline fruit intake (β: 0.01; p:0.04) were associated with greater weight loss at 9-months. Higher self-esteem is associated with increased odds of >4 vegetable servings/day (OR: 1.320; 95% CI: 1.037,1.681; p:0.02); more baseline fruit intake reduced these odds (OR: 0.390; 95% CI:0.225, 0.676). More baseline SA is associated with reduced odds of PA >9hrs/2weeks. (OR: 0.522; CI:0.266, 1.025; p:0.06). More baseline vegetable intake is associated with decreased odds of PA >9hrs/2weeks at 9-months (OR: 0.354; CI: 0.162, 0.775; p: 0.009). **Conclusions:** While the negative impact of baseline sedentary behavior on achieving physical activity success is expected, the negative impact of other baseline healthy behaviors on success outcomes requires explanation. Focus on acquiring one healthy behavior to the exclusion of others may distract adolescents from achieving an overall healthy lifestyle.

T-197-P
Preventing the Pounds: Formative Work to Develop a Weight Gain Prevention eLearning Platform for Older Adolescents

Melissa A. Napolitano, Laurie Posey, Jean L. Gutierrez, Sarah Lynch, Kelley Vargo, Katrina Hufnagel *Washington, DC*

Background: Seventy percent of adolescents matriculate to college, with weight gains by graduation averaging 1.7 to 4.2 kg for females and males, respectively. While colleges provide eLearning offerings for some high-risk health behaviors (e.g., alcohol), most lack scalable programing for weight gain prevention. **Methods:** We describe baseline data and preliminary results from "Raise High for a Healthy U" designed to: 1) quantify physical activity (PA), eating behaviors, and technology use; 2) assess preferences for and to develop a weight gain prevention eLearning platform for matriculating freshmen. Undergraduates (n=82; 74.3% female; mean age=18.66 ± 0.8; 87.7% White; mean BMI=23.02 ± 3.5; 25% had a BMI ≥ 25) completed an online survey to assess targets described above. **Results:** Health behaviors: Minutes of moderate intensity PA=103.15+89.5, Hours sitting per day=8.13+5.0, Days eating breakfast=4.07+1.46; 46.7% of participants bought quick-order foods > 2x/week (p's=NS, for weight status differences). Technology: The top 5 technologies used for learning were: Laptops (96%), Facebook (82.2%), mobile "Apps"(50%), Twitter (35%), Blogs (21%). The top 5 preferences for healthy eating/PA networking were "Apps"(34%); Facebook (13%); Podcast (11%); Blog (11%), Twitter (4%). Similarly,"App" was most commonly endorsed (56%) for receiving tailored feedback followed by personalized letter (13%), and social media (10%). Qualitative themes for intervention content: eating on a budget, campus-specific information, focus on stress/mood, and confidentiality. Most students (86%) preferred weekly feedback. **Conclusions:** This research is an important first step in improving the eating/PA habits and health of older adolescents. Implications of this formative work, as well as sample prototypes and modules of the eLearning platform will be discussed.

T-198-P
Anticipation of Exercise Discomfort, Health-Related Quality of Life and Fitness in Obese Youth

Connie L. Tompkins, Amy Nickerson, David Brock *Burlington, VT*

Background: While several studies have shown that obesity impairs health-related quality of life (HRQOL), physical inactivity may also affect HRQOL regardless of weight status. For obese individuals, the anticipation of discomfort may also complicate the decision whether or not to engage in exercise. Subsequently, this inactivity may lead to lower cardiorespiratory fitness (CRF). Therefore, the purpose of this study was to explore the relationship among anticipation of exercise discomfort, HRQOL, and CRF in obese youth. **Methods:** Prior to beginning the REWARD Teens multi-disciplinary, weight management program, 25 obese [≥95th BMI percentile] youth (12-18 years; 10 males, 15 females) participated in a standardized, treadmill walking test to assess CRF (VO_2max mL/kg/min). Prior to the test, participants were asked to rate how much discomfort (on a scale of 0-10) they expected to experience. The Pediatric Quality of Life Inventory (PedsQL) Measurement Model for teens was also administered to obtain HRQOL. Partial correlations were performed with significance set at p<0.05. **Results:** Adjusted for BMI, significant, inverse relationships were observed between anticipation of exercise discomfort and CRF (r=-.538) and anticipation and HRQOL (r=-.633). Significant, positive correlations were observed between CRF and HRQOL (r=.535) adjusted for BMI. Adjusting for CRF, however, no significant observations were observed between BMI and anticipation of exercise difficulty

(r=-.045) nor BMI and HRQOL (r=-.337). **Conclusions:** Notably, when we controlled for CRF significant associations between the variables were no longer observed. Further research exploring CRF as a potential mechanism by which BMI influences HRQOL and anticipation of exercise discomfort is warranted.

T-199-P[DT]

Family Partners for Health Study: Final Results of a Randomized Controlled Community-Based Trial for Weight Management of Obese Children and Their Parents

Diane C. Berry, Todd A. Schwartz, Robert G. McMurray, Madeline Neal, Emily Gail Hall, Dean Amatuli, Natnaree Aimyong *Chapel Hill, NC*

Background: Overweight and obesity continue to increase at an alarming rate in African American, Hispanic, and non-Hispanic white children and parents. **Methods:** The Family Partners for Health Study was a community-based randomized controlled trial that tested a nutrition and exercise education, coping skills training and exercise intervention for obese 7 to 10 year old children (n = 358) and their obese parents (n = 358) in rural North Carolina. **Results:** At the completion of 18 months in the study, children in the experimental group compared to the wait-listed control group did not have a significant decrease in BMI percentile (p = 0.470) or waist circumference (p =0.060), however did have a significant decrease in triceps skinfolds (p = 0.001) and subscapular skinfolds (p < 0.001) and significantly improved their dietary knowledge (p = 0.018) and were more likely to drink less than 1 glass of soda per day (p =0.052). Parents in the experimental group compared to the wait-listed control group significantly decreased their body mass index (p = 0.001), weight loss in kilograms (p = 0.002), percent weight loss (<0.001), waist circumference (p = 0.005), triceps skinfolds (p < 0.001) and subscapular skinfolds (p < 0.001) and increased their nutrition (p = 0.003), exercise (p < 0.001) and health responsibility (p = 0.055) knowledge and more often chose water or unsweetened drinks when thirsty (p = 0.029) and ate unsweetened breakfast cereal (p = 0.009). **Conclusions:** The results suggest that including both parents and children in the same intervention improved weight in the parents and adiposity and health behaviors in both children and parents and self-efficacy in the parents. Once children and parents are obese, nutrition and exercise habits are harder to change and they may require longer support. Trial Registration: NCT01378806

T-200-P[DT]

Relationships between Infant Tummy Time, Restrained Time and TV Time in Low-Income Hispanic Families at Highest Risk of Early Child Obesity

Rachel S. Gross *Bronx, NY*; Roberta Scheinmann, Michelle Gross, Kenny Diaz, Candice Taylor-Lucas, Alan L. Mendelsohn, Suzy Tomopoulos, Mary Jo Messito *New York, NY*

Background: Early obesity prevention policies recommend increased active and decreased sedentary time in infancy, by promoting tummy time (TT) and limiting TV time (TVT) and time in devices that restrain movement (RT). The prevalence of these practices and relationships between them are not well described. We aimed to characterize the relationship between TT and sedentary time (RT and TVT) in 3 month old infants at high risk for early child obesity. **Methods:** Cross-sectional analysis of low-income Hispanic mothers with 3 month old infants in a longitudinal study of child obesity prevention (Starting Early) at a large urban hospital. Independent variables: TT, defined as time awake in the prone position and RT, defined as time awake and not traveling in car seats, strollers, bouncy seats and swings. Dependent variable: TVT, defined as time infants watched TV. Mothers reported times as minutes/day (dichotomized none vs. any). Logistic regression adjusting for maternal age, parity, marital status, education, working, US born, and pre-pregnancy weight status was used to analyze associations between TT, RT and TVT. **Results:** We assessed 72 mother-infant dyads with mean (SD) age of 28 (6) years, first child 37%, married 70%, less than high school 35%, working 20%, US born 22%, and obese 40%. Mean minutes/day (SD): TT 16 (27), RT 122 (223), TVT 19 (37). Mothers reporting no TT (21%), RT (18%) or TVT (25%). Mothers reporting any RT were more likely than those reporting no RT to have infants with TVT (81% vs 46%, AOR 4.98, 95% CI 1.08-23.06). TT was not associated with TVT (77% vs 68%, AOR 2.06, 95% CI .41-10.46). **Conclusions:** Daily activity patterns of infants in low-income Hispanic families were less active and more sedentary than recommended.

Early obesity prevention efforts aimed at decreasing TVT may benefit from helping families reduce RT. USDA AFRI # 2011-68001-30207

T-201-P

Effects of a Multidisciplinary Lifestyle Intervention on Aerobic Fitness and Motor Skills in Obese Adolescents

Patricia Blackburn, Mario Leone, Lison Houde, Véronique Julien, Julie St-Pierre, Dominique Desrosiers, Johanne Harvey *Chicoutimi, Canada*

Background: Obesity and low aerobic fitness in adolescents are associated with cardiometabolic risk factors. Low motor competence also increased the likelihood to be physically inactive. In this regard, studies are needed to optimize physical fitness in this population. The objective of the study was to examine the effects of a 16-week exercise training program combined with a multidisciplinary intervention on aerobic fitness and motor skills performance in obese adolescents. **Methods:** Thirty-three obese adolescents from 11 to 16 years of age were selected to participate. Each subject was followed by a multidisciplinary team and trained three sessions per week for 16 weeks. The exercise program focused on endurance type activities and all training sessions were supervised and performed in groups. Maximal oxygen uptake, walking capacity and motor skills were measured at baseline, at mid-time and at the end of the intervention as well as 4 months and 8 months follow-up. **Results:** Body mass index (33.6 to 32.7 kg/m2, p=0.0002) and waist circumference (102.4 to 100.5 cm, p=0.05) were significantly reduced after the 16-week intervention program. However, we found that anthropometric variables were returned to baseline levels only 4 months after the 16-week intervention program. The most substantial improvements in maximal oxygen uptake and in walking capacity were observed 8 weeks after the beginning of the intervention (p<0.002).These variables were also returned to baseline levels 4 months after the intervention. Significant improvements were also observed in some motor skill tests (p<0.04). However, we found that few of these motor skills remained improved 4 and 8 months post-training (p<0.0009). **Conclusions:** These results indicate that a multidisciplinary intervention, which includes exercise training, may have a persistent effect on motor skills.

T-202-P[DT]

Maternal Feeding Styles and Child's Dietary Intake among Recent Immigrants

Alison Tovar *Kingston, RI*; Erin Hennessy *Washington DC, DC*; Aviva Must *Boston, MA*; Sheryl O. Hughes *Houston, TX*; Silvina F. Choumenkovitch, David M. Gute, Rebecca J. Boulos, Emily K. Vikre, Christina D. Economos *Boston, MA*

Background: Immigrants are at increased risk for becoming obese with more time in the US. Parental feeding styles may be one potential modifiable risk behavior given their influence on children's food preferences, consumption, portion sizes, and energy intake. However, the relationship of feeding styles and child's dietary among immigrants is unexplored. **Methods:** Anthropometrics, socio-demographics, child dietary intake, years in the US and responses to the Caregiver Feeding Styles Questionnaire (CFSQ) were obtained from 313 mothers enrolled in LiveWell, a community-based, participatory, randomized controlled lifestyle intervention to prevent weight gain in immigrant (< 10 years residence) mother-child dyads in Greater Boston. Associations were explored with multivariable linear regression. **Results:** The influence of feeding style on child diet was modified by time in US of the mother (p<0.01). For mothers who have been in the US for <5 years, having a low demanding/high responsive and low demanding/low responsive feeding style was associated with lower consumption of vegetables and whole grains of their children (β ±SE -0.39± 0.13 vegetables and -0.32 ± 0.15 whole grains) vs. a high demanding/high responsive style. For mothers who have been in the US for ≥5 years, this association was not statistically significant. **Conclusions:** In addition to the stressors associated with moving to a new country, immigrants are exposed to a "obesogenic" food environment, where energy-dense foods are readily available and more healthy foods are costly and less available. Recently immigrated mothers may find it easier to agree to less healthy food requests, especially if the child is vocal about their preferences. More research is needed to better understand the coping strategies of immigrant mother's and their impact on maternal feeding behavior.

T-203-P

Effects of a School-Based Education Intervention on BMI and Physical Activity

Lauren M. Panner *Valparaiso, IN*

Background: The CDC (2011b) reported that there are 12.5 million obese children and adolescents living in the United States (U.S.). The financial burden of childhood obesity in the U.S. is estimated to be 14 billion dollars (Children's Defense Fund, 2012). **Methods:** The primary outcome measure of this evidence-based practice (EBP) project was BMI. A secondary outcome measure focused on the amount of time children spent engaging in physical exercise on a daily basis. For eight weeks, fourth and fifth grade students at a rural elementary school received an additional 30 minutes of classroom education about the importance of physical activity and suggestions for increasing daily physical activity. Student participants were weighed and their height was measured before and after the intervention so that BMI measurements could be calculated and compared. Additionally, students completed pre- and post-tests using the Self Administered Physical Activity Checklist (SAPAC) to assess individual levels of daily physical activity. Data was calculated at the conclusion of the eight week intervention and paired t-tests were calculated to determine whether or not BMI was affected by the inclusion of additional physical activity education in the classroom. **Results:** No statistically significant differences in BMI were found. However, 27 students lost weight with 20 of these students losing more than one pound and nine losing four pounds or more. **Conclusions:** Future projects similar to this one could benefit from a longer intervention period and increased teacher involvement in regular in-classroom exercise. Successful projects have the potential to contribute to decreased rates of childhood obesity.

T-204-P

Eating Out Is Related to Increased Sugar Intake among Rural Appalachian Adolescents: Results of the Team Up for Healthy Living Project

Taylor L. McKeehan *Johnson City, TN*; George E. Relyea *Memphis, TN*; Deborah L. Slawson *Johnson City, TN*

Background: Adolescent obesity has reached epidemic proportions with 13% reported being obese in 2011. Dietary habits, particularly those related to eating meals and snacks away from home, have been shown to impact dietary quality. **Methods:** An assessment of 1,503 Northeast Tennessee adolescents was conducted as part of the Team Up for Healthy Living research project. Frequencies of eating out for breakfast, lunch, supper, and snacks were assessed, as was the frequency of consumption of 84 food and beverage classifications using the Speck Eating Habits Questionnaire. Reported intakes were then converted to a Health Eating Index (2010). Frequency of eating out and the energy from added sugars in the diet were calculated. **Results:** Adolescents who ate out daily or 3-6 times per week had significantly higher energy intake from added sugars compared to adolescents who reported not eating out in the last week or never eating out (ps <.001). The largest reported energy from added sugars was from eating out at breakfast and for snacks. Gender differences were evident. Males had significantly higher added sugar intakes (ps <.011) and were more likely to report eating out daily for breakfast, lunch, supper, and snacks (ps <.001). Females reported eating out less frequently (1-2 times a week) for lunch and supper (ps <.001). **Conclusions:** Adolescents who eat meals away from home are more likely to have a higher energy from added sugars. Interventions to encourage healthy body weight should include a focus on healthy eating out and reducing sugar intake.

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Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

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Intervention Studies - Other-Pediatric

T-205-P

Overweight/Obesity, Serum Vitamin D Inadequacy and Low HDL-C in Urban Schoolchildren

Jennifer Sacheck, Maria Van Rompay, Misha Eliasziw, Christina D. Economos *Boston, MA*

Background: Approximately 30-50% of overweight and obese US children have inadequate serum vitamin D (25-hydroxyvitamin D [25(OH)D]<20 ng/mL). Being overweight or obese appears to promote vitamin D inadequacy, differential responses to supplementation, and cardiovascular disease (CVD) risk factors; however, little is known about these relationships in children. **Methods:** In wave one of The Daily D Health Study (DDHS), 310 racially/ethnically-diverse schoolchildren (9-14y; 38% Caucasian) were enrolled in a randomized vitamin D3 supplementation trial. Multivariable logistic regressions were used to assess associations among weight status, vitamin D, and CVD risk factors. **Results:** At baseline, 60% had inadequate 25(OH)D, 46% were overweight or obese, and 60% exhibited ≥1 suboptimal blood lipid or glucose level. Overweight/obesity was not related to vitamin D inadequacy, but both weight and vitamin D status were associated with CVD risk factors, after controlling for age, sex, and race/ethnicity. Overweight/obese children had 3.7 greater (P<0.0001) odds of having low HDL-C (≤45 mg/dL). Children with vitamin D inadequacy had 2.4 greater (P=0.007) odds of having low HDL-C, but this relationship was stronger for normal weight children (OR=3.9 vs. 1.8) and for Hispanics (OR=3.7 vs. 1.3). After 6 months of supplementation, overweight/obese children experienced smaller increases in 25(OH)D than normal weight children (7.1 vs. 10.6 ng/mL, P=0.002), with differences more evident among certain racial/ethnic groups. However, in this sample of the larger DDHS trial, 6-month changes in 25(OH)D were not associated with CVD risk factor changes. **Conclusions:** Preliminary trial results suggest relationships among overweight/obesity, serum 25(OH)D, and CVD risk factors in children, but longitudinal relationships and the role of race/ethnicity warrant a larger study population.

T-206-P

Treatment Adherence and Facilitator Characteristics in a Community Based Pediatric Weight Control Intervention

Elissa Jelalian *Providence, RI*; Gary D. Foster *Philadelphia, PA*; Amy F. Sato *Kent, OH*; Kristoffer Berlin *Memphis, TN*; Cythia McDermott *Providence, RI*; Deborah Sundal *Minnetonka, MN*

Background: There is a pressing need to develop effective and broadly accessible interventions to address pediatric obesity. An important dimension in translating interventions to community settings is the fidelity with which treatment is delivered. **Methods:** We examined treatment fidelity and facilitator characteristics in a 24-week community based pediatric behavioral weight control (BWC) intervention for youth ages 6-17. The JOIN program involved collaboration between UnitedHealth Group and the YMCA of Greater Providence. Sessions were led by YMCA-based facilitators. Adherence to weekly content and facilitator characteristics were assessed via direct observation at two randomly selected points during the intervention: T1 (selected from sessions 1-4) & T2 (selected from sessions 6-20). **Results:** Participants were on average 11.3 years old (SD=2.8). Fifty-five percent were female and over two-thirds were White (68.4%). There was a significant reduction in percent overweight (M=-3.5%) from baseline to 24 weeks. On average, facilitators adhered to 96.0% (SD=5.2%) of the session content at T1 and 92.6% (SD=6.8%) at T2. Relationships among facilitator adherence, facilitator characteristics, and rate of change in percent overweight were examined using random effects growth modeling. Higher facilitator content adherence at T1 and T2 were associated with greater reductions in percent overweight (p< .01) at 24 weeks. Higher ratings of facilitator characteristics at T2 were associated (0.06) with smaller reductions in percent overweight after 24 weeks. **Conclusions:** Data suggest that paraprofessionals without prior expertise in pediatric weight control can be trained to successfully deliver an evidence-based BWC intervention. Facilitator adherence to the treatment protocol was more related to treatment outcome than were more general facilitator characteristics.

T-207-P

Longitudinal Associations between Change in Overweight Status, Fear of Negative Evaluation and Weight-Related Teasing among Obese Adolescents

Diana Rancourt, David H. Barker *Providence, RI*; Amy Sato *Kent, OH*; Chantelle N. Hart, Elissa Jelalian *Providence, RI*

Background: Obese adolescents experience weight-related stigma and victimization, which are associated with fear of negative evaluation (FNE). While FNE increases during adolescence, behavioral weight control interventions (BWCI) can lead to decreases in obese adolescents' FNE. Secondary data analysis was conducted to examine longitudinal cross-lagged associa-

tions between obese adolescents' change in weight status, FNE, and weight-related teasing using data from a 24-month BWCI. **Methods:** One hundred eighteen obese adolescents (BMI: M = 31.41; Percent Overweight: M = 161.43; 76% Non-Hispanic White; 68% female) 13-16 years (M = 14.33) participated in a BWCI. Percent overweight, Fear of Negative Evaluation (subscale, Social Anxiety Scale – Adolescent), and frequency of weight-related teasing (item adapted from Project EAT) were collected at baseline, end of intervention (4 months), and 12 and 24 months post-intervention. Three multivariate latent difference score models were estimated to examine longitudinal cross-lagged associations between: 1) percent overweight and FNE; 2) percent overweight and teasing; and 3) FNE and teasing. **Results:** Models supported significant lagged associations among the constructs of interest through 24 months. Decreases in percent overweight were prospectively associated with decreases in both FNE (b = .16, p < .01) and weight-related teasing (b = .01, p < .01). Neither change in FNE nor weight-related teasing was predictive of changes in percent overweight. Decreases in FNE were prospectively associated with decreases in weight-related teasing (b = .05, p < .01). Change in weight-related teasing was not predictive of changes in FNE. **Conclusions:** Moderate weight loss in the context of a BWC intervention has positive long-term implications for obese adolescents' peer relations.

T-208-P
Reliability of the EchoMRI-Infant System for Water and Fat Measurements in Newborns

Tatiana Toro-Ramos, Charles W. Paley, Susan Lin, Wenwen Yu, Xavier Pi-Sunyer, Dympna Gallagher *New York, NY*

Background: The precision of the quantitative magnetic resonance (EchoMRI-Infants™) system has not been determined in newborn infants. **Methods:** Phantoms including canola oil and drinking water in increments of 10 g up to 1.9 kg were scanned twice within one day at body temperature (37°C). Instrument reproducibility was assessed from 3 scans with repositioning between scans (within 10 min period) in 12 healthy term newborns (12-69 hours post birth). Instrument precision was determined from the coefficient of variation (CV) of the difference between repeated scans for total water, lean, fat measures for newborns and the mean difference between weight and measurement for phantoms. **Results:** In phantoms, EchoMRI: 1) underestimated fat with a mean difference of -18 g (SD 33g; range -130g to 50g). As oil mass increased, the larger the underestimation of EchoMRI measured fat; 2) overestimated free water (water not bound to tissues), with a mean difference of 23 g (SD 43g; range -90g to 130g). Water phantom and measured free-water were highly correlated (0.999, p<0.001); 3) underestimated total water with a mean difference of -84 g (SD 81g; range -380g to 30g). Water phantom and measured total water were highly correlated (0.997, p<0.001). In newborns, mean weight (SD, range) was 3.13 kg (0.44, 2.64-4.19 kg), mean fat 0.54 kg (0.20, 0.07-0.88 kg), lean 2.32 (0.28, 2.0-2.9), total body water 2.42 (0.31, 2.12-3.10), and percent fat 16.65% (2.67, range 12.53-20.71%). EchoMRI showed excellent reproducibility with a CV of 2.09% for total body fat, 0.98% for lean mass, and 0.81% for total body water. **Conclusions:** The EchoMRI infant system shows good reliability for the measurement of fat, free water, and total water in oil and water phantoms. In infants, precision was high for the assessment of body fat, lean mass, and total body water.

T-209-P
Evaluation of Clinical Measures of Severe Obesity in Youth

Sarah E. Barlow, Roman Shypailo, Benedetta McQueen *Houston, TX*; Aaron S. Kelly *Minneapolis, MN*

Background: To evaluate usefulness across the age range of clinical methods to express degree of excess weight among severely obese youth, we examined the relationship of body fat with four BMI-based measures. **Methods:** 614 obese youth ages 5 to 17 years (60% Hispanic, 26% Black, 10% White, 5% other) underwent body composition assessment via air-displacement plethysmography. Included were 82 5-7 year olds (BMI = 27.2 ± 4.1 kg/m2), 183 8-10 years olds (BMI = 31.2± 5.2 kg/m2), 216 11-13 year olds (BMI = 34.6 ± 6.3 kg/m2) and 133 14-17 year olds (BMI = 39.9 ± 7.5 kg/m2). A prediction equation estimated lung capacity, and the Lohman equation was used to calculate percent body fat (%fat). Stepwise multiple regression models in boys and girls examined %fat as a function of race-ethnicity, age, and each BMI parameter: BMI, BMI percentile (BMI %ile), BMI z-score (BMIz), and percent above the 95th percentile BMI (%of95th).

Results: Among boys, adjusted R2 (aR2) was higher for BMI (0.44) and %of95th (0.44), compared with BMIz (0.25) and BMI%ile (0.21). Standard error of estimate (SEE) ranged from 4.96 to 5.94. Among girls, the aR2 values for the 4 models were similar: BMI = 0.54, %of95th = 0.55, BMIz = 0.53, BMI%ile = 0.44. SEE ranged from 4.02 to 4.50. Among boys, age was not a significant covariate in BMI%ile and %of95th models; however among girls, age was a significant covariate in all the models. Among boys race-ethnicity was significant in all models except BMI%ile, and among girls race-ethnicity was not significant in any of the model. **Conclusions:** For boys, %of95th had the best predictive value for %fat and had no age interaction. For girls, age interaction occured with %of95th but also with the other models. Therefore, %of95th may be a useful BMI-based method to estimate %fat among obese children and adolescents in the clinical setting.

T-210-P
Positive Approaches in the Prevention of Childhood Obesity: A Proactive Method for Teaching Nutrition in a Preschool Classroom Setting

Debra K. Goodwin, Jill F. Marsh *Jacksonville, AL*

Background: This study tested benefits of a five-week age-appropriate nutrition education program directed toward children aged 3 to 5 years in a preschool setting. **Methods:** Fourteen pre-schoolchildren aged 3-5 years participated in a five-week nutrition education program introduced in the form of age-appropriate stories and puppetry. To determine if the program had an appreciable effect on children's intake, a grocery store activity was conducted using a classic pretest-posttest design. In this activity, a mock grocery store was designed containing a wide variety of both healthy and unhealthy foods. Prior to participating in the program, the children went "shopping" in the mock grocery store and were instructed to select five items. After the education program, the grocery store activity was repeated, with the children again instructed to choose five items. Children's food and beverage selections of the pretest and posttest activities were compared in terms of calories, fat, protein, sugar, and servings of fruits and vegetables selected. **Results:** Findings indicated that all of the children (n=14) in this study made at least one positive change (e.g., reduced calories, decreased fat, or increased the numbers of fruits and vegetables) in their food choices. More specifically, posttest findings included a 20% reduction in calories, a 63% reduction in fat, a 24% increase in sugars, and greater than a 200% increase in the servings of fruits and vegetables. **Conclusions:** Overall, the results of this small pilot study are promising and suggest that the program may be effective with regard to improving the food choices of young children.

T-211-P
The Impact of Inpatient Pediatric Weight Management Program

Sharonda J. Alston Taylor, Kimberly Rennie, Cindy Jon *Houston, TX*

Background: Childhood obesity treatment options include medical management with a multidisciplinary team, pharmacotherapy and surgery. Pharmaceutical options are limited and few qualify for bariatric surgery. A treatment alternative is necessary; therefore an inpatient obesity program was created. The purpose of this project was to evaluate the effectiveness of a medically supervised inpatient weight management program. **Methods:** This is a retrospective chart review of 21 patients discharged from an inpatient pediatric weight management program from October 2011 through December 31, 2012. Inclusion criterion for chart review was a minimum stay of 28 days. Of the 21 patients admitted to the program, 3 stayed of less than 28 days and were not included in analyses. Admission criteria were age 2-21 years and (a) BMI ≥ 95th percentile with ≥ one medical comorbidity or (b) BMI > 40 without comorbidites. **Results:** The average patient was 13 years (4-18), had a BMI of 49.8 (32.4-85.4), stayed 75.7 days, achieved 15% weight loss and decreased systolic and diastolic blood pressure (10mmHG and 8mmHg, respectively). Upon admission, 27.8% (n=5) met criteria of a depressive disorder and 11.1% (n=2) for an anxiety based disorder. At discharge, only 1 met criteria for a depressive disorder and 1 continued to meet criteria for an anxiety based disorder. Improvements in comorbidites such as diabetes, obstructive sleep apnea, and exercise tolerance were also observed. **Conclusions:** Inpatient pediatric weight management leads to successful weight loss and improvement in comorbidites and a reduction in mental health diagnoses.

T-212-P

Formalized Assessment of Adolescent Motivation for Weight Change Behaviors

Beth H. Garland, Elisabeth S. Hastings, Sharonda J. Alston Taylor, Rachel S. White, Constance M. Wiemann *Houston, TX*

Background: Adolescent motivation for weight management is a commonly cited psychological variable when treating obesity. Many of the published guidelines support health care professionals assessing motivation/readiness for change. However, limited information exists in specific methods for assessing motivation. Several theoretical papers suggest utilizing the Motivational Interviewing rulers wherein a patient provides a numerical response and justification for perceived confidence and the importance of the change. While a valuable clinical tool for a collaborative environment, these methods have not been empirically studied. In addition, only one measure of motivation has been tested with adolescents in a clinical sample. Formally assessing motivation with validated measures would allow for improved understanding of a patient's journey to change, monitoring change over time, and accurately predicting the role of motivation in behavior change. This poster evaluates the reliability and factor structure of three published measures of motivation in an adolescent sample seeking treatment for weight management. **Methods:** Participants were 118 adolescents between the ages of 12-18, who participated in a behavioral weight management group program. Baseline measures included Diet Readiness Test(DRT), University of Rhode Island Change Assessment(URICA), and the Weight Efficacy Lifestyle(WEL). **Results:** Internal consistency was moderate to excellent (a=0.68-0.87) for the URICA and WEL. Two scales on the DRT did not perform as reliably. Age differences in internal consistency were noted for the WEL and DRT between younger/older adolescents. Exploratory factor analyses suggested modifications to the original factor structure of the URICA. **Conclusions:** Discussion will provide recommendations for modeling motivation in clinical studies as well as in clinical practice.

T-213-P

Physical Health Outcomes of Children and Teens Enrolled in the Healthy Ways Clinic

Nicole F. Swain *Akron, OH*; Charlotte Sutton, Sarah White, Linda Dyer, Jan Simpson *2018 Clinch Avenue, TN*

Background: Pediatric obesity has been found to increase a child's vulnerability to many health comorbidities such as cardiovascular disease and diabetes. In an attempt to minimize these detrimental health outcomes, many have implemented various types of interventions to help reduce pediatric obesity. **Methods:** The purpose of the current study is to present preliminary findings from The Healthy Ways Clinic at East Tennessee Children's Hospital, a hospital-based outpatient family-focused pediatric weight management program. Data was collected at baseline and at the 16 week re-assessment. **Results:** A total of 212 patients (age 3-19; 57% female) were assessed at baseline. 108 patients completed the 16 week program and were re-assessed at that time. Repeat lab values at 16 weeks were done if medically indicated. Findings suggest significant differences from baseline to the 16-week re-assessment in triglycerides, insulin, and total cholesterol, with all lab values showing a significant decrease at 16 weeks. There were also significant differences found in BMI change, waist measurement, and waist/hip ratio (in the 8-12 year old group only) with all improving at 16 weeks (all ps<.05). No significant changes were found in heart rate, blood pressure, HDL, or LDL labs. **Conclusions:** Although there was no control group in which to compare these results, these outcomes are encouraging. Several risk factors for long-term physical health problems such as cardiovascular disease and diabetes were significantly reduced at the 16 week re-assessment. These preliminary findings suggest programs such as the Healthy Ways Clinic are crucial in teaching more appropriate lifestyle changes that can positively impact a child's long-term development.

T-214-P

Long-Term Changes in Body Fat Percentage Associated with Overweight Youth's Participation in Camp Strong4Life

Lauren Lorenzo, Jean A. Welsh, Farrah Keong, Cristiana Milone, Stephanie Walsh, Laura Colbert *Atlanta, GA*

Background: Camp Strong4Life is a summer camp program designed to promote healthy dietary habits among participating campers and their parents through education and positive role modeling in a fun and supportive environment. Our purpose was to determine if participation in Camp Strong4Life was associated with sustained changes in campers' percent body fat. **Methods:** In 2012, 67 overweight youth (BMI > 85th percentile) age 9 to 15 y (mean age 12.2 y) participated in the Camp S4L program including: Family Welcome Weekend (spring; baseline visit), Camper Week (summer; youth only), and Family Reunion Weekend (fall; follow-up visit #1). Body fat percentage was assessed using Air Displacement Plethysmography (Bodpod) for a randomly selected subsample of 11 campers at baseline, Reunion Weekend (3-6 months after baseline), and again at a second follow-up visit (9-13 months after baseline). Change in body fat was determined using longitudinal mixed models. **Results:** Between baseline and follow-up #1, mean body fat decreased from 42.4% to 38.1% (Δ=-4.23%; p=0.003). This decrease was maintained but did not increase further after participation in the camp program had ended, between follow-up visits #1 and #2, (body fat 37.2%; Δ= -0.97, p=0.64). Over the full 9 to 13 month follow-up period, mean body fat percentage decreased by 5.2% among campers. This decrease approached statistical significance (p=0.09). **Conclusions:** These finding suggest that participation in Camp Strong4Life was associated with a sustained decrease in body fat. Further study using a randomized controlled design is needed to confirm these findings.

T-215-P

Short and Long-Term Impact of a Weight Management Summer Camp, Kamp K'aana

Alicia E. Farhat, Shreela Sharma, Stephanie H. Abrams, William W. Wong, Sarah E. Barlow *Houston, TX*

Background: This study assessed the short and long-term effects of Kamp K'aana, a 2-week residential camp, on weight, body mass index (BMI), BMI percentile, and BMI z-score on obese youth **Methods:** 108 10-14 year old obese youth enrolled in the 2-week Kamp K'aana program, which provided an 1800 kcal/day meal plan, recreational physical activities, and nutrition and behavioral lessons. Weight and height were measured at start and end of camp. We examined the outcomes of 71 (66%) subjects who had long-term measures, from either the 11-month reunion (n = 39) or clinical visits within 3 months of reunion measure (n = 32). Subjects were 11.9 ± 1.4 years, 23 (32%) were Hispanic, and 34 (48%) were boys. ANCOVA adjusting for age, gender, and ethnicity was used to assess changes in weight, BMI, BMI percentiles and BMI z-scores from pre-camp to 2-weeks and long-term. Sign test was used to evaluate proportion of campers who had a decrease in BMI z-score of at least 0.2 **Results:** Significant reductions were observed at the end of the 2-week camp in body weight (85.0 ± 18.6 kg vs. 81.4 ± 17.9 kg, p < 0.001), BMI (33.6 ± 5.8 kg/m2 vs. 32.3 ± 5.8 kg/m2, p < 0.001), BMI percentile (98.7 ± 1.0 vs. 98.2 ± 1.5, p < 0.001), and BMI z-score (2.34 ± 0.30 vs. 2.24 ± 0.34, p < 0.001). At the long-term measure, weight and BMI increased (p < 0.001) from baseline, but BMI percentile decreased to 97.3 ± 6.7 (p < 0.001), and BMI z-score decreased to 2.23 ± 0.49 (p < 0.001). A decrease in BMI z-score of at least 0.2 was seen in 14 youth (20%) at 2 weeks (p < 0.001) and 19 (27%) long-term (p < 0.001) **Conclusions:** Participants of the 2-week Kamp K'aana program had not only short-term improvement in weight, BMI, BMI percentile and z-score but also sustained improvement in BMI percentile and z-score over ~11 months

T-216-P

Family-Based Motivational Interviewing and Community Resources Mobilization to Improve BMI in Low-Income Families with Children

Helena H. Laroche *Iowa City, IA*; Bery Engebretsen *Des Moines, IA*; Jennifer Park-Mroch *Iowa City, IA*

Background: Low-income populations have a high-risk of obesity and encounter resource barriers to improving diet and exercise. Children of obese adults are at high risk for obesity. **Methods:** This community-based participatory research pilot intervention focuses on low-income families with children in the home under 18 years where one parent is obese. This intervention combines joint motivational interviewing with parents and any older children to develop family-focused diet and exercise goals and help accessing existing community resources (e.g. nutrition classes, fruits and vegetables, written materials, WIC, heating assistance, exercise resources) to assist families in making healthy lifestyle changes. This is facilitated by a partnership of organizations including a community health center, university extension educa-

tional service, workforce training program, and food pantry network. BMI measurements were done by study personnel. **Results:** After 6 months, 20 families showed the following changes. The obese adult's BMI average change was -0.80 (p=0.04). Among 12 adults with diabetes, their HbA1c levels on average dropped 1.6 points (p=0.05). For children who were over the 85th BMI percentile at baseline, 15% increased, 20% maintained and 20% decreased their BMI percentile. For children under the 85th percentile, 5% increased their BMI percentile to over 85th percentile, 20% increased but remained under the 85th percentile, 15% maintained and 5% decreased their BMI percentile. Score on the Family Nutritional and Physical Activity Scale which predicts risk of obesity showed a significant change from an average score of 54.7 at baseline to 60.4 (P<0.001). **Conclusions:** Motivational interviewing combined with assistance accessing community resources shows promise to help high-risk low-income families with children make healthy life-style changes to prevent obesity.

T-217-P
Dietary Composition and Micronutrient Adequacy among Overweight Boys and Girls Participating in a School Nurse-Delivered Weight Management Intervention

Nicole M. Wedick, Barbara Olendzki, Susan Druker *Worcester, MA*; Mary Ann Gapinski *Boston, MA*; Robert Magner *Worcester, MA*; Stavroula Osganian *Boston, MA*; Kristin Schneider *Chicago, IL*; Lori Pbert *Worcester, MA*

Background: Few data have been published on the macro- and micronutrient adequacy among overweight children. The objectives of this investigation were to examine adolescent nutrient intake in comparison to the USDA's dietary guidelines for boys and girls aged 14-18 years, and to evaluate changes in nutrient intake during a school-nurse-delivered intervention. **Methods:** We conducted a secondary analysis using 24-hour dietary recall data collected at baseline, 2-month, and 6-month visits for 79 overweight/obese adolescents. Linear mixed models treating student and school as random effects were used to examine differences by gender and timepoint for macro- and micronutrients, adjusting for total energy intake and intervention. **Results:** The mean age of participants was 15.8 years. Mean BMI was 31.9 kg/m2 and 68% were obese (BMI percentile ≥95%). Compared to the USDA's dietary guidelines, carbohydrate, protein and fat fell within the recommended ranges. Micronutrient inadequacy was observed among both boys and girls for calcium, magnesium, phosphorus, potassium and all fat soluble vitamins. Iron was especially low for girls (9.7mg/d versus guidelines 15mg/d). Significant differences were observed by gender with boys having higher intakes of protein, iron, potassium, sodium, zinc and all B-vitamins even after adjustment for total caloric intake. Nutrient intake did not significantly change over time for most of the nutrients. **Conclusions:** Among overweight and obese adolescents, we observed low intakes of key vitamins and minerals important for adolescent growth and overall health. Larger studies in diverse adolescent populations are warranted to investigate the prevalence and trends over time for energy-dense nutrient-poor diets. NCT# 00682188

T-218-P
Intake At a Single, Palatable Buffet Test Meal Is Associated with Body Composition in 4- to 6-Year-Old Children

Stephanie N. Fearnbach, Laural K. English, Wendy M. Stein, Terri L. Cravener, Kathleen L. Keller *University Park, PA*

Background: Single-meal studies of intake offer greater experimental control than measures like food frequency questionnaires, but have been criticized for not being representative of consumption under free living conditions. The purpose of this study was to determine the association between intake at a single-session, palatable buffet meal and children's body composition. **Methods:** A sample of children (n=72, mean age±SD, 5.55±0.82 years) participated in a single session where they consumed *ad libitum* from a highly palatable buffet meal, containing sweets (e.g. fruit candies), sweet-fats (e.g. brownies), and savory-fats (e.g. cheese sticks). Body composition was measured by dual-energy X-ray absorptiometry and used as a proxy for tendency to overeat. Secondary analyses are reported using partial correlations and linear regression to examine the association between body composition and intake measures, controlling for child age and sex. **Results:** Total intake was positively associated with percent body fat (p<0.001), but negatively associated with percent lean mass (p<0.001). Percent body fat was positively associated with intake from savory-fats

(p<0.001), but not associated with intake from sweets (p=0.33) or sweet-fats (p=0.43). Regression analyses revealed that android fat percentage was more predictive of total intake (r^2=0.28, p<0.001) than gynoid fat percentage (r^2=0.19, p=0.002) or percent body fat (r^2=0.24, p<0.001). Android fat percentage was positively associated with intake from savory-fats (p<0.001), but not associated with intake from sweets (p=0.43) or sweet-fats (p=0.27). **Conclusions:** Children's body composition, specifically greater android fat, was a strong predictor of intake at a single-session test meal made up of highly palatable foods. Single-meal studies that use highly palatable foods may be valid measures of tendency to overeat.

T-219-P
Infant Body Composition Analysis by Dual-Energy X-Ray Absorptiometry: Comparison of Two Fan-Beam Instruments Using a Solid Anthropomorphic Infant Phantom

Roman Shypailo *Houston, TX*; David A. Fields *Oklahoma City, OK*

Background: Dual energy X-ray absorptiometry (DXA) is used to study infant body composition though little is known about its validity, reliability and precision in an infant population. Differences between manufacturers (Hologic and GE) remain unclear, potentially causing problems in multicenter/longitudinal studies. The purpose of this study was to compare infant scans from different DXA manufacturers at two sites to evaluate precision, agreement and to produce estimated cross-calibration factors. **Methods:** Two sites scanned a solid phantom resembling a 7 kg human infant in body habitus on two DXA instruments, 30 times per scan mode: Hologic infant mode (HOL, Bedford, MA; Delphi v12.1; Baylor College of Medicine site); Lunar infant and thin modes (LUN, Fairfield, CT; iDXA v11-30.062; Oklahoma Health Sciences site). We compared results between devices and scan modes for fat and lean mass and bone mineral (BMC). **Results:** HOL CV for BMC=3.8%, lean=2.5% and fat=5.6%. LUN had better precision (CV<1% for BMC, lean and fat for both modes) with the infant mode having lower precision than the thin mode. All scan modes (LUN infant and thin, HOL infant) differed significantly for BMC and lean mass (p<0.0001). Fat differed between LUN and HOL only (p<0.0001). Absolute differences between LUN modes were small. HOL BMC > LUN BMC by 15%; HOL lean > LUN lean by 6%; LUN fat > HOL fat by 5%. HOL results, relative to anticipated phantom values, overestimated fat (+30%) and underestimated BMC (-12%) and lean (-5%), while both LUN modes overestimated fat (+40%) and underestimated BMC (-14%) and lean (-11%). **Conclusions:** Infant DXA scans done on different manufacturers' instruments are not interchangeable. Although approximately correctable using these comparison results, additional phantoms spanning a range of sizes are needed in order to generate more robust correction algorithms.

T-220-P
Obese by Nature or Practice? Child Lay Theories About Body Weight and Health Habits

Julie Dunsmore, Leanna Berrey *Blacksburg, VA*; David Berry *Blacsburg, VA*; Madlyn Frisard *Blacksburg, VA*

Background: Childhood obesity is increasingly recognized as a major health problem in the United States. Despite the availability of multi-pronged intervention programs, lifestyle change is difficult. Obesity rates have remained steady since 2007. Identifying factors to promote adherence to the challenging task of changing lifestyle habits is a novel and necessary approach to weight loss interventions. Research in other fields robustly demonstrates that beliefs that personal characteristics are fixed (entity lay theories) lead to decreased motivation when facing challenges, whereas beliefs that personal characteristics are changeable (incremental lay theories) lead to increased motivation when facing challenges and to better long-term performance. Viewing body weight as changeable may determine families' choice to participate in intervention programs and their response to setbacks while participating in the program. **Methods:** This study is the first to examine child lay theories about body weight and health habits. Twenty-six parent-child dyads (children aged 8 to 12 years, M age = 9.73 years, SD = 1.37; 57.1% girls; BMI-for-age 14 to 21; BMI-for-age percentiles 3 to 91, M = 45.43, SD = 26.07) completed measures of diet, physical activity, and lay theories. **Results:** Correlations showed that child incremental lay theories were associated with healthier diet (i.e., greater protein, fruits & vegetables intake; ps < .01). Regressions showed that these associations held even after accounting for parental diet and physical activity predictors (ps < .05). **Conclusions:**

Results from the current study suggest that promoting children's incremental beliefs about weight and health habits may be beneficial for weight management program adherence and health.

T-221-P

Hip Strength and Standing Alignment Are Associated with Knee Valgus During Activity in Obese Children

Matthew S. Briggs, Tom M. Best, Sharon Bout-Tabaku, Ajit M. Chaudhari, Colleen Spees, Laura C. Schmitt *Columbus, OH*

Background: Obese children demonstrate increased knee valgus during activity compared to healthy weight children, however contributing factors remain unclear. The aims of this study were to 1) Compare hip strength and knee valgus in obese and healthy weight children and 2) evaluate for correlations of hip strength and standing knee alignment to knee valgus during dynamic activity. **Methods:** Children (ages 11-18) were categorized into two matched groups: obese (OB) [n=9, age: 13.67±2.24, gender: 6M/3F, BMI Z score: 1.95±.18] and healthy weight (HW) [n=9, age: 13.78±2.11, gender: 6M/3F, BMI Z score: .11±.77]. Right isometric hip extension (EXT) and abduction (ABD) strength were measured. Right knee valgus angle [> 0°] was measured during static bilateral standing alignment (STATIC). Peak right knee valgus angle was evaluated during the weight acceptance phase of walking (WALK) and jogging (JOG). Paired T-tests and Pearson's Correlations Coefficients were used to evaluate group differences and correlations. **Results:** OB children demonstrated lower EXT (.988±.46Nm/kg vs. 1.65±.45Nm/kg, p=.008) and lower ABD (.761±.40Nm/kg vs. 1.11±.29Nm/kg, p=.03) and demonstrated greater knee valgus during STATIC (5.49±3.54° vs .503±2.29°, p=.02), WALK (5.39±.3.56° vs .214±2.93°, p=.03) and JOG (6.47±4.59° vs -.604±3.35°, p=.02). ABD, but not EXT, in the OB group correlated with knee valgus during WALK (r=-.860, p=.006). Hip strength did not correlate with knee valgus during JOG in OB or during WALK or JOG in HW. STATIC alignment correlated with knee valgus during WALK (OB: r=-.978, p=<.001 HW: r=-.858, p=.003) and JOG (OB: r=-.817, p=.007; HW: r=-.792; p=.01). **Conclusions:** OB children have less relative hip strength and greater knee valgus. Hip strength and standing alignment may potentially contribute to knee valgus during dynamic activity in OB children.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Surgical Treatment of Obesity

T-222-P

Validity of Bioelectrical Impedance Analysis (Tanita 310) to Estimate Changes in Total Body Water and Percent Body Fat Following Bariatric Surgery

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Background: Bioelectrical impedance analysis (BIA) is an inexpensive, rapid and non-invasive method to estimate body composition; however, few studies have validated BIA in severely obese adults and following substantial weight loss by bariatric surgery. **Methods:** We examined the validity of BIA to assess body composition before (T0) and 12 months (T12) after bariatric surgery (72% Roux-en-Y, 28% Other), and change between time points in a subset of participants (n=32) of the Longitudinal Assessment of Bariatric Surgery-2. Criterion measures were total body water (TBW) determined by deuterium dilution, and percent fat (%fat) calculated with the three-compartment model (3C) (Silva et al., 2004) using deuterium TBW and BodPod determined body volume. BIA TBW and %fat were measured with the Tanita 310. **Results:** T0 to T12 changes in deuterium TBW and 3C %fat were -6 ± 5 L (-14.4%), and -16 ± 9 (-30.5%), respectively. There was no significant difference between BIA and deuterium TBW [T0: 1.2 L (2.4%), p=0.22; T12: 0.11 L (0.003%), p=0.88; Δ: -1.1 L (17.7%), p=0.30]. Compared to 3C, BIA significantly underestimated %fat at T0 and T12 [T0: -3.9 (7.4%), p<0.001; T12: -1.9, (5.3%), p=0.04] and significantly overestimated change [2.0 (12.7%), p=0.04]. Bland Altman plots showed most estimates of BIA TBW (31-32 of 32) and %fat (30-31 of 32) were within 95% limits of agreement with criterion measures at T0, T12 and change. There was no evidence of a fixed bias, i.e., differences between BIA and criterion methods were not related to average values. **Conclusions:** BIA estimates of TBW have good agreement with deuterium dilution. While BIA %fat values differed significantly from 3C values, Bland Altman plots indicated acceptable agreement. Revised BIA equations to estimate % fat in this population may be warranted.

T-223-P

Bariatric Surgery & Lost Work Days: 10-Year Data from the Swedish Obese Subjects Controlled Intervention Study

Martin Neovius *Stockholm, Sweden*; Kristina Narbro *Gothenburg, Sweden*; Catherine Keating *Melbourne, Australia*; Kristian Neovius *Stockholm, Sweden*; Kajsa Sjoholm *Gothenburg, Sweden*; Markku Peltonen *Helsinki, Finland*; Lars Sjöström, Lena M. Carlsson *Gothenburg, Sweden*

Background: The long-term effect of bariatric surgery on work loss is not well-characterized. We aimed to compare lost work days over 10 years in bariatric surgery and conventionally treated obese patients. **Methods:** Prospective, controlled intervention trial of 2010 adults who underwent bariatric surgery (13% gastric bypass, 19% gastric banding, 68% vertical-banded gastroplasty) and 2037 matched controls receiving conventional obesity treatment (recruitment 1987-2001). Inclusion criteria were age 37-60y and BMI≥34 in men and BMI≥38 in women. Data on lost work days from sick leave and disability pension were retrieved from the Swedish Social Insurance Agency (maximum 365 compensated days/year). Mean differences in accumulated days over 10 years after the index date were estimated by sex and adjusted for baseline age, smoking, diabetes, education level, inclusion period, and lost work days during the previous year. **Results:** During the index year women in the surgery group accumulated 119 lost work days versus 72 in controls (adjusted mean difference 31; 95%CI 26-36; P<.001). The corresponding numbers in men were 106 and 66 (adjusted mean difference 27; 95%CI 19-35; P<.001). Among women annual lost work days did not differ during follow-up years 2 to 10, while among men the adjusted mean differences consistently favored the surgery group and were statistically significant for some years. During the 10-year period, women in the surgery group accumulated a mean 1260 lost work days compared to 1028 in controls (adjusted mean difference 103; 95%CI 30-176; P<.001). Corresponding numbers in men were 950 versus 873 (adjusted mean difference -43; 95%CI -155 to 70; P=.46). **Conclusions:** Over 10 years, surgically treated women accumulated more lost work days compared to controls. For men no between-group difference was observed over this time period.

T-224-P

Five-Year Outcome After Gastric Bypass and Duodenal Switch: A Randomized Trial

Hilde Risstad, Torgeir T. Søvik *Oslo, Norway*; My Engstrom *Gothenburg, Sweden*; Erlend T. Aasheim, Jon A. Kristinsson, Morten W. Fagerland, Tom Mala *Oslo, Norway*; Torsten Olbers *Gothenburg, Sweden*

Background: We report the first five-year data from a randomized, controlled trial of gastric bypass versus duodenal switch in superobese patients. **Methods:** In this Scandinavian two-center trial, 60 patients with BMI 50¬–60 kg/m2 were randomized to laparoscopic Roux-en-Y gastric bypass (n=31) or laparoscopic duodenal switch (n=29). Primary outcome was change in BMI. Secondary outcomes included adverse events, changes in cardiovascular risk factors and health-related quality of life (Short Form-36 and Obesity-related Problems scale). Linear mixed models were used to analyze repeated measurements. **Results:** Of 60 participants, 55 (92%) completed follow-up. Mean BMI at baseline was 55 kg/m2 in both groups. At five years, mean BMI was 41 kg/m2 after gastric bypass and 33 kg/m2 after duodenal switch. Mean between group difference was 8.5 (95% CI 4.9–12.2) kg/m2, P<0.001. Improvements in mean fasting concentrations of total cholesterol, LDL cholesterol, triglycerides, and glucose were significantly greater after duodenal switch. Blood pressure and health-related quality of life improved similarly. From >30 days after surgery until five years, 12 (44%) patients in the gastric bypass group and 23 (82%) patients in the duodenal switch group had adverse events (P=0.004). Three patients operated with duodenal switch had elongation of the common channel due to severe malnutrition or diarrhea. One patient operated with gastric bypass died from renal cancer. **Conclusions:** Five years after surgery, duodenal switch patients had greater

weight loss and greater improvements in some cardiovascular risk factors. However, duodenal switch was associated with more adverse events.

T-225-P

Problematic Pre-Surgical Intake of High-Sugar/Low-Fat and High Glycemic Index Foods is Associated with Development of Post-Surgical Substance Use Disorders

Lauren A. Fowler, Karen K. Saules *Canton, MI*; Valentina Ivezaj *New Haven, CT*

Background: It has been documented that post-bariatric surgery patients, particularly those who have had the Roux-en-Y procedure, are overrepresented in substance abuse treatment, constituting about 3% of admissions; about 2/3 of such patients deny problematic substance use prior to their weight loss surgery (Ivezaj et al., 2012; Saules et al., 2010; Wiedemann et al., under review). Therefore, it is important to advance our understanding of the emergence of substance use disorders (SUDs) – particularly the New Onset variant — after bariatric surgery. Burgeoning research with both animal models and humans suggests that "food addiction" may play a role in certain forms of obesity (Avena & Gold, 2011; McFadden, 2010), with particular risk conferred by foods high in sugar but low in fat. Therefore, we hypothesized that bariatric surgery patients who report that high-sugar/low-fat foods, and perhaps also those high on the Glycemic Index, were most problematic for them before surgery would be those most likely to evidence New Onset SUDs after surgery. **Methods:** Secondary data analyses were conducted using a de-identified database from 154 bariatric surgery patients (88% female, mean age of 48.7 and standard deviation of 10.8, mean of 2.7 yrs post-surgery and standard deviation of 2.2). **Results:** Logistic regression analyses revealed that participants who endorsed pre-surgical problems with hi-sugar/low-fat foods and those high on the glycemic index were at greater risk for New Onset SUD in the post-surgical period. These findings remained significant after controlling for other predictors of post-surgical SUD. **Conclusions:** Our findings provide evidence for the possibility of addiction transfer among certain bariatric patients.

T-226-P

A Brief Physical Activity Intervention Improves Preoperative Health-Related Quality of Life in Bariatric Surgery Patients: Results from the Bari-Active Randomized Controlled Trial

Dale S. Bond, Graham Thomas *Providence, RI*; Wendy C. King *Pittsburgh, PA*; Jennifer Trautvetter, Sivamainthan Vithiananthan, Dieter Pohl, Jeannine Giovanni, Beth Ryder, Dean Roye, Rena R. Wing *Providence, RI*

Background: Improved Health-Related Quality of Life (HRQoL), an important goal of bariatric surgery programs, may be undermined by low physical activity (PA). The current study tested the impact of a preoperative PA intervention on HRQoL. **Methods:** Participants (n=51, 88% women, age=47.2±9.0 yr, BMI=45.1±6.7) were randomly assigned preoperatively to 6 wks of PA intervention (PAI/n=28) or standard care (SC/n=23). PAI received weekly individual counseling to increase walking by 30 min/d in bouts ≥10-min. SC attended routine clinical visits only. Participants wore a multi-sensor monitor for 7 d and completed the SF-36 at pre- and post-intervention to measure changes in moderate-to-vigorous PA (MVPA) bout-related min/d and HRQoL, respectively. **Results:** PAI significantly increased bout-related MVPA from pre- to post-intervention (4.4±5.8 to 25.9±23.6 min/d), compared to no change (9.6±19.1 to 8.9±12.3 min/d) in SC (p=0.001). Weight change did not occur in either group. PAI reported greater improvements than SC on SF-36 domains [physical function (PF; 4.4±7.1 vs. 0.9±6.5), bodily pain (BP; 3.4±5.8 vs. 2.6±4.0), general health (GH; 4.2±8.2 vs. -0.2±8.1), vitality (VT; 8.5±8.2 vs. 2.2±6.8)], and the physical component summary (PCS; 4.8±8.1 vs. 2.4±7.2) (p's<0.05). In PAI, greater bout-related MVPA increases were related to greater PF (p=0.03), role-physical (RP; p=0.04), and BP (p=0.02) improvements, controlling for age, sex, BMI, and pre-intervention MVPA and SF-36 values. In this model, for every 10-min/d increase in bout-related MVPA, there was a 1.9 point increase in PCS score (p=0.01). **Conclusions:** Increasing PA improves physical aspects of HRQoL in bariatric surgery patients before surgery and weight loss occurs. Future studies should examine whether this effect improves surgical safety, weight loss outcomes and postoperative improvements in HRQoL.

T-227-P

Are Mortality Benefits of Gastric Bypass Surgery Influenced by the Patient's Age at Surgery?

Lance E. Davidson, Ted D. Adams, Richard E. Gress, Sherman Smith, Steven C. Simper, Rodrick McKinlay, Steven C. Hunt *Salt Lake City, UT*

Background: Several large epidemiological studies have demonstrated an all-cause and cardiovascular disease mortality benefit after bariatric surgery. Bariatric surgery is currently offered as a treatment option to adult patients of all ages. Whether or not reduced mortality risk extends to all age groups is not yet known. **Methods:** In an existing retrospective cohort of 9949 gastric bypass surgery patients and 9628 age-, sex-, and weight-matched severely obese controls, we determined the mortality rates of cardiovascular disease, cancer, and all causes using the National Death Index. Categories of age at surgery were created: <35, 35-44, 45-54, and 55+ years with a mean follow-up period of 7.1 years. **Results:** Adjusted all-cause mortality was higher for younger post-surgery patients than for severely obese controls (HR: 1.52, p=0.01), but lower within all subsequent age categories (HR: 0.64, 0.41, and 0.45, respectively; all p<0.001). External causes (accidents, poisonings, suicides, etc.) alone accounted for the increased mortality risk observed in younger surgical patients (with external causes removed, HR reduced from 1.52 to 1.06, p=0.80). Cardiovascular mortality rates were lower in surgery patients (HR: 0.81, 0.39, 0.38, 0.69, p<0.005 for middle age groups only). Cancer mortality rates were lower than controls across all age categories (HR: 0.13, 0.54, 0.42, 0.37, all p<0.06). **Conclusions:** Gastric bypass surgery appears to be protective against cardiovascular and cancer mortality for all age groups. With the exception of increased externally-caused mortality in younger patients, gastric bypass surgery also significantly reduces all-cause mortality rates. Further investigations should target prevention of external causes of death in younger gastric bypass patients after surgery.

T-228-P

Suicide Risk in Gastric Bypass Patients Relative to a Non-Surgery Comparison Group and Population Controls

Sheila E. Crowell, Lance E. Davidson, Richard E. Gress *Salt Lake City, UT*; Ronette Kolotkin *Durham, NC*; Steven C. Hunt, Ted D. Adams *Salt Lake City, UT*

Background: Recent epidemiological studies report higher rates of accidental death and suicide for those who have undergone gastric bypass surgery. To date, no study has examined whether gastric bypass patients report higher suicide thoughts and planning (suicidality) relative to well-matched comparison groups. **Methods:** This study reports Exam 4 data (10-year follow-up) from a large cohort (n=1156) who either did or did not receive bariatric surgery and population controls. Of those, 146 participants (~49/group) have completed the current assessment. **Results:** Relative to both comparison groups, those who received surgery reported higher suicidality (F(2,89)=3.22, p=.04). This finding remained significant with concurrent depression in the model (p=.02) and approached significance controlling for both depression and weight-related distress (p=.06). To test whether suicidality was due to longstanding psychological problems we tested whether Exam 1 psychological wellbeing negatively predicted Exam 4 suicidality, mediated by concurrent depressive symptoms and moderated by group (surgery vs. not). Results were consistent with full mediation (F(3,83)=8.5, p<.001). Group status did not moderate the association between early psychological wellbeing and later suicidality, which was significant for all groups (t=-4.8, p<.0001). However, the association between depression and suicidality was strongest for those who had received surgery (t=2.6, p=.01). **Conclusions:** Across all groups there was stability of psychological distress over time. However, the association between depression and suicidality is strongest for those who received gastric bypass surgery, even when early psychological well-being is accounted for. This suggests a strong need to assess suicide risk routinely among bariatric surgery patients who are depressed.

T-229-P

Phase III, Randomized, Placebo-Controlled Evaluation of Ferumoxytol Treatment for Iron Deficiency Anemia in Patients Who Have a History of Unsatisfactory Oral Iron Therapy: Fatigue and Health-Related Quality of Life in Gastric Bypass Patients

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Background: Iron is essential for the function of key proteins including hemoglobin (Hgb), cytochromes, and various enzymes. Therefore, iron deficiency can negatively impact patients' health-related quality of life (HRQL). Iron deficiency anemia (IDA) is common in patients after gastric bypass due to malabsorption. However, many patients do not tolerate or adequately respond to oral iron; those patients live with chronic anemia and related negative effects on HRQL. **Methods:** To explore the impact of intravenous iron treatment on patient reported outcomes in IDA patients with a history of unsatisfactory oral iron therapy or in whom oral iron cannot be used, this randomized, placebo-controlled, double-blind, Phase 3 study included Functional Assessment of Chronic Illness Therapy-Fatigue Scale (FACIT-F) and the SF-36. Patients (808) were randomized 3:1 to 1g of ferumoxytol (FER, 2 doses, 510mg, 3-8 days apart) or saline placebo (PL). FACIT-F was assessed at Baseline (BL) and weekly for 5 weeks; SF-36 was assessed at BL and Weeks 3 and 5. This subgroup analysis investigates patients with gastric bypass history. **Results:** Patients' BL FACIT-F scores (FER, n=84, 20.2; PL, n=30, 20.6) were much lower than general US population norms (40.1), as were all BL SF-36 domains (FER, 34.1-44.4; PL, 33.0-46.7; general population, 50). Mean Hgb increased in FER patients by 3.1g/dL from BL to Week 5, vs. a -0.1 g/dL decrease with PL (p<0.0001). In parallel, FER patients showed a significantly greater improvement in FACIT-F than PL at Week 3 (13.0 vs 7.8, p=0.036) and Week 5 (14.0 vs 8.9, p=0.036). FER patients also showed a significantly greater improvement than PL in three SF-36 domains (p≤0.05) from BL to Week 5. **Conclusions:** This analysis found that FER treatment increased Hgb and significantly improved HRQOL in IDA gastric bypass patients with history of unsuccessful oral iron.

T-230-P

Three Year Physical Activity Trajectories and Predictors of Trajectory Class Membership in Bariatric Surgery Patients

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Background: Understanding how and identifying predictors of physical activity (PA) changes following bariatric surgery are critical to assessing the need for and planning effective interventions. **Methods:** We examined 3 year longitudinal trajectories of PA in a subset of participants of the Longitudinal Assessment of Bariatric Surgery-2 study (n=470; 79% female, 89% white, median age 47y, median BMI=45kg/m2, 70% Roux-en-Y) and determined whether preop characteristics predict trajectory group (TG) membership. An activity monitor was worn (3-7d, ≥10 h/d) preop, and annually postop. Steps/d and high-cadence (i.e., moderate-vigorous intensity) min/wk were computed. Group-based trajectory analysis and generalized ordinal logistic regression were applied. **Results:** Of the four steps/d TGs, the two least active TGs (accounting for 91% of subjects) had increases of ~1100-1300 steps/d in y1, while one TG (8%) had a larger increase (~2400 steps/d) and one TG (1%) had a decrease (~3800 steps/d); all steps/d TGs were fairly stable in y2 and y3. All five high-cadence TGs had changes in high cadence/wk through y3; the two least active TGs (accounting for 93% of subjects) had slight increases (~35 min/wk), one TG (3%) had a dramatic increase (~480min/wk), and two TGs (4%) had decreases (~110-230 min/wk). Female sex, Hispanic ethnicity, older age, higher BMI, living as married, having dyslipidemia, worse health-related quality of life, and self-report of not using home exercise equipment or attending exercise classes prior to surgery independently (p<.05) increased the likelihood of belonging to less active TGs. **Conclusions:** Most bariatric surgery patients follow fairly-stable PA trajectories without major increases in PA levels through 3 postop years. Several socio-demographic, health, and lifestyle characteristics associated with unfavorable PA trajectories were identified.

T-231-P

Cognitive Function Predicts Weight Loss 36 Months Following Bariatric Surgery

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Background: Cognitive impairment is found in many patients undergoing bariatric surgery. Past research demonstrates that cognitive dysfunction is associated with reduced postoperative weight loss up to 24 months following surgery. We extend these findings by examining contribution of cognitive function to weight loss durability 36 months following surgery. **Methods:** Fifty-five individuals enrolled in the Longitudinal Assessment of Bariatric Surgery parent project completed cognitive testing at preoperative baseline and serial postoperative timepoints, including 12 weeks and 36 months. Cognitive test scores were normed to control for intelligence and demographic variables. Percent weight loss (%WL) and body mass index (BMI) were calculated at 36 month follow-up. **Results:** Adjusting for gender, baseline global cognitive function, and 12-week %WL, 12 week postoperative global cognition predicted 36 month postoperative %WL (β=.47, p=.03) and 36 month BMI (β=-.55, p=.01). Independent samples t-tests comparing 12 week postoperative cognition in those who remained obese at 36 months (54.5%) versus non-obese revealed poorer global cognitive function in those who remained obese (t(53)=-2.12, p=0.04). Recognition memory, working memory, and semantic fluency showed the strongest link between cognitive performance and 36 month weight loss. **Conclusions:** Poorer cognitive function 12 weeks after bariatric surgery predicted reduced weight loss outcomes 36 months following surgery. Further work is necessary to clarify the mechanisms underlying the relationship between weight loss outcomes and cognitive function, particularly the contribution of adherence, as this approach may ultimately help identify individuals in need of tailored interventions to optimize postoperative weight loss.

T-232-P

Teen-LABS: Severe Obesity, Comorbidity Burden and Adolescent Quality of Life

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Background: Careful study of the safety and efficacy of adolescent weight loss surgery (WLS) is critical to empirically inform age-salient patient care. To date, we lack an understanding of how pre-operative comorbidity burden impacts adolescent health- and weight-related quality of life (HRQOL, WRQOL). **Methods:** Baseline data from a prospective multicenter observational study (Teen-LABS) characterized 242 adolescents undergoing WLS (75.6% female; 71.9% White; Mage=17.1; MdnBMI = 50.5kg/m2). Standardized criterion defined the presence/absence of 14 comorbid conditions, including elevated depressive symptoms (DEP: BDI), binge eating disorder (BED:QEWPR) and HRQOL (SF36) and WRQOL (IWQOL-Kids). A cumulative Comorbidity Index (CI) was computed for males (Mdn=4.3; range 1-8) and females (Mdn=3.9; range 0-9). **Results:** The most prevalent comorbidities were dyslipidemia (74.4%), chronic pain (58.3%), obstructive sleep apnea (56.6%), hypertension (45.0%), and PCOS/menstrual irregularities (43.2%), relative to BED (15.4%) and DEP (14%). Gender-stratified, multivariable regression revealed CI was associated with only male WRQOL. For males and females, BMI, chronic pain, and DEP, as well as BED for females, were significant predictors beyond the CI, although varied by HRQOL/WRQOL scale. Exploratory analyses suggest additional less prevalent conditions (e.g., stress urinary incontinence) also contributed to HRQOL/WRQOL impairment. **Conclusions:** Severe excess weight and associated comorbidities significantly impact adolescent HRQOL/WRQOL. While several indicated factors may resolve with weight loss (e.g., chronic pain, total comorbidity burden), others (e.g., DEP) may not without targeted intervention. This comprehensive characterization establishes an empirical base from which to understand HRQOL/WRQOL postoperatively, as weight and comorbidity profiles change over time.

T-233-P

This abstract has been withdrawn.

T-234-P

This abstract has been withdrawn.

T-235-P

Trends in Weight Regain Following Gastric Bypass (RYGB) Bariatric Surgery

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Background: The purpose of this study is to assess whether percent weight regain following RYGB differs among stratified cohorts of patients based on success of weight loss in the first post-operative year. **Methods:** Study participants were selected from a database of patients who underwent bariatric surgery between 01/01/1999 and 06/30/2009. Participants (n=300, mean procedure age=45.6, SD=9.9) completed surveys by web, phone, or paper/mail recording self-reported pre-operative weight, current weight (i.e. weight at time of survey completion), and subsequent weights over post-operative years. Measured weights and confirmed procedure dates were acquired from patient medical records. Mean pre-operative weight and BMI were 140.8 kg (SD=32.1) and 49.7 (SD=9.9), respectively, and mean years since surgery was 6.9 (SD=4.9). Study subjects were mostly Caucasian (56.7%) and female (80.3%). Participants were arbitrarily stratified into four cohorts based on percentage of weight loss after the first post-operative year: <25% (n=39), 25-30% (n=51), 30-35% (n=73), and >35% (n=113). One-way ANOVA analyses were conducted to assess the effect of year one weight loss on percent weight regain. **Results:** Mean weight regain (%) in the <25%, 25-30%, 30-35%, and >35% cohorts was 29.1 (SD=29.1), 21.9 (SD=17.1), 20.9 (SD=16.2), and 23.8 (SD=20.1), respectively. Differences between groups were not significant (F(3,272)=1.523, p=.209). However, post-hoc tests yielded a significant difference between patients who lost <25% of their weight and patients who lost 30-35% of their weight. **Conclusions:** Percentage of weight lost in the first post-operative year was not significantly associated with percentage of weight regain post-operatively in our study.

T-236-P

Continued Loss in Ectopic Adipose Tissue Even After Weight Stabilization Following Bariatric Surgery

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Background: The effects of bariatric surgery induced weight loss on total adipose tissue (TAT) including sub-depots, subcutaneous (SAT), visceral (VAT), and intermuscular (IMAT) are poorly understood. **Methods:** Whole-body MRI assessed TAT and sub-depots before (T0), at 12 months (T12) and 24 months (T24) after surgery (81% Roux-en-Y, 19% Other) in a subset of participants of the Longitudinal Assessment of Bariatric Surgery-2 (from T0 to T12, n=20F and 3M; from T12 to T24, n=42F and 7M). Paired t-tests and GLM repeated measures examined changes in TAT, SAT, VAT, and IMAT at T12 and T24, with sex and age as covariates. **Results:** Changes from T0 to T12 included weight (-41.9 ± 12.1kg; -36.1%), TAT (-33.5 ± 9.6kg; -56.3%), SAT (-29.2 ± 8.2kg; -55.2%), VAT (-3.3 ± 1.6kg; -72.6%), and IMAT (-0.99 ± 0.68kg; -48.9%), all p<0.001. In females, from T12 to T24, despite stability in weight (p=0.085), TAT (-1.9 ± 6.3kg; -5.4%; p=0.059), and SAT (-1.2 ± 5.6kg; -3.7%; p=0.17), VAT (-0.5 ± 0.7kg; -30.1%; p=<0.001), and IMAT (-0.2 ± 0.4kg; -13.6%; p=0.012) declined further. In males from T12 to T24, weight increased (5.1 ± 5.2kg; 5.6%; p=0.039), but no significant changes were found for TAT (4.0 ± 5.0kg; 14.1%; p=0.078), SAT (3.4 ± 4.6kg; 13.8%; p=0.099), VAT (0.4 ± 1.2kg; 14.8%; p=0.46), and IMAT (0.3 ± 0.5kg; -17.9%; p=0.16) although the direction of change indicated regains. **Conclusions:** Bariatric surgery results in dramatic loss of adipose tissue from both subcutaneous and ectopic, i.e., visceral abdominal and intermuscular depots, even after weight loss has begun to stabilize one to two years post surgery. These results indicate that favorable changes in body composition can continue to occur following bariatric surgery in the absence of further weight change.

T-237-P

Perioperative Outcome of Adolescents Undergoing Bariatric Surgery: The Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS) Study

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Background: Weight loss surgery (WLS) is being used to treat severely obese adolescents, although with very limited data regarding surgical safety for currently used, minimally-invasive procedures. To assess clinical characteristics and 30-day safety outcomes of severely obese adolescents undergoing WLS. **Methods:** A prospective cohort study was conducted at 5 adolescent WLS centers in the U.S. Consecutive patients ≤ age 19 years were offered enrollment into a long-term outcome study. Preoperative anthropometrics, comorbid conditions, and complications occurring in hospital and within 30 days of discharge were examined. Re-operations and hospital re-admissions were adjudicated by independent reviewers to assess relatedness to the WLS procedure. **Results:** Mean age of 242 participants was 17.1±1.6 years and the median BMI was 50.5 kg/m2. Fifty-one percent demonstrated four or more major co-morbid conditions. Laparoscopic Roux-en-Y gastric bypass, vertical sleeve gastrectomy, and adjustable gastric banding were performed in 66%, 28%, and 6% of subjects, respectively. There were no deaths during the initial hospitalization or within 30 days of surgery; major complications were seen in 19 subjects (8%). Minor complications were noted in 36 subjects (15%). All re-operations and 85% of re-admissions were related to WLS. **Conclusions:** In this series, adolescents with severe obesity presented with abundant comorbid conditions. We observed a favorable short-term complication profile, supporting the safety of weight-loss surgery in select adolescents. Further longitudinal study of this cohort will permit assessment of long-term outcomes for adolescents undergoing bariatric surgery.

T-238-P

Pre-Operative Weight Cycling and Post-Operative Weight Regain Following Weight Loss Surgery (WLS)

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Background: While most patients initially lose weight in the first year following WLS, many have difficulty maintaining the weight loss longer-term. We investigated the predictors for long-term weight regain following WLS. **Methods:** Participants (N=343) were recruited from a bariatric surgery office at a major urban hospital. Participants completed the Questionnaire on Eating and Weight Patterns-Revised (QEWP-R). Weight cycling, defined as number of times participant lost and regained 20 lbs or more, was assessed using the QEWP-R. Chart data were reviewed to obtain weights and self-reported weights were used when chart data was unavailable. Participants were assessed prior to WLS and at follow-up points, up to 6 years post-surgery. The current analysis only included participants who had weight data at 18 months post-op or later (n=144). **Results:** Data were analyzed using independent samples t-test. Participants were divided into weight regain group (n=38) (WR) vs. non-weight regain (n=106) (NWR) based on regain of >30% of weight lost (baseline-nadir). Participants in WR group had significantly more episodes of pre-operative weight cycling (M=3.1, SD=0.1) than NWR group (M=2.6, SD=1.0), t(142)=2.33, p=.02. **Conclusions:** Results indicate that long-term weight regain is not uncommon following WLS. Preoperative weight cycling was associated with increased weight regain following WLS. Weight cycling is often linked to patterns of restriction and overeating. These patterns can lead to disruption of the body's physiological hunger-satiation-fullness response that may persist after WLS and contribute to weight regain. WLS candidates with weight cycling episodes may benefit from interventions that encourage correction of the physiological hunger-satiation-fullness response, such as mindful eating.

T-239-P

Food Addiction and Long Term Weight Loss Outcomes Following Bariatric Surgery

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Background: Studies have suggested that food addiction (FA) plays a role in obesity and undermines weight loss efforts. However, no studies have examined the association between FA and long term weight loss outcomes following bariatric surgery. **Methods:** 36 patients who were at least five years post adjustable gastric banding or gastric bypass were contacted to complete the Yale Food Addiction Scale (YFAS). Preoperative behaviors and characteristics, and postoperative outcomes were obtained from clinical records and compared between individuals who met diagnostic criteria for FA and those who did not using t-test and chi-square. **Results:** 8 subjects met the diagnostic criteria for FA and 28 did not. There were no differences in age, sex, preoperative BMI, preoperative tendency to eat until uncomfortably full, eating disorders, surgical procedure, greatest percent excess weight loss (%EWL) achieved, failure to achieve 5o%EWL, or %EWL at the time of YFAS administration between the FA groups. More subjects who were diagnosed with FA experienced significant weight regain (>30% of lost weight) following initial weight loss (62.5% vs 14.3%, p=.005). Subjects diagnosed with FA also reported lower confidence in weight loss success before undergoing surgery (8.2 vs 9.4 on a ten-point scale, p=.02). Preoperative report of emotional eating trended toward significance (87.5% vs 54.5%, p=0.1). **Conclusions:** Patients with FA may be particularly vulnerable to long term weight regain after bariatric surgery. In addition, FA may be associated with emotional eating and impact weight loss confidence in patients who are considering bariatric surgery. Tailored pre and postoperative care, including psychological counseling, is warranted in bariatric surgery patients who are diagnosed with FA. Larger, prospective studies are necessary to further elucidate the role of FA in this population.

T-240-P

Smoking and Alcohol Use in Gastric Bypass Patients

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Background: Bariatric surgery may increase the risk of substance use. The purpose of this study was prospectively assess smoking and alcohol use before and after bariatric surgery, identify characteristics associated with alcohol use and smoking, and examine substance use and weight loss. **Methods:** Participants (N=155, Mean=50.1±11.3 y and 45.7±7.0 kg/m2) were Roux-En-Y gastric bypass patients that completed surveys on substance use pre-operatively and post-operatively. **Results:** Alcohol use significantly decreased preoperatively (72.3%) to postoperatively (63.2%). As preoperative alcohol quantity rose, the odds of consuming any alcohol postoperatively increased six-fold. Higher BMI increased the odds of high alcohol consumption. Of the participants who did not use alcohol preoperatively, 23.2% used alcohol after surgery. Older age decreased the odds of alcohol use and smoking. Smoking status did not differ pre- (19.4%) to post- (14.8%) surgery. Among nonsmokers before surgery, 9.6% reported smoking after surgery. Alcohol use and smoking were not associated with weight loss. **Conclusions:** After weight-loss surgery, alcohol use declined but smoking rates did not significantly change. Younger age patients are more likely to use alcohol and smoke postoperatively. Patients with a higher BMI or a history of substance use may be more likely to use alcohol postoperatively.

T-241-P

Using the EHR to Evaluate the Collateral Impact of Bariatric Surgery

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Background: Bariatric surgery is the only effective long-term treatment for morbid obesity. The bariatric program includes lifestyle changes that may have a collateral effect on co-habitants. Studies on this topic have produced conflicting results, showing both weight loss and weight gain in family members of surgery patients. This is the largest study to investigate the impact of bariatric surgery on the growth pattern of children living with surgery pa-

tients. **Methods:** Child co-habitants, aged 6 to 16 years, of Roux-en-Y gastric bypass patients were identified by matching addresses from the electronic health record . Pre-operative BMI percentile was calculated using CDC growth charts. An expected post-operative weight was calculated using the pre-operative BMI percentile and age/height measured at the post-operative measure. The post-operative expected weight was compared to the actual measured weight using Wilcoxon signed-rank test. **Results:** The 151 children had a mean age of 11 years and 58% (n=88) were male. When stratified by pre-operative BMI percentile, 38% (n=57) had a normal BMI percentile (<85%); 23% (n=34) were overweight (BMI %tile of 85%-95%); and 40% (n=60) were obese (BMI %tile > 95%). Among overweight or obese children, the mean post-operative weight was 3.3 lbs. less than expected (p=0.212). Obese females aged 12-16 had a post-operative weight that was an average of 14 pounds lower than expected (n=20, p=0.0296). Post-operative weight was not significantly different than expected for children aged <12 or for males aged 12-16. **Conclusions:** Adolescent females living with surgery patients experienced a significant weight loss from pre-to post-surgery. We found a similar weight loss trend when we combined all overweight or obese children. Future research should investigate the mechanism for this collateral benefit of bariatric surgery.

T-242-P

Depression Symptoms in Adolescents with Severe Obesity Two Years After Gastric Bypass

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Background: Adolescents with severe obesity have elevated depression symptoms compared to non-obese teenagers. Studies report that 16-39% of adolescents seeking weight-loss surgery present with clinical depression symptoms. A previous follow-up of 16 adolescents demonstrated substantial improvements in depression symptoms two years after gastric bypass (Zeller et al, 2011). **Methods:** We analyzed depression scores in 48 adolescents undergoing gastric bypass in the Swedish Adolescent Morbid Obesity Surgery-study (AMOS). Mean age at surgery: 16.9 years, 67% girls. BMI at baseline: 45.6 kg/m2. Depression was assessed using the depression scale in Beck Youth Inventories (BYI) at baseline and two years after surgery. BYI has Swedish gender specific norms. Scores ≥ 90th percentile are considered clinically elevated. **Results:** At base-line 23% (n=11) of the adolescents had a BYI depression score ≥ 90th percentile, compared to 12% (n=6) at follow-up. Depression symptoms decreased significantly from baseline to two years post-surgery (t= 3,213 p=.002). The mean percentile for depression was 66.5 (range 9.1-99.9) prior to surgery and 47.6 (range 1.9-99.7) two years after surgery. At two years post-surgery, 20 adolescents (42%) had improved and 24 adolescents (50%) had unchanged depression symptoms compared to baseline, 4 adolescents (8%) had deteriorated. **Conclusions:** We found a significant improvement in depression symptoms in adolescents with severe obesity two years after gastric bypass surgery. Depression symptoms were at an average level compared to norms at follow-up, indicating a more normalised mental health post-surgery. However, a minor group deteriorated.

T-243-P

Randomized Comparative Effectiveness Pilot Study of Laparoscopic Bariatric Surgery vs. Intensive Medical Treatment on Diabetes Remission in Patients with Type 2 Diabetes and Body Mass Index 30-35; Assessing the sRAGE Biomarker as a Predictor of Success After Surgery

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Background: Bariatric surgery significantly lowers body weight and improves Type 2 diabetes (T2DM), but is mainly offered to patients with Body Mass Index (BMI) > 35. Extending surgery to Class I obese (BMI 30-35) patients with T2DM is a critical research gap. We partnered with our health system's primary insurer to offer surgery to such patients. The identification of predictive biomarkers may also help determine who would benefit most from surgery. In animal models, the receptor for advanced glycation endproducts (RAGE) is linked to the pathogenesis of obesity and metabolic dysfunction.

In humans, soluble forms of RAGE (sRAGE) are specific biomarkers of the RAGE axis in metabolic disorders. **Methods:** 48 patients with T2DM and BMI 30-35 who otherwise met criteria for bariatric surgery were randomized to surgery (bypass, sleeve or band, based on patient preference) vs. intensive medical weight management. HOMA-IR, HbA1c, weight, BMI, blood pressure, waist circumference, fasting lipids and sRAGE levels were collected at baseline and at 6 months. The primary outcomes assessed at 6 months were (1) change in insulin resistance and (2) remission of diabetes. Secondary outcomes included changes in weight, HbA1c, and sRAGE. **Results:** Interim analysis reveals the surgery group had significantly lower HOMA-IR (-5.0 vs. +1.6; p=0.0055), higher diabetes remission rate (40% vs. 0%; p=0.020), better weight loss (-6.5 vs. -1.1 BMI decrease; p<0.0001) and lower HBA1c (-1.2 vs. -0.3; p=0.021) at 6 months. Higher baseline sRAGE was significantly associated with better weight loss outcomes after surgery (r=-0.641; p=0.046). There were no mortalities. **Conclusions:** Surgery was very effective short-term in patients with T2DM and BMI 30-35. Baseline sRAGE may predict successful outcomes after bariatric surgery. These findings need to be confirmed with larger studies.

T-244-P
Healthcare Provider Opinions Regarding Weight Loss Surgery in Adolescents

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Background: Weight loss surgery (WLS) is a recommended treatment for carefully selected adolescents with severe obesity and comorbidities. However, previous reports found pediatric healthcare providers are resistant to refer for WLS. Given improvements in safety and efficacy of WLS, we explored pediatric providers' obesity treatment practices and perceptions about WLS in adolescents. **Methods:** Surveys were disseminated via email to pediatric list-serves assessing perceptions of WLS, obesity management practices, and demographics. After descriptive analyses, responses were examined via correlations, chi squares and one way ANOVAs to compare responses by provider characteristics (e.g., demographics, specialty, weight status). **Results:** Surveys were completed by 109 providers (50% male; 56% attendings; 38% pediatricians, 32% subspecialists, 24% surgeons). Almost half (45%) do not routinely measure BMI. Providers typically counsel patients about obesity risks and lifestyle change, although with limited perceived benefit; <10% have ever referred patients for WLS. Reasons cited for not making referrals include: cost (20%), risk (49%), or "not indicated in pediatrics" (17%). However, when presented with patient scenarios of different ages and comorbidities, likeliness to refer for WLS increased substantially. Surgeons, younger providers and those with fewer years of experience were more likely to refer for WLS (p<0.05). **Conclusions:** Despite expert consensus recommendations for WLS as part of a comprehensive obesity treatment plan, significant pediatric healthcare provider resistance to refer severely obese adolescents remains. With more evidence supporting efficacy of newer procedures and deleterious consequences of leaving obesity untreated long-term, improved referral and management practices are needed to provide patients with the full spectrum of treatment options.

T-245-P
Preoperative Factors Associated with Early Postoperative Blood Glucose Control in Type II Diabetics Undergoing Gastric Bypass Surgery

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Background: Various factors have been shown to be associated with the resolution of type II diabetes after weight loss surgery. Less has been written about the immediate postoperative period. The purpose of this study was to evaluate for preoperative factors predictive of good glucose control in the immediate postoperative period after gastric bypass surgery and to use the information as a guide to develop an inpatient postoperative glucose control strategy. **Methods:** A retrospective chart review was performed for all patients with type II diabetes who underwent roux-en-y gastric bypass surgery at a single institution from 2001 to 2012. **Results:** There were 227 patients. The majority were female (65%) and Caucasian (94%). The mean BMI was 46.7 and the mean hemoglobin A1C (HgbA1C) within three months of surgery was 7.3. 8.3% of patients were on no diabetic treatment preoperatively, 4.4% were on diet and exercise, 39.2% were on oral medications, 47.1%

were on injectable insulin and 1% were on continuous insulin infusions. The mean preoperative insulin sensitivity (usage/kg) was 0.7 units/kg. Preoperative HgbA1C (6.6 vs. 7.8, p<0.0001), treatment regimen (diet and exercise vs. orals vs. injectable insulin vs. continuous infusion, p=0.0001) and insulin sensitivity (0.5 vs. 0.8, p=0.39) were significantly associated with good postoperative glucose control defined as a blood glucose level of <180 on postoperative day (POD) #1. Age, sex, race and preoperative body mass index (BMI) were not associated with postoperative glucose control. Similar results were seen for POD#2 and #3. **Conclusions:** Preoperative HgbA1C, diabetes treatment regimen and insulin sensitivity are predictive of good postoperative glucose control and should be taken into account when designing a treatment strategy for hyperglycemia in the immediate postoperative period after gastric bypass surgery.

T-246-P
Anemia and Related Nutrient Deficiencies After Roux-en-Y Gastric Bypass Surgery: A Systemic Review and Meta-Analysis

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Background: Roux-en-Y Gastric Bypass (RYGB) surgery is well-known to lead to short-term weight loss and intermediate glycemic control. Its long-term impact on anemia and related nutrient deficiencies remains unclear. **Methods:** MEDLINE and Cochrane Library were searched to identify all English reports published before 1/15/2013. Our outcomes of interest were the change in the following measurements from the baseline, including the proportion of anemia, low plasma levels of ferritin, iron, vitamin B12, and folate. Articles were selected if case number >100, follow-up period >12 months, and presenting data both before and after surgery. Two reviewers independently applied selection criteria, performed quality assessment, and extracted data. We used fixed effect and random effect model with inverse variance weights to calculate the summary estimates of outcome of interst at 6, 12, 24, and 36 months after surgery. **Results:** We identified 10 retrospective and 3 prospective studies with 5,479 enrolled patients for planned comparisons. Proportion of patients with anemia significantly increased from 12.8% at baseline to 28.7% at 12 month follow-up, with a consistent decrease in hemoglobin and hemotocrit level. Patients with low plasma vitamin B12 level increased from 2.8% to 4.6%, and those with low ferritin level rose from 4.4% to 8.0% at 12 month after surgery. No obvious change was found for patients with low plasma folate level. **Conclusions:** Roux-en Y gastric bypass surgery is associated with an increased risk of anemia and related nutrient deficiencies. The cause of anemia could be multifactorial that may warrant regular monitoring and nutrient supplement when necessary.

T-247-P
Bariatric Surgery in Obese Patients with Chronic Kidney Disease in the London Renal Obesity Network (LonRON)

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Background: Bariatric surgery is currently the most effective treatment for obesity. Recent evidence suggests the complication rate may be higher in those with chronic kidney disease (CKD), than without. **Methods:** We report a retrospective study of all obese patients with CKD (kidney damage & under the care of a nephrologist, or eGFR <60ml/min) undergoing laparoscopic bariatric surgery in 3 major London teaching hospitals from 2007-2012. Patient demographics, surgery type, weight loss, adverse events & mortality, were extracted from medical records during Oct 2012-Mar 2013. **Results:** Of 74 patients (33M; 41F), age (mean ±SD) 52 (±10) years, eGFR 48 (±19) ml/min, pre-operative BMI 44.5 (±5.7) kg/m², 38% underwent Roux-en-Y bypass (RYGB), 57% sleeve gastrectomy (SG), & 5% adjustable gastric banding (AGB). 11% were classified as CKD stages 1-2, 59% CKD stage 3, 12% CKD stage 4/stage 5 non-dialysis, & 18% were on haemodialysis at the time of surgery. Across all forms of surgery, weight loss was 24.6 (±11.1) kg at 6 months and 30.9 (±13.3) kg at 12 months post-surgery. Weight loss after RYGP or SG was not significantly different, and both were greater than AGB. There were 16 adverse events (16/74, 22%), including 2 deaths (3%) related to surgical complications of SG. Reversible acute kidney injury occurred in 3/74 after RYGB/SG and 2/13 had dialysis access fistula/graft failure after SG. Gastric leak, acidosis & hyperkalaemia, post-operative chest

infection, B12/Fe deficiency & myocardial infarction were reported after SG only. A further 4 deaths occurred during the study period, including 2 related to cancer. **Conclusions:** While bariatric surgery is effective for weight loss in obese patients with CKD, the adverse event and mortality rates are high. Identification of risk factors for adverse events & investigation of non-surgical alternatives remain priorities.

T-248-P

Secondary Hyperparathyroidism Following Laparoscopic Gastric Bypass and Sleeve Gastrectomy in Non-Caucasians

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Background: Nutritional and metabolic complications after bariatric surgery are challenging. This study looks at prevalence rates of secondary hyperparathyroidism following bariatric surgery in non-Caucasian patients and the relationship between parathyroid hormone and vitamin D metabolism. **Methods:** Retrospective study with levels of PTH, 25(OH) Vit D, Calcium, Phosphate and Alkaline phos obtained pre-op and post-op at 6months, 1yr, 2yrs and 3yrs. primary and tertiary hyperparathyroid and CKD ≥ Stage 3 patients were excluded. **Results:** 386 patients met inclusion criteria. 92% females, 74% white Hispanics, 20% African-Americans. Mean age was 40 ± 0.6 yrs. Roux-en-Y gastric bypass was performed in 61%, sleeve gastrectomy in 39%. Pre-op mean levels were PTH (38 ± 0.75pg/ml), 25(OH) Vit D (20.28 ± 0.53ng/ml), calcium (9.31 ± 0.02 mg/dl), phosphate (3.64 ± 0.03 mg/dl) and alkaline phos (85.93 ± 1.27 U/L). Post-op secondary hyperparathyroidism was observed in 11% of the cases at 6 months (n=142, no difference based on race/type of surgery), 23% at 1yr (n=154, higher in RYGB vs Sleeve, 26% vs 11%, p=0.004), 27% at 2yrs (n=71) and 35% at 3yrs (n=31). Vit D levels increased by 34% at 6months post-op, then declined at 1yr(28%), 2yrs(25%), 3yrs(22%), but were still higher than pre-op levels. PTH and Vit D were not related pre-op (p=0.116) but correlated inversely at 6months(r= -.206, p=.014), 1yr(r= -.245, p=.002) and at 2yrs(r= -.314, p=.008) post-op. **Conclusions:** Following bariatric surgery there was an increased prevalence of secondary hyperparathyroidism over time, consistent with findings from previous studies. Parathyroid hormone and vitamin D showed an inverse relationship. Increased Vitamin D supplementation could help decrease the risk of secondary hyperparathyroidism.

T-249-P

Dietary Intake of Soft and Liquid Calories Is Associated with Weight Regain After Roux-en-Y Gastric Bypass

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Background: Roux-en-Y gastric bypass (RYGB) renders the stomach less capable of mechanical breakdown of solid food, decreasing the proportion of calories absorbed by the intestine. The pyloric sphincter is substituted by an always-patent gastrojejunal anastomosis. Soft and liquid calories quickly exit the pouch, resulting in rapid caloric absorption without induction of satiety. The aim of this study was to analyze the relative effects of nutritional and lifestyle factors on weight regain in post-RYGB patients. **Methods:** 125 post-RYGB patients were seen in the bariatric clinic for follow-up. Dietary intake and eating habits for the prior 24 hours and instances of exercise during the prior seven days were surveyed. Demographic data and pre-RYGB, nadir, and current weight data were abstracted from clinic records. Multiple linear regression was performed using STATA 12. **Results:** 125 patients (49.3 ±0.9 yr, 9M/116F, BMI 48.7 ±1.1 kg/m2) underwent RYGB with postoperative weight loss of 78.0 ±2.3% excess weight loss (EWL) at nadir (loss of 104.1 ±3.2 lb). Patients reached nadir at 18.1 ±1.3 months. The visit occurred at 6.6 ±0.4 yr after RYGB, when patients regained 25.9 ±2.3% of lost weight to reach BMI of 35.7 ±1.0. Regression for % weight regained from nadir was performed for potential predictors: BMI, time since RYGB, instances of exercise, whether patient wakes up to eat, and dietary categories. Regression results revealed that only BMI (coefficient 0.99, 95%CI 0.56-1.5) and servings per day of soft and liquid calories (coefficient 5.6, 95% CI 2.9-8.3) were significant predictors of weight regain. **Conclusions:** After controlling for patient characteristics and exercise habits, intake of soft-consistency foods or liquid calories predicts weight regain after RYGB. Gastric bypass patients may benefit by limiting the intake of soft foods and liquid calories.

T-250-P

Behavioral and Psychosocial Associations of Weight Regain Following Gastric Bypass (RYGB) Bariatric Surgery

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Background: The purpose of this study is to explore the association of behavioral and psychosocial factors with percent weight regain among individuals who underwent RYGB surgery. **Methods:** Participants (n = 300; mean procedure age = 45.6, SD = 9.9) who underwent RYGB between 1999 and 2009 completed surveys of eating behaviors and psychosocial factors by web, phone, or paper/mail. Self-reported weights at the time of survey completion (i.e., current weights) and lowest post-operative weights were obtained. Pre-operative weights and procedure dates were confirmed through medical record reviews. Mean pre-operative weight and BMI were 140.8 kg (SD = 32.1) and 49.7 (SD = 9.9), respectively. The sample consisted of mostly white (56.7%) females (80.3%). At the time of the survey (M = 6.9 years post-op; SD = 2.3), participants had regained a mean of 23.7% (SD = 20.4) of weight lost (M = 55.8 kg; SD = 22.9). One-way ANOVA analyses were conducted to assess effects of eating behaviors and psychosocial variables on percent weight regain. **Results:** Significant effects were seen for lack of control of portion sizes ($F_{(4, 287)}$ = 14.84, p = .00) and food urges ($F_{(4, 286)}$ = 18.12, p = .00), depression ($F_{(1, 287)}$ = 4.14, p = .04), and well-being ($F_{(4, 283)}$ = 9.70, p = .00). No significant effects of stress, emotional eating, procedure age, pre-op weight, or race were seen on percent of weight regain. **Conclusions:** Percent weight regain following RYGB is associated with perceived changes in control of eating, depression and wellbeing.

T-251-P

This abstract has been withdrawn.

T-252-P

The Contribution of Relationship Stability and Relationship Quality to Weight Loss Outcomes among Bariatric Surgery Patients

Shannon Clark, Karen K. Saules *Ypsilanti, MI*; Leslie M. Schuh, Joseph Stote, David Creel *Carmel, IN*

Background: After weight loss surgery (WLS), psychosocial functioning, including quality of social relationships, generally improves, but for a minority, relationship dissolution occurs. We examined how changes in relationship stability and quality from pre- to post-WLS relate to long-term weight loss outcomes. **Methods:** We used long-term follow-up data from 361 patients who provided complete data for the primary analysis of relationship change status and weight loss. The sample was 95.9% Caucasian, 80.1% female, averaged 7.7 years post-WLS, with a mean age of 47.7 years (range 21-72); 87.3% had a Roux-en-Y gastric bypass. Four relationship status groups were created: Never in a relationship (Never, n=66); Post-WLS relationship only (New-Rel, n=23); Pre-WLS relationship only (Lost-Rel, n=17); and Pre-Post Relationship (Maintainer, n=255). **Results:** Current BMI was 34.5 for Never; 40.5 for New-Rel; 37.4 for Lost-Rel; 33.3 for Maintainers (p<.05 for Maintainers vs. New-Rel). With respect to documented predictors of weight loss, weight loss did not differ by gender, but did differ by pre-WLS BMI (lower pre-BMI: greater %EWL). Analyses were repeated with pre-WLS BMI as a covariate; group differences remained significant [F (3, 355) = 3.09, p = .03], as did pre-WLS BMI, [F (1, 355) = 9.12, p = .003]. Among Maintainers, relationship quality mediated weight loss outcomes: those with improved relationships post-WLS had significantly greater %EWL [F(2, 234) = 15.82, p < 0.000; p<.05 for Improved >(Stayed Same = Got Worse)]. **Conclusions:** Findings support the importance of assessing relationship stability and quality in pre-WLS candidates, as healthy and stable relationships may support improved long term outcomes. Interventions to improve relationships pre-and post-WLS may increase both quality of life and weight loss outcomes.

T-253-P

Post-Bariatric Support Group Attendance and Long-Term Weight Loss Outcomes

Karen K. Saules *Ypsilanti, MI*; Leslie M. Schuh, Joseph Stote, David Creel *Carmel, IN*

Background: Most weight loss surgery (WLS) programs offer supportive services and follow-up, but to our knowledge, their efficacy has not been systematically evaluated. One study tracked participants prospectively and found that patients who attended more follow-up visits (with the surgeon or nurse practitioner) had better weight loss outcomes (Shen et al., 2004), supporting the idea that more intensive post-WLS intervention might further optimize outcomes. Two retrospective studies found those who attended support groups had better weight loss outcomes up through 1-yr post-WLS (Elakkary et al., 2006; Song et al., 2008). However, selection factors may impact who attends support groups, and longer-term outcomes of support group attendance are unknown. **Methods:** We used long-term follow-up data (mean of 7.7 yrs since WLS) from a sample of 418 post-surgical patients (86.2% Roux-en-y gastric bypass, 80.2% female; mean of 48.3 yrs old at surgery; 87.5%EWL at nadir; 66.5%EWL current) to evaluate distal outcomes as a function of support group attendance. Patients completed a survey via mail, online, or telephone that assessed a host of variables including current and lowest BMI, medical comorbidities, body satisfaction, relationship satisfaction, substance abuse, emotional problems, and pre- and post-WLS support group attendance. **Results:** Those who attended ANY post-WLS support groups had significantly higher pre-WLS BMI and lower %EWL at nadir. Those who attended 3 or more groups also had lower current %EWL. Support group attendance was not associated with psychosocial or medical outcomes. **Conclusions:** Results suggest that support group attendance may be an indicator of a need for even more intensive services to achieve optimal post-WLS weight loss outcomes.

T-254-P

Differential Effectiveness of Laparoscopically-Adjustable Gastric Banding Versus Lifestyle Modification for Modifying Plasma Lipoprotein Profiles

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Background: Obesity is an important cardiovascular disease (CVD) risk factor implicated in dyslipidemia and vascular dysfunction. Although LDL lowering is often a primary goal of therapy, the size and concentration of lipoproteins provide additional information on the true atherogenicity of plasma lipids. Surgical and lifestyle interventions are options for weight loss, but little is known about their effects on lipoproteins. **Methods:** Changes in BMI and plasma lipoproteins over 1 year were compared between 31 patients undergoing laparoscopically placed adjustable gastric banding (LAGB) and matched participants in two lifestyle change programs differing in scope and intensity. Lipoprotein profiles were determined by nuclear magnetic resonance (NMR) spectroscopy. Baseline values were compared using Wilcoxon Signed Rank tests for matched pairs; changes over time were assessed by paired t-tests. **Results:** Over 1 year, LAGB led to significantly lower BMI (-16%, p<0.001 vs baseline) than intensive (-8%, p<0.001) or moderate (-2%, p<0.05) lifestyle change (matched-pairs p<0.001 in both comparisons). Notably, lipoprotein responses differed between interventions. Intensive lifestyle led to clinical changes in total LDL particles (–10%, p<0.05 vs baseline and matched pairs), while LAGB resulted in a significant increase in HDL particles (+19%, p<0.001) versus intensive (+1%) or moderate (–6%, p<0.05) lifestyle change (matched pairs p<0.001). **Conclusions:** LAGB surgery and lifestyle change led to weight loss and changes in lipoprotein subclasses; however, the interventions may affect CVD risk through different pathways. Lifestyle reduced the atherogenicity of LDL lipoproteins, which may inhibit inflammation and endothelial dysfunction. Gastric surgery improved the number of HDL particles and may protect against CVD through anti-inflammatory and antioxidant activities.

T-255-P

Two Year Evaluation of Effectiveness and Device Complication Outcomes in the Helping Evaluate Reduction in Obesity (HERO) Study

Vincent Lusco *Louisville, KY*; Marcio Torre *Goleta, CA*; Daisy S. Ng-Mak, Arnold Degboe *Irvine, CA*; Caroline Burk *Laguna Beach, CA*; Quanhong Ni *Irvine, CA*; David Voellinger *Charlotte, NC*

Background: Few studies have assessed long term real-world effectiveness and device complication outcomes of the LAP-BAND AP® System adjustable gastric band (LAGB) after surgical implantation. **Methods:** HERO study is a 5-year (yr) registry of 1,106 severely or morbidly obese subjects from 29 centers in North America, Europe, and Australia implanted with LAGB. In the current analyses, the mean change in body mass index (BMI) and percentage excess weight loss (%EWL) at 2 yr are determined in addition to rates of device complications. **Results:** The mean (SD) age of subjects was 43.1 (11.4) yrs and females constituted 79.3%. Mean (SD) weight and BMI at baseline was 126.2(24.1) kg and 45.1(6.9) kg/m^2 respectively. At 2 yr, the mean (SD) BMI decreased by 8.4 (6.2) kg/m^2 and the average (SD) %EWL was 43.5 (33.3)%. Four (0.4%) deaths occurred due to liver cancer, heart failure, ischemic heart disease, and sepsis from surgical complications. None were deemed related to the device. Device complications reported included pouch dilatation (2.0%), port displacement (1.6%), band slippage (1.4%), band erosion (0.5%), infection (0.4%), and port leak (0.1%). Twenty-seven (2.4%) subjects had explants and 35 (3.2%) had a surgical revision of LAGB. Most common reasons for explants included band erosion, abdominal pain, band slippage, and pouch dilatation. **Conclusions:** LAGB was associated with significant weight loss, with 6% of subjects with device complications and less than 3% of explants at 2 years. Future analysis will determine whether the weight changes are durable and the safety outcomes of LAGB remain similar.

T-256-P

Two Year Diabetes and Hypertension Control in the Helping Evaluate Reduction in Obesity (HERO) Study

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Background: Few studies have reported the long term impact of adjustable gastric banding (AGB) on type 2 diabetes (T2D) and hypertension (HTN). **Methods:** Out of 1,106 enrollees, 245 and 474 subjects reported having T2D and HTN respectively at baseline (BL). This analysis included subjects who provided BL and 2 yr data for HbA1c (n=95) and blood pressure (BP) (n=257). T2D control was based on the more stringent definition of HbA1c ≤ 6.5%. Controlled BP was defined as SBP <130 & DBP <80 with T2D and SBP <140 & DBP <90 without T2D. Control of comorbidities was compared between subjects with percent excess weight loss (%EWL) <30 vs. ≥ 30. Chi-square test was used to compare T2D/BP control between %EWL groups. McNemar test was used to evaluate change from baseline results. **Results:** At BL, mean (SD) age was 43.1 (11.4) yrs; females constituted 79.3%. Mean (SD) weight was 126.2(24.1) kg. 33% had HbA1c control and 44% had BP control. At year 2, HbA1c was controlled in 58% (p<0.05 vs. BL); BP was controlled in 53% (p<0.05 vs. BL). Among those with T2D at BL, 70% with EWL ≥ 30% had HbA1c control at yr 2 vs. 44% with EWL < 30% (p<0.05). Among those with HTN at BL, BP control was observed in 61% of subjects with EWL ≥ 30% vs. 42% with EWL < 30% at 2 yrs (p<0.05). **Conclusions:** AGB was associated with improved rates of clinically meaningful T2D and HTN control at 2 yrs. Future analysis will determine durability of these effects.

T-257-P

Two Year Quality of Life in the Helping Evaluate Reduction in Obesity (HERO) Study

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Background: Few studies have reported the impact of weight loss using adjustable gastric banding (AGB) on health-related quality of life (QOL) of obese patients. **Methods:** HERO is a 5 year (yr) registry of 1,106 AGB patients from centers in North America, Europe, and Australia. Our analysis included 585 subjects who completed the baseline (BL) and 2 yr Impact of

Weight on Quality of Life-Lite (IWQOL-Lite) questionnaire. IWQOL was compared between subjects with % excess weight loss (%EWL) <30 v ≥ 30. Multivariate linear regression was used to examine %EWL groups associated with improvement in IWQOL, controlling for age, gender, region (US v OUS), and comorbidities. **Results:** At BL, mean (SD) age was 43.1 (11.4) yrs, mean weight was 126.2 (24.1) kg, and mean IWQOL was 47 (19). Those with %EWL ≥ 30 were younger (mean 43 v 45 years), weighted less (124 v 131kg), more likely to be female (83% v 75%), less likely to have diabetes (25% v 32%) and hypertension (42% v 57%) (p<0.05 for these BL characteristics), and had higher IWQOL scores (48 v 45). At yr 2, mean (SD) IWQOL score was 77 (19). Among those with EWL ≥ 30%, score was 83 (16) v 64 (20) for those with EWL < 30% (p<0.05). Multivariate analysis revealed that women, US region, and EWL ≥ 30% were associated with clinically significant improvement in IWQOL (p<0.05) at yr 2. **Conclusions:** AGB was associated with significantly better QOL at 2 yrs. Further analysis will evaluate the sustainability of these effects.

T-258-P

Effect of Roux-en-Y Gastric Bypass Surgery on Gut Hormones and Appetite in a Cohort of Adolescents

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Background: Surgical strategies are the most effective therapies for long-term weight loss success. The mechanism resulting in sustained weight loss is not well established, though the role of a gut-brain axis is postulated. Study specific aims are: 1) evaluate changes in fasting gut hormones and 2) examine the relationship between gut hormones and appetite, among adolescents undergoing bariatric surgery. **Methods:** Eleven ethnically diverse adolescents (14-18y) undergoing Roux-en-Y gastric bypass participated in a study with 24 hr visits at baseline and 1, 6, and 12 mo post-surgery. Anthropometry by standard techniques, body composition by 3-compartment model, and fasting blood samples were collected at each visit. Biochemistries were analyzed for gut hormones. Food intake was controlled and subjects completed Visual Analog Scales for hunger, satisfaction, fullness, and ability to eat more prior to eating and 1 hr post-prandially. **Results:** At one month post-surgery there were significant decreases in PYY 3_36, ghrelin active, leptin, insulin, glucose, and GLP 2 (p≤0.04). At 6 and 12 mo, PYY 3_36, leptin, insulin, and glucose remained reduced (p≤0.03). Significant influence on pre-meal VAS response to hunger was found for leptin and insulin (P≤0.02); to fullness for ghrelin active (P=0.02); and being able to eat more for leptin and insulin (P<0.01). PYY 3_36 and GLP-2 (P≤0.05) significantly influenced post-meal VAS response to fullness and satisfaction. Additionally, satisfaction was significantly influenced by ghrelin active (P≤0.02). **Conclusions:** Following RYGB, gut hormone levels decreased. These data also demonstrate a link between gut hormones and appetite, thereby supporting the role of the gut-brain axis in long-term weight maintenance. Additional insight could be gained by obtaining post-prandial blood samples which coincide with administration of VAS.

T-259-P

Facilitators and Barriers to Laparoscopic Adjustable Gastric Banding Aftercare Attendance

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Background: Aftercare attendance is associated with greater weight loss and fewer post-surgical complications in obese adults who have undergone Laparoscopic Adjustable Gastric Banding (LAGB). Despite recognition of the importance of aftercare, and the failure of some patients to attend regularly, little is known about the reasons for non-attendance. **Methods:** This study examined patient-perceived reasons for, and barriers to, aftercare attendance, as well as the perceived helpfulness of a range of attrition-reducing strategies. The Gastric Banding Aftercare Attendance Telephone Survey (GBAATS) was developed for the purpose of this study based on previous research and clinical expertise. It included 13 reasons for attendance, 101 barriers to attendance, and 14 possible attrition-reducing strategies. It was administered to 179 LAGB patients who had undergone LAGB between 2005 and 2012. Of these, 107 had attended aftercare regularly and 72 had not attended aftercare at all in the past 12 months. **Results:** Both attendees and non-attendees reported important reasons for aftercare attendance (e.g., band adjustments, questions answered) and experienced multiple barriers to atten-

dance (e.g., inconvenient location, work schedule). Non-attendees reported more barriers, and that those barriers had a greater impact on aftercare attendance. Participants reported that a number of possible attrition-reducing strategies may be acceptable and helpful (e.g., appointment reminders, pre-treatment counseling). **Conclusions:** Results are consistent with previous research examining correlates of non-attendance in weight management programs. Findings highlight the importance of assessing barriers to treatment in both attendees and non-attendees. Addressing barriers that differentiate non-attendees from attendees may be most effective in reducing aftercare attrition.

T-260-P

The Newfoundland and Labrador Bariatric Surgery Cohort Study: Weight Loss and Quality of Life After Laparoscopic Sleeve Gastrectomy

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Background: In Newfoundland and Labrador (NL), Canada, one in three adults are obese. Laparoscopic sleeve gastrectomy (LSG) is the least common of bariatric surgeries. 100-150 LSG's are offered each year at Eastern Health's tertiary care centre. **Methods:** The purpose of the study is to assess health outcomes post-surgery. Data collection began in May 2011. Measures of weight and quality of life are collected on patients with a BMI ≥35kg/m2 (≥ 2 comorbid conditions) or BMI ≥ 40kg/m2 at 6,12, 18 and 24 months. **Results:** Baseline (n=114) and 12 month data are presented. The sample was female (85.1%), average age: 44.2yrs (SD9.5).Baseline weight and BMI were 132.7kg (SD21.5) and 48.3kg/m2 (range 35.7-63.5). Patients presented with: hypertension (52.6%), T2DM (33.6%), sleep apnea (60.0%) dyslipidemia (51.8%), osteoarthritis (44.7%) Quality of life measures included: EQ-5D & Visual Analogue Scale (VAS), SF12 and Impact of Weight on Quality of Life-lite (IWQOL-lite).Pre-surgery patients reported a VAS of 60.7(SD19.5) and SF12 physical and mental component summary scores of 33.7(SD12.8) and 44.9 (SD11.0). The overall IWQOL-lite score was 43.7(SD18.9). At 12 months %EWL and %WL was 52.0% (24.7-85.2), and 25.7 %(13.8-43.1), respectively. The VAS increased to 85.84(SD11.0); SF12 physical 53.9(SD6.8) and mental component summary scores 50.6(SD8.9) were at or approaching Canadian normative scores for overall health. The overall score of the IWQOL-lite increased to 89.7(SD10.2). All changes were significant, p< .05. **Conclusions:** Results of the NL bariatric surgery cohort study report successful weight loss in the majority of patients undergoing LSG and significant improvements in quality of life at one year post-surgery.

T-261-P

Metabolic Surgery: Argentina's Initial Experience

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Background: Roux-en-Y gastric bypass surgery results in remission or improvement of Type 2 diabetes in morbidly obese patients through mechanisms other than weight loss and could be beneficial in less obese patients. The study aimed to evaluate the outcome of this surgical technique in the treatment of Type 2 diabetes. **Methods:** The outcomes of the first 10 patients are reported. At the time of surgery, patients (7 men and 3 women) had a BMI of 30-35 kg/m2, HbA1c of 9,2 ± 1,3%, were being treated with 2 or 3 oral hypoglycemic agents, and 7 of them were receiving insulin treatment. All patients less than 65 years old. The procedure of choice was a Roux-en-Y gastric bypass with a biliary limb of 100cm and an alimentary limb of 150cm. Patients included in this evaluation met the follwoing criteria: type 2 diabetics with poor control, C-peptide >1 pg/dL, HOMA-IR > 3, were negative for autoantibodies. **Results:** The main studied outcomes were percentage of patients with remission of diabetes (HbA1c <6,5% and fasting glucose less than 126 mg/dl without insulin therapy). 1 - Remission of diabetes was detected in 80% of the cases. 2 - The remaining 20% showed an improved glycemic control. 3 - HbA1c decreased from 9,2 ± 1,3 % to less than 6,5% in all patients. 4 - Percent weight loss postoperatively was 23,3 ± 5,9 %. 5 - Morbidity and mortality rates were 20 and 0%, respectively. **Conclusions:** Since November 2011, we perfomed metabolic surgery on diabetic patients with grade 1 obesity (BMI 30-35 kg/m2). The technique of choice was laparoscopic Roux-en-Y gastric bypass, which was effective in achieving

weight loss and improving the metabolic state of type 2 diabetic patients. Our results meet international standars.

T-262-P

Effects of Obesity on Cardio-Pulmonary Function in Patients Undergoing Bariatric Surgery

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Background: Obesity has been shown to be associated with vascular congestion and a high cardiac output state. DLCO is commonly normal amongst obese subjects. However, in some obese subjects, a decrease in membrane diffusion (DM) may be present, particularly in those with elevated capillary blood volume (VC); potentially indicating subclinical pulmonary edema and central circulatory congestion. **Methods:** 54 obese subjects were studied prior to undergoing bariatric surgery. Pulmonary testing included spirometry, plethysmography, DLCO with partition into VC and DM, impulse oscillometry (IOS) to assess distal respiratory function. Cardiac magnetic resonance imaging (MRI) was performed in 24 subjects. **Results:** The mean age was 45 ± 12yr and the BMI was 45 ± 7kg/m2 (71%female). Baseline spirometry revealed no evidence for airway obstruction. DLCO ranged from 59% to 141% predicted, DM ranged from 60% to 155% predicted, and VC ranged from 90% to 218% predicted. To evaluate the relationship between these components of DLCO, the ratio between DM and VC was calculated and two phenotypes were defined as low (<70%) and normal ($\geq70\%$). In these subjects, low DM/VC ratio was associated with significantly higher airway resistance. There were no significant differences in the BMI, spirometry, lung volumes, and incidence of metabolic syndrome or its components between the 2 groups. Of the 24/54 patients who had cardiac MRI performed, there were 12 with a low DM/VC ratio. These subjects had significantly lower cardiac output, stroke volume and right ventricular end diastolic volume. **Conclusions:** This study demonstrates that a distinct phenotype of obese patients can be identified who have low DM, high VC, higher airway resistance and lower cardiac output. These associations suggest a mechanism related to fluid transudation associated with central vascular congestion.

T-263-P

Patients Factors Associated with Undergoing Gastric Banding vs. Gastric Bypass for Weight Loss

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Background: Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Adjustable Gastric Banding (LAGB) are the two most common weight loss surgery (WLS) procedures in the US with different profiles for risk and effectiveness. Little is known about factors that might lead patients to proceed with one procedure over another. **Methods:** We interviewed patients seeking WLS (response rate 70%) recruited from 2 academic WLS centers in Boston. We conducted multivariable analyses to identify patient perceptions and clinical and behavioral characteristics that correlated with undergoing LAGB (n=237) vs RYGB (n=298). **Results:** After adjustment for sociodemographic and relevant clinical factors, older patients [OR 1.03 (95% CI 1.00-1.05)] and those with higher quality of life (QOL) and higher levels of uncontrolled eating were more likely to undergo LAGB compared to RYGB. In contrast, those with type 2 diabetes [0.44 (0.27, 0.71)], those who desired higher levels of weight loss and those who were less likely to assume higher levels of mortality risk to lose weight were less likely to proceed with LAGB. After initial adjustment, men, those with lower body mass index, and those who perceived lower health threat from their weight appeared more likely to opt for LAGB; however, differences across these factors dissipated once we adjusted for patients' perceived ideal weight, predilection to assuming risk to lose weight and eating behaviors. Patients' motivations for weight loss, their primary source of WLS information and their perceived life-expectancy were also not significant correlates. **Conclusions:** Subjects' diabetes status, QOL, eating behavior, their ideal weight loss and the level of mortality risk they were willing to assume to achieve their ideal weight were associated with whether patients proceeded with LAGB vs RYGB. Other demographic and clinical factors were less important.

T-264-P

Endoscopic Sleeve Gastroplasty as a Potential Treatment of Obesity: Six-Month Efficacy Results in Six Patients

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Background: Bariatric surgery is the most effective therapy for obesity and metabolic syndrome. Prior restrictive procedures that do not reduce distal gastric reservoir function are associated with reduced efficacy in achieving weight loss. Emerging endoscopic technologies can replicate, in a minimally invasive and cost-effective manner, the anatomic alterations achieved by surgical sleeve gastrectomy (SSG). Aim: To demonstrate technical feasibility, short term safety and efficacy of transoral endoscopic sleeve gastroplasty (ESG) aimed to replicate sleeve gastrectomy for the treatment of obesity. **Methods:** In a prospective, single-center, pilot study of 6 obese subjects (5 females, mean BMI 36.3 ± 2.2 [SD] kg/m2; age 37 ± 9.5y), we performed ESG using endolumenal suturing (Overstitch, Apollo Endosurgery). Subjects were followed for 6 months to record adverse events and measure changes in weight, three-factor eating behaviors questionnaire R-21 (TFEQ21), and bariatric quality of life (BQL) questionnaire. Repeat upper endoscopy was performed at 3 months to assess durability of the ESG. **Results:** ESG was well tolerated by all with no intraoperative complications; post-procedure, 1 of 6 was admitted for observation, and 5 discharged from the endoscopy unit. The number of interrupted full-thickness sutures placed was 24 + 3. One subject developed a perigastric inflammatory serous fluid collection treated with percutaneous drainage with complete resolution. Percentage body weight loss (BWL) was $15.3 \pm 4.7\%$ at 6 months (p=0.002) resulting in BMI decrease from 36.2 ± 2.2 to 30 ± 2.8kg/m2 and percentage of excess BWL was $35.5\pm6.4\%$. Subjects reported improvement in eating behavior by TFEQ21 and BQL. Repeat upper endoscopy at 3 months (n=3) showed intact sleeve gastroplasty. **Conclusions:** ESG is feasible and safe with short term efficacy similar to that reported with SSG.

T-265-P

Lipid Profile Changes in the Super Obese After Laparoscopic Sleeve Gastrectomy (LSG) at 1, 3 and 5 Years

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Background: Since there is an increasing acceptance of the LSG and limited information on its effect on cardiac risk factors, we assessed lipid profiles. **Methods:** A retrospective review of patient records pre and post LSG was performed. ANOVAS evaluated group differences and change. Pearson correlation coefficients (r) evaluated the relationship between continuous variables. Paired t tests compared variable changes. **Results:** Eighty two patients (67% female) had pre-surgery lipid profiles and follow-up (43 at 1 yr, 28 at 3 yr and 26 at 5 yrs). Groups were not different in gender distribution. The mean age was 46.4 (Group comparison, P=0.07). The pre surgery BMI was 55.7 kg/m2. 65.9 % of the subjects were super-obese. After surgery % excess BMI loss was 58.1% yr 1, 61.3% yr 3 and 39.0% yr 5, [yr 1 p=0.001 and yr 3 p=0.001 compared to yr 5]. Lipid measurements were within the normal ranges for all parameters at all times, however, at baseline approximately 35.4 % had some abnormality. Compared to baseline, cholesterol increased at year 3, p=0.027. At yr 1 triglycerides decreased significantly from baseline (p=0.013). HDL was significantly different from baseline, yr 1, p= 0.025 and yr 3, p=< 0.0001. Yr 3 cholesterol/ HDL decreased, p=0.025 compared to baseline. Yr 1 compared to baseline HDL had a correlation with weight loss (P = 0.06, r= 0.32). For yr 3 the p= 0.08, r= 0.37. Negative linear correlations were present for LDL change at yr 3 (r= 0 .46, p= 0.02) and triglyceride change at yr 5 (r=0.48, p=0.02). The percentage of patients with dyslipidemia or receiving medication did not change significantly during these 5 years. **Conclusions:** Of the population electing LSG, 35.4% showed some abnormality pre-surgery. Weight change does correlate with some changes of triglycerides, HDL, and LDL over time, but the impact is limited.

T-266-P
RYGB Revision Weight Loss and Psychological Functioning Outcomes

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Background: A subset of bariatric surgery patients undergo one or more revision surgeries for inadequate weight loss and/or complications. There are few direct comparisons of these patients and those who do not undergo revision surgeries. **Methods:** Long-term outcome questionnaires were collected from St. Vincent Bariatric Center of Excellence patients: 356 had Roux-en-Y gastric bypass (RYGB) and no subsequent surgical revisions and 36 had an initial surgery that was later revised to RYGB. Presurgical weight (defined as weight at time of revision surgery in the Revision group) was measured and current weight was obtained via self-report. Current psychological well-being and global life satisfaction were assessed using the Flourishing Scale and Satisfaction With Life Scale, respectively (Diener et al., 2010; Diener, Emmons, Larsen, & Griffin, 1985). Overall surgery satisfaction was assessed using a single 0-10 point Likert-type item. **Results:** Groups did not differ significantly on preoperative BMI (50.8±8.8 kg/m2), age (55.8±9.7 yrs), or time since most recent surgery (7.6±1.7 yrs). Compared to the No-Revision group, the Revision group lost a significantly lower percentage of body weight (33.4±12.5% vs. 24.4±19.1%., p< .005), had less overall satisfaction with surgery (8.2±2.3 vs. 7.0±2.8, p< .01), and trended toward reporting poorer psychological well-being (47.1±8.2 vs. 44.0±8.6, p=.06) and less global life satisfaction (24.7±7.3 vs. 22.8±7.1, p=.13). **Conclusions:** Although bariatric revision patients demonstrated outcomes less favorable than primary patients, they did achieve significant benefit and were relatively satisfied overall. Results suggest the importance of optimizing outcomes after primary bariatric surgery and providing realistic expectations about revision surgery outcomes.

T-267-P
Range of Nutrition-Related Adverse Events After Bariatric Surgery: Systematic Review of 156 Case Reports

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Background: Bariatric surgery has increased dramatically during the last decade but there is considerable uncertainty about safety, especially relating to long-term nutritional deficiencies. **Methods:** A systematic review of English articles using MEDLINE and EMBASE from 1981 to December 2012. All published case reports pertaining to bariatric surgery patients were included and summarized in order to provide comprehensive documentation of safety issues. **Results:** In total, there 156 nutrition-related case reports, of which 46% concerned gastric bypass, 31% gastric banding, 7% biliopancreatic diversion, 6% vertical banded gastroplasty, 4% jejunoileal bypass and 7% other. Gastrointestinal (37%), neurological (14%), and device malfunctions (13%) were the most common complications. Gastric bypass and biliopancreatic diversion accounted for 61% of case-reports related to nutritional imbalances, such as Wernicke's syndrome, nutritional neuropathy and oxaluria. Psychosocial complications included anorexia nervosa, eating disorder not otherwise specified, psychosis, pica, depression and alcohol/drug abuse. We identified 32 types of specific nutritional imbalances, such as hypoalbuminemia, energy-protein malnutrition, vitamin B1 and vitamin D deficiencies, with gastric bypass and biliopancreatic diversion accounting for 69%. Sixty-one percent of adverse events were judged as potentially preventable through increased follow-up and adherence to prescribed supplements and post-operative care. **Conclusions:** While case reports may be intrinsically biased in what they report, the available documentation nevertheless suggests that patients were diagnosed with a wide range of nutrition-related complications, many of which could potentially have been prevented with greater post-operative care and follow-up.

T-268-P
Status of High-Sensitivity C-Reactive Protein (hs-CRP) as a Biomarker for Cardiac Health in Laparoscopic Sleeve Gastrectomy Patients

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Background: Adipose tissue plays a role in development of the low-grade inflammatory state associated with obesity. Inflammation may play a key role in the formation and progression of atherosclerotic plaques, which accumulate on blood vessel walls leading to cardiovascular pathologies. C-reactive protein (CRP) is an acute phase inflammatory protein endorsed by the American Heart Association as a biomarker for the assessment of cardiovascular risk (i.e., > 3mg/L-high risk) and a positive correlate with obesity. **Methods:** This study examined changes in circulating hs-CRP levels with respect to cardiovascular health and adiposity in a baseline cohort of patients (n=67) who have undergone laparoscopic sleeve gastrectomy for the treatment of morbid obesity. hs-CRP, fasting lipid panel, and liver function test as well as anthropometric measures were collected at baseline, 3 and 6 months. **Results:** The sampling population at baseline (n=67) was 83.6% female and displayed the following characteristics in terms of mean (SD): age 44.6 (9.8), weight of 133.7kg (22.5), waist circumference (WC) 141.7cm (16.7), and BMI of 43.3kg/m2 (6.7). Patients reported: hypertension (53.6%), T2DM (42%), sleep apnea (60.6%), coronary artery disease (5.8%), and dyslipidemia (57.4%). Pre-operative hs-CRP level: 13.0mg/L (10.4). At 6 months post surgery (n=48) weight, WC, BMI, and hs-CRP were 101.3kg (16.1), 112.4cm (11.6), 36.7kg/m2 (5.2) and, 6.3mg/L (6.4) respectively. All changes significant at p<0.05. **Conclusions:** All eligible surgical patients were assigned an elevated risk category for CVD pre-surgery. Post-surgery, improvements in hs-CRP demonstrate a decreased level of risk for the development of CVD.

T-269-P
Psychosocial Predictors of 2-Year Outcomes among Weight Loss Surgery Recipients: Honing in on Factors That Matter

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Background: Weight loss surgery (WLS) is an effective treatment for long-term weight loss for individuals with Class III obesity. Psychosocial factors can affect short-term WLS outcomes. This study sought to identify psychosocial predictors of longer-term outcomes. **Methods:** In this prospective study, 250 consecutive WLS candidates were evaluated between January 1, 2010 and December 31, 2010. Each completed baseline medical, surgical, and psychological evaluation as part of standard of care. Two hundred and four patients had surgery (81.6%). Successful surgical outcome was defined as ≥ 50% excess weight loss (%EWL) two years post-surgery; outcome data were available for 80 patients. **Results:** Logistic regression revealed an overall effect for a model that examined the association between baseline characteristics and 2-year outcome, X^2 (8) = 17.49, p < 0.0254. Pre-surgical marital status (OR = 6.67), emotional eating (OR = 6.33), functional impairment due to pain (OR = .97), and history of physical abuse (OR = 0.19) were independently associated with outcome, p<0.05. No other significant predictors were identified. **Conclusions:** Being married, perhaps as a proxy for social support, increases the odds of longer-term WLS success. A willingness to acknowledge emotionally driven, disordered eating patterns also increases the odds of longer-term WLS success. However, functional impairment due to pain and a history of physical abuse decease the odds of successful longer-term outcomes. Selection bias may confound findings given the limited number of patients available for 2-year follow-up. Proactively addressing longer-standing functional impairment due to pain and consequences of historical physical abuse may improve WLS outcomes.

T-270-P
A Comparison of Sertraline Tablet and Solution Pharmacokinetics Before and After Roux-en-Y Gastric Bypass

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Background: Few data are available concerning the influence of Roux-en-Y Gastric Bypass (RYGB) on the pharmacokinetics (PKs) of medications. A substantial number of patients take antidepressant medications before and after surgery, underscoring the need for pharmacokinetic data with this class of medications. **Methods:** A prospective, longitudinal trial is underway to assess the PKs of sertraline preoperatively at baseline (BL) and at 3 and 12 months following RYGB. Participants receive single 100 mg doses of sertraline in the tablet (Tab) and solution (Sol) forms, separated by a wash-out period, at each study time-point (BL, 3, 12 months). Sixteen plasma samples are collected over 72 hours at each sertraline administration. An interim analysis of the data is presented here and additional data are forthcoming. **Results:** A preliminary analysis of the data currently available shows a sig-

nificant difference in the mean area under the curve from 0-72 hours (AUC0-72) between BL (n=29; mean=502.1 ± 212.1 ng-hr/ml) and 3 months (n=16; mean=352.2 ± 125.7 ng-hr/ml; Z=-2.9, p=0.003), and BL and 12 months (n=11; mean=306.2 ± 120.8 ng-hr/ml; Z=-2.7, p=0.008) post-surgery associated with the sertraline Tab preparation. No significant reduction was observed between BL and 3 months or BL and 12 month post-surgery Sol AUC(0-72). **Conclusions:** Data collected to date suggest that sertraline Tab bioavailability is reduced at 3 months post-RYGB, whereas Sol bioavailability is not. Data collection is ongoing and analysis with a larger sample will allow us to examine potential mechanistic factors responsible for observed changes in pharmacokinetics.

T-271-P
Revisional Bariatric Surgery: Primary Surgical Procedure but Not Reason for Revision Affects Weight Outcomes

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Background: While bariatric surgery patients frequently experience life-changing health improvements, some require revision surgery for complications or weight regain. More information is needed to predict which patient will achieve sufficient benefit to justify potential complications from another surgery. **Methods:** This retrospective chart review examined bariatric revision surgeries performed at the St. Vincent Carmel Bariatric Center of Excellence January 1, 2008 to December 31, 2011. A subset of patients (N=45) completed a survey on weight, medical outcomes and satisfaction with surgery. **Results:** 132 revision surgeries were performed, of which 93% were Roux-en-Y gastric bypasses (RYGB). Patients were 82% female with a mean age of 51 years. Complications occurred in 21.2% of patients, including wound infection (4.5%), leak (4.5%), and obstruction (3.0%). There were no deaths. Patients lost 38 lbs (13.2% of total body weight) from revision to last followup, on average 1 year post-surgery, and 85 lbs (28.8% of total body weight) from before primary surgery to last followup. Patients had equivalent weight loss after weight-related versus non-weight-related revisions. Patients having a revision RYGB after an adjustable gastric band or vertical ring gastroplasty lost significantly more weight than those having a revision RYGB after a primary RYGB. Rates of most medical comorbidities (9/12) decrease in the first years after revision surgery. Most patients were happy they had surgery (87%), moderately satisfied with surgery results (7/10), and believe their health improved (4.1/5). **Conclusions:** Revisional surgery was effective for most patients, although complication rates were higher than primary bariatric surgery. The type of initial procedure, but not the reason the revision was performed, affected magnitude of weight loss.

T-272-P
Judgments of Life Satisfaction among Bariatric Surgery Patients

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Background: Bariatric surgery may dramatically improve well being. This study examined judgments of past, present and future life satisfaction in patients seeking bariatric surgery. **Methods:** 452 patients (95 male, 357 female) completed Temporal Satisfaction With Life Scale (TSWLS) based on the Satisfaction with Life Scale (Diener et al, 1985) before surgery. 223 patients completed the 15–item TSWLS, measuring past, current, and future life satisfaction (subscales ranged 5-35). 229 completed five items on current satisfaction. Data were collected from January to September 2012. **Results:** Because no gender differences existed, they were combined. Patients completing the entire TSWLS scored 19.2, 19.0, and 23.6 on past, current, and future life satisfaction, respectively. Past and current satisfaction were below average versus US public norms, while future satisfaction was average. Future life satisfaction predictions were significantly greater (p < .0001) than past and current satisfaction, which did not differ. Those judging only current life satisfaction scored 15.6, significantly lower (p < .0001) than current scores of patients completing the entire scale. Both scores are slightly below average. **Conclusions:** Before surgery, bariatric patients had slightly below average life satisfaction. This is typical of persons with a problematic area of life, in this case the health impact of their weight. Bariatric patients' judgments of their future life satisfaction appear realistic. Our prior study of patients 7.6 years post-surgery found their life satisfaction at 24.6, the upper end of average range. Judgment differences between the two pre-surgery groups on cur-

rent life satisfaction is perhaps due to changes in the salience of factors affecting the judgment occasioned by prompting a focus on the future and past.

T-273-P[DT]
Safety Profile of Bariatric Surgery in the Elderly Minorities At a Community Hospital

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Background: With the known efficacy of bariatric surgery and its increasing application to the elderly population, we sought to assess the safety profile of bariatric surgery in elderly minorities at a community hospital. **Methods:** Retrospective study of bariatric patients at a New York City hospital from 2004-2012. Length of stay (LOS), peri-op complications, 30 day readmissions and mortality were compared in patients ≥ 60 years of age vs. random sampling of pts under 60 years old (y.o.) **Results:** Baseline characteristics of ≥ 60 y.o. (43 pts) vs. < 60 y.o. (75 pts) : 76.3% Hispanic, 17.8% AA, 3.4% non-Hispanic whites, 2.5% other: mean age 63.7 yrs (60-72) vs. 39.7yrs (20-57); 83.7% vs. 94.7% females; BMI 46.5 ± 1.0 vs. 45.9 ± 0.7 kg/m2; Excess wt 55.1 ± 2.6 vs. 55.0 ± 2.2 kg; 55.8 vs. 22.1% with DM2; 90.7 vs. 32% with HTN. LOS was significantly longer in ≥ 60 vs. < 60 y.o. (3.46 ± 0.3 vs. 2.6 ± 0.1 days, p=0.03), but this diff disappears after excluding pts with DM2, (2.63 ± 0.34 vs. 2.55 ± 0.13 days, p=0.79). Complications in the immediate post-op period occurred in 4.6% pts ≥ 60 y.o. vs. 2.7% pts under 60 y.o. Readmissions within 30 days occurred in 9.3% pts ≥ 60 y.o. and in 4% pts <60 y.o. There was no mortality in either group. **Conclusions:** While the complication and readmission rates were higher in elderly minorities compared to non-elderly minorities, there was no difference in mortality rates. Diabetic elderly patients may have increased length of stays.

T-274-P[DT]
Effectiveness of Bariatric Surgery in Elderly Versus Non-Elderly Patients

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Background: This study compares the pattern of weight loss after bariatric surgery in patients ≥ 60 years old (y.o.) with patients < 60y.o. and its effect on urine albumin in both the groups. **Methods:** Retrospective study of bariatric patients at a NYC hospital from 2004-2012. Inclusions: patients with pre-op and 1 yr. post-op values for urinary albumin creatinine ratio (UACR) and weight. Exclusions: patients with pre-op CKD ≥ Stage 3. Data are presented as mean ± SE. Paired Student's t-test was used for analysis. **Results:** Baseline characteristics of ≥ 60 y.o. (n=23): mean age 62.8 yrs. (60-68 yrs.); 80.8% Hispanic, 17.8% African American (AA); BMI 46.1 ± 1.3 kg/m2; 56% with DM2; 84% with HTN. Baseline for pts. < 60 y.o. (n=73): mean age 39.7 yrs. (20-57 yrs.); 80.8% Hispanic, 17.8% AA; BMI 46.0 ± 0.7 kg/m2; 25% with DM2 ; 36% with HTN. At 1 year post-op, patients over and under 60 y.o. had significant weight losses, 61.2 ± 3.6% excess weight loss (EWL) and 68.1 ± 2.4% EWL respectively, with no diff in % EWL based on age. At baseline, patients >60 y.o. had significantly higher UACR than those <60 (46.8 ± 19.5 vs. 10.3 ± 2.2 mg/g, p=0.002), and this difference persisted at 1 yr. post-op, p=0.009. At 1 yr. post-op, both groups had decreased UACR, but the difference was not statistically significant compared to baseline. **Conclusions:** Bariatric surgery was effective for weight loss in this group of predominantly Hispanic and AA patients, regardless of age. Baseline UACR was higher in the elderly; this may reflect longstanding diabetic and hypertensive nephropathy. UACR was not significantly changed at 1 yr. post-op in either age group.

T-275-P
The Association between Food Addiction, Alcohol Use and Weight Loss Surgery Outcomes at 6 Months

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Background: Weight loss surgery (WLS) is the most effective treatment for severe obesity. However, 20-40% of WLS patients have poor weight loss outcomes 10 years after surgery. Emerging research related to the complex interaction between substance use, "addiction-like" disordered eating, and obesity may, in part, help explain weight regain post-WLS. In the current study, we examined the relationship between these variables and weight outcomes after

WLS. **Methods:** We examined the association between baseline BMI, alcohol use, a measure of "food addiction", and BMI 6 months post-WLS. No participants reported problematic baseline alcohol use and only 13% of patients met "food addiction" criteria as defined by the Yale Food Addiction Scale. **Results:** Spearman's rho revealed a significant negative correlation between alcohol use and food addiction symptoms at baseline (r=-0.235, p=0.042). Only alcohol use was significantly correlated with baseline BMI (r=-0.239, p=0.039) and with change in BMI 6-months after WLS (r=0.448, p=0.019). Interestingly, alcohol use (r=0.515, p=0.034), but not food addiction symptoms (r=-0.031, p=0.907), was significantly correlated with BMI lost 6-months after sleeve gastrectomy (n=17). There was also a trend for a correlation between BMI lost after Roux-en-Y gastric bypass (RYGB; n=10) and food addiction symptoms (r=-0.486, p=0.154), but not alcohol use (r=0.069, p=0.851). **Conclusions:** We anticipate our sample size increasing to 100 WLS patients by October 2013, increasing our power to detect differences by surgery type. These preliminary analyses suggest that alcohol use at baseline may be related to greater weight loss 6 months post-sleeve gastrectomy, while a higher number of "food addiction" symptoms may lead to less weight loss 6 months post-RYGB.

T-276-P
Frecuency of Vitamin B12, Iron and Folates Deficiencies During the First Three Years of Follow Up After Gastric Bypass

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Background: Gastric bypass causes nutritional deficiencies. In Mexico the prevalence of severe obesity is reported to be 2.99% and it is expected that in the next years the number of subjects undergoing bariatric surgery will increase dramatically. Follow-up of these patients will be a challenge. We aimed to analyze the frequency of anemia, Vitamin B12, Iron and folates deficiencies during the first three years of follow up after gastric bypass. **Methods:** Retrospective analysis of data from patients who underwent gastric bypass from January 2008 to December 2009, with 3 years follow up. All patients were prescribed standard multivitamin supplementation and Iron and Vitamin B12 were indicated when needed. Levels of Vitamin B12, Iron and hemoglobin were assessed, and frequencies of deficiencies during the first 6 months, second and third years of follow up were determined. **Results:** Data of 32 patients was analyzed. 75% were women, mean BMI before surgery was 48.1 kg/m2. The highest deficiencies were found during the second year of follow up: Iron deficiency 32%, and Vitamin B12 44%; the highest frequency of anemia was found during the third year (50%). Folate deficiency was not found in any period. The frequency of anemia increased in women, from 16% in the first year, to 54% during the third year. **Conclusions:** We found a very high frequency on Iron and Vitamin deficiency during the first three years after gastric bypass in a tertiary hospital follow up. It is very important to assess and treat individual micronutrient deficiencies in the postoperative treatment.

T-277-P^{DT}
The Role of the Multidisciplinary Committee in the Evaluation of Bariatric Surgery Candidates with a High-Risk Psychiatric Profile

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Background: Background: Obesity is a growing pandemic. Bariatric surgery is the only durable treatment modality for morbid obesity. Relative contraindications to surgery include serious psychiatric illnesses, such as personality disorders, psychotic symptoms, binge-eating disorder, and substance abuse. Implementation of a multidisciplinary committee (MC) integrated by medical, surgical, nutritional and psychiatric experts may help discriminate adequate candidates for bariatric surgery amongst individuals with a high-risk psychiatric profile. **Methods:** We retrieved demographic data and other parameters of all patients seeking bariatric surgery that were evaluated by the MC from 2009 to 2010. Inclusion criteria for MC included the presence of any significant psychiatric disorder and/or substance abuse. **Results:** A total of 136 patients (106 females, 30 males) with a mean age of 47.5 years (range, 18-85) and a mean BMI of 57.7 kg/m2 (35-98 kg/m2) were evaluated by the MC. The most frequent psychiatric diagnosis was psychological factors affecting a medical condition (obesity), present in 43(31.6%) patients and followed by binge-eating disorder in 19 (14%) subjects. More than 1 psychiatric

diagnosis was observed in 95.6% of the cohort. Only 17 (12.5%) were cleared for surgery, while 35(25.7%) abandoned the process. Pre-operative management duration was 273.8 days (118-598 days) with an average preoperative visit of 10.9 (9-15). Mean length of stay was 4.4 days (3-14 days). Readmission occurred in 47% of the patients, due to non-psychiatric complications. No deaths were registered. **Conclusions:** Bariatric surgery provides satisfactory results in morbidly obese patients with a high-risk psychiatric profile after the thorough intervention of a MC.

T-278-P
Effects of Roux-en-Y Gastric Bypass and Ileal Transposition Surgeries on Glucose and Lipid Metabolism in Skeletal Muscle and Liver

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Background: Roux-en Y gastric bypass (RYGB) and ileal transposition (IT) surgeries produce weight loss and improve diabetic control; however, the mechanisms of glycemic improvements are largely unknown. Because skeletal muscle and liver play a key role in glucose homeostasis, we compared the effects of RYGB and IT surgeries on key molecules of glucose and lipid metabolism in muscle and liver. **Methods:** Sprague-Dawley rats were subjected to RYGB, IT, or sham surgeries; sham-animals were ad-lib fed or pair-fed to RYGB rats (n=7-9/group). At 8 weeks postoperatively, blood samples were collected for glucagon-like peptide-1 (GLP-1) and insulin analyses by ELISA. Leg muscle and liver tissues were analyzed for mRNA (RT-qPCR) and/or protein abundance (western blotting) of important molecules of glucose and lipid metabolism [glucose transporter-4 (GLUT-4), hexokinase, phosphofructokinase (PFK), adenosine monophosphate activated protein kinase-α (AMPKα), cytochrome C oxidase-IV (COX-IV), citrate synthase, carnitine palmitoyl transferase-1 (CPT-1), medium-chain acyl-CoA dehydrogenase (MCAD), peroxisome proliferator-activated receptor gamma co-activator 1α (PGC-1α), PRC, UCP-3] **Results:** Plasma GLP-1 concentrations were increased comparably by RYGB and IT. RYGB and IT increased muscle GLUT-4 protein content, muscle hexokinase mRNA, and liver PFK mRNA. IT increased muscle AMPKα and COX-IV protein content, and liver citrate synthase activity. IT increased muscle CPT-1, MCAD and PRC mRNA, whereas RYGB increased UCP-3 mRNA in muscle and liver, and PGC-1α mRNA in liver. **Conclusions:** Together our data suggest that RYGB and IT surgeries lead to comparable stimulation of GLP-1 secretion and up-regulation of important molecules of glucose metabolism, but produce differential effects on key molecules of lipid oxidation in muscle and liver. *Funding:* Heart and Stroke Foundation of Canada

T-279-P
Regression of Stage IV CKD Post Sleeve Gastrectomy in a Male with Class III Obesity and T2D

Juliana Simonetti, Amanda Powell, Caroline M. Apovian, Andrea D. Coviello *Boston, MA*

Background: Although regression of T2D after bariatric surgery is well recognized, regression of chronic kidney disease (CKD) is not. We describe a case of improved kidney function after bariatric surgery for Class III obesity complicated by stage IV CKD. **Methods:** A 60 yo male with Class III obesity, HTN, HL, and T2D complicated by retinopathy, neuropathy, and nephropathy was referred for weight loss to meet kidney transplant criteria (BMI <40 kg/m2). Obesity was gradual, adult onset with development of T2D. After intolerance of exenatide in addition to oral diabetic agents, A1C improved to 6.5% with basal/prandial insulin but he gained ~50 lbs. Despite progressive CKD (Cr 3.72 mg/dl, eGFR 17 ml/min/m2), he was ineligible for kidney transplant due to BMI 44. After failing diet/lifestyle modifications, he underwent successful laparoscopic sleeve gastrectomy; 3 months post-op his Cr improved to 1.8 mg/dl (eGFR 39, CKD III), and he no longer needed kidney transplantation. **Results:** Obesity causes renal impairment through obesity related glomerulopathy (ORG). Lipotoxicity causes direct podocyte damage leading to glomerular hypertrophy, hyperfiltration, and proteinuria. Hyperinsulinemia increases IGF-1/-2 and TGF-B1 synthesis causing an increase in glomerular extracellular matrix. Histologically, the distinction of ORG from diabetic nephropathy is based on the lack of glomerular basement membrane thickening and nodular sclerosis with less arteriolar hyalinosis. ORG is characterized by proteinuria and renal insufficiency without other causes of FSGS. Small case series suggest that both medical and surgical treatment of obesity can reduce proteinuria in patients with ORG leading to

improvement or stabilization of kidney function. **Conclusions:** Weight loss from bariatric surgery may be associated with improved kidney function in some patients with severe CKD.

T-280-P

Short-Term Changes in Fatty Acid Concentrations of Plasma Phospholipids Following Restrictive Versus Malabsorptive Bariatric Surgery

Nana Gletsu-Miller *West Lafayette, IN*; Rebekah Forbes *Dublin, Ireland*; Danijela Gasevic *Vancouver, Canada*; John R. Burgess *West Lafayette, IN*; Edward Lin *Atlanta, GA*

Background: Bariatric surgery (BS) promotes loss of adipose tissue, induced by decreased dietary fat intake and absorption, but the effect of BS on essential fatty acids (EFA) is unknown. We aimed to determine short-term changes in EFA following restrictive BS (sleeve gastrectomy and adjustable gastric banding [RESTRICT]) versus roux-en-y gastric bypass (RYGB), a malabsorption promoting surgery. **Methods:** Subjects were Caucasian (N=9) and African American (AA, N=11) females who underwent RYGB (N=13), or RESTRICT (N=7), and measures were obtained at baseline (before), 1, and 6 months following surgery. Measures were: fatty acid concentrations in plasma phospholipids (gas chromatography); body fat mass (air displacement plethysmography); and dietary intake (food records). To determine time and group effects, statistical tests included Chi-squared, Mann-U-Whitney, Friedman, and Wilcoxon Signed Rank. **Results:** At baseline, the RESTRICT group had more AA and higher dietary fat intake compared to RYGB group; all other data were comparable. Following surgery, decreases in fat mass and dietary fat intake were similar in both groups. At 1 month transient changes were observed in both groups; 18:2ω6 decreased, while 16:0 and 18:1ω9 increased. Decreases in 20:3ω6 (-47% and -38%) and in 20:5ω3 (-63% and -63%) at 1 and 6 months, respectively, were found only in the RYGB group. Mead acid, a marker of EFA status improved (-70%) in RYGB but not in RESTRICT 6 months following surgery. **Conclusions:** Compared to restrictive surgery, RYGB was associated with a more altered plasma fatty acid profile during the acute 6 months following surgery.

T-281-P

Timing of Glycemic Changes After Roux-en-Y Gastric Bypass in Patients with Type 2 Diabetes Mellitus

Barbara Carranza Leon *Rochester, MN*; Nancy Puzziferri, Ildiko Lingvay *Dallas, TX*

Background: Roux-en-y gastric bypass (RYGB) has shown to resolve Type 2 Diabetes Mellitus (T2DM) in severely obese patients. Our objective was to evaluate the change in T2DM parameters at discharge,12 and 24 weeks post surgery. **Methods:** We performed a retrospective data collection from 60 patients with the diagnosis of T2DM who underwent RYGB at the Dallas Veterans Affairs Medical Center from 2003 to 2010. **Results:** Seventy five percent of patients were male with a mean age of 55+/-5.5 years. Initial weight was 143.4+/-25.0 and 6 months after RYGB it decreased to 107.33+/-22 kg. Fasting plasma glucose returned to normal (91.2 +/- 16.5 mg/dl) within 3 months after surgery and remained unchanged at 6 months, as did HbA1c (decreased from 6.8+/-1.3% to 5.9+/-1.1 at 3 months and 6.2+/-1.1% at 6 months). At discharge, 52% of patients achieved a reduction in dose and/or number of medications. Remission of T2DM was achieved by 11% of patients at discharge, 27% at 3 months and 33% at 6 months. **Conclusions:** . Improvement and remission of T2DM in severely obese patients occurs within days of RYGB before significant weight loss occurs. This suggests that caloric restriction and surgery specific changes are contributing mechanisms. Diabetes improvement seems to reach a maximum at 3 months, with little to no improvement thereafter, despite continuous weight loss. This suggests the presence of a non-modifiable residual underlying abnormality, most likely a severe relative or absolute insulin deficiency.

T-282-P

This abstract has been withdrawn.

Cardiovascular and Cancer Epidemiology

T-283-P

Lifetime Adiposity and Weight Loss Effects on Intima Media Thickness

Nick Finer, Marietta Charakida, Tauseef Khan, William Johnson, Diane Kuh, Rebecca Hardy, John Woodside, John Deanfield *London, United Kingdom*

Background: We have examined whether exposure to obesity has a cumulative effect on carotid intima media thickness (cIMT), and the impact of weight loss. **Methods:** 1147 participants from the MRC National Survey of Health and Development (1946 British birth cohort) with cIMT measurements, now age 60-64ys provided body mass index (BMI) data at age 36, 43, 53 and 63 yrs. If BMI <25 kg/m2 – normal weight (NW), 25-29 – overweight, >30 – obese, >25kg/m2 overweight and obese (OW); hypertension - blood pressure≥140/90mmHg. cIMT was measured in right and left common carotid artery and mean cIMT was calculated. **Results:** BMI at every age was positively associated with cIMT (p<0.001 for all). Exposure to adiposity and hypertension at all ages had an additive adverse impact on cIMT (p<0.001). At 60-64 years, OW participants had higher cIMT compared to NW peers (0.702 (0.13) vs 0.667 (0.11) mm; p<0.001). There was a graded cumulative effect of exposure to adiposity on cIMT at 60-64 years: those OW >20 years had higher cIMT (N=218, cIMT: 0.72(0.14) mm) than those with 10-20 year exposure (N=166, cIMT: 0.70(0.1) mm) and those NW across adulthood (N=256, cIMT: 0.67(0.1)), ANOVA: p<0.001). Weight reduction (a drop in category from obese to overweight or overweight to normal) in any time period was associated with vascular benefit: cIMT (-0.042 (-0.066, -0.017) (N=152) compared to those who never lost weight, (N=379; p=0.001 adjusted for CV risk factors), even if weight loss was not sustained. Vascular benefit of weight reduction was also seen in hypertensive OW female participants. **Conclusions:** Adiposity exposure from early adulthood has a cumulative adverse impact on cIMT and weight loss, even unsustained, is associated with lower cIMT suggesting that interventions producing weight loss during adulthood may produce long term vascular benefit.

T-284-P

Cutoffs of Anthropometric Obesity Measures for Cancer Risk in Postmenopausal Women

Moonseong Heo, Geoffrey C. Kabat, Howard Strickler, Juan Lin *Bronx, NY*; Lifang Hou *Chicago, IL*; Marcia Stefanick *Stanford, CA*; Garnet L. Anderson *Seattle, WA*; Thomas Rohan *Bronx, NY*

Background: Obesity is a risk factor for certain cancers. Information on the extent to which fatness is maximally associated with cancer risk in postmenopausal women is lacking. **Methods:** We used data from the nationwide entire on-going Women's Health Initiative cohort (N>160,000) to derive cutoffs of baseline anthropometric obesity measures that are maximally associated with cancer incidence. The anthropometric measures included: body mass index (BMI), weight, weight-to-height ratio, waist circumference (WC), waist-to-hip ratio (WHR), and WC-to-height ratio. We examined 19 cancer sites including all cancers combined. We applied Cox-proportional hazards regressions to each combination of the cancers and the anthropometric measures controlling for potential confounding variables. Cutoffs were obtained applying a two-fold cross validation method, followed by survival ROC analysis of sensitivity and specificity for 5- and 10-year incidence. **Results:** The following cancers were significantly positively associated with all the anthropometric measures: colorectal, colon, kidney, endometrium, breast and all cancers combined. Lymphoma was associated with only WHR whereas lung cancer among ever smokers was significantly inversely associated with all measures except WHR. The derived cutoffs varied across cancers and obesity measures and so did sensitivities and specificities of the cutoffs for predicting 5- and 10-year cancer incidence. BMI cutoffs, for example, ranged from 27 to 36 kg/m2 across those cancers except for lung cancer among ever smokers. The maximum Youden index over all combinations was 0.18. **Conclusions:** Obesity, however anthropometrically measured, is a significant risk factor for many cancers among postmenopausal women. Nevertheless, predictive accuracy in terms of Youden indices was generally low.

T-285-P[DT]

Blood Pressure and Obesity in Five Cohorts of African Origin: Modeling the Epidemiologic Transition Study (METS)

Amy Luke *Maywood, IL*; Pascal Bovet *Lusanne, Switzerland*; Terrence Forrester *Kingston, Jamaica*; Estelle Lambert *Cape Town, South Africa*; Jacob Plange-Rhule *Kumasi, Ghana*; Lara R. Dugas, David A. Shoham *Maywood, IL*; Dale A. Schoeller *Madison, WI*; Ramon A. Durazo-Arvizu, Richard S. Cooper *Maywood, IL*

Background: Blood pressures in African populations are changing rapidly as more people move to urban areas and adopt a lifestyle resembling consumer cultures in wealthier societies. The pattern of change in cardiovascular (CVD) risk status across Africa is heterogeneous, however, reflecting variation in the process of cultural evolution, and may shed light on the paradoxically high risk of hypertension seen in persons of African origin living outside the continent. **Methods:** We conducted a multi-site comparative study of communities in the African diaspora, drawn from metropolitan Chicago, US; Kingston, Jamaica; rural Ghana; Cape Town, South Africa (RSA); and the Seychelles. At each site 500 participants between the ages of 25 and 44, with approximately equal gender balance, were enrolled for a longitudinal study of energy expenditure, weight and CVD risk. Blood pressure, anthropometrics, body composition were measured using standardized protocols. **Results:** Mean systolic blood pressure (SBP) ranged from 119-129 mmHg among men and between 110-119 among women (Ghana and RSA, respectively). In contrast to BP, BMI in men was equivalent for Ghana and RSA (mean=22) and highest in the US; mean BMI among women varied from 26-34 (Ghana and US). South African men had substantially higher blood pressures than both the Jamaicans and the Ghanaians despite similar or lower BMI and despite significant differences between BMI, men in RSA and US had similar prevalences of hypertension (28-29%). The correlation between SBP and measures of adiposity ranged from 0.15 to 0.30 in men for all sites, except RSA where it was much lower and non-significant; a similar pattern was observed for DBP. **Conclusions:** These data suggest there are contextual factors influencing BP and hypertension prevalence other than anthropometric risk factors in some populations of the African diaspora.

T-286-P[DT]

Insomnia and the Subsequent Risks of Acute Coronary Syndrome: Report from a Nationally Representative Cohort

Ya-Wen Hsu, Shih-Feng Weng, Ming-Ping Wu, Chung-Han Ho, Jhi-Joung Wang *Tainan, Taiwan*

Background: Insomnia has been linked with obesity and cardiovascular-related diseases. While the relationships between insomnia and obesity have been widely studied, limited research has investigated the effects of insomnia on acute coronary syndrome (ACS) among general population. The objective of this study was to investigate whether the presence of insomnia is associated with the incidence of healthcare seeking for ACS longitudinally. **Methods:** This study used data from the Taiwan National Health Insurance Research Database. Enrollees with ICD-9-CM diagnostic codes for insomnia (n=22,677; mean age=49 years) in service claims and without previous diagnosis of ACS and sleep apnea were compared with randomly selected age- and gender-matched non-insomnia enrollees (n=68,031; mean age=49 years) in subsequent hospitalization for ACS from the recruited period (2002-2005) to 2009. Kaplan-Meier curves and the Cox proportional hazards regressions were used to calculate hazard ratios of ACS events for insomniacs and non-insomniacs. **Results:** Diabetes (p<0.001), hypertension (p<0.001), hyperlipidemia (p<0.001), and depression (p<0.001) were more prevalent among insomniacs compared to the non-insomniacs. The crude incidence rate of the composite endpoint was higher in insomniacs than in the non-insomniacs (15.7/1000 vs. 8.86/1000 person-years; p<0.001). Individuals with insomnia had a 77% higher risk of developing ACS compared to those without insomnia [hazard ratio (HR)=1.77; 95% confidence incidence (CI)=1.48-2.12] after adjusting for age, gender, diabetes, social-economic status, hypertension, hyperlipidemia, and depression. **Conclusions:** Among individuals without sleep apnea, the presence of insomnia increased the future hospitalization of ACS. Regular and early screening for insomnia and proper treatments are crucial for the prevention of future cardiovascular risks.

T-287-P

Effect of Polymorphisms in LEP, LEPR and MC4R Genes in Binge Eating Behavior and Cardiometabolic Parameters in Obese Children and Adolescents

Maria E. Melo, Clarissa T. Fujiwara, Ariana E. Fernandes, Marina B. Pioltine, Fernanda P. Quinta, Aritania Santos, Cintia Cercato, Alfredo Halpern, Marcio C. Mancini *São Paulo, Brazil*

Background: Single nucleotide polymorphisms (SNPs) in the leptin (LEP), leptin receptor (LEPR) and melanocortin-4 receptor (MC4R) genes may affect central energy homeostasis system increasing the risk of developing metabolic disturbances and binge eating (BE). These associations, however, remain controversial. Our aim was to investigate the effect of SNPs rs7799039 in the LEP, rs1137100, rs1137101 and rs8179183 in the LEPR and rs12970134 and rs1778231 in the MC4R genes over BE and cardiometabolic parameters in obese children and adolescents. **Methods:** 448 children and adolescents (54.0% girls; 12.5±2.7 years; Z-BMI 3.21±0.54) had anthropometric and metabolic variables assessed. BE was evaluated according to the Binge Eating Scale (BES). Genotyping was performed by Taqman. Statistical analysis were performed using Student's t and Mann-Whitney Tests with significance level set at p<0.05. **Results:** Girls carrying the G allele of rs1137101 (A>G) presented lower BES scores (p=0.013) and higher triglyceride levels (p=0.039) in comparison with AA genotype girls. Among girls, carriers of the G allele of rs1137100 (A>G) showed lower waist-to-height ratio (p=0.007), systolic blood pressure percentile (p=0.004) and higher triglyceride levels (p=0.040). Girls carrying the A allele of rs12970134 (G>A) showed higher BES scores (p=0.012) and carriers of the polymorphic allele of rs12970134 (G>A) and rs1778231 (T>C) presented higher fat mass (kg) (p=0.031 and p=0.043, respectively). Among boys, carriers of the A allele of rs12970134 (G>A) showed lower HOMA-IR (p=0.041), insulin (p=0.046) and leptin levels (p=0.005). Boys carrying the C allele of rs1778231 (T>C) presented higher glucose levels (p=0.029) when compared to TT genotype. **Conclusions:** SNPs in the LEPR and MC4R genes are associated with distinct BE and cardiometabolic parameters in obese children and adolescents.

T-288-P

Relationship between Binge Eating Behavior, Dietary Intake, Cardiometabolic Risk, Screen Time and Physical Activity in Overweight Children and Adolescents

Maria E. Melo, Ariana E. Fernandes, Clarissa T. Fujiwara, Marina B. Pioltine, Fernanda P. Quinta, Cintia Cercato, Alfredo Halpern, Marcio C. Mancini *São Paulo, Brazil*

Background: Epidemiological surveys estimate that binge eating (BE) prevalence ranges from 7.5% up to 30% in clinical studies with obese individuals seeking treatment. BE is a common condition associated with failure in obesity treatment due to a higher frequency of dropout and faster regain of weight among obese reporting BE. Our aim was to investigate the relationship between BE, dietary intake, cardiometabolic risk, screen time viewing and physical activity time expenditure in overweight children and adolescents. **Methods:** 492 children and adolescents (52.8% girls; age 12.4±2.7 years; Z-BMI 3.16±0.66) had BE assessed using the Binge Eating Scale (BES) and dietary intake by a 24-hour dietary recall and analysis of macronutrients and daily energy intake according to meals. Cardiometabolic risk comprised anthropometric and metabolic variables. Screen time (television viewing, computer and video game using) and the physical activity time expenditure were also assessed. Statistical analysis were performed using Pearson's and Spearman's Correlation Tests with significance level set at p<0.05. **Results:** BES scores were positively correlated with leptin levels (p=0.03), waist-to-height ratio (p=0.04), fat mass (%) (p=0,019), television viewing (p=0.011) and screen time (p=0.038). No significant correlation, however, was found between BES scores with computer and video game using (p=0.05). A positive correlation was also observed between BES scores with daily energy (p=0.017), afternoon snack energy (p=0.002), carbohydrates (g) (p=0.03) and saturated fat intake (g) (p=0.015). BES scores was negatively correlated with polyunsaturated fat intake (%) (p=0.021) and physical activity time expenditure (p=0.026). **Conclusions:** Higher BES scores were associated with an increased cardiometabolic risk, poorer diet quality and greater and physical inactivity and screen time viewing.

T-289-P
Body Volume, Body Fatness and Metabolic Syndrome

Eunjung Oh, Jaekyung Choi, Seunah Kim, Ahleum Ahn *Seoul, Republic of Korea*

Background: Body volume by three dimensional body scanner (3DBS) may be an alternative index for evaluating body fatness. The aim of this study was to evaluate the association of body volume with body fatness and metabolic syndrome in Korean women. **Methods:** This study included 38 women who body volume was measured using 3DBS. We measured body fatness using Dual-energy X-ray absorptiometry and computed tomography. Subjects with metabolic syndrome were defined as having three or more components of the following: high blood pressure (≥130/85 mmHg), elevated fasting glucose (≥100 mg/dl), hypertriglyceridemia (≥150 mg/dl), low high-density lipoprotein-cholesterol (<50 mg/dl), and abdominal obesity measured by waist circumference ≥85 cm. **Results:** Total, trunk, lower trunk, and limbs volumes were significantly correlated with total fat mass, percentage body fat, and abdominal fat area. After adjustment for age, current smoking, at-risk drinking, and physical inactivity, the odds ratios(95 % confidence interval) of metabolic syndrome with total, trunk, lower trunk, and limbs volume were 1.08 (1.01-1.16), 1.11 (1.01-1.22), 1.20 (1.01-1.43), and 1.31 (1.04-1.66), respectively. **Conclusions:** Body volume by 3DBS is significantly associated with body fatness and metabolic syndrome. 3DBS may be a useful tool for detecting and monitoring body fatness and metabolic syndrome.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Population-Based Studies of Metabolic Disorders

T-290-P
Smaller Organs with High Metabolic Rate Explain Lower Resting Energy Expenditure in Indian Than in Chinese Men

Tammy Song, Kavita Venkataraman, Yap Seng Chong, Peter Gluckman, Yung Seng Lee, Chin Meng Khoo, Melvin K. Leow, Yin Hao, Eric Khoo, E shyong Tai *Singapore, Singapore*

Background: According to the National Health Survey 2010 conducted in Singapore, obesity prevalence is disproportionately higher in the Malays and Indians as compared to the Chinese. Lower resting energy expenditure (REE) may be a contributory factor. The objective of this study was to examine differences in REE among Chinese, Malay and Indian men and, if observed, whether differences in REE can be explained by body composition and body fat distribution. **Methods:** 210 men from Singapore (n= 84 Chinese, 61 Indians and 65 Malays), aged 21 to 40 years and of body mass index 18.5 to 30.0 kg/m2 were recruited in this cross-sectional study. REE was assessed by indirect calorimetry and body composition by dual energy X-ray absorptiometry. Abdominal visceral adipose tissue (VAT), subcutaneous adipose tissue (SAT) and brain volume were measured by magnetic resonance imaging. **Results:** Chinese (1634±17 kcal/day) had the highest REE followed by Malays (1574±18 kcal/day) and Indians (1552±19 kcal/day). Total fat-free mass(FFM), trunk FFM, limb FFM, fat mass and SAT were important predictors of REE. VAT was a predictor of REE in Malays and Indians but not in Chinese. Brain volume was associated with REE in Malays. The difference in REE between Chinese and Indians persisted after adjustment for total FFM, limb FFM, total fat mass, SAT and VAT, however was no longer significant after correction for trunk FFM and brain volume. **Conclusions:** Lower REE in Indian compared to Chinese men may contribute to the higher rates of obesity and difficulty in weight management observed in the Indian population. Lower REE in Indian men may be mediated by a lower metabolically active visceral organ mass(main contributor of trunk FFM) and brain volume. Public health recommendations tailored to Indians should encourage higher levels of physical activity and lower levels of energy intake.

T-291-P
National Trends in the Comorbid Health Status of Individuals Undergoing Bariatric Surgery, 1998-2010

Rebecca Speck, David Sarwer *Philadelphia, PA*; Tuhina Neogi *Boston, MA*; Dale S. Bond *Providence, RI*; John T. Farrar *Philadelphia, PA*

Background: Bariatric surgery is increasingly recognized for its impact on weight-related comorbidities. Whether the proportion of individuals presenting with more obesity-related comorbidities has increased is unclear. This study evaluated changes in the comorbidity status, including musculoskeletal disorders, among bariatric surgery cases. **Methods:** Nationwide Inpatient Sample data from 1998-2010 were used. Cases of obesity treated with a bariatric procedure were identified per ICD-9 codes, excluding emergent admissions. The Charlson Comorbidity Index (CCI) score was generated; recoded as 0 vs. ≥1, given the small proportion of cases with CCI >2. Musculoskeletal disorders included lower body osteoarthritis (LBOA) and fibromyalgia. Trends were evaluated with Poisson regression for survey data, adjusted for sex, age, and race. **Results:** From 1998-2010 the comorbidity status of cases increased significantly. In 1998 37.1% of cases had a CCI≥1; in 2010 51.6% did. The prevalence of diabetes, renal disease, and rheumatologic disease increased two-fold (or more). Adjusted trends increased significantly for CCI≥1 (3% per year) and fibromyalgia (12% per year). Compared to men, women were 14% less likely on annual average to have a CCI≥1, but 11% more likely to have LBOA and fibromyalgia (8.5-fold increased prevalence). As compared to cases of "other" race (non-White and non-Black), Whites were 9% less likely on annual average to have CCI≥1; Whites and Blacks were 24% and 18% more likely to have LBOA; and Whites were 69% more likely and Blacks 23% less likely to have fibromyalgia. **Conclusions:** Increases in the proportion of cases with more comorbidities and musculoskeletal disorders suggest bariatric surgery is being performed in increasingly sicker patients. There may be an increasing need for greater preoperative counseling and management of these conditions.

T-292-P
Urinary Concentrations of Dichlorophenol Pesticides and Prevalence of Obesity among U.S. Adults with Various Demographic Characteristics

Yudan Wei *Macon, GA*; Jianmin Zhu *Fort Valley, GA*; An Nguyen *Macon, GA*

Background: Accumulating evidence has suggested a possible link between exposure to environmental chemicals, the so called "obesogen", and obesity. In this study, we assessed the potential associations between exposure to dichlorophenol pesticides and obesity in U.S. adults. **Methods:** Study participants aged 20-85 years were selected from the 2005-2008 U.S. National Health and Nutrition Examination Survey, and were categorized as obese and non-obese based on body mass index. Creatinine-corrected urinary concentrations of dichlorophenols were determined to assess level of exposures. **Results:** Significantly higher geometric means of urinary concentrations of both 2,5-dichlorophenol (2,5-DCP) and 2,4-dichlorophenol (2,4-DCP) were found in racial groups of Black, and other (including Hispanic, Asian, and multi racial), in females, and in participants with lower levels of education and family income, which could reflect biological mechanisms and social factors related to the exposures. A significantly higher geometric mean of urinary concentrations of 2,5-DCP was seen in obese adults, compared to that in non-obese adults. A dose-dependent increase in the prevalence of obesity was observed in the study participants across increasing levels of urinary 2,5-DCP (p-trend <0.0001). Multivariate logistic regression revealed that urinary concentrations of 2,5-DCP, but not 2,4-DCP, were significantly associated with obesity after adjustment for age, gender, race, education, total fat intake, and physical activity. **Conclusions:** Our findings suggest a potential relationship between exposure to the fumigant insecticide paradichlorobenzene, measured as urinary concentrations of 2,5-DCP, and obesity in adults. The long-term impact and relevance of this exposure to human health are yet to be understood and future research could further explore these interactions.

T-293-P
Serum Insulin and Insulin Resistance (IR) as Predictors of Weight and Body Fat Gain in African American and Caucasian Children: A Longitudinal Study

Nicole M. Sedaka, Roya Sherafat-Kazemzadeh, Laura E. Yannai, William Stutzman, Cara Olsen, Tania Condarco, Amanda J. Krause, James C. Reynolds, Susan Z. Yanovski, Van S. Hubbard, Jack A. Yanovski *Bethesda, MD*

Background: Studies examining the influence of serum insulin and IR on children's weight and fat gain longitudinally have reported inconsistent results. **Methods:** A cohort of healthy African American and Caucasian children, enriched for obesity, 6-12y were recruited from 1996-2008 and followed longitudinally for up to 15y. Fasting insulin and glucose were

measured at baseline; DEXA was performed yearly. We examined baseline insulin and IR (measured as HOMA-IR) as predictors of follow-up BMI Z score and fat mass in a mixed model longitudinal analysis with fixed effects for independent variables of interest, and child-specific random intercepts and slopes over time, accounting for baseline body composition, pubertal stage, and age, sex, race, socioeconomic status, and duration of follow-up. **Results:** Change in BMI was studied in 249 children; change in fat mass was examined in 178. Data from 1,335 annual visits were included. At baseline, average age was 9±2y. 61% were Caucasian, 39% were African American. 39% were obese. Mean baseline BMI-Z was 1.18±1.15. Children were followed for an average of 7.2±4.3y. After accounting for covariates, neither baseline insulin nor HOMA-IR was significantly associated with follow up BMI (p's>.54), BMI-Z score (p's>.56), fat mass (p's=.16), or fat mass percentage (p's>.28). In all models, baseline BMI (p<.0001) and fat mass (p<.0001) were strong positive predictors for change in BMI and fat mass. **Conclusions:** These data suggest that once demographic and anthropometric factors are taken into account, baseline insulin and IR are not important predictors for gain in BMI and fat mass in children age 6-12y. These data call into question the hypothesis that hyperinsulinemia is an important etiology for obesity in children. Baseline characteristics such as BMI and fat mass are excellent predictors of children's body mass during adolescence.

T-294-P
Characteristics of Metabolically Healthy Obese among Patients Who Underwent Bariatric Surgery

Clare Lee, Jeanne M. Clark, Mariana Lazo *Baltimore, MD*

Background: Recent studies describe a unique subset of obese individuals with normal metabolic profiles despite having excess weight called "metabolically healthy but obese (MHO)." Our aim was to determine factors associated with MHO phenotype. **Methods:** This is a retrospective study of 710 adult patients who underwent bariatric surgery at the Johns Hopkins Center for Bariatric Surgery between 2008 and 2010. All patients underwent a clinical preoperative assessment and intraoperative wedge liver resection. For this analysis, we defined MHO by the absence of both diabetes and hypertension. We used multivariable logistic regression to examine the association between MHO and potential risk factors including age, sex, race, smoking status, BMI, presence of liver fibrosis, steatosis or nonalcoholic steatohepatitis and liver enzymes. **Results:** The sample was 78% female, 77% white, and 48% were less than 45 years old. A total of 28.7%% of the patients had MHO. Compared to those with diabetes and/or hypertension, MHO patients were significantly more likely to be non-Hispanic White OR=0.46 (95% CI: 0.27-0.79), younger OR= 0.32 (95% CI=0.24-0.44), and female OR=0.54, (95% CI=0.30-0.97). In addition, patients with MHO were less likely to have liver steatosis OR=0.43 (95% CI=0.18-1.0) or nonalcoholic steatohepatitis (OR=0.30, CI=0.15-0.60). **Conclusions:** Among bariatric surgery patients, MHO was common especially in patients who were white, younger, female and with less liver injury. Further studies are needed to understand the role of MHO as a predictor of bariatric surgery outcomes.

T-295-P
Obesity Misclassification, Sedentary Behavior and Cardiometabolic Risk among Adults in the United States: NHANES 2003-2006

Mark Peterson *Ann Arbor, MI*; Soham Al Snih *Galveston, TX*; James McClain *Bethesda, MD*

Background: There is a longstanding controversy regarding the screening criteria for obesity, and cardiometabolic risk, and misclassification is prevalent. Sedentary behavior (SB) and obesity are thought to be interdependent "lifestyle" factors and many individuals are at exaggerated risk for preventable disease and early mortality. **Methods:** Adults between the ages of 20-85 were included from the combined 2003-2006 NHANES datasets. Body mass index, percent body fat (%BF) determined by dual energy X-ray absorptiometry (DXA), objectively measured SB, and established markers of cardiometabolic risk were analyzed. Sensitivity, specificity, and receiver operating characteristic curves were used to evaluate the performance of BMI as a continuous variable, as well as various BMI thresholds to detect obesity defined by sex-specific %BF cutoffs. SB was assessed as a stand-alone predictor of risk, as well as adjusted for total daily activity counts. **Results:** Approximately 33% of the men and 46% of the women who were normal weight according to BMI were obese according to %BF. The standard BMI

cutoff for obesity (BMI ≥ 30) had excellent specificity in both men and women (>97%), but very poor sensitivity (<50%). The optimal BMI cutoff to detect obesity by %BF was found to be 26 for men and 25 for women. Cardiometabolic risk was robustly associated with %BF and abdominal obesity, even after adjusting for age, gender, SB, and sociodemographic factors. SB was not associated with higher odds of cardiometabolic risk or the metabolic syndrome when adjusted for total activity counts. **Conclusions:** Obesity misclassification and cardiometabolic risk are prevalent, and thus diagnostic screening for obesity should be modified to account for %BF and abdominal obesity. SB is *not* associated with cardiometabolic risk, when adjusting for total daily activity.

T-296-P
This abstract will be presented during the Obesity *journal session on Friday, November 15.*

Longitudinal Trajectories of BMI and Cardiovascular Disease Risk: The National Longitudinal Study of Adolescent Health

Samantha Attard, Amy H. Herring, Annie Green Howard, Penny Gordon-Larsen *Chapel Hill, NC*

Background: In adulthood, excess BMI is associated with cardiovascular disease (CVD); it is unknown whether risk differs by BMI trajectories from adolescence to adulthood. **Methods:** The National Longitudinal Study of Adolescent Health, a nationally representative, longitudinal adolescent cohort (mean age: 16.9y) followed into adulthood (mean age: 29.0y) [n=13,643 individuals (40,929 observations)] was examined. Separate logistic regression models for diabetes, hypertension, and inflammation were used to examine odds of risk factors at given adult BMI according to varying BMI trajectories from adolescence to adulthood. **Results:** CVD risk factor prevalence at follow-up ranged from 5.5% (diabetes) to 26.4% (hypertension) and 31.3% (inflammation); risk differed across BMI trajectories. For example, relative to men aged 27y and BMI=23 kg/m^2 maintained over full study period, odds for diabetes were comparatively higher for men of the same age and BMI (27y and ≈30 kg/m^2) with gains of ≈8 BMI units between ages 15-20y (OR=2.35; 95% CI, 1.51, 3.66) or in those who maintained BMI≈30 kg/m^2 across the study period (OR=2.33; 1.92, 2.83) relative to individuals with the same gain of ≈8 BMI units, but between ages 20-27y (OR=1.44; 1.10, 1.87). **Conclusions:** Specific periods and patterns of weight gain in the transition from adolescence to adulthood might be critical for CVD preventive efforts.

T-297-P
Increased Eating Frequency Linked to Decreased Obesity and Improved Metabolic Outcomes

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Background: To date, only our group has explored the relationship between eating frequency and obesity and metabolic diseases in Hispanic youth. We found an inverse relationship between eating frequency and visceral adipose tissue and triglycerides. The aim of this study was to examine and potentially replicate the relationship between eating frequency and adiposity and metabolic disease risk in a cohort of exclusively overweight Hispanic youth. **Methods:** This analysis included 183 overweight (≥85th percentile BMI) Hispanic youth (8-18 y) with the following cross-sectional measures: height, weight, BMI, dietary intake via multiple 24-h recalls, body composition via dual-energy X-ray absorptiometry, lipids, and insulin action (insulin sensitivity, acute insulin response (AIR) and disposition index (DI), a measure of beta cell function) via a frequently sampled intravenous glucose tolerance test. Each eating occasion (EO) was defined as ≥50 calories and ≥15 minutes from any previous EO. Infrequent Eaters (IE) were classified as any subject who ate <3 EO on any dietary recall (average 2.6; n=33), whereas Normal Eaters (NE) always consumed ≥3 EO (average 4.3; n=160). **Results:** Using analyses of covariance, NE compared to IE consumed 23% more calories per day (p≤0.01), ate 40% more often, and consumed 19% less calories per EO (p≤0.01). NE also showed a lower BMI (p≤0.01), fasting insulin (p=0.03), and triglycerides (p=0.02), as well as an increased AIR (p=0.02) and DI (p=0.03). The following a priori covariates were included: Tanner, sex, body fat, and energy intake. **Conclusions:** These findings suggest that increased eating frequency is related to decreased obesity and metabolic disease risk in Hispanic youth, despite increases in energy intake. However, experimental studies are warranted to assess causality in this population.

T-298-P[DT]

The Contribution of Obesity to Race/Sex Differences in Cardiometabolic Disease among Patients with HIV/AIDS

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Background: The high cardiometabolic disease (CMD) risk associated with HIV infection may be exacerbated by the obesity epidemic. Though race/sex differences are thought to influence CMD risk and prevalence, we sought to determine the effect of obesity on these disparities among HIV+ individuals. **Methods:** Electronic medical records for patients seen between 7/2010 and 6/2011 were abstracted to determine the prevalence of CMD (dyslipidemia, heart disease, hypertension, diabetes). Staged logistic regression (referent group = white men) was used to examine the impact of race/sex on comorbidities adjusting for key confounders including/excluding obesity (body mass index ≥ 30). **Results:** Of 1800 participants, 77% were male, 54% black, and 25% obese. Obesity prevalence differed by race/sex: black women 49%, black men 24%, white women 24%, white men 15% (P<0.01). Compared to white men, other groups had reduced odds for dyslipidemia (odds ratio=OR 0.4 {0.2,0.6}). Black men had increased odds for hypertension (OR 1.8{1.4,2.3}), and reduced odds of dyslipidemia and heart disease. Black women had a nearly 2-fold increased odds for both diabetes (OR 1.8{1.2,2.8}) and hypertension (OR 1.9{1.4,2.5}) (all models at P<0.01). The associations of black women with diabetes and hypertension were attenuated when obesity was included in the models. Other group differences remained significant. **Conclusions:** Disparities in obesity prevalence do not completely explain race/sex differences in dyslipidemia and heart disease among HIV+ patients. Obesity mediated the association with diabetes/hypertension for black women, who may benefit from weight reduction to decrease disease risk. The nexus of the HIV and obesity epidemics has profound ramifications for long term care and prevention of cardiometabolic disease, particularly among minority women.

T-299-P[DT]

Secular Changes in the BMI- Waist Circumference Relationship in Mexican and Mexican-American Women

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Background: Mexican-origin women carry a high burden of obesity and Type II diabetes. We examined trends in body mass index (BMI) and waist circumference (WC) among Mexican women (MW) and Mexican-American women (M-AW), and whether WC for given BMI level has increased over time. **Methods:** Nationally representative health surveys for women aged 20-49 years from Mexico (1999 and 2012) and the U.S. (NHANES) (1999-2002 and 2007-2010) were used. Quantile regressions estimated age-adjusted changes in the BMI and WC distribution across years; linear regression tested changes in mean WC over time, adjusting for age, BMI, survey year, and interactions between BMI and survey year. **Results:** BMI and WC at all centiles (5th, 50th, and 95th) increased over time in MW and M-AW with the largest increases at the 95th centile. For example, for a 30 year old MW, WC at the 95th centile was 99.7 cm in 1999 compared to 113.3 cm in 2012. The corresponding pattern in M-AW was 111.2 cm in 1999-2002, and 123.2 cm in 2007-2012. WC was significantly higher over time for each BMI level. For example, at age 30 and BMI=30, the WC of MW increased by 9.5 cm from 1999 to 2012. Patterns were similar, though smaller in magnitude for M-AW. **Conclusions:** BMI and WC distributions have not only shifted to the right, but WC at each BMI level has increased significantly in Mexican-origin women in both Mexico and the U.S. These patterns have implications for future cardiometabolic burden in this already high-risk population.

T-300-P

Suitability of Metabolic Syndrome for Screening High Cardiovascular Risk Patients with Type 2 Diabetes: Analyses Based on KNHANES 2008

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Background: Patients with either type 2 diabetes mellitus (T2DM) or metabolic syndrome (MS) are recognized as a high risk group for cardiovascular disease (CVD), and early intervention for disease prevention is important. Several studies have demonstrated the clinical value of MS to predict additional CVD risk in T2DM patients; however, the clinical significance remains debatable. Therefore, we conducted this study to clarify the significance of MS in screening for level of CVD risk among T2DM patients. **Methods:** We used clinical data from the Korea National Health and Nutrition Examination Survey 2008 to classify the study population based on MS and glucose tolerance status and compare clinical characteristics and future CVD risk between the subgroups. **Results:** A total of 18.5% of subjects (n=4,314) were classified with MS. Among MS subjects, 9.5% had T2DM, while only 1% of non-MS subjects had T2DM (p<0.001); however, non-MS subjects accounted for 30.9% of the T2DM subgroup. In the NGT and IFG subgroups, the prevalence of moderate (5–10%) and high (>10%) CVD risk was significantly higher in MS subjects than in non-MS subjects (p<0.001). However, in the T2DM subgroup, there were no differences in clinical characteristics or the prevalence of moderate and high level of CVD risk according to MS status. LDL cholesterol in the T2DM group without MS was significantly higher than in the T2DM group with MS (p=0.010). These results were consistent even after multiple adjustments. **Conclusions:** The efficacy of MS in screening for high CVD risk in T2DM patients may be limited. In Korea, because many T2DM patients do not have MS, conventional risk factors for CVD estimation, such as LDL cholesterol, may play a more important role in screening patients at high risk for CVD.

T-301-P[DT]

Validation of a Cardiometabolic Disease Staging (CMDS) System for Obesity

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Background: Recent approval of new weight loss medications has enabled robust medical models for the comprehensive management of obesity. A complications-centric model requires an evaluation for the presence and severity of obesity related complications (i.e., staging) to identify patients that will benefit most from weight loss as a guide for selecting treatment modality and intensity. **Methods:** The current study validates Cardiometabolic Disease Staging (CMDS) for assigning risk level for diabetes and CVD, using data from Atherosclerosis Risk in Communities (ARIC) Study. CMDS: Stage 0: metabolically healthy; Stage 1: 1 or 2 Metabolic Syndrome risk factors (other than IFG); Stage 2: IFG or IGT or Metabolic Syndrome (without IFG); Stage 3: 2 of 3 (IFG, IGT, and/or Metabolic Syndrome); Stage 4: T2DM and/or CVD. **Results:** During a mean follow up of 11.2 years, there were 1241 newly onsite diabetes and 833 CVD events (myocardial infarction or coronary death) among 10,375 participants (mean age 62.9 y) attending visit 4 examination. Cumulative diabetes incidence was 16.4% overall, and across the risk levels (stage 0 to 3) were 5.0%, 8.2%, 15.8% and 30.7%, respectively. With Stage 0 as the referent group, multivariable adjusted hazard ratios for diabetes also increased exponentially from 1.64 for Stage 1(95% CI 1.15-2.34), 3.33 for Stage 2 (CI 2.39-4.64), and 7.49 for Stage 3 (CI 5.39-10.4). Multivariable adjusted hazard ratios for incident CVD also increased dramatically with advancement of the risk stage from Stage 0 to 4. Adjustment for BMI minimally affected the risks for T2DM and CVD. **Conclusions:** CMDS encompasses and illustrates the progressive spectrum of cardiometabolic disease, and provides granular discrimination over a wide range of increasing risk for diabetes and CVD. CMDS is a valuable risk-assessment tool to optimize benefit/risk ratio for obesity therapy.

T-302-P

Are Overweight and Obese Women More Likely to Receive Preconception Care?

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Background: Women who are overweight or obese before they get pregnant are at increased risk for adverse maternal and infant outcomes. Improvements in outcomes could be improved through provision of preconception care. However, it is unknown if prepregnancy overweight or obesity status results in differences in receipt of preconception care. **Methods:** We used data from the Pregnancy Risk Assessment Monitoring System (PRAMS) (2004-20010) to examine rates of preconception care for overweight (body mass index (BMI) = 25-29.9 kg/m2) and obese (BMI ≥30 kg/m2) women compared to women with normal BMI (18.5-24.9 kg/m2). Data from 13 states (FL, HI, LA, MA, ME, MI, MN, NJ, OH, TN, UT, VA, WV) were used in the analysis to determine the association between prepregnancy BMI and self-reported re-

ceipt of preconception care using logistic regression adjusted for survey design. **Results:** Overall, 33% normal weight, 31% overweight, and 31% of obese women reported receipt of preconception care (n=55,682). Adjusting for mother's age, race, education, income, pregnancy intention, parity, marital status, and infant preterm status, we found no difference in receipt of preconception care among women who were overweight (odds ratio (OR)= 0.94, 95% confidence interval (CI) = 0.87, 1.01) or obese (OR = 0.97, 95% confidence interval (CI) = 0.90, 1.06) before pregnancy compared with women with a normal prepregnancy BMI. **Conclusions:** Prepregnancy overweight and obese status was not associated with self-reported receipt of preconception care. Although it is encouraging that these women are receiving similar rates of preconception care as women with a normal prepregnancy BMI, given the increased risks of adverse pregnancy outcomes for these women, it is important to increase the proportion receiving appropriate preconception care.

T-303-P
Anthropometric Dfferences in School Children from United States and North India
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Background: While overweight and obesity prevalence in children has been well documented in the US, there is less information available for developing countries. With over 155 million overweight school age children worldwide, it is important to determine which populations have excess risk. **Methods:** Data from the 2009-2010 US National Health and Nutrition Examination Survey (NHANES), a serial, cross-sectional, population based survey of the health and nutrition status of American adults and children, and the Vadodara School Study (VSS) in Vadodara, India, a cross-sectional study of anthropometric and metabolic measurements in school aged children in the third largest city in the state of Gujarat, were used to compare anthropometric measurements from school children aged 8-12 years. Both surveys conduct direct anthropometric measurements. **Results:** Although ages were similar (9.9 vs. 9.8; p = 0.4; NHANES [n=1005] and VSS [n=181], respectively), the proportion of males was significantly different (50% vs. 64%). Children from NHANES were significantly heavier (42.1 vs. 38.8 kg; p = 0.04) and shorter (143.5 vs. 146.1 cm; p <0.01), resulting in a higher BMI (20.0 vs. 17.9 kg/m2; p <0.01) and a greater waist circumference (69.7 vs. 66.1 cm; p = 0.01). Half of the US children were overweight or obese (23.5% and 26.4%, respectively) while prevalence was much lower among Indian children (19.9% and 11.1%, respectively) ($\chi 2$ p<0.01). **Conclusions:** US school-aged children were more often overweight or obese with higher waist circumference than Indian children, indicating higher risk of future metabolic syndrome. However, among adults, Indians have been shown to be at a higher risk of metabolic syndrome at a lower BMI than Western adults, thus these children may be equally at risk. Future studies should consider clinical measures of metabolic risk.

T-304-P
Does the Association between Prepregnancy Weight and Breastfeeding Differ by Race/Ethnicity?
Rashmi Kachoria, Reena Oza-Frank *Columbus, OH*

Background: Women who are overweight or obese before they get pregnant have been shown to be less likely to breastfeed, likely due to increased frequency of cesarean section, admission of the infant to the NICU, and complications after childbirth. However, there is limited research examining how the association between prepregnancy weight status and breastfeeding initiation differs by race/ethnicity. **Methods:** Ohio birth certificates from 2006 to 2011 were used to examine the rates of breastfeeding for underweight (body mass index (BMI) <18.5 kg/m2), overweight (BMI 25-29.9 kg/m2) and obese (BMI ≥30 kg/m2) women compared to women with normal BMI (18.5-24.9 kg/m2). Data from 803222 singleton births to Ohio resident mothers of reproductive age (16 to 44 years) were included in the analysis. Logistic regression, stratified by maternal race and adjusted for maternal and infant characteristics, was used to obtain odds ratios and 95% confidence intervals (CI) for breastfeeding initiation. **Results:** Underweight (odds ratio (OR) = 0.81, 95% CI = 0.78, 0.83), overweight (OR = 0.93, 95% CI = 0.91, 0.95), and obese (OR = 0.80, 95% CI = 0.79, 0.81) non-Hispanic White women were less likely than White women of normal BMI to initiate breastfeeding. Among non-Hispanic Blacks, only underweight women were less likely to

breastfeed (OR = 0.89, 95% CI = 0.82, 0.97). Obese Hispanic women (OR = 0.84, 95% CI = 0.77, 0.91) were less likely than normal weight Hispanic women to breastfeed. **Conclusions:** In Ohio, prepregnancy overweight and obesity were strong predictors of not initiating breastfeeding among non-Hispanic White women, but not among minority women, indicating there are significant differences in the association between prepregnancy BMI and breastfeeding initiation by race/ethnicity. Tailored education efforts are needed.

T-305-P^DT
Obesity and Its Association with the Incidence of Gallstone Pancreatitis in Children
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Background: The recent increase in incidence of acute gallstone pancreatitis in adults is attributed to the concurrent increase of the prevalence of obesity. In children, similar observations have not been adequately studied. We examined the incidence of gallstone pancreatitis at a single center over the past 10 years and its association with obesity in children 1-18 years. **Methods:** Retrospective chart review of all children with acute pancreatitis admitted to a tertiary care hospital from 2002 to 2012. The diagnosis of acute pancreatitis was based on the presence of 2 or more of the following criteria: acute abdominal pain, elevated serum amylase and/or lipase, and radiologic evidence of pancreatitis. Gallstone pancreatitis was diagnosed if there was radiologic evidence of gallstones **Results:** One hundred fifty seven cases with acute pancreatitis were identified. The incidence of acute pancreatitis increased from 5 /10,000 admissions in 2002 to 40/ 10,000 admissions in 2012. The prevalence of obesity was 36.4 % (BMI > 95th % based on CDC age- gender specific BMI chart). Forty percent of patients had gallstone pancreatitis. Among all cases of pancreatitis, the percentage of gallstone pancreatitis increased from 15 % in 2002-2003 to greater than 50 % in 2011-2012. The prevalence of obesity in patients with gallstone pancreatitis was 53%. The majority of the patients were females and Hispanics. Using logistic regression analysis, there was a significant independent association between obesity and gallstone pancreatitis (Exp (B)=8.56, P=0.03). **Conclusions:** The incidence of gallstone pancreatitis in children admitted to our hospital has increased during the last decade. Obesity significantly associated with this trend. These results may explain, in part, the recent increased incidence of acute pancreatitis in children.

T-306-P
Obesity Is Significantly Associated with Cardiometabolic Disease Risk Factors in Multiethnic 2-to-9 Year Olds
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Background: One in four US children under age 5 are either overweight/obese with ethnic-minority children being disproportionately affected. Excessive weight gain in the first years of life can alter developing neural, metabolic and behavioral systems in ways that increase the risk for chronic disease later in life. The objective of this analysis was to estimate the prevalence of cardiometabolic disease risk factors in an ethnically diverse sample of 2-to-9 year olds. **Methods:** A retrospective medical chart review identified overweight/obese 2-to-9 year olds (N=150) from one local academic medical practice. These children were compared to an age-, sex-, and ethnicity-matched normal weight group from the 2005-2010 National Health and Nutrition Examination Surveys (NHANES) on systolic (SBP) and diastolic (DBP) blood pressure, total cholesterol and high density lipoprotein (HDL) cholesterol via t-tests and chi square analysis. **Results:** The local overweight/obese sample (64% Hispanic, 74% female) had a high prevalence of cardiometabolic disease risk factors: elevated mean body mass index percentile (99th), diastolic prehypertension (71%), systolic prehypertension (40%), hypercholesterolemia (17%), and family history of type 2 diabetes (76%). They were significantly more likely to have elevated mean SBP (111 mm Hg versus 100 mm Hg, p<0.001), DBP (68 mm Hg versus 55 mm Hg, p<0.0001), and lower mean HDL cholesterol (48 mg/dL versus 55 mg/dL, p<0.001) versus the normal weight NHANES comparison group. **Conclusions:** Our results show that even at this young age, excess weight is significantly associated with cardiometabolic disease risk factors. Overweight/obese children in this age group should be followed closely to assess potential future chronic disease risk.

T-307-P

Weight Status and Albumin-Creatinine Ratio in a Nationally Representative Sample of Children and Adolescents

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Background: Population based studies in adults and previous small studies in children suggest a relationship between kidney function and weight status. Our objective was to compare measures of urinary albumin and creatinine ratios across a U.S. pediatric population, based on weight status. **Methods:** We used the National Health and Nutritional Examination Survey (NHANES) from 1999-2010 to compare random spot albumin-creatinine ratio (ACR, defined as abnormal when ≥30 mcg/mg), for children, adolescents, and young adults ages 2-21 years by weight. Because albumin is produced by the liver, we also examined serum ALT and AST. Measured height and weight were used to determine age- and sex-specific BMI percentiles, with weight categories defined using standard recommendations. We used adjusted Wald tests to compare means and prevalence of abnormal values by weight. **Results:** There were 17,732 participants included with 64% healthy weight, 15% overweight, 13% obese and 5% severely obese. As severity of overweight increases, ACR decreases, and the prevalence of abnormal ACR decreases (28% in healthy weight vs. 12% in severely obese, p<0.001). Liver function was significantly worse with obesity, with AST and ALT higher and more likely to be elevated (1-2% for healthy weight vs. 8-9% for severely obese, p<0.001). **Conclusions:** In a nationally representative cross-sectional sample of children and adolescents, urine albumin to creatinine ratios are significantly better for overweight compared to healthy weight. This unexpected finding, compared to previous adult reports, deserves further consideration. Further exploration is needed to determine if the observed decreases in liver function are related to measurement of kidney function in overweight participants.

T-308-P[DT]

Triglyceride to HDL Ratios in Children: A Tool to Assess Risk of Developing Type 2 Diabetes?

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Background: Identifying potential markers for type 2 diabetes mellitus (T2DM) risk, particularly early in the lifespan, is paramount when developing preventive health strategies. C-peptide is the best measure of insulin secretion; however, the plasma triacylglycerol (TAG) to HDL cholesterol ratio may be a lower cost, less invasive, and more widely available proxy for c-peptide measures. This study evaluated the extent to which TAG/HDL ratios may serve as a predictor of insulin secretion in a pediatric population. **Methods:** Measures of plasma TAG, HDL cholesterol, and c-peptide response (basal (PHIB), first (PHI1) and second phase (PHI2) response to glucose, and c-peptide amount released immediately post glucose administration (X0)) were obtained from 205 non-diabetic multiethnic children aged 7-12 (European-American: EA, African-American: AA, and Hispanic-American: HA). Multiple regression analyses were performed to evaluate the relationships between c-peptide response and triglycerides, HDL, and TAG/HDL ratios. Models were controlled for standard covariates. **Results:** In HA children, X0, PHI1, and PHIB were positively associated with TAG/HDL ratios and negatively associated with HDL (p<0.05). Also, PHIB was positively associated with TAG in both HA (p<0.01) and EA (p<0.05) children. No significant associations were observed in AA children. **Conclusions:** These results indicate that c-peptide response is correlated with TAG levels in HA and EA children and with both HDL and TAG/HDL ratios in HA children; however, no such associations are observed in AA at early stages of life. These relationships add to our understanding of health disparities observed in T2DM, and show that the usefulness of TAG and TAG/HDL ratios as a proxy for c-peptide response may vary by ethnicity, thus reiterating the need for ethnicity-specific guidelines in diabetes testing and prevention.

T-309-P

Food Insecurity and Insulin Resistance in Adolescents from NHANES (2003-2008)

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Background: Among adults, there is mounting evidence suggesting the negative impact of food-insecurity on diet-sensitive chronic diseases such as diabetes. Thus far, metabolic consequences of food insecurity have not been investigated in children. Insulin resistance is an important mediator of metabolic consequences of obesity, and can be estimated using fasting glucose and insulin with a calculated HOMA-IR. **Methods:** We examined adolescents (N=1,201) aged 12 -19 who were part of the fasting subsample in three cycles of continuous NHANES (2003-2008), limited our analysis to subjects with household income ≤ 200% FPL. Sample weights were used to account for complex, multistage, probability sampling design. Univariate linear regression was used, followed by multivariate regression in a model including BMI, race/ethnicity, age, and SNAP participation. **Results:** In univariate linear regression, food insecurity (combined with marginal food security) was associated with HOMA-IR (coeff 0.41, p=0.04). Weighted mean HOMA-IR increased at successive levels of food insecurity for normal weight, overweight, and obese adolescents alike. For obese adolescents, HOMA-IR was 4.8, 6.4, and 8.0, respectively, for food secure, marginally food-secure, and food-insecure subjects. Among obese adolescents, HOMA-IR was significantly associated with marginal food security in the multivariate model (coefficient 2.69, p=0.01). The association with food insecurity (moderate and severe) was comparable but not significant in the multivariate model (coeff 2.65, p=0.16). **Conclusions:** In adolescents, the experience of marginal food security may lead to a disproportionate degree of insulin resistance, conferring a higher degree of cardiometabolic risk beyond what is seen with obesity alone. Further research is needed to clarify the contributing factors.

T-310-P

Critical Cutoff Points for Anthropometric Measures of Obesity Associated with Increased Diabetes Risk: A Multivariate Adaptive Regression Splines (MARS) Approach

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Background: Although anthropometric measures of obesity are used as indicators of diabetes risk, the relationship between blood glucose levels and weight status is not always linear, and is modified by age. **Methods:** Using a sub-sample of 2009-2010 National Health and Nutrition Examination Survey data for participants (n=2031) aged 20 or older, we sought to investigate the relationship between blood glucose levels (valid 2-hr oral glucose tolerance tests) and body mass index (BMI), as well as waist circumference (WC). A Multivariate Adaptive Regression Splines approach was used to select a model to establish the BMI and WC cutoff points associated with increased blood glucose levels while accounting for age. **Results:** A 1-cm increase in WC above 101cm increases risk for pre-diabetes and undiagnosed diabetes by 1.05 times, and after age 32 the risk of pre-diabetes increases by 1.07 each year. If an individual's age is greater than 32 and WC is greater than 136, a unit increase in BMI would increase the risk of pre-diabetes and diabetes by 1.03 times. After adjusting for age and BMI and allowing for interaction between covariates, blood glucose levels linearly increased by 0.80mg/dL with WC until WC reaches 133cm where it levels off. Moreover, blood glucose levels increased by 0.72mg/dL until age 74, and increased by 2.8mg/dL afterwards. **Conclusions:** Waist circumference above 101cm at age 32 and above should serve as a tipping point for screening individuals for pre-diabetes and undiagnosed diabetes.

T-311-P[DT]

Plasma Vitamin D and Adiposity in Five Cohorts of African Origin: Vitamin D Ancillary Study (VIDA)

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Background: Vitamin D (25(OH)D) plays multiple roles in physiologic regulatory pathways and potential links have been described to several chronic conditions, including obesity. Understanding the relationship between 25(OH)D and obesity in populations with differing exposures may elucidate functions of 25(OH)D other than those associated with calcium metabolism. **Methods:** Participants were drawn from the Vitamin D Ancillary Study (VIDA) of the Modeling the Epidemiologic Transition Study; 500 participants, predominantly of African descent, 50% female, were enrolled in each of 5 study sites: rural Ghana (Ghn), urban South Africa (RSA), the Seychelles (Sey), urban Jamaica (Jam) and metropolitan Chicago (US). Along with anthropometrics and body composition using isotope dilution and bioelectrical impedance, total plasma 25(OH)D was assessed (as the sum of

25(OH)D2 and 25(OH)D3). **Results:** Mean total 25(OH)D levels (ng/mL) differed by latitude: US=17.2, RSA=23.7, Jam=28.9, Sey=29.2, Ghn=30.4; mean BMI was lowest in Ghn (23.9) and highest in US (31.9). Among men body fat varied from 19% (Ghn) to 33% (US) and among women from 35% (Ghn) to 46% (US). In multiple regression models adjusting for sex, country and country-by-total 25(OH)D interactions, there were significant associations between total 25(OH)D and all parameters of adiposity: BMI, % fat, fat mass, waist and hip circumferences (all p<0.001). **Conclusions:** 25(OH)D is independently associated with obesity in African-origin populations with very divergent degrees of sun exposure, as well as plasma 25(OH)D concentrations.

T-312-P
Under The Radar: The Skinny on Obesity in Normal Weight First Year College Women

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Background: Obesity may be masked by a normal BMI in young adult women who potentially possess less lean mass due to low levels of physical activity (PA). Moreover, obesity defined by adiposity may be linked to increased risk for metabolic disease in normal weight young adult females. The aims of this study were to a) characterize the relative adiposity (%Fat) of normal BMI young females and b) determine if normal BMI ($\leq$25 kg/m2) but "high fat" young adult women have poorer metabolic disease indices. **Methods:** First year female college students with normal BMI (n=220; 18.3±0.5y, 68.6% Caucasian, 21.6±2.0 kg/m2, 31.7±4.7 %Fat) were assessed for %FAT via DXA, and objective PA [moderate-vigorous (MVPA) and steps/day (STEPS), using the NL-1000 accelerometer]. Fasting total cholesterol (TC), high-density lipoprotein (HDL), low-density lipoprotein (LDL), triglycerides (TRG), glucose (GLU), insulin (INS), and C-reactive protein (CRP) were obtained using conventional clinical methods. Subjects were classified as obese (OB) or non-OB using the threshold of 35.0%Fat. **Results:** As expected, BMI was related to %Fat (r=.49, p<.01); however; STEPS was not related to BMI (r=.04, p>.05) and only weakly related to %Fat (r=-0.18, p<.01). Despite their normal BMI, 25.9% (n=57) of participants exceeded 35.0% fat. No other differences were found for TC, HDL, LDL, TRIG, INS, or CRP after controlling for oral contraceptive use (all p>.05) compared to non-OB. **Conclusions:** Our data indicate that BMI threshold values to diagnose overweight fail to identify young adult females with excess adiposity. Further investigation is warranted to fully examine the relations among weight status, adiposity, PA and metabolic health in normal weight females. Grant Support: USDA 2008-55215-18825

T-313-P[DT]
Disparities in Obesity Prevalence among Adults and Children, United States—1999-2010

Ashleigh May, David Freedman, Bettylou Sherry, Heidi Blanck *Atlanta, GA*

Background: In 2009-2010, 36% of adults and 17% of children in the US were obese. This study describes, among adults and children, trends and disparities in obesity prevalence. **Methods:** 1999-2010 National Health and Nutrition Examination Survey measured weight and height data were used to calculate body mass indices (BMI) for adults (>18 years) and sex and age specific BMI percentiles for children (2-17 years). Differences in obesity prevalence by sex, age, race/ethnicity, educational attainment, disability status (age>60 years), country of birth (Mexican-American; MA), and language spoken at home (MA) were assessed using logistic regression. **Results:** From 1999-2002 to 2007-2010, obesity prevalence increased among men (26.5% to 33.0%; p<0.001) and boys (15.4% to 18.6%; p<0.01) only. Overall (1999-2010) obesity prevalence was highest among non-Hispanic black women (NHB; 51%); this was (10% higher than MA and 20% higher than non-Hispanic white (NHW) women (p<0.001). Overall, MA men born in the U.S. had a 50% higher prevalence than those born in Mexico (39% vs. 26%), and MA men who spoke mostly English at home had a 46% higher overall prevalence than those who spoke mostly Spanish (38% vs. 26%; p<0.001). For boys, the highest overall prevalence was among MAs (24%); for girls, among NHBs (22%). Lowest prevalence was among NHW children (11% boys, 9% girls) whose head of household completed college. **Conclusions:** Obesity rates remain high for all Americans and substantial disparities exist. Continued monitoring of obesity and research are needed to identify and understand

the factors that influence behaviors and aid control, especially among high risk groups.

T-314-P[DT]
The Association between Obesity and Health-Related Quality of Life among Urban Latinos

Matthew J. O'Brien, Karolyn Wanat, Carrie Kovarik, Sara J. Shuman, Gary D. Foster, Robert C. Whitaker *Philadelphia, PA*

Background: Previous studies have demonstrated that obesity is negatively associated with health-related quality of life (HRQL). This literature is limited by small numbers of Latinos and self-reported obesity status. In this cross-sectional study of 202 foreign-born Latinos, we examined differences in HRQL by obesity status in an urban Latino population using the Medical Outcomes Study Short-Form Health Survey (SF-12) and measured anthropomorphic characteristics. We also explored gender as a potential moderator of the relationship between HRQL and obesity status in this cohort. **Methods:** The main outcome measure was health-related quality of life (HRQL) by the Medical Outcomes Study Short-Form Health Survey (SF-12). Including the entire study cohort, t-tests were used to determine the difference between obese and non-obese participants on SF-12 physical and mental functioning scores (PCS and MCS, respectively). The association between obesity status and HRQL summary scores were then assessed separately in men and women. **Results:** There was a small but statistically significant difference between obese and non-obese participants in the physical functioning domain of HRQL (46.1 vs 48.3, P =.02), and no difference in mental functioning scores (44.7 vs 46.3, P =.22). Gender did not moderate the relationship between obesity status and HRQL scores in stratified analyses. **Conclusions:** These results in an under-studied population suggest that obesity may be associated with small decrements in HRQL among urban Latinos. Future studies with larger and more diverse Latino populations are needed to further investigate the relationship between obesity and HRQL, and explore how acculturation impacts the association between these two factors.

T-315-P
Diagnostic Assignment of Obesity, Metabolic Syndrome and Pre-Diabetes: Analysis of Provider Behavior

Taranveer K. Pawar, Theresa A. Piotrowski, David T. Martin, Richard Nesto *Burlington, MA*

Background: Appropriate management of any condition requires correct diagnostic assignment by provider. Studies have shown that early recognition of obesity, metabolic syndrome, and pre-diabetes results in improved health outcomes. We aimed to retrospectively evaluate effective documentation for diagnoses of obesity, metabolic syndrome (MS), and pre-diabetes (PDM) by non-bariatric medicine providers. **Methods:** Chart review was conducted for all consecutive patients referred to an outpatient medical weight loss clinic in 2001-2012. ICD-9 codes for obesity, MS, and PDM were utilized for data extraction at initial visit; compared with updated documentation after evaluation by a bariatric medicine physician. The AHA criterion for metabolic syndrome and the ADA criterion for PDM using Oral glucose tolerance test (OGTT) were used for all new diagnosis. Patient demographics, BMI, weight, fast mass, fat free mass, and lab data were also collected. All continuous variables were compared using T-tests and categorical variables using Chi-square. **Results:** A total of 1202 patients with BMI>30 were included in the study. Mean (±SD) age was 54.5(±13.0) years, 68.2% females, and 92.5% Caucasian. Mean baseline weight was 250.0(±54.3)lbs, BMI 40.5(±7.5), fat mass 113.6(±34.2)lbs, fasting glucose 102.0(±13.6)mg/dL, HDL 49.5(±12.7) mg/dL, and triglycerides 156.3(±133.4) mmol/L. At the time of initial visit, only 40.6% were documented with diagnosis of obesity, 19.8% with metabolic syndrome, and 8.5% with pre-diabetes (p<0.001 for all comparisons). **Conclusions:** Despite obvious patient obesity, proper diagnostic documentation is not commonly practiced amongst non-bariatric medicine physicians. Such provider behavior may delay or prevent effective intervention, and could contribute to the current obesity crisis.

T-316-P
Obesity History Affects Health Profile and Physical Capacity of Postmenopausal Obese Women

Danielle R. Bouchard, Martin Sénéchal, Peter Jones *Winnipeg, Canada*

Background: Obesity-related conditions might not be the same between postmenopausal women obese for a long time of period compared to newly obese older women. **Methods:** Thirty-seven postmenopausal obese women were recruited for this study. Obesity history was determined by a self-reported BMI ≥30 kg/m2 at age of 45. In a single visit, fasting blood sample, resting metabolic rate, anthropometric measures, blood pressure, physical capacity tests, and body composition were collected. Finally, participants were asked to wear a pedometer for seven consecutive days and mail the equipment along with a list of their current medications used. **Results:** Obese women after the age of 45 were lighter compared to women obese before age 45 (P<.01). Even when adjusted for body mass, the two groups presented a difference for waist circumference, hip circumference, and fat mass (all P<.05) with an advantage for women obese after age 45. In regards to the metabolic profile, this latter group also presented a lower fasting blood glucose compared to women obese before 45 years (P=.04). The ability to maintain balance was different between the two groups of women with a lower value in women who were obese for a longer period (3.5 vs. 12.7 seconds; P<.01). **Conclusions:** Obesity history has different health impacts and physical capacity in postmenopausal obese women. Therefore, lifestyle intervention aiming to prevent obesity related comorbidities might need to be personalized based on obesity history.

T-317-P
Diagnostic Definitions of Impaired Fasting Glucose in Obese Individuals with Non Alcoholic Fatty Liver Disease

Kamran Qureshi, Hicham Khallafi *Orlando, FL*; Gary A. Abrams *Montgomery, AL*

Background: The prevalence of Non Alcoholic Fatty Liver Disease (NAFLD) in general population is up to 20% and is higher (70-80%) in obese individuals or those with Diabetes Mellitus (DM).NAFLD comprises of benign form Fatty Liver (FL) and progressive form Non Alcoholic Steatohepatitis (NASH). NASH is associated with Insulin Resistance (IR) and pre-diabetes. American Diabetes Association (ADA) recommends a lower cut-off for the diagnosis of Impaired Fasting Glucose (IFG) than the World Health Organization (WHO) to diagnose this form of pre-diabetes earlier. This study evaluates the impact of lowering the diagnostic threshold for IFG from 110 to 100mg/dl on the prevalence of the stages of NAFLD in obese individuals without diabetes. **Methods:** From the clinical database of 445 obese individuals who underwent gastric bypass surgery and intraoperative liver biopsy, we identified 217 individuals with no prior history of DM and who were identified as non-diabetic by Oral Glucose Tolerance Testing (OGTT). Histological diagnosis of FL, NASH and fibrosis stage was correlated with IFG diagnosis with ADA and WHO criteria recommendations. **Results:** The prevalence of NAFLD was 69.9% in this non-diabetic obese population and none had cirrhosis on biopsy. The mean age and BMI was 39 years and 49 kg/m2 respectively. The prevalence of IFG increased from 11.5% to 45.2% by lowering the cut-off from 110 to 100 mg/dl. IFG diagnosis was made in 3 times more in cases NASH group with ADA criteria. **Conclusions:** NAFLD is highly prevalent in obese individuals who do not have overt DM. Presence of pre-diabetes in NASH predicts poor outcomes and progression of liver disease. Using ADA criterion with more sensitive cut-off to identify IFG/pre-diabetes in obese individuals with NAFLD will lead to early intervention.

T-318-P
Prevalence of Distinct Combinations of Co-Morbid Diagnostic Conditions for Metabolic Syndrome in U.S. Adults

William D. Johnson, Meredith E. Shapiro, Luis A. Escobar *Baton Rouge, LA*

Background: Limited data are available on the prevalence of unique combinations of the component disorders of metabolic syndrome among adults. **Methods:** A complex, multistage, stratified geographic area design for collecting representative samples from the non-institutionalized US population. 11,652 US men and women ages 20 + years, of Mexican-American, non-Hispanic White, or non-Hispanic Black ethnicity in 1999-2010 NHANES data. Per the 2001 National Cholesterol Education Program, metabolic syndrome was defined as having 3 or more disorders in the following measurements: waist circumference, blood pressure, fasting triglycerides, high-density lipoprotein serum cholesterol, and fasting glucose. **Results:** 26.3% of adults had metabolic syndrome, which was most common among Mexican-American women; 77.5% had at least 1 disorder, and 50.3% had at least 2. Large waist circumference was the most prevalent single component disorder, and more women had large waists. The most common unique combination among those with metabolic syndrome was the disordered quartet of large waist circumference with elevated triglycerides, low high-density lipoprotein concentration, and elevated glucose. **Conclusions:** Large waist circumference is the most common single risk factor for all adults, irrespective of race, sex, or metabolic syndrome classification. The 2 most common distinct combinations of disorders for both men and women with metabolic syndrome involve waist circumference as one component. Our findings are consistent with the hypothesis that excess visceral fat may play a pathogenic role in the development of metabolic syndrome.

T-319-P[DT]
Comparison of WC and WHTR Measures as Indices of Central Adiposity in Guatemalan Children with the Double Burden

Maria Fernanda Kroker-Lobos *Guatemala City, Guatemala*; Florencia C. Vasta *Baltimore, MD*; Manuel Ramirez-Zea, Dina C. Roche *Guatemala City, Guatemala*; Benjamín Caballero *Baltimore, MD*

Background: Epidemiological research has shown that the combination of impaired linear growth and obesity may lead to greater cardiovascular disease (CVD) risk. We evaluated waist-to-height ratio (WHtR) compared with waist circumference (WC) in measuring central adiposity as indices of CVD risk in a population of Guatemalan children, where the double burden of overweight and stunting is prevalent. **Methods:** Twenty-one lean-non-stunted (L-NS), 36 lean-stunted (L-S), 53 overweight-non stunted (O-NS), and 26 overweight-stunted (O-S) children 9.4 ± 1.4 years old from poor Guatemalan urban areas were recruited. Waist circumference (WC), waist-to-height ratio (WHtR) and percent body fat (%BF) (using air displacement plethysmography) were measured. ANOVA one-way analysis of variance was used to compare means across the four groups. Bonferroni Tests of pair-wise comparisons were performed to identify specific group differences (statistical significance: p≤0.05). Pearson correlation coefficients were calculated for WC vs %BF and WHtR vs %BF, comparing S and NS children and stratified by sex. **Results:** Overweight, stunted children (O-S) had significantly lower mean WC than O-NS (70.51±6.2 vs 77.21±9.7; p=0.012). However, the WHtR comparison revealed that O-S children had the same level of increased CVD risk as O-NS children (0.6±0.04; p>0.05). We found a greater correlation between %BF and WHtR vs WC for all males (0.61 vs 0.53), S males (0.63 vs 0.46), NS females (0.54 vs 0.44), and S females (0.48 vs 0.46). **Conclusions:** WC alone may underestimate CVD risk in stunted children. Where resources are scarce or %BF measurement is not feasible, using a combination of WC and WHtR to indirectly measure central adiposity may be more accurate than WC alone, particularly in populations where stunting is prevalent.

T-320-P
Awareness, Knowledge and Perception of Concepts Related to Metabolic Syndrome and Cardiovascular Risk Factors among University Students

Najat Yahia, Melyssa Rapley, Robert Lee *Mt. Pleasant, MI*; Mei Chung *Boston, MA*

Background: The prevalence of metabolic syndrome is on the rise, especially among young adults, and its onset may be early in life. Thus, the main objective of this study is to assess students' awareness, knowledge, and perception of concepts related to metabolic syndrome and examines gender differences. **Methods:** A sample of 243 students (72% females and 28% males), with a mean age of 20.6 years, was selected randomly from University campus during spring 2012. Students filled out a self-reported online questionnaire that included 87 questions related to concepts relevant to metabolic syndrome. Questions were divided into seven domains: diabetes, adiposity, hypertension, high blood cholesterol, arteriosclerosis, stroke, and heart infarction. Anthropometric measurements including height, weight, waist circumference, percentage body fat, and visceral fat score were measured. Fisher's Exact Test was used to test the differences in students' responses. A P-value <0.05 was considered a statistically significant difference. **Results:**

Results indicated that the majority of students have "satisfactory" knowledge on concepts related to metabolic syndrome with few gender differences. More than 80% of students identified correctly symptoms and complications of diabetes, hypertension, arteriosclerosis, heart infarction and stroke. Thirty seven percent of male students falsely belief that diabetics may only eat special sweets compared to 22% of females (p<0.01). Adiposity was identified by 92% of students as a risk factor for heart disease. However, more than half of the students falsely identified liposuction as a state-of-the-art treatment in adiposity therapy. **Conclusions:** Overall, students showed a good understanding of illness related to metabolic syndrome with few false beliefs.

T-321-P
Race and Gender Disparities in Body Composition Methodologies in Relation to Inflammatory Biomarkers in Pre-Pubertal Youth

Nicole Pelligrino, Cruz Velasco-Gonzalez, John Estrada, Jovanny Zabaleta, Brian Bennett, Yolanda Powell-Young *New Orleans, LA*; Enette Larson-Meyer *Laramie, WY*; Hamid Boulares, Alexandria Augustus, Melinda Sothern *New Orleans, LA*

Background: Body mass index (BMI), a measure of weight status utilized in clinical settings, does not reflect maturation stage. Unlike Magnetic Resonance Imaging (MRI; a more sensitive measure), BMI cannot discern visceral adipose tissue (VAT) from muscle and bone mass. **Methods:** We examined whether BMI for-gender-age-z-score (BMI z_score) and VAT were correlated with an obesity-associated inflammatory biomarker, IL-8, in healthy pre-pubertal (Tanner <2) black (n=11, M=6, F=5) and white (n=27, M=10, F=17) girls and boys (age 7-9 years). BMI z_score was calculated by Centers for Disease Control (CDC) 2000 growth charts; VAT was measured by MRI. IL-8 levels were measured in serum by Milliplex. Spearman's rho race- and gender- partial correlations were employed. **Results:** Results showed a significant inverse correlation between z_BMI and IL-8 for all subjects (n=38; r= -0.32; p=0.05), while VAT and IL-8 were not significantly correlated (n=31; r= -0.26; p=0.17). After adjusting for race (r= -0.31; p=.066), for race and gender (r= -0.25; p=0.14), or for gender alone (r= -0.25; p= 0.13) relationships between z_BMI and IL-8 became non-significant; relationships between VAT and IL-8 remained non-significant. **Conclusions:** Utilizing MRI to directly measure VAT in pre-pubertal youth elucidated non-significant relationships with IL-8 that z_BMI (an estimate) was unable to detect, until considering gender and race. Precise measures of VAT are crucial in determining central adiposity and its relation to inflammation in developing youth. Accurate examination of the role of inflammation to the development of obesity in racially diverse youth may not be possible if sensitive measures, such as MRI, are not employed.

T-322-P
Inflammation Is Not a Driver of Abnormal Metabolic Parameters in Pre-Pubertal Youth

Jovanny Zabaleta, Cruz Velasco-Gonzalez, Nicole Pelligrino, John Estrada, Maura Mohler, Richard Scribner, Tung Sung Tseng, Amanda Arguello *New Orleans, LA*; Eric Ravussin *Baton Rouge, LA*; Yolanda Powell-Young, Melinda Sothern *New Orleans, LA*

Background: Obesity is a major health problem in the United States. Obesity is considered an inflammatory disease with direct correlation between inflammatory markers and metabolic parameters. However, these associations have been established in adults but there are no reports showing this association early in life. We wanted to examine for the first time the associations between pro-inflammatory cytokines and obesity-related metabolic biomarkers in exclusively pre-pubertal, Black and White children, 7-9 years of age. **Methods:** Body Mass Index (BMI), insulin resistance (HOMA-IR), visceral adiposity (VAT [MRI]); total body (DXA), ectopic, intrahepatic (IHL) and intramyocellular (IMCL) fat (1H-MRS) and serum levels of Interleukin (IL)-1, IL-6, IL-8, Tumor Necrosis Factor alpha (TNF-α), and monocyte chemoattractant protein 1 (MCP-1) were measured in 40 obese and non-obese children. Relationships between inflammatory cytokines and obesity were assessed by ANOVA and Spearman's Rank correlation. **Results:** Significant inverse correlations were found between z_BMI, body fat and IHL and levels of TNF-α (Spearman's rho = -0.36, -0.43, and -0.39, respectively; p < 0.05). Levels of IL-8 were significantly and inversely correlated with IMCL (-0.39; p = 0.03). Inverse relationships remained significant after adjusting for race, and IMCL was inversely associated with TNF-α only after adjusting for race

(-0.37; p = 0.04). **Conclusions:** Relationships between pro-inflammatory and metabolic markers commonly observed in adults are reversed in healthy, Black and White children prior to puberty. Prospective studies are warranted to determine how these inverse relationships modify chronic disease risk later in life.

T-323-P^{DT}
Selective Bias by Metabolic Syndrome Definition in Metabolic Syndrome without Obesity

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Background: Lipodystrophy is a disease characterized by low fat mass and increased insulin resistance. In actual clinical practice, some patients, with insulin resistance but low fat mass, share the characteristics of lipodystrophy patients. Prevalence and characteristics of these similar lipodystrophy in Korea are not well known. **Methods:** Korea representative data, the National Health and Nutrition Examination Survey 2010 data from the present study analyzed the prevalence and characteristics of the country of similar fat dystrophy. We made Z-score of fat mass index [body fat mass (kg) / (Height (m)2] with LMS method. We defined lypodystropy-like patients as not obese (BMI< 25kg/m2 and waist circumference < 90 cm (male), < 85 cm(female), and Z score for fat mass index below 0) and insulin resistance (with metabolic syndrome). Metabolic syndrome followed the NECP criteria. **Results:** The prevalence of metabolic syndrome whose BMI was below 25 kg/m2 was 11.4% (over the age of 20) and 38.4% (over the age of 65). And the prevalence of lypodystropy-like patients was 6.8% (over the age of 20) and 20.4% (over the age of 65). HOMA-IR of lypodystropy-like patients (2.17±1.37) was significant higher than people without metabolic syndrome (1.91±1.83, p<0.001) and was significant lower than with patients with metabolic syndrome and without lypodystropy feature (2.78±2.16). **Conclusions:** In this study, a lot of patients showed the lypodystropy-like feature. They showed increased insulin resistance without the relationship with obesity.

T-324-P
Population Approach for Metabolic Syndrome: Efficacy of Visceral Fat Measurement and Its Relation with Diet/Lifestyle

Hideto Takase, Mitsuhiro Katashima, Takanobu Uchida, Toshihisa Morimoto *Tokyo, Japan*; Naoki Sakane *Kyoto, Japan*

Background: The objective of this study was to examine the efficacy of visceral fat measurement in a population approach to screen for metabolic syndrome (MetS). Relationships between visceral fat and diet/lifestyle were also investigated. **Methods:** Japanese adult employees in six companies (male=5385, female=1857, mean body mass index [BMI] ± SD = 22.5±3.1 kg/m ^{2}, mean age ± SD = 41±11 y) participated in a group health check-up held in each company. BMI, waist circumference (WC), and visceral fat area (VFA) using a bioelectrical impedance analysis (BIA) method were measured. Diet/lifestyle was surveyed by a questionnaire containing 35 items with 5 ranking scales. The incidence of MetS was diagnosed by Japanese criteria for 5106 participants (male=3875, female=1231) whose body measurement data could be combined with their latest blood parameters and blood pressure measurements. Six factors of diet/lifestyle relating to obesity (overeating, irregular meal time, night eating, eating fast, quality of food, and sedentary behavior) were scored by factor analysis of responses to a questionnaire. **Results:** Age-adjusted multiple linear regression analysis revealed that quality of food (vegetable, fish, etc.) was highly related to visceral fat, but not to BMI or WC. VFA had the highest correlation with components of MetS (dyslipidemia, hyperglycemia) in male. The area under a ROC curve and the odds ratio were significantly greater for VFA than for BMI as an indicator for MetS (p=0.001, 0.026, respectively). These findings suggest that VFA is a superior predictor for screening a high-risk population for MetS. **Conclusions:** Visceral fat measurement using the BIA method is cost-effective and radiation-free as compared conventional computed tomography, and may be an effective strategy to improve the incidence of MetS in a population approach.

T-325-P

Impact of Consumption of Olive and Argane Oils on Anthropometric Profile of Postmenopausal Women in Morocco

Hanane Labraimi *Kénitra, Morocco*; Mohamed El Mzibri *Rabat, Morocco*; Nada Benajiba *Riyadh, Saudi Arabia*; Zoubida Charrouf, Yahya Bensouda *Rabat, Morocco*; Abdelfettah Derouiche *Casablanca, Morocco*; Hassan Aguenaou *Kénitra, Morocco*

Background: Worldwide, large studies have shown that the menopause is mainly associated with substantial changes in body composition that result in an increase in waist circumference, fat accumulation and specially weight gain. This overweight could be exacerbated by fat intake. Thus, this study was planned to evaluate the impact of the consumption of these olive and argane oils on anthropometric profile and body composition of postmenopausal women. **Methods:** The nutritional intervention was conducted over a period of 8 weeks, involving daily consumption of 25 ml of argane oil or olive oil in 151 postmenopausal women (55.49 ± 6.18 years). The anthropometric profile (weight, height and BMI) and body composition (Fat mass and Lean mass) were determined at weeks 0 (Baseline), and after 4 and 8 weeks of nutritional intervention. **Results:** Results clearly demonstrate that argane oil or olive oil consumption don't affect the anthropometric parameters and the body composition of postmenopausal women. **Conclusions:** Thus, argane and/or olive oils' regular diet, does not lead to weight gain and postmenopausal women could benefit from their impact on health for a better quality of life and to overcome all menopause associated problems. A longer period of nutritional intervention is required to confirm the trend down that was recorded.

T-326-P

The Glycemic Responses in Lifestyles, Metabolic Syndrome and Obesity in Age-Stratified T2DM – Based on the Diabetes Case Management Program 2001, Taiwan

Martin M. Fuh *Taichung, Taiwan*; Pei-Chin Chen *Hsinchu, Taiwan*; Chia-Ing Li *Taichung, Taiwan*

Background: To evaluate the glycemic control in different lifestyles, metabolic syndrome and obesity in age-stratified T2DM for the ensuing development of individualized care program. **Methods:** From Jan. 2007 to Dec. 2009, 2638 T2DM participating randomly and cumulatively in DCMP 2001 were under study. Accordingly, anthropometric and biochemical data were tri-monthly measured and, the total daily caloric intake, macronutrient consumption and dietary recommendation were also recorded. The normal (BMI≤24) and obese (27<BMI) were defined. The lifestyles were categorized as lifestyle I (no smoking, no alcoholic and regular exercise) and otherwise lifestyle II. The MetS defined was based on the ATP III criteria. All the participants were classified obligatorily by age under 7 subgroups, age 20-30, 30-40, 40-50, 50-60, 60-70, 70-80, and >80. **Results:** The case distributions in lifestyle I/II, MetS/non-MetS and obese/non-obese with corresponding A1c and total daily energy intake (Kcal) in these 7 age-stratified T2DM were demonstrated in Table 1, 2 and 3 respectively. The A1c levels showed gradually declined as the age getting older (p<0.05), whereas there were no statistically significant difference in A1c levels between each age-stratified corresponding group except lifestyle I/II at age 40-60 (p<0.001). The total daily energy intakes, however each age-stratified corresponding group with lifestyle I/II and MetS/non-MetS was significantly different (p<0.035~0.0001). **Conclusions:** The results would suggest that there were almost identical glycemic response disclosed under usual diabetes care in different lifestyles, MetS/non-MetS and obese/non-obese even though the glycemic control shown to be chronologically improved in these age-stratified corresponding T2DM. Therefore, the earlier intervention would be the better in the diabetes prevention program.

T-327-P[DT]

Elevated Risk of Type 2 Diabetes and Hyperlipidemia but Not Hypertension in Urban Obese African American Adolescents

Yulyu Yeh, Kai-Lin, Catherine Jen, Kathryn Brogan, Sylvie Naar-King *Detroit, MI*

Background: Type 2 diabetes (T2DM), hypertension (HTN), and hyperlipidemia are highly associated with obesity. The increase of childhood obesity also increases the risk of these diseases during youth. The aim of this study was to examine the prevalence of T2DM, HTN and hyperlipidemia in a sample of obese African American Adolescents (oAAA) compared to national

data. **Methods:** Laboratory blood assays were conducted on 123 oAAA living in a Midwest metropolitan area (mean age: 13.9±1.3yrs, 72% girls, mean BMI percentile: 98.8±1.1). Disease diagnosis was based on caregiver report. **Results:** The rate of T2DM in oAAA was 7.3%, higher than both the general US adolescents and AAA prevalence based on the SEARCH study (0.042% and 0.11% respectively). The 3% rate of HTN in our sample is equivalent to the prevalence in the general adolescent population based on the NHANES data. OAAA had significantly lower triglyceride (TG) and total cholesterol (TC) levels compared to the recommended value (87 vs 150mg/dl p<0.01; 143 vs 170mg/dl p<0.01). Compared to the NHANES data from obese adolescents, these oAAA have a significantly lower HDL (45.2 vs 34.0 p<0.05) and TC (164 vs. 143 p<0.05) level. There was no significant difference on TG level (86 vs 87, ns). However, oAAA had a higher TC/HDL ratio (4.3) than the general adolescent population (3.6). The ratio is also significantly higher than the recommended cut off point of 4 (p<0.01). This sample of oAAA has a higher prevalence of T2DM and a higher TC/HDL ratio compared to the national data. **Conclusions:** These findings support that oAAA are at higher risk for the early onset of T2DM and hyperlipidemia but not hypertension compared to healthy weight youth. Further studies for the strategies for early detection and prevention of these metabolic abnormalities are warranted.

T-328-P

Diagnostic Value of a Glucose Meter for Screening and Surveillance in Seychelles

Elizabeth Muriuki *Maywood, IL*; Pascal Bovet *Lausanne, Switzerland*; Lara R. Dugas, Amy Luke, David A. Shoham *Maywood, IL*

Background: Screening and surveillance for type 2 diabetes (T2D) rely on the ability to accurately measure fasting glucose. Laboratory methods are preferred, but are expensive and difficult to carry out in many contexts, including Africa. **Methods:** This study focuses on the ability of the Accu-Chek glucose meter to classify pre-T2D and T2D subjects in Seychelles. We sought to establish optimal cut-points for a sample population (n=500, a subsample of the Modeling the Epidemiologic Transition (METS) study) for the purposes of surveillance and screening. Fasting glucose measurements were performed for both capillary (Accu-Check) and venous blood samples (laboratory methods, gold standard), respectively. Subjects were ages 24-45. We measured agreement with correlations, paired t-tests, Lin concordance, Bland Altman analysis and ROC curves. **Results:** Using the World Health Organization guidelines for DM of ≥7.0 mmol/L (126 mg/dL), the proportion of suspected cases were 4.8% (n=23) with meter and 7.1% (n=34) for laboratory. Using a cutpoint of ≥6.1mmol/l (110mg/dl) for pre-T2D; the proportion suspected cases were 18.2% (n=87) and 17.2% (n=82) for the meter and lab, respectively. Agreement between meter and laboratory for detecting pre-T2D and T2D were 54.0% and 69.6%, respectively. The optimal cutoff point for meter-based pre-T2D was 5.7mmol/l (sensitivity and specificity both 74%; AUC=0.81); for T2D, it was 5.8mmol/L (69.5% sensitivity, 72.5% specificity; AUC=0.78). **Conclusions:** We recommend lower cutpoints for Accu-Chek meters than lab-based cutpoints. While potentially useful for screening and prevalence estimates, meter-based measures are not diagnostic and must be confirmed with laboratory methods. Furthermore, the meter could not distinguish between pre-T2D and T2D, as cutpoints for both are nearly identical.

T-329-P

Socioeconomic Status and Insulin Resistance Korea National Health and Nutrition Examination Survey 2008–2010

Jun Goo Kang *Anyang, Republic of Korea*; Yang-Hyun Kim *Ansan, Republic of Korea*; Ki-Young Lee *In-Cheon, Republic of Korea*; Chang Beom Lee *Guri, Republic of Korea*

Background: To investigate the relationship between socioeconomic status (SES) and insulin resistance in non-diabetic adult women. Korea National Health and Nutrition Examination Survey 2008–2010. **Methods:** We analyzed the Korean National Health and Nutrition Examination Survey (2008-2010). Adult participants aged ≥30 years without diabetes in adult women (participants 8,323). SES, as measured by house income or education level. Insulin resistance was assessed by homeostasis model assessment-insulin resistance (HOMA-IR). The adjusted OR for insulin resistance was calculated using multivariate logistic regression analysis across house income and education level quartiles. **Results:** This study showed that SES and insulin resist-

ance had significant correlation. The adjusted OR (95% CI) for insulin resistance for the lowest vs. highest quartile of house income and education level were 0.66(95% CI 0.55-0.81) and 0.71(95% CI 0.56-0.90) in MODEL1. The adjusted OR (95% CI) for insulin resistance for the lowest vs. highest quartile of house income were 0.71(95% CI 0.56-0.90) in MODEL2. However, such relationship was not found among education level in model2. **Conclusions:** We found the relationship between SES, especially house income and insulin resistance in non-diabetic adult women.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Environmental Determinants of Health

T-330-P
Risk of Early Childhood Obesity Associated with Oral Antibiotics and Corticosteroids Administered During Infancy

Charles Bailey, Christopher B. Forrest, Peixin Zhang, Thomas M. Richards, Alice Livshits, Patricia A. DeRusso *Philadelphia, PA*

Background: Medication use early in life has been implicated as a risk factor for obesity, but current evidence is limited. We examined whether exposure to oral antibiotics or steroids at specific times in infancy was associated with early childhood obesity. **Methods:** We conducted a non-concurrent cohort study of 84,679 children in the Children's Hospital of Philadelphia's primary care network. Longitudinal data (2001-2010) were retrieved from the EHR for visits from birth to age 6. Antibiotic, steroid, and ranitidine (negative control) exposures were determined for the first 24 months of life and obesity was defined as a BMI greater or equal to the 95th percentile for age and sex during years 3-5 of life. Cox proportional hazards models were used to estimate the rate ratios (RRs) for the development of obesity. The rate of obesity was examined for those exposed and not exposed while adjusting for demographics, anthropometrics, diagnoses, geographic residence, practice site, and medication exposure. **Results:** Approximately 68% of children were exposed to antibiotics, 12% to steroids, and 13% to ranitidine in the first 2 years of life. The risk of obesity was associated with antibiotic exposure during the first 6 months of life (RR=1.08; 95% CI:1.02,1.14) and during months 13-18 (RR 1.09; 95% CI:1.04,1.15), and increased with the number of courses of antibiotics. Obesity risk was increased with exposure to steroids in months 13-18 (RR 1.16; 95% CI 1.00, 1.34) but no other time period. A diagnosis of reactive airway disease/bronchiolitis correlated with risk of obesity (RR 1.17; 95% CI 1.12,1.23). The risk of obesity was not associated with ranitidine exposure. **Conclusions:** Antibiotic and steroid exposures during infancy are each associated with increased risk of developing early childhood obesity, but age at exposure is an important modifier of this risk.

T-331-P
Prolonged Financial Stress Predicts Subsequent Obesity: Results from a Prospective Study of an Australian National Sample

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Background: The body of research investigating socioeconomic inequalities in obesity has paid little attention to the concept of financial stress, which is a direct indicator of economic deprivation. The aim of this research was to assess the effect of prolonged financial stress (FS) on subsequent obesity **Methods:** Data were from Waves 8 (2008), 9 (2009), and 10 (2010) of Household Income and Labour Dynamics in Australia (HILDA) survey. The outcome was obesity measured in 2010. Prolonged FS was defined as having experienced FS in both 2008 and 2009. FS was measured in each year using seven questionnaire items. Analyses adjusted for health, physical activity, income, education, baseline obesity, and other covariates. **Results:** Prolonged FS was a strong predictor of subsequent obesity. The adjusted risk of being obese in 2010 were 20% higher (RR: 1.20; 95% CI: 1.10-1.30) among individuals who experienced FS in both 2008 and 2009 than those who did not experience FS in either year. The association of FS with obesity was independent of income and constant across income categories. **Conclusions:** Obesity prevention research should pay more attention to FS as an important dimension of economic deprivation, a concept that is distinct from common indicators of socioeconomic status such as income. Future research can examine the effect of financial education and counseling programs that help in-

dividuals with such skills as money management, budgeting, and saving on a reduction in FS and obesity.

T-332-P
Beyond Single Trees: Random Forests for Characterization of Obesogenic Environments in Children

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Background: Obesogenic environments (OE) have long been hypothesized to be drivers of the obesity epidemic. However, few studies have developed measures to classify OEs empirically. Most studies fragment the study of OEs into separate, thematically distinct variables. The goal of this study was to identify a set of diverse community characteristics that, in combination, characterized OEs. We examined the joint, spatially co-occurring distribution of features of the food, land use, physical activity and social environments. **Methods:** We used random forests, a non-parametric machine learning approach, to identify the set of community variables in four domains that best classified OEs. Data were obtained on 1223 communities (census tracts and minor civil divisions) from 37 Pennsylvania counties using multiple data sources. Quartile rank of average body mass index (BMI) z-scores (BMI-z) at the community level was used to "supervise" the selection of variables. BMI-z were obtained from electronic health records of the Geisinger Health System from >160,000 children ages 3-18 years who were geocoded. Obesogenic and obesoprotective communities were defined as the lowest and highest quartiles of the distribution of average BMI-z. **Results:** We identified a set of 15 variables across the four environmental domains that accurately classified 59% of the obesogenic and 70% of the obesoprotective communities ("out of bag" sampling error 35.4%). **Conclusions:** Obesoprotective environments were identified with greater accuracy suggesting greater heterogeneity in more obesogenic communities. Notably, a 10-year lag in community characteristics provided the best classification results. This has important implications for research and interventions. Random forests offer a new, flexible modeling tool for operationalization of OEs.

T-333-P
Moderate Levels of Drinking Water Arsenic Increase Cardiometabolic Risk among Mexican Adults Regardless of Weight Status

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Background: Growing evidence from experimental and observational studies suggests a number of environmental pollutants contribute to cardiometabolic risk. Arsenic (As) in drinking water has been associated with diabetes. However epidemiologic evidence of a role in other cardiometabolic disorders, atherosclerosis and cardiovascular outcomes, is largely limited to a few studies conducted in highly exposed (water As on the order of 100 ppb), lean populations in Asia. **Methods:** Associations between concentrations of As in household drinking water and triglycerides and blood pressure were examined in 928 adults in a cross-sectional study in Chihuahua, Mexico in which 75% were overweight/obese. Logistic regression models were adjusted for age, gender, smoking status, alcohol consumer, waist circumference, and BMI. **Results:** Geometric mean water As was 32.2 vs. 22.5ppb among subjects with vs. without elevated triglycerides (>150µg/dL, 41% of the sample), and 32.8 vs. 25.1ppb among those with vs. without stage 2 hypertension (160/100 or medication use, 23.6% of the sample). Water As was strongly associated with both elevated triglycerides (odds ratio [OR], 95% CI for extreme tertiles 1.5, 1.1-2.2) and hypertension(OR 1.8, 1.1-2.8) after multivariate adjustment. Associations were somewhat stronger among normal weight than obese subjects; excluding those diagnosed with diabetes or hypertension had no meaningful effect. **Conclusions:** Results suggest exposure to moderate levels of drinking water As may contribute to cardiometabolic risk regardless of weight status. As exposure may help to explain elevated metabolic risk among normal weight subjects.

T-334-P

Short Sleep Duration As a Risk Factor for the Development of the Metabolic Syndrome in Adults

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Background: Studies that prospectively examine the association between sleep duration and the metabolic syndrome are lacking. The objective of this study was to investigate the association between self-reported sleep duration and the incidence of features of the metabolic syndrome in adults. **Methods:** A longitudinal analysis from the Quebec Family Study (Canada) was conducted on 293 participants, aged 18 to 65 years, followed for a mean of 6 years. Participants were categorized as short (≤6 h), adequate (7-8 h) or long (≥9 h) sleepers. The metabolic syndrome was defined according to the American Heart Association/National Heart, Lung, and Blood Institute's criteria. The hypertriglyceridemic waist phenotype was defined as high waist circumference (≥90 cm in men and ≥85 cm in women) combined with high fasting triglyceride level (≥2.0 mmol/L in men and ≥1.5 mmol/L in women). **Results:** The incidence rates of metabolic syndrome and hypertriglyceridemic waist phenotype were 9.9% and 7.5%, respectively. Short sleepers were significantly more at risk of developing the metabolic syndrome (RR: 1.74; 95% CI: 1.05-2.72) and the hypertriglyceridemic waist phenotype (RR: 1.82; 95% CI: 1.16-2.79), compared to those sleeping 7 to 8 h per night after adjusting for age, sex, smoking habits, highest education level, total annual family income, alcohol consumption, coffee intake, menopausal status, daily caloric intake, and cardiorespiratory fitness. However, long sleep duration was not associated with an increased risk of developing the metabolic syndrome or the hypertryglyceridemic waist phenotype (either unadjusted or adjusted models). **Conclusions:** Short sleep duration may be an important risk factor for the development of the metabolic syndrome in adults.

T-335-P

Short Sleep Duration Is Associated with Features of the Metabolic Syndrome and with Overall Cardiometabolic Risk in Adults

Jean-Philippe Chaput, Jessica N. McNeil *Ottawa, Canada*; Jean-Pierre Després *Quebec City, Canada*; Claude Bouchard *Baton Rouge, LA*; Angelo Tremblay *Quebec City, Canada*

Background: The objective of this study was to examine the association between self-reported sleep duration and features of the metabolic syndrome in adults. **Methods:** A cross-sectional analysis from the greater Quebec City area (Canada) was conducted on 810 participants aged 18 to 65 years. Participants were categorized as short (≤6 h), adequate (7-8 h) or long (≥9 h) sleepers. The metabolic syndrome was defined according to the American Heart Association/National Heart, Lung, and Blood Institute's criteria. **Results:** Overall, 24.6% of the sample had the metabolic syndrome. A U-shaped relationship between sleep duration and the prevalence of metabolic syndrome (33.3%, 22.0% and 28.8% in short, adequate and long sleepers, respectively) was observed (P<0.01). Only short sleepers had a significant increase in the odds of having the metabolic syndrome (OR=1.76, 95% CI=1.08-2.84) compared to adequate sleepers after adjustment for age, sex, smoking habits, highest education level, total annual family income, alcohol consumption, coffee intake, menopausal status, daily caloric intake, and moderate-to-vigorous physical activity. Likewise, the clustered cardiometabolic risk score (i.e. continuous risk score based on the metabolic syndrome components) was significantly higher in short sleepers compared to adequate sleepers after adjustment for covariates (P<0.05). **Conclusions:** Sleeping ≤6 h or ≥9 h per night is associated with a greater prevalence of meeting criteria for the metabolic syndrome compared to sleeping 7-8 h a day in adults. After adjusting for possible confounders, only short sleep duration is associated with an elevated cardiometabolic risk score and an increase in the odds of having the metabolic syndrome. These results strongly suggest that short sleep duration is a risk factor for the metabolic syndrome.

T-336-P

Common Genetic Variation Near MC4R Moderates the Relationship between Fast Food Restaurants and Body Mass Index

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Background: Many human genes have been identified that are related to obesity including the fat mass and obesity-associated (FTO), serotonin (HT), melanocortin 4 receptor (MCR4), and opioid receptor (OP) genes. To date, no studies have explored the gene-food environment interaction on obesity. The food environment refers to the density of fast food restaurants, convenience stores, full service restaurants, and supermarkets/grocery stores in a neighborhood. The primary purpose of the current study was to determine whether single nucleotide polymorphisms (SNPs) related to obesity interact with the food environment to predict body mass index (BMI). **Methods:** We measured 19 SNPs (FTO, HT, MCR4, and OP) in 203 men and women of varying BMI. A geographic information system was used to map attributes of the food environment, including the number of grocery stores and supermarkets, convenience stores, full-service restaurant, and fast food restaurants within each participant's neighborhood. Linear regression was used to assess the effects of the food environment, SNPs, and the interaction of food environment x genetic polymorphisms on BMI, controlling for proportion of African ancestry. **Results:** Results showed an interaction between *rs17782313* and number of fast food restaurants in predicting BMI (R^2=0.10, β=1.55, p<0.01). Individuals with one or two copies of the C allele on *rs17782313* and who live near a greater number of fast food restaurants have a higher BMI. **Conclusions:** The *rs17782313* risk allele is a genetic variant near MC4R that has been related to snacking and eating high fat food. Having this risk allele and living in an environment where there are more fast food service restaurants is associated with greater BMI. Future investigations need to determine if other obesity related genes moderate the relationship between BMI and the food environment.

T-337-P[DT]

Walkable Built Environments Associated with Child BMI Z-Score: Data from Electronic Health Records

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Background: Childhood obesity remains a prominent public health problem. Walkable built environments may prevent excess weight gain. The purpose of this study was to examine the association of walkable built environment variables with body mass index (BMI) z-score among a large sample of children and adolescents. **Methods:** We used geocoded residential address data from electronic health records of 49,770 children and adolescents aged 4 to <19 years seen at the 14 pediatric practices of Harvard Vanguard Medical Associates from August 2011 to August 2012. We created various geographic information system (GIS) walkable built environment variables (i.e. distance to nearest recreational open space, count of recreational open space, population density, residential density, traffic density, average speed limit, sidewalk completeness, intersections density and land use mix). The main outcome was BMI z-score. Multivariate models were adjusted for child age, gender, race/ethnicity and neighborhood median household income. **Results:** In multivariate models, lower quartiles of distance to recreational open space were associated with lower BMI z-score. For example, those in quartile 1 of the nearest recreational open space had a lower BMI z-score (beta: -0.06; 95% CI: -0.08, -0.03) compared to quartile 4 (reference). Lower quartiles of the count of recreational open space, population density, residential density, traffic density, sidewalk completeness, intersection density, and land use mix were associated with higher BMI z-score. **Conclusions:** Overall walkable built environments were associated with lower BMI z-scores in a large sample of children. Modifying existing built environments to make them more walkable may reduce childhood obesity.

T-338-P

Parental Guidance Suggested: Associations between Parental Television Viewing Rules and Health Behaviors among Obese Children

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Background: Few studies have examined the relationship between parental limits on television (TV) viewing time and child lifestyle behaviors. **Methods:** Parents of obese children ages 6-12 years completed a cross-sectional survey. The main exposure was parental limits in TV viewing time. Outcomes included screen-related behaviors (television in bedroom; eating breakfast or dinner with the TV on; hours watching TV, playing video games, and using internet); time spent walking, in light/moderate, or vigorous physical activity; sleep duration; frequency of falling asleep while watching TV; frequency of eating family dinners. We performed bivariate and multivariable analyses to examine independent associations of parental TV viewing rules with our outcomes. **Results:** Of the 816 children enrolled, 53% were White, 20% Black, 15% Hispanic, 13% Other; 57% of their parents had a college education and 74% of parents were overweight or obese. In multivariable analyses (adjusted for child age, sex, race/ethnicity; parental education & US-born status; household income and primary language), children whose parents set TV time limits were less likely to have a television in the bedroom (OR=0.45; CI:0.31, 0.64), to eat breakfast (OR=0.73; CI:0.53, 0.99) or dinner (OR=0.53; CI:0.39, 0.73) with the TV on, and to fall asleep while watching television (OR=0.47; CI:0.34, 0.67). Children with limits on TV time spent fewer weekday hours watching TV (beta[β]=-0.38; 95%CI: -0.54, -0.21) playing video games: (β= -0.15; CI: -0.25, -0.04), and using the internet: (β= -0.08; CI: -0.15, -0.01). In addition, children with TV time limits had longer sleep duration during weeknights: (β=0.21; CI: 0.05, 0.36). **Conclusions:** Parental limits on TV viewing may be a focus of intervention to improve obesogenic behaviors including screen media time and sleep duration among obese children.

T-339-P

Training of Schools Nurses on a Family-Centered Approach to Modify Diet and Physical Activity Practices of Students at Risk of Obesity and Its Complications: A Pilot Study

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Background: School nurses are uniquely qualified and positioned to provide guidance and support to children at risk for obesity and its complications. The purpose of this study was to test the acceptability and impact of a training designed to 1) build skills in family-centered counseling and 2) promote the use of applicable pediatric obesity prevention and treatment recommendations. **Methods:** In early 2013, all nurses (n=28) in one large metropolitan school district serving over 90,000 students attended a baseline 2-hour training and a 1-hour webinar one month later. Pre and post, self-administered questionnaires were used to assess knowledge, attitudes, and practices. McNemar's tests were used to assess the change. **Results:** With training, there was an increase in the proportion of nurses knowledgeable about the BMI cut-off used to define obesity (6% to 63%) and the goal of maintaining weight with growth rather than weight loss for overweight children (82% to 100%). The proportion of nurses confident in their ability to effectively communicate with students and their parents for behavior change and to apply obesity prevention and treatment recommendations increased from 50% to 74% and 44% to 94%, respectively. Lack of: parent support (40%), time (40%), and effective tools and information to give children and/or parents (32%) were the top 3 most commonly cited barriers to school nurses' ability to provide diet and weight-related guidance to students. **Conclusions:** A brief training for school nurses resulted in increased knowledge and confidence to effectively guide and support students and their parents regarding their weight management related needs.

T-340-P[DT]

Disentangling the Simultaneous Influence of Neighborhoods and Schools on Adolescent Body Mass Index

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Background: Neighborhoods and schools have independently been shown to influence adolescent weight related outcomes. However, prior studies' focus

on one context at a time ignores the reality that individuals exist simultaneously in multiple contexts that could influence health. Our objective was to examine and compare the simultaneous influence of schools and neighborhoods on individual Body Mass Index (BMI). **Methods:** Analyzing data from a nationally representative sample of adolescents in grades 7-12 (n=18,200), we used cross-classified multilevel models to examine both the fixed and random effects of individuals, schools, and neighborhoods on adolescent BMI. We specifically compared associations of sociodemographic markers at the individual-, school-, and neighborhood-level with BMI (fixed effects). We also compared the relative contribution of individuals, schools, and neighborhoods to the variance in individual BMI (random effects). **Results:** There were 18,200 students nested in 128 schools and 2259 neighborhoods, with 2757 unique combinations of schools and neighborhoods. Approximately 25% of students attended schools that were sociodemographically different from their neighborhoods (p<0.001, McNemar's chi squared). Both living in a neighborhood and attending a school with a higher proportion of individuals with parents having at least a high school degree were associated with on average lower individual BMI. Neighborhoods (vojk = 0.14, s.e.=0.061) and schools (uojk = 0.073, s.e.=0.030) both contributed significantly to the variance in individual BMI, though the effect of neighborhood was nearly twice that of schools. **Conclusions:** Though both schools and neighborhoods contribute significantly to individual BMI, neighborhoods appear to contribute more. This has potential implications for where to target weight related interventions.

T-341-P

Differential Community Characteristics Associated with Obesity Prevalence between the South and Non-South United States (U.S.)

Candice A. Myers, Tim Slack, Corby K. Martin, Stephanie Broyles, Steven B. Heymsfield *Baton Rouge, LA*

Background: Obesity prevalence is not randomly distributed across the U.S. In this study we identified regional differences in obesity prevalence and community characteristics associated with observed regional differences. **Methods:** The present analysis used county-level obesity estimates (percent of the adult population [$\geq$ 20 years] that is obese [BMI$\geq$30kg/m2] within a county). Mean±SD obesity prevalence in the 3,109 contiguous U.S. counties was 30.3±4.2% with a range of 13.5–47.9%. Regional differences in obesity prevalence were assessed with an independent samples t-test. Two spatial regression models were estimated for the South and the non-South with z-test procedures to test for significant differences between models. **Results:** County-level obesity prevalence in the South (Mean±SD, 32.0±3.7%) was significantly higher than the non-South (p<0.001). Three community characteristics had significantly stronger positive correlations with obesity prevalence in the non-South compared to the South: unemployment (p<0.001), residential segregation between poor and non-poor populations (p<0.006), and the adult population with less than a high school degree (p<0.005). One community characteristic emerged as having a significantly stronger positive association with obesity prevalence in the South compared to the non-South: African American populations (p<0.001). **Conclusions:** Obesity prevalence is significantly higher in the South versus the non-South with differential community features associated with obesity prevalence between the two regions. African American populations emerged as having a significantly stronger association with obesity prevalence in the South, and while not a modifiable predictor of obesity, this association suggests underlying characteristics (e.g., cultural norms related to diet, physical activity, and weight) that may be intervention targets.

T-342-P

Cross-Sectional and Longitudinal Associations of Environmental Factors Associated with BMI Trends in an Employed Population

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Background: Most adults gain weight over their life course, increasing risk/severity of cardiometabolic disease. Psychosocial and environmental stressors may contribute to weight gain and have been suggested as a point of intervention **Methods:** Using electronic medical record and survey data, we studied 2,029 African American and Caucasian HMO members 25-59y of age, and randomly sampled from 3 condition cohorts: type 2 diabetes (T2DM), dyslipidemia, and low-risk (no major morbidities). A 2005 written survey measured psychosocial stress (friends/family, worksite, 0-100 scale,

most to least), lifestyle (diet/physical activity [PA], 0-100, worst to best), and residential built environment (RBE, 0-100, worst to best for promoting PA). Body mass index (BMI) trajectories were estimated using growth curve models for BMI from '05-'09. Independent variables were '05 support/stress, lifestyle and RBE. Interactions of these factors with time from '05 baseline were tested **Results:** Median baseline age was 50 years; 61% were female; 49% were AA; 30% had T2DM, 36% dyslipidemia, and 34% low risk. Mean '05 BMI was 30.8 (SD 7.0), and rose over a 4-year period (0.14 kg/m2/y, p<0.01). In baseline cross-sectional models, lower stress and better RBE scores correlated with lower BMI (both βs -0.04 kg/m2/scale point, p<0.01). Longitudinal models ('06-'09), however, showed no effect of interaction of stress score with time on BMI trajectory (p=0.5), while better RBE score, surprisingly, predicted more weight gain (RBEXperiod interaction term p=0.02) **Conclusions:** While factors such as social stress/support and the RBE are cross-sectionally (≤1y) associated with average BMI, lower baseline stress and better RBE do not appear to protect against intermediate (1-4y) weight gain in an employed population of insured adults

T-343-P
Mothers' Perceptions of Causes and Ways to Prevent Overweight in Young, Low-Income Children

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Background: Given the persisting prevalence of obesity in young children, more effective prevention and intervention programs are needed. The development of effective programming requires an understanding of mothers' perceptions of causes and ways to prevent child overweight. This study aimed to examine (1) mothers' perceptions of causes of childhood overweight; and (2) mothers' perceptions of ways to prevent young children from becoming overweight. **Methods:** Mothers (n=251) of low-income children, ages 4-7 years, in the Midwest (70% non-Hispanic white; 76% mothers and 43% children overweight/obese) were asked in a semi-structured interview, "What causes a child to be overweight?" "What can parents do to prevent their child from becoming overweight?" and "Do you do any of these things?" Interviews were transcribed. Interrater reliability was established (K>0.70) and responses were coded into 12 themes. Content anaylsis followed. **Results:** Mothers identified dietary intake (food) (90%), parenting practices (47%), and limited physical activity (41%) as causes of overweight. Few identified limiting sugar-sweetened beverages (13%) or screen time (19%) as ways to prevent overweight. Mothers with higher BMI's were more likely to identify parenting practices as a cause of child overweight (p=0.018). Mothers with less education were less likely to identify limited physical activity as a cause of child overweight (p = 0.04) and less likely to identify promoting physical activity as a way to prevent child overweight (p = 0.01). **Conclusions:** Understanding parent perceptions of causes and ways to prevent children from becoming overweight will provide direction in tailoring successful, individualized interventions to establish healthy habits.

T-344-P
The Association between Ways of Coping and Obesity in Mexican Adults

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Background: Overweight prevalence in Mexico is 70.5% and one of the highest in the world. The ways of coping (WOC) stressful situations may increase the risk for developing chronic diseases. The relationship between WOC and obesity in adults from Guadalajara, Jalisco, Mexico was evaluated. **Methods:** Two hundred Mexican adults (20-67 years) participated in a cross-sectional study. Sociodemographic variables included: age, socioeconomic status (SES), years of study and civil status. Overweight and obesity were defined as ≥ 25 kg/m2 and ≥30 kg/m2, respectively. Questionnaires used were: 1) WOC questionnaire included the scales of: confrontative-coping, distancing, self-controlling, seeking social support, escape-avoidance, planful problem solving and positive reappraisal, and 2) Food frequency questionnaire. Statistical analysis included multivariate logistic regression analysis. **Results:** Overweight and obese frequencies were 38.5% and 30%, respectively. Obesity was higher in less-educated (p=0.001), lower SES (p=0.006) and less active (p=0.037). All WOC scales were different among obese vs. non-obese; however, escape-avoidance scale (p=0.021), and positive reap-

praisal scale (p=0.037) were the only statistically significant. Logistic regression analysis showed associations between obesity with positive reappraisal (OR=0.98, p=0.009), and with escape-avoidance (OR=1.02, p=0.049). When these associations were analyzed by years of study, both associations were maintained (OR=0.96, OR =1.03, respectively, p<0.05 for both). When stratified by SES, a positive reappraisal was detected in obese for lower SES (OR=0.96, p=0.034). **Conclusions:** Obesity is associated with higher internal/external demands on stressful encounters, and these are more important in lower academic degree and lower SES. These variables should be taken into account when designing obesity interventions.

T-345-P
Employment Status, Meal Preparation Time and Family Meal Frequency among New Immigrant Mother-Child Dyads

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Background: Family meals may protect against child obesity, yet mothers identify work-related time constraints among barriers to meal preparation and frequent family meals (FFM). **Methods:** Data were derived from Live Well, a community-based participatory-research intervention to prevent excessive weight gain among recent immigrant mothers (<10 years in US) in Greater Boston. Participants reported baseline socio-demographics and eating-related behaviors. Mothers reporting eating dinner with their child, not in front of the TV, ≥5 times/week, were categorized as having FFM (N=380). Logistic regression models estimated the likelihood of FFM from employment status and perceived meal-preparation time (more than enough, just enough, not enough), adjusting for household characteristics; an employment-by-meal-preparation interaction was tested. **Results:** Over 40% of mothers reported FFM; 26% perceived "more than enough" time to prepare meals, 61% had "just enough" and 12% had "not enough". Non-working mothers were 2.3 times (95% CI: 1.4-3.8) more likely to have FFM than those working part-/full-time. Perceived meal-preparation time modified this relationship. In the full model (N=342), working mothers with "just enough" time were 6 times more likely to eat FFM (OR 5.9, 95% CI: 1.9-18.1) than those reporting "more than enough" (referent) and 2.5 times more likely than those with "not enough" time (95% CI: 0.9-6.8, p=.08). Stratification by child age (<6 years old) strengthened associations. **Conclusions:** Non-working mothers were more likely to have FFM than those working part-/full-time. Working mothers who perceived having "just enough" time were significantly more likely to have FFM than those with "more than enough" or "not enough" time. Interventions looking to promote family meals should consider the time constraints of working mothers.

T-346-P
Change in Obesity Prevalence Across the United States (U.S.) and Associated Community Characteristics

Candice A. Myers, Tim Slack, Corby K. Martin, Stephanie Broyles, Steven B. Heymsfield *Baton Rouge, LA*

Background: Recent research has demonstrated significant associations between county-level risk factors and obesity prevalence in the U.S. using cross-sectional data. This study utilizes a longitudinal design to identify community characteristics that are associated with change in obesity prevalence. **Methods:** This analysis used county-level obesity estimates (percent of the adult population (≥20 years) that is obese (BMI≥30kg/m2) within a county). Change in county-level obesity prevalence was calculated between 2004 (Time 1) and 2009 (Time 2). Associated county-level behavioral patterns and measures were assessed with regression analysis using a difference model with both dependent and independent variables measured as change scores (Time 2 – Time 1). **Results:** Mean±SD [range] change in obesity prevalence for the 3,109 contiguous counties was 5.1±2.4% [-3.7 to 14.1%]. Between 2004 and 2009, obesity prevalence decreased in 1.4% (44) and increased in 98% (3,060) of counties, while 0.2% (5) had no change; and was significantly different (p<0.001) between the time points. Regression analysis (p<0.01) revealed that three parameters were positively associated with obesity prevalence change with physical inactivity Δ having the strongest positive effect. Seven parameters were negatively associated with change in obesity prevalence with obesity prevalence in 2004 having the strongest negative effect. **Conclusions:** This study demonstrates that most counties in the U.S. experienced increases in obesity prevalence from 2004 to 2009 and extends the literature by identifying key community correlates associated with this change. The findings help to highlight local level social change associ-

ated with the obesity epidemic and identify areas at highest risk of increasing obesity.

T-347-P
A Time Series Analysis of a Food and Beverage Labeling Intervention in a Hospital Cafeteria

Jason P. Block, Heather J. Baer, Katherine D. McManus *Boston, MA*

Background: No long-term studies using time series analyses have evaluated food and beverage labeling in a workplace cafeteria. **Methods:** Starting in January 2012, in the Brigham and Women's Hospital cafeteria, we assigned all food and beverage items to a green (healthiest), yellow, or red (least healthy) label based on calorie, fat, sodium, and sugar content. From an electronic, check-out scanner, we captured weekly sales data for each item sold during one year of baseline before (2011) and one year after labeling (2012). We also surveyed a convenience sample of employees visiting the cafeteria in the month before (N=188) and 9 months after (N=201) labeling. **Results:** During baseline, the weekly green, yellow, and red items sold (%) were: beverages 1679 (20%), 1997 (24%), 4715 (56%); sides 983 (11%), 239 (3%), 7534 (86%); entrees 3507 (32%), 607 (6%), 6915 (63%), respectively. In the time series analyses, we saw an immediate increase (change in level) of 253 green beverages/week (95% CI 138, 367) after labeling but a declining trend change of -12 bev/wk (95% -8, -16), demonstrating a reversion to the baseline by the end of 2012. We noted a similar pattern for green and yellow side items and for green entrees. For yellow beverages, we saw both a level (408 bev/wk, 95% CI 298, 517) and trend (15 bev/wk, 95% CI 12, 19) change increase after labeling. Red side items had only a level change increase of 571 items/wk (95% CI 232, 910). We found no significant change for red beverages, yellow side items, or red entrees after labeling. In the survey, 72% of employees noticed the labeling program; approximately 1/3 rated the cafeteria offerings as "healthy" both before and after. **Conclusions:** A labeling program in a hospital cafeteria had beneficial effects on sales of the healthiest beverages, sides, and entrees but the effect abated over time.

T-348-P
Chain and Individual Differences in Meal Calorie Content at Fast Food Restaurants

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Background: Limited data are available regarding actual calorie content of fast-food restaurant meals. **Methods:** In 4 New England cities in 2010 and 2011, we made repeated visits to 89 chain fast-food restaurants: McDonald's, Burger King, Wendy's, Subway (all age groups), KFC (adults, school-age children only), and Dunkin' Donuts (adolescents only). We surveyed 1877 adults, 1178 adolescents, and 330 (parents of) school-age children. We collected meal receipts, demographic information. and self-reported height and weight. We calculated the actual calorie content of meals purchased using receipts and nutritional information from restaurant websites. **Results:** The mean age of adults, adolescents, and school-age children was 37.2, 16.1, and 7.9 years; 57%, 51% and 48% were male; and 62%, 82%, and 81% were minority race/ethnicity, respectively. The median meal calorie content was 790 kcal (IQR 480,1130), 698 kcal (406,1070), and 670 kcal (510,920). In multivariable analyses, adult diners at all chains had significantly larger meals than at McDonald's (relative difference, 34% to 65% more calories). Among adolescents, only diners at Subway had significantly larger meals than at McDonalds (35% more calories; 95% CI 6%,73%); meals at Dunkin' Donuts had 51% fewer calories than at McDonald's (95% CI 38%,61%). We did not find differences across chains for school-age children. Other predictors of higher meal calorie content included male sex, younger age and higher BMI for adults; male sex, and Black or Hispanic race/ethnicity for adolescents; and older age for school-age children. **Conclusions:** Meal calorie content differs across fast-food restaurant chains. Compared with McDonald's, adults purchase larger meals at all other chains; among adolescents, only Subway diners purchase larger meals.

T-349-P
Effect of Walkability on BMI Mediated by Physical Activity: Evidence from the Continuous NHANES

Richard Scribner, Claudia Leonardi, Melinda Sothern *New Orleans, LA*

Background: Measures of neighbourhood walkability have been linked to increased physical activity and lower rates of overweight and obesity. Certain waves of the Continuous NHANES have direct measures of all three constructs permitting analyses assessing possible mediation. **Methods:** Multilevel analysis of Continuous NHANES participants (i.e., waves 2003-2004 and 2005-2006) (n=4,190) nested in census tract of residence (n=1,092) were conducted. Body Mass Index (BMI) was obtained from direct measurement of height and weight. Measures of walkability at the census tract level included intersection density, mean block length, link to node ratio, and the gamma index. Physical activity was measured by accelerometry. Additional individual level covariates associated with BMI were included in models (i.e., age, race, ethnicity, gender, family income, marital status, education, smoking status, and nativity). **Results:** ANOVA analysis revealed that 4.1% of the variance in BMI was explained by the census tract of residence. Most measures of census tract level walkability were negatively associated with BMI in multilevel analyses, an effect that emerged only when individual level covariates were included in the models. The individual measure of physical activity (i.e., accelerometry) was strongly associated with BMI and explained most of the effect of the census tract walkability. **Conclusions:** The findings indicate census tract level measures of walkability explain the distribution of overweight and obese individuals across the US. An effect partially explained by a measure of physical activity, suggesting the effect of neighbourhood walkability is mediated by increased levels of physical activity in more walkable neighbourhoods.

T-350-P
Geographic Distribution of Overweight and Obese Participants in NHANES Partially Explained by Elevation of Residence

Richard Scribner, Claudia Leonardi, Melinda Sothern *New Orleans, LA*

Background: Higher leptin levels have been associated with chronic exposure to high altitudes. The NHANES provides an opportunity to determine whether elevation of residence is associated with Body Mass Index (BMI). **Methods:** Multilevel analysis of Continuous NHANES 2003-2006 participants (n=4,190) nested in county of residence (n=104) were conducted. BMI in the Continuous NHANES was obtained from direct measurement of height and weight. County elevation was obtained from the National Elevation Database (NED) for the each county centroid. Additional individual level covariates associated with BMI were included in models (i.e., age, race, ethnicity, gender, family income, marital status, education, smoking status, and nativity). **Results:** ANOVA analysis of BMI in empty multilevel models demonstrated that 4.12% of the variance in BMI was explained by residence location. Multilevel analyses demonstrated a strong effect for elevation of county of residence and BMI. This translates into 0.31 BMI units per 1,000 feet of elevation. Controlling for relevant individual covariates associated with overweight and obesity did not reduce the effect. **Conclusions:** Elevation of residence is associated with BMI such that the geographic distribution of participants in the Continuous NHANES is partially explained by the elevation of the participant's county of residence.

T-351-P
Focus on Green Eating: What Are College Students' Perceptions of Environmentally Conscious Eating?

Jessica Nash, Geoffrey W. Greene, Alison Tovar *Kingston, RI*

Background: Green eating can be described as making environmentally conscious food choices. Increasing green eating has the potential to reduce environmental degradation and improve diet quality. There is limited information however on the knowledge and perceptions of green eating among college students. **Methods:** Nineteen 18 – 24 year-old full-time female students at a public, Northeastern university participated in four focus groups stratified by stage of change for green eating precontemplation/contemplation or preparation/action/maintenance; 2 groups per stage were conducted and initial themes identified. **Results:** The majority of the students perceived green eating to be choosing organic foods, shopping at farmers' markets, consuming more fruits and vegetables and less meat and processed foods. Benefits of green eating were described as: consuming less chemicals, supporting local

businesses, producing less waste and less pollution. Barriers to green eating were identified as lack of knowledge about locations to purchase products or about origin or production methods of foods in the dining hall, limited availability and high cost of green foods on campus. Students described practicing green eating behaviors to be easier at home during the summer than at school identifying both season and location as influencing factors. Precontemplators/contemplators had less knowledge about green eating and discussed green eating behaviors less often compared to those in the preparation/action/maintenance groups. **Conclusions:** Interventions designed to motivate college students to adopt green eating behaviors should focus on increasing knowledge and advocating the benefits of green eating. However, interventions may have limited impact without environmental changes reducing the barriers to green eating among college students.

T-352-P
Chemical and Non-Chemical Stressors Affecting Childhood Obesity: A State-of-the-Science Review

Kim Lichtveld, Kent Thomas, Nicolle Tulve *Research Triangle Park, NC*

Background: Childhood obesity is an epidemic in the United States and around the world. Non-chemical stressors known to impact the onset of obesity include caloric intake, amount of physical activity, sleep, and stress. Recent evidence in the literature suggests that exposure to selected environmental chemicals may also impact obesity. While much research has focused on individual stressors impacting obesity, little research has emphasized the complex interactions of numerous chemical and non-chemical stressors affecting a child's health and well-being. Objectives: The objectives of this research are to (1) identify and characterize chemical and non-chemical stressors that impact childhood obesity; (2) determine the key stressors; and (3) characterize the interactions of these key stressors on children's health. **Methods:** A state-of-the-science literature review was conducted to identify chemical and non-chemical stressors related to childhood obesity. Using this information, a searchable database was created and analyzed to identify key stressors. **Results:** Numerous chemical and non-chemical stressors were identified and grouped into the following domains: land use, transportation, waste and materials, buildings and infrastructure, health, environment, and economy. Stressors were related to the child and the child's everyday environment (home and community) and used to characterize child health and well-being. **Conclusions:** Numerous chemical and non-chemical stressors influence childhood obesity. This research suggests that the interactions of chemical and non-chemical stressors are important when understanding a child's overall health and well-being. By considering these inter-relationships, the exposure science research community can better design and implement strategies for decision makers regarding children's health.

T-353-P
Do Mexican Children Are More Likely to Preferred Energy Dense Foods?

Cynthia De Lira, Montserrat Bacardi-Gascon, Arturo Jimenez-Cruz *Ensenada, Mexico*

Background: Food preferences are mainly acquired during the first years of life; therefore, they might contribute to the development of childhood obesity. Objective: To assess healthy and unhealthy food preferences (FP) of children in preschool (PSC) and elementary school (ESC) and to evaluate whether children are more likely to prefer energy dense foods. **Methods:** Children in PSC and ESC, from 2nd and 6th grade, and one of their parents were assessed. Overweight (OW) and obesity (OB) was calculated according to WHO criteria. Children's and parents' FP were assessed using 54 picture cards and a list of foods usually consumed by Mexican children. Phi correlation test was performed to assess correlations between the parent's preferences and their child's. A Chi square test was conducted to assess the associations of preferences of healthy and unhealthy foods in OW/OB and normal weight children. **Results:** Results: 1230 parent-child pairs participated in the study. Fourteen percent of PSC and 49% of ESC were OW or OB. Low but significant correlations (r= 0.20, p=0.0001) between children's and parents' FP in ESC and PSC were observed. Sixty-two per cent and 37% of PSC and ESC, respectively, preferred unhealthy foods (p=0.0001). Fewer OW or OB children preferred healthy foods (p=0.002), than normal weight ESC. **Conclusions:** The foods that children preferred the most were those with high contents of sugar and energy dense. Preschool children were more

likely to preferred unhealthy foods than ESC and OW/OB children were less likely to prefer healthy foods.

T-354-P
A Novel Approach to Measuring Heat Exposure, Thermal Preference and Time Spent Outdoors

Molly C. Bernhard, Shia T. Kent, Mary B. Evans, Leslie A. McClure, Julia M. Gohlke *Birmingham, AL*

Background: A better understanding of temperatures an individual experiences and its association with body composition may lead to greater understanding of barriers to outdoor physical activity. Current methods for estimating heat exposure and time spent outdoors such as weather station data, activity logs, or GIS instruments may lack accuracy, are expensive or raise privacy concerns. **Methods:** We set out to determine whether a small, inexpensive temperature/sunlight monitor attached to the shoe could be used to estimate heat exposure, thermal preference, and time spent outdoors simultaneously. Community partners in rural and urban areas recruited participants (N=80) to wear monitors for one week. Height, weight and body composition measurements were taken and participants recorded their activities and locations (inside or outside) on an hourly basis. **Results:** In response to an exit survey, most participants (86%) found wearing the monitor on their shoe was very comfortable and reported the monitor was not hard to remember to wear (81%) and 68% reported becoming more aware of the time they spend indoors and outdoors upon receiving a graph of the monitor's output at the turn-in session. Nighttime temperatures and sunlight measurements were used to estimate thermal preference and time spent outdoors, respectively. When data from the individual monitors were compared to data from the closest weather station, weather stations overestimated average heat exposure. In contrast, daily maximum temperatures from a nearby weather station underestimated maximum temperatures experienced by urban participants. **Conclusions:** In conclusion, we have demonstrated an improved, inexpensive method for heat exposure and time spent outdoor estimation.

T-355-P[DT]
Winning the Obesity Battle in the Bronx: The Bronx Campaign to Prevent and Control Obesity

Gretchen Van Wye, Jane Bedell *Long Island City, NY*; Nicole Hollingsworth, Peter A. Selwyn, Joseph Murray *New York, NY*; Susan Kansagra, Andrew Goodman *Long Island City, NY*

Background: In response to the obesity crisis in the Bronx, where the prevalence of obesity and diabetes are 31% and 13%, respectively, the Health Department, Montefiore Medical Center, elected officials, and other key partners are focusing on the five evidence-based strategies to reverse the epidemic. **Methods:** We use a collective impact framework to implement a socio-ecologic approach centered around improving access to healthy foods, decreasing consumption of unhealthy foods, and increasing physical activities by expanding interventions in 1) worksites; 2) retail settings; 3) health care centers and 4) schools; and by implementing 5) educational campaigns. We will measure our impact with process measures and the NYC Community Health Survey which tracks population behaviors like sugary drink and fruit and vegetable consumption, physical activity related to active recreation and active transportation, and height and weight. **Results:** 15 organizations have agreed to align resources around a common agenda. To date, 9 hospitals and 70 retailers are improving their food environments; two health care centers are writing prescriptions for produce and making referrals to the YDPP; 950 elementary school teachers have been trained to lead in-class physical education; and one citywide media campaign has been placed more intensively in the Bronx and work to amplify these results is underway. Trends in obesity, diabetes, and sugary drink and fruit and vegetable consumption are being monitored. **Conclusions:** Progress has just begun and commitments to further expand this work will ensure broader reach and greater impact than possible by any one organization alone.

Wednesday, November 13, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Policy: Environmental/Economic/Health

T-356-P

Ten Years After State Board of Education Policy Requirement: North Carolina Middle School Principal and School District Representative Views on Providing Daily Physical Activity in School

Suzanne Lazorick, Alexis T. Barnett, Lauren Needell, Yancey Crawford, Xiangming Fang *Greenville, NC*

Background: In North Carolina (NC), State School Board policy has been in place since 2003 requiring all middle schools to provide 30 minutes of PA daily. However, implementation has not been consistent. **Methods:** Electronic questionnaires were distributed anonymously to all NC school district wellness representatives ("reps") (N=118) and all middle school principals (N=550) to gather information about attitudes, facilitators and barriers regarding daily PA and resources needed. Qualtrics® software was used for distribution, data compilation, and calculation of descriptive statistics. Once all results are collected, bivariate analyses will be conducted to explore associations of school and principal characteristics with responses. **Results:** The wellness rep results are complete (95 responses, 81%) with principal data collection ongoing (to date 165 responses, 30 %). Preliminary results are described; complete analyses will be reported at the meeting. Results represent all NC school regions. Nearly all respondents were aware of the daily PA requirement (78% reps, 90% principals), but not all believed the goal to be achievable (63%, 51%, respectively). Many reported some (50%, 33%) or substantial (30%, 38%) difficulty meeting the goal. Consistently noted barriers included competing priorities (71%, 57%) and lack of space (27%, 29%), but only 12% of principals noted teacher resistance. More reps (76%) than principals (40%) felt Physical Education should be required to reach daily PA minutes, and approximately one third (38%, 33%) felt training in providing PA would be helpful to increase PA. Among principals, over half (53%) reported that PA was important to them; personal PA reported was often 3 (25%) or 4 (24%) days/week. **Conclusions:** Despite policy requiring daily PA and principals valuing PA, many school leaders experience substantial barriers achieving the goal.

T-357-P

Healthcare Providers' Assistance with Weight Loss in a Bi-Racial Community-Based Sample: Results from the Coronary Artery Risk Development in Young Adults (CARDIA) Study

Dwight W. Lewis, Gareth R. Dutton, Yongin Kim *Birmingham, AL*; Mercedes Carnethon *Chicago, IL*; Nefertiti H. Durant *Birmingham, AL*; Joyce W. Tang *Chicago, IL*; Cora E. Lewis *Birmingham, AL*

Background: There are mixed findings on whether healthcare providers' weight loss advice differs by patients' race and/or sex. The purpose of this study was to compare overweight and obese Black and White participants' receipt of medical weight loss counseling and its association with loss attempts. **Methods:** This cross-sectional analysis included 1,583 Black and 1,816 White participants of CARDIA, a study of cardiovascular disease risk factors, examined in 2010-11. Participants reported both receipt of weight loss advice from a healthcare provider and whether they attempted weight loss during the past year. Multivariable logistic regression models examined the association between both outcomes and demographic, weight, and medical characteristics of participants. **Results:** Only 14%, 34%, and 55% of overweight, moderately obese, and severely obese participants, respectively, were advised to lose weight. Characteristics associated with receiving weight loss advice (OR, 95% CI) included female sex (1.36, 1.13-1.72), overweight (5.08, 3.17-8.13), moderate obesity (14.75, 9.24-23.54), severe obesity (30.34, 18.83-48.88), ≥10-lb weight gain in the past 5 years (1.26, 1.02-1.56), presence of diabetes (1.95, 1.48-2.75), and presence of hypertension (1.75, 1.41-2.17). Race was not associated with weight loss advice (p = 0.27). Participants advised to lose weight were 2.58 times more likely (95% CI 2.08-3.20) to report attempting weight loss. **Conclusions:** Women and those with weight-related comorbidities were more likely to receive weight loss advice. There were no racial differences in the receipt of advice. The associations between advice and weight loss attempts indicate possible value for such com-

munication with patients. There are also missed opportunities to address overweight and obesity during medical encounters.

T-358-P

Objectively Measuring Crime with GIS Methodology for Obesity Prevention Studies

Margaret van Bakergem, Shari Barkin *Nashville, TN*

Background: Perceived safety and subjective crime measures are often reported as barriers to PA and obesity prevention initiatives. Few studies have assesed objective crime using Geographic Information Systems (GIS). Such methodologies could provide the empirical evidence needed to develop policies that foster active and healthy lifestyles for families. **Methods:** The Nashville Metropolitan Police Department (NMPD) provided a document of reported crimes between 2011 and 2012. Crimes were systematically reviewed and included if related to personal safety. Those containing XY coordinates were geocoded in specified zip codes. Remaining crimes only had street names and were geocoded if crimes occurred on a street bound within a single zip code. Crime rates were adjusted by population per zip code. A chloropleth map was created to highlight crime densities. **Results:** The crime document contained 98392 crimes, 57596 related to personal safety. There were 24,583 crimes with XY coordinates, of which 17839 fell within our target zips. The remaining 33013 crimes without XY coordinates were isolated using street data where only streets contained within a zip were analyzed. Street segment dissolving analysis revealed 4730 streets within a single zip, resulting in 11625 additional crimes. Combining the XY coordinate and single-zip processes totaled 29464 relevant crimes. The median crime rate was 0.09 crimes per person per year (IQR 0.05, 0.13) and the highest crime rate was 0.94 per person per year. The chloropleth map revealed that the highest density of crimes occurred in the urban core. **Conclusions:** Utilizing this method in GIS results in an objective measure of crime. Applying this type of consistent methodology could provide researchers, policymakers and others with evidence to target high-crime areas, addressing a common barrier to routine outdoor physical activity.

T-359-P

Impact of Recess and Physical Education on Heart Rate in Urban Public School Children

Susan B. Racette, Cindi L. Inman, Jacqueline C. Castillo, B. R. Clark *St. Louis, MO*

Background: School policies for physical education (PE) and recess vary drastically. In the USA, 43 states require PE in elementary school, only 16 states specify PE time requirements, and the minimum requirements in some states allow PE to be offered only once per week. Only 9 states require recess. The aim of this project was to compare the effects of PE and recess on average heart rate and time spent in moderate-to-vigorous physical activity (MVPA) in urban public school children. **Methods:** Participants included 26 students (50% boys, 85% black, age 9.2 ± 0.4 y [mean±SD]) in grade 3 attending 2 schools. Height, weight, waist circumference, and seated resting heart rate were measured on 2 occasions and averaged. Heart rate was assessed continuously throughout the school day in 15-second intervals using Polar E600 heart rate monitors for a total of 286 observations over 4 months. MVPA was defined as heart rate ≥140 bpm. In-school physical activity was estimated with Omron HJ-151 pedometers. Continuous heart rate data were analyzed using generalized estimating equations and Tukey-Kramer pairwise comparisons. **Results:** Prevalence of overweight/obesity was 19.2%; obesity by BMI matched abdominal obesity by waist circumference at 11.5%. Seated resting heart rate was 91 ± 11 bpm. Average continuous heart rate during PE (129 ± 30 bpm) was greater than during recess (116 ± 29 bpm); both were higher than in the classroom (109 ± 26 bpm, p < 0.001 for all pairwise comparisons). Heart rate results did not differ by sex or school. The proportion of time spent in MVPA was 29.5 ± 16.8% for PE, 14.3 ± 11.9% for recess, and 9.1 ± 3.1% in the classroom. Daily in-school step counts averaged 4630 on PE days and 3745 on non-PE days (p < 0.001); PE was held twice/week. **Conclusions:** School policies should promote daily PE and recess to optimize physical activity intensity and quantity.

T-360-P

TV Food Advertisings and the Consumption of Unhealthy Food in a South Mexican City

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Background: A recent study showed that among women of a Mexico-US border city, TV advertisements influence the purchase and consumption of unhealthy food by children and adults. The objective of this study was to assess the association between food advertisement and consumption of those products by women and children from a Southeastern Mexican City **Methods:** Two national, Mexican television channels were recorded during the schedule of highest audience during October, 2011. Interviews were conducted on women with children one to five years old. A questionnaire about TV habits and advertisements was applied. Anthropometric measurements of mothers and their children were taken **Results:** A total of 200 mothers and their children were evaluated. Forty three percent of the mothers were overweight or obese, and 20% of 1 to 6y old children were at risk of overweight, overweight or obese. A total of 1915 advertisements were registered, of which, 29% corresponded to foods. The most frequent advertised foods were salty foods, whole dairy products, pastries, sweetened cereals, juices, and carbonated beverages. Eight food advertisings were broadcasted every thirty minutes. A positive correlation was found between the frequency of the foods advertised on TV and the consumption of these by the mothers (r=0.34, p=0.005). It was not observed association between the frequency of food advertisements and the consumption of these foods by children. **Conclusions:** The exposition of food advertisements on TV is associated with their consumption by mothers from Southern Mexico

T-361-P

Child-Oriented Marketing in Snack Food Packages in Guatemala

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Background: Guatemala is currently struggling with high stunting and obesity prevalences, both coexisting in urban school-aged children. While food marketing is known to significantly contribute to childhood obesity, in Guatemala evidence on snack food marketing to support evidence based policies is lacking. This study sought to identify the marketing techniques used in child-oriented snack food packages sold near public schools in Guatemala City. **Methods:** We purchased all child-oriented snacks found in stores within 200 square meters from four conveniently selected schools in an urban community. A snack was classified as child-oriented if the package had any promotional characters, premium offers, children′s television/movie tie-ins, sports references, or the word "child". Packages were coded using a checklist that assessed child-oriented references and price. Snack foods were classified as "healthy" or "less healthy" according to the UK standards for the Nutrient Profile Model. **Results:** We analyzed 106 packages found in 55 stores. The most commonly used technique was promotional characters (92.5%) of which 32.7% were spokes characters. Premium offers were found in 34.0% of packages, which were mostly collectibles (50.0%). Median (interquartile range) price was US$ 0.19 (0.25). Most (86%) packages had a nutritional label. All packages with complete nutritional information were classified as "less-healthy". **Conclusions:** In Guatemala, food companies target children through several marketing techniques that promote inexpensive and unhealthy snacks in the school environment. Our data should aid healthcare advocates to push for strong policies that restrict the use of promotional characters in snack food packages in order to halt the obesity epidemic.

T-362-P

Perceptions of Obesity as a Policy Issue: Differences between Healthcare Professionals and the General Public

Theodore K. Kyle *Pittsburgh, PA*; Adam G. Tsai *Denver, CO*; Shahad Abdulnour *Toronto, Canada*; Bonnie Kuehl *Mississauga, Canada*; Christine C. Ferguson *Washington, DC*

Background: Obesity is a complex problem and the subject of contentious policy debates. Scientific understanding of obesity is incomplete. Policy stakeholders hold contrasting views that influence investment in research, prevention, and treatment. This study examines the prevalence of views on obesity as a personal, community, or medical problem in the general public and among healthcare professionals. **Methods:** Through a validated online survey, a sample projectable to the U.S. adult population of 10,556 general population (POP) and 1,077 healthcare professional (HCP) respondents was asked whether they viewed obesity primarily as a personal, community, or medical problem. The HCP sample included registered nurses (RN), physicians (PHY), dietitians and nutritionists (DN), and Healthcare Policy and Management professionals (HPM). We compared both POP and HCP respondents by their views of the problem of obesity using chi-square tests with standardized residuals for categorical variables. Analyses were also stratified according to gender, urban density, and age. **Results:** More POP than HCP respondents (40% v 29%, p<0.001) view obesity as a personal problem of bad choices. HCPs were closely divided between views of obesity as a personal (29%), community (27%), or medical problem (32%). Among HCPs, PHYs were more likely (38% v 28%, p<0.01) than RNs to view obesity as a medical problem. POP respondents that were female, younger, or urban were less likely (p<0.01) to view obesity as a personal problem of bad choices. The most common response of HPMs was to view obesity as a personal problem. **Conclusions:** These data describe conflicting views about obesity. The common view among HPM and POP respondents of obesity as primarily a personal problem of bad choices suggests that barriers remain to integrating obesity treatment into routine systems of medical care.

T-363-P

Employer Wellness Programs, Weight Outcome Hurdles and Obesity Treatment Access

Theodore K. Kyle *Pittsburgh, PA*; Joseph F. Nadglowski *Tampa, FL*

Background: Under provisions in the Affordable Care Act in 2014, employers may impose substantial penalties on employees who don't meet specific wellness goals, including BMI. Horwitz et al recently found that such programs can have the effect of shifting healthcare costs onto employees, without promoting wellness. The present study examines the prevalence of these practices in early 2013. **Methods:** Through a validated online survey, a sample of 7788 respondents projectable to the U.S. adult population were asked if their employer: • Requires wellness plan participation to receive full health benefits • Sets goals for weight and other health indicators • Covers treatment for obesity under their health plan We conducted qualitative interviews with affected employees about their experiences. **Results:** The total respondent pool of 7788 U.S. adults yielded a relevant sample of 5382 employed adults. Of those, 849 (16%) reported that their employer required participation in a wellness program to qualify for full health benefits. Most (67%) of respondents whose employers required wellness program participation also reported that the plan set wellness goals for one or more of the following health indicators: weight (41%), blood pressure (38%), exercise (36%), cholesterol (35%), or diet (25%). But a majority (59%) also indicated that their employers' health plans did not cover any of the following evidence-based treatments for obesity: fitness training (22% covered), dietitian (14%), medical weight loss clinic (11%), weight loss surgery (9%), and weight loss drugs (8%). **Conclusions:** Employers who require wellness program participation for access to full health benefits frequently set weight goals for employees, but do not typically cover evidence-based obesity treatments in their health plans.

T-364-P

Assessing the Obesity Research Agenda: A Survey of the Obesity Society's Membership

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Background: Improving treatment and prevention of obesity requires novel research to test innovative hypotheses that will advance our understanding of the disease. Research resources are limited, so it is imperative that the available resources are allocated to the most novel and promising hypotheses. To assess the current obesity research environment and identify potential barriers or facilitators of novel research, we conducted a survey of attitudes and experiences of obesity researchers in the Obesity Society. **Methods:** An online survey was administered via email to the members of the Obesity Society, the leading scientific society dedicated to the study of obesity, in November, 2012. In total, 331 (15% of members) completed the survey. Demographics were collected for respondents, and statements assessing the research environment were rated using a 5-point Likert scale. **Results:** 65% of TOS members strongly agree that novel interventions are needed to treat obesity, whereas only 27% of respondents strongly agree that ongoing obesity re-

search is novel, and 80% do not feel strongly one way or the other about the likelihood that it will improve our ability to treat obesity. And among respondents who have applied for a research grant, about half (52%) say they have an idea that could result in significant novel findings that they have not submitted because they feared it would be deemed unfundable. **Conclusions:** The future of obesity research depends on novel findings. A majority of respondents believe current research is not novel and expressed reluctance to submit novel ideas due to fear of rejection. This information can be used by funding agencies and researchers to improve the research environment so that testing of novel hypotheses is encouraged and supported.

T-365-P
Labeling in Practice: An Experimental Study on the Use of Food Labels to Control Portion Size in Chile

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Background: Nutrition labeling, if applied correctly and if adequately used and understood, can be an easy and direct tool in order to help consumers taking into account the nutritional content of the food product in their purchase decisions. The present study was conducted in order to understand consumer attitudes and understanding of portion size information on commonly consumed products. **Methods:** An experimental trial was performed on a sample of Chilean mothers and one of their relative. The study was developed in two phases. In the first one, participants were asked to prepare two meals (one meant for a child, one for an adult), with ingredients measured only with kitchen tools. Participants were stratified by portion size information in two groups, one with labels bearing the "100 gr" indications and one with "per portion". Subsequently, every participant was interviewed in order to evaluate knowledge on nutrition and healthy lifestyle, use and comprehension of labels and correct interpretation of given portions. **Results:** 114 subjects were equally divided in 2 settings. When considering total Kcals of prepared meals after the simulation, an increase of calories was recorded in the group of subjects who prepared foods bearing the 100g label, although not statistically significant (p =0.842). In the 100 gr group, outliers with unusually high (or low) observed values were documented. In the subsample that stated to not usually read nutrition information, a statistically significant difference was registered when evaluating both preparation (p = 0.039). **Conclusions:** Portion size use seemed to be a more intuitive way to properly share nutritional information on food label, especially when considering common traditional recipes. Meals' responsible appeared to be much more at ease with per portion labeling, when preparing both children's meals and adult ones.

T-366-P
The Potential Role of Neighborhoods and Schools in Improving Childhood Obesity

Amy E. Schwartz, Brian Elbel, Sean P. Corcoran *New York, NY*

Background: Childhood obesity is a large problem without proven scalable solutions. An increasingly common approach leverages public policy to shape environments in which children spend most of their time: neighborhoods and schools. We estimate the potential for these approaches to improve population childhood obesity rates in a large urban area. **Methods:** We analyze administrative data, including BMI from annual FITNESSGRAM reports, for New York City public elementary and middle school children from 2008-2010. We examine how the incidence of obesity varies by neighborhood and school and estimate the extent to which this variation is explained by student characteristics. We simulate population level changes in obesity arising if students in high obesity neighborhoods/schools matched the obesity rates of neighborhoods/schools with lower obesity rates. **Results:** Among 1,488,877 student-year observations 27.8% were black, 39.1% Hispanic, 85.3% were low-income, and 21.0% were obese. Obesity rates varied widely across schools and neighborhoods, even after adjusting for student characteristics. Using fixed effect regressions, we found the population obesity rate would decrease by 2.4 percentage points, or 11.4%, if above-average obesity neighborhoods/schools had an obesity rate equal to that of the median neighborhood/school. **Conclusions:** There is variation in childhood obesity rates across neighborhoods and schools. If policy interventions successfully decreased obesity in the entire upper half of the distribution of neighborhoods and schools, the change would be welcome but modest relative to the depth

of the problem. This highlights the need for deeper approaches incorporating environmental changes while potentially also targeting children and families in different ways.

T-367-P
Parental Concern for Child Body Size: Findings from School-Based BMI Screening Policy

Lisa Bailey-Davis *Danville, PA*; Karissa Peyer, Shu Yang, Gregory J. Welk *Ames, IA*

Background: School body mass index screening (SBMIS) has been recommended by public health leaders as a policy strategy to raise parental awareness of their child's body size and related health risk. Parents of 12 million public school children in nine states receive SBMIS reports with demonstrated improvements in parental awareness. This suggests progress toward prevention but little is known about parent concern about child body size. Whether parents are concerned about their child's body size and the factors associated with such concern are unclear. **Methods:** This cross-sectional study examined parent concern about child body size for 1,015 elementary-age children (ages 5-12 years) in 2012. All children were enrolled in Pennsylvania public schools (N = 31) that implemented statewide SBMIS policy. Parents received their child's objectively measured BMI report from the school approximately 6 weeks before completing the study questionnaire. Linear regression models were used to examine associations of parental concern with child factors (age, gender, child body size) and parent weight perceptions. **Results:** Most respondents were female parent/guardians, 30-49 years of age, and married that described their own weight as "About Right" or "A Little Overweight." School reports indicate that 16.5% of children were overweight and 18.7% were obese. Parent concern for child body size was significantly associated (all p < 0.001) with child gender, body size, and parent perception of her/his weight but not child age. **Conclusions:** Parent concern was significant for girls and for overweight or obese children overall. Concern for daughters independent of child body size may be unwarranted and potentially harmful. SBMIS should include gender-specific messages and parent education to promote healthy child growth.

T-368-P
Associations between Nutrition Label Use and Added Sugar Intake

Amber Hsiao, Y. Claire Wang *New York, NY*

Background: Since the passage of the Nutrition Labeling Education Act of 1990, nutrition labels have provided key information to help consumers make healthier dietary choices. However, there is little research linking regular reading of nutrition labels to actual consumption of added sugars. **Methods:** Using the 2007-2010 National Health and Nutrition Examination Survey Consumer Behavior Module, we included 6,895 adults ages 20 to 65 who responded to the question "How often do you use the Nutrition Facts panel when deciding to buy a food product?" (always/most of the time, sometimes, or never/rarely). We also used 24-hour dietary recall records to estimate grams of added sugar consumed (a proxy for dietary quality). We controlled for age, place of birth, education, use of special diets, income, and weight status. Regression models were run separately for men and women. **Results:** Compared to those who always or most of the time use labels, those who never or rarely do consumed significantly more added sugar (men: +29.8 g; women: +30.1 g; p<.0001), as did those who sometimes do (men: +13.1 g, p=.0013; women: +8.6 g, p=.0008). While label use and level of education were found to be correlated (p<.0001), label use only partially explains the higher added sugar intake among those with a high school or less education. Further, all groups regardless of income and education consume far more added sugar than recommended. **Conclusions:** There appears to be a correlation between nutrition label use and dietary quality. However, the impact of promoting label use warrants more research, especially for the less educated.

T-369-P

Environmental and Policy-Level Support for Healthy Eating, Active Living and Obesity Prevention among Hospital Workers in the Texas Medical Center

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Background: The purpose was to compare and contrast the employee-related wellness policies and practices for obesity prevention among five major hospitals in the Texas Medical Center in Houston, the world's largest medical complex, collectively employing >40,000 employees. **Methods:** In fall 2012, the NHLBI-validated Environmental Assessment Tool (EAT) survey was used to scan the hospital nutrition and physical activity environment, policies and practices. The scan was conducted by trained independent observers with hospital staff to measure three scales a) organizational characteristics(45 items); b) Food and Nutrition (49 items) and, c) Physical Activity (42 items). Response options were Yes/No and higher scores indicated higher level of support for obesity prevention behaviors. For vending machines, the proportion of healthy beverage or snack item was computed. **Results:** The mean age of employees across the five hospitals was 39-44 years old, 67%-81% are female, 37%-79% work the day shift and, 54%-82% are in a professional or technical job type. Across the five hospitals, for Organizational Characteristics the score ranged from 45% to 73%; for Physical Activity - 8% to 60%; and for Food and Nutrition - 34% to 62%. None of the hospitals provided managers with performance objectives related to worksite health improvement. The scores for the beverage vending machine environment were poor with average proportion of healthy beverage slots ranging from 0% o 40% across five hospitals. **Conclusions:** Results showed significant variation across five hospitals and large policy gaps, including lack of policies supporting: a) employee physical fitness, b) healthy catering/meeting policy, c) subsidized healthy food and beverage options in the dining services, d) healthy snack and beverage vending machines, and e) performance objectives related to worksite health improvement.

T-370-P

Pre-School Childcare Staff Knowledge Is Associated with Healthy Nutrition Feeding Practices

Amanda Arguello, Tung Sung Tseng, Ann Clesi, Leslie Lewis, Julia Volaufova, Melinda Sothern *New Orleans, LA*

Background: Positive attitudes and behaviors toward nutrition must be established at an early age; thus, childhood obesity prevention initiatives should begin during the pre-school years. The knowledge and attitudes of pre-school childcare providers may affect the establishment of healthy feeding practices in this setting. **Methods:** A cross-sectional design was used to determine differences in knowledge, attitudes, and self-efficacy of providers implementing more (N=79) versus less (N=47) healthy nutrition and feeding practices in pre-school childcare centers across Louisiana. Center practices were identified using sixteen selected items of an evaluation tool, Environmental & Policy Assessment & Observation (EPAO), from the Nutrition and Physical Activity Self-Assessment for Child Care (NAPSACC) program. A survey was developed to assess knowledge, attitudes and self-efficacy and was administered to providers in childcare centers. **Results:** Of 15 participating childcare centers, 8 were identified as centers implementing more and 7 were identified as centers implementing less healthy nutrition and feeding practices. Significant differences were found in knowledge scores (p=0.01) between the two groups. A higher percentage of staff in centers implementing more healthy practices reported that new foods, such as fruits and vegetables, may need to be re-introduced multiple times (98.73% vs. 91.30%; p=0.04), and that it is important to let children recognize hunger in order to learn satiety cues (68.83% vs. 51.11%; p=0.05). **Conclusions:** Higher knowledge scores were associated with staff in centers implementing more versus less healthy nutrition and feeding practices. These findings support policy that requires nutrition education and training on feeding practices in pre-school childcare settings.

T-371-P[DT]

Health Literacy, Weight Perception and Calories Purchased among Overweight Fast-Food Consumers in the Bronx, NYC

Nichola J. Davis, Giovanna DiFrancesca, Geordany Gonzalez, Jennifer Lukin, Clyde Schechter *Bronx, NY*

Background: Fast-food consumption is associated with obesity. Calorie labeling in fast-food restaurants (FFRs) may have little impact on calories purchased. Health literacy, calorie knowledge, and weight perception, may impact how consumers use calorie information. We examined whether health literacy, calorie knowledge, or weight perception were related to calories purchased at FFRs. **Methods:** Fifty-five overweight participants who go to FFRs at least once per week were recruited from a municipal clinic in the Bronx, to enroll in the C.H.E.K.S (Calorie Health Education Knowledge and Skills) study. At baseline, participants completed measures including calorie knowledge, health literacy measured by Newest Vital Sign (NVS), and weight perception. Calories purchased from FFRs were determined by FF receipts and food logs collected weekly. One-way ANOVA compared baseline variables to calories purchased. **Results:** Mean (SD) age of participants was 53(23) years. BMI was 34(7) kg/m2. 78%were Black or Hispanic, and 40% had less than HS education. 87% had inadequate HL; 27% correctly identified daily-recommended calories; and 85% considered themselves overweight. Participants with inadequate HL purchased 764(1236); those with adequate HL 470(666) (p=0.54). Participants correctly identifying daily-recommended calories purchased 792 calories vs. 501(920) purchased by those who did not, (p= 0.42). Participants who considered themselves overweight purchased 650(1154) calories; those who considered themselves the right weight purchased 933(1307) calories (p=0.40) **Conclusions:** Consumers with low health literacy, low calorie knowledge, and those who perceive themselves as not overweight may purchase more calories. These factors may be important in interventions to reduce fast-food calories.

T-372-P[DT]

Health Literacy, Knowledge, Weight Perception and Sugar-Sweetened Beverage (SSB) Purchase among Overweight Fast-Food Consumers in the Bronx, NYC

Nichola J. Davis, Giovanna DiFrancesca, Geordany Gonzalez, Jennifer Lukin, Clyde Schechter *Bronx, NY*

Background: SSB consumption is associated with obesity. NYC is debating policies to reduce the size of SSBs sold in fast-food restaurants (FFRs). It is unclear whether these policies will work. Additional interventions may be needed to reduce SSB consumption. We examined whether HL, calorie knowledge, or weight perception were related to SSB calories purchased. **Methods:** Fifty-five overweight participants who go to FFRs at least once per week were recruited from a municipal clinic in the Bronx, to enroll in the C.H.E.K.S (Calorie Health Education Knowledge and Skills) study. At baseline, participants completed measures including calorie knowledge, health literacy measured by the short test of functional health literacy, and weight perception. SSB calories were determined by FF receipts and food logs collected weekly. One-way ANOVA compared baseline variables to calories purchased. **Results:** Mean (SD) age was 53(23) years. BMI was 34(7) kg/m2. 78%were Black or Hispanic, and 40% had less than HS education. 87% had inadequate HL; 27% correctly identified daily-recommended calories; and 85% considered themselves overweight. Participants with inadequate HL purchased 255(744); marginal HL 25 (58); adequate HL 40(120) (p=0.20). Participants correctly identifying daily-recommended calories purchased 10 (40) calories vs. 126(470) purchased by those who did not, (p= 0.34). Participants who considered themselves overweight purchased 88(408) calories; those who considered themselves the right weight purchased 154(408) calories (p=0.90) **Conclusions:** Consumers with low HL, low calorie knowledge, and who perceive themselves as not overweight may purchase more SSB calories. Interventions to reduce SSB consumption may need to address these barriers.

T-373-P

Dissatisfaction with Available Treatment Options Underlies Under-Documentation of Obesity by Medical Residents

Gitanjali Srivastava, Erica Johnson, Lee M. Kaplan *Boston, MA*

Background: The cause of the low rates of obesity documentation and frequent misinterpretation of weight status by medical residents is not known.

Methods: We surveyed all medical residents at this hospital for knowledge, attitudes and documentation behavior about obesity and other issues confronting hospitalized patients. **Results:** 70 of 146 residents completed the survey (46%). Of these, 98.5% reported obesity to be an important medical issue. 89.5% knew BMI criteria and 90% correctly identified a class 2 phenotype from a Stunkard drawing; however, 20.3% incorrectly calculated BMI from ht. and wt. in metric units. 75% estimated obesity prevalence among inpatients as >40% (actual rate 36%), and 60% felt obesity significantly influenced inpatient management in >20% of patients. 94% reported recording obesity in the admission note (actual rate 49.5%). Similar to diabetes, sleep apnea, homelessness and tobacco use, 75% reported addressing obesity in the assessment/plan if contributing to the reason for admission (actual rate 6.3%). Compared with smoking cessation, they reported the absence or inaccessibility of programs for specialized post-discharge obesity care as the primary barrier and deterrent to addressing obesity among inpatients.

Conclusions: There was a dichotomy between resident perceptions and behaviors regarding obesity, with limited attention to this disorder despite overestimates of its prevalence and importance to inpatient care and outcomes. Enhanced resident education about medical implications and effective management of obesity, and establishment of more efficient obesity care pathways in the post-acute setting would likely lead to more attention to this problem. Since attitudes and practice patterns are largely determined during residency, promoting greater trainee attention to obesity care will likely generate important long-term benefits.

T-374-P
The Affordable Care Act Impact on Obesity

Morgan Downey *Washington, DC*; Christopher Still *Danville, PA*

Background: The Affordable Care Act (ACA) is the most far-reaching health care legislation since in the enactment of Medicare and Medicaid in the 1960s. The legislation's principal policy goal is to increase the number of Americans who have access to health insurance. **Methods:** Analysis and Review of legislation and regulations issued pursuant to ACA. **Results:** Specific sections of interest regarding the prevention and treatment of obesity will be reviewed. **Conclusions:** This session with discuss the status of obesity related issues in the following contexts: Private Insurance Market, elimination of pre-existing condition exclusions, annual and lifetime spending caps, coverage of intensive behavioral counseling of adult obesity, employer wellness programs, and new rights to appeal insurance claims decisions. The Medicaid program, including preventive services, behavioral counseling, and future coverage of drugs for the treatment of obesity. New structures including State health insurance exchanges, the definition of "essential health benefits". New models of health care systems, such as Accountable Care Organizations, medical homes, and bundled payments. A major research initiative of the ACA is the Patient Centered Outcomes Research Institute (PCORI). The mission of PCORI is to "identify national priorities for research, taking into account factors of disease incidence, prevalence, and burden in the United States (with emphasis on chronic conditions)." The implications of PCORI for research on the prevention and treatment of obesity will be reviewed. Several other provisions of the ACA have implications for obesity prevention. These include the Prevention and Public Health Fund, access to breast-feeding locations by employers, and calorie labeling. The status of these provisions will be reviewed.

T-375-P
Access to Care Barriers for Adolescents Seeking Bariatric Surgery

Teen-LABS Consortium *Cincinnati, OH*

Background: The number of severely obese adolescents in the U.S. far exceeds the number who undergo weight loss surgery (WLS). To document the challenges experienced accessing to bariatric surgical care, a retrospective multicenter review was conducted at 5 U.S. centers. **Methods:** 52 patients (mean age 16 yrs, range 13-19; mean BMI =53kg/m2) were included who met established clinical criteria for adolescent WLS between 2009 & 2011. Insurance benefits for WLS were verified to exist for all. Programs complied with insurance policy criteria for WLS authorization, typically including a 6 month period of medically supervised weight loss prior to request for WLS authorization. Patients who voluntarily withdrew or were self-pay were excluded. **Results:** Patients were predominantly female (79%), Caucasian (71%) with public insurance coverage (52%). Of initial requests for WLS au-

thorization, 52% were approved. No significant differences in initial approval/denial were found by payor. Median time to decision for those who were initially approved was 18 days. Reasons for initial denial included: age <18 yrs (60%), procedure requested (28%), inadequate medically supervised wt loss (4%), lack of medical necessity (4%), psychological concerns (4%). Of those initially denied, 64% (16) were approved through appeal: 1 appeal (11 approvals of 20 who appealed), 2 appeals (2 of 7), 3 appeals (2 of 5), 4 appeals (1 of 2), 5 appeals (0 of 1). Ultimately, 83% received insurance approval. **Conclusions:** Insurance authorization for adolescent WLS is frequently denied despite families having insurance policies with WLS benefits & meeting established clinical criteria for WLS. Initial denials should be appealed, as appeals are often approved. Awareness of frequency of denials may help set expectations for families until evidence-based changes to coverage guidelines improve access to care.

T-376-P
Assessment of Successful Implementation of Risk Management Program to Assure Safe Use of Qsymia® (Phentermine and Topiramate Extended-Release) Capsules CIV

Michael Cheung *Mountain View, CA*; Kim H. Bullano *Newark, DE*; Barbara Troupin *Mountain View, CA*

Background: Phentermine and topiramate extended-release (PHEN/TPM ER) was one of two new weight loss agents approved in 2012 and was shown to be well-tolerated and efficacious in clinical trials. Because of increased risk of cleft lip/cleft palate seen in pregnant women taking topiramate for migraine prevention or epilepsy, the FDA required a risk evaluation and mitigation strategy (REMS) at approval. **Methods:** A REMS was developed and implemented to inform prescribers and women of reproductive potential about this risk and consists of risk communication letters to health care providers (HCPs) and medical societies, a voluntary HCP training program, and pharmacy certification. Certified pharmacies ensure each prescription is dispensed with the Medication Guide and patient brochure, and information is collected to identify prescribers who have not completed training. This program was assessed initially at 6 months post-approval. **Results:** The Dear HCP Letter was sent to over 110,000 clinicians. Twenty-one medical societies were contacted to disseminate the Dear HCP Letter to their members; 29% participated. At week 10 post product launch, more than 5100 clinicians had prescribed PHEN/TPM ER. During this period, 793 prescribers and almost 2200 non-prescribers completed training, and more than 9000 unique patients were dispensed PHEN/TPM ER. The average patient was 51 years old; 24% were male. Primary care physicians (MD/DOs) accounted for 68% of prescribers. All prescriptions were dispensed according to the REMS requirements. **Conclusions:** During the immediate post-approval period, an educationally-focused REMS program aimed at assuring appropriate use by HCPs and patients was successfully implemented.

T-377-P
Patient Satisfaction of Bariatric Surgery in Mississippi Pilot Project

Katie S. McClendon *Jackson, MS*; Micki Johnson *oxford, MS*; Annette Low, Jacinda Roach *Flowood, MS*; Dena Trusler *Ocean Springs, MS*; Whitney Byars *Oxford, MS*

Background: The State of Mississippi passed legislation which funded bariatric surgery for state employees in a pilot project. **Methods:** This prospective, observational, longitudinal study was conducted at the three accredited Bariatric Surgery Centers of Excellence in Mississippi. The surgical procedure performed was based on patient and surgeon choice. Patients were surveyed on their satisfaction with surgery and weight loss. Wilcoxon Signed Rank Test was used to compare satisfaction among those with 6 and 12 month results. The study was approved by the University of Mississippi IRB. **Results:** Of those responding, at 6 months, 67 of 68 would choose their surgery again and 67 of 69 would recommend their surgery to others. At 12 months, 74 of 77 would choose their surgery again and 75 of 78 would recommend their surgery to others. Using a visual analog scale, with 0 indicating not satisfied at all and 10 indicating very satisfied, the median response for satisfaction with amount of weight loss was 8 at 6 and 12 months, satisfaction with speed of weight loss was 7 at 6 months and 8 at 12 months, and satisfaction with type of surgery was 10 at 6 and 12 months. Among those with responses at 6 and 12 months, the difference was only significant for type of surgery (p value 0.041). The mean response for type of surgery was

9.105 at 6 months and 8.55 at 12 months. **Conclusions:** Most patients were very satisfied with their surgery, weight loss, and speed of weight loss in this pilot project.

T-378-P
Caloric Impact of Substituting Healthier Side Dishes and Beverages for Traditional Options on Children's Menus

Sarah Sliwa, Stephanie Anzman-Frasca, Franciel Dawes, Kyle Washburn, Christina D. Economos *Boston, MA*

Background: Frequenting quick service restaurants (QSRs) contributes to children's consumption of excess calories. Offering healthier sides and beverages by default may reduce the energy density of kids' meals. **Methods:** Menus and nutrition information for the top 10 QSR chains with a children's menu and at least one side dish were collected in Spring 2013. Children's menus were coded to identify the availability of non-fried fruit and vegetable (FV) side dishes, low-fat (LF) or non-fat (NF) milk and water, and whether these were offered by default. The availability of other sides and beverages was also coded. We estimated the caloric impacts of substituting 1) the most commonly offered FV side for the most commonly offered non-FV side; 2) plain LF or NF milk or water for the most commonly offered sugar-sweetened beverage (SSB); and 3) both 1 and 2, at QSRs where these substitutions would be possible, given current menus. **Results:** Although 90% of QSRs offered FV sides, only 40% did so by default, and just 1 QSR offered a vegetable. The most commonly offered sides were apple slices (n=7, 48± 32 kcal) and French fries (n=7, 220 ± 56 kcal). LF or NF milk and SSBs were available at 90% of QSRs and water at 50%. Milk and water were offered by default at 1 QSR, and an SSB was the default at 1 QSR. The most widely available SSB was cola (n=7, 145 ± 36 kcal). Across QSRs, substitutions consistently reduced calories. On average, apples for fries reduced calories by 147 ± 51 (n=5); plain LF or NF milk for cola reduced by 42 ± 39 kcal (n=7); and water for cola reduced by 145± 33 kcal (n=4). Substituting both the beverage and side reduced calories by 178 ± 64 for milk (n=5) and 298 ± 55 for water (n=4). **Conclusions:** Few QSRs offer FV sides, plain low-fat or non-fat milk, or water by default, yet these options consistently reduce total calories in kids' meals.

T-379-P
Physical Activity Design Guidelines for School Architecture

Jeri Brittin, Leah Frerichs *Omaha, NE*; Dina Sorensen, Matthew Trowbridge, Stephen Davis, Joe Celentano, Kelly Callahan *Charlottesville, VA*; Terry Huang *Omaha, NE*

Background: Increasing children's physical activity (PA) at school is a national focus to address childhood obesity. Aspects of school environment have been shown to affect students' PA, but a synthesis of best evidence is needed to guide school design practice and to identify pertinent research opportunities. This paper describes the development and application of Physical Activity Design Guidelines for School Architecture. The aim is to provide architecture and public health new insights and strategies for making school environments conducive to healthy physical activity. **Methods:** We engaged in a collaborative, transdisciplinary qualitative review process with leading architecture experts to develop evidence-based, theory-driven school design guidelines that promote increased PA among students. We addressed the design process, evaluation strategies for impact on institutional and individual outcomes, and application to a particular school test case. **Results:** The design guidelines include specific strategies in school domains including Active Classrooms, Navigation Areas and Stairs, Fitness Facilities, Technology Environment, Outdoor Spaces, Furniture, Signage, and Community Integration. Driving principles include designing for active lifestyle and routine, and applying theory- and evidence-based behavioral science practice to enable the school community to engage in higher levels of physical activity. We examine the specific application of the guidelines to an elementary school project in Virginia. **Conclusions:** Implementation of the guidelines is expected to enable students to adopt healthier physical activity practices. Our results have broad implications in setting new industry and education standards, such as partnership with the U.S. Green Building Council toward translation of the guidelines to LEED innovation credits for school building projects.

T-380-P
Texas CORD: Engagement of Healthcare Offices to Address Childhood Obesity in Low-Income Neighborhoods

Sarah E. Barlow, Nancy F. Butte *Houston, TX*; Deanna M. Hoelscher *Austin, TX*; Jonathan Fanburg *Portland, ME*; Elsie M. Taveras *Boston, MA*; Stephen J. Pont *Austin, TX*

Background: The Centers for Disease Control and Prevention's Childhood Obesity Research Demonstration (CORD) projects identify primary healthcare as a priority in the multisystem, multilevel approach to obesity in Medicaid-eligible children aged 2-12 years. The Texas CORD project has implemented system support in multiple health systems. **Methods:** Non-academic pediatric practices in low-income, diverse neighborhoods were recruited to implement electronic health record (EHR) changes that alert providers to overweight/obese status and embed provider cues regarding assessment and intervention. Obesity behavior change counseling materials (Next Steps) in English and Spanish were provided for use during clinic encounters. A self-paced Next Steps booklet for family use was also developed. Providers received 2-hour training on EHR changes, Next Steps, and motivational interviewing techniques presented in live, teleconference, and video format. Office staff participated in shorter training. Self-administered questionnaires assessed baseline knowledge, self-efficacy and obesity care practices. Office environment was assessed. **Results:** All practices (n=12) and providers (n=43) approached joined the CORD project. Each healthcare system provided in-kind support for changes in their EHR systems (Epic, NextGen and E-Clinical Works). All providers and 80% of office staff completed baseline questionnaire and orientation. Completion of office environment assessment was 100%. The healthcare systems will provide aggregate, anonymous reports from EHR of changes in counseling documentation through the roll-out period 2012-2014 **Conclusions:** The successful engagement of pediatric primary care practices and their parent organizations suggest that EHR changes and counseling materials for childhood obesity are readily scalable and could be implemented in practices across the US.

T-381-P
Recent Shifts Toward Less Healthy Packaged Grain-Based Dessert Products: 2006 to 2011

Kevin C. Mathias, Shu Wen W. Ng, Barry M. Popkin *Chapel Hill, NC*

Background: Grain-based desserts (GBD) (e.g., cookies) are a major source of added sugar, saturated fat and calories in the US diet. Given the current obesity and type 2 diabetes epidemics, shifts toward less healthy GBD products would be concerning. The objective of this research was to examine changes in the distribution of saturated fat concentration, sugar concentration, energy density, and package size of GBD products available to consumers each year between 2006 and 2011. **Methods:** Nutrition Facts Panel information for over 1,600 products on average each year was provided by commercial databases. Simultaneous-quantile regression was used to examine shifts in the distribution of products available to consumers at the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentile. **Results:** Between 2006 and 2011, the saturated fat concentration of GBD products at the 25th and 50th percentile increased significantly by 1.0g/100g of GBD and 0.5g/100g of GBD, respectively, indicating a shift toward higher saturated fat concentrations in the GBD products on the left side of the distribution. Total sugar concentration increased by 16g/100g of GBD, 4g/100g of GBD, and 3g/100g of GBD at the 5th, 10th, and 25th percentile, respectively, indicating a shift toward higher sugar concentrations in GBD products at the lower left side of the distribution. Although shifts occurred in both total sugar and saturated fat concentrations, no appreciable differences were observed at any percentile for the energy density of GBD products. Finally, package size increased by 27g, 43g, 37g, 45g, and 170g at the 25th, 50th, 75th, 90th, and 95th percentile, respectively. **Conclusions:** These results highlight recent shifts in the packaged GBD products available to consumers that are potentially adverse to efforts in the US to decrease obesity and type 2 diabetes.

Thursday, November 14, 2013
Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

Gastric Bypass

T-382-P
Iron Deficiency in Preoperative of Bariatric Surgery; Diagnosis, Treatment

Pablo E. Omelanczuk, Angela M. Sanchez, Viviana Lasagni, Cecilia Penutto, Mariela Abaurre, Natalia Pampillon, Sonia Omelanczuk *Guaymallen, Argentina*

Background: Significant percentage of morbidly obese patients present iron deficiency (ID). Intravenous iron supplementation in preoperative period for patients with iron deficiency is effective in preventing hematocrit decrease. **Methods:** Observational prospective Study that included 89 morbidly obese patients submitted to bariatric surgery. Population was divided in the preopeartive period (pre OP) according to ID condition or absence of it and the postoperative evolution was analyzed (post OP). ID Patients were supplemented with ferric carboxymaltose 500mg intravenous (IV) and evaluated in post OP. **Results:** 23 patients (25.8%) presented ID in pre OP, 6 (6.74%) anemia. 66 patients (74.2%) did not present ID. The group without ID 1 month post OP presented: Hematocrit: $41.30\% \pm 3.77$; Hemoglobin: 13.64 g/l ± 1.25 and Trasferrin Saturation 30.55 %. Patients with ID in pre OP presented: Hematocrit: $40.40\% \pm 3.03$: Hemoglobin: 13.40 g/l ± 1.07; Transferrin Saturation: $15.50\% \pm 4.18$ and Ferritin: 87.10 ng/ml ± 81.23 . In post OP it was observed Hematocrit decrease $38.40\% \pm 3.17$ (p:0.034). ID Patients, without IV iron supplementation (n=15), Hematocrit and Hemoglobin were of $41.2\% \pm 2.5$ and 13.7 g/l ± 0.9 respectively, with decrease in post OP ($37.5\% \pm 3.4$ and 12.3 g/l p<0.05). IV iron supplementation in ID patients (n=9), increased Hemoglobin (13.5 g/l ± 0.7) with respect to pre OP (12.8 g/l ± 1.2; p:0.05), as well as transferrin saturation and ferritin. After 1 month post OP Hematocrit did not have significant changes (Hematocrit pre OP: 39%; Hematocrit post OP: 40% p:>0.05). **Conclusions:** 26% of the patients present ID in pre OP. Treatment with IV iron seems to be effective in preventing Hematocrit decrease and improving iron metabolism in ID patients in pre OP.

T-383-P
Adipocyte Size and Facilitated Fatty Acid Uptake Are Independently Regulated in Obesity and During Bariatric Surgical Weight Loss

Paul D. Berk, Fengxia Ge, Harrison Lobdell, Jose L. Walewski, Gregory Dakin, Alfons Pomp, William B Inabnet, Marc Bessler *New York, NY*

Background: Regulated fatty acid (FA) uptake is a control point for adiposity. We examined effects of obesity & surgical wt loss on both the diffusional & facilitated influx of FA into cells. **Methods:** We studied Non-Obese (NO: BMI 24.2±2.3); Obese (O: BMI 49.8±11.9); and Super-Obese (SO: BMI 62.6±2.8) patients (pts)(10/group). Omental (OM) & subcutaneous (SQ) fat was biopsied at bariatric surgery (BS) in O & SO and at other procedures in NO pts. SO pts had biopsies at initial sleeve gastrectomy & at 2nd BS 16 mos later (SO*reduced*) after losing 55 kg. Adipocyte (AD) surface areas, volumes and [^{3}H]-FA uptake kinetics were determined. **Results:** OM AD volumes increased from 437±74 to 616±53 to 749±124 X 10^3 fl per cell in the NO, O and SO groups; the Vmax for facilitated FA uptake increased from 8.3±0.6, to 20.9±1.4, to 68.7±9.6 pmol/sec/50,000 cells. SQ AD data were similar; Vmax's for OM vs SQ AD were linearly related (r= 0.96). By the 2nd surgery, SO*reduced* BMIs had fallen to 44.4±2.4 kg/m², cell volumes were in the NO range despite elevated BMIs, and OM AD Vmax (42.1±6.4) remained 2X that predicted by the BMI:Vmax regression among NO, O, & SO pts. SQ data were similar. Facilitated FA uptake in SO*reduced* OM & SQ ADs remained up-regulated vs BMI, confirmed by computing Vmax' (Vmax/Cell Surface Area, pmol/sec/µ² cell surface). Although AD volumes and surface areas fell into the NO range, Vmax' remained elevated ~ 5-fold vs NO range. By contrast to Vmax', k', a measure of non-saturable (passive) uptake per unit surface area, was not significantly changed in any group. **Conclusions:** [1] AD grow with obesity & shrink with surgical wt loss. [2] AD size & facilitated FA transport are independently regulated, with transport up-regulation persisting longer than increased size during wt loss. [3] The latter predisposes to wt regain.

T-384-P
Effect of Bariatric Surgery on Subclinical Thyroid States

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Background: The effect of bariatric surgery on subclinical thyroid states is unclear. This study aims to assess the prevalence of subclinical thyroid states in a group of predominantly Hispanic and African American (AA) bariatric patients and changes after surgery. **Methods:** Retrospective study of bariatric patients at a New York City hospital. Serum TSH, free thyroxine (FT4), free triiodothyronine (FT3) and body mass index (BMI) were analyzed. Inclusions: patients with BMI and TFT data. Exclusions: known thyroid disease, on thyroid meds, overt thyroid disease on pre-op labs. Normal TSH: 0.35-4.80 µIU/ml. Data presented as mean ± SE. Comparisons made with t-tests, associations with Pearson's correlations. **Results:** 549 patients: 72% white Hispanic, 23% AA; 91% females; mean age 39.8 ± 0.5 yrs (18-72); baseline BMI 47.7 ± 0.3 kg/m² (35-88). TSH and BMI correlated in euthyroid patients (r=0.13, p=0.002). Subclinical hypothyroidism: in 1.8% (n=10), mean TSH 6.07 ± 0.4 µIU/ml (none w/TSH >10), FT4: 1.17 ± 0.1 ng/dl, FT3: 2.89 ± 0.1 pg/ml, mean BMI 50.7 ± 4.8 kg/m² (no sig diff c/w euthyroid). Subclinical hyperthyroidism: in 0.7% (n=4), mean TSH 0.16 ± 0.1 µIU/ml (3 w/TSH <0.1), FT4: 1.95 ± 0.1 ng/dl, FT3: 2.62 ± 0.4 pg/ml, mean BMI 43.1 ± 1.2 kg/m² (no sig diff c/w euthyroid). Of patients with pre-op subclinical disease, 7 of 14 had post-op data and 100% of these were euthyroid, at a mean follow-up of 1.32 ± 0.2 yrs, with a loss of 23.3 ± 2.0% total body weight (57% excess weight loss). **Conclusions:** We noted marked improvements in subclinical thyroid states after bariatric surgery; whether this represents the natural history of subclinical thyroid disease vs. a surgical effect is unclear. Whether different treatment guidelines should be applied to subclinical thyroid states in pre-op bariatric patients remains unclear. This study's retrospective nature is a limitation.

T-385-P
Effect of Bariatric Surgery on Systemic and Adipose Tissue Inflammation

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Background: Bariatric surgery has shown promising benefits in decreasing and/or reversing metabolic disorders such as diabetes and cardiovascular disease. We hypothesized that adipose and systemic inflammation will be decreased post bariatric surgery. **Methods:** We prospectively enrolled patients undergoing Roux En Y gastric bypass (RYGB) and laparoscopic gastric band placement, collected serum and adipose tissue samples, and measured cytokine levels at the time of surgery, 2 weeks, and 6 months postoperatively. Preliminary data are presented for the first 8 RYGB subjects completed to date. Patient age, gender, presence of diabetes, and hypertension were reported. **Results:** We found a statistically significant change in the mean adipose tissue adiponectin values over time (p=0.001). There was a statistically significant increase in tissue levels of adiponectin from the day of surgery to both two week and 6 month follow-up (p=0.004 and p=0.007 respectively). We observed an initial decrease in serum adiponectin from time of surgery to two weeks and a slight increase from 2 weeks to 6 months postoperatively. The mean serum MCP1 value was significantly reduced from the day of surgery (p=0.035); however, the change between day of surgery and two-week follow-up was not statistically significant (p=.529). **Conclusions:** These results demonstrate an increase in adipose anti-inflammatory adiponectin and a decrease in pro-inflammatory MCP-1 post bariatric surgery. This is a potential mechanism by which bariatric surgery decreases or reverses insulin resistance.

T-386-P

Durability of Improvements in Insulin Secretion and Insulin Sensitivity 2 Years After Gastric Bypass: Results from the Longitudinal Assessment of Bariatric Surgery (LABS) Study

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Background: Patients with type 2 diabetes (T2DM) have impaired islet secretory capacity compared to those without (Controls). We hypothesized that insulin secretory capacity would improve in patients with T2DM after gastric bypass (GBP) but decrease in controls as insulin sensitivity improved with weight loss. **Methods:** 39 subjects with T2DM and 22 Controls were matched for BMI, sex, and age prior to GBP and underwent a meal test (BoostPlus) before, 6 months, and 24 months for fasting blood work and to calculate insulin sensitivity (SI), total insulin secretory rate (Φ), and disposition index (DI). **Results:** At 6 and 24 months, both groups lost weight (BMI's reduced 23% and 29% forT2DM subjects; 25% and 31% for Controls, respectively). 91% of T2DM subjects were in remission after 2 years. Fasting glucose, insulin, C-peptide, and proinsulin levels were lower at each follow-up visit in both groups (P<0.001 for all). Comparing baseline to 6 and 24 months, SI improved 41% (P=0.016) and 69% (P<0.001) in T2DM, and 47% (P=0.007) but then down to 35% (P=0.09) in Controls. Compared to baseline, after 6 months Φ increased 30% in T2DM subjects (P=0.011), but not Controls. By 24 months, Φ was not different from baseline in either group. Disposition Index (DI) increased in T2DM at both 6 (+55%, P=0.034) and 24 months (+64%, P=0.024), but did not change in Controls. Hepatic extraction index for insulin did not change in either group during follow-up. **Conclusions:** Remission of diabetes following GBP is initially (6 months) due to both improvement in Φ and SI. Remission of diabetes after 24 months is primarily due to continued improvements in SI, increasing DI despite a reduction in Φ from 6 to 24 mos. Longer term followup of the LABS diabetes cohort will determine if continued deterioration in Φ occurs predicts re-emergence of T2DM after GBP.

T-387-P

Changes in Gut Hormones in Patients with Type 2 Diabetes Randomized to Roux-en-Y Gastric Bypass or Intensive Lifestyle and Medical Management

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Background: The mechanisms by which Roux-en-Y gastric bypass (RYGB) improves T2DM likely include changes in neurohormonal regulators of energy and glucose homeostasis. This is an ancillary investigation of the Diabetes Surgery Study (DSS), a multicenter trial of 120 patients with T2DM randomized to lifestyle modification and intensive medical management (LS/IMM) or RYGB with LS/IMM (RYGB). Our objective was to characterize hormone changes associated with glycemic changes in RYGB versus LS/IMM. **Methods:** Fasting and postprandial blood samples after a standard meal were drawn prior to and 1y after randomization from 34 patients in each group at 2 of 4 study sites. Area under the curve (AUC) from 0-120 minutes was computed. **Results:** At baseline, pts had mean BMI 35.7 kg/m2 and HbA1c 9.7%. At 1y, there were significant differences between LS/IMM and RYGB in wt loss, 9.2% vs 28.1% (p<0.0001), HbA1c, 7.4% vs 6.4% (p=0.0004), and fasting glucose, 151 vs 117 mg/dl (P=0.005), respectively. Insulinogenic index (change in insulin/change in glucose from fasting to 30min) increased in RYGB (0.24 to 0.51; P=0.006) but not LS/IMM (0.30 to 0.35; P=0.4) pts. RYGB pts had a 69% increase in GLP-1 AUC (P=0.001), with no significant change in LS/IMM (P=0.005 between groups). GLP-2 AUC increased 36% (P<0.01) after RYGB, but decreased 22% (P=0.02) after LS/IMM (P<0.001 between groups). GIP AUC decreased 26% after RYGB (P=0.0001) but did not change (P=0.50) after LS/IMM (P<0.001 between groups). A significant and similar decrease in fasting glucagon occurred in both groups. Glucagon AUC decrease of 15% was only significant in LS/IMM patients (P=0.02), but the change over time was not different between groups (P=0.39). **Conclusions:** There was greater improvement in

glycemia and a different pattern of change in gut hormone levels one year after RYGB compared with LS/IMM patients.

T-388-P

Effects of Roux-en-Y Gastric Bypass Versus Gastric Banding on B-Cell Function in Patients with Diabetes at Matched ~10% and ~25% Weight Loss

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Background: It is highly debated if the altered nutrient route after Roux-en Y gastric bypass (RYGBP) improves type 2 diabetes (DM2) independent of weight loss (WL). **Methods:** Obese subjects with DM2 were studied presurgery (PS) and after RYGBP or gastric banding (GB) (n=6/group) at ~10% and ~25% WL with: 1) a 3h 50g oral glucose tolerance test (OGTT); 2) an isoglycemic IV glucose clamp (iso-IVGC); 3) frequently-sampled IV glucose tolerance test. Calculations: Insulin secretion rate (ISR, pmol/kg/min), derived from C-peptide deconvolution; β-cell glucose sensitivity (BCGS, pmol/kg/min/mmol)=slope of ISR vs. plasma glucose; disposition index (DI)=BCGS/HOMA-IR. BCGS and DI are measures of β-cell function. Mean±SD. **Results:** PS, subjects in the RYGBP and GB groups did not differ in age, DM2 duration and control, weight, BMI, ISR or β-cell function. After matched WL (9.5±1.4 vs. 10.3±2.3%; 27.5±3.0 vs. 25.8±7.2%, p=NS), a similar improvement in insulin sensitivity and a small, comparable increase in ISR and β-cell function, during the iso-IVGC, was observed in both groups. In contrast, after oral glucose there was a significantly greater improvement in β-cell function after RYGBP vs. GB at 10% WL (BCGS: p=.037; DI: 0.28±0.14 vs. 0.03±0.14, p=.025), that persisted at 25% WL (BCGS: p=0.28; DI: 0.75±0.38 vs. 0.53±0.48, p=0.39), albeit non-significantly. Data from n=8/group will be presented. **Conclusions:** After matched 10% and 25% WL, RYGBP and GB led to comparable improvements in insulin sensitivity. After weight loss, improvement in β-cell function during the iso-IVGC was small but similar between surgical groups, while improvement during oral glucose stimulation was dramatically greater after RYGBP vs. GB. These data suggest that the altered nutrient route has an independent effect on the improvement in β-cell function after RYGBP.

T-389-P

Roux-en-Y Gastric Bypass and Laparoscopic Gastric Banding Surgeries Affect the Dynamics of Gut Microbial Ecology and Metabolism

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Background: The gut microbiome in obese individuals contains microorganisms that increase the host's energy extraction. Bariatric surgeries, Roux-en-Y Gastric Bypass (RYGB) and Laparoscopic Gastric Banding (LAGB), change the habitat for the gut microbes and, therefore, the microbiome's structure and function. The aim of this study was to evaluate changes in the colonic microbiome structure and function after bariatric surgery. **Methods:** Using pyrosequencing targeting bacterial 16S rDNA, we analyzed the fecal microbiome's structure in patients that underwent RYGB and LAGB surgeries, as well as normal-weight and obese individuals. To better understand microbiome function and its effect on host metabolism, we measured fecal pH, soluble chemical oxygen demand (SCOD), and short-chain fatty acids (SCFAs). **Results:** LAGB and RYGB groups had more Proteobacteria (mainly Enterobacteriales) than obese and normal-weight groups, due to the nature of surgeries. Prevotella, a carbohydrate-degrading genus, was more abundant in RYGB than in obese and normal-weight groups, due to increasing carbohydrate delivery to the colon after bariatric surgery. Fecal SCOD was the highest in obese group and descended in the following order: LAGB, RYGB, normal-weight groups. SCFAs, propionate, caproate, and butyrate, were more abundant in obese and unsuccessful bariatric surgery groups than in the successful bariatric surgery and normal-weight groups. Fecal pH was the lowest in the obese group, which can be explained by higher production of fermentation products. **Conclusions:** Bariatric surgery changes the gut microbiome, favors the presence of Proteobacteria, and shifts the microbiome's structure towards the microbiome in normal-weight individuals. The abundance of fermentation products seems to correlate with the state of weight-loss and could be key to understanding the pathogenesis of obesity.

T-390-P

GLP-1 Secretory Dynamics in a Man with Colectomy and Ileostomy: Preserved Pulsatile Release at Markedly Higher Circulating Concentrations and Disrupted Coupling with Glucose and Insulin

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Background: Blunted intestinal GLP-1 release with compromised insulin sensitivity has been reported in subjects without a colon. Objective: To assess GLP-1 secretory properties in a male without colon. **Methods:** Study subject: 71 y/o male with colectomy. Control group: 8 healthy men (age 19-60 yrs). Subjects were studied on 2 occasions after an overnight fast, followed by ingestion of either 75 grams of dextrose solution or water. Sessions started at 0800-0900 hr, and continued for 6.5 hrs. Blood was collected at 10-min intervals for measurement of glucose (mg/dL), insulin (μU/mL), and GLP-1 (pmol/L). Secretory pattern of GLP-1 was assessed by deconvolution analysis. ApEn and cross-correlation analyses were used to assess pulse regularity and correlations among glucose, GLP-1, and insulin. **Results:** Subject with colectomy had (1) markedly elevated mean 6.5 hr GLP-1 concentration on control (17 ± 0.4 v 0.26 ± 0.02;P<0.0001) and dextrose (19 ± 0.3 v 1 ± 0.1;P<0.0001) days; (2) blunted response to dextrose intake (8% v 288%); (3) comparable glucose (98 ± 3 v 98 ± 4;P=NS) and insulin (20 ± 4 v 29 ± 5;P=NS) responses to dextrose ingestion; (4) preserved pulsatile GLP-1 release with 85/25 (control/dextrose) fold increases in total GLP-1 secretion, due to augmented basal and pulsatile release; (5) delayed cross-correlation of GLP-1 with glucose (70 v 10 min lag), and obliterated insulin/GLP-1 coupling. **Conclusions:** Pulsatile release of GLP-1 in a subject with colectomy is characterized by increased secretion rate, but unchanged glucose/insulin homeostasis regardless of blunted GLP-1 response to dextrose ingestion and disrupted cross-correlation among glucose, GLP-1, and insulin.

T-391-P

Overnutrition Stimulates Intestinal Epithelium Proliferation Through β-Catenin Signaling in Obese Mice

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Background: Obesity is a major risk factor for type 2 diabetes and cardiovascular diseases. And overnutrition is a leading cause of obesity. After they are ingested, most nutrients are absorbed in the small intestine. Signals from β-catenin are essential to maintain development of the small intestine and homeostasis. **Methods:** In this study, we employed a hyperphagia db/db obese mouse model and a high fat diet induced obese mouse model to investigate the effects of overnutrition on intestinal function and β-catenin signaling. **Results:** The β-catenin protein was upregulated along with inactivation of glycogen synthase kinase-3β (GSK-3β) in the intestines of both db/db and HFD mice. Proliferation of intestinal epithelial stem cells, villi length, nutrient absorption and body weight also increased in both models. These changes were reversed by caloric restriction in db/db mice and by β-catenin inhibitor JW55 (a small molecule that increase β-catenin degradation) in HFD mice. Parallel, in vitro experiments showed that β-catenin accumulation and cell proliferation stimulated by glucose were blocked by the β-catenin inhibitor FH535. And the GSK-3 inhibitor CHIR98014 in an intestinal epithelial cell line increased β-catenin accumulation and Cyclin D1 expression. **Conclusions:** These results suggested that, besides contribution to intestinal development and homeostasis, GSK-3β/β-catenin signaling plays a central role in intestinal morphological and functional changes in response to overnutrition. Manipulating the GSK-3β/β-catenin signaling pathway in intestinal epithelium might become a therapeutic intervention for obesity induced by overnutrition.

T-392-P

GLP-1 Improves Endothelial Dysfunction After Roux-en-Y Gastric Bypass Independently from Body Weight Loss

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Background: The mechanisms of cardiovascular protection after RYGB are still unclear but seem partly weight-independent. Insulin and GLP-1 have endothelial protective actions through endothelial-NO-synthase (eNOS) activation. Here, we investigated the role of insulin and GLP-1 in obesity-induced endothelial dysfunction in rats after RYBG, prior to significant weight loss. **Methods:** Male Wistar rats were exposed for 7 weeks to a high-fat high-cholesterol diet and were RYGB or sham operated. Sham rats were fed ad lib (AL) or body weight-matched (BWM) to RYGB; part of RYGB rats received exendin-9 chronically after surgery. Aortic rings were collected 8 days post-surgery and suspended for isometric tension recordings. Cumulative relaxation responses were performed to insulin and GLP-1 after contraction with norepinephrine. Western blotting of aortic lysates for the GLP-1 receptor and eNOS was performed to address the role of GLP-1 signaling in endothelial function. GLP-1 plasma levels were measured. **Results:** On day 8 post-surgery, the weight difference among the 3 groups was not yet significant; plasma fasting levels of GLP-1 were increased after RYGB compared to sham AL and BWM. Insulin and GLP-1-induced vasorelaxation was improved in RYGB compared to sham AL and BWM rats; the improvement of insulin-induced vasorelaxation was absent in RYGB rats after chronic exendin-9 treatment. In vitro, the eNOS blocker L-NAME inhibited insulin- and GLP-1-induced vasodilation, and exendin-9 blocked the effect of GLP-1. GLP-1 receptor protein expression was lower in aortic lysates from sham AL and BWM compared to RYGB; eNOS expression was also reduced. **Conclusions:** Our study suggests that GLP-1 may be a crucial mediator of the cardiovascular protective effects of RYGB and the early improvement of vasorelaxation induced by insulin or GLP-1.

T-393-P

Roux-en-Y Gastric Bypass Surgery (RYGB) in Combination with Estradiol (E2) Treatment Increases the Number of PYY Cells in the Roux Limb of Ovariectomized (OVX) Rats

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Background: RYGB surgery increases the number of enteroendocrine cells in the Roux limb and the common channel of the small intestine in rat models. Furthermore, both basal and meal-stimulated plasma concentrations of the anorexigenic gut hormone PYY are increased in rats and human RYGB patients. We recently showed that in OVX female rats, E2 increased the anorexigenic and weight-reducing effects of RYGB. The aim of this study was to investigate in OVX rats (a) whether RYGB affects the number of PYY-expressing L-cells in the Roux limb or common channel compared to the corresponding locations in sham-operated animals and (b) whether this depends on E2. **Methods:** OVX and RYGB were done in a single surgery in rats fattened with Ensure diet, and either cyclic E2 treatment or OIL control treatment was begun 12 d later. Intestines were harvested on day 24 post-surgery and then processed for PYY immunocytochemistry. **Results:** There were no differences in the number of PYY cells in the jejunum of SHAM rats. The number of PYY cells in jejunal Roux-limb samples was increased in E2-treated, but not OIL, rats. Surprisingly, however, the number of PYY cells in ileal common-channel samples was increased in OIL, but not E2-treated, rats. **Conclusions:** These results suggest that E2 may potentiate the effects of RYGB on eating and weight loss in OVX rats by increasing PYY secretion from Roux-limb PYY cells.

T-394-P

Affymetrix Analysis of Altered Small Intestinal Gene Expression in Female Rats with Roux-en-Y Gastric-Bypass (GB) Surgery

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Background: GB surgery decreases eating and body weight in male rats, and estradiol (E2) vs. oil (O) treatment increases these effects in ovariectomized (OVX) female rats. Increased satiation due to increased gut-peptide secretion is likely to be an important mediator of these effects. We recently found that GB, but not E2, increased the density of PYY-expressing cells in common-channel ileal samples, whereas E2, but not GB, increased the density of PYY-expressing cells in Roux limb-jejunal samples. To further investigate the potential mediators of the effects of RYGB on eating and weight regulation, and the estrogenic potentiation of these effects, we performed an Affymetrix screen of expression levels of ~17 K genes. **Methods:** . As a preliminary analysis, t-tests were done contrasting fold-differences in gene expression in jejunal-ileal samples from SH-O and GB-O rats. This yielded 36 significant effects with $\alpha = 0.0001$, compared to expectation of ~17 false-positive significances. **Results:** Eight significant differences were in genes related to cell function, 2 genes were transcription factors, 4 were immune-related, and 4

were gut-function related. One of these 4 genes was potentially related to gut-peptide function; the monovalent cation-specific transient receptor potential channel type M5 (TRPM5) was down-regulated 2-fold. Interestingly, gutTPRM5 is up-regulated in gastric mucosa of obese humans and may influence ghrelin and CCK secretion. We also found 24 different gene-expression significances between GB-O and GB-E2 rats: 5 in cell-function genes, 2 transcription factors, 6 immune-related, and 4 gut-function related genes, however none of which seemed related to gut-peptide function. **Conclusions:** We conclude that Affymetrix analysis may provide valuable clues for understanding the therapeutic and side effects of GB.

T-395-P
Insights Into Underlying Mechanism and Improved Efficacy of the Adjustable Gastric Band

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Background: Currently, bariatric surgery remains the only effective treatment for morbid obesity. Laparoscopic adjustable gastric banding (LAGB) is one of the most commonly performed bariatric procedures; however, the mechanism(s) underlying its efficacy are unclear. This study aims to elucidate the role of sensory neural pathways in mediating AGB-induced satiety in a rodent model and assess the effectiveness of adjuvant therapies on AGB-induced weight loss. **Methods:** Adult male Sprague Dawley rats (n=8/group) were fitted with an AGB, just below the gastro-oesophageal junction. To determine the importance of vagal sensory afferents in mediating the increase in neural activation following gastric band inflation, capsaicin was used to ablate unmyelinated c-fibres. Biotelemetry devices implanted between the interscapular lobes of brown adipose tissue (BAT) were used to assess the impact of AGB on energy expenditure in BAT. Pharmacological agents (thyroxine and Contrave) were combined with AGB inflation for four weeks to assess their impact on AGB induced weight loss. **Results:** Capsaicin treatment resulted in a complete elimination of the elevated Fos labelling in the NTS but only a partial attenuation of AGB induced weight loss. Furthermore, AGB induced reductions in body weight and fat mass in obese rats are associated with reductions in energy expenditure that can be effectively ameliorated by co-treatment with factors such as thyroid hormone, which increase energy expenditure in BAT (p<.05). **Conclusions:** These data support the hypothesis that LAGB exerts its effects via the modulation of both, neural and hormonal pathways. Adjuvant therapies that increase energy expenditure can enhance the effectiveness of the AGB.

T-396-P
Mini Vertical Sleeve Gastrectomies Suggest Role of Rapid Gastric Emptying in Weight Loss Following Bariatric Surgery

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Background: The mechanisms of weight loss after Vertical Sleeve Gastrectomy (VSG) are not completely understood. The rat stomach consists of two parts that are morphologically and functionally different. The proximal part is thin and membranous. It regulates gastric emptying by maintaining intragastric pressure. The distal part is thick and glandular and is involved in mechanical processing of food. The VSG operation in a rat model has two components - the complete removal of the proximal part (proximal resection-PR) and the partial removal of the distal part (distal resection- DR) along the greater curvature. Rapid gastric emptying seen after VSG may play a role in weight loss. Since the proximal part of the stomach expands upon arrival of food and prevents rapid gastric emptying, we predicted that PR will play an important role in weight loss following VSG. Our hypothesis was that weight loss will be greatest for the rats with VSG, followed by VSG components PR and DR respectively as compared to sham operated rats (Sham). **Methods:** Two cohorts of male Long Evans rats, LF on regular chow and HF on high fat diet, were operated for VSG, PR, DR, and Sham (n=6 for LF and n=10 for HF in each surgical group). **Results:** The resultant average body weight for PR was significantly lower than Sham but higher than VSG. No weight loss was observed for DR as compared to the Sham. NMR analysis of body composition showed the difference in total body weights was due to the difference in body fat. Gastric emptying analysis with both the oral acetaminophen test as well as the planar gamma imaging study showed significantly higher gastric emptying rates for PR and VSG as compared to Sham and DR.

Conclusions: Thus, the study presents strong evidence for the role of rapid gastric emptying in weight loss following VSG.

T-397-P
Endocrine Responses to Gastric Bypass Surgery in Diet Induced Obese Rhesus Macaques

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Background: Roux-en-Y gastric bypass (RYGB) surgery is an effective and durable treatment for obesity and improves the majority of its comorbidities such as diabetes, hypertension and hyperlipidemia. This study establishes a model of RYGB in diet-induced obese Rhesus Macaques. **Methods:** Twenty obese animals were selected (14 males and 6 females) of which 13 were insulin resistant and 7 required insulin treatment to manage diabetes. In the first phase, animals were food restricted to determine the effects of caloric restriction. In the 2nd phase, after regaining body weight, animals were divided into a group receiving RYGB and one receiving a sham surgery and pair fed to the RYGB group (SHAM/PF). **Results:** After 12 weeks of calorie restriction, we observed 12% weight loss. This improved glucose homeostasis and insulin resistance, however diabetic animals still required insulin therapy. Energy expenditure was proportionally reduced in response to the weight loss as measured by indirect calorimetry. After surgery, food intake was reduced by 80% in the first 2 weeks but returned to pre-surgery levels at week 12. Sham/PF animals lost 13% of their body weight compared to 24% in the RYGB group. Animals had a greater improvement in HOMA-IR and fasting insulin levels following RYGB compared to SHAM/PF or diet restriction alone. Surprisingly, both SHAM/PF and RYGB had similar improvements in glucose stimulated insulin secretion. Consistent with this, there were no changes in islet morphology, size distribution or proliferation. Interestingly, during this 12-week study, RYGB as well as SHAM/PF diabetic animals were able to maintain normal glucose levels without insulin. **Conclusions:** This study demonstrates that RYGB in NHP improves glucose tolerance, but that the caloric restriction following surgery could contribute to the initial improvement in glucose homeostasis.

Thursday, November 14, 2013
**Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A**

GI Hormones, Satiety, and Microbiome

T-398-P
Changes in Pancreatic Polypeptide Responses to a Solid Meal Test Differ During the First Year After Laparoscopic Gastric Bypass vs. Adjustable Gastric Banding

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Background: Animal models implicate a role for vagal nutrient sensing in metabolic changes after gastric bypass (GBP). Pancreatic polypeptide (PP) is considered a plasma marker of pancreatic efferent vagus nerve (VN) activity in humans. **Methods:** We compared plasma PP responses during and 3h after a solid meal test (MT) in obese, healthy patients (38±8yr) having GBP (9F) with preservation of the VN or adjustable gastric banding (AGB; 5F/1M) before (PRE), and ~2 months (2MO) and 1 year (1YR) after surgery. Concurrent changes in weight (WT), fat (FM) or fat-free mass (FFM) (DXA) and plasma fasting, peak and max meal responses (MAX=peak-fast) of PP, insulin and aGLP-1 were compared between and within groups by Student's and paired t tests; effects of surgery (TX) and changes in WT, FM or FFM on PP MT response curves were assessed using mixed model ANOVA for repeat measures. **Results:** All PRE-op PP measures were similar for GBP and AGB and inversely related to WT, FM and FFM. By 2MO, PP peak levels and MAX response were lower post-GBP (p=0.003); in mixed models, TX and WT, FM or FFM losses were independent factors for a lower response (all p<0.0001). PP responses were unchanged after AGB at 2MO. MAX PP responses were associated with MAX aGLP-1 in GBP (r=0.68; p=0.05) and AGB (r=0.95; p=0.004). At 1YR, PP responses in GBP were not different

from PRE levels, but associated with WT (p=0.03) or FM (p=0.05) loss. In AGB, PP response patterns were greater than PRE levels with both TX (p=0.001) and FM loss (p=0.04) as independent factors; MT peak and MAX PP were associated with insulin peak (r=0.91; p=0.01) and MAX (r=0.97; p=0.001). **Conclusions:** GBP results in a relative transient decrease in PP response to a solid MT, while PP responses increased following AGB in the longer term indicating differing effects of these procedures on VN efferent signaling.

T-399-P
Satiety Responses to High-Fat Meals of Varying Fatty Acid Composition in Obese Women

Jada L. Stevenson, Hui Chang, Sridevi Krishnan, Jamie A. Cooper *Lubbock, TX*

Background: To determine the response of the satiety hormone, peptide YY (PYY), and subjective feelings of hunger and fullness after high-fat (HF) meals rich in either monounsaturated (MUFAs), polyunsaturated (PUFAs), or saturated fatty acids (SFAs). **Methods:** This single-blind crossover study was designed to test three HF meal (70% of energy) conditions rich in MUFAs, PUFAs, or SFAs in twelve obese women. Height, weight, body composition and a fasting blood sample were collected. Participants then consumed a HF meal and postprandial (PP) blood draws were collected over 5h (30, 60, 90, 120, 150, 180, 240, and 300min). A visual analog scale (VAS) to assess hunger and fullness was completed with each blood draw. A buffet-style lunch was provided 5h after the HF meal and macronutrient and total energy consumption were measured. **Results:** The PYY response to the PUFA-rich meal was significantly higher (p<0.001), than the MUFA- or SFA-rich meals (mean change in PP PYY for PUFA: 28.0±4.3pg/mL, MUFA: 17.0±3.4pg/mL, and SFA: 12.6±4.6pg/mL). The PUFA-rich meal also elicited the greatest feelings of fullness compared to MUFA- and SFA-rich meals (PP average for PUFA: 46.6±8.4mm, MUFA: 40.4±7.4mm, SFA: 40.6±7.7mm, p<0.01, respectively). No differences in hunger or how much they thought they could eat were found between the meals. There were no differences in the amount of energy consumed or type of macronutrients consumed during the buffet-style meal between the visits. **Conclusions:** HF meals rich in PUFAs elicited the greatest PYY response versus meals rich in MUFAs or SFAs in obese women.

T-400-P
Effects of Acute and Longer-Term Dietary Restriction on Upper Gut Motility, Hormone, Appetite and Energy Intake Responses to Duodenal Lipid in Lean and Obese Males

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Background: 4-day 70% energy restriction enhances gastrointestinal (GI) sensitivity to nutrients, associated with enhanced energy intake-suppression by lipid. Whether these changes occur with 30% energy restriction and are sustained in the longer-term is unknown. We hypothesized that: i) in lean and obese, 4-day 30% energy restriction would enhance the effects of intraduodenal lipid on GI motility, gut hormones, appetite/energy intake, and ii) in obese, 12-week energy restriction associated with weight loss would diminish the effects of acute energy restriction on the responses to intraduodenal lipid. **Methods:** 12 obese males were studied before, and after four days ("day-5"), four ("week-4") and 12 weeks ("week-12"), 12 lean males before and after four days, on a 30% energy restricted diet; each time antropylorodo-denal pressures, gut hormones and appetite were measured during a 120-min (2.86 kcal/min) intraduodenal lipid infusion and energy intake at a buffet-lunch. **Results:** On day-5, fasting cholecystokinin (CCK) was less, and ghrelin increased, in lean (P<0.05), but not obese, and lipid-stimulated CCK and peptide-YY (PYY) and desire-to-eat were greater in both groups (P<0.05), with no difference in energy intake, compared with baseline. In obese, 12-week energy restriction led to weight loss (9.7(0.7) kg). Lipid-induced basal pyloric pressure (BPP), PYY and desire-to-eat were greater (P<0.05), while the amount eaten was less (P<0.05), at week-4 and week-12 compared with baseline. **Conclusions:** 4-day 30% energy restriction modestly affects the responses to intraduodenal lipid in health and obesity, but not energy intake, while 12-week energy restriction, associated with weight loss, enhances lipid-induced BPP and PYY, and reduces food intake (despite increased de-sire-to-eat), suggesting that energy restriction increases GI "sensitivity" to lipid.

T-401-P
Correlation of Gut Hormones with Body Composition Characteristics in Obese Children

Peyvand Amini, Farrell Cahill, Danny Wadden, Pardis Pedram, Wayne Gulliver, Edward W. Randell, Tracey Bridger, Hongwei Zhang, Guang Sun *St.John's, Canada*

Background: Gut hormones and adipokines are important factors in the regulation of energy homeostasis via their orexigenic or anorexigenic effects. However, their role in the regulation of body composition in obese children is still largely unknown. The main objective of this study was to investigate the associations of ghrelin, GLP-1, PYY, leptin and TNF-α with body composition in obese children. **Methods:** 124 obese children (65 girls, 59 boys) between the ages 6-17 years with BMI ≥ 85th percentile, were enrolled in this study. Gut hormones (ghrelin, GLP-1, PYY), leptin and TNF-α were measured using the magnetic bead–based multiplex kit (Millipore). Body composition measurements were performed using dual-energy X-ray absorptiometry (DXA) lunar Prodigy. **Results:** Obese girls had significantly higher leptin (p value = 0.002) but lower TNF-α (p value= 0.007) compared to boys. There was a significantly positive correlation between leptin and body fat percentage (BF%) in obese children (r = 0.73, p < 0.001). In the next step subjects were divided in to two groups based on their gender. In boys, leptin was the only hormone that was significantly correlated with the BF% (r = 0.67, p < 0.001). However, in girls a negative correlation between ghrelin and BF% (r = -0.36, p value = 0.02), and a positive correlation between GLP-1 and leptin and BF% (r = 0.28, p value =0.03, and r = 0.74, p value < 0.001 respectively) were revealed. **Conclusions:** Our results provided further evidence on the role of ghrelin and GLP-1 in the regulation of body composition in obese girls. The gender difference warrants more study.

T-402-P
Gut Hormones and Childhood Obesity in the Newfoundland Population

Danny Wadden, Peyvand Amini, Farrell Cahill, Pardis Pedram, Tracey Bridger, Wayne Gulliver, Edward W. Randell, Guang Sun *St. John's, NL, Canada*

Background: The prevalence of childhood obesity has dramatically risen globally and the immediate health effects can include risk factors for cardiovascular disease, diabetes, bone/joint problems, sleep apnea and psychological problems. Peripheral signals (hormones) secreted from the gastrointestinal tract (gut) have been suggested to be involved in energy homeostasis in adults, however, whether gut hormones are important in the etiology of childhood obesity is unclear. Our objective was to seek evidence by comparing the concentrations of three functionally related gut hormones, glucagon-like peptide-1 (GLP-1), ghrelin and peptide YY (PYY) between a cohort of obese children and a healthy control group. **Methods:** Forty-four obese children from our ongoing Newfoundland Childhood Obesity Study were matched by age and gender with seventeen healthy controls from our CODING Study. Anthropometric measures were taken and body composition was assessed using dual-energy X-ray absorptiometry. Serum concentrations of gut hormone GLP-1, ghrelin and PYY were measured with the Luminex MagPix system utilizing Milliplex magnetic bead assays (multiplexed). T-tests and ANCOVAs were used to compare gut hormones between the matched groups. **Results:** Student t-test analyses showed that circulating ghrelin and GLP-1 concentrations were lower in the childhood obese group as compared to the control cohort (ghrelin: P=0.040, GLP-1: P=0.001). However no differences existed between the groups for serum PYY concentration (P=0.503). When an ANCOVA was performed controlling for age, the significance became borderline for ghrelin (0.05), but remained significant for GLP-1 (0.004) and unchanged for PYY (0.445). **Conclusions:** Our research findings emphasized the important role of ghrelin and GLP-1 in childhood obesity in the Newfoundland population.

T-403-P

Significant Association of Dietary Macronutrient Intake with Serum Gastrointestinal Hormones in Obese Children

Farrell Cahill, Danny Wadden, Peyvand Amini, Tracey Bridger, Wayne Gulliver, Guang Sun *Logy Bay, Canada*

Background: Gastrointestinal (gut) hormones play an important role in the regulation of food intake and metabolism. Dysregulation of gut hormones are often seen in obese children. However, there is very little data regarding the effect of macronutrients (fat, protein and carbohydrates) intakes on circulating levels of gut hormones in childhood obesity. **Methods:** In the present study we investigated the relationship between dietary intake of fat, protein and carbohydrates with fasting serum ghrelin, PYY, GLP-1 and leptin (Luminex MAGPIX platform using milliplex magnetic bead assays) in 100 obese children (6-17yr with BMI > 90th percentile) recruited from the Newfoundland population. Macronutrient intake was evaluated using the Willet Food Frequency Questionnaire and computed with Nutribase software. Obese children were ranked and divided into tertiles (Low, Medium, High) based upon dietary intake of fat, protein, carbohydrates. One-way analysis of variance was used to assess the association of macronutrient intakes with the four hormones. **Results:** Obese children with high dietary fat intake had significantly lower levels of PYY (66.27 ± 43.1 vs 42.43 ± 28.1pg/ml, P = 0.029), GLP1 (18.48 ± 9.2 vs 13.61 ± 5.8pg/ml, P = 0.038), and leptin (26.98 ± 14.3 vs 19.67 ± 9.9ng/ml, P = 0.04). Higher circulating levels of ghrelin (19.86 ± 12.6pg/ml vs 38.8 ± 30.3pg/ml, P = 0.049) were found in those with high carbohydrate intake. The dietary intake of protein was not significantly associated any of the four hormones in obese children. **Conclusions:** In summary, our results provide evidence that lowering dietary fat and carbohydrate intakes may help to normalize circulating gut hormones which are associated with lower body fat.

T-404-P

Association of the Intestinal Microbiome with Obesity and Comorbidities in Children

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Background: Comparison of the intestinal microbiota in normal and obese adults has revealed differences in bacterial composition and diversity. Little is known about the impact of the microbiome on pediatric obesity and its complications. **Methods:** We analyzed the fecal microbiomes of 11 obese children (mean BMI%tile 98.51) and 3 normal (mean BMI%tile 80.33) children. Samples were analyzed using PCR with primers for the 16SrDNA region and analyzed using Nextgen sequencing. Correlations and non-parametric analyses were used; significance p<0.05. **Results:** We found that bacteria in the Firmicutes phyla are more abundant in normal controls (81%) than obese children (64%). Firmicutes were the dominant phylum in 9 obese patients and all 3 controls. There was a trend toward more Bacterioidetes in obese patients (32% versus 16%). Linear regression shows a trend towards increasing BMI as the ratio of Bacterioidetes increases. (R2 = 0.223) There was a positive correlation between an increasing Firmicutes ratio and vitamin D deficiency (p = 0.01). Higher Firmicute populations trended towards a higher microbiome diversity (p = 0.15), Children with an increasing Bacterioidetes population trended towards a negative correlation with diversity (p=0.253). Children with high ALT (NASH) correlated with low diversity (p=0.05). **Conclusions:** We found that morbidly obese children may have different microbial profile than non-obese controls, in terms of complexity and diversity.

T-405-P

Serum Acylated Ghrelin Is Negatively Correlated with High Sensitivity C - Reactive Protein in the Newfoundland Population

Peyvand Amini, Danny Wadden, Farrell Cahill, Pardis Pedram, Sangeetha Vidyasankar, Wayne Gulliver, Edward W. Randell, Hongwei Zhang, Guang Sun *St.John's, Canada*

Background: Ghrelin is an orexigenic gut hormone released from the gastric fundus. This gut hormone is known to initiate food intake and is therefore involved in energy homeostasis. Recently, data from in vitro studies have shown that ghrelin receptors are expressed on human T cells, and that ghrelin can suppress the production of inflammatory cytokines. The objective of this study was to investigate the association between ghrelin and high sensitivity

C- reactive protein (hs-CRP), one of the most important acute phase reactants involved in the inflammation processes, in a large population based study. **Methods:** 2220 subjects from the CODING (Complex Diseases in the Newfoundland population: Environment and Genetics) study were enrolled in our investigation. Serum ghrelin was measured with an ELISA Kit (Spibio-bertin pharma). hs-CRP was measured by the nephlometric method (Beckman Coulter). Dual energy X-ray absorptiometry (DXA) was performed for the measurement of body composition. Multiple regression analyses were used to explore the potential association between circulating acylated ghrelin and hs-CRP adjusting for age, gender, percentage of body fat, physical activity, smoking, alcohol consumption and fasting blood glucose. **Results:** Multiple regression analyses revealed a significant negative correlation between ghrelin and hs-CRP (unstandardized β = -0.06, p = 0.02). After dividing the subjects in to normal weight, overweight and obese groups, based on the Bray criteria, the correlation remained significant only in normal weight group (unstandardized β = -0.18, p < 0.001). **Conclusions:** This study suggests that circulating ghrelin is inversely associated with the inflammatory marker CRP, in the general population, and this effect is more evident in normal weight individuals.

T-406-P

Docosahexaenoic Acid (DHA) Attenuates Postprandial Hyperlipidemia by Activating Peroxisome Proliferator-Activated Receptor-Alpha (PPAR alpha) in Intestinal Epithelial Cells

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Background: Postprandial hyperlipidemia is a risk of cardiovascular disease. Dietary fat contributes to this condition through the production of chylomicrons in the small intestine. Peroxisome proliferator-activated receptor-α (PPARα), which regulates lipid metabolism in peripheral tissues such as the liver, is expressed in intestinal epithelial cells; PPARα activation reduces circulating triacylglyceride (TG) levels. Docosahexaenoic acid (DHA) is a well-known dietary fat that reduces plasma TG levels. However, its effects on intestinal lipid metabolism and postprandial TG response are not fully understood. Therefore, we aimed to explore the effects of DHA on intestinal lipid metabolism and postprandial TG response. **Methods:** In Caco-2 cells, the effects of DHA treated for 48 hours on mRNA expressions of fatty acid oxidation related genes, the activity of fatty acid oxidation, and TG and apoB secretion were measured. In C57BL/6 mice and PPARα deficient mice, the effects of high fat diet containing DHA rich-fish oil on lipid metabolism in the intestine and the liver and postprandial TG secretion after olive oil administration were analyzed. **Results:** In Caco-2 cells, DHA increased fatty acid oxidation and reduced TG and apoB secretion. DHA-rich fish oil increased intestinal fatty acid oxidation in and attenuated plasma TG levels by decreasing TG secretion from intestinal epithelial cells after olive oil administration in C57BL/6 mice. Interestingly, these changes were not observed in the liver. Furthermore, the effects of DHA were abolished in PPARα deficient mice. **Conclusions:** These findings indicate that food-derived compounds such as DHA, which activate PPARα, are promising as regulators of postprandial hyperlipidemia via intestinal fatty acid oxidation.

T-407-P

A Moderate Bile Acid Supplementation in the Diet Induces Some Pathologic Features in Metabolic Syndrome

Reika Yoshitsugu, Keidai Kikuchi, Nobuyuki Fujii, Masahito Hagio, Hidehisa Shimizu, Hiroshi Hara, Satoshi Ishizuka *Sapporo, Japan*

Background: It has been reported that oral administration of cholic acid (CA) promotes energy expenditure. The effect should be considered as pharmacological because the CA concentration is extremely high. Bile acid (BA) secretion also increases in diet induced-obesity (DIO), but the increase is not so much as compared to that in the CA administration study. To elucidate the involvement of moderately increased BAs would contribute to the development of new therapeutic strategies against MS. **Methods:** WKAH/Hkm Slc male rats were fed an AIN-93-based diet with or without 0.05% cholic acid (CA) for 13 weeks, which would not promote apparent energy expenditure in the adipose tissues. We analyzed blood parameters including cytokines and lipids, BA composition in feces, changes in the gut permeability, and gene expressions in some tissues. **Results:** Significant increase was observed in serum AST, ALT, and TNFa. The moderate CA supplementation increased secondary BAs concentration in the feces as well as an increase in the gut

permeability. These are usually observed in DIO. Interestingly, a reduction in the plasma adiponectin was found in the CA group from 3 weeks without weight gain of the adipose tissue. At week 13, IL-10 expression was down-regulated in the mesenteric lymph nodes of the rats fed the CA diet. It is possible that tissues located geometrically close to intestine are relatively sensitive to BA fluctuation in gut contents. Some secondary BAs acids might be a key molecule to regulate IL-10 in mesenteric lymph nodes and serum and AST/ALT. **Conclusions:** The moderate CA administration affected the functions in hepatocytes, adipocytes and immune cells. On the other hand, there was no influence in glucose and lipid metabolism. An increase in BAs would induce some pathologic features in MS.

T-408-P
Identification of Unknown Bile Acids in Feces and Intestinal Contents in Rats Fed-High Fat Diet

Keidai Kikuchi, Nobuyuki Fujii, Reika Yoshitsugu, Masahito Hagio, Hidehisa Shimizu, Hiroshi Hara, Satoshi Ishizuka *Sapporo, Japan*

Background: Importance of bile acids (BAs) is reported both in beneficial and pathological aspects in diet-induced obesity (DIO). Looking into the composition of BAs, the composition appears diverse depending on the experimental design as well as source of the samples. We have already established a reliable extraction and analytical methods in BAs by using UPLC-MS and applied the method to some experimental studies of DIO. Already known BAs are obviously found in the biological samples, but some unidentified molecules were also found in the intestinal contents in experimental DIO. We have tried to identify some unidentified BAs in the experimental DIO and some other relevant studies. **Methods:** WKAH/HkmSlc male rats (3 weeks old) were fed AIN-93G-based control diet, high-fat diet (high sucrose or dextrin), or control diet supplemented with cholic acid (CA) (0.5 g/kg diet) for over 12 weeks. The CA-supplemented group is designed to mimic a BA increase under DIOs and it has been already confirmed that the supplementation level of CA would not induce apparent energy expenditure. The feces were collected every two weeks during the experiment and analyzed the concentration of each known BAs. The identification of some unknown BAs was done by UPLC-ESI/MS with some appropriate standards. **Results:** We have detected some conventional BAs such as deoxycholic acid (DCA) and some types of muricholic acids in the feces and intestinal contents. Almost no taurine- or glycin-conjugated BAs was found in the cecum, colon, and feces even in the rats fed high-fat diet. Interestingly, the concentration of 12-oxo-lithocholic acid has increased along that in DCA in all the treatment groups and the amount was much higher than lithocholic acid. **Conclusions:** Some unidentified BAs might be involved in DIO pathophysiology.

T-409-P
Ingestion of Cholic Acid Modulates the Gut Microbiota and Intestinal Epithelial Proliferation

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Background: Bile acid (BA) increases in the intestinal contents and feces under consumption of high-fat diet and some BAs, such as deoxycholic acid, have strong bactericidal activity. We investigated whether a cholic acid (CA) -supplementation in rats influences the intestinal epithelial proliferation and cecal microbiota, as well as the bile acid metabolism and serum biochemical parameters, **Methods:** WKAH/HkmSlc rats (3-week-old, male) were divided into two dietary groups, such as control group fed either an AIN-93 based diet or CA (2 g/kg diet)-supplemented diet for 10 days. The cecal microbiota was determined with 16S rRNA clone library method. We also measured cell proliferation in IEC-6 intestinal epithelial cell line in response to the sera or cecal contents from rats fed the diets. Some of the rats were irradiated with gamma-rays (0.65 Gy/min, 60Co) at the end of the dietary intervention and analyzed the intestinal epithelial proliferation histochemically assessed by bromodeoxyuridine-incorporation. **Results:** There was a significant increase in epithelial proliferation in CA-fed rats even after exposure to the gamma-rays. In the gut microbiota, population of Firmicutes was beyond 90% in the CA-fed rats. The proliferation of IEC-6 cells was promoted in the culture media supplemented with the sera or cecal contents from the rats fed the CA-supplemented diet. **Conclusions:** In the rats fed the CA-supplemented diet, the microenvironment of the intestinal epithelia included some promotional

factor for the epithelial proliferation. Such increased BA would regulate the gut microbiota as well.

T-410-P
Rats Maintained on a High-Energy Diet Show Increased Sham-Feeding Intake to Sucrose Solutions During the Dynamic Compared to Static Phase of DIO

Yada Treesukosol, Nu-Chu Liang, Timothy Moran *Baltimore, MD*

Background: The diet induced obesity (DIO) model involves presentation of a palatable, calorie-dense diet that animals will overeat and consequently gain weight. The model provides an experimental analogy for the overconsumption of high fat/high calorie foods that lead to obesity in humans. We have shown that rats increase meal size upon initial presentation of a high-fat diet. Meal size decreases with continual access. The increase may be attributed to increased orosensory stimulation and/or reduced sensitivity to postingestive inhibitory signals. During feeding both types of signals are simultaneously in play. **Methods:** Here, sham-feeding (SF) testing was conducted in rats fed a high-energy diet (HE) or 45% high-fat diet (HF) after short (dynamic) and longer (static) periods on the diet and after animals were returned to standard chow. Responses were compared to those of chow-fed controls (CHOW). The procedure involves allowing the rat to ingest a sucrose solution and then preventing accumulation in the stomach. Thus intake with minimized postingestive feedback can be measured. **Results:** We hypothesized enhanced orosensory stimulation across DIO elicited by exposure to the calorically-dense diets would generalize to increased intake of other palatable stimuli. Thus HE and HF groups would show increased SF intake: (1) during dynamic compared to static testing, and (2) compared to CHOW rats. Indeed, compared to responses during dynamic testing, HE rats decreased SF intake during the static phase. The HF and CHOW groups showed similar SF intake across all testing points. **Conclusions:** These findings support the hypothesis that orosensory stimulation across DIO is higher in the dynamic compared to static phase. However changes in orosensory stimulation do not necessarily generalize to increased intake of other palatable stimuli.

T-411-P
The Effect of Oats on Lipid Metabolism and Insulin Sensitivity in the Caenorhabditis Elegans Model

Chenfei Gao, Michael King, Krishna Patel, Frank L. Greenway, William D. Johnson, Roy J. Martin, YiFang Chu, Michael J. Keenan, Frederick M. Enright, Jolene Zheng *Baton Rouge, LA*

Background: Oats reduce body fat by introducing hypocaloric intervention, and/or by activating the PYY-NPY gut-hypothalamic axis. In addition to dietary fermentable and soluble fibers β-glucan, avenanthramides (Ave) are a group of unique phytochemicals that can only be found in oats. Ave is anti-inflammatory, has anti-oxidant capacity, improves lipid metabolism, disproportionally accumulates in heart tissues, and has been implicated to reduce coronary heart disease in humans. We hypothesize that oats increase insulin sensitivity, reduce body fat, and improve a healthspan in wild type Caenorhabditis elegans (N2) by activation of the daf-2 insulin/IGF-1 like receptor pathways, and the oats effect on healthspan will be abolished by hyperglycemia in presence of 2% added glucose. **Methods:** N2, null strains of sir-2.1(ok434)IV, daf-16(mgDf50)I, and daf-16(mgDf50)I;daf-2(m65)III were fed with E. coli (OP50), oats (0.5%, 1.0%, or 3.0%, Instant Oatmeal, QuakerOats, PepsiCo Inc.), which were compared to the same variety of worms fed E. coli and oats in the presence of glucose (2%). Lipid staining dye, Nile red, was selected to determine the intestinal fat deposition (IFD). **Results:** The pharyngeal pumping rate (PPR), a surrogate marker of lifespan, was assessed as a measure of healthspan. IFD was dose-dependently reduced (P<0.05) after feeding oats in N2, daf-16(mgDf50)I;daf-2(m65)III, daf-16(mgDf50)I, but not in sir-2.1(ok434)IV, which indicates that the lipid effects of oats is dependent on sir-2.1and not daf-2 signaling. Oats increased PPR in all four strains (P<0.05). **Conclusions:** These data suggested that oats are a dietary intervention that reduces fat storage in the absence of added sugar, an effect mediated by sir-2.1 genetic pathway.

Thursday, November 14, 2013
Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

Body Composition, Modeling, and Thermogenesis

T-412-P
An Objective Estimate of Energy Intake During Weight Gain Using the Energy Balance Method

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Background: Objective assessments of energy intake (EI) in humans can be derived from measures of total daily energy expenditure and changes in energy stores, but this method has not been tested in response to weight gain. We tested the accuracy and precision of the energy balance method to estimate EI during weight gain in conjunction with controlled overfeeding. **Methods:** Doubly labeled water (DLW) and body composition data (by DXA) from two independent studies of controlled overfeeding; 1 inpatient study (n=8) and 1 outpatient study (n=33) were used in this analysis. Energy requirements at baseline were determined from a DLW study and controlled feeding before consumption of 40% additional calories for 56 days. **Results:** The calculated EI from the combined energy balance method were compared to the actual EI consumed. During the controlled inpatient study where physical activity was confined to the metabolic ward and all meals were consumed under supervision, the EI consumed was 3490±729 kcal/d. The calculated EI was 3489±811 kcal/d which estimated actual EI within 1±16% or 0±503 [CI: -986 to 986] kcal/d. Actual and calculated EI were strongly correlated (r2=0.9, p<0.01) and showed no systemic bias for over- or under-estimation (r2=0.003, p=0.99). During the outpatient study, where food was prepared by the metabolic kitchen but consumed free-living, the EI consumed was 4266±483 kcal/d. The calculated EI was 3765±513 kcal/d which underestimated actual EI by -12±5% or -496±214 [CI: -916 to -77] kcal/d. Actual EI and EI calculated were strongly correlated (r2=0.83, p<0.0001) and there is no significant bias with higher or lower actual EI. **Conclusions:** The energy balance method can be used to estimate EI during weight gain with a high precision when physical activity is limited and with good precision when physical activity is variable in free-living subjects.

T-413-P
Energy Balance with Weight Loss: Does It Add Up?

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Background: Many people report difficulty losing weight despite dietary attempts. **Methods:** Ten healthy obese adults (5M/5F; 36±8 y, 103.9±14.2 kg, 42.0±9.1 %fat) completed a 10-week inpatient study with 6 weeks underfeeding at 50% weight maintaining needs. Food intake was monitored, and caloric content of duplicate meals was determined by direct bomb calorimetry, as was that of stool/urine. Daily energy intake (EI) was calculated from food calories minus calories lost as waste. Twenty-four hour energy expenditure (24EE) was measured in a whole room calorimeter at baseline, post-weight loss, and at least twice during the intervention. The closest EE to any given day during the study was used as a proxy for sedentary EE. Subjects wore activity monitors (Actical) during most of their stay. Body weight was measured daily; body composition was assessed by DXA. Energy equivalent changes in FM and FFM were calculated using published values (9294 kcal/kg FM; 1020 kcal/kg FFM). **Results:** Subjects lost 8.4±3.4 kg and 0.3±2.1 %fat (4.4±3.1 kg FFM; 4.0±2.1 kg FM), which translated to a whole body calorie change of -38,083±21,138 kcal (range -79,811, -4,531 kcal) over 42 days. EI, as defined above, minus the extrapolated 24EE (to account for decreases in EE during underfeeding) summed over 42 days was -26,431±7,706 kcal (-40,236, -12,414 kcal). The difference between this and calculated loss of whole body calories from FFM and FM change was 11,653 kcal (277 kcal/d;-54,173, -7,883). The relationship between this difference in kcal and sedentary time had a correlation coefficient of -0.37 (p=NS). **Conclusions:** There is variability in the observed versus expected whole body calorie change during weight loss even in a highly controlled inpatient setting. This may be explained in part by changes in spontaneous activity, but may imply differences in weight loss efficiency.

T-414-P
Sub-Thermoneutral Housing Temperature Effects in Pre-Clinical Weight Loss Drug Development

Yongbin Yang, Daniel L. Smith *Birmingham, AL*

Background: To investigate the influence of ambient temperature (T_a) on outcomes related to weight loss drug treatment in mice. **Methods:** Eight-week old male C57BL/6J mice were singly housed at room temperature (22°C) or thermoneutrality (30°C) and *ad libitum* fed standard rodent chow (LFD-low fat diet) and water on a 12:12 light cycle. Mice were randomized (n≈12/group) and treated for 8 wks with either placebo control, ephedrine (100 mg/kg/day) or β-3 agonist CL316,243 (0.1 mg/kg/day) mixed in peanut butter pills 2x/day. An additional high-fat diet (HFD) study using a 4-wk diet-induced obesity run-in was performed. Outcomes included body weight and energy intake, baseline/final body composition, metabolic rate and terminal serum analytes. **Results:** Change in body weight (final-baseline) and lean mass were not significantly different among treatment groups at either T_a with LFD feeding, while change in fat mass (p=0.037) and relative fat mass (co-varied for lean, p=0.005,) were significantly different among treatment groups at 22°C, but not 30°C. Conversely, treatment group differences in change in fat mass and fat% were observed at 30°C with HFD feeding (p=0.03), but not at 22°C. Analyzing all treatment groups combined, energy intake and metabolic rate were significantly higher at 22°C (v. 30°C) with either diet (42-55%, all p<0.0001), while final body weight and fat mass were significantly greater at 30°C (p≤0.009). Serum glucose was significantly lower at 30°C with both diets (p≤0.0005); while T_a differentially affected insulin (LFD:p=0.66; HFD:p=0.002) and leptin (LFD:p=0.003; HFD:p=0.53) dependent on diet, albeit with no significant treatment group effects. **Conclusions:** Potential interactions of T_a with drug treatments and diets should be considered in pre-clinical drug design and interpretation of outcomes, particularly those related to body composition.

T-415-P
Doubly Labeled Water Over- and Underestimates Energy Expenditure Changes During Restriction of Dietary Fat and Carbohydrate, Respectively

Bernard V. Miller, Thomas S. Bemis, Stephanie Goodwin, Mario Siervo, Carla M. Prado, Peter J. Walter, Kevin D. Hall *Bethesda, MD*

Background: Dietary macronutrient composition may influence body weight partly by modulating energy expenditure (EE). Measurements of EE using the doubly labeled water (DLW) method (EE_{DLW}) have yet to be validated against metabolic chamber measurements (EE_{MC}) during both energy balance and caloric restriction with differing diets. **Methods:** We investigated twelve inpatient obese volunteers (8F/4M) who were fed an energy balanced diet for 5 days immediately followed by 30% caloric restriction with selective removal of carbohydrate (LC) or fat (LF) for 6 days. After a 2-4 week washout, volunteers repeated the 5-day balanced diet followed by the alternate LF or LC diet. Participants spent days 2, 5, 6, 9, and 11 in a metabolic chamber. On day 1, the subjects were given an oral dose of DLW and urine samples were collected daily. EE_{MC} was calculated using indirect calorimetry equations from 24h O2 consumption and CO2 production measurements. EE_{DLW} was calculated using the DLW measurements of average daily CO2 production and the food quotient (FQ) of the diet. **Results:** During the balanced diet, EE_{MC}=2479±463 kcal/d was slightly lower than EE_{DLW}=2618±545 kcal/d (p=0.02) but these measurements were highly correlated (r=0.91, p<0.001). EE_{MC} decreased by 58±98 kcal/d (p=0.03) and 49±97 kcal/d (p=0.05) in the LC and LF diets, respectively. EE_{DLW} was unchanged during LC diet (1±384 kcal/d, p=0.49) compared with the balanced diet, but decreased by 125±233 kcal/d (p=0.05) during LF diet. FQ was lower after LC (0.81) and higher after LF (0.92) compared to the balanced diet (0.86). 24h respiratory quotient decreased after LC (0.80±0.02, p<0.001), but was unchanged by LF (0.87±0.03, p=0.1) compared with balanced diet (0.86±0.03). **Conclusions:** EE_{DLW} overestimated the EE_{MC} decrease during the LF diet and underestimated the EE_{MC} decrease during the LC diet.

T-416-P

Inter-Individual Correlations of Background Enrichments of ^{18}O and ^{2}H in Humans As a Possible Means for Improving Precision of the Doubly Labeled Water Method

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Background: The precision of the doubly labeled water (DLW) method for measuring total daily energy expenditure (TDEE) in humans is limited by variation in the background isotope enrichments. The factors that drive this background variation remain uncertain. However, if these factors are correlated across individuals, precision could be improved using background variation of unlabelled subjects in parallel to the dosed subjects. The purpose of this study was to quantify natural background variations in the ^{18}O and ^{2}H in humans and evaluate the individual to individual correlation. **Methods:** Urine samples were obtained for 30 consecutive days in forty healthy adults (20 males, 20 females), varying in age (23-62 yr) and body mass index (16.8-32.6 kg/m^2). Samples were collected from the first void in the morning and stored in 5 ml glass vials. **Results:** Background fluctuations varied in both magnitude and direction between subjects and over time. Within a sample, δ^2H and δ^{18}O were strongly and significantly correlated (R^2 = 0.92), but fluctuations were uncorrelated between subjects, within a subject, or with time. Errors in the calculation of TEE by the DLW method due to the magnitude of background fluctuations were modeled using equations as outlined by Schoeller et al. (1986) and found to contribute to a minimum 7% precision error. This error was not reduced by using simultaneous samples from undosed subjects. **Conclusions:** Isotope background fluctuations of δ^2H and δ^{18}O are correlated within a sample, but not within subjects, among subjects, or over time. These data confirm that natural isotope background fluctuations are a significant contributor to the overall precision error in DLW measurements of TEE and suggest that using undosed subjects to model background variations is not a viable strategy.

T-417-P

Increased Resting Energy Expenditure, Diet-Induced Thermogenesis and Preferential Carbohydrate Oxidation after Roux-en-Y Gastric Bypass

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Background: Malabsorptive bariatric procedures such as Roux-en-Y gastric bypass (GBP) lead to greater weight loss than diet alone. We hypothesize that GBP leads to an increase in energy expenditure (EE), both fasting and postprandially, and shift in nutrient partitioning favoring carbohydrate (CHO) oxidation, that is related to altered bile acid (BA) metabolism after GBP. **Methods:** Obese subjects without diabetes, studied either prior to (n=16) or 1 year post-GBP (n=9; n=4 at both timepoints) underwent indirect calorimetry and blood collection both during fasting and postprandially (0-360min) after a 600kcal meal (36% CHO, 14% PRO, 16% FAT). Total glucagon-like peptide-1 (GLP-1), BA levels and composition, and gastric emptying (GE) rates were measured using RIA, mass spectrometry, and the acetaminophen method/spectrophotometry, respectively. **Results:** All comparisons are pre- vs. post-GBP. Body weight (BW) and BMI were significantly lower post-GBP (p<.001). Resting EE was significantly higher post-GBP (15.6±1.6 vs. 17.9±3.0 kcal/kg BW, p<.05). DIT was higher post-GBP during the first 60 min after the meal (AUC 0-60min; 2.6±1.1 vs. 7.3±3.2 kcal/kg, p<.001) as well as overall during the entire postprandial period (AUC 0-360min; 0.33±0.17 vs. 0.75±0.27 kcal/kg/min, p<.01). Preferential CHO oxidation was observed solely during the first 60 min after the meal (RQ; 0.87±.06 vs. 0.96±0.06, p<.01) post-GBP. No significant change in fasting RQ was observed. GLP-1 levels and GE rates will also be presented. Fasting and postprandial BA levels and composition will be analyzed in a subset of subjects and correlated with indirect calorimetry measurements. **Conclusions:** After GBP, REE and DIT are increased, and nutrient partitioning is shifted to favor CHO oxidation. Potential mechanisms will be discussed.

T-418-P

Energetic Adaptations Persist After Bariatric Surgery in Obese Adolescents

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Background: Bariatric surgery weight loss induces energetic adaptations involving the hypothalamic-pituitary-thyroid and -adrenal axes. Energetic adaptations induced by bariatric surgery have not been studied in adolescents or for extended periods post-surgery. **Methods:** Study objective is to measure energetic responses to Roux-en-Y gastric bypass (RYGB) performed in extremely obese adolescents (n=11) relative to weight-matched controls (n=5). At baseline, and 1.5, 6 and 12 mo post-surgery, 24-h room respiration calorimetry, body composition and fasting hormones were measured. **Results:** Mean TEE was 3189 kcal/d pre-surgery, and 2420, 2363 and 2323 kcal/d 1.5, 6 and 12 mo post-surgery, equal to a 24% reduction in TEE. Mean weight loss was -16, -18 and -10 kg at 1.5, 6 and 12 months post-surgery, equivalent to 11, 14 and 9% of weight. Reduction in FFM was -7.4, -0.12, and -0.15 kg, equivalent to 10, 0.3 and 0.4% of FFM. Adjusted for changes in fat-free mass (FFM) and fat mass (FM), TEE was -609, -561 and -664 kcal/d lower at 1.5, 6 and 12 mo post-surgery compared to pre-surgery (p=0.001). Basal metabolic rate and sleeping energy expenditure decreased by 18% and 24% at 1.5 mo post-surgery (p=0.001), and then remained constant. The fall in EE was disproportionately large compared with the reduction in weight or FFM. Changes in TEE were significantly associated with parallel changes in total triiodothyronine, leptin, insulin and norepinephrine. Weight stability and steady EE were observed in the controls. **Conclusions:** RYGB suppressed EE to a greater extent than the reduction in body weight and FFM. Persistent energetic adaptations may hinder further weight loss and contribute to weight regain in severely obese adolescents.

T-419-P

Quantifying the Energy Balance Dynamics of Childhood Growth and Obesity

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Background: Clinicians and policymakers need the ability to quantitatively predict how childhood weight will respond to obesity interventions. **Methods:** To address this issue, we developed the first validated mathematical model of childhood energy balance that accounts for normal growth, development of obesity, and makes quantitative predictions about the effect of interventions. The model was calibrated to reference body composition data in normal children and was validated by comparing its predictions to data not used to build the model. **Results:** The model accurately simulated the body composition and energy expenditure changes during normal growth, and predicted increases in energy intake of ~1200 kcal/d and ~900 kcal/d from ages 5-18 years in males and females, respectively. The development of childhood obesity was found to require a substantially greater excess energy intake per kg excess weight gain compared to adults. For example, children under 10y required greater than 200% of the adult increment in energy intake per kg excess weight gain. Furthermore, the typical energy balance calculations using growth charts vastly underestimated the excess energy intake in overweight and obese children calculated using our model. At the population level, we found that the excess weight of US children in recent years translates to an average energy intake excess of ~200 kcal/d per child compared to the late 1970s. The model also suggests that there may be therapeutic windows of weight management when children can "outgrow" obesity without requiring weight loss, especially during periods of high growth potential in males who are not severely obese at the onset of treatment. **Conclusions:** By calculating the likely weight changes resulting from proposed interventions, our model provides a new tool for strategizing about efforts to end the childhood obesity epidemic.

T-420-P

High Dietary Selenium Intake Is Associated with a Low Percentage of Body Fat in the Newfoundland Population

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Background: Selenium is a trace element involved in the regulation of enzymes related to fatty acid oxidation. Previous animal studies have shown that selenium inhibits adipocyte hypertrophy and decreases abdominal fat. However, to the best of our knowledge there are no studies available on the effect of dietary selenium on adiposity status in humans. Therefore, we designed this study to investigate the association between selenium intake and body fat percentage in a large population based study. **Methods:** A total of 2808 subjects from the CODING (Complex Disease in Newfoundland population: Environment and Genetics) study were assessed. Dietary selenium intake was evaluated from the Willett Food Frequency Questionnaire. Whole body composition measurements were performed using dual-energy X-ray absorptiometry (DXA) Lunar Prodigy (GE Medical Systems, Madison, WI). **Results:** A significantly negative correlation was found between dietary selenium intake and total body fat percentage in the entire cohort ($r = -0.21$, $p < 0.001$), and in males ($r = -0.27$, $p < 0.001$) and females separately ($r = -0.10$, $p < 0.001$). However, after adjusting for age, physical activity, and alcohol consumption the inverse correlation between dietary selenium intake and percent of body fat only remained significant in males (unstandardized $\beta = -0.12$, $p < 0.001$). **Conclusions:** Our findings suggest that higher dietary selenium intake is associated with improved body composition, and this beneficial effect is gender specific.

T-421-P

Adiposity and Indicators of Thyroid Status in Childern and Adolescents

Amanda J. Krause, Nicole M. Sedaka, Brittany Cines, Elizabeth Pogrebniak, Roya Sherafat-Kazemzadeh, Tania Condarco, Marian Tanofsky-Kraff, Lauren B. Shomaker, Sheila M. Brady, James C. Reynolds, Van S. Hubbard, Jack A. Yanovski *Bethesda, MD*

Background: In adults, obesity is associated with abnormalities of thyroid function. However, there are fewer studies in pediatric cohorts. We therefore examined associations of weight and adiposity with indices of thyroid function in children. **Methods:** A sample of 1,203 non-obese (BMI<95th percentile) and obese (BMI≥95th percentile) children 5-18y had height, weight, fat mass by DEXA (n=829), and morning thyroid-stimulating hormone (TSH), free thyroxine (FT4), lipids, and leptin measured. Analyses examined predictors of TSH and FT4 accounting socio-demographic factors. **Results:** The sample included 631 non-obese and 572 obese subjects. TSH was positively related to BMI Z-score and fat mass (p's<.001). FT4 was negatively related to BMI Z-score and fat mass (p's<.001). TSH was positively correlated to leptin (p=.001) even after accounting for fat mass. A positive association between TSH and triglycerides (p<.001), and a negative relationship between FT4 and triglycerides (p=.001) was found in both samples, even after accounting for fat mass. As previously reported in adults, non-Hispanic Blacks had a lower TSH than non-Hispanic Whites (p<.007). **Conclusions:** We conclude that pediatric obesity is associated with higher TSH and lower FT4 concentrations and with a greater prevalence of abnormally high TSH measurements. It seems likely that leptin and thyroid status are interrelated, perhaps through leptin's effects on TSH secretion, as leptin and fat mass were positively associated, even when controlling for adiposity.

T-422-P

Variability of Body Mass Index During Childhood Predicts Adult Obesity Risk: The Bogalusa Heart Study

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Background: It is well known that childhood obesity leads to increased obesity risk in adults. However, it is not known whether variability in obesity measures during childhood is also predictive of adult obesity risk. This study tested the hypothesis that variability of body mass index (BMI) was associated with adult obesity risk. **Methods:** The study cohort consisted of 2,901 participants (1,625 whites and 1,276 blacks; age=20-51 years at follow-up) who had been examined at least 4 times for cardiovascular risk factors during childhood (age<20 years). Variability of BMI was depicted as coefficient of variation (CV) and standard deviation (SD) during childhood. The average follow-up period was 25.6 years. **Results:** Blacks versus whites had significantly greater BMI variability during childhood. Mean levels of BMI were significantly correlated with variability measures (r=0.22 for CV; r=0.50 for SD) during childhood. After adjustment for mean levels of BMI and other co-variates, childhood BMI CV was significantly associated with BMI in adults, with every 10% increase in CV associated with 3.8 BMI units increase (P<0.0001). Similarly, CV during childhood was also associated with risk of obesity (BMI≥30 kg/m2) in adults (P<0.0001); compared with the bottom CV quartile, odd ratio for being obese was 1.9 (95% confidence interval: 1.3-2.7), 2.5 (95% CI: 1.7-3.7), 9.8 (95% CI: 6.6-14.6) for the second, third, and top CV quartile, respectively. Similar results were observed if SD was used to measure BMI variability. **Conclusions:** These findings indicate that the variability of adiposity during childhood is predictive of adult obesity risk, independent of levels of obesity measures. The underlying mechanisms for the reported associations need further investigation.

T-423-P

Changes in Free-Living Energy Intake Can Be Accurately Calculated Using Repeated Body Weight Measurements and a Mathematical Model of Human Metabolism

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Background: Obesity research is hampered by the inability of self-reported food intake to accurately measure free-living energy intake (EI). This has been demonstrated by comparing self-reported EI to energy expenditure (EE) measured by the doubly labeled water (DLW) method in weight stable individuals. During weight loss, EI<EE and measuring EI requires repeated DLW doses along with repeated dual-energy x-ray absorptiometry (DXA) scans to calculate changes in body energy stores. While this DLW/DXA methodology is theoretically sound, it is prohibitively expensive and requires specialized equipment and training. **Methods:** We developed an inexpensive method for calculating EI changes that uses repeated body weight measurements with a validated mathematical model of human metabolism. This method was applied to data from Phase 1 of the CALERIE study in 18 overweight adults randomly assigned to two outpatient diet interventions for a 6 month period. **Results:** The model calculations of EI change correlated well with the DLW/DXA method (r=0.81,p<0.0001). However, the model tended to underestimate EI change by 104±241 kcal/d (p=0.014) because it assumed a constant physical activity. Examination of the EE data demonstrated a reduction in physical activity that appeared to correlate with EI change. To quantify this effect we used the "leave-one-out" cross-validation method to calculate that physical activity decreased by an average of ~0.9 kcal/kg/d for every 1000 kcal/d decrease in EI. Adding this model parameter eliminated the bias of the model-calculated EI change (39±263 kcal/d, p=0.378) while remaining highly correlated with the DLW/DXA method (r=0.81, p<0.0001). **Conclusions:** We demonstrated that an inexpensive model-based calculation of EI change using only repeated body weight measurements agrees well with the DLW/DXA method.

T-424-P

Laboratory Evaluation of the Modular Signal Recorder Triaxial Accelerometer for Measuring Physical Activity

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Background: Physical activity is important for multiple aspects of health including but not limited to: cancer prevention, metabolic disease treatment for diabetes, hyperlipidemia, cardiovascular health and obesity management. There is growing need for technologies that accurately measure physical activity. In this study we validated a tri-axial accelerometer embedded in the Modular Signal Recorder (MSR) 145 data logger. **Methods:** Seven subjects wore the MSR145 data logger along with the validated Physical Activity Monitoring System (PAMS) with different body postures and throughout graded walking at seven velocities. Energy expenditure was measured using indirect calorimetry. **Results:** The seven subjects' laboratory validation testing showed the MSR145 data logger distinguished sedentary and walking activity reliably within ½ mph walking speed increments. It was accurate and precise compared to the PAMS, with an intra-class correlation coefficient (r2> 0.95). The MSR145 data logger showed excellent sequential increases with increased walking velocity (r2>0.95) and energy expenditure (r2 >0.94).

Conclusions: The MSR145 data logger was shown to be accurate and reliable in measuring and quantifying physical activity in the laboratory setting. A comprehensive integrated physical activity measuring device using the MSR145 data logger holds promise in the free living society.

T-425-P

Fat Tissue Bomb Calorimetry in Subjects Undergoing Weight Loss Intervention

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Background: The accepted caloric value for lipid (9 kcal/g) is often used to estimate energy content of adipose tissue (AT). Yet, AT is more than just lipid and its actual caloric content or how this changes with weight loss is not known. **Methods:** Ten obese individuals (5M/5F; age= 35 ± 7.7 yrs, weight = 103.9 ± 14.2 kg, percent body fat = 42 ± 9%) were admitted to a clinical research unit for 10 weeks including 6 weeks of 50% caloric restriction. We investigated the caloric content of AT and adipocyte size (ACS) prior to and following weight loss. Each participant underwent a biopsy of the abdominal subcutaneous AT pre- and post-diet. Fresh AT was immediately analyzed for ACS in duplicate using a Coulter Counter. The remaining AT was flash frozen and later thawed for direct bomb calorimetry in an Isoperibol calorimeter using mineral oil as a spiking agent. Each bomb calorimetry sample was analyzed 10 times. **Results:** Pre-intervention, mean AT caloric density averaged 5.85 ± 0.47 kcal/g and ACS averaged 52 ± 12uM. Post-intervention, mean AT caloric density averaged 5.99 ± 0.29 kcal/g and ACS averaged 58 ± 15uM. In a mixed model analysis of adipose tissue kcal/g to account for repeated measures within individuals, and including study intervention phase, age, sex, and %fat as covariates, post-intervention kcal/g AT was found to be greater than the pre-intervention density (Δ= -183.66 ± 92.38 cal/g; p=0.048). Inter-individual variation in AT calorie content accounted for a greater amount of the variance than did weight loss (p<0.001). **Conclusions:** Adipose tissue caloric content, as measured by bomb calorimetry, was less than the expected 9 kcal/g, and the caloric density per gram AT increased after weight loss. This is likely in part due to changes in non-lipid components in AT such as stromal vascular cells, proteins, and blood vessels.

T-426-P

Validation Study of the Body Adiposity Index (BAI) as a Predictor of Percent Body Fat in Older Individuals: Findings from the BLSA

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Background: A new body adiposity index (BAI) has been developed and validated in adult populations as an indicator of percent body fat (fat%). Objective: To assess the validity of the BAI (BAI = ((hip circumference)/((height)$^{1.5}$)–18)) in an older population (mean age 70.4±9.5 yrs). **Methods:** We used Pearson correlations for both BAI and body mass index (BMI) with fat% (assessed by dual-energy X-ray absorptiometry (DEXA)) in 954 older adults (age ≥ 55yrs) from the Baltimore Longitudinal Study of Aging (BLSA). For a sub-analysis, correlations were also performed by sex. Measurements included DEXA, weight, height and hip circumference. **Results:** There were significant correlations between both BAI and BMI with fat % but BAI was more strongly correlated with fat% than BMI (r=0.7 for BAI and fat% vs. r=0.6 for BMI and fat%, p<0.01) for all subjects. BAI also exhibited a smaller mean difference from fat% (-5.2±6.0 for BAI vs. -7.6±7.2 for BMI, p<0.01) indicating better agreement. For the subanalysis by sex, however, BMI showed better agreement with fat% than BAI did (r=0.6 for BAI and fat% vs. r=0.7 for BMI and fat%, p<0.01) with a smaller mean difference from fat% (-3.0±6.0 for BAI vs. -2.2±5.2 for BMI, p<0.01) in men. Finally, BAI did not accurately predict fat% when DEXA measured body fat percentage fell below 15%. **Conclusions:** BAI provides valid estimates of body adiposity in an older adult population; however, BMI may be a better index for older men. Finally, BAI was not accurate in people with low levels of adiposity (15% body fat or lower).

T-427-P

Cold Acclimation in Healthy Young Men Results in Metabolic Modifications in Skeletal Muscle

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Background: When exposed to cold, humans are able to maintain their body temperature by increasing heat production through shivering and non-shivering mechanisms. Although recent studies have focused on brown adipose tissue-related non-shivering thermogenesis, skeletal muscle may also be an important contributor to heat production. The aim of this study was to quantify effects of acute and chronic cold exposure on skeletal muscle metabolism. **Methods:** Five healthy men were exposed to a cold condition for 150 min (liquid-conditioned garment perfused with 4°C water). Shivering intensity and whole body substrate utilization were measured continuously during the acute cold exposure (CE). A vastus lateralis biopsy was done before and after CE. Oxygen consumption rate and proton leak were measured on permeabilized muscle fibers. The subjects were then exposed to cold (10°C) 2hr/day, 5 days/week, for 4 weeks. The same experiments were done after the cold acclimation (CA). **Results:** Our preliminary results demonstrate that a ~9°C decrease in skin temperature elicits a 2.2-fold increase in energy expenditure. Shivering intensity decreased by 24% following CA. Maximal oxygen consumption with mitochondrial complex I substrates (glutamate/malate) or complex II substrate (succinate) was not different between conditions. Interestingly, maximal complex IV activity was significantly increased by 60% and 25% after CE, for pre and post CA measures, respectively. Furthermore, we observed a 50% increased proton leak after CE in non-acclimated subjects which was completely absent after CA. This result is consistent with the absence of increased skeletal muscle proton leak in response to an acute exercise bout in trained subjects. **Conclusions:** These findings demonstrate that, when exposed to cold, skeletal muscle show metabolic alterations analogous to training effects.

T-428-P[DT]

Lower Awake and Fed Thermogenesis Predicts Future Weight Gain in Subjects with Abdominal Adiposity

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Background: Awake and fed thermogenesis (AFT) is the energy expenditure (EE) of the non-active fed condition above the minimum metabolic requirement during sleep, and is composed of the thermic effect of food and the cost of being awake. The relationship of this component of EE with body size, fat distribution, and future weight change are not fully established. Excess adipose tissue may increase thermal insulation of the abdomen, limiting the body's capacity to release heat into the environment. This suggests that any effect of AFT on weight regulation may be augmented in obese subjects. **Methods:** AFT was estimated from whole room 24-h EE measures in 509 healthy subjects (315M/194F, 368 Native Americans and 141 Whites, age: 29±8 yrs, BMI: 33±8 kg/m2, body fat: 31±9%) while subjects consumed a eucaloric diet. Follow-up data was available for 290 Native Americans (median follow-up time: 6.6 years). **Results:** AFT accounted for approximately 10% of 24-h EE. Energy intake was the major determinant of AFT (ρ=0.29, P<0.001). AFT, normalized as a percentage of intake, was inversely related to age and fasting glucose concentration (ρ=−0.19 and ρ=−0.17, P<0.001), and showed a nonlinear relationship with waist circumference and BMI. Spline analysis demonstrated that AFT becomes inversely related to BMI at an inflection point of 29 kg/m2. The residual variance of AFT after accounting for known covariates predicted future weight change but only in subjects with a BMI>29 kg/m2, such that a 100-kcal decrease from the predicted AFT value corresponded to an average 0.4 kg increase in body weight per year. **Conclusions:** AFT is reduced in individuals with a BMI>29 kg/m2, and predicts future weight gain in these subjects. Once central adiposity develops, a blunting of AFT may occur that then contributes to further weight gain.

T-429-P

What Predicts Visceral Adipose Tissue: Trunk Shape or Trunk Size?

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Background: Trunk shape is a known predictor of amounts of visceral adipose tissue (VAT). The amount of total adipose tissue in the abdomen also predicts visceral adipose tissue mass but it is unknown how much of VAT can be attributed to abdominal shape versus size. Using two new measures of trunk shape and trunk size, we investigated how shape and adiposity along with demographic covariates are related to amounts of visceral adipose tissue. **Methods:** Subject data were pooled from two studies containing dual energy X-ray absorptiometry measured fat mass, and magnetic resonance imaging measured VAT mass. Eight separate indices: A Body Shape Index (ABSI), BMI, waist circumference (WC), hip circumference (HC), trunk size, waist/hip ratio (WHR), trunk shape, and body adiposity index (BAI), were examined as predictors of total VAT mass and % of body weight as VAT using multi-linear regression. 192 different regression models were developed that predict VAT mass. **Results:** Adjusted R^2 values were consistently higher in males than females. Our new measures indicated that trunk size explains much more of the variance in VAT than trunk shape does. Interestingly, in men, trunk size and shape were correlated, indicating that as men become more obese, they tend to store fat in a "pot-belly" pattern, whereas no correlation between trunk size and shape existed in women. Of all 8 indices tested, WC was found to be the most accurate predictor for VAT and %VAT for both genders, and including age as a covariate improved every adjusted R^2 value. **Conclusions:** Trunk size is a better predictor of VAT than trunk shape even after adjusting for age, gender, and height.

Thursday, November 14, 2013
**Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A**

Intervention Studies - Behavioral - Adult

T-430-P

Weight Management Program Participants Achieve Substantial Risk Factor and Medication Changes with Weight Loss

Linda Gotthelf, Linda Grant *Boston, MA*

Background: Employers and health insurers are concerned about the adverse impact of obesity and the need for effective options. The 2013 Workplace Wellness Programs Study by RAND Health reported an average loss of about 1 lb per yr for 3 yrs. Clearly, weight management programs must demonstrate greater outcomes in order to achieve health and financial benefits. **Methods:** This study assessed weight, risk factor and medication changes for 1256 patients in the Health Management Resources® Program for Weight Management (HMR®). All patients had an initial health risk appraisal (HRA) on program entry and a follow-up HRA in 2012. **Results:** The average weight loss being kept off was 43 lbs (17.8% of initial weight) over 3.6 yrs (average time between initial and follow-up). The average BMI decreased 10.5 points (40.5 to 30.0 kg/m2) vs. a 0.15 BMI reduction reported in the RAND study. 70% were keeping off >10% of initial weight. Patients keeping off ≥20% (n=476) had greater risk factor reductions compared to those keeping off 5-10% (n=225), including cholesterol (11.2% vs. 5.2%), TC/HDL (19.4% vs. 6.9%), triglycerides, glucose and blood pressure. The ≥20% group eliminated 50.9% of diabetes medications and 42.9% of all meds assessed at follow-up vs. 18.2% of diabetes meds and 17.4% of all meds for the 5-10% group. Overall, 93% of patients had reductions in risk factors for chronic disease. 97.8% of those with pre-diabetes and 89.2% of those with pre-hypertension at program entry were medication-free at follow-up. **Conclusions:** Programs must demonstrate significant weight losses in order to provide reductions in risk factors and medication use. The RAND study found that participation in less effective programs "was not associated with significant reductions in total cholesterol level." In contrast, intensive lifestyle intervention programs can achieve these significant results.

T-431-P

Validation of a New Six Factor Lifestyle Pattern Questionnaire

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Background: The purpose of this study is to validate a simplified and practical lifestyle patterns questionnaire among overweight and obese individuals. **Methods:** Based on previous research on unhealthy lifestyle patterns (Kushner & Choi, 2010), a 27-item questionnaire was developed to measure six hypothesized dimensions of Accidental Diner (AD), Fast Pacer (FP), Food Lover (FL), Couch Champion (CC), Self-Scrutinizer (SS), and All or Nothing Dieter (AN). Each dimension is measured by 4 to 6 items. The internet-based questionnaire was administered to a sample of 640 respondents, 342 (53%) also completed the Impact of Weight on Quality of Life-Lite (IWQOL-Lite). **Results:** The average age (yrs) of the respondents was 40 (sd=11), 13% M and 87% F; 58% Caucasian; 24% Black, 12% Hispanic. Weight status: 16% normal weight, 22% overweight, 23% Class I, 15% class II and 24% class III obesity. Cronbach's internal consistency reliability estimates for the six subscales were as follows: AD (.80), FP (.83), FL (.84), CC (.81), SS (.81), and AN (.76). Odds Ratio for endorsement of each of the 6 lifestyle patterns was statistically correlated with increasing BMI classification (p<.001). Significant correlations were seen between the lifestyle patterns and worsening IWQOL-Lite dimensions. **Conclusions:** A new lifestyle patterns questionnaire developed by factor analysis is highly correlated with BMI classifications and reduced quality of life. The questionnaire can be a useful measure of unhealthy lifestyle behaviors among the overweight and obese population.

T-432-P

The Clinical Utility of Genetic Testing for Type 2 Diabetes: Results from a Randomized Trial

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Background: The clinical utility of genetic testing for type 2 diabetes (DM) is unknown. In this randomized trial, we examined whether supplementing conventional DM risk counseling with genetic test results affected clinical and behavioral outcomes. **Methods:** Participants were outpatients aged 21-65 with body mass index (BMI) ≥ 27 and without DM. At baseline, fasting plasma glucose (FPG), family history of DM, and lifetime DM risk (based on age, sex, race, and BMI) were assessed. After 2-4 weeks, participants received risk counseling on FPG, family history, and lifetime risk, followed by either DM genetic test results (CR+G; N=303) or attention control eye disease counseling (CR+EYE; N=298). The primary outcome was weight 3 months post-enrollment. Secondary outcomes included HOMA-IR, self-reported dietary intake and physical activity at 3 and 6 months, and weight at 6 months. Linear mixed models were fit for weight, HOMA-IR, and dietary variables; generalized linear mixed models using a negative binomial distribution with a log link were used for walking and moderate physical activity. Models included a common intercept, time effect, time*treatment interaction, and randomization stratification variables (family history and BMI). **Results:** Mean age was 54, 42% were White, 53% were Black, 80% were male, 30% had BMI ≥ 35, and 53% had moderate/high family-history-based DM risk. There were no differences between groups in estimated means for any outcomes with one exception: caloric intake decreased more from baseline to 3 months in the CR+G arm than the CR+EYE arm (p=0.04). In post-hoc analyses, treatment effects did not differ by level of family history risk (both arms) or genetic risk (CR+G arm). **Conclusions:** Because genetic testing for DM did not make a clinically important impact on patients at risk for DM, it may not be appropriate for widespread implementation.

T-433-P

Changes in Sexual Quality of Life with Massive Weight Loss

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Background: Sex life may be adversely affected by overweight and obesity. In the present study we have examined the sexual quality of life (QoL) of individuals with severe obesity before and after massive weight loss. **Methods:** The study population included 104 bariatric surgical candidates and 25 lean controls. Study participants completed the Impact of Weight on Quality of Life (IWQOL) questionnaire which consists of 8 QoL scales including sexual life QoL. Preoperatively, scores for sexual life QoL were examined relative

to age, BMI, gender and other QoL domains. The effects of surgery on sexual QoL was studied before and one year following either sleeve gastrectomy (SG), an adjustable gastric band (AGB) or Roux-en-Y gastric bypass (RYGB). **Results:** Before weight loss, scores on the sexual IWQOL scale for the severely obese (47.03+2.56) were significantly (p<0.0001) below those of the lean controls (95.2+3.1). Effectors of sexual QoL with severe obesity included age, gender and QoL related to social and interpersonal relationships (p<0.05), but not BMI. One year post-surgery scores for sexual QOL improved (70.90+3.44) but remained below those of the lean controls. Improvement in postoperative sexual QoL was significantly greater with RYGB and SG than for the AGB, as were % EWL and total % change in BMI. An increase in self-esteem was, according to multiple regression analysis, the only independent predictor (0.0001) of improved sexual QoL postoperatively. **Conclusions:** Sexual QoL is impaired among individuals with severe obesity. Massive weight loss with bariatric surgery leads to highly significant improvement in sexual QoL in association with greater self-esteem.

T-434-P

Multicenter Study of Social Support and Patient Dyads in a Physician-Supervised Weight Loss Program

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Background: Social support, both emotional and instrumental, has been shown to improve adherence in weight loss programs and encourages greater weight loss in a shorter amount of time. The purpose of this study was to assess whether the support of joining a physician-supervised weight loss program with a partner provides any significant benefits to patients. **Methods:** This retrospective, matched pair study focuses on weight loss expressed in both pounds and as a percentage of patients' starting body weight. Data collection occurred at three sites over a 16-week period. There were 154 dyads (308 individuals) identified. Based on inclusion criteria, 251 individual patients were matched and included in the analysis. Matching criteria included gender, program start date (+ 28 days), age (+5 years), and BMI (+ 3.0kg/m2). **Results:** The median age difference was 1.4 years, with starting BMI differing by 0.9 kg/m2 and the median start date differing by nine days within each matched pair. Patients who joined the program with a partner lost, on average, 24% more weight and remained in the program 26% longer (approximately 3.5 weeks) compared to matched patients who did not join as a pair. During the first three months, dyads had better retention in the program than matched individual patients (61% and 47%, respectively). **Conclusions:** Patient dyads lost more weight and remained in the physician-supervised weight loss program longer than those who enrolled alone. These findings are consistent with previous research that showed that social support — emotional and instrumental —improves adherence in weight loss programs and facilitates improved weight loss outcomes.

T-435-P

Patient Adherence and Weight Loss in a Physician-Supervised Weight Loss Program

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Background: Patients enroll in weight loss programs with varied success. The purpose of this study was to assess the relationship between adherence to weekly visits while enrolled in a weight loss program, patients' weight loss, and the program's retention rate. **Methods:** This is a retrospective, cross-sectional study with weight loss expressed as a percentage of patients' current body weight compared to starting body weight. Data collection occurred at one location and continued until patients discontinued the program (maximum of 16 weeks). New patients (n=477) with initial consultations during the months of January, February, May, June, September and October of 2010 were included. Adherence was defined as excellent (patients missed less than two clinic visits), fair (patients missed 2 clinic visits), and poor (patients missed 3 or more clinic visits). Weekly weight loss in the three adherence categories was compared using the Wilcoxon rank-sum test. **Results:** Nearly two-thirds of the patients lost at least 5% of their body weight and more than one-third lost at least 10% of their body weight. Over the 16-week period, excellent adherence patients lost 5.5% more body weight than poor adherence patients. Over the 16-week period, excellent adherence patients lost

their body weight faster than poor adherence patients [15.4% vs. 9.6% (p<0.01)]. **Conclusions:** Our findings are consistent with other studies that have linked patients' outcomes in weight loss programs to patient adherence. Results indicate that patients with excellent adherence to the program lost more weight than those who were less adherent.

T-436-P

Examining Costs of a Lay Health Educator-Delivered Translation of the Diabetes Prevention Program in Senior Centers

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Background: Older adults in the United States have high rates of obesity. Despite the demonstrated efficacy of behavioral weight loss interventions among older adults, evidence-based lifestyle interventions have not been widely implemented in community settings. Program delivery by lay health educators (LHE) might support greater dissemination because they offer the potential of lower delivery cost and greater program accessibility to low income, rural and medical underserved communities. We examined the costs of a LHE-delivered translation of the Diabetes Prevention Program (DPP) lifestyle intervention for older adults that was implemented in Arkansas senior centers. **Methods:** This cost analysis used data from a cluster randomized control trial in which 7 senior centers (116 participants) were assigned to implement a LHE-delivered group-based 12-session translation of the DPP lifestyle intervention. We calculated direct lifestyle intervention implementation costs, including training, recruitment, materials, and ongoing intervention implementation support. Four-month weight loss data were collected from participants between February 2009 and July 2010. **Results:** Participant weight loss averaged 3.7 kgs at 4-months. The total estimated cost to implement the lifestyle intervention is $2731 per senior center, or $165 per participant. The implementation cost per kilogram lost was $45. **Conclusions:** A LHE-delivered DPP translation in senior centers is effective in achieving weight loss at low cost. These results indicate that a LHE-delivered program offers organizations and communities with limited resources a promising method to disseminate an evidence-based weight-loss intervention.

T-437-P

Extending Sleep in Obese Adults to Promote Weight Loss

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Background: Epidemiologic studies show a dose-dependent relationship between reduced sleep duration and increased body mass index (BMI) and laboratory studies have also documented that sleep loss appears increases appetite. It has been suggested—but never tested—that extending sleep would facilitate weight loss. This pilot study compared the efficacy of sleep extension in combination with a traditional weight loss program for facilitating weight loss in obese individuals. **Methods:** Twenty-one participants (18 female, 3 male, mean age 42.9 ± 14.2 years, mean BMI 33.5 ± 4.6 kg/m2) were randomly assigned to weight loss (WL) or weight loss plus sleep extension (WL+SE) groups. Sleep was extended in 15-minute increments and measured by wrist actigraphy. A behavioral weight loss program, based on the Diabetes Prevention Protocol was used to promote weight loss. Outcome measures include weight loss, blood pressure, fasting glucose levels, insulin levels and HOMA. **Results:** Although participants in the WL+SE increased their nocturnal sleep duration by 18 minutes (p=0.05) at 24 weeks, there were no significant differences in weight loss between the two groups (6.9 kg versus 1.7 kg, p=0.175). There were also no differences in blood pressure, fasting glucose levels, or HOMA between the two groups. Only insulin levels decreased significantly in the WL+SE group (p=0.04) **Conclusions:** This study demonstrates: 1) it is possible to increase sleep duration in obese adults who regularly obtain insufficient sleep; and 2) combining sleep extension and behavioral weight loss treatment confers no benefit on weight loss or metabolic outcomes compared to behavioral weight loss treatment alone.

T-438-P

Influence of Children on Weight Outcomes for Adults Participating in an Internet-Based, Behavioral Weight Control Intervention

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Background: Family-based change is important to pediatric weight management, but few studies have examined whether having children and child weight status influence adult weight control efforts. This secondary data analysis explored the impact of having children and child weight status on home food environment and weight outcomes in 177 overweight and obese adults who participated in a 12-week internet behavioral weight loss program **Methods:** Height and weight measures were taken and a self-report home food environment questionnaire collected from all participants (mean age=47.48+10.26, 85% female, 89% White) at baseline and post-treatment. Participants reported sex, age, height, and weight status for each child<18 years-old living in their home. Based on these data, participants were classified as having no children (NC; n=104), all normal weight children (NWC; n=41), or ≥1child who was overweight (OWC; n=31). **Results:** At baseline, groups did not differ on adult BMI or home fruit and vegetable availability. However, participants with children, irrespective of child weight status, had more salty snacks (p<.05) and kid-friendly foods (e.g., sugar-sweetened cereals; p<.001) in their homes compared to NC. Moreover, relative to NC, OWC participants had more sweets (p<.001) and NWC participants had more sugar-sweetened beverages (p<.05) at home. All participants lost a significant amount of weight during treatment, but groups did not differ on percent weight loss (mean=6.3% across groups; p=0.78). Time x group interactions were not found for assessed foods; all participants increased home fruit availability from pre- to post-treatment (p<.01). **Conclusions:** Having children, irrespective of weight status, increases the obesogenic nature of the home food environment but does not appear to impact adult weight loss.

T-439-P

Facilitating Weight Loss with Real-Time Intake Feedback from a Wrist Worn Monitor

Michael L. Wilson *Clemson, SC*; Tonya F. Turner, Patrick M. O'Neil *Charleston, SC*; Eric R. Muth *Clemson, SC*

Background: The purpose of this pilot study was to determine if energy intake feedback from a wrist-worn monitor could facilitate weight loss. **Methods:** 19 overweight subjects were instructed to wear Bite Counters for 6 weeks to record their number of bites during all eating activities (EA). Subjects were instructed to wear the Bite Counter during all EAs and to turn on the Bite Counter before taking the 1st bite of food and off after taking the last bite of food. The participants (17 F; BMI M = 31.16, SD = 3.57) had biweekly weigh-ins at which Bite Counter data were downloaded. Participants were divided into two groups, one that received feedback (n = 10) from the Bite Counter and daily bite count targets and one that received no feedback or targets (n = 9). **Results:** Although the groups did not differ significantly on weight loss, (t(17) = 0.88, p >.05; d =.43) there was a trend toward greater loss by in the feedback group (M = 2.08 kg, SD = 2.59 kg) compared to the no feedback group (M = 1.18 kg, SD = 0.57 kg). The effect size for this analysis (d =.43) was found to approach Cohen's (1988) standard for a moderate effect (d =.50) suggesting that a larger N or longer weight loss period would produce a difference between groups. **Conclusions:** The data support further research on the Bite Counter as a feedback tool to help individuals reduce intake and thereby lose weight.

T-440-P

Clustering of Accelerometer-Verified Physical Activity Outcomes within Behavioral Weight Loss Groups

Danielle Arigo, Stephanie G. Kerrigan, Meghan L. Butryn *Philadelphia, PA*

Background: Obesity and related health behaviors are known to cluster within naturally-occurring social networks over time. Existing evidence also demonstrates clustering of physical activity (PA) levels in two specific contexts: (1) in self-selected teams of individuals who participate in a web-based intervention (PA assessed by pedometers), and (2) within randomized behavioral weight loss (BWL) groups (assessed with self-report, which has limited validity). The present study extends this work by examining clustering effects on objectively-verified PA levels within randomized BWL groups. **Methods:**

Participants were community-dwelling adults (N=172) with BMIs between 27 and 45 kg/m2 who were enrolled in a BWL RCT. All participants received the same weekly PA goal; goals increased by number of days per week and/or time per exercise bout every 2-3 weeks. Seven-day accelerometer-based PA assessments occurred at baseline and after 6 months of treatment. **Results:** Controlling for the effects of treatment condition and group leader, group membership (k=16) significantly predicted change in percent of time spent in vigorous activity and the overall amount of energy expenditure (kcal; ps<.05). These effects were qualified by interactions with gender (ps<.01). In addition, group membership accounted for small but significant percentages of the variance in total time spent in moderate-to-vigorous PA (MVPA; 6%), number of MVPA bouts in a week (5%), and percent of time spent sedentary (2%; ps<.04). **Conclusions:** Together, these findings demonstrate small, but potentially meaningful, social influences on PA behavior in randomized BWL groups. Increased focus on social influence processes (such as support or comparison to others) in BWL groups may improve adherence to PA recommendations and overall PA outcomes in group-based BWL interventions.

T-441-P

Anhedonia is Related to a Poor Pattern of Learning and Predicts Decision Making Deficits in Obese Individuals on the Iowa Gambling Task

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Background: Decision-making impairments may be related to obesity and maladaptive eating behaviors. The Iowa Gambling Task (IGT) simulates real-life decision-making by assessing ability to sacrifice immediate rewards in favor of long term gains. We hypothesized that IGT performance would be related to eating pathology and a measure of reward processing abnormalities. **Methods:** Seventy-six (53% f) healthy obese volunteers (112±20kg [M±SD]; 35±10y) were admitted to an inpatient unit. While on a weight maintaining diet, they completed the IGT and questionnaires measuring anhedonia, binge eating and cognitive restraint. We categorized binge eaters (BE) as those reporting loss of control during overeating episodes. Subjects were divided into those with low vs. high anhedonia based on median scores. **Results:** Higher anhedonia (r=-0.32, p=0.008) and lower restraint (r=0.27, p=0.03) correlated with poorer IGT performance. BE had lower IGT total scores compared to non-BE (-14 vs. 4; p=0.02). Using a repeated measures ANOVA, we examined net IGT scores for each of the 5 blocks within the IGT (20 trials/block) to analyze the pattern of learning during the test. Those with high anhedonia did not improve their choice behavior over time, whereas participants with low levels of anhedonia showed a learning effect (F=2.4, p=0.05), indicating better performance during the later part of the test. In a GLM, anhedonia (β=-5.23; p=0.02), but not restraint or BE, predicted total IGT scores, after controlling for weight, age, sex, race and education. **Conclusions:** Obese individuals who exhibit loss of pleasure and diminished interest in rewarding stimuli have less adaptive decision-making skills. This indicates an inability to delay gratification and preference for short-term rewards which may result in difficulty choosing behaviors that favor long-term health benefits.

T-442-P

An Innovative Care Model to Limit Gestational Weight Gain (GWG) and Minimize Macrosomia in the Obese Gravida

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Background: Obesity affects over 30% of pregnancies in the US and is associated with complications such as preeclampsia, gestational DM, postdates and c-sections. Prepregnancy BMI and excessive GWG are associated with complications such as macrosomia, stillbirth and long-term sequelae including pediatric obesity. For these reasons, we sought to reduce GWG in the obese gravida through an innovative care model. **Methods:** Obese Medicaid recipients presenting to Johns Hopkins Hospital from 12/2011 to 6/2013 were assigned to the Nutrition in Pregnancy clinic. Participants were exposed to a set of interventions to reduce GWG including: dedicated care by 2 Maternal Fetal Medicine physicians, systematic review of pregnancy and pediatric risks associated with obesity, counseling about appropriate GWG, high frequency prenatal visits (q2 w until 36 w and weekly thereafter), in-depth nutritional consultation at the first visit followed by ongoing nutritional support, a prescription for 30 min of moderate daily exercise, and clinic-based social work and WIC services. Principles of behavioral modification were em-

ployed to encourage ongoing participation. Data were abstracted from medical records with IRB approval. **Results:** A total of 152 women participated in the program, of which 73 (48%) have delivered and 40 (54.8%) have been seen postpartum.We followed weight gain trajectory from first to last prenatal visit. Average weight gain was 1.2 lbs (sd = 6.3 lbs), 3.1 (sd = 11.6), 5.3 (sd = 13.8) for class 1, 2 and 3 obesity. No neonates were macrosomic. Of the 40 women who were seen at 6 weeks postpartum, 18 women (45.0%) had returned to, and 6 women (15.0%) were less than, their weight at first presentation. **Conclusions:** A comprehensive approach to care of the obese gravida has resulted in limiting gestational weight gain in pregnancy and reducing the incidence of macrosomia.

T-443-P[DT]
Working on Weight Loss in Real Life: The Development and Assessment of the STRIDES Program

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Background: Weight loss programs are often less effective in persons who are an ethnic minority, have lower income, or lower-literacy skills. Our team developed the STRIDES weight loss program: a 12-week group weight loss program designed at a 4th grade reading level. STRIDES stands for Steps to Reach Individual Diet and Exercise Solutions. STRIDES includes interactive group learning and individual counseling. STRIDES participants are obese African America (AA) adults recruited from an urban primary care practice. This evaluation assessed attendance and weight loss in STRIDES participants. **Methods:** Analysis of STRIDES program participants records from the program initiation in 2009 to 2012. Analyses comparing patient characteristics conducted using the Cochran-Armitage Trend Test. Bivariate comparisons of the continuous items analyzed using the Chi-square. **Results:** 355 participants enrolled and 253 (71%) attended ≥ 1 class. Of the 253 who attended, 94 (37%) partially completed STRIDES and 99 (39%) completed STRIDES. Completers and drop-outs were: mostly middle-aged, AA women with an average initial body mass index of 42. 18% were at moderate or higher risk of having low health literacy. Mean weight loss was 8 lbs. (3%) but obscures STRIDES participants who were either responders and non-responders: 4 gained (2.8% mean); 27 unchanged; 35 lost (12 lb - 4.8% mean). 29% re-enrolled in another 12-week STRIDES session. **Conclusions:** STRIDES is an innovative program that uses pro-social values and individualized behavioral plans, to accommodate a range of preferences, resources, and literacy levels. STRIDES program participants had clinically meaningful weight loss. Further evaluation of the program's effectiveness is warranted.

T-444-P
Accuracy of a Bite-Count Based Calorie Estimate Compared to Human Estimates with and without Calorie Information Available

James N. Salley, Adam Hoover, Michael L. Wilson, Eric R. Muth *Clemson, SC*

Background: Obesity is an increasing health problem in the US, associated with such dangerous health risks as heart disease and diabetes. Self-monitoring in the form of calorie counting is a critical aspect of successful weight loss. However, calorie estimations are subject to several perceptual and cognitive biases. The present study seeks to assess the accuracy of participants' estimations of the calorie content of meals in the presence or absence of calorie information, and to compare their accuracy with calorie estimations based on bite count. **Methods:** Data were analyzed for 87 participants from a study in which participants were allowed to select from a wide variety of meals in a cafeteria setting. Participants were asked to estimate the number of calories they consumed either with or without a menu containing calorie information. True calorie intake and a calorie intake estimation based on bite count were calculated for each participant. **Results:** A 2 (estimation method) x 2 (presence of calorie information) mixed-design ANOVA revealed a significant main effect for estimation method ($F(1, 83) = 14.381$, $p < .001$), a marginally significant effect for the presence of calorie information ($F(1, 83) = 3.835$, $p = .054$), and a significant interaction between estimation method and the presence of calorie information ($F(1, 83) = 6.384$, $p < .05$). Post-hoc tests revealed that errors in human calorie estimations were significantly reduced by the presence of calorie information ($t(45.89) = -2.731$ $p < .01$). Calorie estimations based on bite count were significantly more accurate than human estimates without the aid of calorie information ($t(32) = -3.578$, $p < .005$). **Conclusions:** The results suggest that bite count may aid individuals with

calorie estimation when other aids are unavailable or be a less burdensome alternative to certain calorie estimation aids.

T-445-P
Incentive Provision and Motives for Exercise in College First-Year Students, a Randomized-Controlled Trial

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Background: A common criticism of incentives for health behaviors is that incentive provision undermines intrinsic motivation to carry out the targeted behavior. This study determined the impact of monetary incentive provision on participation motives for exercise in first-year college students. **Methods:** 117 first-year college students were randomized to one of three conditions; a control condition which received no incentives for meeting fitness-center use goals, a discontinued-incentive condition which received weekly incentives for 12 weeks during fall semester, and no incentives during spring semester, or a continued-incentive condition which received weekly incentives during fall semester, and incentives on a variable-interval schedule during spring semester. The Exercise Motivation Inventory 2 (EMI-2) measured exercise participation motives at baseline, end of fall semester, and end of spring semester. Repeated measures analysis using linear-mixed models compared motive changes in the three conditions. **Results:** Incentives did not decrease participation motives associated with intrinsic motivation in any of the conditions. Results also showed a significant decrease over time in the extrinsically associated EMI-2 domain of Weight Management, $F(2, 216)=6.72, p=0.001$ suggesting that participants' extrinsic participation motives to exercise decreased over the study period. **Conclusions:** Incentive provision did not undermine intrinsically associated participation motives for exercise. Therefore, incentives may be a positive way to encourage exercise behavior in college first-year students.

T-446-P
Food Cravings among Bariatric Surgery Candidates

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Background: Food cravings are common, more prevalent in the obese, and may differ in those who pursue surgical treatment for obesity. Tools used to measure food cravings are most often validated in non-clinical, non-obese samples. The current study sought to explore the nature of food cravings in bariatric surgery candidates. **Methods:** In this retrospective study, the medical records of 250 consecutive bariatric surgery candidates at a large medical center were reviewed. Each completed a comprehensive medical, surgical, and psychological evaluation as part of standard of care. 227 candidates completed the Food Cravings Questionnaire – Trait (FCQ-T). A Principal Components Analysis (PCA) with varimax rotation was used to identify the factor structure of the FCQ-T. **Results:** Based on the Kaiser criterion, the PCA revealed a 7 factor structure that explained 70.89% of the variance. The seven factors were: 1) preoccupation with food, 2) emotional triggers, 3) environmental cues, 4) loss of control, 5) relief from negative emotions, 6) guilt, 7) physiological response. **Conclusions:** Food cravings in bariatric surgery candidates appear to be related most to preoccupations with food, unlike non-surgery seeking obese and non-obese populations. A tendency toward perseverative thoughts may be reflective of recent findings that executive dysfunction may adversely affect bariatric surgery outcomes. Psychotherapeutic approaches and/or neurostimulation techniques targeting these tendencies may improve bariatric surgery outcomes.

T-447-P
To Succeed, or Not Succeed? That Is the Pre-Treatment Question

Erin Lenz, Amy A. Gorin *Storrs, CT*

Background: It has been well-established that behavioral weight loss interventions are intensive and expensive; therefore, elucidating pre-treatment health behaviors that may predict an individuals' success is essential. **Methods:** Participants (N= 201; 48.9 ± 10.5 years; 78.1% women) enrolled in a study comparing a standard behavioral weight loss program (SB; n= 99) to a home-environment focused weight loss program (HE; n=102) completed baseline questionnaires assessing individual control variables (i.e., dietary restraint, self-weighing) and control over the home food environment (i.e., grocery shopping, meal preparation behaviors). Weight loss success (WLS), defined as maintaining a ≥5% weight loss at 18-months, was objectively

measured. Treatment group was examined as a possible moderator. **Results:** 48.3% participants maintained WLS at 18-months [53.9% of HE condition; 42.8% of SB condition]. None of the pre-treatment behaviors were predictive of WLS in either condition. Infrequent self-weighing, although not associated with weight loss outcomes, was associated with eating meals away from home (r= .396, p <.01), and lower dietary restraint (r= -.221, p <.05). Less than half of all participants endorsed being the primary grocery shoppers (44.1% HE; 47.5% SB) or meal preparers (42.4% HE; 37.4% SB). Preparing less than half of all meals at home was associated with poor dietary restraint (r= -.177, p<.05). **Conclusions:** Identifying pre-treatment predictors of weight loss success remains an elusive goal. Although our results did not find specific behaviors predictive of WLS, they do suggest that many individuals enter treatment with little control over the types of food that enter the home. Interventions that include the primary grocery shopper and/or meal preparer in treatment might yield greater weight losses over time.

T-448-P
More Support That Support Matters: Perceived Support from Spouses Associated with Weight Loss Success

Meghan L. Butryn, Danielle Arigo *Philadelphia, PA*; Amy A. Gorin *Storrs, CT*

Background: Spouses and partners can exert a powerful influence on weight control through social and environmental processes. This study examined the relationship between perceived spouse/partner support and behavioral weight loss treatment outcomes. **Methods:** At baseline and 6 months (mid-treatment), participants (n=179) rated the extent to which their spouse/partner (hereafter "partner") supported their weight control efforts. Participants estimated their partner's body size with a figure rating scale and reported at 6 and 12 months (end of treatment) if their partner's weight had changed. Participants' weight loss was measured at 6 and 12 months. **Results:** Ratings of perceived support decreased from baseline to 6 months (p=.05). Partners rated as larger on figure ratings were perceived as providing less support at 6 and 12 months (ps<.04). Changes in support were associated with session attendance (r=.39, p < .01). Participants who reported decreased support attended 78% of sessions vs. 91% in those who reported increased or stable support (p<.01). Partner support at 6 months was associated with participant weight loss at 6 and 12 months (rs=.22 and .26, ps<.05). Participants with the highest ratings of support lost 12.6% at 6 months and 14.8% at 12 months, vs. 9.0% and 10.1% in participants with the lowest ratings of support (ps < .05). At both 6 and 12 months, 51% of participants reported that their partners had lost >5 lbs. **Conclusions:** These findings further support the role of partner support in successful weight loss efforts, and suggest that a substantial proportion of partners may lose weight during the course of a 1-year treatment program. Experimental research is warranted to determine how increasing partner support for weight loss can improve treatment engagement and outcomes in participants and partners.

T-449-P
The Impact of a Weight Management Intervention Conducted During Pregnancy on One-Year Maternal and Newborn Weight: The Healthy Moms Trial

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Background: It is unclear whether weight management interventions conducted during pregnancy can reduce postpartum weight retention and offspring overweight. **Methods:** We randomly assigned 114 obese (BMI ≥30 kg/m2) women at a mean of 15 weeks gestation to either a weight management intervention (IG) or usual care control group (CG). IG participants received an individualized calorie intake goal and advice to follow the Dietary Approaches to Stop Hypertension dietary pattern without sodium restriction. They attended weekly group intervention meetings until giving birth. The IG gained less weight during pregnancy (mean difference=-7.5 pounds, 95% CI [-11.2,-3.8]), weighed less at 3 weeks postpartum (-5.7 vs +2.8 pounds, mean difference=-8.4 pounds 95% CI [-12.9,-3.8]), and had fewer large-for-gestational-age infants (9% vs 26%, p<.05) than the CG. Blinded staff assessed outcomes at 1-year postpartum. Maternal weight change was calculated as 1-year minus randomization weight. Analyses were performed using chi-square and ANOVA. **Results:** Preliminary data for 89 participants showed that the change in mean maternal weights from baseline to one year were not signifi-

cantly different between groups (IG -3.1±18, CG -2.7± 21, mean difference -0.4, 95% CI -8.6 to 7.8). There were similar proportions of women in the IG and CG with 1-year weights below (27% vs 29%) and >10 pounds above (9% vs 13%) their randomization weight (p=0.72). Preliminary data for offspring show the mean weight for length and BMI z-scores were similar for IG compared to CG (0.6±0.8 vs 0.6±0.9, p=0.69), as were the proportions of offspring with a BMI≥85 percentile (overweight, 11% vs 13%, p=0.62). **Conclusions:** This weight management intervention during pregnancy reduced birth size and early weight retention, but did not affect outcomes 1 year after delivery.

T-450-P
Evaluating the Components of a Computer Guided Intervention for Weight Loss: A Preliminary Analysis

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Background: Previous research indicates that weight loss increases with increased intensity of intervention. Computer systems provide interventions that can be specifically tailored. Such individualization requires analyses to determine the effectiveness of the components of the computer program. **Methods:** A longitudinal RCT was conducted over 12 months with 3 incremental levels of weight loss intensity. This study focuses on the computer intervention (N = 589). Participants had weekly access to the computer guided intervention (CGI) throughout the study. One component of the CGI was behavioral prescriptions, which were specific measurable exercise, dietary, and cognitive behavioral goals. The CGI prompted participants to select specific prescriptions at the end of every session. Each participant selected up to five prescriptions they planned to work on between sessions, and rated their success during the following session. **Results:** A significant correlation between final weight loss and CGI use was found (r = .265, P <.001). The average prescription success did not correlate with final weight loss (r =.045). Interestingly, participants' weight loss readiness did not correlate with their final weight loss (r = -.020). **Conclusions:** Despite the relationship between CGI usage and weight loss, both selection and success of behavioral goals were not found to be relate to weight loss, indicating that other components of the CGI may be responsible. Further analyses will determine the relationship of stage of change with weight loss and behavioral prescription success. Evaluating the CGI components has important clinical applications, since identifying component effectiveness will guide accurate research and allow for successful weight loss interventions.

T-451-P
Improving the Satiating Potency of High Energy Beverages: From Concept to Real-World Application

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Background: Calories consumed as a beverage tend to have weak effects on appetite, perhaps because the satiating potency of a food is dependent not only on the physiological effects of its nutrients but also on the consumer's experience of ingesting that food; the sensory experience of consuming liquid calories might result in the beverage being more relevant to thirst processes than to those that control appetite. In a series of studies we examined how manipulating a beverage's sensory properties to make it more relevant to appetite control processes can change how consumers respond to the calories it contains, and whether any changes in response are robust over time and evident outside the laboratory. **Methods:** Participants (n=48) repeatedly consumed a beverage which was either high (279kcal) or low in energy (78kcal) and which either had been thickened and made to taste more creamy or was presented without these sensory enhancements. These beverages were consumed as a mid-morning snack over a two month period. Consumers' satiety responses were measured at pre-exposure, post-exposure and at a 1 month follow-up. **Results:** The high calorie beverage with added thick and creamy sensory properties suppressed appetite to a greater extent than the same beverage without these sensory enhancements, replicating previous findings. However, after repeated consumption of the beverage the beneficial effects of the sensory manipulations became less apparent. **Conclusions:** Overall these data suggest that subtle sensory modifications of high energy beverages might aid appetite management, but whether these effects can have a positive impact on eating behaviour outside the laboratory remains to be seen. A fol-

low-up study will test these ideas in the real-world and a description of this methodology will be discussed.

T-452-P

Factors Associated with Treatment Success for Patients with Loss of Control Eating in a Behavioral Weight Loss Program

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Background: Binge eating has been associated with sub-optimal weight loss in lifestyle change programs. Reasons for this finding are unclear, although loss of control eating may contribute to lower treatment success via poorer behavioral adherence. The present study examined the relations among baseline binge eating with loss of control (LOC), dietary behaviors, hedonic hunger, and weight loss within a 15-week fee-for-service lifestyle change weight loss program incorporating meal replacement products. **Methods:** 111 adults (Mean BMI: 35.9± 7.0, range = 24.6 – 60.1) completed the Power of Food Scale (PFS), Eating Behavior Inventory (EBI), and binge eating screening questions from the Questionnaire of Eating and Weight Patterns before treatment, and repeated the PFS and EBI at the end of treatment. Relations of LOC (present/absent last 6 months) to PFS, EBI and % weight loss were examined. **Results:** LOC binging was reported by 24 (22%) of patients. Although nonsignificant, those with LOC tended to lose less weight than non-LOC patients (M=7.2 ± 4.2% vs. 8.8 ± 5.2%, respectively), t(108) = 1.74, p = .08. The effect of LOC eating on weight loss was at least partially mediated by higher baseline hedonic hunger (PFS) and lower baseline usage of weight control behaviors (EBI). Correlations between improvements in weight control behavior usage and percent weight loss were stronger for LOC subjects than for non-LOC subjects (Total EBI Score z' = 1.88, p< .05). **Conclusions:** To the extent that binge eaters do less well in weight loss programs, results suggest that higher hedonic hunger and lower use of weight control behaviors are contributors. If these results are replicated, a stronger focus on improving weight control behaviors may be particularly important for enhancing weight loss by patients with LOC eating.

T-453-P[DT]

Preliminary Assessment of Engagement Throughout Pregnancy in an Online Appropriate Weight Gain and Healthy Lifestyle Intervention

Margaret M. Demment, Meredith L. Graham, Christine M. Olson *Ithaca, NY*

Background: While overweight/obese women generally use the internet more than normal weight women, little is known about their engagement in online weight and lifestyle interventions. This study aims to identify usage patterns of participants in an online pregnancy intervention to promote appropriate weight gain and examine usage patterns by BMI group. **Methods:** A racially and socioeconomically diverse cohort of pregnant women ages 18-35 were randomized to intervention arms that had access to a website with articles, resources, blogs, BMI tailored weight gain tracker, and diet and physical activity goal-setting and monitoring (n=1112). Latent-class analysis was used to identify patterns of usage and multinomial logistic regression was used to examine associations with demographic characteristics. **Results:** Six distinct patterns of usage emerged: non-users (21%); minimal-users (33%); viewers only (13%); diet-only goal-setters (10%); diet and physical activity goal-setters (11%); and super-users (12%). The proportion of overweight/obese women was highest in the non-user (54%) and super-user (55%) groups. With super-users as the reference, women who are overweight/obese are less likely to be in the minimal (AOR=0.59, 95% CI=0.39-0.88), viewer only (AOR=0.46, 95% CI=0.28-0.75), and diet and physical activity goal-setters (AOR=0.60, 95% CI=0.36-0.99) groups than normal weight women. Women who are low-income, black, and younger are more likely to be in the non-user group compared to their counterparts. **Conclusions:** BMI group was a significant predictor of particular usage patterns of intervention features. Further examining emergent patterns of online intervention usage throughout pregnancy and differences by BMI group could provide helpful information for design and implementation of future interventions.

T-454-P

Does Implicit Attraction to High Calorie Foods Moderate the Relationship between Executive Function and BMI?

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Background: Recent theories of self-control (e.g., Hofmann, 2003) hypothesize that certain neurocognitive processes, specifically executive functions (EF), are necessary for self-regulation in the context of appetitive stimuli, especially when positive implicit attitudes (IA), for the stimuli are high. The current study sought to test the hypotheses that EF correlates negatively with body mass index (BMI) in an overweight sample, and that this association is moderated by IA for high-calorie food. **Methods:** We administered a neuropsychological battery and a measure of IA (Implicit Attitudes Test) to women (n=77; BMI > 27 kg/m2) being screened for behavioral weight loss intervention. **Results:** Results indicate that, controlling for age and IQ, working memory (p = .04, $\eta2p$ = .06) and cognitive flexibility (p = .03, $\eta2p$ =.06) negatively correlated with current BMI. IA significantly moderated the relation between delay discounting and BMI, such that BMI was highest for those with high implicit liking of high-calorie foods and steeper discounting of delayed monetary reward (i.e., those who chose smaller immediate vs. larger delayed reward) (p < .01, $\eta2p$ =.10). Effect sizes for other interaction effects were small ($\eta2p$=.00-.04). Inconsistent moderation effects might be attributable to elevated implicit liking of high-calorie food in this overweight sample, reducing variance in IA scores. **Conclusions:** Our current findings indicate that higher BMI is associated with poorer working memory capacity and cognitive rigidity, and, when implicit liking of unhealthy food is high, ability to delay reward is reduced. Although temporal relations cannot be inferred from the current study, these factors may also represent etiological or maintenance factors for overweight and obesity.

T-455-P

Comparing Three Methods of Intervention Delivery within a Behavioral Weight Loss Program for Young Adults: A Randomized Controlled Pilot Study

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Background: Young adults (YA) are underrepresented in behavioral weight loss (BWL) trials and achieve poorer outcomes than older adults, yet few studies have targeted YA. This study examined the feasibility, acceptability and preliminary efficacy of 3 BWL programs with 18-25 year olds. **Methods:** Participants (N=52, 79% female, 54% minority, Age=22.3+2.0, BMI=34.2+5.4) were randomly assigned to 1 of 3 arms: face-to-face (F2F), web (W), or web plus (W+). All arms received a 12-week BWL program developed based on our previous work. F2F received the program via weekly group sessions and brief bi-weekly individual sessions; W and W+ received a single group session followed by a web-based program. In addition, W+ was given the option of attending experiential groups offered through community partners (e.g., circuit training at a local fitness studio, cooking classes at a local cooking school). Anthropometric, clinical, and behavioral measures were assessed at 0, 12 and 24 weeks. Satisfaction was assessed at 12 weeks. **Results:** F2F participants attended 70% of sessions. Attendance was 100% at the single session in W and W+ arms. W and W+ participants viewed 30.2% and 56.5% of lessons and reported their weight on 45.6% and 73.6% of weeks, respectively. W+ participants attended 23% of the optional experiential groups offered through community partners. The 12-week visits are ongoing; to date 79% of participants have completed the visit (2 wks remain in visit window). Among completers to date, preliminary data indicate 30.8%, 33.3% and 66.7% of F2F, W and W+ participants achieved >5% weight loss. Participants in all arms reported high satisfaction with the program. All follow-up visits will be complete by September. **Conclusions:** Findings will be discussed in terms of viability of each of the approaches and implications for future BWL interventions with 18-25 year olds.

T-456-P
Mind Over Eating®: A Pilot Study Exploring Behavior Changes and Trends

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Background: The Mind Over Eating® program emphasizes mindfulness, mind body therapies, and cognitive behavioral techniques to support obese individuals who are planning bariatric surgery. The program covers areas such as food knowledge, food addiction, stress management, spirituality, and lifestyle modification to initiate changes in behavior and weight loss. The purpose of our study was to explore the effectiveness of Mind Over Eating® on overall lifestyle behaviors and weight loss. **Methods:** We conducted a retrospective study to determine the effectiveness of the 12-week preoperative Mind Over Eating® program. Pre and post questionnaire data were collected from 22 individuals who participated in the Mind Over Eating® program from January 2011 to July 13, 2011. **Results:** The mean weight at the start of the program was 325 lbs. (SD 71.76), with a final weight of 286 lbs (p=.002, SD 56.8). Significant gains were found in the areas of improved nutritional knowledge, mindful eating, and participation in meaningful activities. Water intake increased (p=.006) while soda intake decreased (p=.001). Eating a protein source with each meal increased from 40.9% to 90.9% (p=.001). Participants reported eating meals more slowly (p=.015). Fast food intake decreased (p=.005). At the end of the program participants reported a significant change in their participation in meaningful activities with all of the participants reporting that they engaged in a meaningful activity at least once a month (p=.007). **Conclusions:** The Mind Over Eating® program showed positive trends in weight loss, nutritional knowledge, eating patterns and behavior, and participation in meaningful activities. Mind Over Eating's® foundation in mind-body connection positions it as a valuable tool in assisting people struggling with obesity and increasing success for bariatric patients.

T-457-P
The Impact of Obesity Stigma on Health Behaviors among Treatment Seeking Adults

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Background: Obesity stigma is pervasive and can be debilitating, particularly when obese individuals come to believe and endorse negative stereotypes about themselves (referred to as internalized stigma or weight self-stigma). A recent study showed that exposure to a stigmatizing video led to increased calorie consumption among overweight women in a laboratory setting. However, little is known about how stigma impacts behaviors relevant to weight control, such as dietary choice and self-monitoring. **Methods:** One hundred and thirty weight loss treatment seeking adults (mean = 50 +/- 10) with a BMI range of 30-51 (mean = 37.5) completed a battery of self-report and objective measures prior to entering treatment. **Results:** Weight self-stigma predicted poorer dietary choices and self-monitoring when controlling for BMI (F=4.32; p<.01). In addition, weight self-stigma also predicted lower quality of life, higher anxiety and depression, and more difficulty coping with psychological symptoms. **Conclusions:** Weight self-stigma may play a role in poor health behaviors. Obese people who lose 10% of their body weight (as is typical in behavioral interventions) remain overweight or obese and will likely continue to experience exposure to stigmatization. This could lead to poor health behaviors which could result in weight regain. Future research should examine the longitudinal relationship between stigma and health behaviors and should also seek to identify ways to help obese individuals cope with self-stigma that also allow them to initiate or maintain healthy lifestyle changes.

T-458-P[DT]
Using Technology to Prevent Excessive Gestational Weight Gain in Low-Income, African-American Women: A Feasibility Study

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Background: Nearly 50% of all low-income, African-American women gain more weight in pregnancy than is recommended, placing them at risk for poor health outcomes. Few interventions have been studied to prevent excessive gestational weight gain among women in this population, and none have incorporated technology for skills training and adherence. **Methods:** In 2012-2013, 9 pregnant African Americans were recruited and enrolled in this weight-control feasibility study. At baseline, all participants were over the age of 18 (mean age 25 ± 3.6 years), low income (100% Medicaid), in early pregnancy (mean gestational age 13.3 weeks, range 8-19 weeks), and overweight (mean BMI 32.3 ± 5.9 kg/m2). Participants received a 14-week intervention that included: 2 face-to-face visits; 7 health coach counseling calls; daily skills and monitoring text messages that encouraged appropriate weight gain and healthy eating/exercise; automated text message feedback; individual web-based weight gain graphs; and a Facebook support group. Retention at follow up in the 3rd trimester was 100%. **Results:** Over the study period, participants gained 6.1 ± 3.3 kg and 22% exceeded Institute of Medicine guidelines for gestational weight gain. Participants decreased intakes of soda (50% at baseline drank soda daily vs. 0% at follow up), fried food (78% at baseline consumed fried food at least weekly vs. 44% at follow up), and chips (56% at baseline ate chips at least 2-4 times weekly vs. 11% at follow up). Most found the intervention "extremely helpful" in controlling weight (78%) and improving eating (89%). **Conclusions:** These findings support the feasibility, acceptability, and initial efficacy of an electronically-mediated weight-control intervention for overweight, low-income, pregnant African Americans. A randomized controlled trial with extension postpartum will follow. Support: K23HL106231

T-459-P
Women's Attitudes Toward a Pre-Conception Healthy Lifestyle Program

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Background: Nearly half of U.S. women begin pregnancy overweight or obese, and more than half of overweight or obese pregnant women experience excessive gestational weight gain. Recently conducted lifestyle interventions have helped women avoid excessive weight gain *during* pregnancy, but helping women lose weight *before* pregnancy may be an even more effective way to improve pregnancy outcomes. This study was designed to determine women's attitudes toward pre-pregnancy diet and weight management interventions. **Methods:** In May 2013 we conducted an anonymous survey of women in a health maintenance organization's obstetrics and primary care waiting rooms. This survey focused on attitudes toward participating in a pre-conception lifestyle change program. **Results:** Eighty percent of the 126 women surveyed were pregnant or considering pregnancy within five years. Of the 60 respondents who were overweight or obese, 96% rated healthy diet and healthy weight before pregnancy as very important or important, and 77% expressed an interest in participating in a healthy lifestyle program (diet, weight management and physical activity) before becoming pregnant. Likewise, overweight or obese women reported being likely or highly likely to participate in specific intervention program aspects like keeping phone appointments (77%), using a program website (70%), keeping food and exercise records (63%). **Conclusions:** These results show that women in this population believe that adopting a healthy lifestyle and losing weight are important before pregnancy and that they are interested in programs that will help them achieve those goals in preparation for pregnancy.

T-460-P
Thinking About the Consequences of Consumption: How Expectations Can Change the Satiety Value of a Drink

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Background: Drinks are often reported to be less satiating than the same nutrients consumed as a 'food', such as soup, possibly because they are not expected to have much satiety value. We hypothesised that nutrients consumed as a drink would be more satiating if the drink was expected to be a filling snack rather than a thirst-quenching drink. **Methods:** Participants consumed a high energy (HE, 271kcal) and low energy (LE, 75kcal) version of a fruit drink on two test days, in one of four drink conditions varying in satiety-relevant cognitive and sensory information; thin drinks were either presented as *a refreshing drink to quench thirst* (N=16), *a filling snack to reduce hunger* (N=16) or with no contextual information (N=16). A fourth group of participants received a thickened version of the drink, with no additional information (N=16). *Ad libitum* lunch intake was measured 60 minutes later. **Results:** Lunch intake depended on the drink's energy content and it's cognitive and sensory context. Those who had previously consumed the thin drink alone ate

a similar amount at lunch after the HE drink compared to LE, compensating for just 9% of the extra energy in the HE drink. Explicit beliefs about the drink being 'thirst-quenching' and 'filling' increased energy compensation (29% and 41% respectively), but participants compensated the most when the drink was thicker (75%). However, increased compensation was primarily due to participants consuming more at lunch after the LE drink, rather than less after the HE version. **Conclusions:** These data suggest that anticipating a drink will be satiating can modify it's satiety value. However, these expectations may actually reduce the satiety value of a product if they are not in-line with it's actual nutrient content. This has important implications for the design of reduced energy items which could promote overconsumption.

T-461-P

Measuring Diet Adherence During a 6-Month Weight Loss Program: Self-Report Versus a Mathematical Model of Human Metabolism

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Background: Adherence to a prescribed diet is the primary determinant of a successful behavioral weight loss intervention. Unfortunately, measuring diet adherence is difficult since self-reported food intake is highly inaccurate. In contrast, accurate methods of quantifying free-living energy intake (EI), such as repeated doubly labeled water dosing and DXA scans, are prohibitively expensive. Thus, an accurate and inexpensive alternative for quantifying diet adherence is urgently needed. **Methods:** Self-reported EI changes were measured using food logs from the PRONAF study (Zapico, BMC Public Health 2012) where 17 overweight and 22 obese subjects were prescribed a 6-month 25-30% calorie restricted diet based on individual energy requirements at baseline. Body weight was measured every 2 weeks throughout the intervention and these data were used as inputs to a mathematical model of human metabolism to quantify the EI changes underlying the observed body weight time courses. **Results:** The intervention resulted in an average weight loss of 8.2±5 kg (p<0.001). The self-reported EI change was -1060±510 kcal/d which was not significantly different from the prescribed -999±265 kcal/d (p=0.356). Thus, the self-reported diet adherence was 105±36%. In contrast, the mathematical model calculated an EI change of -647±381 kcal/d which was significantly different from both the food logs (p<0.001) and the prescribed diet (p<0.001) and corresponded to a diet adherence of only 67±40%. **Conclusions:** Mathematical model calculations of EI change from repeated body weight measurements offer a convenient and inexpensive quantification of diet adherence during a weight loss intervention that is more accurate than self-reports.

T-462-P

Improvement in Provider and Patient Self-Efficacy in Weight Loss in Primary Care

Stephanie A. Rose, Pierre Zephyr, Chrisanthi Masero, Kevin Real, Kelly H. Webber *Lexington, KY*

Background: Motivation type, risk perception (RP), and self-efficacy (SE) can predict weight loss success. Enrollment data from a 6-month clinic-based healthy lifestyle intervention was assessed aiming to improve patient weight outcomes and patient and provider (PCP) self-efficacy in obesity. **Methods:** Qualitative survey with questions from the Weight Loss Treatment Self-Regulation, Weight Efficacy Lifestyle, and Health Care Climate Questionnaires; the Perceived Competence Scale; on weight loss SE and RP, medical history, anthropometrics, and demographic data. **Results:** Patients were (n=46 to date) 64% female, 84% white, mean age 50.8 (SD 11.5), mean BMI 42.2 (SD 9.2), mean waist circumference female=48.2 inches (SD 7.3) and male=50.5 (SD 3.95), mean LDL 103 (SD 35.4), mean FBG 137 (SD 67). Mean autonomous motivation (AM) was 5.74 (SD 1.18), controlled motivation (CM) 2.35 (SD 1.07), diet self-efficacy (SE) 4.86 (SD 1.11), perception of obesity susceptibility 3.62 (SD 1.42), and perception of obesity severity 4.78 (SD 1.22) [ranges 1 (low) to 7 (high)]. There was a positive correlation (PC) between SE and AM (r=0.56), a small PC between SE and CM (r=0.04), and a small negative correlation (NC) between SE and perceived obesity susceptibility (r=-0.12) and perceived severity of obesity (r=-0.18). **Conclusions:** We found higher levels of AM than CM, moderate levels of SE, generally low perceived obesity susceptibility, and moderate perceived obesity severity. Patients with higher SE reported lower perceived obesity susceptibility and perceived obesity severity. Future goals include linking SE and risk perception and targeting specific risk factors for poor lifestyle choices, and interpreting PCP data.

T-463-P

Internet-Based Self-Help and Cognitive-Behavioral Therapy in the Treatment of Binge Eating Disorder (INTERBED): A Multicenter Randomized Trial

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Background: Internet-based guided self-help based on cognitive-behavioral principles (GSH-I) may be efficacious in the treatment of binge eating disorder (BED), but efficacy in comparison to cognitive-behavioral therapy (CBT) awaits clarification. **Methods:** This report of baseline characteristics and adherence is based on a multicenter randomized non-inferiority trial of GSH-I vs. CBT. A total of 178 individuals with BED (DSM-IV-TR or subsyndromal) and body mass index between 27-40 kg/m2 were randomized to 4-month GSH-I or individual CBT. Primary outcome (days with objective binge eating over the past 28 days) and secondary psychosocial outcomes were assessed at baseline, mid and end of treatment, and 6- and 18-month follow-up. **Results:** Patients were mostly middle-aged obese women suffering from full-syndrome BED (88.8%) at long duration. Compared to norms, patients had increased rates of affective and anxiety disorders, increased eating disorder and general psychopathology, and lowered self-esteem and quality of life. Patient treatment expectations were positive, and attrition by the end of treatment (4.5%) was low. Therapist adherence to GSH-I and CBT was documented. **Conclusions:** These results show that patients with longstanding and severe psychopathology sought treatment through either GSH-I or CBT. Both treatments were acceptable and could be conducted in a manual-conform way. Future analyses will compare the efficacy of GSH-I vs. CBT in the long-term, and address identification of moderators and mediators.

T-464-P

Individual Differences in Physical Activity and Weight Losses within a Behavioral Weight Loss Program

Stephanie G. Kerrigan, Meghan L. Butryn, Evan M. Forman *Philadelphia, PA*

Background: An understanding of individual differences in response to behavioral modification programs is critical for improving outcomes. While some research has shown differential responses to behavioral weight loss (WL) programs and physical activity (PA) adoption between sex and racial categories, objective measurement of PA in this research is lacking. **Methods:** Overweight/obese participants (n = 174) enrolling in a 12-month behavioral WL treatment wore an Actigraph GT3X+ accelerometer for 7 days at baseline, mid- and post-treatment. PA outcome was minutes spent in moderate-to-vigorous bouts of activity (MVPA). **Results:** At baseline, MVPA was higher (p < .01) in men (n = 47, M = 89.86) than women (n = 127, M = 36.46). Gender moderated the adoption of MVPA (p = .01; η2 = .13). Six months into treatment, women had increased activity (M = 128.58) and maintained at post-treatment (M = 112.83), while men did not change during treatment (M = 77.09 and 82.11 at 6 and 12 months). Percent WL at 6- and 12-months were similar (p = .34 and p = .27). White participants (n = 126) did not differ from participants of a racial minority (n = 47) in MVPA at baseline (p = .99) and racial status did not moderate PA adoption (p = .41; η2 = .03). However, white participants had higher percent WL than non-white participants at 6 (M = -11.46% vs. M = -7.61%; p < .01, η2 = .07) and 12 (M = -13.31% vs. M = -8.89%; p = .01, η2 = .07) months. **Conclusions:** Given the same PA prescription, women appear to be better able to adopt MVPA than do men, though WL is similar. While white and non-white participants have similar increases in MVPA, WL does not reflect this change. A better understanding of the mechanism by which different people adopt PA, and the relationship between PA and WL in different subgroups, is needed to better target adoption and maintenance of PA during WL and maintenance.

T-465-P

Decision-Making Impairment Predicts Weight-Loss Outcome

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Background: Prior research indicates that obese individuals demonstrate a high preference for immediate reward, despite higher future losses in terms of both physical and psychological outcomes. Deficits in decision-making abilities and assessment and consideration of future consequences may represent key elements of the neurocognitive profile of obese individuals that promote or maintain weight gain. **Methods:** The present study used a standardized neuropsychological test, the Iowa Gambling Task (IGT), to assess the decision-making profile of an obese sample (N=42) enrolled in two behavioral weight loss treatments. Participants were randomly assigned to standard behavioral treatment (BWL; n = 23) or behavioral treatment with an environmental-change focus (BWL-E; n = 19). BWL-E was designed to promote changes in food cues and availability, as well as cues for exercise, so that desirable weight control behaviors would become defaults and participants would need to rely less on self-control. **Results:** IGT score moderated treatment effects on weight loss such that those with poor IGT scores lost more weight after 6 months in BWL-E than in BWL (p<.01, partial eta squared=.16). **Conclusions:** These results suggest that a BWL treatment focused on environmental stimulus control, which minimizes the frequency of decision-making between immediate rewards and longer-term healthier choices, may be preferable for obese individuals with poorer decision-making skills.

T-466-P

The Effect of Distress Tolerance on Physical Activity in an Overweight/Obese Sample

Stephanie G. Kerrigan, Stephanie M. Manasse, Evan M. Forman, Meghan L. Butryn *Philadelphia, PA*

Background: High levels of moderate-to-vigorous physical activity (MVPA) are critical for long-term weight control, however, most individuals engage in insufficient levels of PA. Poor adherence to PA goals may be related to an inability to tolerate physical discomfort associated with MVPA. The aim of this study was to evaluate the relationship between objectively-measured physical distress tolerance (PDT) and PA in an overweight sample. Because research suggests that PA differs by gender, we examined these relationships in each gender separately. **Methods:** Overweight/obese participants (n = 78; projected n = 130) enrolling in a weight loss study were asked to wear an Acti-graph GT3X+ accelerometer for 7 days. PDT was assessed by time participants kept their hand immersed in a cold pressor (a circulating water bath kept at 3 degrees Celsius). **Results:** After controlling for BMI, PDT predicted minutes per week in MVPA (p = .04, $\eta2$ = .06). Men were more distress tolerant than women (p = .01, $\eta2$ =.07), but MVPA did not differ between genders (p = .16, $\eta2$ = .03). The sample was divided by gender for the remaining analyses given differences in PDT. In men (n = 12), PDT was very strongly associated with higher daily energy expenditure (p = .03; r = .64), time spent in MV activity (p < .01; r = .76). BMI was unrelated to PDT or PA in men. PDT did not predict MVPA in women (n = 66; p = .23, $\eta2$ = .02), but, controlling for BMI, PDT (p = .06, $\eta2$ = .06) did predict weekly time in sedentary activity. **Conclusions:** This is the first study to examine the relationship between PA and PDT using objective measures. Overall, PDT appears to be related to level of PA. However, this relationship appears to be stronger in men. Potential implications include targeting PDT in weight loss maintenance and PA adoption programs, particularly for men.

T-467-P

Age and Gender Effect on the Short-Term Weight Loss and Long-Term Weight Maintenance

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Background: Age and gender may influence responses to medically-supervised weight loss programs. We sought to determine if age or gender are associated with differences in short- and long-term weight loss and weight maintenance success. **Methods:** A retrospective review was conducted of patients enrolled in a Midwestern weight loss clinic between 2003 and 2011. Inclusion criteria were: (1) BMI ≥25 kg/m2 (2) completion of a minimum of three months of weight loss using Health Management Resource's (HMR)

meal replacements, and (3) age 18 years or older. **Results:** A total of 2054 participants were identified for the study. A majority of the participants were female and Caucasian. At three months, 72.3% (n=1,484) achieved ≥ 10% initial body weight loss (IBWL). Participants aged 18–45 years were more likely to achieve three month weight loss compared to participants aged 45-64 or ≥ 65 years. However, age was not a significant predictor for 12 month weight maintenance success (defined as maintaining ≥ 10% IBWL). Women were less likely than men (OR=0.47, 95% CI 0.38, 0.59) to achieve three month weight loss but more likely (OR=1.94, 95% CI 1.02, 3.67) to achieve 12 month weight maintenance. **Conclusions:** Age < 45 was a significant predictor of weight loss at three months, but was not a significant predictor of 12 month weight maintenance. Females were less likely than males to achieve weight loss at three months but more likely to maintain weight loss at 12 months.

T-468-P

Increasing Physical Activity Through Walking, Bicycling and Gardening

Jonathan W. Decker *Orlando, FL*

Background: Physical activity (PA) has known benefits and should be encouraged. The aim of this study was to evaluate the short-term effects of walking, bicycling, and community gardening approaches to enhancing PA among urban-dwelling older adults and low-income ethnic minorities. **Methods:** 157 adults of all races/ethnicities self-selected into one of three interventions: walking (n = 47), bicycling (n = 35), or gardening (n = 75). Interventions were 10 weeks long, with follow-up data collection every 3 months until 1 year. Data collected included: self-report questionnaires, measured PA, and PA focus groups. **Results:** After intervention and at 9-months, three differences in data arose. Bicyclists showed a significant increase (p < 0.01) in social networks from pre- to post-intervention, and at 9-month data collection, as well as a significant improvement (p < 0.001) in perceived environmental attributes, as well as an increase in duration, frequency, and distance of bicycling. PA focus groups revealed the following themes: meeting new people, a spirit of community, accountability, increasing exercise, and developing community awareness. **Conclusions:** Although only bicyclists showed significant changes, other important data did emerge. Gardening was the most successful intervention, with a greater percentage of individuals who wanted to participate, completed data collection, and continued to garden after the study. Once the intervention period was completed, walkers showed a lack of sustainability among individual participants. Despite few statistically significant findings, the results should be considered in their entirety. Participant verbal comments and feedback throughout the study, in addition to during focus groups, reflected the positive impacts that these interventions had upon the participants' lives.

T-469-P

Habituation and Repeated Orosensory Exposure Via the Olfactory and Gustatory Systems

Kate Benson, Hollie Raynor *Knoxville, TN*

Background: Greater exposure to an orosensory cue could increase habituation, producing more rapid satiation. Exposure can occur via olfactory and gustatory systems and repeated exposure through both systems may increase habituation. This investigation examined salivary habituation during 10 lemon juice trials providing exposure via olfactory, gustatory, and combined systems. **Methods:** Healthy, normal-weight, unrestrained females (20.7 +/- 2.7 yrs, 22.2 +/- 1.5 kg/m2, 63.0% white) were randomly assigned to 1 of 3 conditions: olfactory (SMELL: n = 8), gustatory (TASTE: n = 10), or olfactory + gustatory (SMELL + TASTE: n = 9). All conditions completed 12, 2-minute, trials (trials 1-2: water [baseline]; trials 3-12: lemon juice). In conditions with taste exposure, 0.05 ml of the stimulus was placed on the tongue. In conditions with smell exposure, 4.0 g of the stimulus was held 0.5 in from the nose. Participants were instructed to not swallow during trials. Trial salivation was measured using dental rolls and mean salivation of every two trials was the dependent variable. **Results:** A mixed-factor ANOVA, controlling for baseline lemon juice hedonics, found a significant (p < 0.05) interaction of condition x trial. SMELL + TASTE significantly (p < 0.05) increased salivation from baseline (trials 1 & 2) to lemon juice (trials 3 & 4, 5 & 6, and 7 & 8), and decreased salivation by trials 9 & 10, and 11 & 12, which was not significantly different from baseline. TASTE had a significant (p < 0.05) increase in salivation from baseline to lemon juice, with no de-

crease. SMELL showed no significant increase in salivation to lemon juice from baseline. **Conclusions:** Repeated exposure to an orosensory cue by the combined olfactory and gustatory systems produced a faster rate of habituation than exposure by the gustatory system alone.

T-470-P

Complementary and Alternative Medicine Use and Disclosure to Physicians: Do Obese Patients Differ from Non-Obese Patients?

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Background: Complementary and alternative medicine (CAM) use is growing but may be less common among obese patients. Nondisclosure of CAM use to providers is frequent and possibly risky, but it is not known whether obese CAM users are more or less likely to discuss with their doctors **Methods:** Using baseline survey and electronic medical record data from 845 HMO members eligible for an RCT of a medication (statin, ACE-I, ARB) adherence intervention, we studied the cross-sectional relationship between BMI category (obese vs. not) and odds of reported use of 3 CAM categories (Products (e.g. supplements), Providers (e.g. massage), and Practices (e.g. yoga)). Among CAM users, we then examined whether the odds of discussing CAM use with a provider differed by BMI category using multivariable (MV) logistic regression, adjusting for age, sex, race/ethnicity, and education **Results:** Compared to non-obese respondents (n=364), obese (n=481) were younger (mean 62.2y(SD10.3), vs. 69.3y(11.1)), more likely female (59.9% vs. 44%), non-Caucasian (65% white vs. 69.5%), and with equal educational level (60% vs. 61% ≥some college). In MV models, odds of CAM Product use were lower for obese patients (OR 0.71 (95%CI: 0.50-0.99)), while there was no difference in the odds for other CAM modalities (Provider: 0.75 (0.50-1.10), Practices:1.02(0.64-1.66)). Among CAM users, obese patients were equally likely to have discussed their use of products and practices with their doctors (Product MV OR 1.06 (0.67-1.67)), Practices crude OR 0.80(0.34-1.87)), but more likely to have discussed their use of provider-based CAM therapy (MV OR 3.53(1.66-7.85)) **Conclusions:** Obese patients were less likely to report some forms of CAM use than non-obese patients, but, among users, were actually more likely to have discussed their practices with providers, perhaps in context of discussions about weight loss

T-471-P

Effect of a Small-Changes Approach for Weight Loss: A Randomized Controlled Trial

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Background: Little research has been done on promoting weight loss in predominantly male populations with high prevalence of comorbidities. Moreover, there is currently a debate about whether small changes is a viable obesity treatment option. Our objective was to test whether a small-changes intervention (ASPIRE), delivered in a group or via telephone, promoted greater weight loss than a conventional weight management program.
Methods: This trial enrolled and randomized 481 overweight or obese subjects between 2010 and 2011 to three parallel arms, stratified by two study sites. The two ASPIRE arms were delivered by coaches via in-person groups (ASPIRE-Group) or via one-on-one phone sessions (ASPIRE-Phone). Clinical medical center staff delivered the conventional program. Weight changes at 3 and 12 months were compared across the three arms by linear mixed-effects models. **Results:** Overall, 85% of subjects were male, 43% were Non-Caucasian, the mean BMI was 36.5 (25.2-63.0), and mean age was 55 (23 to 87). Subjects in all three arms lost significant (p<.01) weight at 12 months compared to baseline. However, subjects in the ASPIRE-Group arm lost significantly more weight at 12 months than those in the other two treatment arms (a mean of -2.8 kg [95% CI, -3.8 to -1.9] in ASPIRE-Group arm versus -1.4 kg [-2.4 to -0.5] in the ASPIRE-Phone arm and -1.4 kg [-2.3 to -0.4] in the conventional arm). **Conclusions:** A group-based, small-changes weight management intervention delivered by non-clinician coaches resulted in greater weight loss over 12 months compared to a telephone or conventional program in a predominantly male population with a high burden of comorbidities.

T-472-P^DT

Perceptions of Social Support for Healthy Eating and Exercise among Males Seeking Behavioral Weight Control

Jennifer Pells, Chandra Quigley *Durham, NC*

Background: Men are underrepresented in research and clinical settings involving behavioral weight management. This preliminary analysis of adult males examined perceptions of social support for weight control and associations with weight-related constructs. This area is understudied in men and may be relevant in understanding treatment-seeking behavior. **Methods:** Participants were men (M age=52.7 yrs; 95% white, non-hispanic) who completed a 4-week residential obesity program. Pretreatment health and weight measurements and self-report questionnaires were collected (Impact of Weight on Quality of Life–Lite, Eating Inventory–Disinhibition Scale, Sallis Social Support Scales). Analyses were limited to bivariate correlations given the exploratory study and modest sample size. **Results:** Average BMI was 44.6; higher BMI was associated with lower weight-related quality of life (r=-.60,p<.001). BMI was not correlated with Social Support or Eating Disinhibition. Higher scores for Social Support–Eating were correlated with greater eating disinhibition (r=.40, p<.01), triglycerides (r=.36,p<.01) and glucose (r=.28,p<.05). Social Support-Exercise was positively associated with overall and sexual quality of life (r's=.28 and .27,p's<.05).
Conclusions: Perceptions of support for weight loss may offer information about males' reluctance to participate in behavioral treatment. Results revealed significant associations between perceived social support for healthy eating with increased eating disinhibition and higher triglycerides and glucose. Support for healthy eating may be experienced in a negative way (controlling or intrusive) and lead to unintended consequences such as overeating with resulting health effects. The cross-sectional, correlational nature of the study limits causal conclusions but suggests further examination of weight-related social support among males.

T-473-P

Randomized Controlled Trial of Text4baby: Maternal Obesity Risk Factors and Weight Management Outcomes

William D. Evans, Melissa Napolitano *Washington, DC*

Background: Sponsored by the Telemedicine and Advanced Technology Research Center (TATRC), investigators from The George Washington University and Madigan Army Medical Center designed and implemented an RCT to evaluate the text4baby program (text4baby.org). Primary study questions were What effects do the messages have on: a) health knowledge, attitudes, beliefs, and social norms; b) maternal and child health outcomes? Additionally, given recent gestational weight gain guidelines, these amounts and weight related health behaviors were also examined. **Methods:** The study is a randomized prospective design in which pregnant women receive text4baby plus usual care or usual care alone. At baseline, we recruited pregnant women presenting for pre-natal care at Madigan. We followed participants through their first post-partum appointment. Baseline data were collected from 943 women, with follow up data collection ongoing. The evaluation protocol examined: 1) self-reported health behaviors targeted by text4baby; and 2) clinical outcomes from patient records. **Results:** We examined pregnant and postpartum women's weight status and initial results from the RCT. Initial findings: statistically significant increases (p < .05) in daily fruit & vegetable consumption and seeking health information online. Participants gained an average of 16.3 kg during pregnancy. Following completion of the full sample, we will report on differences in weight outcomes between the treatment and control groups during the study period. **Conclusions:** These findings and preliminary data from the trial will be put in context related to other studies. Implications of text4baby for future post-partum weight control programs and recommendations for future research will be covered.

T-474-P

Biopsychosocial Approach to the Treatment of Obesity: A Retrospective Review

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Background: The increasing prevalence of overweight and obesity needs effective approaches for weight loss. Weight loss treatments include weight-loss medications along with nutritional education and exercise, behavioral strategies aimed at lifestyle modifications, or nutritionally restrictive dieting.

Our purpose was to see if a more comprehensive, "Biopsychosocial" program that integrates the biological, psychological and behavioral issues, will help patients lose weight. **Methods:** The "Biopsychosocial" program was used to help patients lose weight at a weight loss clinic. The program teaches the role of insulin in weight loss, uses appetite suppressants to reduce cravings, implements cognitive behavioral therapy to reframe thinking, and utilizes behavioral therapy to break old eating habits through six visits. From 2011-2013, patients who completed at least 8 weeks of treatment were retrospectively reviewed and analyzed. Data included demographics, duration of treatment, medications, weight and BMI. **Results:** Participants lost an average of 23 pounds, or 11% from the initial weight (p<0.05) over an average of 97 days of treatment. **Conclusions:** The "Biopsychosocial" program is an effective weight loss method that addresses biological, psychological and behavioral issues. Further prospective study is needed.

T-475-P
Mindful Awareness Training Versus Computer-Based Inhibitory Control-Training for Decreasing Hedonic Eating

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Background: Obesity is largely attributable to excess caloric intake in particular from low-nutrition discretionary ("junk") foods, including salty snack foods (SSF). Evidence suggests that hard-wired preferences translate (via implicit processes) into poor eating choices, unless overturned by inhibitory mechanisms. Recent work suggests that enhancing mindful awareness of the automatic processes that drive hedonic eating facilitates conscious restraint/inhibitory mechanisms. An exciting new group of studies suggests that computer-based training of inhibitory mechanisms can successfully modify real-world eating decisions. **Methods:** Healthy weight and overweight individuals who reported consuming SSF ≥4 days/week, and who actively desired to reduce their SSF consumption were randomized to one of four 75-minute interventions: computer-based inhibitory control training (ICT), mindful awareness training (MT), both ICT and MT (ICT+MT) or psychoeducation. For 7 days prior to the intervention, and for 7 days subsequent to the intervention, participants made 3 ratings per day of SSF consumption using a smartphone-based ecological momentary assessment system. **Results:** ANCOVA results (n=96, data collection ongoing) indicate large effects of condition on SSF consumption ($F(3,80) = 3.26$, $p = .03$, $\eta p2 = .11$), and specifically that both MT and ICT+MT produced the largest decrease in SSF consumption ($p = .04$, $p < .01$), with a trend towards ICT+MT consuming the fewest (particularly in the shorter-term). **Conclusions:** These results strongly support the efficacy of mindful awareness training in decreasing hedonically-motivated eating, and to some extent, the efficacy of a computer-based inhibitory control training when synergistically combined with mindful awareness training.

T-476-P
Virtual Communities for Weight Management: A Systematic Review

Ilana B. Lane, Charlotte H. Stoute, Gary G. Bennett *Durham, NC*

Background: Virtual communities – web-based environments through which people can give and receive peer social support - are an increasingly popular channel for weight management interventions. The efficacy of virtual communities for weight management has not yet been reviewed. **Methods:** We systematically reviewed the efficacy of virtual communities for weight loss or maintenance among overweight and obese adults. We also examined how participant engagement in these interventions varied as a function of study features and design, as well as the extent to which investigators have examined associations between engagement and weight loss outcomes. We searched 7 databases for randomized controlled trials evaluating the outcomes of weight management interventions, and for which a virtual community was the primary mode of intervention delivery. Our primary outcome was weight change. **Results:** From a total of 6261 papers, 9 studies met the criteria for inclusion. We found that most virtual communities were equally efficacious in promoting weight change as compared to the control arms, most of which were standard in-person group therapies for weight management. Effect sizes were small-to-moderate across trials. The clinical significance of weight change in these trials is undetermined, as these figures were not reported. We were unable to make conclusions about the associations between study features and engagement, due to the heterogeneity in the reporting of engagement metrics. **Conclusions:** We found that weight change produced through participation in virtual communities was not significantly different from that found in traditional group therapy interventions. These findings suggest that virtual communities may be an efficacious and potentially cost effective alternative to group therapy for weight management.

T-477-P
Success of Medicare's Intensive Behavioral Therapy for Obesity in a Small Clinic Setting: A Retrospective Chart Review

Kari Uusinarkaus, Jennifer Ziegenbein, Susan Harms, Kelly Smith, Julia LaPorte *Colorado Springs, CO*

Background: Obesity is a fast growing epidemic in the United States. Within the Medicare population, over 30% of men and women are obese. The strong association between obesity and many chronic conditions, including cardiovascular disease and diabetes, highlights the need for intervention and preventative care in this population. Under the Affordable Care Act, the Centers for Medicare and Medicaid Services were authorized to add coverage for "additional preventative services," including Intensive Behavioral Therapy (IBT) for Obesity for Medicare eligible individuals with a BMI ≥ 30 kg/m2. Medicare's IBT for Obesity can be an effective tool for weight loss. **Methods:** A retrospective chart review was performed averaging the progress of twelve patients seen by a physician assistant under the Medicare IBT for Obesity program. **Results:** Results revealed that after an average of 8.5 visits, the total body weight lost was 6.9 pounds, or 3.0% of original body weight. Waist measurements decreased by 0.83 inches and body mass index decreased by 3.7%. Both systolic and diastolic blood pressure readings decreased by 1.5% and 3.8% respectively. **Conclusions:** These results illustrate that an in-office, behavior focused program can be effective for weight loss. The success of programs such as Medicare's IBT for Obesity will depend largely on patient and provider awareness of program existence, cost to patient, quality of education provided, and patients' willingness to change. If utilized to its full potential, this program can impact not only patient health, but future healthcare costs.

T-478-P
Addition of Voluntary Beverage Service Offering Enhanced the Efficacy of Web-Based Self-Care Lifestyle Modification Program for Weight Loss

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Background: The objective of this study was to examine the efficacy of a web-based self-care lifestyle modification program (The Qupio(TM) Program) for weight loss in T2DM, overweight, and obese adults and to determine if adding a voluntary beverage service changed engagement or weight loss. **Methods:** Two-hundred twenty participants (male = 41, female = 179, with diabetes = 93, without diabetes= 127, mean BMI(±SD) = 34.8±8.1 kg/m2, mean age(±SD) = 51±13 years) enrolled in the program for 6 months. Goals for the user by the end of the program were weight loss of 7% of their starting body weight and a total of 150 minutes a week of physical activity. At entry into the study, diet and physical activity goals were set and meal plans and exercise routines were recommended for each participant to help them achieve calorie balance. Participants recorded their diet, activity, and body weight on the web-based tracking system. Tracked records were reviewed automatically by the application every 4 weeks and new goal and new meal and activity plan were re-adjusted depending on participant's performance and circumstances. During the service offering period, participants voluntarily chose packaged beverages (coffee or green tea) to consume over the course of a 12-week period. A total of 31.4% (69/220) of the participants volunteered for the beverage service. **Results:** As a result, participants in the voluntary beverage subgroup showed significantly higher login frequency compared to the non-beverage subgroup (1.01 times/week vs. 0.29 times/week, p<0.01) and achieved greater weight loss (2.28±0.50% vs. 0.92±0.21%, p<0.01). **Conclusions:** In conclusion, participatory programs for users such as a voluntary beverage service may enhance user access rates and weight loss in web-based self-care programs and facilitate lifestyle modification for the weight loss.

T-479-P

The Relationship between Diet Cheat Days and Weight Plateaus

Diana Thomas *Montclair, NJ*; Corby K. Martin, Leanne Redman, Steven B. Heymsfield *Baton Rouge, LA*; Steven Lettrieri *Pittsburgh, PA*; James Levine *Rochester, MN*; Carl Bredlau *Montclair, NJ*; Dale A. Schoeller *Madison, WI*

Background: Clinical weight loss in individuals typically stabilizes at six months; however, validated thermodynamic energy balance models consistently predict weight plateaus between 1 and 2 years. **Methods:** We developed two thermodynamically based energy balance models to investigate this discrepancy. The first model predicted weight loss in long-term calorically restricted confined Rhesus monkeys that were fed measured amounts of food and weighed on a regular basis. The second model allowed for hypothetically based behavioral fluctuations in adherence to dietary prescriptions during weight loss. **Results:** The Rhesus monkey model predictions compared well with actual data and matched the timing of weight plateau between 1-2 years. Additionally, the model which included changes in dietary adherence generated realistic fluctuating weight graphs which matched well to actual subject weight loss observed in previous studies. Moreover, it was found that both the time point of the weight loss plateau and the value of the plateau were affected by intermittent loss of adherence to prescribed energy intake. It was found that a 6 month weight loss plateau can be generated even if an individual adheres to dietary prescriptions the majority of the time. **Conclusions:** The early weight loss plateau in experimental human studies is the result of intermittent loss of dietary adherence. Since most weight loss experiments observe a 6 month plateau, intermittent loss of dietary adherence is likely a natural response to caloric reduction and should be accounted for in model predictions.

Thursday, November 14, 2013
**Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A**

Intervention Studies - Diet with & without Physical Activity-Adult

T-480-P

Dose-Response Effects of Weight and Fat Mass Loss on Inflammation in Overweight and Obese, Older Adults: The IDEA Study

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Background: Sub-clinical inflammation is a risk factor for disease and disability and is associated with elevated weight and fat mass. Weight loss reduces chronic inflammation; however, the amount of weight and fat mass loss necessary to achieve clinically desirable inflammation levels is unknown. **Methods:** Data come from a single-blind, 18-month, randomized controlled trial including 450 overweight/obese older adults with osteoarthritis. Participants were randomized to diet-induced weight loss-plus-exercise (D+E; n=150), diet-induced weight loss-only (D; n=149), or exercise-only (E; n=151), with 10% weight loss goals achieved in D+E and D arms. Weight, fat mass (measured via dual x-ray absorptiometry) and high-sensitivity C-reaction protein (CRP) and interleukin-6 (IL-6) were measured at baseline and 18 months. **Results:** D+E and D participants experienced lower 18-month CRP [5.0 (SE=0.7) and 4.9 (0.7) vs 7.3 (0.7) mg/dL] and IL-6 [2.7 (0.2) and 2.7 (0.2) vs. 3.2 (0.2) pg/mL] levels compared to E (both p<0.01). Reductions in CRP (B=0.24 (0.06) mg/dL; p<0.01) and IL-6 (B=0.05 (0.02) pg/mL; p<0.01) were significantly associated with reduction in total body fat mass. The odds of achieving clinically desirable levels of CRP (<3.0 mg/dL) and IL-6 (<2.5 pg/mL) were 3.6 (95% CI: 1.7,7.8) and 2.3 (1.2,4.6), respectively, with 5% weight loss and 3.8 (1.6,8.9) and 2.2 (1.1,4.6), respectively, with 5% fat mass loss. **Conclusions:** Diet-induced reductions in weight and fat mass predict reduction of CRP and IL-6. The odds of achieving a clinically desirable level of inflammation more than doubles with 5% loss of either weight or fat mass.

T-481-P

The Comparison of a Technology-Based System and In-Person Behavioral Weight Loss Intervention in the Severely Obese

Renee J. Rogers, Kelliann K. Davis, Bethany Barone Gibbs, John M. Jakicic *Pittsburgh, PA*

Background: Technology-based systems incorporating a physical activity monitor and web interface to monitor dietary intake and weight combined with monthly telephone contact has been shown to be an effective intervention for weight loss. Whether this type of intervention is effective for individuals with Class II (BMI = 35.0 to <40.0 kg/m2) or III (BMI >40 kg/m2) obesity has not been examined. Moreover, continuous enhancements in technology require ongoing evaluation of the effectiveness of these interventions. **Methods:** 39 adults (age: 39.9±9.7, BMI: 39.5±2.8 kg/m2) were randomized to BWLI (N=14), TECH (N=12), or EN-TECH (N=13). Subjects decreased energy intake (1500-2100 kcal/d), and increased physical activity (200 min/wk). BWLI attended weekly group sessions. TECH was provided with a wearable activity monitor that interfaced with a web-based program, and received one 10-minute telephone call per month. EN-TECH received the same components as TECH, with enhanced Bluetooth capability for real-time monitoring of energy balance. **Results:** Weight was significantly reduced from 110.9±9.1 to 105.9±9.1 kg in BWLI (-5.0±6.2 kg, p<.001), 112.2±10.5 to 107.9±11.6 in TECH (-4.3±4.7 kg, p<.001), and 111.6±15.0 to 107.5±17.0 in EN-TECH (-4.1±6.1 kg, p<.001) from 0 to 6 months. However, weight loss was not significantly different between the intervention groups. **Conclusions:** Findings suggest that short-term weight loss can be achieved in individuals with Class II or III obesity with less in-person contact using a technology-based system with periodic telephone contact. Findings may have clinical implications for delivery of weight loss interventions for severely obese adults. Long-term effectiveness of a technology-based intervention warrants further investigation.

T-482-P

Effects of Visceral Adipose Tissue Reduction on Cardiovascular Risk Factors Independent of Weight Loss: The Look AHEAD Study

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Background: To determine whether visceral adipose tissue (VAT) reduction improves cardiovascular disease (CVD) risk factors, independent of the amount of weight loss. **Methods:** We analyzed data from 100 participants of the Fatty Liver Ancillary Study of Look AHEAD (Action for Health in Diabetes), who completed magnetic resonance imaging at baseline and 12 months, and had no missing data in the variables of interest. In the Look AHEAD, participants were randomly assigned to an intensive lifestyle intervention (ILI) which combined diet and physical activity or a control group who received diabetes support and education (DSE). We used multivariable regression models to correlate changes in VAT and CVD risk factors, while adjusting for weight-loss and treatment arm (ILI vs. DSE). **Results:** Overall 52% were women, 36% were black, mean age was 61 years. In the DSE arm, mean weight and VAT increased 0.1 % (*p=0.90*) and 4.3% (*p=0.39*), respectively, over one year. In the ILI arm, mean weight and VAT decreased by 8.0% (*p<0.001*) and 7.7% (*p=0.01*), respectively. Overall, mean weight reduction was 3.8 kilograms or 3.6% (*p<0.001*), mean VAT reduction was 6.0 cm^3 or 1.2% (*p=0.22*). Changes in VAT correlated with changes in plasma high density lipoprotein-cholesterol (HDL-C; r =-0.37, *p = 0.03*) but were not significantly correlated with changes in blood pressure, triglycerides, LDL, glucose or HbA1c. After adjusting for age, sex, race, treatment group, weight change, changes in plasma HDL-C were not significantly associated with changes in VAT; however, VAT changes were independently associated with changes in fasting blood glucose (beta=-0.7, *p <0.04*). **Conclusions:** Among a sample of overweight and obese adults with type 2 diabetes, after adjusting for weight loss, VAT reduction over a one year period was not associated with coincident improvements in CVD risk factors.

T-483-P

Increased Fruit and Vegetable Intake Has No Discernible Effect on Weight Loss: A Systematic Review and Meta-Analysis

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Background: A common dietary recommendation for weight loss is to eat more fruits and vegetables (F/V). Without a compensatory reduction in the intake of total energy, significant weight loss would be unlikely. Our objective was to synthesize the best available evidence on the effectiveness of being assigned to eat more F/V for weight loss or prevention of weight gain. **Methods:** We searched multiple databases for randomized controlled trials (RCTs) where the singular effect of F/V intake was evaluated for effects on body weight/composition. Inclusion criteria: N per arm ≥ 15; duration of intervention ≥ 8 weeks; stated primary or secondary outcome variable is body weight/composition; stated goal of the intervention is weight/fat loss or prevention of weight/fat gain; intervention includes a variety of F/V that remain minimally processed; and was published prior to August 1, 2012. **Results:** Five RCTs met all criteria, but only three reported usable weight data; seven other RCTs met all criteria except for having weight as a primary outcome, but only three reported usable weight data. Preliminary analysis indicates a standardized effect (positive estimates indicate increased weight as a result of F/V consumption) for RCTs meeting all criteria was -0.24 (95% CI -0.56 to 0.08), p = 0.14. The standardized effect of increased F/V intake on body weight for RCTs meeting all/most criteria was -0.02 (95% CI -0.14 to 0.11), p = 0.80. The six RCTs for which weight data was unusable for meta-analysis all reported non-significant differences between treatment and control groups for weight/body composition outcomes. **Conclusions:** Based on present evidence, recommending increased F/V consumption to treat or prevent obesity without explicitly combining with efforts to reduce intake of other energy sources is unwarranted.

T-484-P

Effects of Overeating and Dietary Protein Content on Spontaneous Physical Activity

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Background: Spontaneous physical activity (SPA) is believed to increase following overeating but no daily measurements of SPA exist following overeating or in response to variable dietary protein intake. **Methods:** Twenty-five (16M, 9F) healthy weight stable adults (18-35y) with BMIs from 19 to 30 kg/m2 were recruited for this inpatient study. In a parallel group design, participants were fed 140% of energy needs with 5%, 15%, or 25% of energy from protein for 8 weeks. Participants wore an RT3 accelerometer daily (at the waist); completed whole room metabolic chamber assessments (% of activity and spontaneous physical activity; SPA) at weeks 0 (baseline; energy balance energy intake), 1, 2, and 8 (140 % overeating); and completed the doubly labeled water (DLW) method at baseline and week 7. **Results:** Activity energy expenditure (AEE, measured with accelerometry) increased during week 8 of overeating even after adjusting for fat-mass and fat-free-mass. However, percent of activity in the metabolic chamber did not change with overeating. SPA (kcal/d) measured in the chamber increased at week 8 and activity related energy expenditure (AREE) from DLW increased during overeating, yet these effects were not significant after adjusting for fat-mass and fat-free-mass. **Conclusions:** Within the confines of an inpatient unit, protein intake did not affect changes in activity following overeating. AEE by accelerometry increased in response to overeating suggesting metabolic adaptation, however SPA and AREE did not increase after adjusting for body composition. Thus the gold standard activity measurements demonstrate increased SPA was due to the increase in body weight and RT3 accelerometry may overestimate AEE with overeating. Disclosures: This study was funded in part by the USDA 2010-34323-21052, LSU, NIH K23 DK068052 and NIH P30 DK072476. Conflicts of Interest: None.

T-485-P

Energy Density and Macronutrient Composition During Short Term Overeating Results in Incomplete Compensation of Energy Intake

John W. Apolzan, George Bray, Marc T. Hamilton, Theodore W. Zderic, Hongmei Han, Catherine M. Champagne, Desti N. Shepard, Corby K. Martin *Baton Rouge, LA*

Background: Body weight increases during weekends and holidays suggesting that people do not compensate after short periods of overeating. **Methods:** To evaluate the effects of overeating (140% of energy requirements) a high-fat low-energy density diet (HF/LED, 1.05kcal/g), high-fat high-energy density diet (HF/HED, 1.60kcal/g), and high-carbohydrate (HC) LED (1.05kcal/g) for 2-days on subsequent 4-day energy intake (EI), activity levels, appetite, and mood on an in-patient unit. Using a randomized crossover design, energy expenditure and EI were standardized during overeating. To our knowledge, this is the first overeating study to include a HF/LED. **Results:** In 20 adults with a mean ± SD BMI of 30.7 ± 4.6 kg/m2, EI was not suppressed until the second day after overeating and accounted for ~30% of the excess EI. Reductions in EI did not differ among the 3 diets yet EI decreased after the HF/LED when EI from days 2-4 were analyzed. Overeating had no effect on subsequent energy expenditure but steps/day decreased after the HC/LED and HF/HED. Sleep time was increased after the HF/HED compared to both LEDs. After overeating a HF/HED vs. HF/LED, carbohydrate cravings, hunger, prospective food consumption, and sadness increased and satisfaction, relaxation, and tranquility decreased. **Conclusions:** Diet type had no impact on compensation over 4 days, though EI decreased from baseline after the HF/LED on days 2-4. No adaptive thermogenesis was observed, rather overeating resulted in less activity and higher sleep. The HF/HED vs. HF/LED had detrimental effects on food cravings, appetite, and mood. These results help explain previous findings that HF/HEDs are associated with hyperphagia. Disclosures: The study was supported by USDA 2010-34323-21052, NIH K23 DK 068052, and NIH P30 DK072476. Conflicts of Interest: None.

T-486-P

Effect of a Vegetarian-Like Diet on Blood Coagulation and Other Health Parameters in Blood Types A and O: An Evaluation of the "Blood Type Diet"

Carol Johnston, Jennifer M. Brown *Phoenix, AZ*

Background: Although not discussed in the popular diet book "Eat Right 4 Your Type," non-O blood types have an increased risk of thrombosis and cardiovascular disease (CVD) due in part to higher concentrations of Von Willebrand Factor (VWF). This 4-week trial examined the effects of the book's type A, vegetarian-like diet (TAD) versus type O, high-protein omnivorous diet (TOD) on body weight and blood parameters in adults with A or O blood type. **Methods:** Omnivore participants were stratified by blood type and weight and randomized to TAD (n=12 type A and 12 type O) or TOD (n=11 type A and 12 type O). Fasting blood was analyzed for prothrombin time (PT), activated partial thromboplastin time, VWF, LDL and HDL cholesterol, triglycerides, and CRP. **Results:** VWF was 46% higher in type A vs. type O participants at baseline. In comparison with TOD, adherence to TAD significantly increased PT (+0.24±0.32 sec) and HDL (+2.1±5.5 mg/dl) in type O, but not type A, participants. Both groups of participants lost weight on TAD (average loss=2.2 lb). No other changes were noted for TAD or TOD adherence. **Conclusions:** The changes in PT and HDL in type O participants adhering to TAD are healthful. It appears that type A participants may be less responsive to dietary intervention and require more rigid dietary guidelines to see beneficial changes. In order to overcome an increased risk of CVD linked to higher levels of VWF, type A individuals should adhere to diets that have been established as antithrombic and heart healthy by scientific research.

T-487-P

Alternate Day Fasting Versus Daily Calorie Restriction for Weight Loss and Cardio-Protection

John Trepanowski, Cynthia M. Kroeger, Monica C. Klempel, Yolian M. Calvo, Krista A. Varady *Chicago, IL*

Background: Alternate-day fasting (ADF) has been shown to reduce body weight and improve coronary heart disease (CHD) risk parameters in overweight and obese humans. Whether ADF produces greater improvements in

these parameters compared to traditional calorie restriction (CR) remains unknown. **Methods:** Overweight and obese subjects (n = 25) were randomized to 1 of 3 groups for 24 weeks: 1) ADF (feed day: 125% of energy needs, alternated with a fast day: 25% of energy needs; all meals provided); 2) CR (75% of energy needs every day; all meals provided); 3) Control (100% of energy needs every day, self-selected diet). **Results:** ADF and CR resulted in similar (p > 0.05 relative to each other) reductions in body weight (8.3 ± 1.5% and 7.2 ± 1.2%, respectively; both p < 0.02 relative to control), fat mass (14.0 ± 2.2% and 15.2 ± 1.8%, respectively; both p < 0.02 relative to control), and visceral fat (0.51 ± 0.11 kg and 0.38 ± 0.12 kg, respectively; both p < 0.01 relative to control). Fat-free mass did not change in any group (p > 0.05). Plasma lipids, glucose, insulin, C-reactive protein, and systolic and diastolic blood pressure did not change in either intervention group relative to the control group (p > 0.05 for each) over the 24-week trial. **Conclusions:** ADF and CR produce similar weight loss and body composition changes, and neither diet appears to modulate CHD risk. These findings are limited by small sample size, however, and warrant further investigation.

T-488-P
Alternate Day Fasting is Effective for Weight Loss and Weight Maintenance in Obese Adults

Cynthia M. Kroeger, John Trepanowski, Monica C. Klempel, Surabhi Bhutani, Kristin Hoddy, Krista A. Varady *Chicago, IL*

Background: Alternate day fasting (ADF; 75% restriction fast day alternated with ad libitum feed day) is effective for weight loss in obese individuals. Whether ADF can also be used for weight maintenance, is not yet known. Accordingly, we examined the effects of modified ADF versus a conventional weight maintenance approach on body weight, visceral fat, and markers of coronary heart disease (CHD) risk. **Methods:** Obese subjects (n = 32) were randomized into 1 of 3 groups: 1) ADF, 2) calorie restriction (CR; 25% restriction daily), or 3) control, for a 24-week weight loss period. After weight loss, subjects began a modified ADF program (50% restriction fast day alternated with ad libitum feed day) or CR-maintenance program (100% energy intake daily) for an additional 24 weeks. **Results:** During the weight loss period, body weight and visceral fat decreased (P < 0.01) in the ADF (18 ± 4 kg; 0.5 ± 0.1 kg) and CR group (16 ± 3 kg; 0.3 ± 0.1 kg). Body weight and visceral fat mass remained stable during the weight maintenance period in both groups. Plasma lipids, glucose, insulin, CRP, and blood pressure did not change after 24-weeks of weight loss in the ADF and CR groups versus control. These CHD risk parameters remained unaltered during the maintenance period as well. **Conclusions:** These findings suggest that ADF may be just as effective as a conventional weight maintenance approach for maintaining weight loss and visceral fat loss, though the effects on CHD risk are not clear.

T-489-P
A Whole-Grain Fiber Composite Ingredient Reduced Acute Food Intake and Appetite Ratings in Men and Women

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Background: Previous studies suggest that type 2 resistant starch from high-amylose maize impacts satiety Highly viscous fibers have similar effects. The current study was designed to assess the satiety effects of a novel co-processed ingredient containing a viscous fiber and high-amylose whole grain corn flour. **Methods:** Ninety adults completed a crossover, placebo-controlled study comparing two doses of the ingredient (20 and 30 g) in a fruit-based smoothie served with breakfast. Ad libitum food intake was measured for the remainder of the day and visual analog scales were used to assess subjective appetite sensations. **Results:** Subjects consumed 7% less energy at dinner following the 30g dose (p = 0.02) compared to control In addition, a trend for lower lunch intake (5%) was observed for the 20 g dose (p = 0.10). Reductions were also observed for the two meals combined, with 4% lower caloric intake observed for the 20 g dose and 5% less weight of food consumed for the 30 g dose. Lower hunger was reported at 3 hr after breakfast for both doses. In addition, for the 30 g dose, less hunger was reported at 2 and 3 hrs after lunch. Higher fullness ratings were reported after 30 g compared to control but no interaction with time was found. Similar results were found for the amount of food participants felt they could eat with lower rat-

ings after 30 g. With ratings combined to compute an overall appetite score, a trend for an interaction of condition and time was found with subjects reporting lower appetite scores at 3 hrs after breakfast for both doses. **Conclusions:** The results of this study show that a new composite satiety ingredient comprised of a high-amylose whole grain corn flour and viscous fiber can affect acute satiety responses in men and women.

T-490-P
Characteristics of Dieters Choosing Either a Low Carbohydrate or Low Fat Diet in a Randomized Trial Examining the Impact of Choice on Weight Loss

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Background: Allowing people to choose diet may enhance weight loss by increasing autonomy and aligning food preferences with diet. In a randomized trial testing this hypothesis, we characterized participants who chose either a low carbohydrate (LCD) or a low fat diet (LFD). **Methods:** In small groups, participants randomized to the 'Choice' arm (vs 'Assigned Diet' arm) were presented information about the two diets and individual results from the Geiselman Food Preference Questionnaire (FPQ) indicating which diet best aligned with their food preferences. One week later, participants selected a diet to follow for 48 weeks, with the option of switching after 12 weeks. **Results:** Of 105 'Choice' arm participants, 61 (58%) chose the LCD and 44 (42%) chose the LFD. Diet choice was not associated with age, race, sex, education, alcohol use, BMI, or diabetes (all p>0.05) but was associated with tobacco use (LCD 18% vs LFD 5%; p=0.04). For those reporting any prior weight loss attempt (n=86), diet choice was associated with prior LFD attempt (LCD 12% vs LFD 31%; p=0.02) but not other strategies. FPQ results aligned with diet choice in 64% of participants choosing LCD vs 24% of those choosing LFD (p=0.0003 for association of diet choice with FPQ result). Top rated reasons for diet choice included how well the diet would help weight loss, health reasons, descriptions of the diets, understanding of the diets, FPQ results, and food preferences prior to FPQ result, with the latter most frequently rated as most important. Only 5 participants (3 LCD, 2 LFD) switched diets after 12 weeks. **Conclusions:** When provided options, more weight loss seekers chose LCD than LFD, possibly reflecting limited availability of LCD in programs. Food preferences guided diet selection. Programs focusing on one diet approach may be of limited appeal to patients with contrasting diet preferences.

T-491-P
The Keys to Dieting Success: Psychosocial Characteristics of Long-Term Calorie Restrictors

Angela C. Incollingo Belsky *Los Angeles, CA*; Elissa E. Epel *San Francisco, CA*; A. Janet Tomiyama *Los Angeles, CA*

Background: In light of the current obesity epidemic, intervention efforts and clinical recommendations often focus on low calorie dieting. Challenges remain, however, in long-term maintenance of dieting and therefore weight loss. **Methods:** To better understand the qualities of those who succeed at long-term dieting maintenance, this study analyzed the psychosocial characteristics of 28 long-term calorie restrictors from the Calorie Restriction Society and followers of the CR way compared to two age-, gender-, ethnicity-, and educational attainment-matched comparison groups, one normal weight and the other overweight/obese. The outcome measures were key demographic and crystallized psychosocial characteristics including personality, IQ, and psychopathology. **Results:** Results indicated the CR group practiced on average 10 years of calorie restriction, but scored lower than comparison groups on measures of eating disorder and other psychopathology. Particularly in comparison with overweight/obese participants, CR participants scored lower on neuroticism and hostility, and were stronger in future time orientation. Taken in aggregate, it appears that individuals who succeed at long-term calorie restriction differ from others in personality and demographic characteristics; characteristics that may in fact predispose them to dieting success. **Conclusions:** These results have important treatment implications. Rather than recommending dieting to all individuals, as is common among general practitioners presently, and rather than blaming a failed diet on the unsuccessful dieter, these results suggest that dieting may be a viable and recommendable option only for a unique subset of individuals.

T-492-P

Weight Loss, Glycemic Control and Cardiometabolic Response to Differential Diet Composition in a Commercial Weight Loss Program in Type 2 Diabetes

Cheryl L. Rock, Shirley W. Flatt *La Jolla, CA*; Nancy E. Sherwood, Kerrin Brelje *Minneapolis, MN*; Dennis D. Heath, Angela F. Leone, Bilge Pakiz, Kenneth S. Taylor *La Jolla, CA*

Background: Achieving and maintaining a healthy body weight is a primary strategy for managing type 2 diabetes. Science-based commercial weight loss programs may provide the structure and support to optimize that effort. **Methods:** Across two sites, participants (227 men and women) with type 2 diabetes and BMI 25-45 kg/m2 were randomly assigned to a higher carbohydrate, lower fat diet (LF); a lower carbohydrate, higher fat diet (LC); or usual care (UC) control group, to examine effects of study participation on weight loss, markers of glycemic control, and cardiometabolic risk factors. The program includes in-person individualized diet and exercise counseling, with prepackaged foods in a planned menu during the initial weight loss phase. **Results:** At 6 months, mean weight change was significantly different across all arms: -10.7% in LC, -8.6% in LF, and -2.7% in UC (P<.05). Only 6% of UC participants achieved a 10% loss from baseline weight, compared with 47% in the intervention groups (P<.0001). Mean(SD) HbA1C% differed across arms, being lower in LC (6.2%[0.8]) than in LF (6.7%[1.0]) and UC (7.2%[1.5]) (P<.02). Fasting glucose (mg/dL) was lower in LC (125[32]) than in LF (139[40]) or UC (148[46]) (P<.05). Among 41 subjects using insulin at study entry, 69% of those in the intervention arms decreased or discontinued insulin use before the 6-month clinic visit, compared with 8% of UC. Triglycerides decreased by 31 mg/dL in intervention subjects but did not change in the UC group (P=.003). **Conclusions:** These results suggest that both dietary intervention arms achieved greater weight loss than the control group, and the LC diet produced greater weight loss and better metabolic improvements than a LF diet in individuals with type 2 diabetes. Follow-up measurements at 12 months will assess whether these favorable changes in weight and glycemic control are sustained.

T-493-P

Weight Loss in Obese Patients with Pre and Type 2 Diabetes in Response to a Medically Supervised Outpatient Very Low Calorie Diet Program

Zhaoping Li, Chi-Hong Tseng, Max Deng, Qian Li, Michelle Engle, David Heber *Los Angeles, CA*

Background: Type 2 Diabetes Mellitus (T2DM) affects approximately 10% of Americans while 79 million Americans are estimated to have glucose intolerance or pre-diabetes (Pre-DM). Some prior work suggested that insulin resistant subjects lose weight more slowly. The present study was designed to determine whether obese patients with Pre-DM or T2DM would lose weight as effectively in VLCD/LCD program. **Methods:** Patients enrolled in a self-paid, university-based, outpatient weight loss program with VLCD (500–800 Cal/day), exercise, and group behavioral counseling were studied retrospectively. Patients entering the program for the 1st time and attending weekly clinic for >4 weeks were were analyzed in the linear mixed effects model. **Results:** A total of 367 patients with T2DM, 583 patients with pre-DM, and 1143 patients without T2DM entering the program from 1991 to 2010 met all the inclusion criteria and were included in the analysis. The body weight at baseline was 104.0±20.0 kg for DM, 101.4±18.4 for pre-DM and 99.0±18.8 kg for non-DM. Weight loss and percent of weight loss within 12 months were analyzed utilizing a linear mixed effects model. There was no significant difference between DM vs non-DM (p=0.4597) and pre-DM vs non-DM (p=0.6006) in the weight loss per day in 12 months. The length of enrollment in the program was positively correlated to weight loss rates in all patients (p<0.001). **Conclusions:** The data obtained in a large number of patients demonstrate that all three patient groups - obese, Pre-DM, and DM lost weight effectively over 12 months. Given the impact of weight loss on the progression of co-morbid conditions these data support the hypothesis that VLCD should be more widely used in the treatment of obese patients with type 2 DM.

T-494-P

Does Low Fat High Carbohydrate Regimen Improve Lipid Profile in Patients Following Coronary Artery Bypass Grafting Surgeries?

Amr Abdelmonem, Amr Alfaramawi *Giza, Egypt*

Background: The objective of this study is to compare the effect of three different dietary regimens over a period of six months, post CABG surgery on abdominal obesity and lipid profile. **Methods:** A total of 105 post CABG dyslipidemic male patients were enrolled in this study. The patients were randomly allocated into three groups; low fat high glycemic index carbohydrate (LFHC); low glycemic index (LGI); and mixed dietary regimen(MDR). Body mass index, segmental abdominal fat, muscle mass and lipid profile were measured at one month(0) post CABG, then at three months (1) and six months (2) post treatment. **Results:** BMI 1 and 2 decreased significantly in the three groups (31.9±2.9, 27.3 ±2.4 vs 37±2.6 Kg/m2), while Triglycerides (1 & 2) showed a significant increase in the LFHC group with a significant decrease in LGI and MDR groups (P value <0.05), despite the fact that SAF (1 & 2) decreased significantly in the MDR and LGI groups (P value <0.05). **Conclusions:** For post CABG patients, the low fat high carbohydrate regimen resulted in increased triglycerides with decreased muscle mass.

T-495-P

Behaviors That Predict Weight Loss Maintenance at One Year

Bobbie G. Paull-Forney, Frank Dong, Justin B. Moore *Wichita, KS*; Linda Gotthelf *Boston, MA*; James L. Early, Elizabeth Ablah *Wichita, KS*

Background: Few studies have sought to determine predictors of weight loss maintenance (WLM) after medical weight loss. **Methods:** We conducted a retrospective analysis of adult participants in a commercial weight management program (Health Management Resources®) between 2003 and 2010. Logistic regression was conducted to explore the relationship between successful weight loss maintenance at one year (WLM; sustaining ≥ 10% of initial body weight loss) and predictors (age, gender, ethnicity, baseline body mass index [BMI] category, percent initial body weight lost [%IBWL], meal replacement intake, fruit and vegetable [F/V] intake, activity level, and attendance of group sessions). **Results:** A total of 934 participants completed 12 weeks of active weight loss and enrolled in the WLM phase. Participants were predominantly middle aged, Caucasian, and female. Baseline BMIs ranged from 23.5 to 99.4 kg/m2 (M=45.3, SD=10.05). At one year, 196 participants remained in the maintenance group. Of those, 74% (n=143) achieved WLM. This group reported higher F/V intake, activity levels, and rates of attendance. Primary predictors of WLM at 1 year were attendance of ≥ 40 weekly group sessions and a %IBWL ≥ 10%. The multivariate odds ratio (OR) for successful WLM for participants attending <40 weekly sessions versus those attending > 40 sessions was 1.10 [95% CI, 1.05, 1.14]. The multivariate OR for successful WLM for participants having lost > 10% IBW versus participants having lost less than 10% IBW during the first 12 weeks was 5.29 [95% CI, 2.23, 12.56]. **Conclusions:** Conclusions: Achieving ≥ 10% IBWL during an initial short term weight loss phase and consistent attendance of maintenance group sessions are associated with successful WLM at one year follow up in a commercial weight management program.

Thursday, November 14, 2013
Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

Intervention Studies - Physical Activity Only-Adult

T-496-P

Empirically Informed Estimates of Energy Balance Compensation in Free Living Participants in Randomized Controlled Trials of Exercise Interventions

Kathryn A. Kaiser, Emily J. Dhurandhar, Karen D. Keating, Amy S. Thomas, David B. Allison *Birmingham, AL*

Background: Mathematical models of human energy metabolism and body weight change (WC) are available, and can estimate effects under the assumption of no active compensation. Naïve application of such models to free living subjects may overestimate WC because they only account for passive compensation components such as shifts in requirements due to body composition changes. Objective: to quantify the amount of active compensation that occurs in response to exercise under high treatment fidelity condi-

tions in free living adults. **Methods:** A systematic review of supervised exercise randomized controlled trials (RCTs) yielded 9 studies (14 treatment arms in total) which met inclusion criteria (7+ days, N≥5, objective verification of compliance, e.g. observed or electronic monitors, ≥80% reported compliance). Extracted WC data was compared to mathematical predictions (obtained with the NIDDK body weight simulator). **Results:** Prescribed exercise interventions were predominantly aerobic in nature, durations of 2 to 26 wks, and average daily amounts ranged from -96 to -1023 kcal. An OLS regression model indicates average observed WC was 28.1% of predicted values (95% CI = 15.9 to 40.3). Thus, active compensation lead to a 71.9% decrement in WC during exercise interventions. **Conclusions:** A large amount of active compensation occurs in free living subjects in response to exercise interventions. This information may be helpful in planning doses of exercise needed to obtain desired weight changes.

T-497-P

The Efficacy of Incentives to Motivate Continued Fitness-Center Attendance in College First-Year Students, a Randomized-Controlled Trial

Lizzy Pope, Jean Harvey-Berino *Burlington, VT*

Background: This study determined whether exercise habits of first-year college students established with the provision of weekly monetary incentives would persist after the discontinuation, or decreased frequency, of incentives. The study also examined weight change of first-year college students. **Methods:** Randomized-controlled trial with control, discontinued-incentive, and continued-incentive conditions involving 117 first-year students at a public university in the northeast. For 12 weeks in fall semester 2011 students in incentive conditions received monetary payments for meeting fitness-center use goals. For 12 weeks in spring semester students in the discontinued-incentive condition no longer received incentives, and participants in the continued-incentive condition received payments on a variable-interval schedule. Participants in the control condition received no incentives. Electronic ID-card attendance records tracked fitness-center use. **Results:** When incentives were discontinued, fitness-center goal achievement decreased from 63% of goals met to 3% of goals met in the discontinued-incentive condition. When rewarded on a variable-interval schedule, the continued-incentive condition met 39% of the goals, a significantly higher goal-completion rate than the discontinued-incentive and control groups, $\chi2=(2,n=113)=21.07, p<0.001$. Mixed-model analysis revealed no significant interaction between condition and BMI change, $F(6, 332)=0.67, p=0.68$. **Conclusions:** When incentives were discontinued students no longer met fitness-center attendance goals. A variable-interval reward schedule better maintained attendance, and may be an effective way to encourage fitness-center attendance in first-year college students. Although all groups experienced some weight gain, this weight gain was not significant.

T-498-P

Fitness and Exercise for Post-Bariatric Patients (FEPP): Baseline Psychosocial and Behavioral Outcomes from a Randomized Trial Testing an Exercise Program Specifically Designed for Post-Bariatric Patients

Susan S. Levy *San Diego, CA*; Susan L. Caparosa *Pasadena, CA*; Jeanne F. Nichols, Ken Fujioka *San Diego, CA*; Corinna Koebnick, Kari McCloskey, Anny H. Xiang, Karen J. Coleman *Pasadena, CA*

Background: Little is known of the relationship between post-surgery psychosocial health and post-bariatric surgery weight loss outcomes. Understanding the role of post-surgery psychosocial factors in exercise behavior may provide insight into successful exercise promotion strategies. **Methods:** We examined baseline psychosocial and behavioral characteristics of post-bariatric surgery patients recruited to participate in an exercise study. We measured the following for 51 patients, 6-24 months post-bariatric surgery: objectively-measured physical function (8 foot up and go, arm curl, chair sit and reach, 30 second chair rise, six minute walk), behavior (pedometer steps, self-reported physical activity, self-reported eating behaviors), and self-reported psychosocial factors (exercise self-efficacy, physical activity enjoyment, social physique anxiety). **Results:** Exercise self-efficacy was most strongly related to measures of physical function (r-range .46 to -.60, p < .003), but less to pedometer steps (r=.29, p < .04) and self-reported physical activity (r=.16, p > .25). Exercise enjoyment was correlated with exercise

self-efficacy (r=.47, p < .001) and self-reported physical activity (r=.25, p < .09). Moderate relationships were found between social physique anxiety and self-reported activity (r= -.32, p<.03), strength training (r=-.31, p < .03), and fast food consumption (r=.41, p < .004). **Conclusions:** These findings suggest that post-bariatric patients' exercise self-efficacy is related to physical function abilities. Exercise programs may need to emphasize improvements in function in order for self-efficacy to translate to increased exercise behavior. In addition, social physique anxiety relationships were similar to those found in non-surgical groups, suggesting that weight loss surgery does not affect certain aspects of psychological function.

T-499-P

Effects of Chronic Exercise Training on Inflammatory Markers in Australian Overweight and Obese Individuals in a Randomized Controlled Trial

Sebely Pal, Suleen Ho, Satvinder Dhaliwal, Andrew Hills *Perth, Australia*

Background: Physical activity has been shown to lower levels of inflammatory markers. However, results are inconsistent; indicating different modes of exercise may have different effects on inflammatory cytokines. We aimed to investigate the effects of 12 weeks of moderate-intensity aerobic, resistance or combination exercise on TNF-α and IL-6 compared to no exercise in overweight and obese individuals. **Methods:** Overweight /obese adults were randomized to four groups; no exercise, 30 minutes of aerobic, 30 minutes of resistance or a combination of 15 minutes of aerobic and 15 minutes of resistance exercise five days a week for 12 weeks. Fasting blood samples were taken for determination of inflammatory markers at baseline and 12 week. **Results:** TNF-α levels were significantly decreased at week-12 compared to baseline by 20.8% in the Aerobic group (p=0.011), 26.9% in the Resistance group (p=0.0001) and 32.6% in the Combination group (p=0.003). Levels of TNF-α were significantly lower in the Combination compared to the Control group after 12 weeks of exercise training (-22.6%, p=0.025) when adjusting for baseline levels. **Conclusions:** Twelve weeks of moderate-intensity aerobic, resistance, but mainly combination exercise training, decreased TNF-α in overweight and obese individuals compared to no exercise. Therefore, combination exercise training may be physiological relevant in decreasing risk of developing chronic diseases.

T-500-P

A Zumba ® Dance Intervention Promotes Weight Loss, Body Fat Loss and Improves Aerobic Capacity in Overweight/Obese or Type 2 Diabetic Women

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Background: Cardio dance regimes, such as Zumba® have recently become popular forms of exercise. We did a study to determine whether a 16-week Zumba® dance intervention would improve health, physical fitness, and attitudes toward exercise in adult women. **Methods:** Twenty eight sedentary women (14 overweight/obese non-diabetic (ND); 14 type 2 diabetic women (DM)) participated in this 16-week intervention (classes 3d/week, 60min/d). Baseline and post-intervention measures included: (a) anthropometric: body weight, body fat %, and waist and hip circumference; (b) fitness: aerobic capacity (Rockport walk test) muscular flexibility (sit-and-reach test), and muscular endurance (chair stand test); (c) clinical: HbA1c, fasting plasma glucose, insulin, and blood lipids; and (d) questionnaires: BREQ-2, PSNE and FPAI to evaluate positive and negative attitudes towards exercise and exercise-related autonomy (freedom to exercise). **Results:** Average compliance for the dance classes was 74.4±2.5%. Despite not being a weight loss study, the women lost weight (-1.1 ± 0.6 kg, p= 0.04), body fat (-1.2% ± 0.6%, p=0.05), and waist and hip circumference (-3.8 ± 0.8, -2.9 ± 1.3 cms, p<0.01, p=0.03 respectively). Muscular endurance increased (1.4 ± 0.7 chair stands, p = 0.05), as did aerobic capacity (1.1 ± 0.4 mL/kg/min, p=0.05), but there was no change in flexibility. Exercise related autonomy showed a trend for an increase (1.8 ±0.9, p=0.07), and positive attitude scores towards exercise increased (4.7 ±1.1, p<0.01). There were no significant changes in clinical measures. **Conclusions:** A Zumba® dance intervention is effective in reducing body weight, improving physical fitness and attitudes towards exercise.

T-501-P
Physical Activity among Overweight and Obese Young Adults: Association with Fitness and BMI

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Background: Physical activity (PA) is an important correlate of weight status and fitness, and an important behavior for weight loss and fitness change. This study compared PA using objective and self-report, and examine associations with body mass index (BMI) and fitness in overweight and obese young adults. **Methods:** Participants (n=463; ages=30.6±3.7 years; BMI=31.5±3.9 kg/m^2) provided data prior to engagement in a randomized clinical trial. Participants completed a measurement of fitness using a graded exercise test, and measures of moderate-to-vigorous PA (MVPA) using a multi-sensor PA monitor (PA-MONITOR) (BodyMedia, Inc.) and questionnaires (Global PA Questionnaire [GPAQ]; Paffenbarger Questionnaire [PAFF]). MVPA from PA-MONITOR was defined as bouts ≥10min at an intensity of ≥3 metabolic equivalents (METS). **Results:** Median (IQR) MVPA from the PA-MONITOR [101.0 (28.0,194.0) min/wk] was significantly less than GPAQ total MVPA [230 (100.0, 440.0) min/wk, p<0.0001] but significantly more than GPAQ recreational MVPA [60.0 (0, 180) min/wk, p=0.0001] and PAFF [80.0 (20, 180) min/wk, p=0.01]. The correlation with fitness was stronger for MVPA measured by PA-MONITOR (r=.39; p<.0001) compared to either GPAQ (total MVPA r=.06, p=.18; recreational MVPA r=.18, p<.001) or PAFF (r=.21, p<.0001). BMI was inversely correlated with MVPA measured by PA-MONITOR (r=-.24; p<0.0001) but not with PAFF (r=-0.04) or GPAQ (recreational MVPA r=-.02; total MVPA r=.03). **Conclusions:** MVPA varies by method of measurement, with objective measures being more strongly associated with fitness and BMI. Results suggest inclusion of objective measures of PA when examining the influence on BMI and fitness in overweight and obese adults. PA may also be important an important behavior to improve fitness and reduce BMI in overweight and obese adults. Supported by NIH (U01 HL096770)

T-502-P
An Unsupervised Walking Program for Overweight and Obese Women Promotes Moderate Physical Activity During Pregnancy

Kai Ling Kong, Christina Campbell, Randal Foster, Anna Peterson, Lorraine M. Lanningham-Foster *Ames, IA*

Background: Walking may be a strategy for increasing moderate physical activity (MPA) during pregnancy. The purpose was to promote MPA among overweight and obese pregnant women, via walking, and to evaluate the impact of the intervention on maternal and birth outcomes. **Methods:** Thirty seven overweight or obese pregnant women were randomly assigned to an unsupervised walking intervention or control group. Anthropometric, objective PA (StepWatch™ Activity Monitor), and self-reported diet data were collected for 4, one-week periods: weeks 10-14 (V1), 17-19 (V2), 27-29 (V3) and 34-36 (V4) of gestation. Participants provided information about maternal and birth outcomes. A cadence of ≥80 steps/min was defined as MPA, and "meaningful walking" was defined as moderate walking in ≥ 8 minute bouts. ANOVA was used to determine the differences in walking amount and meaningful walks between groups; Kolmogorov-Smirnov test was used for walking intensity distribution analysis; Fisher's exact test was used for maternal and infant outcomes analyses. Pearson correlation was used to examine the association between pre-pregnancy BMI and gestational weight gain (GWG). **Results:** There was significantly more MPA among intervention group women compared to controls at V2 (overweight p < 0.0001; obese p < 0.025), V3 (overweight p < 0.0001), and V4 (overweight p < 0.0001; obese p < 0.025). Women in the intervention group significantly increased their meaningful walks at V2 (p = 0.054), V3 (p = 0.01) and V4 (p = 0.014). There were trends for intervention group women to have more favorable maternal and birth outcomes compared to the control group. Rates of GWG at measurement points during pregnancy were significantly associated with preceding rates of GWG. **Conclusions:** The walking intervention increased the MPA of overweight and obese women during pregnancy.

T-503-P
Building an Innovative Physical Activity Program for College Students

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Background: There is a notable decrease in physical activity (PA) during young adulthood, which, for many, corresponds with the beginning of college. Innovative interventions are needed to promote PA in this population. Moreover, research has not addressed student interest in a web-based PA program, a medium demonstrating strong efficacy in promoting other health behaviors. **Methods:** To this end, an online survey assessing current physical activity levels and program interest and opinions has been administered to normal-overweight undergraduate students (n = 224). Fifty-eight percent indicated interest in participating in a web-based PA program that focuses on psychological and behavioral strategies for commitment to PA. **Results:** Results showed that students who preferred a web-based intervention had lower levels of self-efficacy (t(155)=-2.48, p=.01), lower levels of current PA (t(155)= -1.99, p=.05), and a higher dissatisfaction with weight (t(155)=3.59, p<.001) than those who did not want a web-based intervention. When asked about program components that they find most valuable, students who preferred an Internet intervention format ranked information about PA training programs higher (t(155) = -2.41, p=.02), and ranked social support lower than those who preferred an in-person format (t(155)= 2.24, p = .03). **Conclusions:** Survey results suggest that a PA program would be well-received by students and provide information regarding program preferences among those who would participate in a web-based intervention. Based on preliminary findings, a web-based PA program is currently being constructed for college students. The program will deliver psychological and behavioral strategies designed to enhance commitment to a PA plan. Data from the survey, as well as descriptions and samples of modules, will be presented at the conference.

T-504-P
Do Improvements in Sleep Lead to Weight Loss and Improvements in Health with Exercise?

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Background: Recent research has linked insomnia with insufficient sleep to greater risk for cardiometabolic disease. Exercise improves health and also sleep in persons with insomnia. The goal of this study was to determine if improvements in sleep would predict improvements in inflammatory markers, glucose metabolism and BMI among older adults enrolled in a randomized trial of exercise versus non-physical activity for insomnia. **Methods:** Participants included 17 healthy adults age >55 with primary insomnia (age M= 61.5, SD=4.2, one male) with sleep duration < 6.5 hours and/or sleep efficiency < 85% documented with wrist actigraphy (Actiwatch-64, Minimitter). Participants were randomized to 16 weeks of either sleep hygiene plus aerobic exercise or sleep hygiene plus structured activity. At baseline and 16 weeks, participants underwent a 4 day 3 night protocol that included questionnaires, exercise testing, and a fasting blood sample. Measures from the laboratory protocol included c-reactive protein (CRP), fasting glucose, HbA1c and BMI. Sleep-wake patterns were monitored via actigraphy and sleep diary. Sleep variables included: sleep onset latency, total sleep time, wake after sleep onset, sleep efficiency and fragmentation index. Data were analyzed with repeated measures ANOVA and correlations. **Results:** Results demonstrated that participants in both groups did not improve in inflammatory, metabolic measures or BMI from baseline to 16 weeks, however there was variability. Participants with greater improvement in sleep efficiency had greater reduction in CRP. In addition, participants who had greater change in self-reported sleep quality had a greater reduction in BMI. Associations were strongest in the exercise condition. **Conclusions:** These results suggest that improvements in inflammatory markers may link exercise to improvements in sleep.

T-505-P

Impact of Supervised Exercise Training in Subjects Awaiting Bariatric Surgery

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Background: To optimize bariatric surgery (BS) results, experts recommend regular practice of physical activity but data is lacking concerning exercise training before BS. We aimed to evaluate the impact of a Pre-Surgical Physical Exercise Training (PreSET) on the health of subjects awaiting BS. **Methods:** 50 candidates for BS will be randomized in 2 groups: one group following the PreSET (3x80min/week for 12 weeks of endurance and strength training) and a control group. The two groups receive usual interdisciplinary care with individual lifestyle counselling. Body composition, blood pressure, physical fitness, physical exercise beliefs and health related quality of life (HRQOL) are assessed before and after the PreSET, then each 3 months for one year postoperatively. **Results:** Fifteen subjects are currently recruited [age=42.0 (34.0-53.9) years, BMI=50.2 (44.3-56.2) kg/m2] and 11 have completed the 12-weeks program. The 5 subjects in the PreSET group participated in 59.5 (42.5-77.6) % of the supervised exercise sessions proposed. After the intervention, we observed greater improvements in beliefs in exercise benefits (p=0.05), sexual life HRQOL subscores (p=0.07), time of half-squat test (p=0.06) and heart cost during the 6-minute walk test (p=0.07) in the PreSET group compared to the control group. In addition, resting systolic blood pressure (p=0.08) and embarrassment during PA (p=0.07) tend to be improved after the intervention only in the PreSPET group. There was no difference between groups for other outcomes. **Conclusions:** This preliminary data suggests positive short-term effects of a PreSET. The continuation of the project is underway to confirm these beneficial effects on long term and achieve greater statistical power.

Thursday, November 14, 2013
Posters on Display: 10:00 AM – 3:30 PM
and 5:30 PM – 7:00 PM
Location: Exhibit Hall A

Intervention Studies - Other-Adult

T-506-P

Empirically Informed Predictions of Human Adult Body Weight Change in Response to Energetic Perturbations

Karen D. Keating, Emily J. Dhurandhar, Kathryn A. Kaiser, Amy S. Thomas, David B. Allison *Birmingham, AL*

Background: Mathematical models of human energy metabolism and body weight change (WC) are available, and can report effects under the assumption of no active compensation. Naïve application of such models to free living subjects may overestimate WC by only accounting for passive compensation such as shifts in requirements due to body composition changes. Mathematical models of human energy metabolism and body weight change (WC) are available, and can report effects under the assumption of no active compensation. Aim: develop a prediction model for WC interventions that is informed by empirical studies in free living populations to better estimate intervention and policy effects when active compensation may occur. **Methods:** A systematic review of randomized controlled trials (RCTs) yielded 18 studies (29 treatment arms) which met inclusion criteria (7+ days, N>5, objective verification of compliance, ≥80% reported compliance). We report the results of a meta-regression (OLS) of weight change effects. The predictors include a main effect for treatment type (Diet, Exercise or Both), plus main effects and two-way interactions for baseline body weight, age, duration of the study, and compliance-adjusted difference in dosage between the treatment and control arms. The predicted values were generated via leave-one-out cross validation. **Results:** For the 29 study arms analyzed, the model indicated a predictive R-square = 54.3% (predictive MSE = 0.8462). A large proportion of weight change can be predicted with relatively few baseline parameters. **Conclusions:** Use of methods that account for conditional adaptations that may change weight loss or gain trajectories in free living populations will provide patients, clinicians and researchers with better guidelines for adjustments of treatment levels to account for active compensation in free living persons.

T-507-P

Empirically Informed Estimates of Energy Balance Compensation in Free Living Participants in Randomized Controlled Trials of Diet or Overfeeding Interventions

Emily J. Dhurandhar, Kathryn A. Kaiser, Karen D. Keating, Amy S. Thomas, David B. Allison *Birmingham, AL*

Background: Mathematical models of human energy metabolism and body weight change (WC) are available, and can report effects under the assumption of no active compensation. Naïve application of such models to free living subjects may overestimate WC because they only account for passive compensation components such as shifts in requirements due to body composition changes. Aim: to quantify the amount of active compensation that occurs in response to energy intake perturbations (caloric restriction- CR or overfeeding - OF) under high treatment fidelity conditions in free living adults. **Methods:** A systematic review of CR/OF randomized controlled trials (RCTs) yielded 9 studies (15 treatment arms) which met inclusion criteria (7+ days, N>5, objective verification of compliance, e.g. observed or provided with returned unused portions, ≥80% reported compliance). Extracted WC data was compared to mathematical predictions (obtained with the NIDDK body weight simulator). **Results:** Intervention periods ranged from 4 to 39 wks. Energy prescriptions ranged from a daily average deficit of –180 to -1277 kcal in CR. Energy excess ranged from +359 to +1338 kcal daily average in OF treatment groups. An OLS regression model indicates average observed WC was 59.7% of predicted values (95% CI = 31.4 to 88.0) for CR studies. Thus, active compensation lead to a 40.3% decrement in WC. A regression model indicates in OF studies an average WC observed was 9.6% of predicted values (95% CI = 4.0 to 15.2). Thus, active compensation lead to a 90.4% decrement in WC. **Conclusions:** Significant active compensation occurs in free living subjects in response to caloric restriction/overfeeding interventions. Thus, projections of weight gains or losses with consumption of some energy intake interventions need to account for active compensation.

T-508-P

Effect of Short-Term Estrogen Replacement Therapy on Endothelial Function of Overweight/Obese Postmenopausal Women: A Double-Blind Placebo-Controlled Randomized Study

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Background: Postmenopausal women are at risk for cardiovascular (CV) and metabolic diseases. Visceral adiposity is also a risk factor for such conditions. Microvascular dysfunction is a predictor for type 2 diabetes mellitus and also for CV events. We aimed to investigate the isolated effects of estradiol on endothelial function (EF) of overweight/obese postmenopausal women. **Methods:** We evaluated the effect of transdermal estradiol gel, 1mg/day during 3 months, on muscle microvascular function, measured by venous occlusion plethysmography, and on markers of endothelial function (ICAM-1 and E-selectin) in non-diabetic overweight/obesity postmenopausal women. Muscle forearm blood flow (FBF) was measured at resting and after 3 minutes ischemia during post-occlusive reactive hyperemia (PORH). **Results:** 44 women were recruited (51.7±2.30 years, BMI 31.5±2.54 kg/m2) and randomized into two groups: placebo (n:22; 51.4±2.15 years, BMI 31.48±2.85 kg/m2) and estradiol (n:22; 52.1±2.44 years, BMI 31.5±2.24 kg/m2). Mean time from menopause did not differ between groups (3.45±2.93 vs. 3.98±2.75 years; NS). At baseline, groups were similar in weight, waist circumference, systolic and diastolic blood pressures, glycemia, insulinemia, microvascular FBF, and levels of total cholesterol, HDL-cholesterol, LDL-cholesterol, triglycerides, ICAM-1 and E-selectin. Placebo did not add any benefit on the analyzed parameters, although estradiol gel was able to decrease ICAM-1 (194±65 vs. 176±56 ng/ml; p<0.01) and E-selectin (75.25±30.9 vs. 67.6±27.21 ng/ml; p<0.05). Furthermore, FBF at resting (1.97±0.65 vs. 2.63±0.97 ml/min.100ml tissue-1; p≤0.01) and during PORH (5.95±2.23 vs. 7.49±3.01 ml/min.100ml tissue-1; p<0.001) increased with the use of estradiol. **Conclusions:** Our findings demonstrated that overweight/obese postmenopausal women improved EF with short-term use of estradiol.