T-509-P

Acute Satiety Effects of Egg/Sausage-Based Convenience Breakfast Meals in Premenopausal Women

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Background: Dietary protein at breakfast has been shown to enhance satiety and reduce subsequent energy intake (EI) more so than carbohydrate or fat. The objective of this trial was to examine the acute effects of commercially-prepared egg/sausage-based breakfast meals at two different protein levels (30g and 40g/serving), compared to a pancake breakfast (3g protein) and no breakfast (water), on appetite ratings and EI at a subsequent meal. **Methods:** Premenopausal women (N=34; age 32.2±1.6 yr; BMI 24.9±0.5 kg/m^2) consumed one of three meals or water only, on four separate days in a randomized sequence. Test products provided ~280 kcal/serving and were similar in fat (12-14g) and fiber contents (0-1g). Visual analog scale ratings for indices of perceived appetite and satiety were measured at baseline and 30 min intervals for 240 min. EI was recorded at an *ad libitum* pasta/sauce lunch meal at 240 min. **Results:** The moderate and higher protein meals showed reduced appetite and increased satiety ratings vs. the pancake and no breakfast conditions (P<0.001 for all). Median EI at the lunch meal was less following the moderate and higher protein meals (661 and 592 kcal, respectively) vs. the pancake (779 kcal; P<0.001 vs. 40g protein; P=0.05 vs. 30g protein) and no breakfast (746 kcal; P<0.03 for all) conditions. Median total EI from the test condition + lunch meals was higher (P<0.001) for the moderate and higher protein meals (941 and 882 kcal, respectively) vs. the no breakfast condition (746 kcal), and less than the pancake breakfast (1054 kcal; P<0.01 vs. 40g protein condition only). **Conclusions:** These results suggest that egg/sausage convenience meals providing 30g or 40g protein/serving produce greater appetite control and satiety and reduce subsequent intake at lunch relative to a lower-protein meal, or no breakfast. *Supported by Hillshire Brands.*

T-510-P

Body Fat Remains Elevated in Young Men Six Months After Short-Term Energy Excess

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Background: While the effects of overfeeding on weight gain are well-studied, less is known about the dynamics of weight recovery following overfeeding (OF) in humans. The purpose of this study was to examine fat deposition after 2 months of controlled overfeeding and the recovery of weight and body composition over the next 6 months of eating *ad libitum*. **Methods:** After comprehensive investigations at baseline (BL), we overfed 29 healthy men (27±5 y, BMI 25.5±2.3) for 8 weeks 40% above their BL energy requirements with a diet composed of 41% CHO, 15% protein and 44% fat. Subcutaneous abdominal (SAT) and visceral (VAT) adipose tissues were measured by MRI, intrahepatic (IHL) and intramyocellular lipid (IMCL, soleus) by ^{1}H-MRS, and whole-body fat-free (FFM) and fat mass (FM) by DXA at BL, after OF, and at 6 months post-OF. Here we report data only on those men who returned for post-OF testing (n=25). **Results:** Participants gained 4.1±1.5 kg of FM and 3.3±1.4 kg of FFM during overfeeding (total gain, 7.4±2.0 kg). SAT increased by 1.3±0.6 kg (30%), VAT by 0.4±0.2 kg (61%) and IMCL by 0.1±2 %lipid (23%) (all p<0.05), whereas IHL did not change. Subjects lost 1.7±1.3 kg at 1 month post-OF, 3.9±2.1 kg at 3 months post-OF, and 4.1±3.6 kg at 6 months post-OF, i.e. a 55% loss of the overfeeding-induced weight gain. Whereas FFM had returned mostly to BL levels by 6 months post-OF (+0.6±2.0 kg over BL, p=0.17), participants retained 44% of FM, 38% of SAT, 40% of VAT, and 78% of the IMCL gained during overfeeding (all p<0.05 vs. BL). **Conclusions:** In conclusion, body weight and composition did not spontaneously return to baseline levels 6 months after 2 months of overfeeding. Even in these young men, almost half of the fat gain was retained and alarmingly, lipids remained elevated in ectopic depots (skeletal muscle, viscera) associated with unhealthy metabolic consequences.

T-511-P

Comparison of Pursestring Versus Interrupted Suture Technique in Endoscopic Full-Thickness Transoral Outlet Reduction

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Background: Weight regain after Roux-en-Y gastric bypass (RYGB) is correlated with dilated gastrojejunal anastomosis (GJA). Endoscopic transoral outlet reduction (TORe) is a safe and effective modality for management of dilated GJA. Although interrupted suture placement (IT) has proven effective in arresting weight regain in a randomized controlled trial, the pursestring suturing technique (PT) uses a single suture to distribute the force applied to tissue. Aperture size is better controlled as suture is tightened over an endoscopic balloon. The pursestring technique may result in increased magnitude and durability of weight loss. **Methods:** All consecutive TORe procedures performed using a full-thickness suturing device with a 6-month follow-up weight were included. Percent excess weight loss (%EWL) was determined. Statistics are reported as mean ± SEM. **Results:** 45 patients had TORe with IT and 16 patients had PT. Baseline characteristics were similar between groups, including gender (IT 24% male, PT 25% male), age (IT 49.3 ±1.5 y, PT 51.2 ±2.7 y), and BMI (IT 40.4 ±1.6, PT 38.3 ±1.6); all p>0.05. Anatomic characterstics, including pouch length (IT 4.31 ±0.3 cm, PT 4.1 ±0.4 cm) and GJA aperture (IT 25.4 ±1.0 mm, PT 22.5 ±1.9 mm), were similar. Post-TORe GJA aperture was 6.2 ±0.3 mm in the IT group versus 10.1 ±0.4 mm in the PT group (p<0.01). In the IT group, one patient had bleeding requiring transfusion and one patient required dilation for nausea; there were no complications after PT. There was a trend towards increased 6-month %EWL (IT 17.0 ±2.2%, PT 25.2 ±5.3%); p<0.10. **Conclusions:** Both techniques demonstrated safety for transoral outlet reduction. Patients who underwent pursestring technique demonstrated a trend towards higher %EWL at 6 months. Further study is needed to assess whether there is a difference in long-term durability and weight loss.

T-512-P

The Effects of Diabetic Medication on Mean Fat

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Background: 25.8 million individuals in the United States suffer from type 2 diabetes. Diabetes can be controlled using several different options. However, little is known about the effect of combining lifestyle interventions with different types of pharmacological controls. **Methods:** The purpose was to investigate the effects of exercise on type 2 diabetes patients grouped by different standard diabetes regulation medication. A recent exercise intervention in type 2 diabetes patients randomized participants into three intervention groups; aerobic, resistance, and aerobic combined with resistance. We calculated mean loss of fat in all participants grouped by medication types: Biguanide, Sulfonylon, Thiazolid, Combo Class, Incretins, DPP4, Hypoglycemia, Antihyperglyciemic, Alphaglucoidase, and Insulin. **Results:** It was found that the highest reduction in fat mass was in the Biguanide group (-1.672 ± 5.599). The Sulfonylureas group(s) were resistant to loss of fat (0.0155 ± 1.584). The Incretins appeared to have fat loss comparable to exercise interventions in non-diabetic participants (-1.192 ± 1.271). The information obtained for the Sulfonylureas medication was from 45 patients, 137 patients for Biguanide, and 25 patients for the Incretins. **Conclusions:** It is a well-documented fact that five percent of mass body loss improves diabetes. Knowledge about just how little or how much medication affects weight regulation is extremely significant for doctors, especially when they are prescribing medication and life style interventions to their patients. Some of the groups studied a small amount of patients. Therefore, increasing the number of individuals within the groups will help further research on interventions with people taking diabetes medications.

T-513-P

Effects of Obesity-Related Health Status Changes on Behavioral Weight Loss Treatment Utilization in an Integrated Healthcare Setting

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Background: Initiation of behavioral weight loss treatment may be triggered by weight gain or by new diagnosis of an obesity-related comorbidity, events which may also motivate sustained treatment use. **Methods:** In a retrospective cohort study of 45,272 Veterans Affairs (VA) patients with BMI >30 kg/m^2, we used logistic regression to examine whether recent weight change or obesity-related comorbidities newly diagnosed in past 6 months were associated with initiation of a VA behavioral weight management program (MOVE!) in 2010. Among patients initiating MOVE!, we examined whether weight change or new obesity-related comorbidity diagnoses prior to initiation were associated with sustained MOVE! use (> 8 sessions). Weight and diagnoses of 10 obesity comorbidities were extracted from medical records.

Weight change in prior year was categorized as >3% weight loss, no weight change (<3% change), 3-5% weight gain, 5-10% weight gain and >10% weight gain. Analyses were adjusted for age, sex, race, marital status, baseline BMI, number of primary care visits in previous two years, and pre-existing obesity comorbidities. **Results:** Patients were 91% male, 68% white, and had a mean age of 58. Patients were more likely to initiate treatment if they had weight gain of 3% or greater in prior year (3-5%: odds ratio (OR)=1.64, 95% CI (1.52,1.77); 5-10%: OR=1.99 (1.84, 2.16), 10%+: OR=2.68, 95% CI (2.32, 3.10)) or if newly diagnosed with any of the 10 examined obesity-related comorbidities (ORs: 2.14-3.59). Recent weight change and newly diagnosed comorbidities were generally not associated with sustained MOVE! use. **Conclusions:** Adverse obesity-related health events were associated with initiation of behavioral weight loss treatment offered at no cost in an integrated healthcare setting but not associated with persistence with the program.

T-514-P

The Relationship between Pre-Treatment Macronutrient Intake and Weight Loss During a Randomized Trial of Different Diet Approaches

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Background: Across two diets restricting different macronutrients, pre-intervention intake of the macronutrient targeted for reduction may be associated with weight loss during intervention. **Methods:** The parent study compared a low carbohydrate diet (LCD; n=71) to a low fat diet with Orlistat therapy (LFD+O; n=73) over 48-weeks in overweight and obese Veterans Affairs patients. Percent fat and carbohydrate intake were measured at baseline using 4-day food records analyzed with nutrition software. Weight was measured at intervals of 2 weeks (1-24 weeks) and 4 weeks (24-48 weeks). For current post hoc analyses, linear mixed models of weight over time were fit separately for each diet with model predictors of baseline percent macronutrient intake; linear, cubic, and quadratic time effects; and the interaction of time and baseline macronutrient intake. **Results:** Participants mean age was 52, baseline BMI 39.3, and 72% were male. For LCD, lower baseline percent carbohydrate intake was associated with more rapid initial weight loss (linear interaction: p=.02) and more rapid weight regain (cubic interaction: p=.03), but not weight at intervention end. For LFD+O, lower baseline percent fat intake was not associated with initial weight loss rate or weight at intervention end, but was associated with less rapid weight regain (cubic interaction: p<.001). Follow-up exploratory analyses showed that lower baseline percent fat intake was also associated with slower weight regain in LCD; baseline carbohydrate intake was not associated with weight in LFD+O. **Conclusions:** Pre-intervention intake of a macronutrient targeted for reduction has an inconsistent effect on weight in the two diets studied and is not influential on weight at intervention completion. Pre-intervention lower fat intake may be a marker for greater dietary adherence capability regardless of diet type.

T-515-P

Influence of a Childhood Obesity Prevention Program on Parent Body Mass Indexes

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Background: The Shape-Up Somerville (SUS) childhood obesity intervention altered children's school and community environments to encourage healthy dietary practices and physical activity. While SUS focused on children, we hypothesize that many of its environmental changes influenced other community members. For instance, all Somerville residents, not just children, had access to increased opportunities for physical activity through city walkability/bikeability ordinances. The spillover effect is likely to be strongest among parents/guardians (parents) of SUS children because they were exposed to both SUS school- and community-based components. This study investigates whether SUS was associated with body mass index (BMI) changes in parents of children that participated in the SUS intervention. **Methods:** Data collection for the SUS intervention's control and treatment groups occurred over two complete school years (2003/04-2004/05). In addition to covariates, parents' baseline and post-study BMIs (self-reported) were extracted from pre- and post-study self-administered questionnaires. Parent BMI changes were analyzed with a matching estimator model accounting for non-exact covariate matches, non-constant treatment effects, and het-

eroskedasticity. The model accounted for the diverse demographics of the SUS sample (n=530) through a number of covariates including race, Hispanic ethnicity, age, language spoken at home, and education. **Results:** The results indicate that the SUS program had positive spillover effects on parent BMI. SUS' average treatment effect on BMI of treated parents was - 0.391 (95% CI: -0.774 to -0.008). Results from alternative matching and more traditional estimation methods were similar. **Conclusions:** The results support the hypothesis that community-based childhood obesity interventions can impact children's parents.

T-516-P

Using Formative Work to Improve Recruitment of Young Adults Into Behavioral Weight Loss Programs

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Background: Young adults (YA) are underrepresented in behavioral weight loss (BWL) trials and little is known about how best to recruit them. **Methods:** We recently conducted SPARK RVA, a randomized pilot study comparing 3 approaches to BWL delivery with 18-25 y/o. Recruitment for this trial was informed by extensive formative work, which suggested that messages should be gain-framed and focused on lifestyle, fitness and feeling better, rather than weight loss. Data also indicated we should recruit via online outlets and email/ listservs, and use a recruitment website and a web-based screening process. **Results:** Utilizing approaches suggested by our formative data, we recruited 196 individuals to complete the web screener over a 6-week period. The outlet with the greatest yield was radio (49.5%), followed by email/listservs (22%). Of those who completed the web screener, 46% were eligible; 81% of those individuals scheduled an orientation, 80% of those attended orientation and consented, and 89% of those completed baseline visits and were randomized. This translates to 26.5% of initial screens being randomized. Men were difficult to recruit, representing 15% of initial screens, 17% of eligible screens, and 21% of those randomized. Minority recruitment was more successful, representing 53% of initial screens, 51% of eligible screens, and 54% of those randomized. **Conclusions:** Relative to our previous work with YA, recruitment in SPARK RVA was markedly improved in terms of initial yield, timeline, and percentage of participants retained through screening and randomization. Although radio emerged as an unexpected high yield outlet, employing strategies routed in formative work appears to have enhanced recruitment efforts with this difficult to engage age group. Details regarding messages used and implications for future recruitment efforts with YA will be discussed.

T-517-P

Patient Attendance and Weight Loss at a Weight Management Clinic in a County Academic Center

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Background: Few clinics offer low-cost integrated behavioral, medical, and risk factor management of obesity for adults. This project's purpose was to evaluate attendance and weight loss in patients at a weight management clinic (WMC) at an academic county medical center serving a diverse population. **Methods:** Review of electronic medical record (EMR) data for 4,162 adult patients seen in WMC 6/1/2005-9/30/2012 with no history of obesity surgery. Primary measures were attendance and weight loss. Secondary measures were the association of demographic factors and "weight friendly" medications for co-existing conditions on weight loss. **Results:** Patients were 81% female; 46% African American (AA); Median age 47.5 yr and BMI: 44.5. Payer mix was 32% private, 23% uninsured, 13% Medicare, and 32% Medicaid. ATTENDANCE: 66% returned for a second visit; 48% for ≥ three visits and 23% had >5 visits. WEIGHT LOSS: 51% at 3 mo. (n=1,492); 69% at 6 mo. (n=862); 65% at 12 mo. (n=561). Predictors of weight loss were commercial insurance, Caucasian race, and 55-65 years of age. The cohort's mean weight loss at 12 mo. was 18.9 lb., BMI decrease: 3.0, and 6% weight loss. Risk factors control improved and only topiramate was associated with more weight loss than behavioral management. **Conclusions:** A self-sustaining WMC staffed by providers trained in obesity medicine serves diverse patients with severe obesity. This feasible, affordable, effective clinic provides ready patients weight-loss, improved risk factor management, and appropriate bariatric surgical referrals. Further analyses will examine drop-out, weight loss at 24 months, and bariatric surgery outcomes.

T-518-P

Liposuction-Induced Alterations on mRNA Expression and Levels of Inflammation-Related Adipose Tissue Cytokines Are Not Affected by Exercise Training

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Background: The aim of this study is to investigate the effects of liposuction on inflammation-related cytokines in women (20-35 years; BMI: 23.8 ± 2.2 Kg/m2) who were either exercise-trained or not after surgery. **Methods:** Thirty-six women underwent a small-volume abdominal liposuction. Two months after surgery they were randomly divided into two groups: trained (four-month exercise program; n=18) and non-trained (n=18). Body fat distribution and abdominal visceral to subcutaneous fat ratio (V-S ratio), plasma levels of inflammation-related adipokines, and insulin were assessed at baseline (PRE), two (POST2) and six months after surgery (POST6). Adipose tissue gene expression of inflammation-related adipokines was assessed at PRE and POST6. **Results:** V-S ratio equally increased in both groups from PRE to POST2 and POST6 by 65% (p=0.0001). Adiponectin plasma levels were markedly decreased (68%) (p=0.001) and a small decrement in adiponectin gene expression in subcutaneous abdominal and thigh adipose tissue was also observed (p<0.05, within-group comparisons). Plasma levels of IL-6, TNF-α and IL-10 were unchanged throughout the study in both groups. In contrast, these cytokines' gene expression was significantly increased by 3 to 12 fold in both subcutaneous abdominal and thigh adipose tissue (p<0.05, within-group comparisons). Finally, insulin sensitivity was significantly improved only in the trained group at POST6 (data previously published). **Conclusions:** These results indicated that a small-volume liposuction markedly down-regulated the secretion of adiponectin whereas it up-regulated adipose tissue expression of inflammation-related genes six months after surgery in both groups. Importantly, exercise training improved insulin sensitivity. Thus, health professionals should strongly recommend exercise training following liposuction surgery.

T-519-P

Implementing the 5As of Obesity Management™ in a Primary Care Setting

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Background: Obesity remains poorly managed in primary care. The 5As of Obesity Management™ provide a theory-driven, evidence-based minimal intervention designed to facilitate weight management interventions. The aim of this project was to test the feasibility and effectiveness of implementing this tool in primary care. **Methods:** Electronic self-administered surveys were completed by pre-screened obese subjects at the end of their appointments in four clinics (>25 health care providers; HCP) from the South Calgary Primary Care Network. These measurements were performed before (Baseline, n=51) and 4 weeks after a implementing the 5As of Obesity Management™ (post-intervention, n=51). Intervention consisted of one online training session (90min) and distribution of the 5As toolkit among HCPs of participating clinics. **Results:** Subjects completing the survey before and after the intervention were comparable in terms of age, sex, BMI, comorbidities, satisfaction and self-reported health status (p>0.2). Implementing the 5As of Obesity Management™ resulted in a 2-fold increase in obesity management discussion initiation (19 vs. 39%, p=0.03) and caused a significant increase the perceived Follow-up/Coordination efforts (self-reported PACIC components, 45±22 vs. 67±12 pts, p=0.002), as well as the Assess (50±29 vs. 66±15 pts, p=0.03) and Assist (54±26 vs. 72±13 pts, p=0.01) components of the 5As framework. **Conclusions:** Our results suggest that implementing the 5As of Obesity Management™ facilitates weight management in primary care by favoring dialog initiation and providing and a structured management framework.

T-520-P

Effects of Anti-Obesity Drugs, Diet and Exercise on Weight Loss Maintenance After a Very-Low-Calorie Diet: Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Background: Weight loss maintenance remains a major challenge in obesity treatment. We aimed to evaluate the effects of anti-obesity drugs (sibutramine and orlistat), diet or exercise on weight loss maintenance after an initial weight loss period with a caloric intake <1000 kcal/d. **Methods:** Systematic review of English articles using MEDLINE, Cochrane Controlled Trial Register, and EMBASE from 1981 to February 2013. Randomized controlled trials specifically evaluating weight loss maintenance strategies after an initial VLCD period, followed by randomization to a maintenance strategy or control. Two authors performed independent data extraction from included papers using a predefined data template. All pooled analyses were based on random-effects models. **Results:** 20 studies with a total of 27 study arms and 2828 participants were included, with the following treatment categories anti-obesity drugs (3 arms), meal replacements (4 arms), high protein diets (6 arms), dietary supplements (6 arms), other diets (3 arms) and exercise (5 arms). During the VLCD period, the pooled mean weight loss was -12.3kg (median duration: 8wks, range 3-16wks). Compared with placebo/control, anti-obesity drugs improved weight loss maintenance by -3.5kg (95%CI -5.5,-1.5: median duration 18mo, range 12-36mo), meal replacements by -3.9kg (-5.0,-2.8: median duration 12mo, range 10-26mo), and high protein diets by -1.5kg (-2.1,-0.8: median duration 5mo, range 3-12mo). Exercise (-0.8kg: -2.8,1.2: median duration 10mo, range 6-12mo) and dietary supplements (0.0kg: -1.4,1.4: median duration 3mo, range 3-14mo) did not influence weight loss maintenance. **Conclusions:** Anti-obesity drugs, meal replacements, and high protein diets were associated with improved weight loss maintenance after a VLCD, whereas dietary supplements and exercise were not.

T-521-P

Screening for Diabetes and Diabetes Risk in a Weight Loss Program

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Background: Many people are unaware of their risk of developing a serious medical condition such as Diabetes Mellitus. The purpose of this study was to examine hemoglobin A1c (HgA1c) levels of patients entering a physician-supervised weight loss program to assess usefulness of testing and changes after weight loss. **Methods:** This observational study occurred at four sites over 17 months (n=3482). The sample included new patients (n=2276) and patients who restarted the program (n=1206). HgA1c data was categorized into three levels: normal (<5.7%), prediabetic (5.7%-6.4%), and diabetic (>6.4%). Individuals younger than 20 were excluded. **Results:** 52% of new patients (n=1188) and 60% of restart patients (n=725) had HgA1c levels in the normal range. 42% of new patients (n=952) and 37% of restart patients (n=452) were in the prediabetic range. 6% of new patients (n=136) and 2% of restart patients (n=29) had levels in the diabetic range. 71% of patients in the prediabetic or diabetic range had a BMI > 40. After an average time of 14 weeks and a weight loss of 25-35 pounds, 59% of patients considered prediabetic moved into the normal range. 82% of diabetic patients moved to prediabetic and decreased their HgA1c levels by 17%. **Conclusions:** Individuals who experienced weight loss saw a decrease in their risk of developing diabetes. Results indicate that implementing HgA1c testing within physician-supervised weight loss programs can help patients realize the full benefits of weight loss.

T-522-P

Changes in Body Composition with Weight Loss in a Physician-Supervised Weight Loss Program

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Background: The usual objective of a weight loss clinic focuses on patient weight loss, but the ultimate goal is to lost body fat and increase fat free mass (FFM). The purpose of this study was to examine body composition changes

(I.e., body fat and fat free mass [FFM]) overtime among patients in a physician-supervised weight loss program. **Methods:** This retrospective, cross-sectional study examined changes in body composition (defined as percentage of FFM) while on a physician-supervised weight loss program. There were 342 new patients included in this study. Data collection occurred at one physician-supervised weight loss clinic and followed patients weekly (maximum of 16 weeks). The study included all patients enrolled for at least four weeks and focused on a subset of patients who remained in the program for at least 16 weeks. **Results:** On average, patients lost 13 pounds of weight (6.5% body weight) during the first month and 28 pounds if they remained in the program through week 16. On average, 70% of the weight lost in the first month was from fat with the remaining 30% coming from FFM. About 75% of the weight lost in the form of FFM was water (22% of total weight lost). At later interval visits (weeks 8, 12, and 16), the percentage of fat lost increased to 77% of total weight lost while the percentage of body water lost declined to 18% of total weight lost. **Conclusions:** These findings suggest that duration of participation in a physician-supervised weight loss program is positively associated with greater fat loss in patients. Strategies to increase program retention are linked to better outcomes for patients.

T-523-P
Comparative Effectiveness of Group and Individual Prenatal Care on Gestational Weight Gain
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Background: Excessive weight gain during pregnancy is associated with detrimental outcomes for mother and child, including persistent maternal obesity postpartum and pediatric obesity. Yet 45% of women gain weight during pregnancy in excess of clinical guidelines. Although research has been done to facilitate healthy gestational weight gain, to date, prenatal care delivery models have not been sufficiently evaluated for their efficacy. This study examined differences in gestational weight gain for women in CenteringPregnancy (CP) group prenatal care versus the standard model of individually delivered prenatal care. **Methods:** We conducted a retrospective chart review and used propensity scores to form a sample of 393 (nCP = 158; nIC = 235) women (76% African-American, 13% Latina, 11% White; average age 22 years) matched on a wide range of demographic and medical background characteristics receiving prenatal care at a community health center in the South. **Results:** Compared to the matched group of women receiving standard prenatal care, CP participants were less likely to have excessive gestational weight gain, regardless of their pre-pregnancy weight (b = -.99, 95% CI [-1.92, -.06], RRR = .37). CP reduced the risk of excessive weight gain during pregnancy to 54% of what it would have been in the standard model of prenatal care (number needed to treat=5). Regardless of whether women entered into pregnancy healthy, overweight, or obese, those in CP were significantly less likely to have excessive weight gain. The beneficial effect of CP was largest for overweight and obese women. **Conclusions:** Group prenatal care had statistically and clinically significant beneficial effects on reducing excessive gestational weight gain relative to standard individual prenatal care.

T-524-P
Low-Level Laser Therapy Enhances Fat and Weight Loss and Decreases Waist, Hip and Thigh Circumference
John McGettigan *Tucson, AZ*

Background: This unblinded pilot study was designed to assess the ability of low level laser therapy (LLLT) in conjunction with a ketosis diet plan to decrease body weight and body fat and reduce body circumference. **Methods:** Subjects were men and women (N=22) with a mean (SD) age of 45.7 (14.2) years (range, 18-82 years) and a mean BMI of 33.6 (2.5) kg/m(2) (range, 30.0-40.9). Each subject received three weekly LLLT treatments for 4 consecutive weeks while adhering to a ketosis diet program. The LLLT device consists of five diodes each emitting 17mW of 635nm red laser light. Each 40-minute session consisted of 20 minutes of anterior and posterior exposure. **Results:** After 4 weeks, subjects achieved a mean 3.9% decrease in body weight (p<0.0001) and 1.4% decrease in BMI (p<0.0001). Dual-energy X-ray absorptiometry (DEXA) scan revealed mean total body fat mass (kg) decreased from 40.0 (6.5) to 37.3 (6.2) (p<0.0001) and there was a significant decrease in mean triglyceride levels from 142.6 (56.2) to 103.5 (41.5) mg/dL (p<0.0005). There was also a numerical but non-significant decrease in LDL

and HDL cholesterol. Subjects also achieved mean circumferential decreases (inches) of their waist (1.76), hip (1.33), and right (0.97) and left thigh (1.28) (for each, p<0.0001). After 4 weeks, 77% of subjects were satisfied with the results they achieved. These improvements were maintained among subjects available for evaluation 6 months after treatment (N=4 except DEXA scan, N=3). There were no adverse events. **Conclusions:** LLLT in conjunction with a ketosis diet plan enhances body weight and body fat reduction and reduce body circumference.

T-525-P
The Effect of Duodenal-Jejunal Bypass Liner (DJBL) on Prediabetes with Obesity
Veronica Irribarra, Rodrigo Munoz, Fernando Pimentel, Dannae Turiel, Allan C. Sharp, Fernando Muñoz, Alex Escalona *Santiago, Chile*

Background: The endoscopic DJBL (EndoBarrier) has shown to lead to weight loss and the improvement of T2D. The aim of this study was to evaluate the effect of the DJBL on glycaemic control in a group of prediabetic subjects with body mass index (BMI) >35, treated for one year. **Methods:** DJBL-treated patients with BMI >35 were followed for 12 months (n=61). They were evaluated at baseline, 1, 2, 3, 6, 9 and 12 months after DJBL implantation for weight, HbA1c and glucose. **Results:** Forty-two (42) of the 61 patients were women (68%). Age was 35.4±9.7 years and BMI was 43±5.6 kg/m2. Twenty-one (21) patients were diagnosed as diabetic or prediabetic at baseline and all were receiving at least one oral antidiabetic medication. The baseline fasting glucose (FG) for this group was 117.4±46.1 mg/dL and HbA1c was 6.8±1.7%. One month after implantation, HbA1c was 6.2±1.2% (p<0.001) and FG was 105.9±38.3 mg/dL (p <0.045) as compared to baseline. At 12 months, all patients (n=61) had lost an average of 46±18% of excess body weight (EW). The T2D/preDM group, had lost 44.4±17.6% EW. HbA1c was 6.1±1.1% (p=0.004 from baseline) and 10/21 (47%) achieved normal HbA1c of <5.7%. **Conclusions:** The DJBL have a positive impact on glycaemic control in the prediabetes population of individuals with obesity. Use of the DJBL in this group may have a significant impact on the time course of the disease.

T-526-P
Validity of Bertin Equation to Estimate Visceral Fat Using DXA in Women: A MONET Group Study
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Background: Computed tomography (CT scan) is considered as the gold standard to measure visceral fat (VF). However, this method is expensive and the exposure to radiation from CT scan limits its uses. Therefore, Bertin et al. (2000) developed an equation using dual energy X-ray absorptiometry (DXA) measures to estimate VF. However, this equation was validated in overweight/obese men and women. Therefore, the purpose of the present study was to validate the Bertin equation in a sample of non-obese premenopausal women. **Methods:** Secondary data analysis of MONET (Montreal Ottawa New Emerging Team) 5-year longitudinal study of 102 women. Weight, height, body mass index, waist circumference, body composition measured by DXA as well as visceral and subcutaneous abdominal fat by CT scan were measured in 93 participants in year 1(age: 51.0 ± 1.9 years; BMI: 23.2 ± 2.3 kg/m^2; VF: 51.6 ± 24.4 cm^2) and year 3 (age: 51.3 ± 5.6 years; BMI: 23.36 ± 2.4 kg/m^2; VF: 58.4 ± 28.5 cm^2) **Results:** We observed a moderate correlation between estimated VF using the Bertin equation and VF measured by CT scan (r = 0.57; R^2 = 0.33; p < 0.01). The mean difference (MD) between measured and estimated VF was 1.382 cm^2 with a root-mean square error (RMSE) of 21.78 cm^2. A Bland-Altman plot showed that 96.8% of values fell within limits and no bias was found. Similar results were observed for year 3 with a MD of -5.06 cm^2 with a RMSE of 25.53 cm^2 where 95.3% values fell within limits and a bias was found. **Conclusions:** The results suggest that Bertin equation is not a valid tool to estimate VF in non-obese premenopausal women.

T-527-P

Changes in Body Satisfaction, Eating Behaviors and Weight Over the First Two Years of College: Relationships with Pedometer-Assessed Physical Activity

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Background: Few college women engage in enough PA to garner its health benefits (e.g., weight gain prevention), but the experiences that motivate PA in this group are not well understood. The present study was designed as a longitudinal investigation of eating, weight, and PA during the first two years of college. **Methods:** Women who endorsed risk factors for weight gain at the start of college (N=294) completed assessments at baseline, 6 weeks, 6 months, 1 year, and 2 years. Assessments included measured weight, body satisfaction, eating behaviors, and PA (pedometer steps). Multilevel models were used to address the resulting nested data structure. **Results:** Over two years, within-person change accounted for 65% of PA variability (ICC=.35). The average participant took 10,893 (SD=3370) steps per day at baseline; 59% of participants increased PA over two years, whereas 41% decreased. The average difference between a participant's highest daily PA and her lowest daily PA (per assessment) differed by 4362 (SD=3385) steps. PA was greatest at times when body satisfaction was lower (p<.04), and when disinhibited eating, hedonic huger, and weight were higher, than an individual's average (ps<.03). Compensatory exercise characteristic of eating disorders was unrelated to steps (p>.15), however. Thus at times of particularly negative body image, poorly regulated eating behavior, or weight gain, college women engaged in more PA. **Conclusions:** Findings indicate that weight-conscious college women may increase PA in response to negative eating and weight experiences; these experiences change over time, which may partly explain inconsistent patterns of PA observed previously. Health promotion and weight gain prevention efforts would benefit from helping college women to identify alternative, positive motivators for PA, which would facilitate more consistent PA engagement.

T-528-P

Duodenal-Jejunal Bypass Liner (DJBL) Induces Favorable Changes on Hormones Involved in Glucose Homeostasis Regulation in Morbidly Obese Patients

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Background: Endoscopic placement of DJBL has shown to improve glycemic control in patients with Type 2 diabetes mellitus (T2D). However, the mechanisms associated with this effect have been poorly characterized. We sought to characterize the endocrine changes that follows endoscopic placement of DJBL in morbidly obese patients of hormones involved in glucose homeostasis. **Methods:** Seventeen obese patients (Seven with T2D) (mean age, 34.8±9.5 years) and a body mass index (BMI) of 42.59±5.16 kg/m2, were challenged with a 180 minutes meal test (Ensure ® 237 cc) before and 12 weeks after DJBL placement. Plasma levels of total and active GLP-1, and glucagon were analyzed. **Results:** Mean weight loss at 12 weeks was 13±3.8 % of total body weight. Meal-stimulated levels of active GLP-1 was enhanced at 12 weeks by 2 fold has demonstrated by a 120% increase of the AUC (501 vs 1104 arbitrary units, p=<0.05). Fasting glucagon levels decreased from 42±6 to 30±4 pg/ml (p<0.05). Similarly, meal-stimulated levels of glucagon were diminished as demonstrated by a 21% reduction in the AUC (8486±974 vs 6740±751, p=<0.05). These changes were not accompanied by significant changes in either fasting glucose or glucose tolerance non-T2D patients. Conversely, T2D patients significantly decreased fasting glucose levels from 161±32 to 118±14 (p<0.05) and improved glucose tolerance as demonstrated by a 20% reduction on the AUC after 12 weeks of DJBL-treatment (34374±6173 vs 27262±3478, p=<0.05) **Conclusions:** Duodenal-jejunal nutrient exclusion with the DJBL modify secretion of key hormones involved in glucose homeostasis. Augmented levels of active GLP-1 and decreased levels of glucagon may mediate the anti-diabetic effect of DJBL

T-529-P

Serum Bile Acid Concentrations Rise as a Result of Duodenal-Jejunal Bypass Liner (DJBL) Implantation

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Background: The Duodenal-Jejunal Bypass Liner (DJBL) is an effective treatment of Type 2 Diabetes (T2D) and obesity. Our understanding of mechanisms involved in weight loss and metabolic improvement resulting from DJBL placement, and of the role ofbile acids in metabolic and body weight control is evolving.. The aim of this study was to evaluate changes in fasting and post-prandial serum bile acids in obese patients during DJBL implantation. **Methods:** Seventeen obese subjects (Age: 34.8±9.5 years; BMI: 42.59±5.16 kg/m2; 76.5% female, 35% T2DM) were evaluated before and 12 weeks after DJBL placement. Mixed meal tolerance tests were performed with blood samples obtained at fasting and after the ingestion of 237cc of Ensure®. Blood samples were taken every ten minutes for 30 minutes and every 15 minutes for 180 minutes. **Results:** Twelve weeks after DJBL-placement patients had lost on average 13±3.8 percent of total body weight. The mean fasting serum bile acid concentration was 4.87±2.84 μmol/L at baseline to 14.23±5.3 (μmol/L) at 12 weeks (p<0.005). The mean bile acid concentration during the Ensure® challenge rose ~2.8-fold (p<0.05). Fasting serum bile acid levels were inversely correlated with BMI (r=-0.468, p<0.005) and total cholesterol (r= -0.465, p<0.005). **Conclusions:** Fasting and post-prandial serum bile acids rise after DJBL implantation and are inversely correlated with BMI and total cholesterol levels. It is possible that bile acids are involved in the beneficial changes observed in patients with the DJBL.

T-530-P

Improvement in Sleep Efficiency by an Amino Acid Based hGH-Secretagogue: A Pilot Study

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Background: A recent randomized, cross-over, double blind clinical trial showed the ability of an optimized oral amino acid based functional compound (SeroVital®) to increase serum growth hormone levels by 682% from baseline at 120 minutes (p=0.01). Given the known connection between impaired hGH levels and sleep fragmentation [van Liempt, S., et al. 2011 Psychoneuroendocrinology 36(9): 1361-1369], we investigated the direct effect of repeated daily administration of the amino acid based supplement on parameters of sleep efficiency. **Methods:** Fifteen healthy subjects [10 males, 5 females; mean age=33±7 years] determined to have baseline sleep parameters within a normal range (Epworth Sleepiness Scale) consumed the amino acid based supplement orally on an empty stomach prior to bedtime every night for twenty consecutive days. Sleep latency (estimated time to fall asleep) and length of time awake during sleep were reported daily by the study subjects. These data were log-transformed and fit with a mixed-effects linear model with random subject intercept effects (to account for the repeated measures on each subject) and a fixed time effect. **Results:** Both time to fall asleep and time awake in the night decreased according to the exponential model Ae^{-Bt}. For sleep latency, the average intercept was A=18.8 and the common slope was B=-0.012±0.005. For time awake in the night, the average intercept was A=3.25 and the common slope was B=-0.032±0.013. Both slopes were significantly different from zero, (p=0.015 and p=0.012, respectively). **Conclusions:** These results suggest progressively greater sleep efficiency by measurements of sleep latency and time awake during sleep. A larger multi-center study is being planned.

T-531-P

A Picture Is Worth a Thousand Perceptions: Stereotype Content of Obese Individuals

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Background: Weight based stigmatization contributes to poor psychological functioning (Puhl & Heuer, 2009). There is not a complete understanding of the content of weight based stereotypes which is necessary to combat stigmatization. **Methods:** In two studies the authors examine the content of stereotypes and perceptions of obese versus thin individuals using before and after weight loss photos. In study 1 heterosexual participants (N=176) rate dating profiles of opposite gender targets with photos. Ratings for each profile in-

clude traits about the target, questions about the targets' potential success at finding a partner and participants' likelihood of choosing each individual. Two of the profiles include the same individual before and after a significant weight loss. In order to examine interactions between target and participant gender, study 2 (N=175) asks participants to rate profiles of male or female class partners for an ostensible semester long project. Profiles in study 2 include similar trait ratings. **Results:** In both studies obese participants are assigned more negative traits (e.g. lazy), seen as more unattractive, more disgusting, less likely to be chosen as a partner by participants, and less likely to be successful in finding a partner than their thin counterpart. Men view obese female targets as less pleasant (e.g. kind), less feminine (e.g. similar to most women), and more unintelligent than thin targets. Similarly women rate obese male targets as more pleasant, more weak, less masculine (e.g. similar to most men) and more feminine than their thin counterpart. Repeated measures ANOVAs yield significant gender (participant x target) interactions for pleasantness, femininity, attractiveness, intelligence and likelihood of choosing to work with each partner. **Conclusions:** Predictors of differential ratings are explored and implications are discussed.

T-532-P
Sugar-Sweetened Beverages and Adiposity: Systematic Review of RCT

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Background: An association between consumption of sugar sweetened beverages (SSB) and metabolic diseases has been observed. The aim of this study was to analyze randomized clinical trials (RCT) of 12 or more weeks of intervention among ≥ 13 year old individuals, which examined the consumption of SSB on adiposity. **Methods:** An electronic literature search was conducted in the PubMed database of RCT studies published up to April 10th, 2013. Term used for this search was "Sugar Sweetened Beverages" **Results:** Four studies were found. In one of the studies, after the reduction of SSB consumption, a reduction in BMI was observed (p = 0.045). Another study showed that the reduction of 355 ml/day was associated with 0.7kg (95% CI: 0.2-1.1, p = 0.01) of weight loss. In a different study, in the group consuming regular Coke, an increase in the visceral: abdominal subcutaneous fat ratio, was observed (p = 0.01). In another study, there were no differences on adiposity between the intervention and control groups. **Conclusions:** The results of this review indicate that most RCT on ≥ 13 year old individuals showed an effect of the consumption of SSB on adiposity

T-533-P
Absolute or Functional Iron Deficiency in Morbidly Obese Patients

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Background: Assess iron deficiency (ID) prevalence in morbidly obese patients. **Methods:** Observational prospective Study that included 89 morbidly obese patients. Analyzed data: sex, age, weight, height, BMI, iron metabolism, PCR ultrasensitive test. Population was divided according to ID condition or absence of it. ID was classified into absolute or functional. **Results:** 89 patients were included with an average age 42.8 ± 10.8 and a BMI of 43.96 ± 6.54. 78.7% (70 patients) were female. 23 patients (25.8%) presented ID. Average age in this group was 41.74 ± 11.07. 91.3% (21 patients) were female. BMI was of 44.47 ± 5.70. 73.9% (17) of the female patients had their menstrual cycle and 6 of them (26.1%) had hypermenorrhea. ID was classified as absolute in 5 cases (21.7%) and relative in 18 (78.3%). 12 patients (75%) of the patients with functional did not have the antecedent of hypermenorrhea. **Conclusions:** 1) ID is a frequent problem in morbidly obese patients; it is present in 25.8% of the patients. 2) ID can be absolute or functional; apparently the latter is the most frequent.

T-534-P
Changes in Body Weight and Blood Pressure: Paradoxical Outcome Events in Overweight and Obese Subjects with Cardiovascular Disease

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Background: In the Sibutramine Cardiovascular OUTcomes (SCOUT) trial, long-term sibutramine treatment with diet and exercise showed a significantly increased relative risk of nonfatal cardiovascular events but not of mortality. We aimed to examine the relationship between early changes (both increases and decreases) in body weight and blood pressure, and the impact of these changes on subsequent cardiovascular outcome events. **Methods:** Post hoc subgroup analyses of weight change (categories) and blood pressure were performed overall and by treatment group (6-week sibutramine followed by randomized placebo or continued sibutramine). The primary outcome event (POE) was a composite of nonfatal myocardial infarction, nonfatal stroke, resuscitated cardiac arrest, or cardiovascular death. Time-to-event analyses of the POE were performed using Cox regression models with factors for treatment, subgroups and interactions. **Results:** During the initial 6-week sibutramine treatment period, systolic blood pressure decreased progressively with increasing weight loss in hypertensive subjects (-8.1±10.5 mmHg with <5 kg weight loss to -10.8±11.0 mmHg with ≥5 kg weight loss). The highest POE incidence occurred mainly in groups with increases in both weight and blood pressure. However, with long-term sibutramine treatment, a markedly lower blood pressure tended to also be harmful. **Conclusions:** Modest weight loss and modest lower blood pressure, each, reduced the incidence of cardiovascular events, as expected. However, the combination of early marked weight loss and rapid blood pressure reduction seems to be harmful in this obese elderly cardiovascular diseased population.

T-535-P
Long-Term Successful Medical Treatment of Severe Obesity: The GET-ReAL Program

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Background: Suboptimal long-term results from medical treatment (maximum 8% initial body weight (IBW) loss in 2 years) have led to the increasing application of bariatric surgery in class 3 obesity (CL3OB). We report continuing results from our behavior modification program, designed to offer an alternative to surgery. **Methods:** 95 adults with CL3OB or CL2OB with obesity-related complications (BMI 44.2 ± 0.6 kg/m2, age 49 ± 1 yr) attended 10 group lessons, alternating with individual consultations with internist, dietician, physician-assistant and exercise physiologist. Individualized exercise and diet instructions (1200-2000 kcal/day) were given. 120 controls (BMI 43.0 ± 0.5 kg/m2, age 51 ± 1 yr) received standard care. **Results:** 62 patients (65%) completed 2 years of the program, weight loss averaging 18.2 ± 1.2 kg* (14 ± 1% of IBW, 25 ± 2% of excess body weight (EBW)). 41 patients lost ≥10% of IBW, 14 of whom ≥20%, and 3 ≥30%. Controls gained 1.1 ± 0.7 kg (p=NS; 0.9 ± 0.6 % of IBW, 2 ± 1% of EBW), 2 people losing ≥10% IBW. Last observation carried forward analysis (LOCFA) showed mean weight loss of 15.1 ± 1.4 kg* (11 ± 1% of IBW, 21 ± 2% of EBW). At 2 years, 28% achieved ≥35% EBW Loss, 34% reached BMIs <35 (obese patients) or 40 (super-obese patients) and 46% reached EBWs ≤50% (20, 24 and 35% in the LOCFA respectively). The latter are criteria used in surgery to classify results as "satisfactory" or better. Preliminary results from 3 and 3.5 years (n=61 and 44) show respective mean losses of 19 ± 1% and 21 ± 1% (completers) and 12 ± 1% and 11 ± 1% of IBW (LOCFA). **Conclusions:** Non-surgical weight loss at 2-3 years is achievable in severely obese patients in outpatient settings; the efficacy/safety trade-off in obesity treatment is an important consideration in interpreting these results. *p<0.001

T-536-P
Factors Associated with Early Postpartum Weight Loss in Women with Recent Gestational Diabetes

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Background: Women with gestational diabetes (GDM) have a 30-70% risk for developing type 2 diabetes (T2DM) later in life. Postpartum weight retention is highly predictive for future obesity, and further increases risk for T2DM. We sought to identify factors predicting early postpartum weight loss in women with recent GDM. **Methods:** We recruited women with GDM during pregnancy or just after delivery. Pre-pregnancy weight was self-reported at recruitment. We extracted pregnancy history from medical records. We asked participants to come in at 6 weeks postpartum to measure weight and fill out demographic, breastfeeding, depressive symptom, and sleep questionnaires. We used backward selection to fit a multivariable logistic regression model to identify factors associated with losing 75% or more of pregnancy weight gain by early postpartum. **Results:** We measured participants at mean 7.2($\pm$2.1) weeks postpartum. Our study included 75 women (mean 33$\pm$5 years; pre-pregnancy BMI 31.4($\pm$5.6) kg/m2; 57% White, 29% African-American, 15% Asian, with 20% Hispanic). Mean pregnancy weight gain was 12.5 kg($\pm$7.8). 52% of participants lost at least 75% of their pregnancy weight gain by the study visit. In a multivariate model adjusting for weeks postpartum, increased age (OR 1.31; 95% CI 1.06 to 1.76) and less pregnancy weight gain (OR 0.63; CI 0.48 to 0.76) were associated with $\geq$75% postpartum weight loss. Pre-pregnancy BMI, breastfeeding, nulliparity, and sleep were not retained in the multivariate model. **Conclusions:** A substantial proportion of women with recent GDM lost at least 75% of their gestational weight gain by early postpartum. Older women and those who had gained less weight during pregnancy were significantly more likely to have lost 75% of gestational weight. Future analyses will address how early weight loss affects weight at one year postpartum in women with recent GDM.

T-537-P
Intermittent Fasting Reduces Abdominal Obesity and Improves Cognitive Function in Obese Adults

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Background: Growing evidence suggests that obesity increases risk of cognitive decline and dementia. Plausible linking mechanisms include insulin resistance, inflammation, oxidative stress, and a neurotrophic deficit. Interventions that reduce obesity and improve these factors may help to prevent cognitive decline. Intermittent fasting (IF) is a dietary regimen which has significant metabolic and neuroprotective effects in animals, including improved insulin sensitivity, improved memory, increased neurogenesis and synaptic plasticity, and increased resistance to neurotoxic insult. The effects of IF on human neurocognitive function have not yet been tested. We tested the effects of weight loss by IF on human cognition and explored effects on cardiometabolic risk factors. **Methods:** Twenty-six obese adults aged 23-55 years were randomized to 8 weeks of either a standard calorically restricted dietary control (-400 kcal) or IF, in which participants alternated between eating ad libitum one day and complete fasting the next. All meals for both groups were provided. In-patient study visits at baseline, week 1, week 8 and 6 month follow-up assessed cognitive function (CNS Vital Signs®), adiposity (DXA), insulin sensitivity (FSIVGTT), and plasma leptin and the neurotrophin BDNF. **Results:** Both groups showed similar weight loss after 8 weeks (IF 6.5% +/- 5.0%; SDR 5.75% +/- 2.5%). Although no changes in cognition were apparent for either group at 8 weeks, the IF group showed significantly improved memory (p=0.013) and a trend towards increased BDNF levels (p=0.07) at a 6 month post-intervention time point. These changes corresponded to continued reduction in trunk fat (time x group interaction p=0.008). **Conclusions:** This exploratory study demonstrated safety of IF and found preliminary evidence of enduring visceral fat-reducing and cognition-enhancing effects in humans.

T-538-P
Alternate Day Fasting for Weight Loss in Normal Weight and Overweight Subjects: A Randomized Controlled Trial

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Background: Alternate day fasting (ADF; 24 h ad libitum feeding, alternated with 24 h 25% energy intake), is effective for weight loss and coronary heart disease (CHD) risk reduction in obese individuals. Whether these beneficial effects are also demonstrated in non-obese individuals remains unknown. Objective: This study examined the effect of ADF on body weight and CHD risk in normal weight and overweight adults in a randomized controlled feeding trial. **Methods:** Thirty-two subjects (BMI 20-29.9 kg/m2) were randomized to either an ADF group (provided all fast day meals), or a control group (no meals provided), for 12 weeks. A sub-analysis of normal weight (ADF-NW) versus overweight (ADF-OW) subjects was also performed. **Results:** Body weight and fat mass decreased (P < 0.05) in ADF-NW (5.4 $\pm$ 1.1 kg; 3.7 $\pm$ 1.0 kg) and ADF-OW (5.0 $\pm$ 1.4 kg; 3.5 $\pm$ 1.1 kg) groups. Fat free mass decreased in all intervention groups. LDL cholesterol concentrations decreased (31 $\pm$ 9 mg/dl, P < 0.05) and LDL particle size increased (5 $\pm$ 1 Å, P < 0.01) in the ADF-OW group only. Likewise, diastolic blood pressure decreased (10 $\pm$ 3 mm Hg, P < 0.05) and leptin concentrations were reduced (16 $\pm$ 4 ng/ml, P < 0.05) by ADF-OW only. HDL cholesterol, triacylglycerols, homocysteine, C-reactive protein, adiponectin, and resistin concentrations remained unchanged. **Conclusions:** These findings suggest that ADF is effective for weight loss in normal weight and overweight adults. As for the cardio-protective benefits, further research is required before solid conclusions can be reached.

T-539-P
An Examination of Weight Bias among Treatment-Seeking Obese Patients with and without Binge Eating Disorder

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Background: Little is known about sex and racial differences in weight bias among obese individuals who binge-eat despite high rates of obesity and binge eating among both men and women and across minority groups. This study compared weight-bias attitudes among treatment-seeking obese patients with and without binge eating disorder (BED vs. NBO) and explored racial and sex differences and correlates of weight-bias attitudes. **Methods:** Participants included 221 obese patients (169 female; 109 White) seeking treatment for eating/weight concerns recruited through primary care settings. 168 patients met BED criteria. Patients completed semi-structured interviews and psychometrically-established self-report measures of attitudes about obesity, eating pathology, and depression. **Results:** Patients with BED had significantly higher levels of negative attitudes towards obese people *M*=60.12, *SD*=18.90) than NBO patients (*M*=67.53, *SD*=18.55, *F*(1,169)=13.03, *p*<.0005). Interactions between study group (BED vs. NBO) and sex (*p*=.020) and race (*p*=.056) were significant and marginally significant, respectively. Men with BED endorsed the greatest weight-bias attitudes (*M*=50.21, *SD*=13.00) compared to women with BED (*M*=63.49, *SD*=19.45, *p*=.002), NBO men (*M*=70.33, *SD*=20.57, *p*=.023), and NBO women (*M*=66.87, *SD*=18.27, *p*=.001); NBO African-American patients endorsed lower levels of negative weight attitudes (*M*=75.79, *SD*=15.51) than BED White patients (*M*=58.38, *SD*=17.77, *p*=.009). Greater negative attitudes towards obesity were significantly correlated with greater depression and eating pathology across both patient groups. **Conclusions:** Negative attitudes towards obesity, which were observed in treatment-seeking obese patients, were differentially associated with binge eating status, sex, and race, and were associated with heightened levels of eating pathology and depression.

T-540-P
Gastrointestinal Symptoms Are More Prevalent in Obese Individuals

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Background: Reports have shown increased prevalence of gastrointestinal (GI) symptoms in the obese population. To our knowledge no study has systemically documented the prevalence of upper and lower gastrointestinal symptoms in obese individuals. The aim of this study was to compare the prevalence of gastrointestinal symptoms (GI) in obese individuals seeking

care in a weight management clinic with non-obese individuals seeking care in a General Internal Medicine clinic. **Methods:** Obese patients BMI >35 kg/m2 (n=114) and non-obese patients BMI <25 kg/m2 (n=182) completed the GI symptoms survey between August 2011 and April 2012. The survey included 24 items pertaining to upper and lower GI symptoms. The participants rated the frequency of symptoms as absent (never, rarely) or present (occasionally, and frequently). The symptoms were clustered into five categories: oral symptoms, dysphagia, gastroesophageal reflux, abdominal pain, and bowel habits. Responses to each symptom cluster were compared between the obese and normal weight groups using logistic regression. **Results:** Of the 24 items, 18 had a higher frequency in the obese group (p<0.005 for each). After adjusting for age/gender, the obese patients were more likely to have upper GI symptoms: any oral symptom (OR=2.3, p=0.0013), any dysphagia (OR=2.9, p=0.0006), and any gastroesophageal reflux (OR=3.8, p<0.0001). Similarly, the obese patients were more likely to have lower GI symptoms: any abdominal pain (OR=1.7, p=0.042) and concerning bowel habits (OR=2.8, p<0.0001). **Conclusions:** These observations suggest a significant increase in frequency of both upper and lower GI symptoms in obese patients when compared to non-obese subjects.

T-541-P

Pre-Pregnancy BMI Predicts Breastfeeding Success in Primiparous Mothers Intending to Breastfeed

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Background: Breastfeeding has been shown to have short and long term benefits for both mother and child. Many factors may hinder breastfeeding success, such as high pre-pregnancy BMI and excessive gestational weight gain (GWG). This study investigates the relationship among pre-pregnancy BMI, GWG, and breastfeeding success while examining potential covariates. **Methods:** A cohort of 118 primiparous mothers intending to breastfeed with singleton births at least 34 weeks gestation were enrolled in a randomized control trial. Breastfeeding success was defined at least 80% breastfeeding at 4 months. Excessive GWG was calculated using the 2009 IOM recommendations. Women reported how long they intended to breastfeed in the hospital shortly after birth. **Results:** Mean income was $50,000-$75,000. More than half the sample had completed at least some college (80%) and were married (66%). Mean pre-pregnancy BMI was 25 kg/m2. Pre-pregnancy BMI predicted breastfeeding success (p<.01) after adjusting for covariates including education, marital status, income, and mother's age. Married mothers were more likely to be successful at breastfeeding than single mothers, or mothers not married but living with a partner (p<.05). The length of intended breastfeeding positively predicted breastfeeding success (p<.0001). GWG did not significantly predict breastfeeding success as a continuous variable (p=.6) or dichotomous (excessive; yes or no) (p=.2). **Conclusions:** High maternal pre-pregnancy BMI was negatively associated with mothers' successful breastfeeding, regardless of GWG. A majority of mothers in this sample had excessive GWG (64%), which may explain why no effect of GWG on breastfeeding success was observed. Women intending to become pregnant can improve a number of pregnancy outcomes including successful breastfeeding by achieving a healthy weight prior to pregnancy.

T-542-P

Association between Vitamin D and Inflammation in Morbidly Obese Pre-Menopausal Women

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Background: Vitamin D possesses anti-inflammatory properties in vitro. It is unknown if plasma vitamin D suppresses inflammation in adipose tissues and its association with circulating markers of inflammation. **Methods:** 76 healthy obese (BMI: 49.03±9.17 kg/m2) pre-menopausal women undergoing bariatric surgeries, free of diabetes and other inflammatory conditions were assessed for serum interleukin-6 (IL6), C-reactive protein (CRP) and vitamin D (25(OH)D) and abdominal visceral (VAT) and subcutaneous adipose tissue (SAT) mRNA expression of marker of macrophage infiltration (CD68) and inflammation (IL6, IL1β, TNFα). **Results:** Serum 25(OH)D (70.30±40.11 nmol/l) and inflammation (CRP: 5.45±3.10 μg/ml) levels were healthier than anticipated given participants' morbid obesity. No association between serum log25(OH)D levels and CRP and IL6 occurred. Regression analysis revealed significant interaction between serum log25(OH)D and waist circumference (WC) in predicting SAT CD68 and VAT IL6 mRNA expression. Directional change for log25(OH)D in predicting SAT CD68 and VAT IL6 mRNA expression occurred at WC of 132 and 139 cm, respectively. Log25(OH)D negatively predicted SAT CD68 mRNA expression when WC was >132 cm and positively predicted it when WC was <132 cm (interaction term: p=0.05; R2=0.15). Log25(OH)D negatively predicted log of VAT IL6 mRNA expression when WC was >139 cm and positively predicted it when WC was <139 cm (interaction term: p=0.03; R2=0.10). SAT IL1β mRNA expression positively predicted circulating CRP levels (β=0.23; p=0.05). **Conclusions:** Circulating vitamin D has anti-inflammatory effects in adipose tissue in morbidly obese women with WC >139 cm and pro-inflammatory effects when WC is <139 cm. Response to routine vitamin D supplementation in morbidly obese women may vary dependent on degree of central adiposity.

T-543-P

Executive Function and Implicit Attitude Predict Early Outcome in a Behavioral Weight Loss Intervention

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Background: Converging evidence suggests that a broad range of neurocognitive and implicit processes contribute to the ability to self-regulate and engage in health behavior change. However, such processes, including executive functioning (EF) and implicit attitudes (IA) towards high-calorie foods, have yet to be investigated as predictors of outcome in behavioral weight loss interventions (BWLI). **Methods:** The current study administered a neuropsychological battery and a measure of IA to overweight (BMI 27-50 kg/m2; N=29; projected N=70) women before entry into a BWLI to evaluate if IA moderated the relationship between EF and weight change, such that those with high IA and poor EF lose the least amount of weight in a BWLI. **Results:** Preliminary results suggest that specific dimensions of EF and level of IA at baseline prospectively predict weight after 16 weeks of treatment, after controlling for weight at week 1, age, and IQ. Specifically, planning (p = .03, η2p=.23), implicit attitudes (p = .05, η2p = .19), cognitive flexibility (p =.06, η2p =.18), and ability to inhibit incorrect responses (p = .07, η2p =.17) were very strong predictors of weight at week 16. Additionally, IA strongly moderated the relations between planning (p =.02, η2p = .35) and weight change and delayed discounting (p = .07, η2p = .22) and weight change, such that higher IA and poorer EF performance were associated with less weight loss. **Conclusions:** Results highlight the importance of implicit and neurocognitive processes for outcome in BWL interventions, and provide preliminary support for the hypothesis that EF may be particularly important for success in BWL programs when IA is high. Future studies should examine whether training EF and/or IA could enhance BWLIs.

T-544-P

Compliance with Wearing and Using a Wrist Worn Eating Activity Monitor During a Twelve Week Study

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Background: The purpose of this study was to examine compliance with wearing and using the Bite Counter, a wrist worn eating activity (EA) monitor. **Methods:** Twenty overweight participants were instructed to wear Bite Counters for 12 wks to record their bites during all EAs. Participants were instructed to wear the Bite Counter during all EAs and to turn on the device before taking the 1st bite of food and off after taking the last bite of food. The participants had bi-weekly laboratory visits during which Bite Counter data were downloaded. Two subjects were removed from data analysis: one for not completing the study and one for taking a 3 month break during the study. Data from the remaining 18 participants were analyzed (16 F, ages 26-81, average BMI = 32). Compliance was measured as: percent of days capturing at least one EA and average EA's/day. **Results:** Eight participants were identified as compliant, capturing an average of 90% of the days and 3.5 EA's/day. Ten were identified as non-compliant, capturing an average of 52% of the days and 1.2 EA's/day. The participants were further sub-divided with three participants identified as hyper-compliant, capturing an average of 97% of the days and 4.6 EA's/day. Five identified as compliant, capturing an average of 86% of the days and 2.8 EA's/day. Seven identified as under-compliant, capturing an average of 63% of the days and 1.4 EA's/day. Finally, three were identified as non-compliant, capturing an average of 25% of the days and 0.5

EA's/day. **Conclusions:** The data indicate that some individuals (~20%) will wear and use the Bite Counter with minimal training, most individuals (~60%) will be able to wear and use the Bite Counter correctly, but will require training beyond a simple instruction, and some (~20%) will likely not use the Bite Counter in a way that would accurately track their EA.

T-545-P
Sarcopenia as a Predictor of Knee Surgery and Comorbidities in a Cohort of Obese Patients

Sarah A. Purcell, Jingjie Xiao, Robert Thornberry, Angelina Cain, Michael J. Ormsbee, Sunita Ghosh, Jeong-Su Kim, Dawn Smith, Carla M. Prado *Tallahassee, FL*

Background: Sarcopenic obesity is a complex condition with the double burden of low muscle mass and excess adiposity. Recent findings suggest that this condition might increase the risk of knee surgery and other unfavorable outcomes. The aim of this study was to evaluate the prevalence and implications of sarcopenia in obese patients. **Methods:** Obese patients with bioelectrical impedance analysis (BIA) measurements available were recruited from a weight loss clinic serving northern Florida. Body composition variables included fat mass (FM), fat free mass (FFM) and FFM index [FFMI, FFM (kg)/ height (m)2]. Information on metabolic profile and health status was gathered from medical records to further examine associations between body composition and clinical outcomes. **Results:** Ninety-one participants (BMI 46.4±7.6 kg/m2; age 57±11years) were included. Patients showed a wide range of FFMI (14.5-36.3 kg/m2) and high occurrence of morbid obesity (81.3%). Sex-specific cutpoints that defined a significant association between low FFMI and knee surgery were ascertained by optimum stratification analysis: 62 (68%) patients were classified as having sarcopenia. FFMI was a predictor of knee surgery (OR = 3.33, 95% CI = 2.0-5.7, p <0.0001). Sarcopenic patients presented with greater %FM (p = 0.014), greater FM/FFM ratio (p = 0.009), higher prevalence of diabetes (p = 0.022), higher blood pressure (p = 0.037), and higher depression rates (p = 0.048) compared to non-sarcopenic patients. **Conclusions:** This study provides evidence of the great variability of body composition in obese patients and links body composition, especially sarcopenia, to clinical implications such as knee surgery and co-morbidities.

T-546-P
Baseline Food Addiction Measures in Severely Obese Individuals Considering Bariatric Surgery, Dietary Weight Loss or No Treatment

Susan Murray *Gainesville, FL*; Kyle Morse, Alexis Conason, Allan Geliebter *New York, NY*; Nicole Avena *Gainesville, FL*

Background: Animal research suggests several neurochemical and behavioral similarities between drug addiction and binge consumption of palatable foods. Further, recent evidence shows behavioral parallels between drug addiction and excessive food intake behaviors in clinical samples. We are conducting a longitudinal study designed to assess the presence of addiction-like responses to food over time in obese individuals who 1) undergo bariatric surgery, 2) participate in a weight loss program, or 3) receive no treatment. **Methods:** Participants (n=36) were recruited from the bariatric surgery office at St. Luke's-Roosevelt Hospital in New York City, pre-bariatric surgery support groups, flyers posted in the hospital, as well as newspaper and Craigslist advertisements. Participants were asked to complete the Yale Food Addiction Scale, which assesses eating habits based on the substance dependence criteria included in the DSM-IV. The data presented here are from time point 1 (T1) and were collected prior to any intervention to provide a baseline for later longitudinal and between-group comparisons. **Results:** Of the 36 participants, 83.3% were female and 16.6% were male. The mean age was 35.5 (range: 19.6-62.9) and the mean body mass index (BMI) was 42.1 (range: 37.6-50.2). 41.6% of participants endorsed three or more food addiction criteria. 16.6% met the more stringent criteria for food addiction, which requires additional evidence of clinically significant impairment. **Conclusions:** These preliminary data show that a considerable percentage of severely obese individuals report addiction-like behaviors and attitudes regarding food. Further research regarding the effects of various weight loss strategies on food addiction scores may indicate the relevance of treatment type and associated weight loss for what appear to be unhealthy patterns of eating.

T-547-P[DT]
The Effects of Individualized Nutrition Intervention on Mentally Disabled Athletes

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Background: Mentally disabled populations have a nutritional risk because of lack of adequate nutrition education or because comorbidities modify and/or increase nutritional requirements; Special Olympics International is aware that risks increase as physical activity does, so this organization provides health assistance for athletes. **Methods:** The objective of this study was to test the hypothesis that the effects of an individualized nutrition intervention regarding energy and macronutrient intake, weight, and body mass index on athletes with and without Down Syndrome are not the same. A 16-week nutritional intervention programme was conducted on 55 Mexican Special Olympics athletes (aged 6-49 y): 24 diagnosed with Down Syndrome (DS) and 31 with other diagnoses (No-DS). Energy and macronutrient intakes, body weight, and height were measured and BMI was calculated before and after the intervention, with a monthly monitoring. Statistical analysis was conducted using ANOVA. **Results:** No significant differences were found in energy and nutrient intakes of the population as a whole before and after the intervention. There were significant differences among the different subgroups: men consumed more calories than women; female children more than female adults, and male children fewer than male adults. The same was found in relation to proteins, lipids, and carbohydrates. Males ingested more proteins, lipids, and carbohydrates than females. DS adults lost weight, while NO-DS adults and all children gained weight. Consequently, BMI of DS adults decreased, while BMI of NO-DS adults and children increased. **Conclusions:** No differences were found in the popultation as a whole, but there were statistical differences in subgroups. These findings suggest a need for further micronutrient and qualitative diet analysis and body composition examination.

T-548-P
Obesity Does Not Correlate with Non-Articular Pain

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Background: Small scale studies and a recent survey based study have shown that increasing body mass index (BMI) is associated with increasing musculoskeletal pain. The aim of our study was to determine if this association held true in patients preparing for weight loss surgery. We evaluated only non-articular pain. **Methods:** 495 patients were enrolled in this study. Patients who completed a Chronic Pain survey were included in the study. Quality of life (QOL) and depression were evaluated by the Impact of Weight Questionnaire (IWQOL-Lite) and the Beck Depression Inventory (BDI), respectively. The presence of pain in patients with different BMI's was correlated with BDI and QOL using Pearson's correlation coefficients. **Results:** Of the 495 patients, 202 (40%) completed the Chronic Pain, BDI and IWQOL-Lite surveys. No correlation between increasing BMI and level of pain was found (p > 0.5). QOL was significantly decreased (p< 0.039) as the BMI increased and also with older age, female sex, and analgesic use. Higher BDI scores were associated with higher pain score but not with BMI. **Conclusions:** Unlike other studies, we found no correlation between BMI and level of non-articular pain. This finding may be a result of our study patient population which was limited to patients undergoing bariatric surgery evaluation and by sample size. Our findings do support previous studies that found a correlation between advanced age and female gender with increased pain and decreased QOL.

T-549-P
Endothelial Dysfunction and Fetal Birth Weight of Gestational Diabetes

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Background: Background: The objective of this study was to assess the endothelial markers (sE-selectin, sVCAM-1, and ICAM-1) in control and GDM pregnant women and its correlation with the neonatal birth weight. **Methods:** A prospective cross-sectional study was performed on 39 GDM and 58 healthy control pregnant women. They were recruited from Hammed Med-

ical Corporation (HMC)-Qatar. Fasting blood sample were assessed the circulating levels of the endothelial markers during the second trimester. **Results:** The GDM and control subjects were matched for age and BMI; (31.39 ± 5.60), (30.33 ± 5.34) years and BMI was 31.0 (25.5-41.0) kg/ m2 at first trimester in GDM women while it was 31.0 (27.0-, 38.25) kg/ m2 among the control group. Mean ± SD of systolic pressure for GDM was (113.76 ± 11.80) mmHg and was (120.49 ± 10.46) mmHg among control. The diastolic pressure was (67.28 ± 8.92) mmHg in GDM and in the control was (69.24 ± 13.49) mmHg. sE selctin for GDM with median and interquartile was not significantly different between GDM 0.079 (0.074- 0.08) ng/ml and the control group 0.079 (0.074-0.081) ng/ml (p=0.621), but GDM had lower sICAM-1 level 0.310 (0.17-0.45) ng/ml than control 0.365 (0.21-0.54), p=0.213 and higher sVICAM-12.085 (1.61-3.27) ng/ml than control 2.065 (1.55-2.86), p=0.731. Insulin level in median and interquartile for GDM 67.47 (36.45, 117.03) mIU/ml was significantly higher than the controls 47.814 (4.24-115.30) mIU/ml, p=0.043. The fetal birth weight was 3.22 ± 0.56 kg among controls which was not significantly different than GDM 3.37 ± 0.56 kg, p=0.189. No significant correlations were detected between the endothelial markers sE-selectin, sICAM-1 and sVCAM-1 with the fetal birth weight (r= -0.031, p=0.769), (r=0.077, p=0.463) and (r=0.029, p=0.783) respectively. **Conclusions:** No significant impact of endothelial on fetal birth weight of GDM.

T-550-P
Similar Effects on Cognitive Performance During High and Low Carbohydrate Obesity Treatment

Angie Makris *Philadelphia, PA*; Valerie Darcey *Washington, DC*; Diane Rosenbaum *St. Louis, MO*; Eugene Komaroff, Stephanie S. Vander Veur, Bradley N. Collins *Philadelphia, PA*; Samuel Klein *St. Louis, MO*; Holly Wyatt *Aurora, CO*; Gary D. Foster *Philadelphia, PA*

Background: Low carbohydrate diets are often used for weight loss but their effects on cognitive function are not well understood. **Methods:** The present study compared the effects of a low carbohydrate (L-CHO) and high carbohydrate (H-CHO) weight loss diet on cognitive function in 47 adults (25 males) with a mean + SD age of 47.4 + 8.7 y and BMI of 35.3 + 3.4 kg/m^2. Participants were randomized to either a L-CHO (n = 22) or H-CHO (n = 25) weight-loss diet. Cognitive function was evaluated by four computerized cognitive tasks (Stroop Task, Continuous Performance Task, Word Recall, and Wisconsin Card Sorting Task) presented in random order before and at 1, 4, 12, and 24 weeks after the initiation of the L-CHO or H-CHO diet. **Results:** There were no significant differences in weight loss between groups at any time point. There were significant improvements on color Stroop task accuracy over time in both diet groups (p<0.05), but there were no differences in performance between groups on this or any other cognitive task at any time period. **Conclusions:** These findings suggest that weight loss has neither a positive nor negative effect on cognitive function and that L-CHO and H-CHO weight-loss diets have similar effects on cognitive performance.

T-551-P^{DT}
A New BIA Equation Estimating the Fat-Free Mass of Young Non-Hispanic Black Women

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Background: Several populations have reported greater incidence of overweight (OW) and obesity (OB), including non-Hispanic black (NHB) women where a reported 78.0% aged 20-39 yrs are classified as OW (BMI > 25.0 < 29.9 kg/m2) or OB (BMI > 30 kg/m2). One of the difficulties of conducting obesity research is identifying a safe, non-invasive, economical, valid method of assessing body composition that can be used in several settings and is well-tolerated by subjects. Bioelectric impedance analysis (BIA) fulfills many of the optimal method requirements; however, the lack of population specific equations is problematic. Therefore, the purpose of this study was to develop and cross-validate a new BIA body composition equation for young NHB women. **Methods:** Data were collected for 79 (37 healthy-weight, 25 OW, 17 OB) NHB women ages 18-30 yr. Using a single frequency (50 kHz) tetra-polar BIA unit and a 4 component body composition methodology and equation (4Comp) as the criterion method, a BIA regression equation was developed and then cross-validated using the "leave- one- out" method. **Results:** The new equation was 4Comp FFM = -14.6 + 0.0257(Imp) + 0.249(Wt) + 0.629(Ht2/Imp) where 4Comp FFM = 4Comp fat-free mass

(kg); Imp = impedance (ohms); Wt = body weight (kg); Ht = standing height (cm). The model explained 88.5% of the variance in 4Comp FFM. Cross-validation results demonstrated a small amount of statistical shrinkage by explaining 83.5% of the variance in 4Comp FFM. The 95% confidence interval for the predicted value of 4Comp FFM was y' ± 5.662 kg. **Conclusions:** The new BIA equation will help to provide an accurate method to estimate the body composition of young NHB women in a variety of settings. The use of this equation may help to identify effective intervention strategies to prevent or combat obesity in this population.

T-552-P
A 12-week Low-Calorie Diet Plus Behavioral Modification Acutely Improves Glycemic Parameters in Type 2 Diabetes Mellitus

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Background: This study sought to determine the effect of a 12-week low-calorie diet and behavioral modification program (Health Management Resources Corporation®) on fasting plasma glucose (FPG) levels, glycated hemoglobin (GHb) levels, use of hypoglycemic agents, and change in glycemic parameters in an overweight or obese population with type 2 diabetes mellitus. **Methods:** A retrospective review was conducted of participants who voluntarily enrolled in a Midwestern weight loss clinic. Logistic regression was conducted to explore predictors affecting improvement in glycemic parameters. **Results:** A total of 129 participants were identified for the study. FPG decreased from 7.77 ± 2.62 mmol/l to 6.66 ± 1.93 mmol/l (p < 0.005). Glycated hemoglobin decreased from 7.34 ± 1.38% to 6.55 ± 0.95% (p < 0.005). Use of hypoglycemic agents decreased from 1.69 ± 1.09 medications per patient at baseline to 1.01 ± 0.93 medications per patient after 12 weeks (p < 0.005). The prevalence of optimal glycemic parameters, defined as a GHb < 6.5% and a FPG < 7.0 mmol/l while off medications, increased from 1.8% (n=2/113) to 22.5% (18/80). Males were more likely to achieve optimal glycemic parameters than were females (OR 3.7, 95% CI [1.2, 11.8]). Participants with a baseline GHb ≤ 7.0% were more likely than those with a GHb > 7.0% to achieve optimal glycemic parameters (OR 4.6, 95% CI [1.4, 15.7]). **Conclusions:** A 12-week low-calorie diet combined with behavioral modification is effective in reducing FPG, GHb, and use of hypoglycemic agents and it is associated with acute improvement in glycemic parameters in obese subjects with type 2 diabetes mellitus.

T-553-P
A Study of the Quality of Life Following Gastric Bypass: Patients' Perspectives

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Background: Understanding obesity means recognizing that it is a complex disease and requires care of the whole person. Many studies have suggested that the single most important aspect of a successful weight-loss diet is not the composition of the diet, but adherence to the diet long-term. Therefore, it becomes increasingly important for health care professionals to understand the individual's lifestyle and attitudes towards food and health. This mixed design study used qualitative and quantitative approaches to understand how bariatric patients viewed their quality of life post operatively with a focus on nutrition related concerns. **Methods:** We interviewed 6 patients (4 women and 2 men) with a mean age of 51 ± 11 years. The semi-structured interviews were audiotaped, transcribed verbatim, and coded, categorized and formed into themes. We triangulated the interview data with the Bariatric Quality of Life Index (BQL). **Results:** Participant's current mean body mass index was 32.7 ± 4.9 kg/m2 and they had a mean score of 56.17 on the BQL, indicating a perceived high quality of life. Five themes surfaced from the qualitative data: Reasons for surgery, Post-operative experiences, Lifestyle adaptations, Challenges of the medical system, and Mental health. **Conclusions:** The foundation of post-operative success for gastric bypass patients is currently sub-optimal and should include an interprofessional approach to meet the physical and psychological needs. Medical and social supports need to be addressed pre-operatively and continued long term to sustain lifestyle changes.

T-554-P
Meal Replacement Diets and Transaminase Elevations

Kelly A. Holes-Lewis, Joshua D. Brown, Robert J. Malcolm, Patrick M. O'Neil *Charleston, SC*

Background: Transient transaminase elevations, often without any other liver dysfunction or clinical sequelae, occur frequently in patients (pts) on meal replacement diets for the treatment of obesity. **Methods:** We evaluated a sample of 51 subjects,18 males and 33 females between the ages of 24 and 72 years who participated in a 12 week meal replacement diet. **Results:** Forty-nine out of 50 patients (one pt was missing a baseline AST value) had elevations of AST from baseline values. Elevations of ALT from baseline values were identified in 46 out of 51 pts. Twenty-three pts had elevations of ALT above the upper limit of normal(ULN). Average elevation above the ULN in those patients was 74.2 points. Thirty-three of the 51 pts had elevations of AST above the ULN. Average elevation above the ULN for these pts was 25.9 points. Mean weight loss was 59.45lbs. Further analyses are underway. Mild to modest transaminase elevations above the ULN occurred in 71% of pts participating in a meal replacement diet. **Conclusions:** Much is known about the reductions of transaminase levels that occur with weight loss in obese individuals with fatty liver disease. Conversely, little is known about elevations in transaminase levels that occur with weight loss independent of liver dysfunction. We identify a pattern of transient elevations of transaminase levels that occur with weight loss independent of baseline liver dysfunction. Understanding these changes may aid clinicians in the appropriate management and oversight of these changing laboratory values and could avoid unnecessary work-ups and investigations given their transient nature.

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

Behavioral and Social Epidemiology

T-555-P[DT]
Overweight and Obese Young Adults Demonstrate Greater Weight Gain Throughout Adulthood Than Normal-Weight Young Adults

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Background: Weight gain during adulthood is common. Existing studies have shown overweight/obese young adults experience greater 5-10 year weight gain than their normal-weight peers. We examined long-term (i.e., 25-year) trends in weight change beginning in early adulthood and into middle-age. **Methods:** The Coronary Artery Risk Development in Young Adults (CARDIA) study includes a demographically-balanced sample of 5,115 Black and White adults followed from 1985-86 (ages 18-30) to 2010-11 (ages 43-55). Linear mixed models estimated 25-year weight change, and models were stratified into four groups: Black men (BM), Black women (BW), White men (WM), and White women (WW). Regression models examined 25-year weight change according to baseline BMI (i.e., normal weight=18.5-24.9 kg/m2, overweight=25-29.9 kg/m2, obese≥30 kg/m2). **Results:** All race-sex groups demonstrated significant weight gain over 25 years, p<0.0001. Participants who were overweight or obese (vs normal weight) at baseline had greater weight gain. Compared to participants who were normal weight at baseline, BM, BW, WM, and WW who were overweight gained an estimated mean difference of 14.2 kg, 15.5 kg, 14.0 kg, and 15.0 kg more weight, respectively, over 25 years, all p<0.0001. BM, BW, WM, and WW who were obese at baseline gained 37.6 kg, 38.3 kg, 35.3 kg, and 35.2 kg more weight, respectively, p<0.0001. **Conclusions:** Overweight/obesity in early adulthood was associated with continued and substantial weight gain into middle-age for Black and White women and men. Targeted strategies to prevent overweight/obesity before early adulthood as well as efforts to minimize further weight gain in those who are already overweight or obese are warranted.

T-556-P
People-First Language, Demographics and Bias Against Persons with Diabetes or Obesity

Theodore K. Kyle *Pittsburgh, PA*; Rebecca Puhl *New Haven, CT*; Randi M. Williams *Rockville, MD*; Steven C. Kyle *Pittsburgh, PA*; Scott Kahan *Washington, DC*

Background: Bias and stigma contribute to poor health in both obesity and diabetes. Weight bias has been shown to be stronger than bias against other targets, but has not yet been compared with chronic diseases like diabetes. People-first language ("a person with diabetes"), as opposed to condition-first language ("a diabetic") has been adopted when referring to some chronic diseases and disabilities, but has not been widely adopted for obesity. This study compares attitudes toward people with diabetes and obesity, and the extent to which using people-first language influences attitudes. **Methods:** 800 respondents completed an online study fielded by Lab42. Participants were randomized to one of four experimental conditions, in which they were asked about a person described as one who 'has obesity,' 'is obese,' 'has diabetes,' or 'is diabetic.' Respondents completed explicit measures of bias including the Universal Measure of Bias Scale and a measure of social distance. **Results:** Demographic characteristics were similar across all four conditions. Variations in race and ethnicity were controlled by multivariate analysis. People-first language had a marginal effect (p < 0.10) on bias and social distance toward people with diabetes, but no effect toward people with obesity. Bias against obesity was greater than diabetes (p < 0.001). Males expressed more bias and social distance than females towards people with diabetes or obesity (p<0.05). Respondents who themselves had diabetes or obesity expressed less bias (p<0.05). Younger respondents expressed more bias against diabetes than older participants (p < 0.05). **Conclusions:** More work is needed to identify whether people-first language can help reduce bias in the context of obesity. Gender differences in weight bias and social distance have important implications for efforts to address both diabetes and obesity.

T-557-P
People-First Language Is an Indication of Less Explicit Weight Bias

Theodore K. Kyle *Pittsburgh, PA*; Rebecca Puhl *New Haven, CT*; Randi M. Williams *Rockville, MD*; Steven C. Kyle *Pittsburgh, PA*; Scott Kahan *Washington, DC*

Background: Weight bias contributes to poor health and quality of life. People-first language ("a person with obesity"), rather than condition-first language ("an obese person"), has been adopted for some chronic diseases and disabilities to help reduce stigma, but has not been widely adopted for obesity. This study examines reactions to people-first language and bias associated with people-first or condition-first language for obesity. **Methods:** Three separate groups of respondents participated in an online study fielded by Lab42. The three groups were: respondents who prefer using people-first language for obesity (PF group, n=256), those who prefer using condition-first lanaguage (CF, n=359), and a separate representative sample of respondents who perceive their weight status to be very overweight or having obesity (O, n=200). The PF and CF cells completed explicit measures of bias: the Universal Measure of Bias Scale and a measure of social distance. The O cell was asked about the acceptability of their doctors either calling them obese or telling them they have obesity. **Results:** Younger age (p<0.001), lower BMI (p<0.05), and CF language preference (p<0.001) were significantly associated with higher weight bias among participants. Male gender (p<0.001) and younger age (p<0.05) were significantly associated with greater social distance, but CF language was not. The majority of the O cell respondents (70%) found it more acceptable for their doctor to tell them they 'have obesity' than to call them 'obese.' Females were significantly less likely (p<0.01) than males to accept being called 'obese.' **Conclusions:** Individuals who use people-first language for obesity exhibit less explicit bias toward people with obesity than those who use condition-first language. People with obesity and severe overweight find people-first language more acceptable from their doctors.

T-558-P

Childhood Adversity in Relation to Adult Obesity: A Meta-Analysis

Erik Hemmingsson *Stockholm, Sweden*

Background: There is a need to understand the role of childhood adversity in relation to obesity and whether different forms of adversity differ in terms of risk of developing obesity. **Methods:** Meta-analysis of observational studies on the role of childhood adversity in adult obesity. Pubmed searches using the search terms "childhood adversity", "childhood abuse", "trauma" and "post-traumatic stress disorder", as well as "obesity" were carried out, resulting in nine cohort studies (4 prospective and 5 retrospective), with 19 separate comparisons of different adversity types (5 physical, 3 emotional, 6 sexual, and 5 general abuse including verbal, fear of physical abuse and humiliation). Two of the nine included studies reported dose-response effects. A random effects model was used to quantify effect sizes. **Results:** Overall, adults who had suffered adversity as children were significantly more likely to develop obesity (OR: 1.31, 95% CI: 1.21-1.42, P<.001). Of the different types of abuse, the greatest risk was seen for emotional abuse (OR: 2.53, 1.05-6.11, P=.039), followed by physical abuse (OR: 1.47, 1.21-1.80, P=.004), sexual abuse (OR: 1.27, 1.02-1.58, P=0.038) and general abuse (OR: 1.25, 1.18-1.33, P<.001). In studies with dose-response data, a high adversity exposure was more associated with obesity (OR: 1.31, 1.24-1.39) than low/moderate exposure (OR: 1.10, 1.06-1.14). No major difference in effect size was noted between retrospective (OR: 1.30, 1.24-1.37) and prospective studies (OR: 1.38, 1.11-1.73). **Conclusions:** Childhood adversity was associated with an increased risk of adult obesity, especially emotional abuse including parental neglect. There was also a dose-response association between childhood adversity and obesity risk, suggesting a key role in obesity development.

T-559-P

BMI Is Associated with Reaction Time and Working Memory in 1292 UK 7-10 Year Olds

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Background: Reaction time (RT) commission errors (CE) and working memory (WM) are domains executive functioning, associated with BMI, but data are inconsistent. A literature review of cross-sectional analyses incorporating neuropsychological task data on healthy children aged 4-18 years yielded 8 studies, which revealed 7 significant and 10 null associations, with no one study or domain showing consistently significant relationships. As sample sizes were modest (N=24-177), and one study reported a significant interaction with age, we extended the current evidence by analyzing task performance on 1292 children with a tight age range (7-10 years). **Methods:** We collected RT data on the Fast Task, in which children press buttons corresponding to stimulus location, RT and CE data on the Go/no-go task in which children press a button in response to the 'go' stimulus, but not the 'no-go' stimulus, and WM data on the Digit Span backwards task, where children repeat a number string backwards. BMI was determined from self-reported height and weight. We constructed mixed linear models to examine the association between BMI and task performance, controlling for age, gender and clustering within families. **Results:** . BMI was positively associated with RT on both the Fast Task (F=11.05; P=.001) and Go/no-go task (F=4.07; P=.04) and negatively associated with WM (F=6.50; P=.01). BMI was not associated with CE (F=.75; P=.39). The associations held when additionally controlling for IQ. **Conclusions:** Our findings demonstrate several robust associations between task performance and BMI, suggesting that BMI is associated with increased RT, and decreased WM, but not CE, an index of the ability to inhibit responses. The results implicate decreased executive functioning is associated with BMI and support the use of large sample sizes and tight limitations of age range in future studies.

T-560-P[DT]

Low Recognition of Early Childhood Weight Status among American Indian Caregivers

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Background: Children from American Indian (AI) communities are disproportionally affected by childhood overweight and obesity (OV/OB), which increases the risk of adult OV/OB and other chronic diseases. Caregiver knowledge, attitudes, and behaviors influence risk factors for childhood OV/OB, and we previously reported low caregiver recognition of childhood OV in school-age AI children. **Methods:** To determine the recognition of childhood OV/OB in younger children, 150 2-to-5 year old children and their caregivers from 4 Wisconsin tribes were assessed by health questionnaires as part of the Healthy Children Strong Families study. For the question addressing concern of overweight, possible responses included "no, a little, a lot, or already is overweight". Height and weight were measured, and BMI was calculated according to adult and child reference values. **Results:** In total, 17.2% of the children were classified as OV and 29.8% as OB; 76.6% of adults were considered OV/OB. OV/OB children were more likely to have an OV/OB parent than normal weight children (p<0.05). Caregivers were unable to recognize OV/OB in children, with only 2 of 69 children in these categories being correctly identified by their caregiver (<3%; χ2, NS). In contrast, 30.6% of OV and 57.5% of OB caregivers correctly identified themselves (χ2, p<0.05). **Conclusions:** These data suggest that while adults were better able to recognize their own weight status, caregiver recognition of OV/OB in very young children was extremely low. Furthermore, poor recognition of weight status is occurring in younger children than previously demonstrated. Future interventions targeting caregiver perceptions and behaviors regarding healthy weight status in preschool children may help inform childhood obesity interventions in this particularly vulnerable age group of AI children.

T-561-P

Obesity in Children and Young People in Out-of-Home Care: A Systematic Review of Prevalence and Interventions

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Background: Children placed in out-of-home care (OOHC) have typically experienced some form of abuse or neglect and experience poorer educational and health outcomes than their same-aged peers in the general community. One health outcome that appears to have been ignored is the prevalence of overweight and obesity of children placed in OOHC. Hence, the overall goal of this section was to review the current literature on weight-related issues for children in OOHC. **Methods:** A search was conducted in December 2012 via: Academic Search Complete, CINAHL- with Full Text, Global Health, Health Policy reference centre, Health Source- Consumer edition, Medline, Social work Abstracts, and PsycINFO. The review was informed by PRISMA guidelines. **Results:** 10 studies were deemed relevant for the current review. Results from international studies (e.g., US, UK, Korea) reveal high rates of overweight and obesity among children in OOHC; furthermore, BMI appears to increase once they enter care. In contrast, there is a paucity of studies that have examined the weight status of Australian young people in OOHC. Only two of the reviewed studies (both from the UK) discussed specific approaches for intervention. **Conclusions:** Prevention and intervention strategies which target children as they enter OOHC are needed urgently. Given the association between unhealthy weight status, self-esteem, depression, and body image, strategies that target these factors in combination with healthy eating and physical activity habits, in this target population, may be more likely to be successful.

T-562-P

Do Parent-Child Interactions Influence Child Eating Behaviours and Child BMI? A Prospective Study of Mothers and Their Preschool Children

Helen Skouteris, Defne Demir *Melbourne, Australia*

Background: Past research examining the influence of mothers on preschool childhood overweight/obesity has focused predominantly on parent-centered uni-directional aspects of parenting (i.e., what the mother does or believes). Over the last 5 years, we have developed a program of research focused on how parenting and mother-child interactions impact on preschool children's

eating habits and subsequent patterns of weight gain. **Methods:** Home observations of the mother-child mealtime interactions were recorded and coded at baseline (n = 35 mother-child dyads) and then again 12 months later (n = 33); mother-child responsiveness and affect, maternal control and child compliance were coded from the video recordings. Child eating behaviours were self reported by mothers and child weight status was measured objectively by the researchers. **Results:** Mother-child responsiveness was associated positively with child enjoyment of food, and negatively with child food fussiness; mother-child responsiveness was also negatively associated with satiety responsiveness as was mother-child positive affect. Maternal control was associated positively with child emotional over-eating, as well as child food fussiness and associated positively and negatively with child BMI, highlighting mixed results. Mothers with lower maternal control were more likely to have children with an unhealthy weight status. **Conclusions:** The findings suggest that child weight gain, as one aspect of the child's physical development, is best understood in the ecology of family relationships and that maternal socialisation of children's eating is grounded in the extent to which the mother-child dyad are mutually responsive. Our findings have implications for current ecological models of childhood obesity.

T-563-P
Prevalence of AMA-Recommended Behaviors to Prevent Childhood Obesity among Parents of Preschool-Age Children
Sherry T. Liu, Phyllis L. Pirie, Kendall Leser, Carol Smathers *Columbus, OH*

Background: In 2007, the American Medical Association (AMA) convened an expert committee to review the literature and identify effective strategies to prevent childhood obesity. The expert committee recommended that parents adopt a set of core behaviors that focus on diet, screen time, and family meals to promote healthy weight in children. This study examined prevalence of AMA-recommended behaviors among parents of preschool-age children. **Methods:** Seven AMA-related parenting behaviors (i.e., has rule about sugar-sweetened beverages, offers fruits every day, offers vegetables every day, has rule about screen time, no television in room where child sleeps, offers breakfast every day, eats meal with child every day) were examined. Data were from a cross-sectional survey of 302 parents of randomly selected 2-5-year-olds across three low-income ZIP codes in Columbus, Ohio. The proportion of parents reporting each behavior and total number of behaviors performed were calculated. **Results:** Of the 7 AMA-related behaviors, offering breakfast every day (90.7%) and having a rule about sugar-sweetened beverages (77.2%) were most commonly reported by parents. Behaviors related to screen time were less common; 34.8% of parents do not allow a television in the room where the child sleeps and 49.7% have a rule about screen time. While more than two-thirds of parents followed at least 4 of the behaviors, only 9.9% performed all 7 behaviors. **Conclusions:** Parents of preschool-age children are engaged in obesity prevention behaviors; however, behaviors related to screen time are less common. Childhood obesity prevention efforts involving parents should be more comprehensive and emphasize the importance of adopting the set of core behaviors.

T-564-P
Links between Early Childhood Household and Family Stressors and Obesity in Adolescence
Lori A. Francis, Elizabeth J. Susman *University Park, PA*

Background: Early life exposure to stress is linked to biobehavioral dysregulation, including obesity. The purpose of this study was to examine links between children's exposure to stressful family environments in early life (as early as 6 months) and obesity at age 15. **Methods:** Data were drawn from the National Institute of Child Health and Human Development's Study of Early Child Care and Youth Development. Participants included 844 children from 10 locations in the U.S., followed from birth through age 15. Parents also participated in the study. We examined 3 main risk factors for the development of obesity in children, measured at 6 months and age 3: poverty level (poor/not poor); maternal depression (high/low); and maternal parenting sensitivity (high/low). Age- and sex-specific BMI z-scores at age 15 were calculated from measured height and weight; body fat percentage was assessed via tricep and subscapular skinfold measurements at age 15. Latent class analysis was used to examine family risk profiles and their association with obesity at age 15. **Results:** Adolescents from poor families and those who had mothers with higher depressive symptoms had higher BMI z-scores at age 15. Adolescents with mothers who were insensitive in their parenting at 6 months of age

also had higher BMI z-scores at age 15. Four classes of risk were identified. The class that conferred the greatest risk for adolescent obesity was characterized by the highest prevalence of single parenthood, poverty, maternal depression, and insensitive parenting at 6 months. Compared to the low risk class, children from families in the high risk class had a 60% increased odds of being obese at age 15. **Conclusions:** The results from this study highlight early childhood family environmental factors that may place children at risk for obesity.

T-565-P
Links between Adverse Childhood Events and Obesity in a National Sample of Youth Ages 10-17 Years
Lori A. Francis, Rhonda Belue *University Park, PA*

Background: Exposure to early life stress is related to a number of negative cardiometabolic outcomes, including obesity. We examined links between exposure to adverse events in childhood and obesity status in 10- to 17-year-old youth. **Methods:** Participants included a sample of 95,677 youth whose data were drawn from the 2011 National Survey of Child Health (NSCH). Adult respondents were asked to indicate whether the target child experienced the following 8 adverse events in their lifetime: (1) financial hardship, (2) divorce, (3) death of a parent, (4) parent incarcerated, (5) parent physically abused, (6) witness/experienced violence in their neighborhood, (7) parent suicidal/has severe mental illness, and (8) parent abuses drugs/alcohol. Latent class analysis was used to examine various profiles of risk, and their relation to youth obesity. Respondents reported youth height and weight, which were used to calculate age- and sex-specific body mass index (BMI) using standardized criteria. **Results:** Five classes of risk were identified, and the class conferring the greatest risk for obesity had the greatest prevalence of multiple risk factors. More than 60% of youth in the highest risk class experienced 4 or more adverse childhood events. Compared to the lowest risk class (prevalence of experiences with most adverse events was close to zero), youth in the highest class had a significantly increased odds of being obese. **Conclusions:** The results from this study provide evidence for links between early life exposure to stressful events and obesity risk. The mechanisms by which this link exists should be explored.

T-566-P
Sleep Duration and Body Mass Index and Waist Circumference: Findings from the National Health and Nutrition Examination Survey 2005-2010
Earl Ford, Chaoyang Li, Anne G. Wheaton, Daniel P. Chapman, Geraldine S. Perry, Janet B. Croft *Atlanta, GA*

Background: Short sleep duration has been linked to increased body mass index and obesity. However, the shape of the relationship between sleep duration and anthropometric measures remains unsettled, and possible differences in these relationships by gender and race or ethnicity remain unclear. **Methods:** We used data from 13821 participants aged ≥20 years from National Health and Nutrition Examination Survey 2005-2010. Sleep duration was obtained with a single question and categorized as ≤6, 7-9, and ≥10 hours (short, normal, or long sleeper, respectively). Body mass index (BMI) was calculated from measured height and weight. Obesity was defined as BMI ≥30 kg/m2 while abdominal obesity was defined as waist circumference of ≥102 cm in men and ≥88 cm in women. **Results:** About 36.6% of participants reported sleeping ≤6 hours/night, 61.4% reported sleeping 7 to 9 hours/night, and 2.1% reported sleeping ≥10 hours/night. Depending on the regression model, short sleepers were as much as 2.0 kg/m2 heavier and had 3.9 cm more girth than long sleepers. Sleep duration was significantly associated with BMI and waist circumference in an inverse linear association in the entire sample, men, women, whites, African Americans, participants aged 18-39 years, and participants aged ≥60 years. The regression coefficients for Mexican Americans failed to reach statistical significance. No evidence for statistical interaction by gender and race or ethnicity was observed. However, regression coefficients were notably stronger among adults aged 20-39 years. Compared to participants who reported sleeping 7 to 9 hours per night, short sleepers were more likely to be obese and to have abdominal obesity. **Conclusions:** In this nationally representative sample of U.S. adults, sleep duration showed inverse linear associations with body mass index and waist circumference.

T-567-P
Restrictive Feeding Style and Toddler Weight Change: Protective Effects for Toddlers At-Risk for Obesity?

Allison E. Doub, Cynthia A. Stifter *University Park, PA*

Background: Parents help infants learn about food and eating which influences obesity risk. Responsive feeding is recommended, yet meal and snack routines should be established in toddlerhood (Black & Aboud, 2011; Satter, 1995). Child weight and appetite shape parent feeding style but little is known about feeding control, weight, and diet in infancy. This study examined parent restrictive feeding style and change in child weight from 12 to 18 months. **Methods:** Participants were 92 mother-infant dyads. At 6, 12, and 18M mothers reported on their feeding decisions and completed the original Infant Feeding Style Questionnaire (Thompson et al., 2009) which assessed feeding beliefs/behaviors and was used to create subscales for restrictive feeding and child appetite. Weight and length were measured and converted to WHO weight-for-length z scores (WFLz). **Results:** Mothers who reported higher levels of restrictive feeding at 12M had introduced solids later and reported more concern about their child's weight. Restrictive feeding was higher among mothers who reported feeding on a schedule versus on demand. To test if feeding was related to change in WFLz, change in WFLz from 12 to 18M was regressed on 12M WFLz, restrictive feeding, and their interaction, controlling for maternal education. Change in WFLz was predicted by 12M WFLz (β = -.21, t = -3.95, p < .001), restrictive feeding (β = -.15, t = -2.0, p < .05), and their interaction (β = -.12, t = -1.76, p = .08). Infants high in 12M WFLz whose mothers endorsed high restriction decreased in WFLz, while those exposed to low restriction maintained. **Conclusions:** Some feeding behaviors associated with restriction may be protective for infants at risk for obesity. However, given that restrictive feeding is associated with eating in the absence of hunger among older children more research on structured infant feeding is needed.

T-568-P
Dieting Makes You Fat: The Effect of Dieting on Obesity in a Longitudinal National Sample of Adults in Australia

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Background: Several studies have shown an association between dieting to lose weight and subsequent weight gain. However, very few have employed large national samples and none have examined whether dieting is prospectively associated with obesity status. **Methods:** We used data from Wave 9 (2009) and Wave 10 (2010) of the Household Income and Labour Dynamics in Australia (HILDA) Survey. In Wave 9, respondents were asked: "In the last 12 month, how often have you dieted in order to lose weight? Never, once, more than once, always on a diet?" We examined the effect of this variable on obesity status in Wave 10, controlling for obesity status, physical activity, mental health, distress, self-rated health and sociodemographic variables measured in Wave 9. The statistical analysis (n = 8,888) involved multivariable logistic regression and adjusted for complex sampling design. **Results:** Adjusted results revealed that the frequency of dieting was a strong predictor of subsequent obesity (P<0.001). Compared to those who never dieted in the past year, respondents who dieted once, more than once, or were always on a diet in Wave 9 had 90% (95% CI: 1.5-2.5), 200% (95% CI: 2.1-4.3) and 240% (95% CI: 2.2-5.2) higher odds of being obese in Wave 10, respectively. **Conclusions:** Dieting to lose weight is associated with subsequent obesity. More research is required to examine the mechanism of the association of dieting and obesity.

T-569-P
BMI, Physical Activity and Mortality in Women Diagnosed with Ovarian Cancer: Results from the Women's Health Initiative

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Background: The purpose of our study was to investigate the association of pre-diagnosis (1) measured body mass index (BMI), and (2) self-reported physical activity with ovarian cancer-specific and all-cause mortality in post-menopausal women enrolled in the Women's Health Initiative (WHI). **Methods:** Participants were 643 women diagnosed with primary ovarian cancer subsequent to enrollment in the WHI. Exposure data, including measured height and weight and reported physical activity from recreation and walking, used in this analysis were ascertained at the baseline visits for the WHI. Cox proportional hazard regression was used to examine the associations between pre-diagnosis BMI, physical activity and mortality endpoints. **Results:** Being overweight (BMI 25.0-29.9 kg/m^2) was significantly associated with a 24% lower risk of ovarian cancer specific-mortality (HR=0.76; 95% CI: 0.58-1.00) and 25% lower risk of all-cause mortality (HR=0.75; 95% CI: 0.59-0.97) compared to normal BMI (18.5-24.9 kg/m^2) among women diagnosed with ovarian cancer. The only physical activity category associated with lower mortality was 9-14.9 MET hr/wk, which had a 35% lower risk of ovarian cancer specific-mortality (HR=0.65; 95% CI: 0.44-0.98) compared to no physical activity. **Conclusions:** Moderate obesity and moderate physical activity, assessed prior to ovarian cancer diagnosis (average 6.6 years) are associated with lower risks of ovarian cancer mortality.

T-570-P
Infants' Acceptance of Green Vegetables and Fruits Show Differential Effects on Weight Change

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Background: Recent studies have contributed to our knowledge of factors that increase infants' acceptance of fruits and vegetables. Infants are more likely to accept sweet foods (e.g. fruits) than foods with bitter tastes (e.g. green vegetables). However, much less is known about how acceptance of fruits and vegetables may affect weight gain during infancy. **Methods:** Infant weight and length measurements were collected from laboratory visits when the infants were 12 and 18-months-old. The measurements were used to calculate weight-for-length (WFL) z-scores according to WHO growth standards, as well as change in WFL z-scores from 12 to 18-months. Mothers reported how easily their infants accepted specific fruits (e.g. bananas, apples) and green vegetables (e.g. peas, green beans). Aggregate scores were created for how easily the infants accepted fruits and green vegetables. **Results:** Infants who easily accepted fruits only showed greater weight-for-length z-score change between 12 and 18-months than infants who easily accepted both fruits and green vegetables (p < .05) Further, easy acceptance of fruits was associated with increased WFL z-score change (p < .05), while easy acceptance of green vegetables was related to decreased WFL z-score change (p < .05). The relationships were present above and beyond the effects of duration of breastfeeding, age introduced to solids, and maternal years of education. **Conclusions:** Results suggest that initial acceptance of green vegetables and fruits may have differential effects on weight change during infancy. Future analyses will investigate factors that contribute to initial acceptance of fruits and vegetables, such as infant temperament and parent feeding style.

T-571-P[DT]
Breastfeeding Offers Protection Against Obesity in Children of Recently Immigrated Hispanic Women

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Background: The protective effect of breast feeding in children of Hispanic women is not well defined. We evaluated the association between breastfeeding for 12 months or more and risk for obesity in a cohort of children of recently immigrated, relatively unacculturated Latino mothers. **Methods:** Maternal characteristics at birth, including length of stay in the United States, breastfeeding habits at 4-6 weeks of age, 6 months, and one year, and anthropometric measurements were obtained for a cohort of 196 children enrolled in a prospective study. **Results:** At 1 year of age, 38.8% of infants were still breastfed. Being breastfed at 1 year of age was associated to a decreased risk of obesity in both univariate (odds ratio (OR) 0.49, 95% confidence interval (CI) 0.21-0.83) and multivariate models (OR 0.39, 95% CI 0.02-0.93) adjusting for maternal BMI, marital status, education level, country of origin, age, years of living in the United States, and child's birth weight at 3 years of age, regardless of mother's acculturation status using length of stay in the United States as a proxy for acculturation. This association persisted at 4 years of age (OR 0.29, 95% CI 0.11-0.8). The major significant factor associated with longer breast feeding was introduction of supplemental formula. **Conclusions:** Breastfeeding duration of at least 12 months provides a significant protective effect on the development of obesity in early childhood in a

cohort of children of high-risk, recently immigrated, relatively unacculturated Hispanic women in San Francisco. Introduction of supplemental formula has a negative impact on duration of breast feeding and thus may predispose to increased risk of obesity. Further studies in this and other population groups and related public health implications need attention.

T-572-P

Family Routines Around Sleep, Meals and Screen-Viewing in Relation to Obesity among Low-Income, Urban, Preschool-Age Children in Central Ohio

Sherry T. Liu, Phyllis L. Pirie, Carol Smathers, Kendall Leser, Sarah E. Anderson *Columbus, OH*

Background: Family routines may help children maintain a healthy weight, but few studies have focused on low-income preschool-age children. We hypothesized that less structure around eating, sleeping, and screen-viewing would be associated with higher obesity prevalence. **Methods:** Parents (n=302) of 2- to 5-year-old children (n=361) in 3 low-income zip codes in Columbus, Ohio were recruited from the hospital-system serving most children in this area. Children were randomly selected and parents/guardians were invited to be interviewed between May 2012 and May 2013, at which time the child's height and weight were measured. **Results:** Children (50% male) were a mean (SD) age of 48.5 (13.7) months, 44% were not in child care, and 15% were obese (BMI-for-age ≥95th %tile) . On weeknights, 30.2% of children went to bed by 8:30PM, 44.3% between 8:30 and 9:30, and 25.5% after 9:30PM. Bedtime was not statistically significantly associated with obesity (χ^2 p=0.32), and in contrast to our hypotheses, obesity was highest (19.3%) for those with early bedtimes. Among children (71.2%) who had a family meal everyday, 14.4% were obese vs. 16.4% if they had less frequent family meals (p=0.64). Having a regular morning routine was also not related to obesity (p=0.79). For a majority of the children studied, the television was usually on in their house (83%), they slept in a room with a TV (65%), and their parent did not have a rule limiting their screen-time (51%), but of these screen-viewing-related behaviors only having a rule about screen-time was related to obesity prevalence (11.2% vs. 18.6%, p=0.05). **Conclusions:** In this sample of low-income preschool-age children, routines associated with meals, sleep, and screen-viewing were not strongly related to obesity prevalence, but obesity was less common among those children whose parent limited their screen-viewing.

T-573-P

Modeling Obesogenic Environments in Three Dimensions Using Confirmatory Factor Analysis

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Background: Obesogenic environments (OE) have been hypothesized to be drivers of the obesity epidemic. However, few studies have used advanced psychometric techniques to test a theory of how OEs are structured. Most studies have separately examined single features of OEs, leaving the literature fragmented and inconsistent. We show how psychometric theory and models can be used to improve measurement and hypothesis testing. **Methods:** We used confirmatory factor analysis (CFA) and data from 1026 communities (census tracts and minor civil divisions) located in 37 Pennsylvania counties. We hypothesized three distinct but correlated latent variables: 1) land-use & physical activity environments more conducive to physical activity, 2) social & economic characteristics that may be obesogenic, and 3) food environment features that promote over-consumption. Data from the census and secondary data sources were combined via GIS. **Results:** After reducing our initial list of 25 hypothesized indicators, we finalized 12 variables that fit our three-factor measurement model well. To establish construct validity, we used the average Body Mass Index z-scores (BMI-z) and percent of children over the 85th percentile in BMI-z from >160,000 children (ages 3-18) from electronic health records who resided in our communities to examine associations between the three-factor scores and outcome. In path analysis, all three factor scores were separately associated with both outcomes in the expected direction. In a combined model, only the factor score for social and economic characteristics was independently associated with the outcome. **Conclusions:** Measurement has been neglected in the study of environmental factors and obesity in children. We demonstrate how CFA can be used as a measurement and analysis strategy to explore the spatially co-occurring pattern of multiple features of OEs.

T-574-P

Are New Modes of TV Viewing and Active Video Game Playing Associated with BMI in Young People?

Jennifer Falbe, Walter C. Willett, Bernard Rosner, Alison E. Field *Boston, MA*

Background: Recent technologies have changed the nature of screen time. Now TV can be viewed anywhere at any time. Content can be collected via digital recorders, downloads, and online streaming and viewed on hand-held devices, laptops, and TVs. Video games are no longer strictly sedentary—some require physical activity. While broadcast TV and sedentary video games have been linked to obesity, the impact of newer forms of media on BMI is uncertain. **Methods:** To assess relations of watching TV through different modes (broadcast, recorded, online, downloaded, and on hand-held devices) and use of active video games with BMI (kg/m2), we conducted a cross-sectional analysis of the 2011 wave of the ongoing Growing Up Today Study II. Analyses included 2,905 females and 2,027 males aged 17-22 years with data on media and BMI. Models adjusted for age, race, physical activity, dieting, and other screen time. **Results:** In addition to broadcast TV time, several forms of non-broadcast viewing were associated with BMI. Among females, each hour/day of recorded TV was associated with a 0.52 kg/m2 higher BMI (95% CI: 0.09-0.95); each hour/day of online TV (e.g., Hulu) was associated with a 0.46 kg/m2 (95% CI: 0.08-0.84) higher BMI; and watching ≥½ h/week of TV on hand-held devices was associated with a 0.68 kg/m2 higher BMI (95% CI: 0.02-1.34). Among males, each hour/day of online TV was associated with a 0.52 kg/m2 higher BMI (95% CI: 0.01-1.03). Active video game playing was related to higher BMI among females only. However, after restricting analyses to those not trying to lose/maintain weight, active gaming was no longer associated with BMI. This suggests the possibility that those trying to lose/maintain weight may have started playing active games as a means to control their weight. **Conclusions:** Limiting TV, regardless of how it is viewed, may be beneficial for body weight.

T-575-P

Sedentary Behavior Is an Independent Predictor of Psychological Well-Being in Individuals Seeking Behavioral Weight Loss Treatment

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Background: Psychological well-being may be compromised in overweight and obese individuals. Regular physical activity (PA) may protect against, and sedentary behavior (SB) may exacerbate, depressive symptoms and the deleterious effects of stress. **Methods:** Regression analyses controlling for age, gender, and body mass index (BMI; kg/m2) were used to investigate associations between depressive symptoms (Center for Epidemiological Study Depression scale), perceived stress (Perceived Stress Scale), weekly leisure time PA minutes (Paffenbarger Physical Activity Questionnaire), and weekly SB minutes (Sedentary Behavior Questionnaire). Measures were completed by 85 overweight/obese individuals (mean±SD BMI=40.23±40.45, age=53.59±10.66 yrs, 82.4% female) entering an 18 month behavioral weight loss program. **Results:** Analyzed separately, higher PA levels (mean±SD 86.76±188.86 min/wk) were associated with less stress (mean±SD 14.54±6.3; β=-.23, ρ=.04) and a trend toward lower depressive symptoms (mean±SD 6.17±4.78; β= -.22, ρ= .05), whereas higher SB levels (mean±SD 3728.57±1645.72 min/wk) were associated with both increased depressive symptoms (β=.34, ρ=.001) and stress (β=.29, ρ=.01). When analyzed simultaneously, SB levels were a significant predictor of depressive symptoms (β=.31, ρ=.01) and stress (β=.26, ρ=.02), whereas PA minutes did not predict depressive symptoms (β=-.15, ρ=.17) or stress (β=-.17, ρ=.13). **Conclusions:** These findings suggest that higher SB levels are independently associated with poorer psychological status among individuals entering a behavioral weight loss program. Targeting SB may be especially important for maximizing improvements in psychological well-being.

T-576-P
Dieting and Restrained Eating as Prospective Predictors of Weight Gain: A Review

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Background: Research in normal weight individuals paradoxically suggests that measures of attempted eating restriction might represent robust predictors of weight gain. This review examined the extent to which measures of dieting (e.g., self-reported weight loss dieting in the past year) and dietary restraint (e.g., the Cognitive Restraint scale from the Three-Factor Eating Questionnaire) have prospectively predicted weight change. **Methods:** We located and reviewed 25 prospective studies containing 40 relevant comparisons. Studies were limited to those in which participants were non-obese (with a mean BMI between 18.5 and 30) and averaged at least 12 years old. **Results:** Neither measure predicted future weight loss. Fifteen of the 20 comparisons (75%) that examined measures of dieting significantly predicted future weight gain whereas only 1 of 20 (5%) that examined restrained eating measures did so. **Conclusions:** Two plausible explanations for these findings are that: 1) dieters and restrained eaters do not differ in terms of an underlying proneness toward weight gain, but restrained eating represents a more effective means of preventing it; and 2) normal weight individuals who diet do so because they are resisting a powerful predisposition toward weight gain which dieting ultimately fails to prevent. Recent dieting in non-obese individuals may be a valuable proxy of susceptibility to weight gain. This easily assessed characteristic could identify individuals for whom obesity prevention interventions would be particularly appropriate.

T-577-P[DT]
Acculturation and Risk of Obesity in Hispanic Children

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Background: Hispanic children in the U.S. are disproportionally affected by obesity. The role of acculturation in obesity is unclear. This study examined the relationship between child obesity, dietary intake, and maternal acculturation in Hispanic children. We hypothesized that children of more acculturated mothers consume more unhealthy foods and have higher BMI%tiles. **Methods:** 209 Hispanic mothers (68% Puerto Rican, 12% Mexican, 20% Other) of children ages 2-4 years (50%F, 35.3 ± 8.7 months, BMI%tile 73.1 ± 27.8, 30% obese, 19% overweight) were recruited for an obesity prevention/reversal study (Steps to Growing Up Healthy). The associations between baseline maternal acculturation (ARSMA-II), child BMI %tile, and child diet (Children's Dietary Questionnaire) were examined. **Results:** Factor analysis of the ARSMA-II resulted in two new factors which were named the Hispanic Orientation Score (HOS; 4 items, loadings .57-.83) and U.S. Mainland Orientation Score (USMOS; 6 items, loadings -.72-.93). Mothers with a higher USMOS served more noncore foods (p<.0001), and had children with higher BMI%tiles (p<.04) compared to mothers with a lower USMOS. Mothers with a higher HOS served less noncore foods (p<0.0001). Children who consumed more noncore foods were more likely to be overweight or obese (p<0.01). **Conclusions:** Greater maternal acculturation to the U.S. is associated with a higher child BMI%tile. This relationship is associated with greater noncore food consumption in children of more U.S. acculturated Hispanic mothers, and together these factors could contribute to increased obesity rates.

T-578-P
Identification and Prediction of Patterns of Dieting Strategies among 15y Girls

Katherine N. Balantekin, Jennifer S. Savage, Leann L. Birch *University Park, PA*

Background: While adolescent girls likely endorse different weight control strategies, this is not captured by the dichotomous measures of dieting typically used. The current objective was to identify patterns of specific weight control strategies endorsed by adolescent girls, and to determine psychosocial factors that predict group membership. **Methods:** The sample included 166 non-Hispanic white girls and their mothers. Girls reported dieting behaviors at 15y using an adapted version of French Weight Control Scale. Latent Class Analysis (LCA) was used to determine classes of dieting behaviors, adjusting for BMI, and to quantify measures of disordered eating, perceived peer relationship quality, and maternal encouragement to diet as predictors of group membership. **Results:** LCA revealed 3 distinct classes of dieting behaviors at 15y: non-dieters (ND, 35%), healthy dieters (HD, 48%, endorsed increasing exercise, reducing junk food, increasing fruits/vegetables), and meal skippers (MS,17%, endorsed healthy dieting behaviors along with skipping meals and eating low-calorie food). Girls were at increased odds of membership in the MS group if they had higher BMIs, higher levels of disordered eating, experienced greater parental encouragement to diet, and had lower perceived peer relationship quality relative to girls in ND and HD classes. However, perceived peer relationship quality, BMI, and maternal encouragement to diet did not differentiate membership in HD and ND classes. **Conclusions:** Dieting was common in the current sample; however, these results suggest that "dieting" does not mean the same thing to all girls. Future interventions may need to be tailored based on the pattern of weight control strategies endorsed. Research should focus on the promotion of the healthy weight control methods outlined by the Dietary Guidelines for Americans.

T-579-P
Psychosocial Correlates of Responsive Feeding Practices among Low-Income Mothers

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Background: Low-income and minority populations are disproportionately at risk for obesity. Establishing solid self-regulatory skills in childhood to help navigate in an obesogenic environment is one step to curbing the obesity epidemic. Responsive feeding practices, and responsive parenting practices more generally, show some promise in establishing self-regulatory skills among children; however, very little is known about what factors are most-strongly associated these parenting feeding practices, particularly among low-income populations. The current study intends to fill the gap in the literature. **Methods:** Data came from 337 mothers of toddlers aged 1 to 4 attending the Women, Infants, and Children program in Pennsylvania. Measures included demographic, psychosocial (e.g., attitudes about feeding practices and self-efficacy about parenting), and responsive feeding practices (e.g., limiting exposure to unhealthy foods and not using food to control behavior). Multiple linear regression analyses were performed to determine which factors were significantly associated with responsive feeding practices, controlling for maternal age, race/ethnicity, education, and BMI. **Results:** More indulgent attitudes about toddler eating was associated with less restriction, limiting exposure, having rules, and not bringing certain foods into the home. In addition, not being satisfied with how one is parenting was associated with less limiting exposure to certain foods but more controlling feeding practices such as restriction and pressuring. **Conclusions:** Based on the initial findings from this study, we find that psychosocial social factors are associated with responsive feeding practices in the anticipated direction. Final results will lay the groundwork for building an effective intervention targeting these factors, thereby reducing childhood obesity.

T-580-P
Self-Reported Advertising Exposure to Sugar-Sweetened Beverages among U.S. Youth

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Background: An Institute of Medicine (IOM) committee concluded that food and beverage marketing influences preferences and health of children, although evidence in adolescents was insufficient. There is minimal research on adolescent-reported exposure to advertising of sugar-sweetened beverages (SSBs), of which adolescents are the highest consumers of. **Methods:** Data were obtained from the 2012 YouthStyles Survey administered to U.S. youth aged 12 to 17 years (n=847) to examine self-reported frequency of overall food/beverage marketing exposure for soda, fruit drinks, sports drinks, and energy drinks (< 1 time/week, 1 to 6 times/week, and ≥ 1 time/day). Multivariate logistic regression analyses were used to examine associations between frequency of SSB advertising exposure and sociodemographic variables. **Results:** Approximately 40% to 55% of youth reported seeing/hearing SSB advertisements ≥ 1 time/day. For soda advertising, the odds of seeing/hearing advertisements ≥ 1 time/day was significantly higher among 14- to 15-year-olds and youth whose parents had ≤ high school education. For fruit drinks, the odds were significantly higher among African-

Americans and youth whose parents had ≤ high-school education. For sports drinks, the odds were significantly higher among 14- to 15-year-old males and African-Americans. For energy drinks, the odds were higher among 14- to 15-year-olds and youth whose parents had ≤ high-school education. **Conclusions:** Almost half of youth sampled reported daily SSB advertising exposure, with higher exposure among 14-15 year-olds, African-Americans, and youth with less educated parents, depending on beverage type. Further research may clarify which of these sociodemographic groups among adolescents are more susceptible to possible effects of advertising, such as increased consumption of SSBs.

T-581-P
Longitudinal Spousal Correlations in BMI among Older U.S. Adults

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Background: Although a positive correlation in spousal BMI has been well established, less is known about longitudinal correlations in spousal BMI. Accounting for individual stability, are BMI changes in one spouse associated with changes in their partner's BMI? This research tested for spousal correlations in BMI across sixteen years of data **Methods:** Data come from eight waves of the Health and Retirement Study (1992-2008). 2,371 couples were identified, with a mean age of 55 years at baseline. Dyadic multilevel models were used to estimate spousal correlation in mean BMI as well as the correlation in residual BMI scores within a given year. **Results:** The mean BMI of the typical husband and wife over all observations was estimated to be 28.39 and 28.02, respectively. There was significant positive covariance between mean husband and wife BMI ($p<.01$), with an estimated correlation of 0.22. There was also significant positive covariance between husband and wife residual BMI scores for a given year ($p<.01$) with an estimated correlation of 0.07. **Conclusions:** There is a modest positive correlation between mean husband and wife BMI, in line with previous research. Results from this analysis further suggest a positive correlation between husband and wife BMI residuals in a given year, albeit the association is weak. This suggests that shared environmental factors or direct actor/partner effects influence the BMI of older adults at the level of the individual as well as the dyad.

T-582-P
Topping Up: Infant Feeding Practices among Low-Income Minority WIC Participants in New York

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Background: Many mothers give infants cereal before the recommended age of 6 months. Early introduction of solids correlates with obesity by age 3. A better understanding of early infant feeding practices is needed to change this practice. **Methods:** 726 caregivers of children <2 yrs. participating in New York WIC were interviewed at randomly selected WIC sites in 2 waves, 2009-10 and 2012. Caregivers were asked about infant feeding practices and current child diet and activity patterns. Logistic regression was used to estimate predictors of additions to the baby's bottle and early introduction of solids. **Results:** Children averaged 7 months, 53% were Latino and 20% Black. 79.3% had ever breastfed, of whom 43% stopped before age 4 months. 41% received something beside formula in the bottle, and 45% were given solids foods before 6 months. Logistic regressions show that Black and US-born mothers were more likely to add cereal and sweeteners to the bottle. Several caregiver attributes were associated with early introduction of solid foods: Black race, working, child cared for at home, HS or higher education. Previous infant feeding practices were associated with early introduction of solid foods, which was less likely for children ever breastfed (OR=.45), and more likely if they were given juice or soda before 6 months (OR=38.3) or had anything added to their bottle (OR= 2.77). **Conclusions:** Adding cereal and sweeteners to formula was prevalent among WIC children in New York. This practice is associated with early introduction of solids. Changing infant feeding practices needs to include a focus on very early feeding practices, particularly among the caregivers giving their infants formula.

T-583-P
Severe Early-Onset Obesity: Medical and Lifestyle Characteristics

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Background: The aim was to identify medical and lifestyle characteristics that differentiate children who are severely obese. **Methods:** The sample included 407 White and African American 5-18 year-olds. Height and weight were measured in clinic, and severe obesity was defined as ≥98th BMI CDC percentile. Participants self-reported medical conditions and lifestyle behaviors. Independent sample t tests were used to examine differences in lifestyle characteristics between severely obese versus non-severely obese. Logistic regression analysis was used to compute the ORs (95% CI) of medical conditions, controlling for age, sex, race, and household income. **Results:** Thirty-five percent of the sample was obese, of which 82 were severely obese. Severe obesity was more common among African Americans than Whites ($p<0.01$), but there were no significant differences by age, sex, or income. In multivariable models, compared to participants <98th percentile, those with severe obesity consumed more fast food meals ($p<0.05$), slept fewer hours ($p<0.01$), were less physically active ($p<0.01$), and spent more hours viewing TV ($p<0.01$) and using the computer ($p<0.01$). Compared to obese individuals between the 95th and 98th percentile, those ≥98th percentile consumed more fast food meals ($p<0.05$), slept fewer hours ($p<0.01$), were less physically active ($p<0.05$), and spent more hours using the computer ($p<0.05$). In multivariable models, individuals with severe obesity had 2.3 greater odds (1.2 to 4.3) of asthma and 2.5 greater odds (1.2 to 5.4) of vision problems, with no differences in prescription use or other medical conditions. **Conclusions:** Severely obese children had a higher prevalence of asthma and vision problems. Lifestyle factors differed between non-severely obese versus severely obese youth, indicating opportunities for early intervention to halt the onset of severe obesity.

T-584-P
Tweeting Off the Pounds: Using Social Networks to Assess Interest in Weight Loss and Fitness Over Time

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Background: Posts to social networks have been used to track influenza outbreaks, predict stock market outcomes, and assess the relationship of personal interests with obesity prevalence. Studies in free-living adults have found weight gain to be more prevalent during holidays and physical activity lower in winter vs. summer. **Methods:** The present study used Twitter to examine the temporal relationship of messages related to weight loss and exercise posted in 2012 (#weightloss and #fitness). Three a priori time periods were examined with an equal number of days in each period: 1) Winter holidays (pre-, during, and post-holidays), 2) Seasons (summer vs. winter), and 3) New Year's (pre- and post-New Year's). **Results:**). Mixed model regressions, accounting for the serial dependencies among days, were estimated. Regarding weight loss, there were 145 (95%CI 79 to 211) more posts/day during holidays and 143 (95%CI 76 to 209) more posts/day after holidays as compared to 480 pre-holiday posts/day; 231 (95%CI 178 to 287) more posts/day during the winter vs. summer (441 posts/day); and 192 (95%CI 69 to 315) more posts/day post-New Year's vs. pre-New Year's (58 posts/day). There were 946 (95%CI -1173 to -719) fewer mentions of fitness post-holiday compared to pre-holiday (2083 posts). No difference was observed between pre-holiday and holiday posts of fitness. There were 289 (95CI -403 to -176) fewer fitness posts/day in winter vs. summer (1530 posts/day) and 1535 (95%CI -1841 to -1230) fewer fitness posts/day after-New Year's vs. pre-New Year's (2663 posts/day). **Conclusions:** The frequency of weight loss and fitness Twitter posts followed inverse temporal trends. Examining posts to social networks, such as Twitter, may be an effective way to track interest levels for certain health behaviors, which could aid in timing interventions when motivation among individuals is high.

T-585-P
Neighborhood Ethnic Composition, Food Access and Dietary Acculturation among Hispanic Adolescents

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Background: Past research has shown that dietary fiber intake is related to reduced visceral adiposity, while sugar intake is related to increased risk of type 2 diabetes in overweight Hispanic youth. The influence of acculturation and built environmental factors on Hispanic youths' fiber and sugar intake has rarely been studied. **Methods:** Multiple linear regression analyses were used to estimate the relationships between dietary sugar and fiber intake (DI), acculturation orientation (AO) and % Hispanic population (%HP) in 2000 Census tract. Models were adjusted for mean caloric intake, age, gender, and body mass index percentile (BMI%ile). Food access (counts of supermarkets, corner stores, and fast food stores) within 0.5 miles from home was additionally included in later models to examine for potential confounder. **Results:** The analysis included 124 Hispanic youths (mean age 13.60±3.15, mean BMI%ile 90.61±16.29). No significant association between DI and AO was detected. %HP was positively associated with grams of fiber intake per day (p<0.01) and negatively associated with grams of sugar intake per day (p<0.01), controlling for mean caloric intake, age, gender, and BMI%ile. The magnitude and direction of associations between %HP and sugar and fiber intake remained significant (p<0.01) after food access were adjusted separately. **Conclusions:** Living in areas with high proportions of Hispanic population may protect Hispanic youths from adopting high sugar and low fiber diet regardless of youths' acculturation orientation and food access in the immediate neighborhood. Future studies that examine youths' dietary behaviors in other social and physical contexts, such as family and school, are needed to clarify the role of culture in association with youths' dietary behaviors.

T-586-P
Gender Differences in Weighing Comfort within Common Situational Contexts

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Background: Self-weighing and weight monitoring are commonplace within many health-related contexts, and efficacious for weight management in certain populations. The purpose of this study was to examine the role of gender in weighing comfort within several common scenarios. **Methods:** As part of a larger study, undergraduates (n=232; 71% female; 89% White) reported their comfort with being weighed (1-very uncomfortable to 5-very comfortable) alone, by a health professional (HP) of the same sex and of the opposite sex, and in front of a group. Repeated measures ANCOVA was used to examine between- and within-gender differences in comfort, controlling for BMI, weight management approach, and body image. **Results:** Overall, women expressed less comfort with weighing than men (p<.001). Women were less comfortable than men being weighed by a HP of the opposite sex (p=.002), or in front of a group, (p<.001). Group weighing elicited the least comfort for men and women. Women reported less comfort when being weighed by a HP of the opposite sex compared to one of the same sex (p<.001), while a HP's gender was unrelated to men's comfort. **Conclusions:** Men and women differ in their level of comfort with the weighing experience. To minimize discomfort, weighing should occur in a non-group setting, and by a health professional of the same gender as the individual being weighed.

T-587-P[DT]
Overweight among African American College Students at a Historically Black University

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Background: Overweight and obesity are of major concern in the United States, particularly among minority populations. Given that the obesity epidemic disproportionately affects African American college students, a greater understanding of overweight of this population is required to reduce obesity comorbidities among young African Americans. The purposes of this investigation were to examine the prevalence of overweight and to explore differences by individual student characteristics among African American college students at a historically black university. **Methods:** A Personal Wellness Profile questionnaire was completed by 268 African American college stu-

dents (18-25 years) in 2013. Participants' actual weight and height were measured with participants wearing light clothing without shoes, and their body mass index (BMI kg/m2) was calculated. **Results:** Five in 10 students (47.4%; 46.6% men vs 47.9% women) were overweight or obese (BMI ≥ 25.0). More females than males (23% vs. 9%; p < .01) had a family history of obesity. Approximately twice as many females (32%) as males (17%) engaged in no days of aerobic exercise of at least 20 to 30 minutes per week (p = .022). More females than males (24% vs. 14%; p < .001) had no regular exercise program, generally avoided walking and exertion when possible. A family history of obesity, skipping breakfast, and lower family income were significantly associated with overweight (p < .05). **Conclusions:** This study provides important insights into interventions reducing racial/ethnic health disparities in overweight and into educational efforts helping historically black universities have a positive impact on future health disparities in overweight.

T-588-P[DT]
Relationships between Maternal Depressive Symptoms and BMI in New Immigrants

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Background: Depression has been associated with maternal obesity in both cross-sectional and longitudinal samples. Little is known about this association among new immigrants. **Methods:** Participants were Haitian, Brazilian, and Latina mothers (n=344) enrolled in LiveWell, a community-based, participatory, randomized controlled lifestyle intervention to prevent weight gain in new immigrants (≤10 years in the US). Mothers reported socio-demographics and completed the Center for Epidemiological Studies Depression Scale (CES-D) and Perceived Stress Scale. BMI was calculated from measured heights and weights. Multivariable models tested whether depressive symptoms predicted BMI. Predictors in the initial model were: depressive symptoms, ethnic group, and their interaction, and two covariates: perceived stress and income. Subsequent models were estimated to explore additional interactions between predictors. **Results:** Forty-four percent of mothers (66% of Haitians, 36% of Brazilians, 30% of Latinas) had high depressive symptoms (CES-D score ≥ 16). Seventy-one percent (83% of Haitians, 54% of Brazilians, 81% of Latinas) were overweight/obese (BMI ≥ 25). Depressive symptoms were associated with perceived stress (r=0.58, p<.0001) and income (r=-0.19, p<.001). In the initial model, mothers higher on depressive symptoms tended to have higher BMI (p=.07). With inclusion of significant interaction terms, a 3-way interaction between depressive symptoms, ethnic group, and income was revealed (p<.01), such that some subgroups (lower-income Brazilians; higher-income Latinas) showed an inverse association between depressive symptoms and BMI, in contrast to the overall trend. **Conclusions:** High levels of depressive symptoms and obesity among new immigrants are noteworthy, and links between them appear to vary by ethnic group and income.

T-589-P
Report of an Intensive, Behavior Focused Management of Obesity

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Background: Current research is concentrated on the multifactorial causes, and reasons for perpetuation, of obesity. Few studies have reported outcomes from a practical therapy designed to account for such multiple factors in a medical setting. **Methods:** We report results of an intensive non-surgical treatment for obesity that included multidisciplinary providers. All consecutive patients referred to a medical weight loss clinic from January 2010 to December 2012 were retrospectively reviewed. Paired sample t-testing was used to compare baseline and 12 month data; linear mixed model analysis assessed outcomes over time. **Results:** Of 1202 consecutive patients, 51 were excluded due to missing data, leaving 1151, 585, 311, and 109 patients assessed at 0, 3, 6, and 12 months. Baseline data: 68.2% female, 92.5% Caucasian, mean (±SD) age 54.5(±13), BMI 40.5(±7.5), weight 250.0 lbs.(±54.3), and fat mass 113.6 lbs.(±34.2). At 12 months, statistically significant (mean, 95% CI) reductions (p<0.001) were seen in BMI 4.0, (3.2 to 4.8) and fat mass 17.9 (13.6 to 22.3); with a low prevalence of weight re-gain (6%). **Conclusions:** A multidisciplinary clinical approach to non-surgical

treatment in the morbidly obese population can lead to significant and sustained weight reduction in those adhering to therapy in the long-term.

T-590-P[DT]

Race and Variation in the Importance of Weight Stigma Relative to Other Quality of Life Domains among Obese Primary Care Patients and Patients Seeking Bariatric Surgery

Christina C. Wee, Roger Davis, Mary Beth Hamel *Boston, MA*

Background: Obesity leads to adverse psychosocial effects. Scores on individual quality of life (QOL) domains do not necessarily indicate the relative importance of various domains to patients (pts); thus the importance of psychosocial effects such as weight stigma relative to other QOL domains is unclear. **Methods:** We interviewed 338 primary care pts with a BMI >35 (58% response rate) and 574 pts seeking weight loss surgery (WLS) (70% response rate). We determined pts' health utility (value pts attach to their current weight/health) via standard gamble scenarios assessing pts' willingness to risk death to lose weight or achieve perfect health (0=death, 1=most valued health/weight state). We assessed associations between pts' utility and QOL domains from the Impact of Weight on Quality of Life-lite separately, adjusting for age, education, and sex: public distress (weight stigma), self-esteem, physical function, work life, and sex life. We used Model R2s to identify the domain that explained the greatest variation in utility (devaluation of health state due to obesity). **Results:** The mean utility was 0.94 among primary care pts and 0.88 among WLS-seeking pts i.e. pts valued their current weight/health at 94% and 88% of their most valued state, respectively. Among primary care pts, the strongest correlate of utility was weight stigma for Caucasian pts, sex life for African Americans (AAs), and work life for Hispanics. Among pts seeking WLS, work life, weight stigma and physical function were comparably important for Caucasian pts; weight stigma was the strongest correlate in AAs, and weight stigma, sex life and work life were comparably important for Hispanics. **Conclusions:** Weight stigma appears to be important in pts' devaluation of their current state among those seeking WLS and among Caucasian but not AA or Hispanic pts in primary care.

T-591-P

Gender and the Importance of Weight Stigma and Other Quality of Life Domains among Obese Primary Care Patients and Patients Seeking Bariatric Surgery

Christina C. Wee, Roger Davis, Mary Beth Hamel *Boston, MA*

Background: Obesity leads to quality of life (QOL) consequences that may vary by gender. Scores on individual QOL domains do not necessarily indicate importance of the domain to patients (pts). **Methods:** We interviewed 338 primary care pts with a BMI >35 (58% response rate) and 574 pts seeking weight loss surgery (WLS) (70% response rate). We determined pts' health utility (value pts attach to their current weight/health) via standard gamble scenarios assessing pts' willingness to risk death to lose weight or achieve perfect health (range 0-1, 0=death and 1=most valued health/weight state). We then examined sex-specific associations between pts' utility and the following domains from the Impact of Weight on Quality of Life-lite separately, adjusting for age, education, and race: public distress (weight stigma), self-esteem, physical function, work life, and sex life. We used Model R2s to identify domains that explained the greatest variation in utility. **Results:** The mean utility was 0.97 among men and 0.93 among women primary care pts with obesity, and 0.85 and 0.88 among men and women seeking WLS i.e. pts valued their current weight/health 97%, 93%, 85%, and 88%, respectively, relative to their most valued state. Among primary care pts, individual QOL factors explained only a small amount of the variation in men's utility, with sex life being the most important to men (3% of variation in utility); for women, weight stigma was the strongest correlate (5% of variation). Among pts seeking WLS, physical function (8% of variation) and weight stigma (6% of variation) were the strongest correlates for men and weight stigma (5% of variation) and work life (5% of variation) were the strongest correlates for women. **Conclusions:** Social stigma is the strongest determinant of the adverse effects of obesity on quality of life for women but not men.

T-592-P[DT]

Weight Disparities Among Transgender and Non-Transgender Young Adults

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Background: No population-based study to date has examined transgender disparities in weight behaviors. It is imperative to understand if transgender individuals experience adverse health related to weight. Furthermore, young adulthood is a critical age for addressing weight issues because of declines in positive weight behaviors. To address this research gap, the purpose of this study is to examine transgender disparities in weight and weight behaviors among young adults. **Methods:** Data were from the 2007-2011 College Student Health Survey, a population-based survey of 2- and 4-year Minnesota college students (n=34,324) attending 40 institutions. Cross-sectional, multivariate regression models, adjusted for clustering at the school level, were fit. Analyses compared transgender young adults (n=53) to non-transgender (i.e., identified as male or female) for 13 weight and weight behavior indicators. **Results:** Compared to non-transgender, transgender individuals were more likely to be either underweight [adjusted relative risk (95% CI): 4.2 (1.4-12.3)] or obese [2.5 (1.2-4.9)] than normal weight, to not engage in ≥2.5 hours/week of strenuous physical activity [1.16 (1.01-1.34)], to not engage in any strengthening physical activity [1.3 (1.1-1.6)], and to spend ≥2 hours/day engaging in screen time [1.3 (1.0-1.5)]. There were no significant differences for fruit and vegetable, breakfast, soda, diet soda, fast food, and restaurant food consumption, moderate physical activity, unhealthy weight control, and body dissatisfaction. **Conclusions:** Findings indicate that transgender young adults may experience adverse health related to weight, physical activity, and screen time. This is the first population-based study to explore transgender disparities across a variety of weight-related indicators. Future work should build an understanding of the context of these disparities.

T-593-P

Young Overweight and Obese Firefighters Don't Receive Weight Recommendations

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Background: National guidelines state health professionals should advise patients on the importance of maintaining a healthy weight. Firefighters have high rates of obesity and cardiovascular events are the leading cause of line of duty deaths in firefighters. No study has investigated the prevalence and predictors of weight recommendations for firefighters. This study assessed the impact of age and BMI on the occurrence of health professional weight recommendations among firefighters. **Methods:** Self-reported health professional recommendations were recorded as no advice, maintain, gain, or lose weight for a national sample of male firefighters (N=1002). Measured BMI was categorized as normal (<25.0kg/m²), overweight (25.0-29.9kg/m²), obese (30.0-34.9kg/m²), and severely obese (≥35.0kg/m²). The odds of receiving weight advice were estimated between age and BMI categories using multinomial regression. **Results:** Most firefighters (96.3%) reported visiting a physician in the past 12 months. The majority (69.1%) of all firefighters and nearly half (48.5%) of obese or severely obese firefighters reported receiving no advice about their weight. In general, higher levels of BMI predicted health professional advice to lose weight. Interaction terms between age and BMI categories were statistically significant suggesting younger firefighters were less likely to receive health professional advice to lose weight than older firefighters, except among the severely obese. **Conclusions:** Healthcare providers are important sources of health information for firefighters. Still, overweight and obese firefighters do not consistently receive healthcare provider advice on weight, particularly in the youngest age group. This marks a missed opportunity to prevent further weight gain and reduce obesity related adverse health outcomes.

T-594-P

Change in Childhood Body Mass Index in a Safety-Net Population: A Longitudinal Analysis

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Background: Childhood obesity is highly prevalent; community- and clinic-based obesity interventions need effective tools to monitor collective impact. New Certified Electronic Health Record Technology incentives create opportunities to comprehensively and longitudinally review BMI to gauge intervention value. The objectives of this study are to determine the utility of patient-level BMI measurements as a tool to measure overweight and obese population trends, among higher-risk patients seen at a safety-net clinic. **Methods:** This is a longitudinal observational study over 8 years (2005-2012) from a network of safety-net outpatient clinics in an urban community with electronic health records. Children were stratified based on BMI into weight status groups and followed for a minimum of 1 year but as long as 8 years. Secondary analysis, preparatory to a randomized controlled trial - Community Outreach: Obesity Prevention Trial. **Results:** Among children (N=33,542) the rate of overweight was 16% and rate of obesity was 18% at their last visit. Among these, 12,945 (36%) were followed for an average of 3.32 (+/-1.72) years to measure trends and change in weight status across early and late childhood. Before 6 years, 13% were overweight and 11% were obese. Children who were obese at 2-5 years had a nearly 70% chance of being obese between 6 and 11 years. The mean change in BMI z-score per person year of observation was 0.10 with increasing (and significant) change based on BMI category at last visit. **Conclusions:** Childhood obesity prevalence was high in this observational study. Progression to overweight and obesity between 2-5 years old and 6-11 years was substantial. A longitudinal measure for population-base monitoring of BMI z-score was consistent with empiric observations in this study.

T-595-P

Maternal and Child Predictors of Preschool Children's Eating and Body Mass Index: A Prospective Study

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Background: Research has largely overlooked the role of child temperament implicated in the development of certain obesogenic risk factors and BMI of preschoolers. Hence, the overall aim of this study was to evaluate cross-sectional and prospective associations between child temperament, maternal feeding, maternal parenting styles, mother-child interaction, preschoolers' eating behavior and BMI. **Methods:** Two-hundred and one mothers of 116 female and 85 male children aged between 2 and 5 years (M = 2.92, SD = 0.75) completed child temperament, eating behaviors, BMI, maternal parenting styles and maternal feeding practices questionnaires at T1. Mothers reported child BMI and eating behaviours again after one year. **Results:** Child irritability, cooperation-manageability and easy-difficult temperaments, mother-child dysfunctional interaction, maternal pressure to eat and restriction were significantly cross-sectionally associated with child eating behaviors. Child enjoyment of food was significantly associated with child BMI. Longitudinally, easy-difficult temperament and mother-child dysfunctional interaction predicted child eating behavior and baseline child BMI predicted child BMI after one year. **Conclusions:** The influence of the associations between child temperament, maternal practices and child eating behaviours on child weight status was not evident after one year, however, it is possible that this relationship could become more apparent as children's early growth phases stabilise. Average maternal ratings of child temperament within this sample were relatively neutral, potentially explaining why most associations were not robust longitudinally. Future research should include a sample of greater socio-economic and BMI diversity as well as objective measures of child temperament, diet composition, maternal feeding practices, and mother-child interaction.

T-596-P

Social Support for Lifestyle Modification: What Adolescents Want from Family, Peers and Professionals

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Background: Promotion of social support is a key aspect of effective behavioral modification programs for children and adults. For children, programs with parental involvement are more effective than those without. Adult programs show enhanced efficacy when social support promotion is a component. Relative to programs for children and adults, the development of effective programs for adolescents has lagged behind. Understanding better the unique developmental needs of adolescents is important for developing age appropriate and effective interventions for this age group. **Methods:** The current study utilized focus groups to identify adolescents' social support preferences when making lifestyle changes for health or weight maintenance. Participants were 28 (50% female) adolescents ages 13-18 identified by medical record review as having had a BMI > 85th percentile within the last year. They participated in one of four age- and gender-stratified groups. Focus groups followed a structured format and data were analyzed following guidelines from Krueger & Casey (2000). **Results:** Results indicated that adolescents desire from family instrumental, emotional, companionship, and modeling support that focuses on the positive and supports their autonomy. From peers, adolescents seek companionship and emotional support. They wanted peers to be committed to healthful habits and voiced a need for environments to be safe from negative judgment. Adolescents demonstrated preliminary awareness of professionals as resources for establishing healthful habits. In addition to expecting expert information, adolescents spoke of the importance of a trusting relationship, regular follow up, and respect of autonomy and privacy from professionals. **Conclusions:** Adolescents raised important concepts to consider when developing interventions to promote healthy weight in this age group.

T-597-P[DT]

Using Anthropometrics and Behavioral Patterns to Distinguish Metabolically Healthy Obese from Non-Metabolically Healthy Obese Youth

Tiago V. Barreira, Peter T. Katzmarzyk *Baton Rouge, LA*

Background: The aim of this study was to determine if anthropometrics, socio-economic, nutritional, and behavioral information can be used to distinguish metabolically healthy obese (MHO) from non-metabolically healthy obese (NMHO) youth. **Methods:** A total of 83 obese (BMI percentile >= 95) 5-18 year-old youth (52% female; 46.7% White, 50.4% African American, 2.9% Other) were included in this analysis. Participants were classified as MHO (0 cardiometabolic risk factors) or NMHO (2+ cardiometabolic risk factors). Socio-economic, nutritional and behavioral information was collected by questionnaire. Anthropometrics (height, weight, waist circumference) and cardiometabolic risk factors (blood pressure, triglycerides, fasting blood glucose, and HDL-C) were measured by trained staff. Stepwise discriminant function analysis was performed to determine which variables best discriminate between the two groups. Further discriminant analyses were run with the significant variables to obtain classification accuracy. **Results:** Fifty two participants were classified as MHO and 28 as NMHO. Age, drinking low fat milk, drinking diet soft drinks, eating bread, being physically active, eating vegetables, and eating cereal were significant variables in the model. Overall classification accuracy was 83% with a 13% misclassification rate for MHO and 21% for NMHO. **Conclusions:** It is possible to use nutritional and behavioral information to distinguish MHO from NMHO youth with a relatively high degree of accuracy.

T-598-P

Association of Eating in the Absence of Hunger and Obesity Among College Mexican Students

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Background: Few studies have examined disinhibited eating behaviors in Mexico. Eating in the absence of hunger (EAH), defined as eating in response to the presence of palatable foods in the absence of physiological hunger, is one of the more frequently studied behaviors. The aim of this study

was to assess the association between obesity and eating in the absence of hunger among college students in Tijuana, Mexico. **Methods:** Two-hundred and one sophomore college students complete the Eating in absence of hunger questionnaire (EAH-C). Weight, height, and waist circumference were assessed. To assess reproducibility a test-retest was conducted in a subset sample (n=20). Test-retest correlations ranged from Rho=0.44 to 0.86, p ≤ 0.01 . **Results:** The prevalence of overweight and obesity was 29.1% and 13.7% respectively. The internal validity was assessed Cronbach's alpha. Internal consistency for all subscales was: α=0.83, negative affect (α=0.92) and fatigue/boredom (α=0.86). Principal component analysis generated four subscales for the EAH-C: External eating, negative affect, fatigue and boredom. Female students had higher scores in negative affect subscale (p≤ 0.001). Normal weight students had higher scores on boredom subscale than obese students (p≤ 0.008). **Conclusions:** We conclude that the EAH-C had internally consistent subscales with good convergent validity. In this population we found no association between EAH and obesity.

T-599-P[DT]

Dietary Intake and Related Attitudes Toward Healthy Eating Differ between African-American and Hispanic Underserved Youth

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Background: Underserved African-American (AA) and Hispanic youth are disproportionally affected by obesity. This comparative study examined dietary intake and attitudes toward healthy food intake between AA and Hispanic underserved youth. **Methods:** Participants (n=112) ages 8 to 12 (X= 9.2) were assessed prior to beginning an after-school obesity prevention program at various community centers in Fort Worth, Texas. Forty-two percent were normal weight and 58% were overweight or obese. Youth completed a 24-hour dietary recall, and cumulative scores for Healthy Food (HF) and Unhealthy Food (UF) intake were obtained. Self-report surveys included confidence for increasing fruit/vegetable intake (FV) and for reducing fat intake (FAT), and intrinsic motivation for healthy eating (MOT). Differences between Hispanic and AA youth for HF, UF, MOT, FV and FAT were analyzed using Mann-Whitney U. Relationships among variables were analyzed using Spearman correlation. Bonferroni correction was applied. **Results:** AA as compared to Hispanic youth reported less HF (p=.003). Between group comparisons for other variables were non-significant. HF was correlated with FV for AA (r=.395, p=.003) and Hispanics (r=.452, p=.001), and with MOT for AA (r=.419, p=.002). All other correlations were non-significant. **Conclusions:** Among underserved youth, AA may be consuming much less healthy food than Hispanics. Although they did not differ in motivation or confidence for healthy eating, intake of healthy food appears highly related to degree of confidence for choosing fruits and vegetables for both groups. A focus on improvement in motivation also may be valuable in improving healthy food intake for AA. Results have implications for the development of culturally sensitive dietary interventions.

T-600-P[DT]

Purchasing Patterns of Adults, Adolescents and Children in Urban Corner Stores: Quantity, Spending and Nutritional Characteristics

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Background: Urban corner stores, also known as bodegas, are prevalent in low-income urban areas and primarily stock high calorie foods and beverages. Little is known about individual level purchases in these locations.The purpose of this study was to assess corner store purchases (items, nutritional characteristics and amount spent) of children, adolescents and adults in a low-income urban environment. **Methods:** Intercept surveys (n=9,238) directly examined food and beverage purchases of a large sample of adults, adolescents and children at 192 corner stores in Philadelphia from March-July 2011. **Results:** Among 9,238 intercept surveys, there were 20,244 items. Shoppers overall spent $2.74±3.52 per visit. The average total number of calories purchased per corner store visit was 666.0±1064.6 kcal for 2.2±2.1 items (1.3±2.0 food items and 0.9±0.9 beverage items). Beverage purchases occurred during 65.9% of intercepts and accounted for 39.2% of all items. Regular soda was the most popular beverage purchase (32.2% of intercepts, 29.7% of all beverage items). High calorie foods accounted for a large portion of food items, including chips (17.9%), pastries (10.1%), and candy

(7.9%). When data were examined by total items purchased or by intercept, the five most popular product categories remained the same (beverages, chips, prepared food items, pastries, and candy). Compared to children and adolescents, adults spent the most and purchased the most calories. **Conclusions:** Corner store purchases were low in cost and high in calories. Obesity prevention efforts may benefit from including interventions aimed at changing corner store food environments in low-income urban areas.

T-601-P

A Knowledge Translation Tool to Address Decision Making Needs of Perimenopausal Women Considering Options to Manage Their Body Weight

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Background: To develop and evaluate a knowledge translation (KT) tool to support perimenopausal women facing decisions about body weight. **Methods:** Needs assessment with perimenopausal women based on the Ottawa Decision Support Framework and a KT tool developed to address needs and evaluated for acceptability and usability. Results are analysed descriptively **Results:** Sixty women (40 to 62 yrs, BMI 17.0 to 44.9 kg/m2) were interviewed. Women were considering options for weight loss (82%) or maintenance (18%). Preferred information sources were: written materials (n=58), counseling (n=54), face-to-face discussion (n=51), and social networking (n=26). Factors for implementing decisions were self-motivation, support from others, and routine. A KT tool was developed to summarize current evidence on menopause and body weight, options to manage weight, and track decisions for implementing change (e.g., physical activity, nutrition). Of 53 women, 27 (51% RR) provided initial feedback and 25 (93% RR) used the tool over 4 weeks. Women rated the KT tool as acceptable [excellent (n=10), good (n=13) or fair (n=3)]. All (70%) or most (30%) of the information on the tool was clear. The amount and length were just right (67%), and they would tell others about the tool (81%). After 4 weeks, women said the wording made sense (89%), instructions were clear (85%), and format (74%) and usability (81%) were easy. Most women (59%) said there was enough information, 22% wanted less, and 11% wanted more. Most women (67%) felt space was limited. **Conclusions:** Many factors influence women facing decisions about body weight. The developed KT tool demonstrated acceptability and usability. Need to consider longer formats to facilitate journal entries,

T-602-P

Predicting Increases and Decreases in Parental Restriction from 7 to 9y

Brandi Y. Rollins, Jennifer S. Savage, Leann L. Birch *University Park, PA*

Background: Research to date has identified factors that predict increases in parental restriction; however, less is understood about the factors that predict decreases in restriction, which may reduce the risk of dysregulated eating in girls. **Methods:** We identified change in restricted access to 10 palatable snack foods from 7 to 9y using a sample of non-Hispanic, white mothers and girls, and evaluated whether change in maternal and girls' weight and eating behaviors predicted increases and decreases in access to these foods. Girls' and maternal height/weight and psychosocial measures were assessed at 7 and 9y. **Results:** Latent transition analyses revealed 3 distinct patterns of restricted access: Anytime Access, Snack Time Access, and Special Occasion Access. Between 7 and 9y, 24% of girls transitioned to a higher level of restricted access, 26% transitioned to a lower level of restricted access, and 50% had no changed in access. Among non-overweight mothers, transitioning to higher restricted access was predicted by maternal weight gain and girls' staying overweight from 7 to 9y; while, transitioning to lower restricted access was only predicted by maternal weight gain. Among overweight mothers, girls' becoming overweight predicted transitioning to higher restricted access, while transitioning to lower restricted access was predicted by lower concern for girls' weight, less change in girls' BMI from 7 to 9y, and lower girls' BMI at 9y. **Conclusions:** Factors that predict increases and decreases in girls' access to snack foods may depend on maternal weight status; non-overweight mothers may be more responsive to changes in their own weight while overweight mothers may be more responsive to changes in their daughters' weight. More work is needed to evaluate whether decreases in parental restriction is protective of girls overweight.

T-603-P[DT]

Racial Differences in Health Related Quality of Life (HRQOL) in Obese and Severely Obese Adolescents

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Background: Obesity has a deleterious effect on quality of life in youth. Black children are more likely than White children to be obese although attitudes about obesity are reportedly more tolerant in Black than White communities. The objectives of this study were to (1) examine differences in generic and weight-related quality of life in severely obese youth ≥ 97th vs. ≥ 99th %ile; and (b) to examine racial differences in the above BMI categories. **Methods:** In this cross-sectional study, 91 obese (BMI ≥97th%ile) 133 severely obese (≥99th%ile) and 68 non-obese (BMI< 85th%ile) youth and their parents completed the Pediatric Quality of Life Inventory (PedsQL) and the Impact of Weight on Quality of Life-Kids (IWQOL-kids). Youth were weighed and measured. Differences by BMI category and race in total and subscales for HRQOL were analyzed using ANOVA. **Results:** QOL scores were impaired in obese vs. non-obese youth. PedsQL (high score =worse QOL). QOL for BMI ≥99th %ile vs. ≥97th %ile was not significant. Emotional score for Blacks ≥99th%ile/≥97th %ile 2.89/2.79 vs. Whites 5.29/3.88 p=0.01. Parents reported scores ≥99th %ile vs. ≥97th %ile for total 26.63/21.90, F=4.12, p=0.04; physical 9.92/7.13, F=7.34, p=0.007; and emotional 4.71/4.12, F=3.87, p=0.05 subscales. IWQOL (low score=worse QOL): Youth reported physical scores ≥99th %ile 22.86 vs. ≥97th%ile 25.50, F= 10.17, p=0.001. Body esteem in Blacks vs. Whites ≥99th%ile 35.16/ 31.47, F=5.24, p=0.02, and ≥97th %ile 104.65/ 109.62, p=0.03, F=4.57. Parent reported physical scores in Blacks vs. Whites 22.8 5/25.60, F=14.66, p=0.001. **Conclusions:** Parents reported significant impairments in QOL in severely obese youth compared with obese youth. Black youth reported better emotional functioning and body esteem. Additional supports are needed for severely obese youth and their parents.

T-604-P

New Media Use, Body Image and High Risk Health Behaviors among Overweight/Obese Females

Melissa A. Napolitano *Washington, DC*; Sharon Hayes *Philadelphia, PA*

Background: New media approaches show promise for weight loss interventions. Recent data suggest that greater use of new media among adolescents might be related to high risk health behaviors, and higher body image dissatisfaction. However, these relationships have not been extensively studied among adults. **Methods:** This study examines new media use (social networking (SN), on-line role playing games (RPG), and online health information seeking (OHI)) among 128 overweight/obese women (Mage=34.10±13.01 years; BMI=34.30±8.15; race: 57.0% White; 25.8% Black; 10.2% Asian/Pacific Islander; 3.9% Hispanic/Latino; 3.1% other) interested in technology and weight loss. Participants reported smoking and alcohol use, body image dissatisfaction (Social Appearance Anxiety Scale and the Body Self-Esteem Scale for Adolescents), and binge eating (Eating Disorders Diagnostic Scale). **Results:** Use of new media: 87.5% (n=112) reported SN; 32.0% (n=41) played RPG; 85.2% (n=109) used OHI. Health behaviors: 43.8% reported binge behaviors, 27.3% reported smoking, and the average number of drinks per week was 3.54 ±5.5. For SN, alcohol use was higher (3.8drinks/wk±5.8) among users vs. nonusers (1.3drinks/wk ± 1.7) p < .001. For RPG, those who played had higher social appearance anxiety (50.7±16.7) p < .01 than those who did not play (42.8±15.6). All other comparisons were NS. **Conclusions:** Despite limitations (e.g., sample may have had interest and comfort in technology; information on use patterns was not available), this study offers information about new media use among adults, health behavior, and body dissatisfaction. It is possible that SN may normalize alcohol use among women, while RPG play may reinforce unrealistic body ideals and heighten appearance anxiety. Implications for intervention design and future directions for research will be discussed.

T-605-P

Family Nutrition/Physical Activity and Screening for Childhood Obesity Risk Reduction

Kathy S. James *San Diego, CA*; Panagiotis Matsangas *Monterey, CA*; Cynthia D. Connelly *San Diego, CA*

Background: Family dietary and nutritional behaviors may predispose children to obesity. The purpose of this study was to examine the feasibility and acceptability of a screening tool in identifying overweight children and offering family tips for healthy children in a time efficient manner that could likely be used in primary care settings. **Methods:** A cross section study using the Family Nutrition Physical Activity Tool (FNPA) was self administered by 98 overweight mothers identifying risk factors for childhood obesity. Participants were attending a weight loss clinic in southern California. Mothers completed a demographic and the 20 item screening survey with subscales on family meal patterns, family eating habits, food and beverage choices, restriction/reward, screen time behavior and monitoring, healthy environment, family and child activity involvement, and family routine. Participants completed the survey on paper or on online after consent was obtained. After completing the survey, a summary of recommended practices from the American Academy of Pediatrics was provided. **Results:** In the sample of parents with 172 children between 2-18, 37% of children were overweight or obese. Lower FNPA scores were associated were higher BMI, family income, race/ethnicity, education and mother's BMI. Parents' and children's obesity was comparable to what is found in larger populations, whereas obesity in the age group between 2 and 5 years was doubled. **Conclusions:** It is feasible and acceptable for families to screen for risk for childhood obesity using the FNPA survey. Findings support maternal obesity is significant predictor for the development of child obesity. Health professionals can screen for childhood obesity risk and reinforce the importance of parent as role model.

T-606-P[DT]

Nutritional Knowledge Is Related to Self-Efficacy in Making Healthy Food Choice among College Students

Trias Mahmudiono, Bridget R. Byquist, Xiaofei Song, Nancy Muturi *Manhattan, KS*

Background: Obesity-related diseases cost the U.S. billions of dollars each year and prematurely end or diminish the quality of millions of Americans' lives. People of low-income, including some college students, are disproportionately impacted by obesity. This research project was sought to identify the factors that contribute to food choices among low-income residents, particularly college students, with the goal of designing a communication campaign to improve healthy food choice behavior. **Methods:** This project is a cross sectional study that surveyed 110 college students in Mid-Western University using a structured questionnaire that measured key variables that were derived from the Social Cognitive Theory **Results:** The results show that manycollege students had high nutritional knowledge and self-efficacy, but lacked awareness of available, budget-friendly healthy food choices and did not believe they could afford healthy food choices. Most students also agreed that they sometimes made food choices even though they knew they were unhealthy. Chi-square test confirmed that there is a significant correlation between respondents' MyPlate awareness and nutritional knowledge (p<0.001) as well as nutritional knowledge and self-efficacy (p=0.022). Nearly 85% of student respondents indicated that they had home access to the internet as their primary source of health and nutrition knowledge. **Conclusions:** In conclusion, improving nutritional knowledge especially in regards to access to cheaper healthy food option on campus is important to boost students' self-efficacy. The study recommends an online awareness campaign to promote affordable healthy food choices for college students and encourage them to make healthy food choices more frequently.

T-607-P[DT]

Evaluating Healthy Growth Among WIC Infants: A Qualitative Review

Angela Valencia, Burris Duncan, Andrew Arthur, Laurie Robinson, Lillian Romero, Jennifer Peters, Cynthia Thomson *Tucson, AZ*

Background: Childhood obesity is a serious public health problem affecting 10% of 2 y olds and > 20% of 5 y olds and even higher percentages of Hispanics and Native Americans. Early age onset obesity is associated with higher risk for physical and psychological problems in childhood and obe-

sity-related chronic disease in adulthood. The overall objective of this project was to assess knowledge, attitudes, and behaviors of WIC staff and WIC moms regarding weight evaluations for infants and toddlers and to evaluate the acceptability and feasibility of growth charts as a tool to monitor infants' growth longitudinally. **Methods:** A mixed-method included quantitative questionnaires and qualitative interviews with WIC staff (n=6) and focus groups with WIC moms (n=25). Content analysis (NVivo software) and data triangulation were performed to identify themes/ patterns of response. **Results:** Mean age of focus group participants was 35y (range: 19-65y); 88% Latino; 72% were born in Mexico. Qualitative themes from interviews and focus groups included concern for underweight status, limited conversations between mothers and health care providers regarding overweight status, and infant feeding practices and beliefs that may contribute to feeding behavior associated with greater risk for excess weight gain in early infancy. Growth charts were well received, but effectiveness of growth plotting may be limited without the provision of culturally sensitive education regarding healthy growth and growth monitoring among Latino moms. **Conclusions:** An educational intervention teaching mothers how to plot and interpret growth using growth charts is acceptable and feasible. Whether such efforts will prevent excess weight gain in early childhood is yet to be determined.

T-608-P
Predicting Success in Weight-Management Based on Decision-Making Style

Gilly Koritzky, Camille Dieterle, Chantelle Rice, Katie Jordan, Antoine Bechara *Los Angeles, CA*

Background: Behavioral interventions to treat obesity, i.e., weight management programs, are highly limited in their success. Evidently, there is a pressing need to understand the underlying factors of successful weight-management, in order to design more effective interventions. Evidence associating impaired decision-making with the persistence or complication of obesity is mixed. We applied a more refined approach, looking into differences in the types of decision-making impairments found in obese individuals. We hypothesized that compared to unsuccessful dieters, successful dieters are less influenced by recent information at the expense of relying on their full past experience. This tendency is measured by the Expectancy Valence (EV) model: a paradigm for estimating individual differences in several underlying components of decision-making. **Methods:** Subjects (N=40, 70% female, mean age 44 yrs) completed a weight-management program. Mean initial weight was 198.66 lbs and mean BMI was 32.6. For 16 weeks, participants met weekly with a therapist and received information and dietary guidance. Success was defined as losing at least 5% of initial weight. In the beginning of the program, participants completed a laboratory decision-making task, whose results were analyzed using the EV model. **Results:** Only 26% of the participants were successful in losing weight. Successful and unsuccessful participants did not differ in initial BMI, age, or other demographic variables. As hypothesized, successful dieters were less likely than unsuccessful dieters to be influenced by recent information at the expense of relying on past experience (p<0.05). **Conclusions:** These results advance our understanding of the cognitive processes associated with successful weight-loss, and suggest that improving decision-making can foster better results among dieters.

T-609-P[DT]
Racial Disparities in Sugary Drink Consumption in Preschool Children in Louisiana

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Background: In US children aged 2-5 years, the prevalence of obesity has increased from 5% in 1970 to 14.4% in 2010. The association between consumption of sugary drinks and obesity has been confirmed. We investigated sugary drink consumption behaviors between black and white preschool-aged children in Louisiana, and examined the relationship between obesity and sugary drink consumption. **Methods:** Data was collected from baseline measurements of 145 children, aged 2-5 years participating in the Nutrition And Physical Activity Self-Assessment for Child Care, which aimed to improve the environment and policies, and patient-staff interaction in childcare centers in Louisiana in order to prevent obesity. Children's sugary drink and fruit juice intake was measured by parent report using a Harvard Children's Nutrition Questionnaire. Baseline height and weight were measured and con-

verted to BMI percentile and BMI z score. The chi-square, fisher's exact test, and t- test were used to analyze data. **Results:** Participants were predominantly white (54.1%) with 51.2% females. 12.5% of participants were obese. Black children consumed more sugary drinks than white children (76.92% vs. 48.15%) especially black boys (91.67% vs. black girls 64.29%, white girls 51.85%, and white boys 44.44%). However, no significant differences were identified in consumption of orange juice, and other juices. **Conclusions:** Black preschool children within child care centers in Louisiana have the highest consumption of sugary drinks. Therefore, efforts to prevent obesity among black preschool children should include interventions to reduce consumption of sugary drinks.

T-610-P
Childhood Obesity Interventions Evaluated in Canada: A Review of the Literature

Nathalie Dumas, Gandonou Migan K. Michael, Frederic Bergeron *Quebec, Canada*

Background: In Canada concerted efforts have been made with regard to childhood obesity prevention. In this manner human resources, time as well as funding are keys factors. The Evaluation Platform on Obesity Prevention (EPOP) was created in 2010 to evaluate the impact of those interventions. **Methods:** A critical holistic review was undertaken to gather peer-reviewed publications related to the prevention of obesity of Canadian children aged between 0 and 18 years old. We looked at components of the energy balance, politic, legal, economic and built environments approaches. Methods: 10 search strategies were composed from numerous search terms including Canadian interventions implemented between January 2000 and December 2012. MEDLINE/PUBMED, Embase, Sociological Abstracts, PsycINFO and SPORTDiscus databases were used. **Results:** 17 534 articles were managed using EndNote (version 16). Once duplications removed, 12 837 abstracts was reviewed. We kept 1 508 articles for further reading. 68% was conducted after 2008. These were mainly descriptive predictive, genetic or non-reproducible designs. We assessed in detail 52 articles focusing on interventions. Majority was intending to changing behaviors. Few of them were evaluated. Among them, the vast majority showed no success in inducing a weight reduction. **Conclusions:** Based on our results, the amount of peer-reviewed publication dedicated to our topic of interest over the last twelve years appears to be scarce with regard to the important of resources' invested. It seems worthwhile extending the review to the grey literature and use comprehensive approaches such as the 2012 Canadian Council Innovative Practices Evaluation Framework.

T-611-P[DT]
DSM-V Binge Eating and Emotion Regulation: Parallels between Women and Overweight Men

Tamara M. Loverich, Ashley A. Wiedemann, Jillian Carey, Karen K. Saules *Ypsilanti, MI*

Background: Difficulties in emotion regulation and emotional eating have been examined as predictors of binge eating and overeating, which are associated with overweight. No studies have examined these variables in conjunction with one another while taking gender and weight status into account. **Methods:** Undergraduate students (n=614) completed an online survey of binge eating (QEWP-R), emotional eating (EES), and emotion regulation (DERS). Chi-square analyses were conducted to explore gender differences in binge eating symptomatology. ANOVAs explored gender and weight group differences in emotional eating and emotion regulation. **Results:** High rates of objective BE were found. Overweight males and females experienced more significant loss of control and purging. Normal weight females and overweight males looked similar and reported significantly more binge episodes and eating to discomfort. Women and overweight males were more likely to eat alone and to feel negatively about BE. Shape concerns were most prominent in males while females exhibited significantly more emotional eating and emotion regulation difficulty. **Conclusions:** Binge eating was significant in this nonclinical sample. The relationship of binge behavior to overweight appears complex. Some symptoms were more associated with normal weight in females and overweight in males, while others were more strongly associated with overweight in both genders. Women and overweight men looked similar, perhaps indicating that behaviors that have been viewed as gendered are not. The marked shape concern of males was unexpected. The data suggest that normal weight men manage emotion differently than all

women. BE that does not rise to the level of BED appears to be present in normal and over weight students. Gender should be a consideration in future studies of binge eating, emotion and weight.

T-612-P
Obesity and Its Comorbidities Three-Dimensional Didactical Model

Mario O. Morales Suarez, Raul Morin, Adriana Madero, Mario Octavio Morales Suarez, Juan R. Romero *Mexico D.F., Mexico*

Background: . Overweight and obesity are a public health problem and their comorbidities, alas biological constraints, generate an important economic burden to the individual, the family and the health authorities. Ignorance and lack of right information are paramount causes in the genesis of the disease. **Methods:** We built this three-dimensional anatomical model as an educational tool to show patients in a comprehensive way the morphological changes that arise as a consequence of being overweight or obese. **Results:** Encourage the doctor involved in the bonding process and cultural awareness, moral and behavioral through health education **Conclusions:** Improving all aspects of the quality of education for patients to get results in health improvement

T-613-P[DT]
Food Intimacy: A Parental Perspective of Eating Behaviors in Obese Pre-Adolescents

Jennifer S. Laurent *Burlington, VT*

Background: Disordered eating behaviors are implicated in the development and persistence of obesity in childhood, adolescence, and adulthood. The purpose of this study was provide a qualitative perspective of obese youth's eating behaviors through the lens of their parent as they attempt to create healthy changes. **Methods:** In-depth secondary analysis of the concept of food intimacy that evolved as part of a larger study investigating how parents promote health for their obese child. Seventeen parents of 10-14 year old obese youth were interviewed. Themes and concepts were developed using grounded theory. **Results:** Parents described child behaviors such as losing control and sneaky eating to obtain food, as well as using food for comfort, pleasure, and simply loving food. The relationship between these children and food was identified as the over-arching theme, food intimacy. Food intimacy evolved as a third party relationship (child-food-parent) that was perceived by parents as a significant barrier to creating healthful changes for their obese child. **Conclusions:** This study highlights the intimate relationship these children developed with food and the powerful influence of this relationship on their eating behaviors. This suggests that prescribed interventions such as exercising more and eating less maybe ineffective in certain obese children, and that more focus should be placed on investigating the relationship an obese child has with food.

T-614-P
Preliminary Support for the Identification of Food Addiction in Obese Youth

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

Background: Increasing evidence implicates food addiction in the development and persistence of obesity in adults but has yet to be characterized in obese youth. **Methods:** Upon entry into the REWARD Teens multi-disciplinary weight management program, 16 obese (≥95th BMI percentile) youth, ages 12-17, completed the Yale Food Addictions Scale for Kids (YFASk). Parents of these youth also completed questionnaires regarding their child's eating behaviors. **Results:** Four youth (25%), 3 male and 1 female, met criteria for food addiction. Independent parental report identified compulsive eating, craving sweets, hiding food, and overeating in their child. Binge eating was not reported. Complete data was lacking in 4 additional youth entering the program and could not be analyzed; therefore identifying 25% of these youth with food addiction may actually be an underestimation of the prevalence of food addiction in this population. **Conclusions:** While food addiction has been recognized in adults, to our knowledge this is among the first studies to identify food addiction in obese youth. Despite the small number of obese youth in the current study, one-quarter met the diagnostic criteria for food addiction with independent parental confirmation of such behavior.

These findings support the need for further investigation into the role of food addiction in obese youth.

T-615-P
Children's Power of Food Scale: Psychometric Properties in a Diverse Sample of Pre-Adolescents

Jennifer S. Laurent *Burlington, VT*

Background: The Children's Power of Food Scale measures appetitive responsiveness across three domains, food available but not present, food present but not tasted, and food tasted but not eaten, and a total aggregate score. Although validated in adult populations it has not been tested in youth. **Methods:** 47 ethnically diverse 10-14 year old youths were sampled for this methodological study to establish reliability. 6 content experts were recruited to establish content validity (CVI). **Results:** 2-week test-retest followed lunch to limit the influence of homeostatic hunger on responses. Internal consistency within each factor at each time-point demonstrated a Cronbach's alphas from 0.61-0.89. Intra-class correlation coefficients for the reliability of factor scores were 0.68 for factor 1, 0.28 for factor 2, and 0.61 for factor 3, and 0.55 for the aggregate scale. Factor 2 increased to 0.43 when analysis was limited to English as primary language. Quadratic weighting showed kappa (κ) ranged from 0.19 to 0.69 for individual questions. Mean kappa was 0.41 and median was 0.44. CVI index was 0.87. **Conclusions:** This study suggests that C-PFS is an adequate to good measure of appetitive responsiveness in 10-14 year olds in food abundant environments. Factor 2 should be interpreted with caution in English language learners and further inquiry should examine the temporal stability of the food present but not tasted construct. The C-PFS may serve as useful instrument to identify youth more vulnerable to food preoccupation and overconsumption given the obesogenic food environment.

T-616-P[DT]
Exploring Innovative Approaches and Patient-Centered Outcomes from Positive Outliers in Childhood Obesity

Gareth Marshall, Mona Sharifi *Boston, MA*; Roberta E. Goldman *Providence, RI*; Christine M. Horan, Renata L. Koziol, Stephanie Ferisin, Richard Marshall, Thomas Sequist, Elsie M. Taveras *Boston, MA*

Background: Successful strategies to inform obesity interventions and reduce disparities can be found among 'positive outliers,' i.e., individuals who have succeeded where others have not in reducing BMI and developing resilience in adverse built and social environments. We explored perspectives and strategies of parents whose children have improved their BMI despite living in high risk neighborhoods. **Methods:** We collected height/weight from the previous four years of electronic health records for 22,657 children age 6-12 seen for well-child care in Massachusetts from August 2011-August 2012. We identified obese children (BMI ≥95th percentile) and defined obesity "hotspot" zip codes where >15% of children were obese. We generated a BMI z-score slope for each child using a linear mixed effects model. From the sub-sample with negative slopes living in hotspots, we recruited parents for focus groups. We analyzed group transcripts and discussed emerging themes in iterative meetings using an immersion/crystallization approach. **Results:** We reached thematic saturation after 5 focus groups with 41 parents of diverse education and racial/ethnic backgrounds. Commonly cited outcomes that mattered most to parents and motivated change were child inactivity, clothing size, exercise intolerance, and peer comparisons; few reported BMI as a motivator. Convergent strategies among positive outlier families were family-level changes, parent modeling, consistency, household rules/limits, and creativity in overcoming resistance. Parents voiced preferences for obesity interventions that include tailored education and support that extends outside clinical settings and is delivered by both health care professionals and successful peers. **Conclusions:** Successful strategies learned from positive outlier families can be generalized and promoted to accelerate progress in childhood obesity.

T-617-P
Self-Regulatory Traits as Predictors of Dietary Behavior among Overweight/Obese Adults Enrolled in a Weight Loss Program

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Background: Trait factors are rarely considered as predictors of dietary behavior in help-seeking individuals such as participants enrolled in a weight

loss program. However, several health behavior models suggest that self-regulatory traits may impact health-related behaviors both by affecting self-control of health behavior and through coping with stress and failure. In this study, we assess the associations between trait anger, self-control, and coping competence on food consumption patterns among 91 overweight/obese participants of a diet-based weight loss program. **Methods:** Participants completed a survey assessing trait predictors and binge eating three times in 3-month intervals using well-validated instruments. Further, we collected 8-day pre-intervention food diaries and post-intervention food records using a Nutrition Software. Food records were analyzed for macronutrient content, and daily average consumption was calculated as the % of the recommended dietary allowance (RDA) using age, gender, height, weight, and self-reported activity level and a target BMI of 25 as reference point. Correlational and multiple linear regression analyses were conducted, controlling for age, gender, and dieting self-efficacy beliefs. **Results:** In all cross-sectional and most prospective analyses, trait predictors were significantly related to binging (r = |.25| to |.51|), % kcal consumption (r = |.16| to |.38|), and % carbohydrate intake (r = |.25| to |.45|). Only emotion regulation variables (anger or coping competence) remained significant in multiple regressions, explaining between 4% and 7.4% of incremental variance in cross-sectional and 9.6% to 11.6% of incremental variance in 2 out of 4 longitudinal analyses. **Conclusions:** Emotion regulation variables should receive more attention in future weight loss intervention research with overweight/obese populations.

T-618-P
Do Symptoms of Depression Mediate the Relationship between Childhood Adversity and Night Eating?

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Background: Night eating syndrome (NES) is characterized by morning anorexia, excessive hunger in the evening, insomnia, and snacking during nighttime awakenings, and associated with weight difficulties and poorer weight loss in individuals undergoing treatment for obesity. Previous research demonstrated relationships between childhood adversity and NES, NES and depressive symptoms, and childhood adversity and depression. Few studies have investigated the role of depression in the relationship between childhood adversity and NES. Moreover, little is known regarding NES symptoms in a non-obese sample. **Methods:** We evaluated the following hypotheses: *1) childhood emotional abuse (EA) predicts symptoms of NES; and 2) symptoms of depression mediate the relationship between EA and symptoms of NES*, in a sample of 277 undergraduate students (ages 17-36) who completed online and paper and pencil surveys assessing childhood adversity, eating patterns and psychological symptoms. **Results:** Both hypotheses were supported. EA significantly predicted severity of NES symptoms (β= .36, t (277) = 6.46, p < .001). EA significantly predicted symptoms of depression (β = .45, t(277) = 8.42, p < .001). Symptoms of depression predicted NES symptoms controlling for EA (β=.34, t (277) = 5.67, p < .001). Bootstrap analyses indicated a statistically significant indirect effect of EA through depression (estimate = .27; bias corrected 95% CI .15, .43). **Conclusions:** Results suggest that depressive symptoms mediate the relationship between childhood emotional abuse and symptoms of NES. Thus, it is important to assess NES symptoms in individuals with depression, and it may be beneficial to address symptoms of depression when treating individuals presenting with NES.

T-619-P
A Novel Delayed Discounting Task Reveals Correlations between Impulsivity, Percent Body Fat and Self-Reported Eating Behavior in Obese and Lean Adults

Valerie Darcey *Washington, DC*; Juen Guo, Kevin D. Hall *Bethesda, MD*

Background: Obesity treatment often pits immediate food rewards against the delayed rewards associated with weight loss. **Methods:** To investigate how delayed rewards are discounted in comparison to immediately available rewards, we studied a group of Lean (12M/9F, BMI=22.5 ± 2.7kg/m², body fat=23.4 ± 8.6%) and Obese (8M/6F, BMI=36.5 ± 4.9 kg/m², body fat=41.0 ± 9.8%) subjects using a computerized delay discounting task, performed 1.5h after a standard meal. Subjects indicated their preference for hypothetical fixed immediate rewards ($2.50 or salient food) versus a mostly larger, monetary reward ($1 - $100), available after a variable delay (now-3 years) presented in random order. The immediate food reward was subject-specific, selected as the highest rated item on a liking/wanting task. Reaction time-

weighted responses were used to calculate indifference points for each delay and the area under the indifference curve (AUC) was calculated for both commodities. A smaller AUC indicates a preference for the immediate reward and is an index of impulsivity. **Results:** AUC_S and AUC_{Food} were correlated (r=0.55, p=0.008) but were not significantly different between groups for either AUC_S (p=0.18) or AUC_{Food} (p=0.37). BMI was not related to either AUC measure, but there was an indication of greater impulsivity for monetary rewards (decreased AUC_S) in subjects with higher % body fat (r=-0.4, p=0.053). Both Disinhibition and Hunger on the Three Factor Eating Questionnaire were significantly greater in the obese group (p=0.001 and p=0.04, respectively), but were not related to discounting for either commodity. In contrast, Cognitive Restraint was correlated with both AUC_S (r=0.63, p=0.003) and AUC_{Food} (r=0.5, p=0.028). **Conclusions:** These results suggest that individuals reporting greater Cognitive Restraint over eating also display greater ability to delay gratification.

T-620-P
Perinatal Exposure to High-Fat Diet Increases the Risk of Offspring Developing Behavioral Disorders

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Background: Prevalence of pediatric neuropsychiatric disorders has dramatically increased during the past decade propelled largely by increased incidence of Autism Spectrum Disorders and Attention Deficit Hyperactivity Disorders. The underlying causes of these disorders remain elusive; however, there is evidence that the environment encountered during fetal development has a considerable influence on the risk of these disorders. As maternal obesity increases placental inflammation and the delivery of inflammatory cytokines to the fetus, we hypothesize that exposure to maternal obesity and its metabolic complications impact the development of neural circuits critical in behavioral regulation, which subsequently alters behavior. **Methods:** We used a non-human primate model of diet-induced obesity to examine the consequences of maternal obesity and high-fat diet (HFD) consumption on the central serotonin system and behavioral response of offspring. Female Japanese macaques consuming either a low fat diet (13% of calories from fat) or a HFD (36% calories from fat) and their juvenile offspring were examined. Responses to novel items and social situations were analyzed. In situ hybridization was used to assess the serotonin system in the dorsal raphe. **Results:** HFD offspring display behavioral abnormalities that mimic features of neurodevelopmental disorders including social withdrawal, increased aggression in response to a novel peer, increased anxiety in response to a novel object, and reduced exploration of novelty. These offspring also showed a suppression of the serotonin system in the dorsal raphe and cerebrospinal fluid, which persists into the juvenile time period. **Conclusions:** These findings indicate that maternal obesity initiates a fetal environment that results in neural reprogramming and predisposes HFD offspring to pediatric neuropsychiatric disorders.

T-621-P[DT]
Inadequate Nutrient Intake in Obese People with Serious Mental Illness

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Background: Nutritional deficiencies have been identified in the morbidly obese. People with serious mental illness are twice as likely as the general population to be obese and more likely to be morbidly obesity (body mass index ≥ 40kg/m2). We explored the nutritional adequacy of the diet of obese people with serious mental illness. **Methods:** Cross sectional analysis of baseline data on 209 obese persons with serious mental illness enrolled in a healthy lifestyle intervention. Participants had a diagnosis of major depression (15%), bipolar disorder (29%), or schizophrenia spectrum disorder (56%). Nutritional intake from diet and supplements in the past month was obtained with the Block Food Frequency Questionnaire. We calculated the percentage of participants meeting the U.S. Department of Agriculture Dietary Reference Intakes for vitamins and minerals stratifying by gender where reference intakes varied by gender. **Results:** Participants had a mean age of 43.9 years (SD 11.3), 50.7% were female and 53.6% White. Mean body mass index was 36.9 kg/m2 (SD 8.2) and 31.1% were morbidly obese. Mean caloric intake for females was 2019 calories (SE 108) and for males 2277calories (SE 125). More than one fourth of participants did not meet the nutrient requirements for folate, vitamin A, zinc (males only), iron (females

only) and/or magnesium (females only). More than half had inadequate intake of vitamin D, calcium, vitamin E, magnesium (males only), and/or potassium. **Conclusions:** A significant proportion of obese people with serious mental illness have inadequate micronutrient intakes increasing their risk of nutritional deficiencies.

T-622-P

Use of an American Board of Pediatrics' Maintenance of Certification (MOC) to Improve Counseling for Weight Management at Well-Child Check-Ups

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Background: Participation in approved Maintenance of Certification (MOC) programs is now required for all American Board of Pediatrics certified physicians. We evaluated the impact on physician practices of an MOC program designed to encourage the use of evidenced-based, patient-centered counseling to promote healthy diets and physical activity among children and their parents. **Methods:** 67 pediatricians from 7 practices enrolled in the Strong4Life MOC program and agreed to: 1) attend training (a 2-hour baseline and 1-hour on-line refresher), 2) inform their staff about the MOC, and 3) participate in a peer-review of patient charts. Charts from well-child visits 1 month before, 3 and 6 months after training were reviewed (15 charts per physician per time point) to assess prevalence of: counseling related to key healthy diet and physical activity habits; BMI percentile plotting; and wellness goal-setting. **Results:** . Frequency of counseling about eating out and intake of sweet drinks and fruits and vegetables increased from 9%, 28%, and 41%, respectively, before training to 93%-98%, 94%-97%, and 96%-98%, 3 and 6 months after training. Counseling about daily physical activity and screen time were 72% and 76%, respectively, at baseline and increased to 94%-98% at 3- and 6-month follow-up. BMI plotting was high at all three timepoints (99%-100%). Wellness goals were documented for 12% of patients at baseline, 87% at 3 months and 91% at 6 months. **Conclusions:** Pediatrician participation in an MOC designed to promote patient-centered counseling for healthy diet and physical activity behaviors resulted in a rapid and sustained improvement in counseling practices.

T-623-P

Factors Associated with Parental Misclassification of Their Overweight Child's Bodyweight: A Cross-Sectional Study in the State of Georgia

Jean A. Welsh, Scott Gillespie, Courtney McCracken, Miriam B. Vos *Atlanta, GA*

Background: Research has shown that parents often misclassify the weight status of their overweight children. The purpose of this study was to identify factors associated with this misclassification among parents living in the state of Georgia. **Methods:** A telephone survey of parents of normal weight or obese children age 6-15 years (n=1411) throughout Georgia was conducted in November 2012. Quota sampling was done to enable subgroup analyses by: child's weight status based on parent reported weight and height (BMI <85th percentile [normal weight] or BMI >95th percentile [obese], race/ethnicity (Hispanic or white, black, other), and income (<$50,000 vs. >$50,000/annually). Parents were asked to categorize their child's weight status as "underweight", "normal weight", "overweight", or "extremely overweight or obese". Multiple logistic regression was used to identify factors affecting the odds of parents correctly identifying their child's weight status. **Results:** 22.0% of parents identified their child as under or normal weight while their BMI score indicated overweight or obesity. The odds of a parent correctly classifying their child's weight were greater in higher (≥ $50,000) vs. lower (< $50,000) income families, OR = 1.6 (95th CI: 1.2 – 2.0); odds of a parent correctly classifying their child's weight were lower in non-Hispanic Blacks and Hispanics relative to non-Hispanic whites, OR = 0.51 (95% CI: 0.38 – 0.68) and OR= 0.44 (95% CI: 0.26 – 0.76), respectively. **Conclusions:** Non-Hispanic White parents and households with higher incomes were more adept at gauging their child's weight, relative to not Hispanic Black and Hispanic parents and households with lower incomes, respectively.

Physical Activity Epidemiology

T-624-P

Inadequate Physical Activity and Health Care Expenditures in the United States

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Background: The 2008 Physical Activity Guidelines for Americans recommend that for substantial health benefits, adults should participate weekly in at least 150 minutes of moderate-intensity equivalent physical activity. This study examines health care expenditures in the U.S. associated with inadequate levels of physical activity. **Methods:** Physical activity data from the National Health Interview Survey (2004-2009) were merged with health care expenditure data for the next 1 to 2 years from the Medical Expenditure Panel Survey (2006-2010) for adults (≥20 years), excluding those pregnant, underweight, or who reported being unable to do physical activity (N=41,992). Physical activity was classified as: active (≥150 min/week moderate-intensity equivalent activity); insufficiently active (some activity but not enough to meet active definition); or inactive (no leisure-time activity). Mean difference in expenditures for those inactive and insufficiently active compared to active were estimated using a 4-part multivariate econometric model. **Results:** Mean difference (compared to active and adjusting for covariates) in health care expenditures per capita was $1382 (95%CI: 917, 1846) for those inactive and $804 (95%CI: 399, 1209) for those insufficiently active. After adjusting for BMI, the mean difference for those inactive was $1259 (95%CI: 789, 1729) and $680 (95%CI: 285, 1075) for those insufficiently active. About 13.1% of aggregate health care expenditures were associated with inadequate physical activity, 11.7% after adding BMI to the model, and 10.2% after adding difficulty walking. **Conclusions:** Inadequate physical activity is associated with a significant percentage of health care expenditures. Increasing adults' physical activity to meet guidelines has the potential to reduce health care expenditures in the U.S.

T-625-P

Lack of Association Between Sedentary Behavior and Cardio-Metabolic Biomarkers Once Analyses Are Adjusted for Total Physical Activity

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Background: Recent literature has posed sedentary behavior as an independent entity to physical inactivity. This study investigated whether associations between sedentary behavior and cardio-metabolic biomarkers remain when adjusted for total physical activity. **Methods:** Cross-sectional analyses were undertaken on 4,618 adults from the 2003/04 and 2005/06 U.S. National Health and Nutrition Examination Survey. Minutes of sedentary behavior, minutes of moderate-to-vigorous physical activity (MVPA), and total physical activity (defined as total daily accerelerometer counts excluding sedentary counts) were determined from 7-day accelerometry. Associations between sedentary behavior and cardio-metabolic biomarkers were examined using linear regression. **Results:** Sedentary behavior was detrimentally associated with 8/11 cardio-metabolic biomarkers when adjusted for MVPA minutes. However, when adjusted for total physical activity, the associations effectively disappeared, except for C-reactive protein, which showed a very small, favourable association (β=-0.06) and triglycerides, which showed a very small, detrimental association (β=0.04). Standardised betas suggested that total physical activity was consistently favourably associated with cardio-metabolic biomarkers (9/11 biomarkers, standardized β=0.08-0.30) while sedentary behavior was detrimentally associated with just one biomarker (standardized β=0.12). **Conclusions:** Associations between sedentary behavior and cardio-metabolic biomarkers disappear or are greatly attenuated once analyses are adjusted for total physical activity. This contrasts with previous studies which have adjusted for MVPA only. It is possible that the mechanism underpinning the previously identified relationship between sedentary behavior and health outcomes is lack of activity, rather than unique metabolic processes associated with sitting.

T-626-P

Cut-Points of Muscle Strength Associated with Metabolic Syndrome in Men in the Aerobics Center Longitudinal Study

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Background: The loss of muscle strength with age increases the likelihood of metabolic syndrome (MetS). However, the minimal threshold of muscle strength at which the risk for MetS increases is unclear. The objective of this study was to identify a threshold of muscle strength associated with MetS in men. **Methods:** We created receiver-operating curves for muscle strength and the risk of MetS from a cross-sectional sample of 5685 men aged < 50 years and 1541 men aged ≥ 50 years. The MetS was defined according to the NCEP ATPIII criteria. Upper and lower muscle strength was determined from 1-RM tests on bench and leg press. **Results:** MetS was evident in 23% of men and was less common among men < 50 years compared with men aged ≥ 50 years (20.7% vs. 31.6% P <0.01). In men aged < 50 years, the odds of MetS were 2.20 fold (95%CI: 1.89-2.54) higher in those with low muscle strength, independent of age, smoking, and alcohol intake. The strength of this association was similar for men aged ≥ 50 years (2.11 95%CI: 1.62-2.74). In men aged < 50 years, the thresholds associated with MetS were 1.29 kg/kg body weight and 2.02 kg/kg body weight for bench press and leg press, In men aged ≥ 50 years these thresholds were 0.71 kg/kg body weight and 1.67 kg/kg body weight. **Conclusions:** This study is the first to identify a threshold of muscle strength associated with an increased likelihood of MetS in men. Our results may help tailor resistance training programs for chronic disease management in men.

T-627-P[DT]

Physical Activity Patterns in the U.S., Jamaica and 3 African Countries

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Background: Obesity varies significantly between developing and developed countries, due in part, to differences in socio-economic status (SES). The Modeling the Epidemiologic Transition Study (METS) is a longitudinal study, in 5 countries spanning the epidemiologic transition. **Methods:** METS seeks to define the association between physical activity (PA), obesity and CVD risk in populations of African origin: Ghana (GH), South Africa (SA), Seychelles (SEY), Jamaica (JA) and the US (suburban Chicago). Baseline measurements of objective PA, SES, anthropometrics and body composition, were completed on 2500 men and women, aged 25-45 years. PA (min/d) was explored as moderate PA (MPA), vigorous PA (VPA) and moderate/vigorous PA (MVPA). **Results:** Among the men, obesity prevalence reflected the level of economic transition and was lowest in GH (1.7%) and SA (4.8%) and highest in the US (41%). SA (55%) and US (65%) women had the highest levels of obesity, compared to only 16% in GH. More men and women in developing countries engaged in manual labor and this was reflected by an almost doubling of measured MPVA among the men in GH (45 min/d) and SA (47 min/d) compared to only 28 min/d in the US. Women in GH (25 min/d), SA (21 min/d), JA (20 min/d) and SEY (20 min/d) accumulated significantly more MPVA than women in the US (14 min/d) yet this difference was not reflected by dramatic differences in BMI between SA, JA, SEY and US. MPA constituted the bulk of the PA, with no countries except SA men accumulating > 5 min/d of VPA. Among the women, no sites accumulated >2 min/d of VPA. Overweight/obese men were 22% less likely to engage in manual occupations. **Conclusions:** While there is some association for PA with obesity, this relationship is inconsistent across the epidemiologic transition and suggests that PA policy recommendations should be tailored for each environment.

T-628-P

Temporal Patterns in Accelerometer-Measured Physical Activity among U.S. Youth: Differences by Weight Status

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Background: Youth physical activity (PA) differs by weight status. Less is known about the relationship of weight status and within-day temporal PA patterns **Methods:** Youth (6-19 years) from the 2003-6 National Health and Nutrition Examination Surveys with at least one 10+ hour weekday of accelerometer data were included (n=4852; 50% male). Temporal patterns were represented by segments that broadly reflect before (6-9am), during (9am-3pm), after school (3-6pm), and evening (6-9pm) time. Weight status groups were: normal (5th-84th %ile), overweight (85th-94th %ile), and obese (≥95th %ile). Statistics for mean counts per minute (cpm) were expressed as daily cpm, and for each time segment across all valid weekdays. Covariates were age, race/ethnicity, and sex. Sample weights accounted for the complex survey design. **Results:** Compared to normal weight [mean cpm(SE)=299.9(4.0)] and overweight [mean cpm(SE)=274.3(6.0)] youth, obese youth [mean cpm(SE)=257.9(4.7)] had a lower mean count rate across weekdays (p<.05 for all comparisons). From 6-9am, the count rate for overweight youth was higher than obese youth [mean cpm(SE)=212.7(15.1) vs. 186.5(11.5); p<.05]. From 9am-3pm, the count rate for normal weight youth was higher than obese youth [mean cpm(SE)=453.1(6.3) vs. 402.4(9.8); p<.05]. The largest significant rate differences between normal weight and obese youth occurred from 3-6pm [mean cpm(SE)=627.7(11.6) vs. 504.9(13.4); p<.05] and from 6-9pm [mean cpm(SE)=506.7(15.2) vs. 414.7(15.4); p<.05]. Patterns and relationships were similar by sex. **Conclusions:** Accelerometer count rate is highest in normal weight vs. overweight and obese youth throughout the day, with the greatest differences occurring between 3-6pm. Temporal analyses of accelerometer data provide a more complete profile of youth PA to inform future intervention targets and strategies.

T-629-P

Relationship between Sleep Characteristics and Adiposity in a Nationally-Representative Sample

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Background: Short sleep has been established as a risk factor for obesity. However, sleep is a multidimensional behavior that cannot be characterized solely by sleep duration. Other sleep characteristics, such as sleep latency, disturbances, fragmentation, and overall quality, may also influence obesity. In a nationally-representative sample, we evaluated various aspects of sleep in relation to adiposity. **Methods:** Participants in 2005-2006 NHANES who were 20 or older with information on sleep and body composition were included (N=4503). Sleep characteristics were self-reported, weight, height and waist circumference were measured and fat mass was determined by dual-energy X-ray absorptiometry (DXA). The association between sleep and adiposity were examined using linear regression models adjusted for confounders and NHANES sampling procedures. Additionally, we simultaneously entered all the sleep variables that were significantly associated with adiposity in a model to evaluate their independent effects. **Results:** People who reported <6 hr sleep, sleepy during the day, snoring and ever diagnosed with sleep disorder had significantly higher BMI, waist circumference, and fat mass. Trouble falling asleep, nighttime arousal and waking too early were not associated with adiposity measures. Sleep duration, snoring and sleep disorders were independently associated with BMI, waist circumference, and fat mass. Compared to their respective reference group (8 hr, never snored, and no sleep disorder), <6 hr sleep, snoring 5+ day/week, and sleep disorder were associated with 1.04, 4.28 and 3.18 units higher BMI, 2.28 cm, 9.36 cm and 7.91 cm larger waist circumference, and 1.85 kg, 7.17 kg, and 5.15 kg more total body fat, respectively (all p<.05). **Conclusions:** Short sleep, snoring and sleep disorders were independently associated with higher adiposity.

T-630-P

Do Exercise Interventions Reduce BMI in Overweight and Obese Youth?

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Background: Commonly used in population studies, BMI is also a measure of weight status in individuals, including children. Using systematic review

and meta-analysis, we evaluated the effect of exercise interventions on BMI in overweight/obese youth. **Methods:** Forty-three randomized control trials assessing fitness were identified in PubMed, CINAHL, EMBASE, SPORT-Discus, ISI Web of Knowledge, and PsycInfo from 2000-2013. Of these, the 32 studies reporting BMI had a median age of participants of 11 yr, weekly exercise dose of 135 min, and intervention length of 13 wk. Effect sizes (ES) were calculated as the standardized mean difference. **Results:** A small, significant overall ES (ES=-0.36; 95% CI=-0.158 to -0.561) was observed for BMI reduction in exercise intervention versus control groups, but heterogeneity was moderate (I^2=67%) among studies. Mode of exercise intervention did not influence the BMI ES, although strength training tended to have a lower ES (ES=-0.021; n=5 studies) compared to a combination of strength and aerobic training (ES=-0.53; n=6 studies), aerobic training alone (ES=-0.37; n=20 studies), or other training (e.g., games) (ES=-0.48; n=4 studies). Subgroup analysis indicated no difference in BMI ES for exercise vs. control (ES=-0.38; n=24 studies) compared to dietary treatment + exercise vs. control (ES=-0.29; n=10 studies). Meta-regression indicated significant association between BMI ES and weekly exercise dose (min/wk), but not intervention length (total weeks) (p<0.0001 and p=0.27, respectively). **Conclusions:** Exercise interventions result in a small but significant reduction in BMI for overweight/obese youth. This effect is similar across a range of exercise treatments and modes. However, physical activity interventions approaching federal guidelines of 60 min/day result in greater impact on BMI.

T-631-P
Morningness-Eveningness Chronotype and Exercise Response in the Training Interventions of Genetics of Exercise Response (TIGER) Study
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Background: Self-reported optimal performance varies throughout the day across individuals and may impact response to behavioral interventions for weight loss. This study examined the relationship between morningness/eveningness (ME) and objectively measured components of exercise performance and response. **Methods:** Participants (M=276/F=382, 18-35y) completed 15 wks of aerobic exercise training in the TIGER study. Exercise heart rate (HR), duration (DUR, min), intensity (INT, %HR reserve), and time of day (TIME, hr:min) were recorded using computerized HR monitors. Total exercise dose was calculated by adjusting duration by intensity and summing over all sessions to formulate a heart rate physical activity score (HRPAS). ME was assessed using the Horne-Ostberg Morningness-Eveningness scale. Analyses were adjusted for age and gender. **Results:** ME was not significantly associated with baseline physiologic measures or exercise parameters; however ME was significantly associated with HRPAS (p<.05). Morning Types had a higher HRPAS (774.6±234.6) compared to Evening Types (738.3±253.1). TIME was significantly associated with both exercise HR (p<.03) and INT (p<.005) with morning times (before 9:30 a.m) associated with a higher average HR (159.5±7.5) and INT (0.694±0.061) compared to later times (after 12pm, HR:157.9±7.1, INT: 0.672±0.065). Concordance between ME type and TIME was significantly associated with both HRPAS (p<.02) and change in waist/hip ratio (p<.03). ME-TIME concordance was not associated with any other measure of exercise response. **Conclusions:** These results suggest that both the timing of exercise and chronotype may influence exercise tolerance and response. Further study is needed to examine whether time of day preferences help explain health outcomes (e.g., lipids and weight loss) in exercise trials.

T-632-P
Is Improvement in Physical Fitness Associated with Reductions in Risk Factors in Overweight and Obese Youth?
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Background: Little is known regarding the association between changes in physical fitness and health risk factors in youth, particularly for overweight or obese youth. The purpose of this study was to systematically review the literature to examine the association between changes in health-related fitness and chronic disease risk factors in overweight and/or obese youth. **Methods:** Studies published from 2000-2010 were included based on the following: randomized control trial evaluating an exercise intervention for overweight/obese youth; fitness test measures (e.g., aerobic capacity, muscular

strength/endurance); measures of chronic disease risk factors related to adiposity, cardiovascular, musculoskeletal, metabolic, and mental/emotional health. Mean change scores were extracted for measures of fitness and health and categorized by significant positive, negative or null effects (p >0.05). **Results:** The search identified 33 studies meeting the criteria. Aerobic capacity improved significantly (p<0.05) in 91% of 35 measures ranging from laboratory-based maximal oxygen uptake to field run/walk tests. Muscular strength and/or endurance improved in 82% of 17 measures. For studies reporting improved fitness, a total of 237 measures of chronic disease risk were reported. Of these, measures of adiposity (73), cardiovascular (85), musculoskeletal (15), metabolic (61), and mental/emotional health (3) improved in 60%, 32%, 53%, 41%, and 33% of cases, respectively. **Conclusions:** Overweight and obese youth can improve fitness using a variety of test measures. When aerobic or muscular fitness improves, beneficial health effects are observed in some, but not all chronic disease risk factors.

T-633-P
Association between Sedentary Behaviors and Physical Activity with Obesity in Mexican Adults: Results from the 2012 National Health and Nutrition Survey (ENSANUT)
Catalina Medina, Ian Janssen *Kingston, Canada*; Simón Barquera *Cuernavaca, Mexico*

Background: Insufficient moderate-to-vigorous physical activity (MVPA) and excessive sedentariness are two distinct behaviors. The purpose of this study was to determine the independent associations between time spent in MVPA and sedentary behaviors with obesity in a representative sample of Mexican adults. **Methods:** The study sample consisted of 10,189 adults (aged 20 to 69 years) who participated in the 2012 ENSANUT. The International Physical Activity Questionnaire (IPAQ) was used to assess MVPA; participants were categorized as being physically active (≥150 minutes/week of moderate or ≥75 minutes/week of vigorous physical activity) or inactive. Sedentary behavior questions included time spent in front of a screen and using motorized transportation; participants were divided by high (≥8.5 hr/week) or low (<8.5 hr/week) sedentary category. Height and weight were objectively measured and obesity was classified using a BMI cut point of 30 kg/m2. Odds ratios and 95%CI were assessed using multivariate logistic regression controlling for sex, age, education, and total energy intake and testing for interactions. **Results:** MVPA was not correlated with the sedentary behaviors. Relative to physically active individuals with low sedentary behavior levels, the odds ratio (95%CI) of obesity in the physically inactive/low sedentary group was 3.06 (2.10-4.43), in the physically active/high sedentary group was 1.29 (1.01-1.64), and in the physically inactive/high sedentary group was 3.48 (2.67-4.45). **Conclusions:** Time spent in MVPA and sedentary behaviors were independently associated with obesity in this representative sample of Mexican adults. National obesity strategies need to address both of these behaviors.

T-634-P
School's Out for Summer: Seasonal Variation in Health Behaviors among Children and Adolescents
Amanda E. Staiano, Peter T. Katzmarzyk *Baton Rouge, LA*

Background: Children typically gain weight during the summer, which may contribute to pediatric obesity. It was hypothesized that children's health behaviors during the summer are less favorable than during the school term. **Methods:** The sample included 407 White and African American 5-18 year-olds. Physical activity (PA) was self-reported as bouts/wk of >15 min of PA during free time, and d/wk of ≥1 hr of PA. Youth self-reported hr/d of sleep, TV viewing, and computer use, and consumption frequency of breakfast, meals prepared away from home, and fast food meals. BMI-z was calculated using the CDC growth charts, based on objectively measured height and weight. Analysis of covariance was used to examine differences between youth surveyed during summer (June and July, n=122) versus youth surveyed during the school term (August to May, n=285), controlling for age, sex, and race. Multivariable-adjusted means are reported. **Results:** Youth surveyed during the summer vs. school term did not vary by sex, race, or BMI-z but were older (13 vs. 12 years old, p<0.01). Compared to youth surveyed during the school term, those surveyed during summer reported more strenuous PA (4.3 vs. 3.3 bouts/wk, p<0.05), more moderate PA (4.7 vs. 3.7 bouts/wk, p<0.05), more sleep (8.7 vs. 8.4 hr/d, p<0.05), and more TV viewing (3.6 vs. 3.1 hr/d, p<0.01). There were no significant differences in mild PA bouts, PA

d/wk, computer use, or in consumption of breakfast, meals prepared away from home, or fast food meals. **Conclusions:** Contrary to the hypothesis, children's health behaviors were more favorable during summer, including more PA and sleep, and there were no dietary differences. Discretionary time during summer may increase time spent in all leisure activities. Future research should investigate how these activities relate to pediatric weight gain during summer.

T-635-P
Seasonal Variations in Physical Activity and Changes in Adolescent BMI

Melanie Kornides, Jorge Chavarro, Matthew W. Gillman, Catherine Berkey, Alison E. Field *Boston, MA*

Background: Results are mixed on the association between physical activity and weight gain among adolescents. Some studies have found seasonal differences in BMI gain. No previous studies have examined seasonal variability in meeting Department of Health and Human Services activity guidelines and weight gain. **Methods:** Annually during 1997-2003, 5324 boys and 7067 girls from the Growing Up Today Study completed surveys with 17 (female)/18 (male) questions on specific activities. We modeled activity as hrs/wk in individual activities, as well as hrs/wk of moderate to vigorous activity in each season. The outcome was becoming overweight or obesity over a 6-year period. Generalized estimating equations were used to estimate the association of activity with risk of becoming overweight or obese. Analyses were sex-specific, and controlled for age, race, baseline BMI, and sexual development. **Results:** In 1997, mean age was 12.5 years; 18% of girls and 21% of boys were overweight or obese, which increased to 21% and 30% by 2003. Youth who didn't meet recommendations of engaging in > 1 hour/day over the past year were 2-3% more likely (Girls: OR 1.02, 95% CI 1.01-1.03; Boys: OR 1.03, 95% CI 1.02-1.04) to become overweight or obese during 6 years of follow-up. Similar associations were seen among youth who were active > 1 hour/day in 1-2 v. 3-4 seasons (Girls OR: 1.02; Boys: OR 1.01). Compared to those who were active for 3-4 seasons, youth who did not engage in > 1 hour/day in any season were 3% more likely to become overweight or obese (Girls: OR 1.03, 95% CI 1.02-1.04; Boys: OR 1.03, 95% CI 1.02-1.05). **Conclusions:** Youth engaging in < 1 hr/day of activity were only slightly more likely to become overweight or obese than their more active peers. Current activity guidelines may be insufficient for preventing excessive weight gain.

T-636-P[DT]
What Black Mothers and Daughters Say About Being Physically Active

Wanda M. Thompson *Camden, NJ*

Background: Black adolescent girls are less physically active than any other U.S. racial/ethnic group. Obesity and obesity-related health conditions, such as type-2-diabetes, are directly related to the higher prevalence of physical inactivity. Qualifying what Black adolescent girls and their mothers think about physical activity (PA) may hold the key to improving physical activity among this group. **Methods:** This study explored factors related to lower physical activity behavior in 13 Black adolescent girls (mean age15.9 ± 1.2 years) and their mothers (mean age 48.4 ± 6.0 years). Focus groups were conducted using semi-structured questions to explore Black mothers' and their adolescent daughters' perspectives regarding physical activity. Mothers and daughters were interviewed separately with all sessions digitally recorded and transcribed verbatim. Atlas.ti was used to facilitate the coding and management of the transcribed data into meaningful themes. **Results:** Themes that emerge from the data included concerns about health, lack of knowledge, issues with time, and the importance of keeping it fun. These four themes were consistently noted among both groups. **Conclusions:** The themes that emerged from this study provide information that can be used in the development and implementation of future interventions. Both mothers and their daughters' seemed to recognize the need and importance of regular physical activity, but need help on how to best integrate regular physical activity into their daily lives. Time management was an important concern and barrier to both groups, thereby, warranting the need to include time management sessions within future interventions.

T-637-P
Race Modifies the Relationship between Physical Activity and Age in Preschool-Aged Children

Dianne S. Ward, Derek Hales, Stephanie Mazzacca, Amber E. Vaughn *Chapel Hill, NC*

Background: While it is well recognized that African American children suffer disproportionately higher rates of obesity, less is known about racial differences in weight-related behaviors like physical activity, particularly in young children. This study examined differences in objectively measured, moderate and vigorous physical activity (MVPA) between African American (AA) and white (W) children aged 2-5 years. **Methods:** Children (n=262) wore Actigraph accelerometers for 7 days as part of baseline data collection for a larger intervention trial. Parent and child height and weight were measured, and parents completed questionnaires. SAS 9.3 was used to fit General Linear Models (PROC GLM) to test the relationship between MVPA and race, including covariates and interactions. A final model was developed by systematically removing covariates and interaction terms with p>0.2. **Results:** MVPA was higher for AA children compared to W children, 66.6 vs. 54.3 minutes per day (p<0.0001). In the final model, the main effect for race was significant (p=0.03), as was the interaction between race and child age (p=0.0001). Compared to W children, AA children accumulated an additional 1.2 minutes of MVPA at age 2 y, 12.5 minutes (25% higher) at age 3 y, 22.9 minutes (39% higher) at age 4 y, and 1.6 minutes (2.5% higher) at age 5 y. The final model, which also included month PA data were collected, index parent age, parent BMI group, family income, child sex, BMI percentile and age), explained 43% of the variance in MVPA. Race and age alone explained 23% of the MVPA variance. **Conclusions:** Physical activity levels of African American children are generally higher than white children, but reasons for this difference are unclear. Additional research is needed to determine if MVPA differences persist over time and how they may contribute to future health and weight.

T-638-P
Physical Activity, Dietary Intake and BMI among Teenagers in a Mexican City: A Prospective Study

Ana Lilia Armendariz-Anguiano, Montserrat Bacardi-Gascon, Arturo Jimenez-Cruz *Tijuana, Mexico*

Background: Obesity/overweight (OW) is a serious pediatric health conditions among teenagers that may be associated to reduce physical activity and unhealthy eating habits. The aim of this study was to assess the effect of physical activity (PA), sedentary behavior and dietary intake on later BMI among teenagers in a Mexican City. **Methods:** A six months prospective study was conducted in a cohort of 563 children from 7th to 8th grade, 12-15 year old students, in 20 randomly selected groups from 15 public middle schools. Weight, height, and waist circumference were assessed from students of all groups. BMI was calculated. BMI and height z-scores for age and sex were classified according to WHO criteria (2006). Food intake was assessed with a 24 h recall. PA and sedentary behavior were assessed with the YRBSS validated questionnaire. **Results:** Mean age was 13.1±0.7 years (52.8% were female). The initial frequency of overweight (OW) and obesity was 43.8%, which decreased to 41.2% six months later. At the end of the study, OW and Obese children had fewer portions of grains (p<0.0001), vegetables (p=0.03), meat (p=0.003) and savory snacks (p=0.005). At six months, boys who had < 9 portions of grains per day (OR=2.06, 95% CI 1.08-3.93, p=0.03), girls that consumed < 6 portions of grains per day (OR=2.33, 95% CI 1.43-3.79, p<0.001), and girls with < 2 d/wk. of physical education classes (OR=2.12, 95% CI 1.27-3.60, p=0.004), were more likely to be OW/Obese. **Conclusions:** Fewer physical education classes and consuming fewer portions of grains/day increased the risk of having OW and Obesity among these Mexican teenagers.

T-639-P
Play to Win — Role of Active Video Games in Improving Health-Related Outcomes in Young Adults

Yijing Li, Audrey A. Opoku-Acheampong, Noel Rizzuti, Patrick Saunders, Nancy Muturi *Manhattan, KS*

Background: Although physical activity is an essential factor in disease prevention and health promotion, nearly 70% of adults and more than 30% of children and adolescents aged 6-19 years are considered overweight or obese.

College students are at great risk due to a lifestyle change as they transition into adulthood. Active video games (AVGs) require a moderate level of physical activity and full body movement and when played on a regular basis, can contribute to the player's daily physical activity. **Methods:** This study was a survey of college students 18-24 years of age in a Midwestern University (N=98). Based on the Social Cognitive Theory, the study identified primary factors for sedentary lifestyles; student's level of awareness and perceived self-efficacy of physical activity participation. **Results:** Nearly 80% of students are willing to use AVGs to increase daily physical activity but they are limited by the cost and the ability to readily access them. Students who are willing to try AVGs (42.2%) also showed interest in participating in AVG-related group fitness class. There is a significant relationship between playing AVGs and general physical activity. Additionally those who play AVGs are more likely to keep playing if they gain positive reinforcement. **Conclusions:** Students are aware of the health benefits of physical activity but are physically inactive due to low self-efficacy. Although the cost of AVGs is a barrier to students, majority of them will play if they have access. Group physical activities that incorporate AVGs will motivate greater participation among college students.

T-640-P
Low Levels of Vitamin D in Obese and Normal Weight Children vs. Metabolic Risks

Clarice Martins, Luisa Aires, Gustavo Silva, Luís Lemos, Henrique F. Nascimento, Jorge Mota *Porto, Portugal*

Background: Vitamin D (VIT-D) deficiency has been shown associated with metabolic risk factors in obese children and adolescents. Thus, the aim of this study was to evaluate de relationship between VIT-D and cardiovascular risk factors in obese and non-obese children and adolescents with low levels of VIT-D. **Methods:** 59 obese and 38 non-obese youngsters with low levels of VIT-D, 7–15 year-olds, were evaluated. Measurements included anthropometric variables (waist circumference- WC and BMI), metabolic measurements by venipuncture (plasma lipids, glucose, insulin, VIT-D and alanine aminotransferase - ALT), abdominal fat by dual-energy X-ray absorptiometry. Homeostatic model assessment - HOMA was calculated. Relationships between VIT-D and metabolic risks were examined using binary and partial correlations. Analyzes were performed with SPSS 20.0 for Macintosh (p≤0.05). **Results:** In obese subjects, significant negative correlations were observed between VIT-D and WC, ALT, insulin, glucose and HOMA. For the non-obese sample, significant results were observed between VIT-D and WC, ALT and insulin. When adjusted for abdominal fat, no significant result was observed. **Conclusions:** VIT-D is related to several metabolic risk factors in obese and non-obese children and adolescents. When adjusted for abdominal fat, these relationships disappeared. Further studies are needed to clarify the role of abdominal fat in the relationship between VIT-D and metabolic risks in non-obese children with low VIT-D.

T-641-P[DT]
Obese Minority Youth May Need More Than 60 Minutes of Physical Activity Per Day

Arushi P. Mahajan, Kathryn Brogan, Angela J. Jacques-Tiura, Sylvie Naar-King, Deborah Ellis, Kai-Lin, Catherine Jen *Detroit, MI*

Background: Obesity is highly prevalent in minority youth. Physical activity (PA) in obese African American (AA) adolescents is an understudied, yet potentially efficacious, strategy for treatment. Therefore, our aim was to describe the type and intensity of PA by recall in obese AA adolescents. **Methods:** A sample of 151 obese AA adolescents (BMI 37.78±7.13, age 13.72±1.34 yrs, 70% female) completed the 3 day Physical Activity Recall (Pate, 2003) before starting a 6 month behavioral weight loss trial. Participants self-reported activities in 30 minute blocks from 7am to 12am. **Results:** The most commonly endorsed activities were sedentary: sleeping (99% of participants, 3.31±1.84 hrs/d overall), watching TV/movie (83%, 1.71±1.62 hrs/d), and eating a meal (80%, 0.74±0.84 hrs/d). Participation in a sport, cardio, or strength activity was reported by 60% of the youth. The most common were walking briskly (23%, 0.20±0.54 hrs/d), P.E. class (20%, 0.12±0.29 hrs/d), and playing basketball (15%, 0.16±0.61 hrs/d). Moderate intensity activities were endorsed by 76% with a mean of 1.12±1.23 hrs/d. Vigorous activities were endorsed by 48% with a mean of 0.68±1.13 hrs/d. **Conclusions:** Our data indicates that this group of obese AA adolescents report spending most of their time in sedentary activities. Interestingly, these adolescents met the CDC recommendations for moderate to vigorous time spent doing PA, although some level of self-report bias may be present. Greater amounts of PA coupled with a focus on caloric intake may be indicated for treatment of obesity in minority youth.

T-642-P
The Effect of Obesity on Chest Radiography, from the Database of Preoperative Autologous Blood Donation (PABD)

Naohito Saito *Yokohama, Japan*; Kimie Kumagai, Daisuke Horiguchi, Kazuyoshi Watanabe *Koshigaya, Japan*; Osamu Toyoshima *Yokohama, Japan*; Chieko Matsumoto, Satoru Ozeki *Koshigaya, Japan*

Background: The severities and the population of Obesity and its complications are increasing, but its effect on respiratory system is not considered enough. We established database of PABD (DBPABD), in which we analyzed the effect of BMI on lung size. **Methods:** We defined Transverse Cardiac Distance (TCD), Transverse Radius of the Thorax (TRT), Longitudinal Pulmonary Distance (LPD) and Sagittal Pulmonary Distance (SPD). We statistically analyzed the measurements with using previously studied Cardiothoracic Ratio (CTR) and obesity definition (25≦BMI) among Asians in Japan. **Results:** Asians of 359 people (202 female, 157 male) in Japan engaged in PABD from 1st June 2010 to 30th May 2012. BMI of female population increased till age of 80 years old, while BMI of male population increased till age of 60 years old. Some of the people (40 or more years old, n = 295, female 154, male 141) were classified into 250 (BMI<25) or 251 (25≦BMI). Both in female and male, the elongation of CTD, the elongation of TRT, the shortening of left LPD and the shortening of right LPD were statistically significant, while the increase of CTR was significant only among female population. SPD of 251 was longer compared to SPD of 250 both among female (n = 137) and male (n = 88) population, which was statistically significant. FEV1% increased among male obese population, when we stratified BMI every 2 kg/m2 and FEV1% every 5% without excepting for the population of respiratory diseases. **Conclusions:** To our knowledge, this is the first report on measurements of the lung and the thorax among obese people. FEV1% might not decrease among obese people of DBPABD contrary to studies from other groups.

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

Genetic Epidemiology

T-643-P
A Genome-Wide Association Study Identifies SLC2A9 As a Strong Determinant of Serum Uric Acid Levels in Hispanic Children

V. Saroja Voruganti, Sandra Laston, Karin Haack *San Antonio, TX*; Nitesh Mehta *Houston, TX*; Shelley A. Cole *San Antonio, TX*; Nancy F. Butte *Houston, TX*; Anthony G. Comuzzie *San Antonio, TX*

Background: Elevated levels of serum uric acid (SUA) are associated with increased risk for gout, cardiovascular and renal diseases. Studies in adults have consistently shown association of solute carrier family 2, member 9 (SLC2A9) single nucleotide polymorphisms (SNPs) with variation in SUA. However, it is not known whether this association of SUA with increased disease risk and/or SLC2A9 SNPs extends to children. Thus, our aim was to investigate whether variation in SUA is under genetic influence and whether the association with SLC2A9 SNPs generalizes to Hispanic children of the Viva La Familia Study. **Methods:** We conducted a genome-wide association study with 1.1 million SNPs using the Illumina Infinium technology in 815 children. **Results:** We found SUA to be significantly heritable (h2 =0.45 (0.08), p = 5.8 x 10-11) and a significant association (p < 10-09) of SLC2A9 SNPs with variation in SUA. Several of the significantly associated SNPs (rs6449213,rs10805346,rs1014290 and rs737267) were previously associated with SUA in adults of various populations.We also found positive genetic correlations between SUA and BMI z-score (rhog = 0.45, p = 0.002), percent fat (rhog = 0.28, p = 0.04), fat mass (rhog = 0.34, p = 0.02), waist circumference (rhog = 0.42, p = 0.003) and waist/height ratio (rhog = 0.46, p = 0.001). **Conclusions:** The results show that variation in SUA in children is under significant genetic influence and is associated with obesity-related phenotypes.

In addition, GWAS results of SUA in adults extend to children suggesting its additional importance as a pediatric biomarker of disease risk.

T-644-P[DT]

Pediatric Insulin and Glucose Concentrations Respond to the Interaction Trans Fat and Carbohydrate Consumption with Amerindian Genetic Background

Michelle M. Bohan Brown, Jose R. Fernandez *Birmingham, AL*

Background: Research has suggested that culturally-influenced diets consumed by culturally-defined populations may result in healthier metabolic outcomes, suggesting that the effect of food consumption and disease risk factors can be mediated by individual's ancestral genetic predisposition. Therefore, we explore if variability in insulin-related outcomes in children could respond to the interactive effect of dietary intake and genetic ancestral background. **Methods:** Measures of insulin sensitivity index (Si), acute insulin response to glucose (AIR), fasting insulin and fasting glucose were obtained from 262 multiethnic children through an intravenous glucose tolerance test. Measures of total carbohydrate, added sugar, and total, saturated (SFA), monounsaturated (MUFA), polyunsaturated (PUFA) and trans (TFA) fats were obtained from two 24 hour dietary recalls. Regression models evaluated the independent and interactive effects of dietary measures and Amerindian genetic admixture (ADM) on insulin-related outcomes, after adjusting for standard covariates. **Results:** The interaction of ADM and total carbohydrate was significantly associated with fasting insulin (p=0.0124). Fasting glucose was associated with the interaction of ADM and TFA intake (p=0.0372). There was no association of AIR or Si with the interaction of ADM and any of the dietary intake variables. The interaction models explained more of the variance than the model with ADM alone (1.86 % for fasting glucose and 2.19% for fasting insulin). **Conclusions:** Our study indicates that fasting insulin and glucose in children may be dependent on how ancestral background interacts with dietary consumption. This finding may be useful in developing strategies for the prevention of diabetes using culturally relevant diets.

T-645-P

Obesity Exacerbates Genetic Predisposition for Hypertriglyceridemia

Christopher Cole, Majid Nikpay, Mary-Ellen Harper, Robert Dent, Ruth McPherson *Ottawa, Canada*

Background: The Global Lipids Genetics Consortium* identified 95 common loci that explained 12.2% (LDL-C), 12.1% (HDL-C) and 9.6% (triglycerides [TG]) of total variance in plasma lipid traits in the Framingham Heart Study. Since adiposity is associated with plasma levels of TG and HDL-C, we hypothesized that the predictive value of common risk variants for these lipid traits would differ for obese versus lean subjects. **Methods:** The study population consisted of two independent cohorts of subjects of European descent, genotyped on the Affymetrix 6.0 array with 1000G imputation. 1) OBLE: 959 obese/869 lean. 2) CC (healthy elderly subjects recruited as controls for a CAD study) 830 obese/1,044 lean. A genetic predisposition score was calculated for each individual as a sum across SNPs of the number of risk alleles at that SNP multiplied by the effect size of the SNP. **Results:** In the OBLE cohort, a genetic risk score explained a greater percentage of the total TG variance in obese vs lean (beta GRS=0.154 mmol/L (p<2e-16) vs 0.094 mmol/L (p=5.8e-10); adjusted R2 =0.090 vs 0.042), a finding that was replicated in the CC cohort for obese vs lean (beta GRS=0.153 mmol/L (p=1.5e-7) vs 0.102 mmol/L (p=4.2e-6); adjusted R2 =0.044 vs 0.024). A similar but less significant trend was noted for LDL-C. In addition, the genetic risk score predicted variability in TG better than sex/age for obese subjects. In contrast a genetic risk score for HDL-C was a better predictor of this trait in lean versus obese subjects in both the OBLE and CC cohorts. Genetic risk scores for each lipid trait showed no association with BMI (P>0.2) indicating that the above findings are not due to possible overlap between genetic loci for BMI and lipid traits. **Conclusions:** Genetic predisposition to elevated plasma triglycerides and LDL-C and low HDL-C is highly sensitive to extremes of BMI.

T-646-P

DNA Methylation Patterns in Blood from Successful Weight Loss Maintainers Resemble Normal Weight Individuals and Differ from Obese Individuals

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Background: A role for DNA methylation in obesity has been established in animal models. Emerging research further indicates that change in weight through intentional weight loss in obese adults may change methylation of specific genes in adipose tissue and peripheral blood mononuclear cells (PBMCs). **Methods:** We examined DNA methylation patterns in PBMCs of 16 normal weight participants (NW; mean BMI=21.9, SD=1.8), 16 obese participants (mean BMI=34.6, SD=3.7) and 16 successful weight loss maintainers who lost sufficient weight to go from obesity to normal weight and maintained the weight loss for at least three years (SWLM; mean maximum BMI=33.0, SD=3.1, mean current BMI=23.8, SD=1.6). We used autosomal loci from the Illumina 450K methylation chip and corrected for age, gender, and the normal cell lineages of the PBMCs. **Results:** Two peaks emerged in three-group, chip-wide analyses, including RYR1 (cg05254946, p=1.54E-06), which plays a critical role in calcium efflux from skeletal muscle during muscle contraction, and TUBA3C (cg22274414, p=4.78E-06), previously associated with insulin levels. In post-hoc analyses, both NW and SWLM differed significantly from currently obese individuals (RYR1 cg05254946: NW-obese, p=1.32E-04, SWLM-obese, p=8.76E-06; TUBA3C cg22274414: NW-obese, p=3.30E-05, SWLM-obese, p=1.79E-05) but did not differ from each other (RYR1 cg05254946: NW-SWLM, p=0.11; TUBA3C cg22274414: NW-SWLM, p=0.30). **Conclusions:** These data indicate that SWLM had peripheral blood DNA methylation profiles that resembled normal weight individuals but differed from obese individuals at two loci. Further studies are needed to understand the mechanisms through which obesity is associated with DNA methylation and the role of successful weight loss in altering these associations.

T-647-P

This abstract has been withdrawn.

T-648-P[DT]

Genome-Wide Association Study of Percentage Fat Mass (PFM) in Africans

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Background: African populations have, for the most part, not been adequately represented in the ongoing global efforts to understand the biology of obesity. Here, we conducted the first genome-wide association study (GWAS) of percentage fat mass (PFM) in Africans living on the continent. **Methods:** The study participants comprised 1808 Africans enrolled in the Africa America Diabetes Mellitus (AADM) study. PFM was measured using bioelectric impedance analysis (BIA). Genotyping was carried out using the Affymetrix Axiom PANAFR SNP array (~2.1 million SNPs) imputed using the latest 1000 Genomes cosmopolitan reference for a total of 15 million SNPs included in the analysis. Association tests were adjusted for age, gender, T2D, BMI, and the first 3 principal components (PCs) of the genotypes. **Results:** At genome-wide significance level of 5x10-8, 19 loci located on 9 distinct chromosomes were associated with PFM. The Top-ranked SNP (rs189658072, p=2.6 x10-13) is an intronic variant located on chromosome 6 in laminin alpha 2 gene (LAMA2). LAMA2, an extracellular protein, participates in cell integrity and movement. Other members of the laminin gene family were previously associated with body composition (LAMA5) or were significantly induced along with other extracellular matrix proteins (ECM) in obese adipose tissue. **Conclusions:** This first GWAS of PFM in Africans identified loci that may be related to the importance of ECM in the biology of obesity and related traits.

T-649-P

How Sweet It Is? Taste Genetics Influence Children's Intake of Sweet vs. Savory Foods at an Ad Libitum Buffet

Kathleen L. Keller *University Park, PA*; Annemarie Olsen *Copenhagen, Denmark*; Karol Meyermann, Christopher van Belle *New York, NY*; Rachel Bloom, Terri L. Cravener *University Park, PA*

Background: Inherited sensitivity to the bitter taste of 6-n-propylthiouracil (PROP) has been associated with dietary selection. We previously used questionnaires to show that children who are PROP tasters reported greater intake of sweets and lower intake of meats (savory fats) relative to nontaster children. Laboratory studies are needed to confirm these findings. **Methods:** 75 children (mean ± SD age = 5.04 ± 0.77 y. and BMI z-score = 1.0 ± 1.02 kg/m2) from diverse ethnicities attended 4 laboratory sessions, the last of which included a highly palatable buffet consisting of savory-fats (e.g. pizza), sweet-fats (e.g. cookies, cakes), and sweets (e.g. juices, candies). Children were classified as tasters (n=53) or nontasters (n=22) using standard screening procedures. Height and weight were measured on the first visit. Data were analyzed by ANOVA with intake from savory fats, sweet-fats, and sweets as dependent variables and PROP status as the independent variable. BMI z-score was a covariate in all analyses. **Results:** Taster children consumed more calories from sweet foods than nontasters, 191.2 ± 111.0 kcals (tasters) vs. 137.6 ± 91.8 kcals (nontasters). Nontaster children consumed 50 kcals more from savory-fats than taster children, but BMI z-score strongly influenced this model (p<0.001) and the effect of PROP status was not significant. Intake of sweet-fats did not differ by weight or PROP status. **Conclusions:** At a highly palatable meal, PROP taster children preferentially consumed more sweets than nontaster children, while heavier children consumed more savory fats. These findings may have implications for understanding differences in susceptibility to hyperphagia in children.

T-650-P

The Methylation of the LEPR/LEPROT Genotype at the Promoter and Body Regions Influence Concentrations of Leptin and BMI in Girls at Age 18 Years If Their Mother Smoked During Pregnancy

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Background: Leptin binds to the leptin receptor encoded by the LEPR/LEPROT genotype. To determine whether DNA methylation (DNA-M) of the leptin receptor genotype (LEPR/LEPROT) links gestational smoking and leptin serum levels and BMI later in life, we focused on female offspring, 18 years of age, from the Isle of Wight Birth Cohort (IOWBC). **Methods:** Using general linear models, we tested a two-stage model. First, we investigated whether single nucleotide polymorphisms (SNPs) acting as methylation quantitative trait loci (methQTLs) depending on gestational smoking were related to differentially methylated cytosine-phosphate-guanine (CpG) sites . In stage 2, we tested whether the selected CpG sites, in interaction with other SNPs (modifiable genetic variants, modGV), were associated with serum leptin and BMI (stage 2). Children from the IOWBC were followed from birth to age 18. Information on gestational smoking was gathered upon delivery. SNPs tagging LEPR and LEPROT genes were genotyped. Data on LEPR/LEPROT DNA-M and leptin were obtained from blood samples drawn at age 18; to determine BMI, height and weight were ascertained. Blood samples were provided by 238 girls. **Results:** Of the 21 CpG sites tested, interactions between gestational smoking and SNPs were detected for 16 CpG sites. Methylation of seven of the 16 CpGs were, in interaction with modGVs, associated with leptin levels at age 18 years. Two CpG sites survived a multiple testing penalty, were associated with leptin and with BMI. **Conclusions:** This two-stage model may explain why maternal smoking has a long-term effect on leptin levels and BMI in girls at age 18 years.

T-651-P

Niemann-Pick C1 Gene Variants and Association with Obesity or Diabetes in New Mexico Populations

William Garver, David Jelinek, Joseph C. Castillo, Randall Heidenreich, Li Luo, Lesley de la Torre, William F. Rayburn, Vallabh O. Shah *Albuquerque, NM*

Background: A Niemann-Pick C1 (*NPC1*) gene variant cluster (His215Arg/Ile858Val) has been found to be associated with extreme (early-onset and morbid adult) obesity in European populations. More recently, another *NPC1* gene variant (Ile642Met) has been found to be associated with diabetes independent of body weight in a Saudi Arabian population. **Methods:** To further investigate the *NPC1* gene in relation to these distinct but often interrelated metabolic diseases we determined the frequency of these *NPC1* gene variants and association with obesity or diabetes using two different adult cohorts in our ethnically diverse New Mexican population. **Results:** The results indicated no significant difference in frequency of the His215 risk allele for obesity among self-identified Caucasians, Hispanics, or Native Americans. In contrast, there was a significantly increased frequency of the Ile858 and 642Met risk alleles for obesity and diabetes, respectively, among Hispanics and Native Americans compared to Caucasians. With respect to these *NPC1* gene variants and association with obesity or diabetes in our population, we replicated previous studies indicating that the His215 and Ile858 risk alleles were significantly associated with obesity (BMI ≥ 30 kg/m2), in addition to pre-type 2 diabetes (HbA1c = 5.70-6.49) and type 2 diabetes (HbA1c ≥ 6.50) when adjusted for age, gender, and ethnicity. However, we were unable to replicate previous studies indicating that the 642Met risk allele is associated with diabetes when adjusted for age, gender, and ethnicity. **Conclusions:** Therefore, further studies are needed to determine whether the different *NPC1* gene variants are capable of predisposing to these distinct metabolic diseases.

T-652-P

Association of FTO Gene and Obesity among Children in Qatar

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Background: The fat mass and obesity–associated (FTO) gene has been associated with obesity and in a genome wide association studies. Our aim is to study the associations between the following variants in FTO, (rs9939609, rs8050136, rs1421085,) among Qatari children. **Methods:** A total of 52 unrelated children aged 6 up to 18 years old Qatari, living in Qatar. The children will be recruited from pediatric obesity and school care clinic-Hammad Hospital-Qatar. The study subjects were diagnosed as obese (n=22) and non-obese (control, n=30) based upon the criteria IOTF. Blood sample were drawn for genotyping for FTO gene variants using TaqMan assay. **Results:** The mean age (years) and (SD) of the obese subjects (10.92±2.31) were not significantly different than control (10.71±2.32),p=0.790. The body mass index (kg/m2) was significantly higher in obese (28.97±4.29) than in control subjects (17.48±4.37),p<0.001. The frequency distribution in (%) of the genotypes for rs8050136 were (AA: 20.0, 46.7; AC: 45.0, 46.6; CC: 35.0, 6.7) for control and obese respectively, p=0.083. The frequency distribution in (%) of the genotypes for rs1421085 were (CC: 20.0, 33.3; CT: 50.0, 53.3; TT: 30.0, 13.4) for control and obese respectively, p=0.233. The frequency distribution in (%) of the genotypes for rs9939609 were (AA: 23.8, 46.7; AT: 38.1, 6.7; TT: 38.1, 46.6) for control and obese respectively, p=0.021. Only the carriers of the risk allele A for rs8050136 increases the risk of obesity with odds ratio 3.15 and 95% confidence interval (1.15-8.95), p=0.023. The odds ration and 95% CI showed that AA+AC Vs. CC carriers of rs8050136 was 7.54 (1.43-23.21), p=0.036. The other polymorphism was not significantly associated with the the obesity. **Conclusions:** FTO rs8050136 variant is associated with an increased risk of Obesity in Qatari children.

T-653-P[DT]

Associations of Genetic and Environmental Risk Factors with Obesity and Cardiometabolic Outcomes in Underserved African-American Adults

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Background: African Americans experience among the highest rates of obesity in the U.S., and its development may be largely influenced by genetic risk. Additionally, genetic factors may interact with environmental risk to influence obesity and related outcomes. This study aims to test the direct and interacting effects of genetic risk factors previously studied in populations of European descent, on cardiometabolic outcomes in African American adults residing in high-risk environments. **Methods:** Data were collected in 430 African American adults living in underserved communities (poverty rates of 23-39%). Buccal swabs were collected for genotyping single nucleotide polymorphisms (SNPs). Blood pressure, anthropometric, accelerometry-estimated physical activity, psychosocial, and environmental (e.g. community-level socioeconomic status, neighborhood satisfaction) data were obtained using standard protocols. Preliminary genotyping was done using samples from 40 participants with varied phenotypes based on waist circumference and body mass index (BMI) distributions; analyses within the larger sample are ongoing. **Results:** The sample is predominantly female (65%) and preliminary findings showed that a BDNF SNP (rs925946) was associated with larger waist circumference (BDNF, r=.36, p<0.05) and a trend toward larger composite BMI-waist circumference (BDNF, r=.30, p=.10). An FTO SNP (rs1121980) was not associated with outcomes in this small subsample. **Conclusions:** Findings support a role of genetic risk in cardiometabolic outcomes for African American adults, and the effects demonstrated in this small sample suggest that the relation of BDNF may be robust. Future investigation of gene-environment interactions within the larger sample may inform a more comprehensive understanding of obesity in African American adults in high-risk environments.

T-654-P

Association of a Variant at 15q26.1 with Long-Term Weight Regain After Bariatric Surgery

Laura J. Rasmussen-Torvik, Jennifer A. Pacheco, Sharon Aufox, Kwang-Youn Kim, Eric Hungness, Maureen Smith, Mercedes Carnethon, Philip Greenland *Chicago, IL*

Background: A recent GWAS showed a SNP at 15q26.1 to be associated with peak weight loss after gastric bypass. We examined the association of SNP rs2200674 with long-term weight loss and weight regain after gastric bypass. **Methods:** Participants in Northwestern University's biobank (NUgene) who donated DNA and gave researchers permission to access their electronic health records (EHR) were included. Individuals who had undergone gastric bypass were identified through billing, surgical history, or procedure codes. Surgery dates as well as all available weight measurements (and associated dates) were extracted from the EHR. Demographics were obtained from the NUgene intake questionnaire. Linear mixed effects models were implemented in SAS PROC MIXED to model weight loss from 1- 9.5 years post-surgery. SNP rs2200674 (in nearly perfect LD with rs17702901 in Caucasians) was typed on stored DNA. Marginal effects of the SNP and its interactions with post-surgical time were included in models. **Results:** 77 individuals in the biobank had undergone Roux-en-Y gastric bypass, self-identified as white, had genotyping, and had at least 1 weight measurement 1 year post-surgery. There were 1059 weight measurements in the dataset. Four individuals in the dataset were heterozygous for the minor allele of rs2200674. SNP rs2200674 was not significantly associated with overall long-term weight loss, but was nearly significantly associated with weight regain after surgery (p-interaction = 0.12). Individuals heterozygous for the minor allele regained about 3% more of their initial weight each year post-surgery than those without the allele. **Conclusions:** SNP rs2200674 may be associated with weight regain after gastric bypass surgery. These results are very preliminary and SNPs in this region should be further investigated with post-surgical phenotypes in larger populations.

T-655-P[DT]

Racial Variation in the Distribution of Demographics, Body Mass and Weight-Related Medical Co-Morbidities among the Mega-Obese: Analysis of 1,673 BOLD Database Patients

Ezekiel F. Adewale, Gus J. Slotman *Vineland, NJ*

Background: Interaction of race and medical problems in the mega-obese is unknown. This study identified racial variations of weight, BMI, and co-morbidities in severely obese patients. **Methods:** Surgical Review Corporation's BOLD data on 1,673 patients who were pre-op for duodenal switch was analyzed in four groups: African-American (n= 131), Caucasian (n=1,380), Hispanic (n=48), and Other (Pacific Islands, Native American, or >1 race recorded; n=108). Age, weight and Body Mass Index (BMI) underwent analysis of variance. Dichotomous variables were assessed by Chi-squared. **Results:** Results: African-American Caucasian Hispanic Other p value Age 41+-10 46+-11 42+-11 42+-11 <0.05 Weight (kg) 161+-32 148+-33 145=-33 150+-33 <0.05 BMI 57+-10 52+-9 53+-11 52+-9 <0.05 Hypertension 60.31% 63.99% 56.25% 52.78% <0.05 Sleep Apnea 63.36% 62.1% 50% 45.37% <0.01 Pulmonary Hypertension 6.11% 13.62% 14.58% 5.56% <0.001 Diabetes 35.11% 43.62% 52.08% 27.78% <0.01 Cholelithiasis 12.98% 22.75% 20.83% 21.3% <0.05 Hyperlipidemia 28.24% 46.81% 52.08% 33.33% <0.0001 Depression 33.33% 44.49% 31.25% 13.89% <0.0001 Unemployed 24.43% 31.45% 45.83% 17.59 0.0013 **Conclusions:** Conclusions: In mega-obesity, severe co-morbidities are common and vary by race. African-American weight and BMI are greatest. Caucasians and African-Americans have highest hypertension and sleep apnea. Diabetes, pulmonary hypertension, and hyperlipidemia are most frequent among Caucasians and Hispanics. Caucasians are oldest and have depression most often. Hispanics are unemployed at the highest rates. Clinical suspicion for these race-related clinical factors should be heightened in managing extremely obese patients. Attention to these findings may facilitate pre-surgical preparation, and could help optimize obesity outcomes.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Bone

T-656-P

Physiologic Relevance of Lipid Profile on Bone Modeling in Obese Children

Anna L. Newton, Lynae J. Hanks, Krista Casazza *Birmingham, AL*

Background: The prevalence of fracture has increased in obese children indicating an impaired metabolic milieu with excess adiposity. While investigations into explanatory mechanistic pathways have primarily focused on glucose dysregulation, physiologic lipid distribution is integral and has been relatively underappreciated. Obesity-induced perturbations in lipid homeostasis represents a potential physiologic mechanism underlying impaired bone integrity in obese children. The objective of this study was to investigate the association between lipid profile and markers of bone turnover in obese early pubertal females on a six-week eucaloric diet. **Methods:** Participants included white and black girls (BMI%ile ≥85th; n=12) ages 8-11 years. Bone mineral content (BMC) and total fat were assessed by DXA. Measures of bone deposition (P1NP) and resorption (CTX,) and lipid metabolism (Chol; HDL; LDL; TG) were assessed from a fasting blood sample. **Results:** In the absence of substantial weight change all measures of lipid metabolism decreased over the six-week eucaloric period with the exception of HDL, which increased. An inverse association between CTX and change in Chol, LDL, and TG was observed (r=-0.77, -0.82, -0.71; all p≤0.05, respectively), whereas change in HDL was positively associated with P1NP (r=0.76, p=0.03). **Conclusions:** Improvements in lipid profile were associated with markers of increased bone mineralization, suggesting that optimizing the lipid profile through diet may confer greater balance in the bone modeling process in obese children. Understanding the relationship between lipid metabolism and bone homeostasis is paramount to intervention efforts to support healthy bone formation.

T-657-P

Is a Blast Off in FGF23 a Factor Underlying Fracture During Growth?

Lynae J. Hanks, Krista Casazza, Ambika P. Ashraf, Orlando M. Gutierrez
Birmingham, AL

Background: The increased fracture risk in obese children suggests excess adiposity may have an adverse effect on the growing skeleton. While obesity has been associated with increased densitometric bone measures, qualitative assessments of bone have indicated impaired bone structure. Thus identification of signaling factors and pathways which correspond with bone phenotypes early in the lifecourse is essential. The bone-derived hormone fibroblast growth factor- 23 (FGF23), integral in systemic phosphorus regulation with an inhibitory role in bone mineralization, has emerged as a potential mediator of bone quality. However, data on FGF23 in children is lacking. **Methods:** We investigated associations of FGF23 with body composition in children and the extent to which obesity may influence the relationship. FGF23, fat mass, and bone mineral content (BMC) and density (BMD) were assessed in twenty-five children ages 7-11yr (36% male). All of the females and a third of the males were obese. **Results:** There were no differences in age, height, BMC, BMD or FGF23 by weight status. In boys, mean FGF23 was higher in those who were obese vs. lean (p=0.02). Bivariate correlations revealed a positive association between FGF23 and height (p=0.06), weight (p=0.02), BMD (p=0.03) and total fat (p=0.03). After controlling for height and pubertal stage, FGF23 was marginally correlated with total fat in females (r=0.44, p=0.11), and was inversely associated with BMD (r=-0.98, p=0.02) in lean boys. **Conclusions:** These data suggest that FGF23 concentrations are associated with body composition in children and that the magnitude and direction of these associations may differ by obesity status.

T-658-P

Osteogenic and Anti-Adipogenic Effects of Guggulsterone in Human Mesenchymal Stem Cells

Srujana Rayalam *Suwanee, GA*; Jeong Yeh Yang, MaryAnne Della-Fera, Clifton A. Baile *Athens, GA*

Background: The accumulation of adipocytes in bone marrow is a major factor contributing to age-related bone loss. Mesenchymal stem cells (MSC) within bone marrow can differentiate to form either adipocytes or osteoblasts and factors that suppress adipocyte differentiation have beneficial effects on bone formation. In this study, the anti-adipogenic and osteogenic effects of guggulsterone (GS), a natural phytosterol found in the resin extracted from the bark of Commifora mukul, was investigated in human MSC cultures. **Methods:** Commercially available hMSC were cultured under adipogenic or osteogenic conditions, as recommended by the supplier with slight modifications. Effect of GS treatment on adipogenesis was determined by treating post confluent hMSC with adipogenesis induction and maintenance media and quantitating lipid content using Nile Red dye based AdipoRedTM assay kit. For osteogenesis assays, pre-confluent hMSCs cultured in osteogenic induction medium were treated with GS and alkaline phosphatase activity and cell proliferation were determined after 10 days of treatment. Osteoblast mineralization (calcium deposition) was measured after 10 and 22 days of treatment. **Results:** Results indicated a dose-dependent effect of GS on inhibiting lipid deposition in hMSC cultured under adipogenic conditions. GS stimulated osteogenic differentiation in hMSC as indicated by increases in alkaline phosphatase activity at day 10 (P < 0.05) and calcium deposition at days 10 and 22 after induction of differentiation. In addition, GS increased the proliferation of osteoblasts derived from hMSC (P<0.05). **Conclusions:** In summary, guggulsterone exerts favorable effects on bone formation by influencing the differentiation potential of human mesenchymal stem cells derived from bone marrow.

T-659-P

Preliminary Analysis of Selected Interactions between Adipose Tissue and Bone Metabolism in Humans

Wojciech Blogowski, Lukasz Blazkowski, Karol Serwin, Marta Budkowska, Daria Salata, Barbara Dolegowska, Marek Lokaj, Piotr Prowans, Teresa Starzynska *Szczecin, Poland*

Background: Recent experimental studies suggest existence of a metabolic cross-talk between adipose tissue (AT) and bone metabolism (so called "bone-fat" axis). However, till today little is known about the direct composi-

tion of human AT environment in terms of key molecules influencing bone (marrow) metabolism. **Methods:** In this study we analyzed blood and AT samples (35 subcutaneous and 35 omental) derived from individuals undergoing elective surgery. Plasma and AT-derived interstitial fluid levels of parathormone (PTH), osteocalcin and stromal-derived factor-1 (SDF-1) were measured and compared between lean, overweight and obese individuals. **Results:** We found that obese patients had significantly lower plasma osteocalcin, and higher SDF-1 and PTH levels (p<0.05 for all). Importantly, AT levels of all examined substances were significantly lower than the corresponding levels in the plasma (in all cases at least P<0.05), and depot-specific differences in levels of examined parameters were observed. AT PTH and osteocalcin values were associated with SDF-1. Subcutaneous and visceral/omental concentrations of osteocalcin and PTH, were strongly associated with values of such parameters as age, body mass or adiposity indexes (BMI and BAI, respectively) and/or waist-to-hip ratio (WHR). **Conclusions:** In summary, our study demonstrated that obese patients have significantly different composition of AT environment in terms of levels of molecules regulating bone (marrow) metabolism, and this seemed to be associated with systemic changes in PTH, osteocalcin and SDF-1. Our study also offers further indirect translational evidence for existence of a biochemical cross-talk between bone and AT metabolism (so called "bone-fat" axis) in humans.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Adipose - Cellular and Whole Body Studies

T-660-P

5-aza-2 Deoxycytidine Ameliorates Atherosclerosis Through Suppressing Macrophage Inflammation

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Background: Inflammation marks all stages of atherogenesis. DNA hypermethylation in whole genome or in specific genes is associated with inflammation and cardiovascular diseases. **Methods:** We aim to study the role of DNA methylation in atherosclerosis. Low density lipoprotein receptor knockout (LDLR-/-) mice were put on an atherogenic diet and administrated with either saline or the DNA methyltransferase inhibitor 5-aza-2-deoxycytidine (5-aza-dC) (0.25mg/kg) for up to 30 weeks. The development of atherosclerosis was analyzed. **Results:** 5-aza-dC treatment markedly decreased the formation of atherosclerotic plaques in LDLR-/- mice without changes in body weight, plasma lipid profile and macrophage cholesterol content. Instead, this effect was associated with decreased macrophage content and suppressed macrophage inflammation in atherosclerotic plaques. Specifically, 5-aza-dC treated macrophages had down-regulated expression of genes involved in inflammation (TNF-α, IL-6, and iNOS) and chemotaxis (CCL2, CCL5 and CCL9), which in turn resulted in attenuated migration and adhesion to endothelial cells. 5-aza-dC also suppressed macrophage endoplasmic reticulum (ER) stress, a key upstream signal that activates macrophage inflammation and apoptotic pathways, and reduced apoptosis in atherosclerotic plaques. Finally, 5-aza-dC demethylated liver X receptor α (LXRα) and peroxisome proliferator-activated receptor γ1 (PPARγ1) promoters, which are both enriched with CpG sites. This led to over-expression of LXRα and PPARγ, which may be responsible for 5-aza-dC's anti-inflammatory and atheroprotective effects. **Conclusions:** Our findings provide strong evidence that DNA methylation plays a significant role in cardiovascular diseases and may serve as a therapeutic target for the prevention and treatment of atherosclerosis.

T-661-P

Epigenetic Regulation of Macrophage Polarization by DNA Methyltransferase 1 (DNMT1)

Xianfeng Wang *Winston-Salem, NC*; Qiang Cao *Atlanta, GA*; Liqing Yu *College Park, MD*; Bingzhong Xue, Hang Shi *Atlanta, GA*

Background: Obesity is associated with increased classically activated M1 adipose tissue macrophages (ATMs) and reduced alternatively activated M2 ATMs, which contributes to insulin resistance. Epigenetic mechanisms play important roles in complex diseases including obesity and insulin resistance.

Methods: We have used macrophage-specific DNMT1 knockout mice (MD1KO) as a tool to study the role of DNA methylation in the regulating of macrophage polarization and inflammation. **Results:** DNMT1 is significantly induced in macrophages exposed to the saturated fatty acid (SFA) stearic acid and the pro-inflammatory cytokine TNFα, is higher in ATMs from obese mice, but is significantly lower in M2 than in M1 ATMs. Macrophages from MD1KO mice have significantly up-regulated M2 markers, including arginase 1 (ARG1), mannose receptor, Dectin-1, interleukin 1 receptor antagonist, interleukin 10, and peroxisome proliferator-activated receptor γ1 (PPARγ1), key regulator of M2 macrophage activation; whereas over-expressing DNMT1 profoundly suppresses interleukin 4-induced ARG1 and PPARγ1 expression. PPARγ1 promoter is enriched with CpG sites. Macrophages from MD1KO mice have significantly decreased, whereas macrophages treated with stearic acid and TNFα have significantly increased PPARγ1 promoter DNA methylation. Finally, MD1KO mice have lower adipose tissue inflammation and significantly improved insulin sensitivity without altering body weight. **Conclusions:** In summary, DNMT1 plays an important role in regulating macrophage polarization and inflammation. Inhibiting DNA methylation by DNMT1 at PPARγ1 promoter in macrophages promotes M2 macrophage polarization and suppresses inflammation; whereas in obesity, elevated SFAs and pro-inflammatory cytokines enhance PPARγ1 promoter DNA methylation, which contributes to deregulated ATM polarization, inflammation and insulin resistance.

T-662-P

5-aza-2 deoxycytidine Improves Insulin Sensitivity Through Promoting Macrophage Alternative Activation

Xianfeng Wang *Winston-Salem, NC*; Qiang Cao *Atlanta, GA*; Liqing Yu *College Park, MD*; Hang Shi, Bingzhong Xue *Atlanta, GA*

Background: Obesity is associated with deregulated adipose tissue macrophage (ATM) polarization and inflammation, which contributes to insulin resistance. **Methods:** In this study, we aim to investigate the role of DNA methylation in the regulation of macrophage polarization, inflammation and insulin sensitivity. 5-aza-2-deoxycytidine (5-aza-dC) was used as a DNA methylation inhibitor. **Results:** Macrophages treated with 5-aza-dC have significantly increased expression of alternatively activated M2 macrophage markers, including arginase 1, mannose receptor, interleukin (IL) 10, IL4 receptor α and IL1 receptor antagonist. Pretreating macrophages with 5-aza-dC for 4 days significantly inhibited lipopolysaccharide- and stearic acid-induced TNFα expression and secretion. 3T3L1 adipocytes co-cultured with 5-aza-dC-pretreated macrophages have significantly improved insulin-stimulated signaling events, insulin-stimulated glucose uptake, and reduced expression of pro-inflammatory cytokines. Treating diet-induced (DIO) or genetically (*ob/ob*) obese mice with 5-aza-dC resulted in improved insulin sensitivity without changes in body weight. This was associated with increased M2 ATM content and reduced adipose tissue and ATM inflammation. Finally, peroxisome proliferator-activated receptor γ1 (PPARγ1) may be an epigenetically regulated target, as 5-aza-dC significantly increased PPARγ1 expression, which is associated with reduced DNA methylation at PPARγ1 promoter; whereas stearic acid and TNFα profoundly suppressed PPARγ1 expression in macrophages, which is associated with increased DNA methylation at PPARγ1 promoter. **Conclusions:** In summary, DNA methylation plays an important role in regulating macrophage polarization and inflammation, and may be one of the underlying mechanisms leading to deregulated ATM polarization, inflammation and insulin resistance in obesity.

T-663-P

Impact of Successful Leptin Replacement Therapy in Japan on Adult and Child, Systemic and Partial Lipodystrophy

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Background: Leptin is implicated in the regulation of appetite and energy expenditure. Lipodystrophy is a rare disorder characterized by loss of adipose tissue due to genetic and acquired causes, which presents increased appetite, metabolic abnormalities such as insulin-resistant diabetes and hypertriglyceridemia and fatty liver. In pre-clinical studies, by cross-mating experiments between our leptin-transgenic skinny mice and model mice of lipodystrophy, A-ZIP/F1 mice, we demonstrated that leptin replacement improves augmented appetite and metabolic abnormalities. **Methods:** We have performed clinical studies on leptin-replacement therapy for 15 patients with lipodystro-

phy (11 congenital generalized (9 adults and 2 children), 2 acquired generalized, 2 partial) since April 2001 in Japan. **Results:** Leptin-replacement therapy has dramatically improved exaggerated appetite, insulin resistance, hyperglycemia, hypertriglyceridemia, and fatty liver, and is also effective for albuminuria associated with diabetic nephropathy, and acanthosis nigricans in all cases. Menstrual disturbance observed in female patients has been normalized. We have altered the leptin injection protocol from twice a day to once a day, but no substantial changes were observed. A 37-year-old patient, our eldest case, died after the 1-year effective leptin treatment because of intrahepatic cholangiocarcinoma associated with long- lasting liver cirrhosis from non-alcoholic steatohepatitis. **Conclusions:** Leptin-replacement therapy (once a day) is effective and safe in various types of lipodystrophy, whether they are acquired or congenital, generalized or partial, child or adult. Based on these results, we have completed the submission to PMDA in Japan and successfully obtained the regulatory approval of the leptin replacement therapy for lipodystrophy in March of 2013 for the first time in the world.

T-664-P

Autocrine Role of Leptin in Regulating Adiponectin Expression in Humans

Prachi Singh, Pragya Sharma, Karine Sahakyan, Diane E. Davison, Fatima H. Sert-Kuniyoshi, Abel Romero-Corral, James M. Swain, Michael D. Jensen, Francisco Lopez-Jimenez, Virend K. Somers *Rochester, MN*

Background: Adiponectin is an adipokine with important roles in reducing inflammation, improving lipid metabolism and insulin sensitivity. Although it is known that adiponectin expression is decreased in obesity, whether weight gain is directly responsible for diminishing adiponectin expression is unclear. We investigated the role of weight gain in altering adiponectin expression in humans and determined the underlying molecular mechanisms. **Methods:** We used an overfeeding protocol to determine the effect of weight gain on adiponectin expression in humans, along with in-vitro and ex-vivo validation of our findings. **Results:** Modest weight gain of 3.8 ± 1.2 kg over 8 weeks of overfeeding in normal weight healthy subjects (n=33, 22 men, 30 ± 7 years) increased adiponectin expression. Changes in leptin during weight gain correlated with changes in adiponectin (rho=0.35, p=0.045), suggesting that leptin may regulate adiponectin expression. In cultured differentiated human white preadipocytes, leptin increased adiponectin mRNA and protein, while leptin-antagonist caused decreases in adiponectin mRNA and protein. Further, leptin activated cellular signaling pathways and increased adiponectin mRNA in adipose tissue only in normal weight subjects, but not in adipose tissue from overweight and obese subjects. Caveolin-1 expression was increased in adipose tissue of obese subjects and caveolin-1 overexpression impaired leptin-dependent increases in adiponectin mRNA. **Conclusions:** Leptin induces adiponectin expression. In obesity, leptin signaling is impaired in the adipose tissue thus preventing concordant increases in adiponectin. Therefore, altered leptin signaling may contribute to low adiponectin in obesity. Targeting leptin-signal impairment may be beneficial in preventing obesity-associated cardiac and metabolic disorders, partly by increasing adiponectin expression.

T-665-P

Fasting and Post-Oral Glucose Adiponectin and Leptin Secretory Patterns in Healthy Men: Effect of Total Body Fat and Body Fat Distribution

Ali Iranmnesh *Salem, VA*; Donna M. Lawson *Roanoke, VA*; Johannes D. Veldhuis *Rochester, MN*

Background: Adiponectin and leptin roles in nutrient metabolism are known, but their secretory properties and correlation with body fat and nutrient intake are not well defined. Objective: To assess adiponectin/leptin secretory properties per se, and in correlation with total and segmental body fat **Methods:** 14 men (age 19-60 yrs, BMI 18-30 Kg/m2) were studied on 2 occasions after an overnight fast, consisting of ingestion of 75 grams of dextrose solution or water. Sessions started at 0800-0900 hr and continued for 6.5 hrs, with blood collected at 10-min intervals for measurements of adiponectin and leptin. Body composition and abdominal fat were assessed by DXA and single-slice CT of abdomen. Secretory patterns of adiponectin/leptin were assessed by deconvolution analysis. Pulse regularity was assessed by ApEn statistics. **Results:** (1) adiponectin and leptin release consisted of pulsatile and basal components, with no effect of dextrose ingestion on secretion parameters, pulse regularity, and mean 6.5 hr concentra-

tions. (2) Leptin was positively correlated (R2/P) with total (FMI:0.64/<0.0001) and segmental (CT-AFA: 0.53/<0.0001) body fat. (3) basal, but not pulsatile leptin release, was significantly correlated with total and segmental body fat, with FMI (fat mass index) having the highest predictive value per stepwise backward regression analysis (R2/P:0.73/0.0001). (4) adiponectin concentrations and secretory parameters did not correlate with total or segmental body fat. **Conclusions:** The present study revealed pulsatile pattern in adiponectin and leptin release not acutely affected by dextrose ingestion. Total and segmental body fat has strong association with basal (non-pulsatile) leptin release, but not adiponectin secretion.

T-666-P
Adipocyte Lipogenic Factors Differ by Subcutaneous Fat Depots, Sex and Fat Cell Size

Kazanna C. Hames, Christina Koutsari, Nikki C. Bush, Sylvia Santosa, Michael D. Jensen *Rochester, MN*

Background: Patterns of adipose tissue fat storage are correlated with sex-specific body fat distribution. This lipogenic pathway includes CD36 (facilitated transport), acyl-CoA synthetases (ACS;the first step in fat metabolism) & diacylglycerol acetyl-transferase (DGAT;the final step of triglyceride synthesis). Our goal was to define differences in adipose CD36, ACS & DGAT in relation to upper & lower body subcutaneous (UBSQ & LBSQ) fat depots, fat cell size & sex. **Methods:** We analyzed subjects' UBSQ & LBSQ fat biopsy samples collected in the postabsorptive state. Fat cell size (microscopy), as well CD36 protein content (ELISA) and ACS & DGAT enzyme activities (expressed per 1000 cells) were measured, as was body composition (DXA & CT). Data are presented as medians;25th:75th quartiles. **Results:** Healthy, premenopausal females (n=78) & males (n=60) did not differ by age (37;28:46 yr), BMI (28.4;24.6:32.1 kg/m2), UBSQ (0.60;0.45:0.83 μg/cell) or LBSQ fat cell size (0.76;0.60:0.94 μg/cell). CD36, ACS & DGAT increased as a function of fat cell size in both depots & sexes (p<0.007), except for UBSQ ACS in males. All three lipogenic factors were greater in LBSQ than UBSQ fat (p<0.05). LBSQ fat ACS & DGAT were greater in females than males (ACS: 59 vs 9 pmol/1000cells/min; DGAT: 4.3 vs 3.1 pmol/1000cells/min; p<0.0003); there were no differences in UBSQ fat lipogenic factors between sexes. There were no sex differences in UBSQ or LBSQ fat CD36. **Conclusions:** CD36, ACS & DGAT increase as a function of fat cell size in SQ fat, but the increases in ACS & DGAT are generally greater in females than males, which may explain greater fat storage in females. ACS & DGAT are greater per 1000 cells in LBSQ than UBSQ in both sexes. The absence of a sex difference in CD36 suggests facilitated transport may not be a rate limiting difference in fat storage between the sexes.

T-667-P
Decrease in Smaller Lipid Droplet Density Is Protective Against Overfeeding-Induced Increase in Fat Cell Size and Weight Gain

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Background: Overfeeding is associated with increased fat cell size (FCS) and body weight (BW). Whether overfeeding causes an increase in intramyocellular lipid (IMCL) is less clear. We aimed to determine the effects of 8-wk high fat diet overfeeding (40% extra calories; 44% fat) on the changes in IMCL content and lipid droplet density in 28 healthy male (27±1years; BMI 25±0.4 kg/m2; mean±SE). **Methods:** FCS was assessed by osmium fixed adipocytes from subcutaneous abdominal biopsies on a Multisizer Coulter counter and IMCL content was measured by Oil-Red-O staining from vastus lateralis muscle biopsies. Lipid droplet size and density were assessed from stained images using ImageJ software in a size scale of 1-40 pixels (n=13). **Results:** Overfeeding resulted in an average 7.5±0.4 kg increase in BW and ~39% increase in FCS without a change in IMCL (3572±241.1 to 3671±230.2 AU; p=0.99). The density of smaller lipid droplets decreased in muscle fibers (-16% and -20% for 1-2 and 3-5 pixel size lipid droplets; p<0.05) after overfeeding. The density of smaller lipid droplets located at the periphery of the muscle fibers decreased significantly (-17% and -20% for 1-2 and 3-5 pixel size lipid droplets; p<0.05), while there was no significant change in centrally located lipid droplet density. The decreased density of smaller lipid droplets was negatively associated with the overfeeding induced

increase in BW (R2=0.27 for 1-2 pixel lipid droplets; p<0.05) and FCS (R2=0.27,for 1-2 pixel lipid droplets; p<0.05). **Conclusions:** High fat diet overfeeding does not change overall IMCL content. However, it reduces the density of smaller lipid droplets located at the peripheral region of the muscle fibers. This restructuring of lipid droplet sizes in muscle fibers may represent a protective mechanism counteracting the deleterious effects of fat cell hypertrophy and weight gain.

T-668-P
Adipocyte-Derived Exosomal miRNAs Associated with Body Mass Index in Adolescents

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Background: Though the connection between adiposity and the development of cardiometabolic disease is well established, direct mechanisms driving this effect are unclear. Adipose tissue releases exosomes containing miRNAs that can travel to and affect target organs. The aim of this study was to isolate and characterize obesity effects on adipocyte-derived exosomal miRNAs, specifically testing for relationships to body mass index (BMI) in lean and obese adolescents. **Methods:** Adipose exosomes were isolated from lean (L; N=5; BMI 23.2 ± 1.3 kg/m2) and obese (Ob; N=7; BMI 41.2 ± 6.5 kg/m2) females. Paired visceral and subcutaneous adipose samples were collected for each subject. Exosomal miRNA were isolated and analyzed via microarray analysis (Affymetrix Genechip miRNA 3.0 arrays). Results were analyzed using Spearman Rank correlation between global miRNA expression and BMI. **Results:** Twelve miRNAs were significantly correlated to BMI (p<0.01). Prioritizing miRNAs with the highest mean expressions, the top results positively correlated with BMI were miR-548o (r=0.58; p=0.003) and miR-96-star (r=0.53; p=0.008). The top results negatively correlated with BMI were miR-629 (r=-0.53; p=0.007) and miR-4423-3p (r=-0.51; p=0.009). Pathway analysis revealed: multiple genes associated with coronary artery disease are predicted targets of both miR-548o (N=13) and miR-96star (N=33), while 16 targets for miR-629 are associated with abnormal epithelial cell function. miR-4423-3p was most ubiquitously expressed by adipocyte-derived exosomes; pathway analysis suggest a key role in kidney dysfunction (33 genes involved in kidney cell death and 9 genes involved in glomerular cell proliferation). **Conclusions:** BMI correlates to adipose-derived exosomal miRNA expression, suggesting a possible mechanism by which increased adiposity can affect cardiometabolic disease development.

T-669-P
Inhibition of Adipocyte Differentiation in 3T3-L1 Cell Line by Quercetin or Isorhamnetin

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Background: Quercetin is a bioactive compound found in a variety of foods that are consumed daily. Isorhamnetin is a bioactive compound found in some foods and a quercetin metabolite. **Methods:** The objective of this study was to test the effect of quercetin or isorhamnetin at physiological and supraphysiological concentrations on the inhibition of the differentiation process of 3T3-L1 pre-adipocyte to adipocyte. Cell viability was determined by the MTS assay. MCP-1 levesl were determined by ELISA. Expressions of PPAR-γ, C/EBP-α, and β-catenin were determined by Western blot. **Results:** Cell viability results demonstrated no significant difference (P > 0.05) between non differentiated cells, control and quercetin or isorhamnetin treated cells. During adipocyte differentiation in the presence of quercetin or isorhamnetin, cell viability was above 94.84% and 97.63%, respectively. Red oil O staining assay was performed to evaluate the inhibitory effect of quercetin or isorhamnetin on cytoplasmic lipid droplet accumulation. Significant differences (P < 0.05) were reported. Isorhamnetin was more effective than quercetin in inhibiting cytoplasmic lipid droplet accumulation. Neither quercetin nor isorhamnetin had an effect on the expression of macrophage chemoattractant protein -1 (MCP-1). CCAAT/enhancer binding protein α (C/EBP-α) was down-regulated by quercetin or isorhamnetin. Compared to control quercetin decreased PPAR-γ 1 and 2 expressions by 45.03 ± 3.17% and 27.58 ± 12.39%, while isorhamnetin decreased PPAR-γ 1 and 2 expressions by 41.48 ± 9.51% and 2.01 ± 32.46%, respectively. β-catenin was not dose dependent either for quercetin or isorhamnetin and did not follow a specific trend. **Conclusions:** Isorhamnetin more than quercetin at physiologically attainable concentration can exert potential anti-obesity effects by inhibiting differentiation of pre-adipocytes.

T-670-P

Affinity Tagging of Adipocyte Nuclei in Mice to Examine Epigenetic Controls in Obesity

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Background: Obesity is characterized by increased adipose development in muscle and bone marrow as well as an expansion of visceral adipose depots. It is widely speculated that harmful differences in obese adipose tissue gene expression are under epigenetic control. Considering that epigenetics is the study of cell type specific differences in a developmental context, it is important to examine isolated adipocytes from tissue. However, adipocytes represent only a small subset of cells in these tissues and they are too fragile to isolate. **Methods:** We find adipocyte nuclei are relatively easy to isolate. We are implementing an innovative new technology, INTACT (Isolation of Nuclei TAgged in Specific Cell Types), which will enable the rapid isolation of adipocyte nuclei from any mouse tissue. We are expressing a transgenic Nuclear Envelope Proteins (NETs) fused to a fluorescent protein reporter (e.g., RFP) and an immunoepitope tag (3xFlag) under control of the adipocyte-specific adiponectin promoter (ADNp). **Results:** We have tested the ADNp controlled expression of several different NETs in 3T3-L1 cells, during their differentiation into adipocytes. Engineered NETs, including Nesprin3-RFP-Flag, SUN1-RFP-Flag, and RANGAP-GFP were all successfully targeted to the nuclear membrane of cultured adipocytes. Further, we have confirmed the paramagnetic bead based purification of SUN1-RFP-Flag nuclei. We are constructing an engineered mouse that expresses one of these nuclear targeted nuclear membrane proteins. **Conclusions:** INTACT technology will enabled adipocyte nuclei from different tissues of normal and environmentally compromised mice or lean and obese mice on different diets to be purified from VAT, SAT, muscle, or bone on anti-FLAG or anti-RFP paramagnetic beads and their epigenetic differences examined.

T-671-P

In Vitro Characterization and Engraftment of Adipocytes Derived from Human Pluripotent Stem Cells

Michio Noguchi, Kiminori Hosoda, Kazuwa Nakao *Kyoto, Japan*

Background: Human induced pluripotent stem (iPS) and embryonic stem (ES) cells can differentiate into a variety of cell types. We reported on adipogenic potential of human iPS and ES cells in vitro. **Methods:** In the present study, we investigate survival and maintenance of adipocytes differentiated in vitro from human iPS and ES cells after transplantation. **Results:** Following adipogenic induction in vitro, the differentiated cells exhibited functional properties of adipocytes such as lipid storage, lipolysis and insulin responsiveness. Subsequently, Matrigel containing the differentiated human iPS and ES cells was transplanted into the subcutaneous tissue of nude mice. After 1 to 4 weeks, the cells with adipocyte-like features were observed in transplanted Matrigel by histological analysis. The human origin of the cells, their lipid accumulation and gene expression of adipocyte markers in transplanted cells were then confirmed, suggesting the presence of adipocytes in transplanted Matrigel. When the relative areas of these cells were calculated, we found that they peaked at 2 weeks after transplantation, and that the adipocytes persisted at 4 weeks. Furthermore, there was diversity among cell lines with respect to the survival and maintenance of adipocytes. **Conclusions:** The present study demonstrates that human iPS and ES cells can differentiate into adipocytes with functional properties and that adipocytes derived from human iPS and ES cells can survive and maintain the differentiated properties of adipocytes for at least 4 weeks after transplantation. Adipocytes derived from human iPS and ES cells thus have the potential to open new avenues for stem cell-based research into metabolic diseases and future therapeutic applications.

T-672-P

Ad36 May Require Insulin for Its Adipogenic Effect, but Not for Enhancing Glucose Disposal

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Background: Obesity is often associated with inadequate insulin action or quantity. In animal models, Ad36 -a human adenovirus, increases adiposity, yet improves glycemic control. Ad36 bypasses the proximal insulin signaling while increasing cellular glucose uptake by up-regulating AKT signaling. Of the AKT isoforms, AKT1 is mainly linked with the induction of adipogenesis and AKT2 with the induction of Glut4 and glucose disposal. We investigated the modulation of AKT signaling and glucose uptake by Ad36 in the presence or absence of insulin in human adipose derived stromal cells (hASC) –a cell model of clinical relevance. **Methods:** Primary hASC obtained from 6 individuals were infected with Ad36 or mock infected. Glucose uptake, AKT signaling and Glut4 protein abundance were determined in in basal or insulin stimulated conditions. **Results:** hASC obtained from several individuals responded similarly to Ad36. Ad36 increased basal and insulin-stimulated glucose uptakes compared to respective mock groups by about 2-fold (p<0.0004). Compared to the mock group, Ad36 enhanced the activation of AKT1 only in presence of insulin. Whereas, Ad36 increased AKT2 activation or Glut4 abundance in the presence or absence of insulin. **Conclusions:** Ad36 may require insulin for its adipogenic effect, but not for enhancing glucose disposal. Ad36 may provide a template to treat insulin resistance as well as insulin deficiency. Funding: Vital Health Interventions

T-673-P

Regulation of Adipogenesis and Inflammation: Role of microRNAs

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Background: Early and rapid onset of obesity in the Qatari population, along with a primarily abdominal deposition of adipose tissue, is closely associated with inflammation and insulin resistance. Interest has focused on miRNA both as biomarkers of disease and as therapeutic targets. This study investigated the expression of a panel of miRNAs associated with inflammation and insulin resistance in peripheral blood cells. **Methods:** Non-diabetic Qatari subjects were recruited from patients awaiting weight reduction surgery and from a normal population. Anthropometric measures, fasting blood samples were obtained from all subjects, for determination of lipids, glucose, insulin and adipokines and miRNA from peripheral blood cells. **Results:** Three miRNA (miR150, 26b and 96) were significantly different between these groups. Conversely 12 miRNA changed significantly when the insulin sensitive (n=9) were compared to those with insulin resistance (n=42). Weight loss was also accompanied by significant changes in the expression of ten miR species. **Conclusions:** It is apparent that significant differences in expression of the miR species occur along with changes in metabolic and inflammatory parameters in the four groups studied. The target genes of these miR are currently being investigated to assign possible functionality.

T-674-P

Lycopene Supplementation Increases Plasma Adiponectin Concentration and mRNA Levels of Adiponectin, SIRT1 and FoxO1 in Adipose Tissue of Obese Rats

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Background: Adiponectin is a protective adipokine against obesity. Lycopene exhibits anti-inflammatory activity; however, its effect on adiponectin levels in obesity has not been evaluated. Also, there is evidence that both SIRT1 and FoxO1 are involved in adiponectin regulation, although no data are available regarding the effect of lycopene on SIRT1 and FoxO1. Thus, this study investigated whether lycopene can modulate adiponectin levels and SIRT1 and FoxO1 gene expression in adipose tissue from diet-induced obese rats. **Methods:** Male Wistar rats were first fed with hyperenergetic diet (H, n=12) for 6 wks and afterwards, these animals were randomly assigned to receive H (n=6) or H with lycopene-rich tomato oleoresin (equivalent to lycopene 10 mg/Kg BW/d, H+L, n=6) by gavage for additional 6 wks. Plasma lycopene and adiponectin levels were analyzed by HPLC and immunoassay, respectively. The mRNA expressions of adiponectin, SIRT1, FoxO1, FAT/CD36, and PPARγ in adipose tissues were determined by real time PCR. **Results:** Lycopene was detected in the rat plasma from H+L group but not in the H. Although both body weight and adiposity were not different between two groups, there was a significant increase in both plasma concentration and mRNA expression of adiponectin in adipose tissue from H+L group. In addition, the lycopene supplementation up-regulated mRNA expressions of SIRT1, FoxO1 and FAT/CD36, but down-regulated PPARγ in adipose tissue of obese rats. **Conclusions:** These data suggest health benefits of lycopene in

adipose tissue, which may play a role against obesity-related complications.
Support: FAPESP # 10/19746-4

T-675-P[DT]

Androgenic Sex Steroids Contribute to Metabolic Risk Beyond Intra-Abdominal Fat in Overweight/Obese Black and White Women

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Background: Visceral adipose tissue (VAT) and androgenic sex steroids have both been reported to contribute to metabolic risk. The purpose of this study was to examine the contribution of sex hormone binding globulin (SHBG), total testosterone (TT), and bioavailable testosterone using the free androgen index (FAI), to the variance in metabolic risk beyond VAT. **Methods:** A total of 66 (36 white, 30 black) premenopausal overweight/obese volunteers soliciting a weight loss program were recruited (mean age = 40.14±8.6). A multiple regression interaction analysis was used after controlling for VAT. **Results:** Results showed SHBG contributed to the variance in insulin (P=0.003), insulin resistance using HOMA-IR (P=0.006), and high density lipoprotein-cholesterol sub-fraction 2 (P=0.029). TT contributed to the variance in systolic and diastolic blood pressure (P<0.001), total cholesterol (P=0.003) low density lipoprotein-cholesterol (P=0.003) and apolipoprotein B (P=0.004). FAI contributed to the variance in the greatest number of metabolic variables beyond VAT. A significant SHBG-race effect for insulin (P=0.038) and HOMA IR (P=0.01), TT-race effect for HOMA IR (P=0.035), and FAI-race effect for HOMA IR (P=0.01) were also found. There was also a significant FAI-race interaction for fasting glucose (P=0.013) with a Pearson's correlation coefficient showing a significant relationship between FAI and glucose in white women (r=0.48, P=0.003) while no relationship was found in black women (r = -.01, P= .941). **Conclusions:** Our study showed that androgenic sex steroids contributed significantly to the variance in metabolic variables associated with health risk. However, androgenic sex steroids do not provide sufficient information relevant to insulin/glucose status in black women.

T-676-P

Dietary Phytochemicals Increase Brown Adipose Tissue Activity in Adult Ovariectomized Rats

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Background: Brown adipose tissue (BAT) uncouples respiration, using lipids as an energy source while dissipating heat. Increases in BAT activity are protective against obesity, thus compounds that increase BAT activation may help prevent weight gain. Resveratrol (R) increases BAT activity by up-regulating thermogenic genes. As phytochemicals have synergistic properties, our research strategy has included investigation of the efficacy of relatively low concentrations of phytochemical blends on BAT activation. **Methods:** Previously, we showed that R combined with genistein (G) and quercetin (Q) reduced weight gain in aged ovariectomized (OVX) female rats. In the current study, OVX rats were fed diets containing doses of phytochemicals with vitamin D (diet 1: 1000 mg/kg G; diet 2: 500 mg/kg G, 200 mg/kg R, and 1000 mg/kg Q; diet 3: 1000 mg/kg G, 400 mg/kg R, and 2000 mg/kg Q). **Results:** After 16 weeks, rats in the high dose group had a significantly smaller scapular BAT depot compared to non-OVX controls (0.74 g v 0.92 g; p<0.05). It was hypothesized that the reduction in BAT mass was due to phytochemical-driven increases in BAT lipid metabolism. After 16-weeks reduced lipid content in BAT of the high dose group was seen compared to non-OVX controls (0.35 ± 0.02 v 0.44 ± 0.04; p=0.01). Two-fold increases in BAT-related genes including Sirt3, Nrf1, and Pparg1c were observed in the high dose group compared to non-OVX controls (p<0.10). Similarly, Acc1 expression was increased by 34-fold (p<0.02) and Lipe expression was increased by 29-fold (p<0.004) in the high dose group. **Conclusions:** These findings are consistent with our hypothesis that a dietary phytochemical blend increases energy utilization and respiration in BAT. These data provide further support for the anti-obesity effects of synergistic phytochemical combinations.

T-677-P

Leptin Transgenic Mice on Short-Term High Fat Diet Show Leptin Resistance without Obesity

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Background: Leptin resistance is seen in the almost all cases of human obesity. In animal models, high fat diet (HFD) is one of the most major causes of leptin resistance while the precise mechanism is still unknown. One of the reasons that make it difficult to analyze leptin resistance is coexistence of obesity and leptin resistance. Leptin resistance induces obesity and obesity itself modifies leptin resistance. In most animal models with high fat diet, leptin resistance coexists with obesity, making primary causes of leptin resistance obscure. In this study, we induced leptin resistance in the HFD-fed leptin transgenic mice that are lean by ectopically over-expressed leptin in the liver. **Methods:** Wild type (WT) mice and leptin transgenic (Lep Tg) mice were fed standard chow or high fat diet (60% fat) for one week. They are sacrificed one hour after intraperitoneal leptin administrations (3mg/kg). Immunohistochemical analyses were performed with brain slices. **Results:** One-week (1W) high fat diet increased body weight in Lep Tg mice. However, Lep Tg mice on 1W HFD were still not obese as compared with WT mice. Lep Tg mice on 1W HFD, but neither Lep Tg on chow nor WT mice on 1W HFD showed blunted suppression of food intake by exogenous leptin and decreased leptin-responsiveness of c-fos immuno-reactivity, a marker of neuronal activation, in the arcuate nuclei. **Conclusions:** Lep Tg mice on one-week HFD showed leptin resistance without obesity. They can be used as a tool for analyzing HFD-induced leptin resistance without secondary modification by obesity.

T-678-P

Weight Cycling Does Not Increase Relative Body Fat of Mice

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Background: To investigate age-dependent body composition changes with a diet-induced-obese (DIO) model including dietary restriction (DR) and long-term weight cycling in C57BL/6J mice. **Methods:** 555 singly-housed mice (1:1 M/F) were ad libitum (AL) fed a 45% high-fat diet from 2 ~11 months of age, with the 200 heaviest mice of each sex subsequently randomized to one of four groups: ever obese (EO, continued AL feeding), obese weight losers (OWL, diet restricted to a body weight similar to low-fat diet fed controls), weight cycling (WC, two weight-loss-and-regain cycles of diet restriction followed by AL-refeeding until stable weight). Body weight was monitored weekly. Body composition was measured at 23 and 43 weeks (W) of age and then at the time of each apex and nadir of WC body weight (~3 months intervals, 56w/nadir, 71w/apex, 84w/nadir, 99w/apex). **Results:** No significant differences in relative fatness (between EO and WC) were observed after either one weight cycle (71w, p=0.873/male, p=0.287/female) or two (99w, p=0.069/M, p=0.780/F). After one weight cycle, a sex difference in weight regain was observed that male WC had lower body weight (p=0.003), fat mass (p=0.004) and lean mass (p=0.006) compared with EO, with no differences between female WC and EO in body weight (p=0.258), fat mass (p=0.287) and lean mass (p=0.718). For the 2nd weight cycle, neither male nor female WCs had significantly different body weight (p=0.848/M, p=0.148/F) or fat mass (p=0.520/M, p=0.226/F) than their EO counterparts; however, male WC had significantly less lean mass than EO (p=0.018), with females showing a just significant difference (p=0.050). **Conclusions:** While sex differences existed in weight regain, repeated weight cycling did not increase relative fatness in either sex compared with those remaining obese.

T-679-P

Factors Distinguish Adipose Tissue of Insulin Sensitive and Insulin Resistant Obesity in Human and Mice

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Background: Although massively obese individuals undergoing bariatric surgery are usually insulin resistant (IR), some (~25%) are insulin sensitive (IS). The IR obese population is more prone to metabolic syndrome-associated diseases than their IS counterparts. We have reported that AMP-activated protein kinase (AMPK) activity is lower, and the expression of various

inflammatory genes as well as oxidative stress higher in adipose tissue of IR than BMI-matched IS population. However, the number of genes examined was limited. **Methods:** Visceral adipose tissue was obtained from morbidly obese patients undergoing gastric bypass surgery. Patients were stratified as IS (n=8) or IR (n=8) based on HOMA-IR (>2.3 considered IR). A custom PCR array was used to investigate the association between insulin sensitivity and markers of inflammation, mitochondrial function, and other parameters. In parallel, epididymal fat obtained from diabetic db/db and littermate control mice were analyzed. **Results:** PCR array data confirmed and extended our previous findings. In addition, the expression of inflammatory genes including IL-1β, CD4, CD68, TLR4 was increased in the IR group, as well as collagen VI and TXNIP, the latter thought to be a link between cellular stress and inflammation. In contrast, markers of mitochondrial function had lower expression level in the IR group. Results from the db/db mouse model revealed parallel findings including systemic insulin resistance, diminished AMPK activity, increased oxidative stress, and activation of the inflammasome in adipose tissue. **Conclusions:** The results confirm and extend the observation that differences in AMPK activity, oxidative stress, and inflammatory gene expression distinguish IS vs IR obesity. They also suggest that changes qualitatively similar to those in adipose tissue of the IR patients occur in the db/db mice.

T-680-P
Leptin: Adiponectin Ratio among Patients with Cancer
Elizabeth Phillips, Nicole L. Mihalopoulos *Salt Lake City, UT*

Background: Two-thirds of Americans are overweight or obese, a condition defined by the excess accumulation of adipose tissue. Among other risks, such as cardiovascular disease and diabetes, the presence of excess fat is associated with increased risk for cancer; additionally it can cause an adipokine imbalance. The purpose of this study was to determine leptin:adiponectin (L:A) ratio among different malignancies in a population undergoing FDG-PET/CT scans. **Methods:** A convenience sample of patients undergoing FDG-PET/CT scans were recruited and enrolled (n=181). Age, sex, and cancer diagnosis were obtained; height, weight and fasting serum adiponectin and leptin were measured. BMI and L:A ratio were calculated. Analysis of Variance (ANOVA) was performed to determine differences in L:A ratio among the different malignancies (breast, colorectal, esophageal, lung, multiple myeloma, lymphoma, other). **Results:** Mean age was 59 ± 14 years, 72 were female. Mean BMI was 28.6 ± 10.6. The malignancies with the highest prevalence were multiple myeloma (n=48), colorectal (n=28) and lymphoma (n=26). L:A ratio was highest in those with lymphoma (14.7±18.1), breast (13.8±12.5) and colorectal cancer (13.3± 18.4); and lowest in those with lung (6.4±7.3) and esophageal cancer (7.3±6.1), but the difference among malignancies was not statistically significant. **Conclusions:** Excess adipose tissue causes a dysregulation of adipokines, which has myriad physiological effects, including an increased risk of malignancy. This process may be mediated by inflammation due to metabolic dysregulation and adipokine imbalance, but proposed mechanisms are still speculative.

T-681-P
Effects of Lycopene-Rich Lipidic Tomato Extract in a Hormonal Model of Benign Prostate Hyperplasia in Obese Male Wistar Rats
Juventino Colado-Velazquez, Josue V. Espinosa-Juarez, Patrick Mailloux-Salinas, Beatriz Guillen-Garcia, Osmar A. Jaramillo-Morales, Guadalupe Bravo *Mexico, Mexico*

Background: Obesity has been linked to an increase in the incidence and prevalence of prostate disease. Current therapy has adverse effects affecting the life quality of patients. New therapeutic alternatives have been proposed such as lycopene, which can be found in lipidic tomato extract. **Methods:** 36 Male Wistar rats were randomized in 6 groups. Control animals were given standard laboratory animal diet and water while obese were given 30% sucrose instead of water ad libitum for 44 weeks. On the 36th week, testosterone enantate (4 mg/kg) was administered weekly to induce prostate hyperplasia for 8 weeks. On the 40th week, treatment with lipidic tomato extract (5 mg/kg/day) was performed for 4 weeks. After treatment, the animals were sacrificed by decapitation. Blood and organs were extracted, weighed and assays were performed: Total nitrites, malondialdehyde, blood glucose, triglycerides, HDLc, LDLc. **Results:** Obese rats had significantly higher prostate weight than the hyperplastic controls and untreated controls. Treatment with lycopene significantly decreased prostate weight in obese groups,

but did not have a significant effect in control animals. Bladder and testicle weight did not change significantly by the treatment. Obesity increased LDLc and triglycerides, while decreasing HDLc significantly. Treatment with the extract significantly decreased LDLc and increased HDLc. Obese animals had significantly higher levels of nitrites and MDA compared to control. **Conclusions:** Lycopene has beneficial effects reversing prostate size and improving biochemical parameters in blood. Its antioxidant effect also improves markers of oxidative stress such as Nitric Oxide and MDA, potentially decreasing cell damage and inflammation. More research is needed to clearly describe the effects of lycopene in obesity.

T-682-P
Effects of Sabal Serrulata and Lycopene in Prostate Health in Obese Male Wistar Rats
Josue V. Espinosa-Juarez, Juventino Colado-Velazquez, Patrick Mailloux-Salinas, Beatriz Guillen-Garcia, Osmar A. Jaramillo-Morales, Guadalupe Bravo *Mexico, Mexico*

Background: Prostate disorders are highly prevalent in male patients aged 50+. Obesity is a risk factor in the development of benign prostate hyperplasia. Lycopene and Sabal serrulata extracts have been proposed as therapeutic alternatives with less adverse effects than the standard therapy **Methods:** Male Wistar rats were randomized into 6 groups. Obesity was induced with hypercaloric diet (30% sucrose in water), control animals only received water, both groups were given standard laboratory chow for 44 weeks. At week 40 treatment with Sabal s. (25mg/kg/day) and lycopene (5 mg/kg/day) was performed, controls received vehicle (corn oil) for 4 weeks. The animals were sacrificed; prostate and bladder were excised and prepared into isolated organ chambers for contractility testing with norepinephrine (NE), acetylcholine (Ach) and isoproterenol (ISO). Slices of these organs were fixed in paraffin for histopathological evaluation **Results:** Prostate weight was significantly higher in obese animals. The extracts significantly reduced the weight of the prostate. Obesity significantly increased NE contractility of prostate samples compared to control; treatment significantly reduced contractility to levels comparable to control. There was significant difference in bladder contractility to ISO while no difference to Ach between obese and control. The extracts did not have a significant effect in bladder contractility. Histopathology from obese animal prostates showed stromal and epithelial hyperplasia. Treatment with both extracts showed a marked decrease in hyperplasia. There were no changes in control tissues. **Conclusions:** Both extracts had a beneficial effect improving prostate contractility and reducing its weight/size in obese animals while not affecting controls. The use of these extracts may be beneficial in treating or preventing prostate disease in obese patients.

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Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

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Inflammation

T-683-P
The Response and Interaction of Adiponectin,Leptin and TNF-α Due to a Short-Term Positive Energy Challenge
Farrell Cahill, Peyvand Amini, Danny Wadden, Yunqi Ji, Sam Khalili, Edward W. Randell, Sudesh Vasdev, Guang Sun *St. John's, Canada*

Background: Adiponectin, leptin, and TNF-α are adipokines affecting, insulin sensitivity, appetite and energy homeostasis. However, little data are available regarding the response and the interaction of these three adipokines under a positive energy challenge(PEC) which is a major factor in the development of obesity. Therefore, we investigated the response and potential interaction(s) of circulating adiponectin,leptin and TNF-α to a PEC along with the influence of obesity status. **Methods:** Sixty-four young men(19-29yr) were overfed 70% more than normal daily energy requirements for 7-days. Subjects were stratified into normal weight (NW, n=25) and overweight/obese(OW/OB, n=39) according to percent body fat measured by DEXA. Enzyme-linked immunosorbent assays were used to measure the three adipokines. ANOVA and multiple regression analyses were used to assess the relationships between the three adipokines before and after overfeeding in NW and OW/OB. **Results:** Adiponectin and TNF-α before overfeeding were not associated with adiposity. After overfeeding circulating TNF-α increased in NW men only (p=0.032) and adiponectin increased

(p<0.001) independent of adiposity status. However, leptin concomitantly increased with adiposity at baseline (p<0.001) and also increased in response to the PEC (p<0.001). Among OW/OB, baseline TNF-α was negatively associated with the change in adiponectin (p=0.028) while baseline leptin was positively associated with the change in TNF-α (p<0.001) due to overfeeding after adjusting for adiposity at baseline. **Conclusions:** Circulating levels of adiponectin, leptin and TNF-α were increased by the PEC. Additionally, our results suggest that baseline levels of TNF-α and leptin predict a reduced response in adiponectin and an increased response of TNF-α due to a PEC, respectively, independent of adiposity in overweight/obese.

T-684-P
Human Adenovirus Ad36 and Its E4orf1 Gene Enhance Cellular Glucose Uptake Even in Presence of Inflammatory Cytokines

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Background: Obesity is often linked with insulin resistance via a chronic preponderance of pro-inflammatory cytokines such as MCP1, or TNFα. Attempts to improve insulin resistance with anti-inflammatory agents have yielded marginal benefits, if any. Ad36 –a human adenovirus, improves high-fat diet induced hyperglycemia in obese mice. The E4orf1 gene of Ad36 enhances cellular glucose uptake in vitro by up-regulating the phosphatidyl inositol 3-kinase(PI3K) / Glut4 pathway of insulin signaling. Here, we tested if Ad36 or E4orf1 will enhance cellular glucose uptake in presence of inflammatory cytokines **Methods:** A) 3T3-L1 preadipocytes were treated with TNFα (0, or 20 ng/mL) or MCP1 (0, or 25 ng/mL) and then infected with 0 or 5 particles/ cell of Ad36. B) 3T3-L1 cells that inducibly express E4orf1 or a null vector were treated with TNFα or MCP1 as above, followed by the induction of E4orf1 with doxycycline treatment. Cellular uptake of 2-deoxy glucose was measured, and the PI3K signaling was determined. **Results:** In the mock control groups, TNFα or MCP1 decreased glucose uptake and down-regulated PI3K signaling as indicated by reduced AKT-phosphorylation, and decreased GLUT4 abundance. Whereas, Ad36 infection or E4orf1 expression increased glucose uptake in presence of MCP1 or TNFα (all p<0.0002) and up-regulated AKT-phosphorylation and GLUT4 abundance. **Conclusions:** Ad36, and particularly E4orf1, may provide a valuable template to improve hyperglycemia even in presence of chronic inflammation. Funded by Vital Health Interventions.

T-685-P
The Role of Neuromedin U in Glucose Homeostasis

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Background: Neuromedin U (NMU) is a peptide that has been implicated in central energy homeostasis and a wide variety of physiological role, including smooth muscle contraction, stress response, and pro-inflammatory response. In previous reports, NMU deficient mice (NMU-KO) showed increased body weight and adiposity, hyperphagia, decreased energy expenditure, and fatty liver. Though these mice also showed normoglycemia, the role of NMU in glucose homeostasis remains unclear. We speculate that NMU is involved in diet-induced insulin resistance via inflammatory signals. **Methods:** We fed NMU-KO and wild type mice (WT) high fat diets from the age of 8 weeks, and examined metabolic parameters and inflammatory signals at 35 weeks. **Results:** Body weight was significantly increased in NMU-KO compared with WT with increased fat mass. There was no significant difference in food intake and energy expenditure between the two genotypes. Postprandial glucose and insulin levels were significantly decreased in NMU-KO compared with WT. In glucose tolerance test, blood glucose levels tended to be lower in NMU-KO than in WT. In insulin tolerance test, hypoglycemic response to insulin injection was significantly enhanced in NMU-KO compared with WT. Messenger RNA expressions of IL-6 and IL1b in adipose tissue and the number of F4/80-expressing cells in fat tended to be lower in NMU-KO compared with WT. **Conclusions:** These results demonstrate that NMU is involved in diet-induced insulin resistance by promoting inflammatory signals in adipose tissue.

T-686-P
Profile Analysis of Inflammation State between Human Adenovirus 36-Induced Obesity and Diet-Induced Obesity

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Background: Obesity is associated with a state of chronic low-grade inflammation. Previous studies have supported the theory that immune cells, especially adipose tissue macrophage (ATM), and inflammasome, are related to the development of obesity. We recently reported that adipogenic human adenovirus 36 (Ad36) can trigger acute and chronic inflammation and that this inflammation is required to stimulate adipogenesis. In here, we compared Ad36-induced obesity (AIO) and diet-induced obesity (DIO) via analysis of the ATM population (M1 and M2 ATM) and inflammasome activation in both early and late stages of obseity. **Methods:** Epididymal (e) fat tissue was harvested from AIO or DIO mouse models 7 days (early stage) and 90 days (late stage) after Ad36 infection or high fat diet (HFD) for further studies. **Results:** During the early stage, total ATM and M1 ATM increased only in AIO but not in DIO. Moreover, inflammasome activation was observed in only AIO. During the late stage, total ATM and M1 ATM population were increased in both AIO and DIO. Also, inflammasome was activated in both AIO and DIO. **Conclusions:** Whereas AIO showed inflammatory status via a lopsided toward M1 and inflammasome activation during the early stage, DIO did not. However, both AIO and DIO stimulated chronic inflammation and inflammasome activation during the late stage. Therefore, increases of M1 and inflammasome activation in e fat tissue may have a role in both AIO and DIO.

T-687-P
Sepsis Alters the Signal Transducer and Activator of Transcription 3 (STAT3) and Nuclear Factor Kappa B (NFκB) Pathways in White Adipose Tissue

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Background: Obesity increases rates of sepsis. Our previous data demonstrate that obesity enhances inflammation and increases mortality after experimental sepsis. We hypothesize that sepsis alters adipose tissue inflammation through alteration of pro-inflammatory mediators and is affected by obesity. **Methods:** C57BL/6 mice (6wk old) were randomized to HFD (60% kcal fat) or a control diet (CD) (16% kcal fat). After 8wks of feeding, polymicrobial sepsis was induced by cecal ligation and puncture (CLP). Mice were sacrificed at 0 or 6h after CLP. Plasma and white adipose tissue (WAT) were obtained for analysis. p≤0.05 was significant. **Results:** Following 8wks of feeding, HFD mice had greater body weights, fat mass and plasma leptin levels compared to CD (p≤0.05). After CLP, leptin increased in both diet groups but was significantly higher in obese mice. Plasma TNFα increased in both groups after CLP but was lower in obese compared to control mice (136±13 vs 186±29 pg/ml, p≤0.05 by ANOVA). To understand the molecular mechanisms in WAT that contributes to systemic inflammation we investigated the NFκB pathway. At western blot, inhibitor κB (IκBα) expression was lower in WAT from obese compared to control mice at baseline (0.8±0.09 vs 1±0.07 relative units, p<0.05). However after the induction of sepsis IκBα was lower in both groups and not affected by diet. Surprisingly, NFκB DNA binding activity decreased after CLP in both groups. Leptin induces signaling through the JAK/STAT pathway therefore we explored activation of pSTAT3 expression. WAT pSTAT3 was increased in both control and obese groups after CLP compared to baseline (8.5 vs 1.2 relative units and 8.8 vs 1.8 relative units, p≤0.05 respectively) but not affected by diet. **Conclusions:** The leptin changes in sepsis may alter WAT expression of the STAT3 and NFκB pathways. (NIH K08GM093135; P30DK078392).

T-688-P
Steatosis Progression, without Oxidative Stress and Inflammatory Response, Did Not Alter the Cardiac Performance in Diet-Induced Obese Rats

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Background: Recent evidences suggest that non-alcoholic fatty liver disease is a risk factor for cardiovascular disease, including cardiac dysfunction. However, this relationship is inconsistent. This study evaluated whether chronic nutritional overload promotes hepatic steatosis and inflammation

progression and, consequently, has a negative effect on cardiac performance. **Methods:** Male Wistar rats were randomly divided to receive either chow diet (12% calories from fat) [C group] or high-fat diet (49.7% calories from fat) plus sucrose in the drinking water (300 g/L) [H group] for 6, 12 and 24 weeks. **Results:** The nutritional overload significantly increased adiposity index of rats in all three experimental periods compared to C group. This was associated with increased plasma levels of insulin, resistin, leptin, glucose and decreased adiponectin. Although the plasma triacylglycerol concentration was increased in all time points, plasma free fatty acid was only elevated with 24 weeks treatment. The nutritional overload resulted in a time-dependent hepatic steatosis progression in H group, while oxidative stress, hepatic inflammatory foci as well as TNF-α and IL-6 mRNA levels were not affected. The steatosis progression in H group was not involved with additional metabolic alteration, plasma inflammatory response and cardiac dysfunction when compared with C group. **Conclusions:** Chronic nutritional overload induced and promoted hepatic steatosis progression. However, this metabolic scenario did not alter cardiac performance in rats, possible due to lack of oxidative stress and inflammatory response in liver. Support: FAPESP #11/09945-2, #11/07690-7

T-689-P
Tissue Specific Induction of ChREBP Isoforms in Carbohydrate Refed Mice
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Background: Carbohydrate response element binding protein alpha (ChREBP-α) is a transcription factor involved in carbohydrate induced de novo lipogenesis. Recently, a novel isoform (ChREBP-β) has been discovered and the purpose of this study was to determine the effect of different carbohydrates on ChREBP-β transcriptional activity. **Methods:** Male mice were fasted for 24 hours and refed either a high glucose, sucrose, or fructose diet for 12 hours. Tissues were collected to assess changes in lipogenic and gluconeogenic gene expression as well as ChREBP-α and ChREBP-β induction. HEK293 cells were transfected with plasmid DNA expressing either ChREBP-α or ChREBP-β and treated with either 25mM glucose or fructose for 24 hours and changes in lipogenic gene expression was assessed. **Results:** ChREBP-α was not induced with carbohydrate refeeding, in fact it decreased after all three diets whereas ChREBP-β increased in all tissues assessed except muscle. Sucrose refeeding caused the largest increase in ChREBP-β expression followed by fructose, then glucose (24.4±11.1, 17.8±9.5, and 10.1±3.2 fold increase, respectively vs. fasting). ChREBP-β expression was also associated with lipogenic gene expression. SCD1 expression increased 8.6±4.0, 8.4±3.0, and 4.4±1.3 fold with sucrose, fructose, and glucose refeeding respectively. **Conclusions:** ChREBP-α and ChREBP-β can be detected separately and their induction is detectible in the liver and other peripheral tissues of carbohydrate refed mice. ChREBP-β expression appears to be responsible for carbohydrate-induced lipogenic gene induction and not ChREBP-α.

T-690-P
Phloretin Prevents, but Not Reverses High Fat Diet-Induced Obesity and Hepatic Steatosis in Mice
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Background: Oxidative stress has been considered as the link between obesity and obesity-associated disorders, and recent studies have suggested that antioxidants may have beneficial effect on preventing and reversing obesity and obesity related disorders. The objective of this study is to examine the activity of phloretin, a natural antioxidant found in apple leaves, in preventing and reversing the high-fat diet-induced obesity and hepatic steatosis in mice. **Methods:** C57BL/6 mice were fed a high fat diet (60% kJ from fat, 20 from carbohydrates and 20% from proteins) for 12 weeks. Preventive effect of phloretin on high fat diet-induced obesity was studied by twice weekly i.p. injections of phloretin (10 mg/kg) or dimethyl sulfoxide as control (n=5/group). Therapeutic effect of phloretin was assessed on mice pre-fed a high fat diet for 6 weeks, and then injected i.p. phloretin for 6 weeks. Body weight, food intake and body composition were monitored on these treated animals and compared to control. Serum concentrations of insulin, glucose and fats, and insulin sensitivity and glucose tolerance assay were performed to assess the effect of phloretin on glucose and lipid metabolism. Histochemistry analysis on the liver and adipose tissues was performed on treated animals and the results compared to control animals. **Results:** Twice weekly

injection of phloretin blocked high fat diet-induced weight gain and hepatic steatosis, but no therapeutic effect of phloretin was observed with the similar treatment of animals pre-fed with a high fat diet. Phloretin did not reverse the fatty liver in the obese mice. **Conclusions:** Phloretin may be used to prevent and alleviate high-fat diet-induced obesity and liver steatosis.

T-691-P
Gain of Nrf2 Function Leads to a Less Obese and More Glucose Tolerant Phenotype in Mice; A Role for Car-Mediated Repression of Gluconeogenesis
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Background: Nrf2 is a transcription factor that lies central to the regulation of the adaptive response to oxidative and electrophilic stresses. Nrf2 is bound to Keap1 in the cytoplasm, which facilitates its proteasomal degradation. Extrinsic or intrinsic stimuli can modify reactive cysteines in Keap1 and cause dissociation of Nrf2 from the Keap1/Nrf2 complex and rescue Nrf2 from degradation. Thus, Nrf2 accumulates and translocates to the nucleus and induces the transcription of its cytoprotective target genes. Nrf2 has recently been described to cross-talk with metabolic pathways and has come under the spotlight of obesity research. **Methods:** C57BL6J wild-type (WT) male mice or mice with hypomorphic Keap1 allele (a model of gain of Nrf2 function-"Keap1-hypo") were fed a standard (10kcal% fat) or a high-fat diet ("HFD") (60 kcal% fat) for 90 days. Indirect calorimetry, body composition (Echo-MRI), insulin sensitivity assessment and gene expression analysis (qRT-PCR, immunoblots) were performed. **Results:** The Keap1-hypo mice were partially protected from HFD-induced obesity, were more glucose tolerant and tended to have higher energy expenditure than their WT counterparts. They also preserved the glucose-stimulated insulin secretion from their pancreas. In vivo peripheral insulin signaling, as revealed by Akt phosphorylation at Ser473 and Thr308 was increased in muscle and tended to be increased in the liver of the Keap1-hypo. Moreover, the lower mRNA levels of G6pase and Pepck (key gluconeogenesis genes) along with the higher Car (a known gluconeogenesis repressor) levels in the liver of the Keap1-hypo mice suggest a Car-mediated gluconeogenesis repression under HFD. Promoter analysis of Car revealed 3 potential Nrf2 binding sites. **Conclusions:** The activation of Keap1/Nrf2 pathway appears to be an attractive option to prevent or treat type 2 diabetes.

T-692-P
E4orf1, A Novel Viral Protein That Improves High Fat Diet Induced Hyperglycemia in Mice
Ha-Na Na, Vijay Hegde, Olga Dubuisson, Tamra M. Mendoza, Nikhil V. Dhurandhar *Baton Rouge, LA*

Background: Adipogenic human adenovirus Ad36 is linked with better glycemic control and lower hepatic steatosis in animals and humans. In mice, Ad36 improves hyperglycemia without reducing dietary fat or obesity, a potentially attractive property, given the limited success of common weight loss strategies. In vitro studies credit the anti-diabetic effects of Ad36 to its E4orf1 gene. To test its role in vivo, we used replication deficient viral vectors to transiently express E4orf1 in mice. **Methods:** Mice fed a 60% fat diet were inoculated with pBabe retrovirus expressing E4orf1 (pBabe-E4), either intra-peritoneally(IP) alone, or IP, intra-muscularly, and subcutaneously (multi-site; MLT). The control group (CON) was inoculated with pBabe expressing null vector. In another experiment designed identically, mice were inoculated with adeno-associated-virus (AAV) expressing E4orf1 (AAV-E4) or a null vector (AAV-CON). **Results:** pBabe-E4 infected mice significantly attenuated the rise in glucose during glucose tolerance tests (GTT) at 1 and 2 wk post infection(pi), vs CON. The MLT group, which showed the greatest response, had 80% less area under the curve (AUC) for GTT vs CON (p<0.03) on wk 1. As expected from transient gene expression, the effect of E4orf1 on GTT declined after wk 2 pi. Upon sacrifice 5 wk pi, adipose tissue of the PBabe-E4 group expressed E4orf1 and significantly increased adiponectin mRNA vs CON. Mice inoculated with AAV-E4 also reduced the AUC for GTT by 63% (MLT, p<0.05), vs AAV-CON. **Conclusions:** This study creatively exploited the beneficial properties of a virus, by selectively harnessing its E4orf1 protein to improve hyperglycemia, -a frequent comorbidity of obesity. This proof of concept study provides critical confirmation

to advance the development of E4orf1-based anti-diabetic treatments. Funding: Vital Health Interventions.

T-693-P

Associations between Tissue Retinol Binding Protein-4 Levels and Insulin Resistance in Morbidly Obese Subjects

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Background: Retinol binding protein-4 (RBP-4) is a pro-inflammatory factor and may play a role in insulin resistance. The association between tissue RBP-4 concentrations and insulin resistance is not completely understood. The objectives of this study were to measure RBP-4 concentrations in blood, liver, muscle, subcutaneous, omental, and mesenteric adipose tissues in morbidly obese subjects, and investigate their relationship to insulin resistance. **Methods:** Blood and tissue samples were collected from 38 morbidly obese subjects (BMI ≥40 kg/m2) by a surgeon during the Roux-en-Y surgery. Blood lipids and insulin resistance biomarkers were measured using standard methods. Gene expression and protein concentrations of RBP-4 in tissues were measured using real time PCR and ELISA kit, respectively. **Results:** Based on blood hemoglobin A1c (HbA1c) concentrations, subjects were divided into non-diabetic (n=13), pre-diabetic (n=12) and diabetic (n=13) groups. Diabetic subjects had significantly higher blood glucose concentrations and Homeostasis Model of Assessment-Insulin Resistance (HOMA-IR), and lower blood HDL-cholesterol concentrations than non-diabetic and pre-diabetic subjects. Blood and tissue RBP-4 concentrations were similar among three groups. Liver had the highest RBP-4 concentrations, followed by muscle, subcutaneous, omental, and mesenteric adipose tissues in a decreased order. Omental adipose RBP-4 gene expression levels were positively associated with HOMA-IR (r=0.355, p=0.029). Liver RBP-4 concentrations were positively associated with blood glucose concentrations (r=0.363, p=0.025). **Conclusions:** Liver had the highest RBP-4 concentrations among 5 collected tissues, and liver RBP-4 may have a modest role in insulin resistance.

T-694-P

A High-Pufa Fat Diet Atenuates the Deleterious Metabolic Effects of a High-Saturated Fat Diet Associated with Partial Lipectomy

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Background: Increased visceral fat is directly associated with increased cardiovascular risk. Experimental studies demonstrated that its partial removal is associated with improvements in some risk parameters. However, when associated with a high-saturated fat diet, lipectomy has been shown to lead to deleterious effects (i.e., increased insulin resistance). The aim of this study was to investigate the effects of the partial removal of visceral fat on metabolic risk factors in rats fed different types of high-fat diets. **Methods:** Male Wistar rats were randomized into four groups: high saturated-diet/lipectomized (HSL), high saturated-diet/sham-lipectomized (HSS), high polyunsaturated-diet/lipectomized (HPL), high polyunsaturated-diet/sham-lipectomized (HPS). Eight weeks after the diet lipectomy was performed. Body weight, food intake, fasting glucose and glucose tolerance were assessed before and three weeks after the lipectomy. HOMA index, hepatic lipid content, adiposity and lipid profile were assessed after the interventions. **Results:** HSL and HSS showed impaired glucose tolerance and impaired insulin resistance when compared to the other groups (p<0.05). HSS and HPS showed increased total adiposity and epididymal fat whereas HPS also showed increased brown fat content (p<0.05). HSL showed increased hepatic lipid content when compared to all groups (p<0.02). Lipectomy per se induced increased hepatic fat content. PUFA-rich diet showed a protective effect increasing brown adipose tissue content while not inducing the negative effects of saturated-fat diet such as insulin resistance, retroperitoneal compensatory growth, increased cholesterol levels or increased hepatic fat content as caused by lipectomy. **Conclusions:** So we suggest that lipectomy associated to saturated-rich diet exerted deleterious effects while polyunsaturated-rich diet seems to prevent it.

T-695-P

Chlorogenic Acid Suppresses High Fat Diet-Induced Inflammation and Hepatic Steatosis

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Background: Coffee polyphenols have been shown to have various health-protective effects, such as suppressing fat accumulation, inhibiting hyperglycaemia and hyperlipidemia. Chlorogenic acid (CGA), the most abundant form in coffee, also exerts hypoglycemic effect and regulates lipid metabolism. The objective of this study is to assess the mechanism of chlorogenic acid-mediated protection on high fat diet-induced obesity. **Methods:** A series of q-PCR analysis was performed in tissue of C57BL/6 mice fed a regular chow or high fat diet for 15 weeks with or without twice weekly injections of CGA (i.p., 100 mg/kg) or dimethyl sulfoxide (carrier solution), in conjunction with physiological and biochemical measurements of body weight, body composition, fat content in the liver, serum glucose, insulin level, and levels of inflammatory cytokines. **Results:** Chlorogenic acid-treated animals showed significant reduction of inflammation in adipose tissue, as evidenced by low levels of macrophage markers F4/80, Cd68, Cd11b, Cd11c and inflammatory factors Tnfα and Mcp-1. CGA treatment also reduced hepatic inflammation in obese mice and attenuated diet-induced hepatic steatosis by suppressing triglyceride and total cholesterol levels in the liver and reducing hyperlipidemia. At physiological level, chlorogenic acid blocked high fat diet-induced gain of fat mass by 70% without change of their lean mass. Analysis of genes involved in lipid metabolism showed CGA markedly reduced lipid transporter Cd36 expression and increased Cpt1 and Fgf21 mRNA level. In addition, CGA improved hyperinsulinemia and hyperglycemia, and inhibited diet-induced pancreatic insulin gene expression. **Conclusions:** The results support that supplementation of CGA exerts a preventive role in diet-induced obesity and improves obesity-related inflammation and hepatic steatosis.

T-696-P

Effect of Short and Long-Term High-Fat Diet on Modulation of Hepatic Lipogenesis in Rats

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Background: The development of fatty liver in insulin resistant obesity suggests that insulin-stimulated hepatic fat synthesis is preserved despite impaired control of gluconeogenesis. Insulin regulates the expression of SREBP-1c and its conversion to the mature form, which regulates transcription of genes for the lipogenic enzymes Fatty Acid Synthase (FAS) and Acetyl-CoA Carboxylase (ACC). **Methods:** We fed male Sprague-Dawley rats a high-fat (HF; 55% of kcal as fat) diet for 1 or 10 wks to produce fatty liver, or a control low-fat (LF,15%) diet. Liver samples were obtained from rats after a 24 hr fast or after a fast and refeeding for 16 hr with a 55% carbohydrate meal. **Results:** At wk 1, refeeding increased 1) plasma insulin levels 2X in both groups; 2) SREBP-1c, FAS and ACC mRNA more in LF than HF rats; 2) SREBP-1c precursor protein in both groups, but mature SREBP-1c only in LF; 3) FAS and ACC protein markedly in HF but not LF; and 4) mTORC1 activity in both groups. At wk 10, refeeding still increased SREBP-1c, FAS and ACC mRNA more in LF than HF rats, but failed to increase levels of SREBP-1c, FAS or ACC protein, or mTORC1 activity in either group. **Conclusions:** The enhancement of synthesis of lipogenic enzymes in HF rats at wk1, perhaps via mTORC1 effects on translation, was no longer observed in older animals. Decreased induction of lipogenic genes by refeeding at both wk 1 and 10 indicates an early and persistent defect in control of lipogenesis in HF diet-induced fatty liver.

T-697-P

Developmental Origins of Distal Tubular Damage and Type 2 Diabetes in Fatty Zucker Rats and Protection of Leptin Deficient Fatty Rats by Brown Norway Alleles on Chromosome 1

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Background: Fatty Zucker rats are homozygous for a Leptin Receptor (Leprfa/fa) mutation on chromosome 4. Fatty Zuckers develop type 2 diabetes and renal disease. We bred a fatty ZUC.BN-Chr1 congenic homozygous for Leprfa/fa, which is 95% identical to Zucker fatty rats except half of chromosome 1 is derived from Brown Norway (BN). Type 2 diabetes and renal disease are reduced in the congenic. **Methods:** Male fatty Zucker and fatty BN chromo-

some 1 congenic animals were phenotyped at 9, 15 and 28 weeks of age. RNAseq from kidney, liver and retroperitoneal fat tissues was performed. Also measured were 12 urinary protein markers of glomerular and tubular disease (Myriad RatKidneyMAP), and urinary metabolites by NMR. **Results:** Positional candidate genes at congenic region QTL peaks that have high fold differences congenic vs Zucker have been identified. ACSM5 is 12-14-fold higher congenic>Zucker in fat tissue and 54-139-fold higher congenic>Zucker in liver all ages. Differences in kidney were not found.. ACSM adds AcylCoA to 4-11 carbon fatty acids in mitochondria. A SNP near uromodulin and ACSM5 is associated with glomerular filtration rate in humans. 4-times more EGF was lost per day in congenic than Zucker urine at 28 weeks (p=0.0003). 2-15-fold more GST-μ was lost per day by Zucker than congenic rats (p<0.008) . Both results suggest distal tubular damage in the Zucker strain. No other significant effects were observed. Zuckers had increased urine urea at all time points (p<0.0001). Zuckers also lose 3-4 times more myo-inositol (p<0.0001), 5-10 fold more glucose and 3-4 fold more creatine (p<0.0001) than congenics. Fasted serum glucose and BUN were lower in congenics. **Conclusions:** The chromosome 1 BN donor region protects animals that are fatty Leprfa/fa from distal tubule disease and type 2 diabetes. Supported by Nora Eccles Treadwell Foundation

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Brain

T-698-P
Genistein Enhances Expression of Genes Associated with Memory and Eating Behaviors in the Ventral Hippocampus of Ovariectomized Rats

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Background: The hippocampus, the brain structure critical for formation of short- and long-term memories, plays a significant role in the memory of a meal. Hippocampal damage, like that seen in Alzheimer's patients, results in disordered eating and conversely, obesity-mediated inflammation causes damage to hippocampal neurons. Alzheimer's-like complications are even more prevalent following menopause in women. Phytoestrogens such as genistein (G) and resveratrol (R) have been shown to act on estrogen receptors to reduce inflammation and mediate neuroprotective effects. Previously, we showed that synergistic combinations of these compounds along with quercetin (Q) and vitamin D reduced weight gain in ovariectomized (OVX) female rats. However, these synergies may not exist when it comes to phytochemical roles the brain. **Methods:** In the current 16-week study, OVX rats were fed diets containing doses of phytochemicals (diet 1: 1000 mg/kg G; diet 2: 1000 mg/kg G, 400 mg/kg R, and 2000 mg/kg Q). **Results:** qRT-PCR of ventral hippocampal tissue showed that rats in the G-only group had significantly increased levels of mRNA for genes associated with hippocampal memory and appetite such as CREB1 (1.9-fold increase), TH (1.6), POMC2 (3.5), CCK (1.4), GnRH1 (2.6), NPY (1.9), SOCS3 (1.8); while those in the phytoestrogen combination group showed no significant increase in any of these markers. **Conclusions:** These data provide new evidence for the complex effects of phytochemical compounds on different tissues in the body. Phytochemical combination appears to have no added beneficial effects on hippocampal gene expression compared to genistein alone treatment. Further studies are needed to investigate the neuroprotective effects of genistein and phytochemical combinations.

T-699-P
Rats Deficient in Melanocortin 4 Receptor Lose Less Weight During Calorie Restriction

Tariq I. Almundarij, Eric Dyne, Colleen M. Novak *Kent, OH*

Background: Melanocortin 4 receptor (MC4R) mutation in humans is one of the few known monogenic causes of obesity. MC4R is also the target of numerous genetic variants that contribute to human obesity. Central MC4R plays a critical role in controlling energy homeostasis, increasing energy expenditure and decreasing food intake. Here, we investigate the contribution of energy expenditure (EE) to obesity in MC4R-/- rats, and test the hypothe-

sis that MC4R signaling underlies differential weight loss during calorie restriction (CR). **Methods:** Rats homozygous (MC4R-/-) and heterozygous (MC4R-/+) for the non-functional MC4R were compared to wild-type (WT) rats. We examined 24-hour EE, spontaneous physical activity (SPA), and respiratory exchange ratio (RER). The rats then underwent 21 days of 50% calorie restriction (CR); changes in body weight and composition were measured. **Results:** MC4R-/- rats ate and weighed significantly more and showed less SPA compared to both MC4R-/+ and WT rats. No differences were found in EE once differences in body weight were taken into account. RER was significantly higher in MC4R-/- rats compared to both MC4R-/+ and WT rats. MC4R-/- rats lost 10% of their body weight during CR, significantly less than the other groups; MC4R-/- rats also showed better conservation of both fat and lean mass. Interestingly, MC4R-/+ rats lost significantly less weight than WT rats, even though the starting body weights were similar. **Conclusions:** Our data do not support the supposition that rats deficient in functional MC4R have lower baseline EE, but rather that elevated food intake plays a disproportionate role in the obesity seen in MC4R-/- rats. During food restriction, however, higher MC4R function was related to lack of conservation of body mass and adiposity.

T-700-P
Ventromedial Hypothalamic Melanocortin Receptor Activation and Energy Expenditure of Activity: Role of Skeletal Muscle Activity Thermogenesis

Chaitanya K. Gavini, Colleen M. Novak *Kent, OH*

Background: The ventromedial hypothalamus (VMH) is part of the hypothalamic energy balance-regulating pathway, thought to exert its actions via peripheral glucose and lipid allocation. The central melanocortin (MC) system also plays a vital role in controlling energy balance, increasing energy expenditure (EE) and decreasing appetite. We have demonstrated that intra-VMH MC receptor activation increases EE and physical activity (PA) and decreases respiratory quotient, switching fuel utilization to fats and decreases fuel economy. Here, we test the hypothesis that the excess calories are dissipated by skeletal muscle as heat, possibly through thermogenic mediators. **Methods:** Male Sprague-Dawley rats (n=12) received guide cannulae aimed at the VMH; temperature transponders were implanted near the gastrocnemius (gastroc) muscle of both hind limbs. Rats received intra-VMH microinjections of the MC receptor agonist Melanotan-II (MT-II, 20pmoles/200nl) and vehicle (aCSF, 200nl) in random order. Gastroc temperatures were measured during a treadmill activity test to rule out differences in PA as a confounding factor. In a separate group of rats, we examined skeletal muscle expression of uncoupling proteins 2 and 3 (UCP2 and 3) after intra-VMH microinjection of either MTII or vehicle. **Results:** Intra-VMH-MTII induced a significantly greater PA-induced rise in gastroc temperature compared to vehicle treatment. MTII also significantly elevated UCP2 and 3 expression in both quad and gastroc. **Conclusions:** These results support the hypothesis that MC acts in the VMH to lower economy of activity and that the excess calories are dissipated as heat, possibly through enhanced expression of mediators of EE in skeletal muscle. The data are consistent with the role of MC in the VMH in modulation of skeletal muscle utilization of metabolic fuels, particularly lipids.

T-701-P
A Combination of Dietary Fat and Nicotine Administration Enhances Endocannabinoid CB1 Receptor Expression in Hypothalamic Nuclei in Mice

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Background: Rimonabant, though withdrawn due to psychiatric side effects, has proved the potential effectiveness of endocannabinoid CB1R blockade for the treatment of obesity and smoking cessation. CB1R is a GPCR expressed widely in the brain as well as in the liver or adipose tissue. While the consequences of genetic or pharmacologic CB1R blockade have been studied extensively, the precise expression of the receptor within the hypothalamus or its potential regulation has not been thoroughly addressed. **Methods:** To examine the distribution of CB1R, we micro-dissected hypothalamic nuclei, hippocampus and neocortex from male B6 mice and analyzed mRNA levels by QPCR. We further explored a possible change in CB1R mRNA levels by analyzing samples from mice fed high fat diet (HFD:60%kcal fat) for four

weeks, mice injected ip. with nicotine (3µg/gx4 q6hr) and mice treated with both. **Results:** CB1R levels in the hypothalamus were ~40% lower than in the hippocampus. The expression was slightly higher in the arcuate and lateral nuclei compared with paraventricular and ventral-dorsal medial hypothalamus. Neither HFD nor nicotine alone altered CB1R levels in any of the nuclei tested. In contrast, treatment of HFD-fed mice with nicotine led to a significant increase in CB1R levels in the arcuate, paraventricular and lateral nuclei. Such a response was not observed in the expression of neuropeptides or melanocortin receptors. Melanocortin receptor agonist MT-II as well as nicotine suppressed body weight in HFD-fed mice. However, MT-II did not show any effect on CB1R expression. **Conclusions:** CB1R mRNA is distributed in multiple hypothalamic nuclei and the level is augmented by the combination of HFD and nicotine, suggesting a possible interaction between dietary fat overload and tobacco smoking in the regulation of CB1R expression in the brain.

T-702-P
Novel Melanocortin 4 Receptor (MC4R) Gene Mutations in Pediatric Obese Patients

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Background: Melanocortin-4 receptor (MC4R) plays critical roles in regulating food intake and energy balance. Mutations in the MC4R are the most common cause of monogenic human obesity. Alabama has the highest rate of overweight and obesity in the nation. Therefore, we have a unique opportunity to use this extraordinary resource to determine genetic polymorphisms of MC4R gene and investigate the impact of genetic variants on the obesity development and outcome of different treatment. **Methods:** Clinical and biochemical characteristics of the 84 pediatric obese patients were obtained with BMI > 40 kg/m2. Blood samples were obtained and the coding region of MC4R is amplified by PCR and all PCR products are fully sequenced. To examine the function of the mutated MC4Rs, single MC4R mutation was constructed. Standard ligand binding and cAMP assays were performed. Data are expressed as mean ± SEM. Student t test was used for statistical analysis, with p < 0.05 considered to be statistically significant. **Results:** In this study, we have identified four new mutations (E100K, F202V, K242H, and C277-stop) in pediatric obese patients. Our functional study indicates that the mutation of the C277-stop is not expressed at cell surface and NDP-MSH does not bind to this receptor. Two mutations (E100K and K242H) significantly decreased receptor expression and function while F202V only decreased receptor expression (P<0.05). **Conclusions:** MC4R mutation altered receptor function. Mutation E100K is located in the NDP-MSH binding site in which mutation affects ligand binding and signaling. This study provides important insight into the key role of MC4R mutation in human obesity development.

T-703-P
Molecular Insight Into the MC4R Mediated Biased Signaling by Different Agonists

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Background: The melanocortin-4 receptor (MC4R) plays a key role in the regulation of food intake. alpha-MSH binds to MC4R and activates cAMP, calcium and MAPK pathways, whereas MC4R synthetic agonist THIQ can only activates cAMP pathway. The molecular basis of the MC4R for this ligand selectivity is unknown. We hypothesize that different MC4R agonist can stabilize different MC4R conformation which links to different signaling events. **Methods:** In this study, we utilized the metal-ion chelator approach to determine receptor conformation change by cross-linking two transmembrane helices (TM3 and TM6) and thus inhibiting receptor activation when Zn++ is present. 20 single or double mutations were created at the end of TM3 and beginning of the TM6. Standard ligand binding and cAMP assays were performed. Student t test was used for statistical analysis, with p < 0.05 considered to be statistically significant. **Results:** Twelve single mutations and eight double mutations at the end of TM3 and beginning of the TM6 of the MC4R were tested. Our results indicate that these single or double mutations did not significantly alter NDP-MSH or THIQ binding affinity and potency. However, the receptor activation by THIQ, not NDP-MSH, is blocked by adding Zn++ in the medium at the double mutation I150+248H, suggesting that THIQ might induce different receptor conformation change compared to that of NDP-MSH. **Conclusions:** Our results suggest that

NDP-MSH and THIQ activate different signal pathways by inducing different receptor conformation changes. This study provides insight into the molecular mechanism of why different MC4R agonists can induce different receptor signaling pathway.

T-704-P
Gene Expression Profiling of Single Amylin-Activated Neurons in the Rat Area Postrema

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Background: Amylin belongs to the calcitonin gene related peptide family and is co-secreted with insulin in response to feeding. Amylin acts as satiating signal to inhibit food intake by activating area postrema (AP) neurons. Amylin displays strong binding to the AP. One identified component of the amylin receptor belongs to the family of the seven transmembrane G protein-coupled receptors, the calcitonin receptor (CTR). High affinity amylin binding requires the co-expression of CTR with a member of the receptor activity modifying proteins (RAMPs) 1 or 3. The coupling of these two subunits forms AMY1 or AMY3 receptors, respectively. CTR, RAMP1 and RAMP3 are expressed in the rat AP; however, it has never been demonstrated that all components are present in a single cell. **Methods:** We therefore used laser capture microdissection (LCM) to discriminate between different neuronal populations and to analyze them at the single cell level. To identify if receptor subunits are expressed in one amylin-activated neuron, c-Fos immunohistochemistry coupled with LCM and real-time quantitative PCR (RTqPCR) were performed. Male Wistar rats were treated with amylin (20 µg/kg, i.p.). Ninety minutes later, brains were rapidly removed, embedded in OCT and snap-frozen in cold isopentane. Subsequently, brains were cut at 10 µm thickness on a cryostat. c-Fos-positive single cells were immediately processed under LCM; single cells were captured and RNA was extracted, purified and amplified. Expression profiling of mRNA was done by using RTqPCR to provide a real-time evaluation of gene expression in the rat AP. **Results:** CTR mRNA and RAMP 1 and 3 mRNA were detected in a single amylin-activated neuron collected from the rat AP. **Conclusions:** Hence for the first time, we demonstrate that CTR and RAMP1 and 3 are expressed in a single, amylin-activated neuron in the rat AP.

T-705-P
Synergistic Effects of PYY(3-36) and Liraglutide on Food Intake and Body Weight, Possibly Mediated by Altered Arcuate Y Receptor Expression

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Background: Glucagon-like peptide-1 (GLP-1) and Peptide YY (PYY) are co-released from enteroendocrine L-cells. Both act as postprandial satiety signals and reduce appetite and inhibit food intake. It is likely that both GLP-1 and PYY act on centrally located receptors, but the exact sites of action and the molecular mechanisms involved remain to be determined. **Methods:** Here, we assessed the combined effect of the once-daily GLP-1 analog liraglutide (LIRA) and PYY(3-36) on body weight in diet induced obese (DIO) hamsters. Liraglutide is in phase 3 clinical development for the treatment of obesity. Next, obese DIO C57BL/6J mice were treated with LIRA (0.2 mg/kg/bidaily) for 14 days and subsequently analyzed for Y1, Y2, Y5 receptor expression in the hypothalamus using semi quantitative in situ hybridisation. **Results:** Whereas LIRA (0.2 mg/kg/bidaily) and PYY3-36 (1mg/kg, s.c. osmotic minipumps) showed a statistically significant 11% and 7% weight loss, respectively, compared to vehicle (veh), co-administration of the two peptides led to a marked synergistic 32% effect on weight loss following 16 days of dosing. The synergistic effects of LIRA and PYY(3-36) on body weight prompted us to examine a potential cross-talk between GLP-1 receptor and Y receptor signaling pathways in the hypothalamus. Interestingly, we found that LIRA treatment lowered the orexigenic Y1 receptor mRNA levels by 34% versus veh (4.48±0.91 LIRA versus 6.79±0.73 veh) and increased the anorexigenic Y2 receptor expression by 18% (7.34±1.55 LIRA versus 5.51±1.25 veh) in the arcuate nucleus known to harbor GLP-1 receptors – but not in the paraventricular nucleus which also has GLP-1 receptors. **Conclusions:** In conclusion, the LIRA-induced shift in Y-receptor balance could potentially explain the synergistic effects on body weight of co-administered LIRA and PYY3-36.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Neuroscience

T-706-P

The Role of TRPV1 Channels in Gastric Vagal Afferent Satiety Signalling in Lean and Obese Mice

Amanda Page, Stephen Kentish, George Hatzinikolas, Tracey O'Donnell, Gary Wittert *Adelaide, Australia*

Background: TRPV1 deficient mice are resistant to high fat diet induced obesity (HF-DIO; Circ.Res. 2007:100;1063). Activation of mechanosensitive gastric vagal afferents (GVAs) induces satiety. Responses to mechanical stretch are reduced in HF-DIO (J Phys 2012:590:209). TRPV1 channels are expressed in GVAs (Am J Phys 2010:298;G212). Knockout of TRPV1 reduces gastroesophageal responses to stretch (Am J Phys 2008;294:G130). The effect of HF-DIO on TRPV1 mediated GVA mechanosensitivity is unknown. We aimed to determine the role of TRPV1 on GVA mechanosensitivity and food intake in lean and DIO mice. **Methods:** 8wk old male TRPV1+/+ (WT) and -/- (KO) mice were fed either standard (SLD; 12% energy from fat) or HF chow (60% energy from fat) for 20wks (N=10/group). Food intake and weight were monitored. At 20wks, single fibre in vitro recordings of GVA mechanoreceptors were obtained. **Results:** GVA tension receptor response to stretch (1–5g) was reduced and food intake (grams) increased in KO SLD mice (p<0.001 v WT SLD). Tension receptor responses to stretch decreased in WT HF (p<0.001), but not KO mice. Food intake (grams) was similar in the KO and WT HF mice. Weight gain, on either diet was less in KO than WT mice (p<0.01). Energy intake as Kcals/gram weight gained was 3 fold greater in the KO HF mice (p<0.001 v WT HF). TRPV1 KO had no effect on the response of gastric mucosal receptors to mucosal stroking in mice on either diet. **Conclusions:** TRPV1 channels modulate GVA tension receptor mechanosensitivity and may mediate the reduction in GVA mechanosensitivity in response to HF-DIO, an effect not seen in the KO mice. The observation that food intake in grams was the same rather than less (as expected) in the KO vs WT mice may be a consequence of the marked decrease in metabolic efficiency in the KO in response to the HFD. Funding: Gum Bequest, Royal Adelaide Hospital

T-707-P

Expression and Distribution of Glucagon-Like Peptide-1 (GLP-1) Receptor mRNA, Protein and Binding in the Non-Human Primate Brain

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Background: Glucagon-like peptide-1 (GLP-1) is released from the gut in response to high carbohydrate and high fat meals. However, GLP-1 is also produced centrally in the nucleus of the solitary tract (NTS), where it is an anorectic neurotransmitter and has effects on glucose homeostasis. While the distribution of GLP-1 receptor (GLP-1R) has been described in the rodent brain, it is known that there are some differences in the central GLP-1 system in the primate brain. **Methods:** In the current study we characterised the distribution of the GLP-1R mRNA and protein in the adult macaque brain using in situ hybridisation, in situ ligand binding and immunohistochemistry using a primate specific GLP-1R antibody. **Results:** Immunohistochemistry demonstrated that the GLP-1R is localised to both cell bodies and fiber terminals in a very selective distribution throughout the brain. The highest concentrations of GLP-1R-immunoreactivity were present in select hypothalamic regions, such as the paraventricular nucleus and the arcuate nucleus. Within the brainstem, the highest concentrations were in the area postrema, NTS, and dorsal motor of the vagus. Overall, there was very good correlation in the receptor distribution characterised by the three different techniques. Importantly, the highest level of receptor expression was in areas involved in the regulation of food intake, which correlates well with the functional role of this system. Finally, while there were strong similarities in the distribution of GLP-1R between the rodent and macaque, there were a few key areas of differences, including the amygdala, where GLP-1R expression was much higher in the primate than in the rodent. **Conclusions:** In conclusion, GLP-1R in the non-human primate brain is mainly distributed along the functional continuum of nuclei and areas involved in appetite functions.

T-708-P

Association of Melanocortin 4 Receptor Gene Variation with Gastric Emptying and Satiation in Overweight and Obese Adults

Andres Acosta, Andrea Shin, Paula Carlson, Duane Burton, Jessica O'Neill, Deborah Eckert, Alan R. Zinsmeister, Michael Camilleri *Rochester, MN*

Background: Melanocortin (MC) pathway and specifically the melanocortin 4 receptor (MC4R) have major roles in energy homeostasis. MC4R deficiency has been associated with monogenic obesity and poor prognosis after Roux Y Gastric Bypass. The rs17782313 mutation, mapped 188 kb downstream from MC4R, has been associated with satiety in children, higher BMI and total calorie intake in adults. Aim: To determine if rs17782313 variation of MC4R is associated with gastric functions, satiation or satiety in overweight and obese people. **Methods:** 178 predominantly Caucasian overweight or obese subjects were studied: 120 females, 58 males; mean BMI 33.4+5.3kg/m2; age 37.7+11.2y. Quantitative traits assessed were: gastric emptying (GE) of solids and liquids by scintigraphy; fasting and postprandial gastric volume (GV) by SPECT; satiation by Ensure® drink test (maximum tolerated volume [MTV], total symptom score [TSS] and individual symptoms [nausea, fullness, bloating, and pain, each on 100mm VAS]; and satiety by kcal intake during buffet meal. Genotyping (rs17782313) was by Taq-Man® assay. Associations of genotype and quantitative traits were by AN-COVA (gender, BMI co-variates), based on a dominant (TC [n=72]-CC [n=12] vs. TT [n=94]) genetic model. **Results:** There were no significant associations of MC4R rs17782313 with age, BMI, GE liquids, GV, MTV and satiety. However, MC4R rs17782313 was associated with delayed proportion of solid GE at 2 (mean delta [Δ] 0.067; p=0.008) and 4 (median Δ 0.0315; p=0.006) hours, and T½ (median Δ 6 minutes; p=0.034) as well as postprandial satiation (median Δ TSS 27.5 mm, p=0.036). **Conclusions:** MC4R rs17782313 is associated with solid GE and satiation symptoms in overweight and obese adults, suggestingMC4R pathway may affect satiation in part through effects on gastric motor function. Funding: NIH DK67071

T-709-P

Gastric Vagal Afferent Modulation by Nesfatin Is Altered by High Fat Diet Induced Obesity

Stephen Kentish, Tracey O'Donnell, Gary Wittert, Amanda Page *Adelaide, Australia*

Background: Originally identified as a hypothalamic satiety peptide nesfatin is abundant in ghrelin producing gastric X/A like endocrine cells. Nesfatin levels vary with metabolic state and peripheral or central injection inhibits dark phase feeding in rodents (Endocrinology. 2009; 150(2):662-71). Activation of mechanosensitive gastric vagal afferents induces satiety. While nesfatin has been shown to activate isolated vagal afferents (Biochem Biophys Res Commun 2009; 390(3):958) its effect on gastric vagal afferent mechanosensitivity has not been determined. We will determine the effect of nesfatin on the response of gastric tension and mucosal receptors to mechanical stimulation in lean and high fat diet (HFD) induced obese mice.
Methods: 8 week old female C57BL/6 mice were housed on a 12hr light: dark cycle and fed either standard mouse chow (SLD; 12% energy from fat) or HFD (60% energy from fat) ad libitum for 12 weeks. At the end of 12 weeks, single fibre in vitro recordings of gastric vagal mechanoreceptors (J Neurophysiol, 2002: 87; 2095) and their responses to nesfatin (30-100pM) were obtained from both groups of mice. **Results:** In SLD mice nesfatin (100,300pM) potentiated the mucosal receptor response to mucosal stroking with von Frey hairs (10-1000mg; p<0.01), but had no effect on tension receptors. In HFD mice nesfatin (30-300pM) inhibited tension receptor sensitivity to circular stretch (1-5g; p<0.001), but had no effect on the mucosal receptor sensitivity. **Conclusions:** Nesfatin modulates specific populations of gastric vagal afferents in a nutrition dependent manner. The physiological significance of this modulation remains to be elucidated. Supported by NH&MRC grant #1023972

T-710-P
Food Intake Attenuates Brain Responses to Unpleasant Images in Humans

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Background: Emotional eating is a maladaptive behavior predisposing to weight gain. We hypothesised that brain responses to negative emotional stimuli would be reduced by food intake, and may be influenced by psychological traits e.g. disgust sensitivity and emotional eating. **Methods:** Healthy, non-obese adults (n=18, mean ± SEM age 23.6 ± 0.7y, BMI 23.0 ± 0.6 kg/m2) had functional MRI while viewing unpleasant vs. neutral pictures (IAPS). Subjects were scanned after fasted overnight (~16h) and when fed (110 min after ingestion of a 1200 kCal liquid meal) in a randomized, crossover design. Correlations of ROI activation were made with trait measures of disgust sensitivity (DS-R) and emotional eating (DEBQ). **Results:** BOLD activation to unpleasant images was significantly lower when Fed than Fasted in the orbitofrontal cortex (OFC), caudate and putamen (P<0.01), but not insula, nucleus accumbens or amygdala (P=0.25-0.44). Positive correlations were seen between DS-R (but not DEBQ-emotional eating) and BOLD activation to unpleasant pictures when Fasted (r=+0.57-0.72, P<0.01), and the decrease in activation from Fasted to Fed state (r=+0.45-0.59, P=0.01-0.06), in the amygdala, insula, OFC and hippocampus. **Conclusions:** Brain responses to negative emotional stimuli are attenuated after food intake, which may reflect the stress alleviating effects of food consumption underlying emotional-induced eating, perhaps via changes in gut hormones such as ghrelin.

T-711-P
Salience Resting State Network Integrity Is Increased in Obesity and Predicts Orbitofrontal Cortex Activation to High-Calorie Food Cues

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Background: Obesity and fasting may alter food hedonics and brain reward systems. Brain activity in the resting state (in absence of a task) may also be functionally important. Identified resting state networks include a salience network (SALN) involving insula, ventral anterior cingulate (vACC) and orbitofrontal (OFC) cortex, regions also activated by food cues. We hypothesised that the SALN is altered in obesity and by feeding state. **Methods:** 83 adults (64% male, mean ± SD age 33.2 ± 10.7y, BMI 19.1-53.1 kg/m2, 29 lean, 28 overweight, 26 obese) had 10min resting state fMRI after an overnight fast. 22 of the non-obese subjects (17 male) re-attended twice, remaining fasted or receiving a 730kCal breakfast, and 85min later had resting state fMRI followed by task fMRI while rating the appeal of food pictures. **Results:** Obesity was associated with increased resting SALN integrity including OFC, vACC and insula (P<0.05), but not as a control the motor-sensory network. In the sub-cohort, there was no significant effect of fasting on SALN integrity (P=0.70-0.75 vs. fed). When fasted, resting SALN integrity in the OFC was positively correlated with task OFC activation to high-calorie foods (r=+0.52, P=0.02), but this was not significant to low-calorie foods or when fed (P=0.2-0.8). **Conclusions:** The salience network at rest may encode aspects of food reward given the acute and chronic influences of nutritional state.

T-712-P
A Chromosome 15q11.2 Microdeletion Involving SNORD116 with Hyperphagia, Childhood-Onset Morbid Obesity and Hypogonadotrophic Hypogonadism but without Short Stature, GH Deficiency or Mental Retardation

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Background: Three previous cases of childhood-onset obesity, hyperphagia, male hypogonadism/hypogenitalism and mild-moderate mental retardation with microdeletions of the paternally-inherited chromosome 15q11.2 involving a limited number of Prader-Willi syndrome (PWS) region genes have implicated the snoRNAs, particularly SNORD116 cluster, in these phenotypes. **Methods:** A 24 year old man with morbid obesity and OSA was referred to our PWS clinic. Height was 1.82m (mid-parental height 1.86m), weight 188.4kg, BMI 57.2 kg/m2. He had a neonatal weak cry but no history of infantile hypotonia, feeding difficulties, delay in developmental milestones or mental retardation. He developed obesity from age 4y and binge eating episodes between 7-14y, but hyperphagia attenuated from his late teens. He had undescended testes and a unilateral orchidectomy aged 14y. He had micropenis and scrotal hypoplasia with no palpable testes. **Results:** Tests revealed hypogonadotrophic hypogonadism but otherwise normal pituitary function including dynamic GH testing, normal blood pressure, lipids and glucose tolerance but fasting hyperinsulinaemia. MRI brain/pituitary was normal. X-ray revealed thoracolumbar scoliosis. WAIS neuropsychometric testing was normal (full scale IQ 104). SNRPN methylation-specific PCR was normal but array CGH demonstrated a 218kb chromosome 15q11.2 deletion. The microdeletion was not present in parental DNA samples. This deletion is predicted to include SNORD 109A/B, all copies of SNORD116 and copies 1-22 of SNORD115 clusters. **Conclusions:** This case further supports a role for these snoRNAs, particularly SNORD116, in the regulation of eating behaviour and hypothalamic-pituitary-testicular development. Such microdeletions should be sought in childhood-onset obesity with hypogonadism even in the absence of short stature, mental retardation and other PWS phenotypes.

T-713-P
Adipokine and Cytokine Correlates of Neural Activation to High-Calorie Food Images in Obese Endometrial Cancer Survivors

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Background: Obese endometrial cancer (EC) survivors have a 3-to 6-fold increased risk of death compared to normal weight EC survivors. Adipokines and inflammatory cytokines may play a role in obesity related EC mortality. Leptin, which helps regulate food intake and energy expenditure, has been shown to stimulate EC cell growth and, TNF-α can disrupt insulin signaling and lead to aberrant EC cell growth. We previously reported that obese EC survivors had increased activation in response to high-calorie food images in brain regions associated with food reward and motivation, which were markedly reduced after a 6-month lifestyle intervention (Survivors in Uterine Cancer Empowered by Exercise and a Healthy Diet, SUCCEED). **Methods:** Here, we measured circulating levels of adipokines and cytokines at baseline and 6-months after the SUCCEED intervention and, examined potential correlations between these markers and neural activations to high-calorie food images in obese, early stage EC survivors (n=8). **Results:** We found that TNF-α was significantly reduced (Baseline, B: 3.19 ± 0.30 pg/ml; End of Intervention, EOI: 2.67 ± 0.61, p=0.01) and leptin (B: 29.34 ± 19.38 ng/ml; EOI: 24.17 ± 14.64, p=0.07) was marginally reduced after the intervention. We observed significant correlations between markers and differential post-meal activations at baseline including correlations between changes in leptin and increased precuneus activation (ρ=0.75, p=0.05) and between changes in TNF-α and increased posterior cingulate activation (ρ=0.81, p=0.02). **Conclusions:** Our results suggest that higher baseline activation in food reward and motivation regions may help predict EC survivors with smaller intervention-related improvements in adipokines and cytokines, which could ultimately affect their survival. Larger, longer-term studies are needed to confirm our preliminary findings.

T-714-P
Understanding Role of Anorexigenic Proopiomelanocortin Neurons in the Arcuate Nucleus of Hypothalamus Responding to Leptin Using Manganese Enhanced Magnetic Resonance Imaging

Anna Ulyanova, Weiping Han, Kai-Hsiang Chuang *Singapore, Singapore*

Background: Obesity is a great concern in the world that signified with leptin resistance. Regulation of energy homeostasis is dependent on central and peripheral signals in the hypothalamus. There are two main subpopulations of neurons responding to leptin: anorexigenic proopiomelanocortin/cocaine and amphetamine-related transcript (POMC/CART) and orexigenic neuropeptide Y/agouti-related peptide (NPY/AgRP) neurons in the arcuate nucleus (ARC) of hypothalamus. Understanding their interactions is a first step to determine dysfunction of energy homeostasis. **Methods:** We used Manganese Enhanced

Magnetic Resonance Imaging (MEMRI) to study the POMC neural function in vivo. Two sets of experiments were performed on C57BL/6 and POMC/STAT3 knockout (KO) mice. Groups: non-fasted, fasted, non-fasted and fasted injected with leptin. **Results:** We compared MEMRI signal intensity (SI) time-course in ARC in fasted vs non-fasted C57BL/6 mice. Consistent with literature, we saw increase of SI in fasted (4.43 ± 0.09) vs non-fasted (2.99 ± 0.02) condition, which suggests firing of NPY/AgRP neurons. Under leptin infusion, decrease SI in fasted (3.3 ± 0.2) while increase in non-fasted (3.64 ± 0.01) condition suggests work of POMC/CART neurons. The smaller change under leptin implicates that orexigenic and anorexigenic neurons may be uneven with the NPY/AgRP stronger than POMC/CART. In POMC/STAT3 KO SI in the wild-type are similar to the C57BL/6 mice while in KO non-fasted injected with leptin has rise of SI. **Conclusions:** Observed changes in SI under different physiological conditions and leptin infusion suggest activation of AgRP neurons without inhibition from POMC or stronger activity of AgRP neurons. Further analysis of other nuclei can help to understand overall picture of leptin signaling neuronal pathway and fill up missing gaps about orexigenic vs anorexigenic neuronal interaction.

T-715-P
Brown Adipose Tissue Thermogenesis Is Time-Dependently Downregulated by Olanzapine in Rats

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Background: Obesity is twice as prevalent in schizophrenia as the general population. Olanzapine, widely used to treat schizophrenia, is associated with increased metabolic risks including body weight gain, in which reduced energy expenditure is a major contributor especially in the late stages. The sympathetic neuronal circuitry, involving the actions of tyrosine hydroxylase (TH), is responsible for brown adipose tissue (BAT) thermogenesis and hence energy expenditure. However, the effect of olanzapine on sympathetic neuronal circuitry related to BAT thermogenesis has not been investigated. **Methods:** Rats were treated with olanzapine (1mg/kg, orally, 3x/day, n=12/group) or vehicle for 1 week, 2 weeks, or 5 weeks. BAT temperature was measured by an implant microchip. Postmortem brain and BAT samples were collected for measurement of hypothalamic and brainstem TH mRNA (real-time PCR) and BAT uncoupling protein 1 (UCP1) and peroxisome proliferator-activated receptor gamma coactivator 1α (PGC-1α) protein levels (Westernblot) (n=6/group). **Results:** BAT temperature was reduced by olanzapine treatment from Day 18 during the light phase ($P < 0.05$). Consistently, UCP1 and PGC-1α expressions at BAT were reduced in the 5-week olanzapine treatment group compared to control (-30% and -27%, respectively, both $P < 0.01$). Interestingly, mRNA expressions of TH in both hypothalamus and brainstem were also decreased at the 5-week olanzapine treated rats (-31% and -35%, respectively, both $P < 0.05$). **Conclusions:** Olanzapine downregulates mRNA expressions of TH at hypothalamus and brainstem in a time-dependent manner, which may be the cause of the reduction of UCP1 and PGC-1α protein expressions at BAT, contributing to the time-dependent reduction of BAT thermogenesis.

T-716-P
MRI Detects the Development and Reversal of Hypothalamic Gliosis in Mice with Diet-Induced Obesity

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Background: High-fat diet (HFD) feeding in mice is associated with inflammation and gliosis in the mediobasal hypothalamus (MBH) that can be quantified in vivo using magnetic resonance imaging (MRI), but the rate of progression and reversibility of these findings are unknown. **Methods:** C57BL/6 male mice (n=8/group) were fed HFD for 20 wk, chow for 20 wk, or HFD for 16 wk then chow for 4 wk (reversal). MRI and body composition were performed at baseline and after 1, 16 and 20 weeks on diet. To quantify gliosis by MRI, T2 relaxation time was measured in the MBH and in control regions (thalamus and cortex). **Results:** At 16 wk, HFD mice were heavier than chow mice (mean 32.7g vs 26.1g, P<0.01). At 20 wk (following 4 wk of chow), the mean weight of the reversal group approached that of the chow group (27.9g vs 26.0g, P=0.11) and was significantly less than the HFD group (27.9g vs 35.9g, P<0.01). There was no effect of diet on MBH T2 relaxation time at 7 days (P=0.1) or 16 weeks (P=0.24). There was a significant effect of time (P<0.01) for mice on HFD; mean MBH T2 relaxation time at

20 wk was higher than baseline (20 wk=31.8 ms, SD 0.77 vs baseline=30.5 ms, SD 0.76; P=0.02). Between wk 16 and 20, T2 relaxation time in the MBH tended to increase in the HFD group (+0.96 ms) while decreasing in the reversal group (-0.38 ms) (P=0.12). Decreases in MBH T2 relaxation time correlated with decreases in percent body fat during diet reversal from 16 to 20 wk (P=0.04, R2=0.19). **Conclusions:** Quantitative MRI is useful to detect chronic gliosis in the MBH of mice with diet-induced obesity and to document reversal of these changes with switch back to chow. These results support the continued development and application of quantitative MRI in the study of hypothalamic gliosis in animal models and the pursuit of translational studies applying this technology in humans.

T-717-P
PPAR Gamma Delition in POMC Neurons Protects Again High Fat Diet-Induced Obesity

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Background: We have previously shown that high fat diet (HFD) feeding induced peroxisome proliferation via PPARg activation in the arcuate nucleus melanocortin system. Pharmacological inhibition of this mechanism diminished leptin resistance in diet-induce obese mice by affecting reactive oxygen species (ROS) levels in POMC neurons. **Methods:** We got the specific PPARg-POMC KO mice by cre-loxP system. **Results:** Here we show that selective deletion of PPAR gamma in POMC neurons protects against obesity during HFD feeding. Mice with PPARg deletion in POMC neurons had significant lower body weight gain compared to control mice on HFD due to a significant reduction in fat mass. Expenditure and locomotor activities were elevated while food intake was reduced. In agreement with an improved metabolic phenotype, glucose metabolism and insulin sensitivity were also significantly better in these mice compared to their controls. Analysis of ROS levels showed significantly greater elevations of ROS and decreased peroxisome density in POMC neurons of PPARg-POMC KO mice. In addition, PPARg-POMC KO mice showed increased leptin sensitivity revealed by increased suppression of feeding and elevated pSTAT3 levels in the POMC neurons. **Conclusions:** Altogether, our data support an important role for PPARg in POMC neurons for whole body adaptation to overnutrition mediated by ROS control.

T-718-P
The Hyperphagia in Synphilin-1 Overexpressing Mice Is Characterized by Increased Meal Size

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Background: Synphilin-1 is a cytoplasmic protein that has been shown to be involved in energy balance control. We recently generated a human synphilin-1 transgenic mouse model (SP-1), in which overexpression of human synphilin-1resulted in hyperphagia and obesity. **Methods:** To further characterize the synphilin-1-induced hyperphagia, meal patterns of synphilin-1 mice were observed. **Results:** The results showed that synphilin-1 overexpression resulted in increased meal size without a change in meal number. Increased meal size may be mediated by increased positive signals such as those arising from the oral cavity. To assess whether SP-1 mice had altered orosensory responsivity, we tested SP-1 and control mice in a brief access test. This taste procedure is designed to present various taste solutions in short (5-s) trials across one session and thus to minimize the effect of postingestive cues. Concentration-dependent licking responses were assessed in 6-week ("pre obese") and 4-month old ("obese") SP1 mice and controls to a concentration array of sucrose. SP1 mice displayed concentration-dependent licking across the sucrose concentration range tested similar to their non-transgenic controls. However, at 6-weeks of age, SP1 mice initiated significantly more trials to sucrose across the testing sessions and licked more vigorously to the highest concentration presented, compared to non-transgenic controls. These group differences in responsiveness to sucrose were not apparent in obese SP1 mice. **Conclusions:** These findings suggest that the hyperphagia observed in SP1 mice is due to increases of meal size that may be partially mediated by an increased appetitive behavioral component to palatable foods. However, these changes are not likely attributed to robust alterations in taste responsiveness to preferred stimuli.

T-719-P

Isolated Nuclei for the Cell-Type Specific Analysis of Neurons and Adipocytes

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Background: Epigenetic reprogramming of diverse neurons in the hippocampus and hypothalamus and other parts of the brain appear to control aberrant eating behavior, hunger, and satiety, while reprogramming of adipocytes in visceral and subcutaneous adipose tissues (VAT, SAT) likely controls the inappropriate secretion of adipokines. However, the cell-type-specific epigenetic reprogramming of neurons in the brain or adipose tissue is essentially unexplored due to the technical difficulty of isolating these fragile cell types. Neuronal and supportive glial cell types are highly interdigitated within brain tissues and adipocytes are very large and unstable relative to other cells within VAT or SAT. **Methods:** We are characterizing the nuclei from brain, VAT, and SAT to perform cell type specific analyses of these fragile cell types. The nuclei from all three are relatively easy to isolate. **Results:** Fluorescence Nuclear Cytometry (FNC) provided an initial characterization of populations of nuclei derived from mouse brain and porcine VAT and SAT. Using the pan-neuronal marker NeuN, we found NeuN-H (high) and NeuN-L (low positive) neuronal nuclei in young mouse brain were coordinately expressed with high and low levels of histone deacetylases HDAC2 and SIRT1, respectively. By contrast, the non-neuronal NeuN-mostly glial nuclei either expressed very low levels of HDAC2 and SIRT1 or were double negative. Two other novel techniques utilizing nuclei, Fluorescence Activated Nuclear Sorting (FANS) and CApture by Nuclear Antibody (CANA) are being developed to isolate biochemically useful quantities of nuclear subpopulations. **Conclusions:** These new nuclear-based approaches, FNC, FANS, and CANA should enable cell-type specific epigenetic and proteomic analyses of fragile cell types of interest to obesity research.

T-720-P

Translating tDCS Into the Field of Obesity: Using Computational Models to Guide Parameters and Protocols in Clinical Trials

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Background: Transcranial direct current stimulation (tDCS) is a noninvasive brain modulation technique with emerging applications in a variety of clinical conditions. Recent neuroimaging studies link obesity with an imbalance in brain circuits involved in reward and cognitive aspects of food intake. Manipulating brain activity –via tDCS– can help rebalance these circuits and thus provide therapeutic benefits in obesity. Optimal tDCS parameters and protocols in this condition have not been defined yet. **Methods:** We used MRI-derived high-resolution computational models that delineated six head tissues (air, skin, skull, cerebral spinal fluid, gray matter, and white matter) plus subcutaneous fat in five human heads from subjects with BMI 20.9-53.5 kg/m2. First we examined the effect of BMI on tDCS current density distribution. Second, we dilated the fat tissue on two lean heads to determine if fat thickness would affect current density keeping all other factors constant. Last, we simulated high-definition tDCS (HD-tDCS) montages to test the most optimal combination of sources to reach the following targets of interest: hypothalamus, nucleus accumbens, insula and several sectors of the prefrontal cortex. **Results:** We observed no association between BMI or any tissue layer thickness and peak current intensity. We found that the relative influence of head fat represents only a small fraction of the variability accounted for by head anatomy as a whole. The contribution of head fat does not seem to be a major issue to prompt a general adjustment of dose. We are currently conducting a clinical trial with tDCS in obese patients following laparoscopic adjustable gastric banding (ClinicalTrials.gov identifier: NCT01632280). **Conclusions:** tDCS is a promising neuromodulatory technique in obesity. Computational models can inform and guide future clinical trials in this field.

T-721-P

Human Visceral Adipose Tissue Conditioned Media Protects Against H2O2 Induced Neurotoxicity in Human SH-SY5Y Cells

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Background: Adipose tissue is recognized as an endocrine organ, releasing factors that could potentially damage (e.g., tumor necrosis factor [TNF]-α) or protect (e.g., nerve growth factor [NGF]) neurons. The concept of adipose-brain crosstalk is supported by widespread expression of adipokine receptors in the central nervous system. The aim of this study was to 1) explore the effects of human adipose tissue secreted factors on oxidative stress-induced toxicity in human SH-SY5Y neuroblastoma cells; and 2) determine whether adipose tissue depot-specific effects existed. **Methods:** Preperitoneal adipose tissue samples were obtained from 8 female subjects [age 52± 6 yr, body mass index (BMI) 24.1 ± 1.1 kg/m2] and subcutaneous adipose tissue samples were obtained from 4 female subjects (age 47±3 yr, BMI 30.3±2.0 kg/m2) undergoing abdominal surgeries. Adipose tissue organ cultures were maintained for 24 hr and adipose tissue conditioned media (ATCM) was collected and transferred to SH-SY5Y neuronal cells. Following a 2 hr pre-incubation, SH-SY5Y cells were challenged with H2O2 (800 μM) and MTT assay was performed to assess cell viability after 48 hr. **Results:** H202 killed ~70% of neuronal cells; ATCM from the preperitoneal depot completely rescued oxidative stress-induced neurotoxicity while media from subcutaneous depot has no such effect. Heating preperitoneal ATCM (95°C for 10 min) abolished its neuroprotective effects. **Conclusions:** It is concluded that heat-sensitive factors secreted from human visceral adipose tissue can protect against H2O2 induced toxicity in SH-SY5Y neuronal cells. Further studies are warranted to 1) identify the putative neuroprotective factors; 2) determine whether factors secreted by adipose tissue are protective against other neuro-toxins; and 3) explore what is causing the apparent depot specific effects.

T-722-P

Reduced Evoked Neural Activity in the Locus Coeruleus of Female Rats Exposed to Dietary-Induced Binge Eating

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Background: Stress is often associated with binge eating. Previous investigations into this relationship have focused on the hypothalamic-pituitary adrenal (HPA) axis. These experiments sought to examine how dietary-induced binge eating influences the neuronal activity of the locus coeruleus (LC)-norepinephrine system. **Methods:** Young female Sprague Dawley rats were exposed to a repeated intermittent cycle of 24 h food deprivation followed by 30 min access to a highly palatable sweet-fat food (restrict-binge). Age- and weight-matched female control rats were exposed to standard chow feeding (naive). On week 3, in vivo single unit LC electrophysiological activity was recorded under isoflurane anesthesia. Spontaneous neural activity was recorded for 3 min, followed by sensory-evoked activity during a trial of sciatic nerve stimulation (50 stimuli, 3 mA, 0.5 ms duration, 0.2 Hz). **Results:** Restrict-binge rats (20 cells, 6 rats) had significantly (t= -2.62, p < 0.05) reduced evoked LC discharge rates compared with naive rats (22 cells, 7 rats) (11.6 ± 0.5 vs. 14.4 ± 0.8 Hz). Spontaneous and tonic discharge rates were not different between the two groups. Components of the averaged peristimulus time histogram revealed differences in the biphasic LC neuronal profile between groups. Restrict-binge rats had a blunted evoked phase (20-124 ms post-stimulus)[F(1,40) = 8.9, p<0.005], which was accompanied by a slower recovery during the inhibitory phase (156-540 ms post-stimulus)[F(49,1960)=1.4, p<0.005]. **Conclusions:** Such data suggest that dietary-induced binge eating alters the neural response of LC neurons to sensory stimuli. This research furthers our understanding of how highly palatable foods and dietary conditions dampen the neural stress axis.

T-723-P

Eating-Associated Hippocampal Expression of the Synaptic Plasticity Marker Arc Correlates with the Duration of the Postprandial Intermeal Interval and Is Diminished in Rats with Poor Hippocampal-Dependent Spatial Memory

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Background: We hypothesize that hippocampal neurons form a memory of a meal and temporarily suppress meal onset during the postprandial intermeal

interval (ppIMI). In support of this, we found previously that neonatal pain-induced hippocampal-dependent memory deficits in adult rats are associated with accelerated meal onset and increased body mass. In the present experiment, we tested the prediction that neonatal pain-induced hippocampal-dependent memory deficits are accompanied by diminished eating-associated hippocampal expression of the synaptic plasticity marker *Arc* and that hippocampal *Arc* expression following a meal correlates with ppIMI duration. **Methods:** An intraplantar injection of carrageenan (1%) was used to induce neonatal inflammatory pain in Sprague Dawley rats on the day of birth; control animals were handled in a similar manner. Once the rats reached adulthood, we measured meal onset and hippocampal-dependent spatial water maze memory. The rats were then euthanized after consuming a sucrose solution and hippocampal *Arc* mRNA expression was measured with fluorescence *in situ* hybridization. **Results:** Preliminary results suggest that compared to control rats, neonatally injured rats with poor spatial water maze memory may have decreased sucrose-associated hippocampal *Arc* expression. Also, sucrose-associated hippocampal *Arc* expression correlates positively with the satiety ratio (a measure of the ppIMI that controls for the size of the first meal). **Conclusions:** These findings suggest that hippocampal-dependent spatial memory deficits are associated with impaired memory of a meal and accelerated meal onset. Collectively, our results have significant implications for our understanding of the neural controls of meal onset and the possible contributions of hippocampal dysfunction to obesity.

T-724-P
Enhanced Chemotherapy-Induced Neuronal Activation in Obese Rats

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Background: The medical impacts of obesity and cancer have never been greater. To cure cancer, it is critical that patients follow prescribed chemotherapy without interruption, even in the face of severe side effects [e.g. nausea, vomiting, severe appetite suppression and weight loss]. It is surprising that given the enormous risk of obesity with many cancers, the potential role of obesity on chemotherapy-induced activation of neuronal areas implicated in mediating chemotherapy-induced nausea is virtually unexplored. **Methods:** We hypothesized that obesity would exacerbate cisplatin chemotherapy-induced nausea and neuronal activation in areas implicated in the control of chemotherapy-induced emesis and energy balance dysregulation. Rats were maintained on chow or high fat diet for 12 weeks. Following this period, separate groups were injected with doses of cisplatin based on total or "ideal" body weight and sacrificed at 6 and 48 h in order to examine acute and delayed phases of cisplatin-induced sickness. **Results:** Cisplatin-induced neuronal activation in the parabrachial nucleus, amygdala, and dorsal vagal complex, as measured by c-Fos immunoreactivity (Fos-Li), were greater in obese rats relative to chow-fed lean controls, regardless of whether cisplatin dose was based on actual or "ideal" body weight calculations. **Conclusions:** These experiments provide a basis by which to further study how obesity may exacerbate activation of brain areas regulating cisplatin-induce sickness, even when administered drug doses comparable to normal weight controls. Overall, the data are central to gaining understanding of the brain pathways of nausea and improving pharmacological treatments for nausea in lean and obese patients.

T-725-P
Pre-Dosing with a Dopamine Reuptake Inhibitor Reduces Model Binge Eating Behavior and Fat Content of Chosen Food Rein Forcers in Obese Women

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Background: The role of low dopamine (DA) tone in eating behavior differences between obese binge eaters (B) and non-binge eaters (C) is not established. We assessed the dose effect of the stimulant methylphenidate (MPH), a dopamine reuptake inhibitor, on a laboratory operant binge eating task after a caloric preload. **Methods:** Fifteen obese women (9 B, 6 C) completed three sessions of computer operant task performance 1 hour after MPH dosing. One of three doses of MPH (0, 20, 40 mg) was tested per session. Subjects consumed 600 kcal of a liquid meal 30 minutes before operant task performance, in which subjects chose between food or non-food gift categories by pressing on the designated computer key. Successive choice of the same gift category required an increasing number of key presses. The main outcome measure was food break point (FBP; the highest ratio of computer responses completed when choosing the food category). Data were analyzed by repeated measures ANOVA with binge eater status as the between subjects factor. **Results:** Dosing with 20 mg and 40 mg MPH produced a 39% decrease in FBP (F = 8.6, p = .012, power = .77) but no significant difference between B and C. Fat grams of operant task food choices were significantly reduced by 43% (F = 8.6, p =.013, power = .77) by 20 mg MPH. **Conclusions:** Our data suggest that differences in eating behavior between B and C are not due to DA transporter function. They also suggest that targeting DA reuptake may be useful in reducing intake of high fat foods independent of binge eating status.

T-726-P
Physiological and Behavioral Responses to Binge Food Cues Are Eliminated by Dosing with a Dopamine Reuptake Inhibitor

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Background: As part of a study examining dopamine (DA) agonist effects on laboratory binge eating, we examined differences in self-reported eating behavior between fifteen obese women with (9 B) and without (6 C) binge eating disorder (per EDE interview) and correlated results with ad libitum food intake and autonomic nervous system response to exposure to binge food, after dosing with methylphenidate (MPH), a DA reuptake inhibitor. **Methods:** Three doses of MPH were tested (0, 20, 40 mg), with each dose administered during a separate session. Heart rate (HR) was monitored during the 120 minutes of the test session. Participants completed the TFEQ during a screening session. **Results:** HR increased significantly across the 120 minutes of the placebo session in both B and C (F = 6.7, p = 0.024) and between B and C (18.1 ± 7.2 vs 6.5 ± 5.2, F = 11.2, p = 0.006). Baseline HR (0 mg MPH) correlated positively with kcal of ad libitum food intake across B and C (r = 0.67, p = 0.009). B status was correlated with restrained eating (CR) (r = 0.61, p = 0.02), but not disinhibition (r = 0.25, p = 0.38) as measured by the TFEQ. B status was also correlated with HR response measured 120 minutes after binge food exposure under 0 mg MPH (r = 0.67, p = 0.009), as was CR (r = 0.58, p = 0.038). Dosing with 20 and 40 mg of MPH eliminated the correlations between HR, B status and ad libitum food intake. **Conclusions:** The data suggest that B status is accompanied by physiological responses that predict binge eating. Dosing with a DA reuptake inhibitor disrupts this association and may prove useful in reducing cue-induced bingeing.

T-727-P
Decreased BOLD Activation in an Inhibitory Behavioral Pathway During Alcohol Infusion Correlates with Increased Food Consumption

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Background: Consuming an alcoholic beverage prior to a meal (aperitif) has been shown to stimulate appetite and increase energy intake. We hypothesized that this results from alcohol's disinhibiting effects. Using functional magnetic resonance imaging, we studied the blood oxygenation level dependent (BOLD) response to the stop-signal task, a measure of behavioral inhibition (the time needed to inhibit a ballistic hand movement). **Methods:** BOLD activation to the stop signal task in normal weight (n=25, BMI 22.0±0.4 kg/m2, age 25.1±0.9 yr) women was evaluated on two separate, randomized days: once during intravenous infusion of 6% v/v EtOH, clamped at a steady-state breath alcohol concentration of 50 mg/dL (approx. 2 drinks), and once during infusion of saline using the same pump rates. Following imaging, participants ate ad libitum with consumption recorded. Imaging from a 3T Siemens Trio-Tim scanner was analyzed by SPM8, with the primary contrast of interest, [Inh > Go], comparing successful inhibition "Inh" and "Go" trials. **Results:** Alcohol infusion as compared to saline led to increased food consumption (650.1±42.6 vs. 542.7±30.6 gm; p= 0.01). For those 18 women who increased food consumption, there was a negative correlation between the increased food consumption and the decreased BOLD activation in the right anterior, inferior frontal cortex. **Conclusions:** In a majority of the women tested, pre-meal alcohol intoxication increased food consumption when compared to placebo exposure. A concomitant reduction in right prefrontal BOLD responses to stop-signal inhibition after alcohol intoxication

suggests that increased food consumption may be driven by alcohol's effects on a behavioral inhibition pathway.

T-728-P
Abnormal Brain Reactivity to a Glucose Challenge in Insulin Resistant Polycystic Ovary Syndrome Patients

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Background: Insulin signals acute and chronic positive energy balance. We postulate that insulin resistance may lead to impaired insulin signaling in the brain. We tested our hypothesis in a cohort of polycystic ovary syndrome (PCOS) patients because there is a high incidence of insulin resistance in this condition. **Methods:** Nineteen women diagnosed with PCOS were recruited to the study. Subjects underwent functional magnetic resonance imaging on two occasions while viewing pictures of high calorie (HC) or low calorie (LC) foods 15 minutes after ingesting either 75 grams dextrose or an equivalent volume of water. Blood oxygen level dependent (BOLD) response to visual food cues was determined during water or dextrose ingestion. An effect of insulin sensitivity on brain responsiveness was examined by including homeostasis model assessment 2-insulin resistance (HOMA2-IR) as a regressor. Body mass index (BMI) was included as a nuisance covariate in order to control for potential effects of adiposity. **Results:** A positive correlation between HOMA2-IR and activation in the medial prefrontal cortex, anterior cingulate, insula, and cingulate gyrus was observed in response to both HC and LC food pictures and in the inferior orbitofrontal cortex, amygdala/hippocampus, and midbrain in response to the HC-LC contrast following dextrose ingestion. No association between and insulin resistance and BOLD response was observed when subjects were imaged after drinking water. **Conclusions:** The correlation between HOMA2-IR and BOLD response to visual food cues during a glucose challenge may reflect an impaired brain response to a glucose challenge in subjects who are insulin resistant. The inability of postprandial hyperinsulinemia to inhibit brain responsiveness to food cues may result in continued eating despite the presence of positive energy balance signals.

T-729-P
Hypothalamic fMRI Responses to Different Sugars Under Normal Intake Conditions: A Pilot Study

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Background: It is known that neuronal activity in the hypothalamus changes according to glucose levels, but there is limited data for the case of other sugars. Recent human neuroimaging studies suggest that ingestion of fructose can cause a relative reduction of hypothalamic activity in comparison with glucose (Page et al., 2013). Such decrease in hypothalamic activity may reveal differences in satiety sensation. The relevance of these findings is uncertain, as the amount and type of sugar used in these investigations did not represent daily consumption levels or patterns. The aim of this pilot study was to examine hypothalamic activity to different sugars under normal conditions of intake. **Methods:** Seven healthy young volunteers underwent a randomized, crossover, double-blinded fMRI study under 5 different conditions (separete days): 9% of energy of fructose or glucose, 18% of energy of high-fructose corn syrup or sucrose and regular 1% milk. The protocol consisted of 6 runs of resting-fMRI. During the first two runs subjects were in the fasting state. Subsequently they ate a standardized meal outside the scanner that included the specific sugar condition administered in a liquid formula. After the meal (30 min), subjects were scanned four additional runs. For data analysis, standard image preprocessing was performed using FSL software. A seed of 4 mm was placed in the hypothalamus based on a previous study (Page et al., 2013) to compute the percent signal change. **Results:** In this pilot study mimicking the conditions of a regular meal, we did not find any significant differences in hypothalamic activity between the five sugar conditions. **Conclusions:** Although these results should be considered preliminary, they suggest that the previously identified differences may not occur under conditions that are more representative of normal daily intake levels and patterns.

T-730-P
Dexamethasone Induced Anorexia and Decreased Sweet Preference

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Background: This study investigated if dexamethasone-induced suppression of food intake and weight gain is accompanied with decreased sweet preference. Anhedonia, a core symptom of depression, can be assessed in rats by measuring sweet preference. **Methods:** Rats received daily injections of dexamethasone (0.1 or 1 mg/kg) or saline. Food intake and weight gain were recorded daily, and preferences to sucrose solution measured weekly. Rats were subjected to ambulatory activity and forced swim tests after 2 days or 4 weeks of daily drug injections. **Results:** Food intake and weight gain was suppressed by daily dexamethasone in a dose dependent manner. Decreased sweet preference was observed after 2 and 3 weeks of drug treatment. Depression- and anxiety-like behaviors were observed after 3 weeks, but not 3 days, of drug treatment. Sweet receptor, T1R2 and T1R3, expression in the circumvallate papillae was not significantly affected by dexamethasone treatment. **Conclusions:** These results suggest that not only dexamethasone-induced anorexia but also anhedonia may not comprise decreased sweet perception, and that decreased weight gain and food intake may at least partly contribute to the psycho-emotional outcome of dexamethasone treatment.

T-731-P
Working Memory and Attention on Reinforcing Efficacy of High Energy Dense Foods in Women

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Background: Choices between different types of foods, healthy or low energy-dense (LED), and unhealthy or high energy dense (HED), can lead to differences in energy intake over time. One aspect of food choices is the reinforcing efficacy of different foods, or how much money one is willing to spend for a portion of food. Individual differences in choices and reinforcing efficacy of food may be related to a variety of higher order cognitive functions, including working memory and attention. Working memory is related to decision-making and to self-regulatory behaviors, while attentional bias to food versus non-food is predictive of BMI and weight change over time. Individuals who direct attention towards food may also have trouble disengaging from food cues, in addition to being unable to assess alternative options if combined with low working memory. **Methods:** A study of 48 adult women measured working memory (operational span task), attention to food (dot-probe) and reinforcing efficacy of HED and LED foods. **Results:** . A significant interaction between working memory and attention bias for HED foods was found for HED breakpoint or the maximum amount of money one was willing to spend on an HED snack food (p = 0.01). The simple slopes revealed that attention to foods did not influence maximum spending for HED foods in individuals with low working memory. Individuals with high working memory showed a significant effect of attention such that those with a low attentional bias for HED foods were not willing to spend as much on HED snack foods as individuals with a high attentional bias for those foods. **Conclusions:** These results show that both working memory and attention to food are involved in food choice.

T-732-P
Increased Intravenous Morphine Self-Administration and Altered Opioid Receptor Modulation of Sucrose Reward Following Roux-en-Y Gastric Bypass in Dietary Obese Rats

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Background: Roux-en-Y gastric bypass (RYGB) is the most successful therapy for obesity and associated comorbidities. One potential adverse outcome, however, is increased risk for drug use. Previously, we found increased motivation to seek and consume alcohol in outbred high fat diet-induced obese (HF-DIO) rats following RYGB (Thanos et al. 2012, Hajnal et al., 2012). In the present study, we tested whether RYGB also alters motivation to intravenously self-administer (IVSA) morphine, and investigated the effects of the non-selective opioid receptor antagonist naltrexone on sucrose self-administration. **Methods:** HF-DIO male rats received RYGB (n=6) or sham-

surgery (SHAM; n=7), and three month after the surgeries were fitted with jugular catheters and trained on a fixed ratio-2 (FR-2) lick task to obtain morphine (0.225 mg/kg/inf) in daily sessions. A separate set of rats (RYGB, n=10; SHAM, n=9) was tested on a progressive ratio-10 (PR-10) task for 1.0M sucrose solution following pretreatment with single injection (IP) of low doses of naltrexone (0.1-0.4 mg/kg). **Results:** Compared to SHAM, RYGB rats completed more cycles and obtained more IV infusions of morphine at an accelerated rate starting on Day 6 to reach a two-fold increase by Day 12 (RYGB: 11±1.49 vs. SHAM: 5.2±0.86 infusions, p<0.05). Naltrexone at all tested doses was ineffective in altering appetitive or consummative responses to sucrose in the SHAM group. In contrast, RYGB rats demonstrated ~30% reduced operant performance ("break-point") on the PR-10 task at 0.4 mg/kg dose (p<0.05) to earn sucrose reward. **Conclusions:** These findings collectively suggest an augmented opioid signaling after RYGB, which may lead to compulsive drug use. Further research is warranted to confirm applicability of these findings to humans. This research is supported by NIH grant DK080899 (to A.H.).

T-733-P

Disruption of Promoter I but Not Promoters IV or VI of Brain-Derived Neurotrophic Factor (BDNF) Is Associated with Obesity

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Background: BDNF appears to function downstream of leptin signaling to control energy balance. *BDNF* expression is driven by multiple promoters, but their individual roles in energy regulation remain to be elucidated. **Methods:** We studied C57BL/6J male mice in which promoters I (*Bdnf-I$^{-/-}$*), IV (*Bdnf-IV$^{-/-}$*), or VI (*Bdnf-VI$^{-/-}$*) were disrupted by the insertion of a GFP-STOP cassette, resulting in preserved *Bdnf* RNA expression (confirmed by qRT-PCR in hypothalamus and hippocampus) but lack of BDNF protein translation from transcripts driven by the disrupted promoter. Mice were fed *ad libitum* regular chow diet from weaning and weighed weekly. Body composition (MRI and dissection), food intake, physical activity (PA, beam breaks), energy expenditure (EE, indirect calorimetry), and glucose and insulin tolerance tests were assessed. ANCOVAs adjusted for lean mass and percent body fat. **Results:** *Bdnf-IV$^{-/-}$* and *Bdnf-VI$^{-/-}$* mice had body weights similar to wild-type (WT) littermates. In contrast, *Bdnf-I$^{-/-}$* mice had higher body weights compared to WT by 12 weeks (mean ± SEM, *Bdnf-I$^{-/-}$* vs. WT: 33.8 ± 1.4 vs. 28.5 ± 0.6 g, p=0.009), which was more pronounced at 6 months (48.4 ± 1.5 vs. 32.5 ± 0.8 g, p<0.0001) and associated with higher percent body fat (30.7 ± 1.2 vs. 16.0 ± 1.1%, p<0.0001), greater food intake but similar body composition-adjusted food intake, lower adjusted resting EE at 30°C, higher adjusted PA, and similar adjusted total EE compared to WT. *Bdnf-I$^{-/-}$* mice had hyperinsulinemia, insulin resistance, and enlarged fatty livers. **Conclusions:** Disruption of *Bdnf* promoter I resulted in 50% greater body weight and 2-fold higher percent body fat at 6 months, whereas disruption of promoters IV or VI had no significant effect on body weight. Our findings suggest that *Bdnf* promoter I, but not promoters IV or VI, plays a critical role in regulating energy balance.

T-734-P

The Relationship between Cognitive Control and Measures of Physical Fitness and Body Composition in Hispanic Elementary School Children

Chantis Mantilla, Arlette C. Perry, Laura Quirola, Brian Arwari *Coral Gables, FL*

Background: Many studies have shown that aerobically fit children perform better than their less fit peers on cognitive control tasks. However, most of the research has focused on aerobic fitness and not general physical fitness measures. Fewer studies have examined the relationship between fitness and cognitive control accounting for body composition. Furthermore, no studies have examined these relationships in an exclusively Hispanic population. **Methods:** The purpose of this study was to determine whether cognitive control varied in relation to a battery of physical fitness and body composition measures in a group of 29 elementary school, Hispanic children (mean age= 8.5 years). Participants performed a flanker task to measure cognitive control and several physical fitness tests including: 2-minute walk, vertical jump, 1-minute-curlup, and right/left handgrip strength test. Body composition meas-

ures included: body mass index, percent body fat, waist circumference, and sagittal height. A multiple regression analysis was used to predict variation in flanker task reaction time by physical fitness and body composition measures after controlling for gender and age. **Results:** Children who performed better on the 2-minute walk test had faster reaction times on the flanker task (r=0.79, P<0.01). There were no statistically significant differences found between the flanker task and other physical fitness and body composition measures. **Conclusions:** Our findings support the positive relationship between aerobic fitness and cognitive control in elementary school Hispanic children, independent of other measures of physical fitness or body composition.

T-735-P

Differences between Adherers and Non-Adherers to an Exercise Program During a Delay Discounting Paradigm

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Background: Increasing compliance with exercise programs has been a major hurdle in weight management and increasing positive health outcomes. Unfortunately, little is known about the underlying neural and behavioral mechanisms that lead to success in exercise adherence. **Methods:** This ongoing study followed obese and healthy weight adult participants (N = 26) over the course of a 9-month exercise program (75% maximal heart rate; 50 minutes/session; 5 days/week). Before beginning exercise, each participant completed a Delay Discounting Paradigm during fMRI. The Delay Discounting Paradigm involves choosing between receiving immediate but smaller, or larger but delayed, financial rewards. At the 9-month time point, each participant was classified as an Adherer or Non-adherer. Adherence is defined as ≥ 80% of 250 minutes a week at the participant's target heart rate (±4 BPM). Whole brain GLM was conducted for each subject using AFNI's 3dDeconvolve program. Regression coefficients for immediate and delayed choices were averaged for Adherers and Non-adherers and compared using AFNI's 3dttest++. **Results:** Several significant (p < 0.01, FWE corrected) interactions in a priori regions were found. When making both immediate and delayed choices, Non-Adherers showed increased activation in the hippocampus (xyz: 26,14,-14) and cingulate (xyz: -6,-48,6) compared to Adherers. When making immediate choices, Non-adherers showed greater activation in the striatum (xyz: 26,4,11). **Conclusions:** These brain regions are a part of motivational networks implicated in reward processing, and results are consistent with increased sensitivity to immediate reward. This impulsive style of decision-making can lead to discounting the delayed benefits of exercise making it difficult to continue in the face of more immediately rewarding choices. Support: R01DK085605, Hoglund Brain Imaging Center.

T-736-P

Identifying structural Brain-Based Differences in Obese Adolescents with and without Type 2 Diabetes (T2D)

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Background: Type II diabetes mellitus (T2DM) is associated with reduced cognitive performance on measures of executive function, inhibitory control, and impulsivity. These performance deficits have been hypothesized to be related to differences in brain networks, including gray matter volume and white matter integrity. Thus, we predicted that adolescents with T2DM would have smaller brain volumes and reduced white matter integrity compared to obese adolescents without T2DM. **Methods:** Five obese adolescents with T2DM, five obese adolescents without T2DM, and five normal weight adolescents participated in a Magnetic Resonance Imaging (MRI) pilot study and were matched on sociodemographic variables including race, age, and sex. Diffusion tensor imaging (DTI) was used to measure white matter integrity and an automated method was used to determine volume of the amygdala, striatum, and hippocampus from high-resolution anatomical images **Results:** We found that adolescents with T2DM had smaller gray matter volumes in all regions except the amygdala when compared to either the obese group or normal control group. Adolescents with T2DM also had reduced integrity of corticostriatal white matter tracts from the lateral frontal cortex compared to the obese or normal weight groups. **Conclusions:** Our preliminary results suggest that T2DM and the metabolic changes associated with the disease may have damaging effects on brain health and integrity during a period of life when the brain is reaching its full potential.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Intervention Studies - Pharmacotherapy

T-737-P
Icosapent Ethyl (Eicosapentaenoic Acid Ethyl Ester) Therapy in Hypertriglyceridemic Stable-Statin-Treated Patients with Metabolic Syndrome: Effect on High-Sensitivity C-Reactive Protein Levels

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Background: Increased waist circumference and high triglyceride (TG) levels are diagnostic components of the metabolic syndrome (MetSyn), which is a collection of cardiovascular disease (CVD) risk factors. Increased adiposity may promote an increase in high-sensitivity C-reactive protein (hsCRP), which is also a CVD risk factor. Statins reduce hsCRP, but prior reports of eicosapentaenoic acid (EPA) combined with docosahexaenoic acid (DHA) on hsCRP are inconsistent. Icosapent ethyl (IPE; formerly AMR101) is a high-purity prescription form of EPA ethyl ester (EPA alone, without DHA) approved in the United States as an adjunct to diet to reduce TG levels in adult patients with severe (>=500 mg/dL) hypertriglyceridemia. **Methods:** The ANCHOR study was a multicenter, placebo-controlled, double-blind, 12-week study of IPE in 702 randomized diet- and statin-stable high-risk patients with TG >=200 and <500 mg/dL despite low-density lipoprotein cholesterol (LDL-C) control. This analysis evaluated the hsCRP effects of IPE in a subset of patients from the ANCHOR study with MetSyn. **Results:** In the ANCHOR study, there were 645 patients with MetSyn in the intent-to-treat population. Compared to placebo, IPE 4 g/day significantly reduced TG (21.7%, p<0.0001), non-high-density lipoprotein cholesterol (13.5%, p<0.0001), apo B (8.8%, p<0.0001) and LDL-C (5.2%, p=0.0236). IPE 4 g/day also reduced hsCRP levels by 23.0% (p=0.0003) compared to placebo. **Conclusions:** Compared to placebo in hypertriglyceridemic patients with MetSyn, IPE 4 g/day improved lipid levels and reduced hsCRP; these effects were in addition to stable statin therapy.

T-738-P
Effects of Lorcaserin on Lean and Fat Mass Loss in Patients with Type 2 Diabetes Mellitus from the BLOOM-DM Study of Obese and Overweight Patients

Caroline M. Apovian *Boston, MA*; Randi Fain, William Soliman, Tony Ma *Woodcliff Lake, NJ*; Matilde Sanchez, Joanne Quan *San Diego, CA*; Domenica Rubino *Arlington, VA*

Background: Lorcaserin (LOR), a selective 5-HT2C agonist, is approved in the US for chronic weight management as an adjunct to a reduced-calorie diet and increased exercise (DE) in obese and overweight patients (pts), with ≥1 comorbidity. We report the total weight loss and loss of fat and lean body mass over 1 year (y) as determined by dual-emission X-ray absorptiometry (DXA) in a randomized subset of pts from BLOOM-DM. **Methods:** Together with DE, 604 obese and overweight adults with type 2 diabetes (T2DM) and baseline HbA1c of 7-10% were randomized to LOR 10 mg once daily (qd), LOR 10 mg twice daily (bid), or placebo (PBO). DXA scans were done at baseline, 6 months, and 1 y in 63 patients. Body fat and lean mass were stratified by baseline HbA1c. **Results:** The decrease in weight from baseline at 1 y was 4.7 kga or 4.5%a (LOR bid, n=251), 5.0 kga or 5.0%a (LOR qd, n=94), and 1.6 kg or 1.5% (PBO, n=248). In the DXA population at 1 y, the decrease in fat mass from baseline was 4.3 kgb (LOR bid, n=18), 4.6 kgb (LOR qd, n=22), and 1.4 kg (PBO, n=23), while the decrease in lean mass was 1.8 kg, 1.7 kg, and 2.0 kg, respectively. For pts with baseline HbA1c <9%, the fat mass loss was 2.6 kg (LOR bid, n=15), 3.7 kg (LOR qd, n=18), and 1.4 kg (PBO, n=17) vs 9.1 kg (n=3), 5.0 kg (n=4), and 0.2 kg (n=6), in pts with baseline HbA1c ≥9%. The lean mass loss in pts with baseline HbA1c <9% was 0.8 kg (LOR bid), 1.3 kg (LOR qd), and 2.1 kg (PBO) vs 4.8 kg, 1.8 kg, and 1.0 kg, for baseline HbA1c ≥9%. **Conclusions:** Fat-mass loss was significantly greater with LOR+DE than PBO+DE while lean-mass loss with LOR+DE was comparable (0.2 kg-0.3 kg lower) to that of PBO+DE in pts with T2DM. Although the populations were too small for definitive conclusions, loss of fat mass appeared greater in pts with baseline

HbA1c ≥9% than in pts with lower initial HbA1c. aP<0.0001 vs PBO. bP<0.05 vs PBO.

T-739-P
Effects of Lorcaserin on Lean and Fat Mass Loss in the BLOSSOM Study of Obese and Overweight Patients

Domenica Rubino *Arlington, VA*; Randi Fain, William Soliman, Sharon Zhou *Woodcliffe Lake, NJ*; Matilde Sanchez, Joanne Quan *San Diego, CA*; Caroline M. Apovian *Boston, MA*

Background: Lorcaserin (LOR) is a selective serotonin 2C receptor agonist for weight management. Lean and fat body mass tends to be greater in overweight and obese than normal weight patients (pts). We report fat and lean body mass loss relative to overall weight loss achieved over 1 yr as determined by dual-emission X-ray absorptiometry (DXA) in a randomized subset of pts from BLOSSOM, a placebo (PBO)-controlled study of LOR efficacy and safety. **Methods:** Together with diet and exercise counseling (DE), obese and overweight adults were randomized to LOR 10 mg once daily (QD), LOR 10 mg twice daily (BID), or PBO. DXA scans were performed at baseline, 6 months, and 1 yr. Body fat and lean mass loss were analyzed by sex and magnitude of weight loss. **Results:** DXA data was collected from 189 pts. In this group at week 52, the decrease in body fat mass from baseline was 9.9%a (LOR BID, n=85), 6.1%b (LOR QD, n=35), and 4.6% (PBO, n=69), while the decrease in lean mass was 1.9%c, 2.0%d, and 0.3%, respectively. For females, the body fat mass decrease was 9.9% (LOR BID, n=77), 6.0% (LOR QD, n=31), and 3.4% (PBO, n=53) vs 10.4% (n=8), 6.6% (n=4), and 8.5% (n=16), respectively, in males. The lean mass decrease in females was 2.0% (LOR BID), 2.1% (LOR QD), and 0.2% (PBO) vs 0.8%, 0.7%, and 0.6%, respectively, in males. In subjects with ≥5% weight loss at week 52, fat mass loss was 18.4% (LOR BID, n=47), 15.6% (LOR QD, n=15), and 13.8% (PBO, n=20), while lean mass loss was 3.2%, 3.9%, and 2.7%. **Conclusions:** LOR was associated with an overall reduction in fat body mass. Fat mass loss was greater with LOR BID+DE than PBO+DE, and most LOR-associated weight loss was fat mass. Our results suggest that the composition of weight loss with LOR favors fat vs lean mass loss. aP=0.005 vs PBO. bP=0.526 vs PBO. cP=0.020 vs PBO. dP=0.054 vs PBO.

T-740-P
Early Achievement of Significant Weight Loss with Naltrexone/Bupropion Is Associated with Additional Weight Loss at One Year - An Integrated Analysis of Four Phase 3 Trials

Raymond A. Plodkowski, Brandon Walsh *La Jolla, CA*; Paulos Berhanu *Deerfield, IL*; Kevin Shan, Frank Cerasoli, Ken Fujioka *La Jolla, CA*

Background: Naltrexone sustained-release (SR) / bupropion SR (NB [32mg/360mg]) significantly reduced body weight vs. placebo (PBO) in four Phase 3 trials of overweight/obese subjects (BMI ≥27 and ≤45 kg/m²) at week 56: NB -7.0% (SE=0.2) body weight vs. PBO -2.3% (SE=0.2; p<0.001). As early response to treatment may be indicative of greater long-term weight loss, an integrated analysis of four Phase 3 NB trials (N=2043 NB, N=1319 PBO) was performed to evaluate the proportion of early responders (observed ≥5% weight loss at week 16) and their long-term weight loss. **Methods:** Treatment differences (LS mean) in the modified ITT-LOCF population (≥1 post-baseline weight on study drug) were evaluated by ANCOVA with treatment, study, and baseline values as covariates. **Results:** Baseline characteristics were similar between treatment groups: 81% female, 79% Caucasian, age 46 yrs, and BMI 36 kg/m². The goal of ≥5% weight loss by week 16 was achieved in 51% of NB subjects (similar across the overweight and 3 obesity BMI classes [range: 44-54%]) and 19% of PBO subjects. Of the early NB responders, 87% completed 56 weeks of treatment. In the early NB responders (-9.2% weight change at week 16), body weight at week 56 was further reduced (-11.3% from baseline) and weight loss of ≥10% or ≥15% was achieved by 55% and 30% of subjects, respectively. The safety/tolerability profile of NB was consistent with its individual components, and early responders demonstrated adverse events (AEs) that were similar to the overall Phase 3 population. The most frequent AEs with NB in both the overall Phase 3 population and the early responder population were nausea, constipation, and headache. **Conclusions:** The majority of subjects treated with NB achieved ≥5% weight loss by week 16; these subjects exhibited additional weight loss at 1 year, and 87% continued treatment to study end.

T-741-P

Naltrexone/Bupropion Is Associated with Early and Longer-Term Improvement in Binge Eating Disorder That Is Related to Improvement in Depression

Susan McElroy *Mason, OH*; Brandon Walsh, Amy E. Halseth, Kevin Shan, Frank Cerasoli *La Jolla, CA*

Background: A bidirectional association exists between obesity and depression, especially major depressive disorder (MDD). Naltrexone sustained-release (SR)/bupropion SR (NB) combination therapy is an investigational obesity treatment believed to act at CNS reward centers and the hypothalamus to improve control of eating behavior and reduce appetite. Given that bupropion monotherapy is approved to treat MDD, NB therapy may be uniquely suited to treat overweight/obese individuals with MDD. **Methods:** An open-label, single-arm study of NB in overweight/obese subjects with MDD suggested that NB is associated with significant reductions in weight, depression scores, and binge eating (assessed using the Binge Eating Scale [BES]). This exploratory analysis assessed the time course of improvement in BES scores with NB, and the relationship between changes in depression (Inventory of Depressive Symptomatology–Self-Report [IDS-SR]) and BES scores. **Results:** Baseline characteristics (N=25) include: 100% female; age 47 y; BMI 35 kg/m²; BES score 28.4; IDS-SR score 43.2. 48% of subjects completed 24 weeks of NB treatment. BES was significantly reduced by -14.7 units (SD=9.5; p<0.001) at week 4 and remained significantly improved throughout the trial, with a -20.1 (SD=9.4) unit improvement at week 24 (p<0.001). In subjects who completed 24 weeks of treatment, baseline BES classification was either "severe" (75%) or "moderate" (25%), while at endpoint (24 weeks) none were classified as "severe," 18% as "moderate," and 82% as no longer having binge eating problems. Change in IDS-SR score was correlated with change in BES at each time point (r=0.59 to 0.70 at weeks 4, 8, 12, and 24; all p<0.05). **Conclusions:** This exploratory analysis suggests that in subjects with MDD, binge eating behavior is rapidly improved with NB treatment and the improvement is related to improvement in MDD.

T-742-P

Number Needed to Treat Analysis (NNT) of Lorcaserin in Overweight and Obese Patients

Zhixiao Wang, Xuan Li, Randi Fain *Woodcliff Lake, NJ*; Ken Fujioka *La Jolla, CA*

Background: NNT is an effective way for healthcare practitioners and payers to assess treatment impact in a population based on clinical trials. It is calculated as the inverse of absolute risk reduction over a given time period. A NNT analysis was conducted for phase 3 trials of lorcaserin, a pharmacotherapy for obese (BMI≥30) and overweight (BMI 27-29.9 and ≥1 weight-related comorbidity, WRC) adult patients. **Methods:** BLOOM/BLOSSOM (N=7190) enrolled overweight (BMI 27-29.9 with ≥1 WRC) and obese (BMI 30-45) adult patients without diabetes. BLOOM-DM (n=604) enrolled similar patients with diabetes. FDA recommended that patients not losing ≥5% of baseline body weight at 12 weeks should discontinue treatment to maximize benefit and minimize unnecessary exposure. Therefore, this NNT analysis evaluated 1-year endpoints including weight loss (WL), reduction in waist circumference (RWC), and change in HbA1C (BLOOM-DM only) in those who achieved ≥5% WL at 12 weeks (responders) and the lorcaserin overall population, in comparison to the placebo group. **Results:** 85.5% and 49.8% of BLOOM/BLOSSOM responders achieved at least 5% and 10% WL at 1 year. NNTs in responders for 5% WL, 10% WL, 10% RWC are 1.6, 2.4, and 2.4, lower than the NNTs for the lorcaserin overall population (4.1, 7.3, and 6.8). 70.5% and 35.9% of BLOOM-DM responders achieved at least 5% and 10% WL at 1 year. NNTs for 5% WL, 10% WL, 10% RWC, and HbA1C≤7% are 1.8, 3.2, 4.1, 2.2 in responders and 4.8, 8.4, 9.8, 3.9 in the lorcaserin overall population. **Conclusions:** This NNT analysis suggests that using 5% WL at 12 weeks as a criterion for discontinuation of lorcaserin can help physicians predict how many patients are likely to respond to therapy. This may increase the likelihood for success, avoid unnecessary risk, and ensure effective use of healthcare resource.

T-743-P

Effects of Phentermine and Topiramate Extended-Release (PHEN/TPM ER) Treatment on Weight Loss (WL) by Gender, Race and Ethnicity Over 1 Year

Donna H. Ryan *Baton Rouge, LA*; Santosh T. Varghese *Mountain View, CA*

Background: In obese/overweight individuals, gender, race, and ethnicity can affect the success of WL interventions. PHEN/TPM ER has induced significant WL in the EQUIP study of obese subjects (BMI ≥35 kg/m²) and in the CONQUER study of obese/overweight subjects (BMI ≥27 to ≤45 kg/m²) with ≥2 weight-related comorbidities. **Methods:** Data from these 2 double-blind, randomized Phase 3 studies were pooled. Subjects received placebo (PBO), PHEN 3.75 mg/TPM ER 23 mg (3.75/23), PHEN 7.5 mg/TPM ER 46 mg (7.5/46), or PHEN 15 mg/TPM ER 92 mg (15/92) and lifestyle modifications based on the LEARN program. WL at week 56 was assessed in responders (≥3% WL at week 12) stratified by gender, race (black and non-black), and ethnicity (Hispanic/Latino and non-Hispanic/Latino). Analysis was restricted to those with a week-12 measurement. **Results:** At week 12 in the overall population, 2033/3126 (65%) subjects had ≥3% WL: 34.7%, 59.2%, 82.5%, and 88.6% of the PBO, 3.75/23, 7.5/46, and 15/92 groups, respectively; similar response rates were seen in male, female, non-black, and non-Hispanic/Latino subjects. Responder rates for PBO, 3.75/23, 7.5/46, and 15/92, respectively, in black subjects were 26.5%, 51.6%, 81.3%, and 87.2% and in Hispanic/Latino subjects were 28.1%, 50.0%, 67.7%, and 80.0%. At week 56, least-squares mean percent WL was greater with 7.5/46 and 15/92 vs PBO across gender and race responders (*P*<.05, all comparisons). WL with 7.5/46 and 15/92 was greater in females vs males (*P*<.05) but not significant between race and ethnicity groups. Common adverse events—constipation, dry mouth, and paraesthesia—were similar across all strata. **Conclusions:** PHEN/TPM ER, as an adjunct to lifestyle modifications, can be an effective WL treatment for obese/overweight patients, regardless of gender, race, or ethnicity.

T-744-P

Cost of Completing 1 Year of Treatment with Phentermine/Topiramate Extended Release in an Overweight and Obese Population

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Background: As prevalence rates of overweight/obesity rise, the need for cost-effective treatments becomes pertinent. The objective is to estimate the cost Per Treated Member Per Month (PTMPM) for patients who complete a year of therapy with phentermine/topiramate extended-release (PHEN/TPM ER) plus lifestyle modification (LM) compared with LM only. **Methods:** A 1-year model was developed from a health plan perspective using clinical trial data and published literature to estimate the PTMPM costs in an overweight (BMI ≥ 27 kg/m²) and obese population (BMI ≥ 30 kg/m²) completing 1 year of therapy. Costs include PHEN/TPM ER costs, medical and pharmacy cost offsets for comorbidities (diabetes, hypertension, dyslipidemia) and progression to these 3 comorbidities. PHEN/TPM ER costs are calculated using the current wholesale cost, dose utilization based on total dispensed pills, and average Tier 3 patient co-pay ($60). **Results:** In the model, the cost PTMPM for patients who complete 1 year of therapy with PHEN/TPM ER is $382.36 versus $385.24 for LM. This results in a PTMPM cost savings of $2.88 ($34.56 per treated member per year cost savings). Additionally, 82% of patients achieve the labeled indication weight loss targets to remain on therapy and did not discontinue due to adverse events. Common treatment-emergent adverse events were constipation, dry mouth, and paraesthesia. **Conclusions:** PHEN/TPM ER may be a cost-effective treatment option as the PTMPM costs demonstrate cost savings compared to LM for the overweight/obese population. With more than 8 out of 10 patients on PHEN/TPM ER achieving weight loss targets, health plans should expect to see considerable cost benefits from treatment.

T-745-P

Effect of Topiramate on BMI in Severely Obese Adolescents

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Background: Adolescents with severe obesity respond marginally to lifestyle modification (LSM) alone, yet pharmacological options for use as an adjunct to LSM in this population are lacking. Topiramate, an antiepileptic

medication, is associated with weight reduction in obese adults, yet no studies have examined the effect of topiramate on obesity in adolescents. The purpose of this study was to examine the effect of topiramate plus clinically-prescribed LSM on BMI reduction in adolescents with severe obesity. **Methods:** Data for this retrospective chart review were collected from patients enrolled over the past 3 years in a tertiary care, multidisciplinary pediatric weight management program. Patients included were those who were treated with LSM plus topiramate (median dose 75 mg daily, range 25 to 125 mg daily) for a minimum of 3 months. Paired t-tests were used to compare baseline and follow-up characteristics. **Results:** Twenty-eight patients (71.4% girls, mean age 14.9±2.6 years) were identified for inclusion in this analysis. Baseline mean BMI was 45.3±10.4 kg/m2. After a mean treatment time of 7.8±4.7 months, mean BMI decreased to 43.2±10.3 (P=0.0001). The mean BMI percent change from baseline was -4.8±5.2%. A sub-analysis of patients (N=14) who were not concurrently taking any other weight-altering medications or specialized diets demonstrated a mean BMI percent change from baseline of -6.1±5.8% after a mean treatment time of 9.0±5.5 months. Two of the 28 patients experienced paresthesias and one experienced hair thinning. **Conclusions:** Topiramate with concurrent LSM was associated with clinically-meaningful BMI reduction and acceptable tolerability in adolescents with severe obesity. Randomized controlled clinical trials examining the efficacy and safety of topiramate for the treatment of severe obesity in this population are needed.

T-746-P

Assessing Gastric Emptying Before and After Introduction of GLP-1 Agonists for Glycemic and Body Weight Control in Prader-Willi Syndrome

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Background: Best practice for type 2 diabetes mellitus treatment in the genetic obesity syndrome PWS is uncertain. Insulinotropic/anorexigenic GLP-1 agonists might help with glycemic control and weight loss. However, there are theoretical concerns about their safety in PWS because of adverse effects on gastric motility. There have been several reports of gastric necrosis and fatal rupture in PWS perhaps related to delayed gastric emptying (unconnected to GLP-1 analogues). **Methods:** We performed gastric emptying studies using Tc-99 semi-solid meal scintiscan to measure emptying half-life (t1/2, normal <60 min) in 6 patients (19-43y) with PWS and T2DM, one of whom had been on 1.2mg Liraglutide for 1 year. Two patients had gastric emptying re-assessed 3 months after starting Liraglutide up to 1.8mg, with re-assessment of glycaemic control and body weight at 6 months. **Results:** Gastric emptying was markedly delayed in 1/5 patients not on Liraglutide (t1/2 >180 min), while the 6th case already on Liraglutide had t1/2 79 mins, precluding further dose increase. Gastric emptying was slowed by Liraglutide in 2 cases (48 to 83 min, 25 to 49 min). In one case, together with increases in insulin dose which previously led to weight gain, HbA1c decreased by 1.9% with 2.5% weight loss. In the other, HbA1c decreased by 0.8% with 0.5% weight loss. Neither had improvement in hyperphagia scores or side effects. **Conclusions:** GLP-1 analogues may improve glycemic control in PWS with T2DM but may not have a major impact on hyperphagia or weight control other than attenuating insulin-associated weight gain. However Liraglutide can markedly delay gastric emptying (without symptoms), which may be delayed even at baseline. Some caution in the use of GLP-1 agonists and assessment of gastric emptying both before and after their introduction therefore seems appropriate in patients with PWS.

T-747-P

Effects of Phentermine and Topiramate Extended-Release (PHEN/TPM ER) on Weight Loss (WL) and Glycemia When Stratified by Baseline Body-Mass Index (BMI) Over 1 Year

Timothy Church *Baton Rouge, LA*; Wesley W. Day *Mountain View, CA*

Background: The risk of type 2 diabetes mellitus (T2DM) is positively associated with BMI. PHEN/TPM ER, used in conjunction with lifestyle modifications, has been shown to induce WL and improve glycemia compared with placebo in a 56-week, double-blind, Phase 3 evaluation of obese and overweight subjects (CONQUER). **Methods:** In this post hoc analysis of CONQUER, change in weight, HbA$_{1c}$, fasting glucose, and fasting insulin were

assessed in 2448 obese and overweight adult subjects (BMI ≥27 and ≤45 kg/m²; ITT) with ≥2 weight-related comorbidities receiving placebo (n=979), PHEN 7.5 mg/TPM ER 46 mg (7.5/46; n=488), or PHEN 15 mg/TPM ER 92 mg (15/92; n=981). Subjects were stratified by baseline BMI (kg/m²): <30, ≥30 to <35, ≥35 to <40, and ≥40. **Results:** At baseline, HbA$_{1c}$ was 5.9%±0.8% and 16% of subjects had T2DM. At week 56, least-squares (LS) mean percent WL was significantly greater with PHEN/TPM ER vs placebo (*P*<.0001; ITT-LOCF) across all baseline BMI subgroups. LS mean changes in HbA$_{1c}$ for placebo, 7.5/46, and 15/92, respectively, were significant in all BMI subgroups ≥30 vs placebo (*P*<.05): <30 kg/m², -0.07%, -0.18%, and -0.07%; ≥30 to <35 kg/m², 0.07%, -0.07%, and -0.05%; ≥35 to <40 kg/m², 0.03%, -0.07%, and -0.10%; and ≥40 kg/m², 0.03%, -0.07%, and -0.15%. Improvements in fasting glucose and fasting insulin were greater with PHEN/TPM ER vs placebo across all BMI categories ≥30 kg/m² (*P*<.05 for 15/92 dose, all comparisons). Common adverse events were constipation, dry mouth, and paraesthesia. **Conclusions:** PHEN/TPM ER was associated with significant WL vs placebo across all BMI categories and improvements in glycemia across BMI categories ≥30 kg/m². This suggests that PHEN/TPM ER, in conjunction with lifestyle modifications, may assist a wide range of obese patients in achieving WL, with additional glycemic benefits.

T-748-P

Eighty-Five Obese Hypogonadal Men with Type 2 Diabetes Treated with Testosterone Up to 6 Years Achieve Weight Loss and Improved Glycaemic Control in an Observational Registry Study

Farid Saad *Berlin, Germany*; Ahmad Haider *Bremerhaven, Germany*; Gheorghe Doros, Abdulmaged Traish *Boston, MA*

Background: Obesity is a risk factor for type 2 diabetes (T2D). In men, both diseases have a high prevalence of testosterone deficiency (hypogonadism), and testosterone treatment has been shown to improve weight and T2D. We studied the effects of normalising testosterone in obese hypogonadal men with T2D. **Methods:** Cumulative, prospective, observational registry study of 300 men with testosterone levels below 12.1 nmol/L receiving testosterone undecanoate injections for up to six years. We selected a subgroup of 85 men (mean age: 61.01±4.84 years) with obesity and T2D. **Results:** Mean weight (kg) decreased from 114.93±11.88 to 93.19±8.74. This decrease was statistically significant vs baseline (p<0.0001) and each year compared to previous year. The mean change from baseline was -20.81±0.63 kg. The mean per cent weight loss (%) was 17.98±0.51 after 6 years. Mean waist circumference (cm) decreased from 111.94±7.05 to 100.85±6.9. This decline was statistically significant vs baseline (p<0.0001) and each year compared to the previous. The mean change from baseline was -11.25±0.31 cm. Mean BMI (kg/m2) decreased from 37.05±3.62 to 30.45±2.58. This change was statistically significant vs baseline (p<0.0001) and each year compared to previous year. Mean fasting glucose decreased from 116.89±13.88 to 96.19±2.55 mg/dl (6.49±0.77 to 5.34±0.14 mmol/L) (p<0.0001 vs baseline, significant for the first 3 years vs previous year). HbA1c decreased from 8.21±0.76 to 6.31±0.56% (p<0.0001 vs. baseline, significant for the first 5 years vs previous year). **Conclusions:** Correcting hypogonadism by testosterone treatment in obese hypogonadal men with T2D resulted in significant and sustained improvements in weight, waist circumference, fasting glucose and HbA1c over the full 6 years of the study.

T-749-P

Long-Term Treatment with Testosterone Undecanoate Injections Leads to Sustained Weight Loss and Improvement of Metabolic Syndrome Parameters in 381 Hypogonadal Men

Farid Saad *Berlin, Germany*; Michael Zitzmann, Sabine Kliesch *Muenster, Germany*

Background: Testosterone deficiency (hypogonadism) is closely associated with obesity and metabolic syndrome in a bi-directional relationship. In our department for clinical andrology, we studied long-term effects of testosterone replacement therapy in men with hypogonadism of different etiologies. **Methods:** Prospective, cumulative, observational registry study including 381 men with testosterone levels below 12 nmol/L receiving testosterone undecanoate injections for up to 16 years. 169 men had primary, 113 secondary and 99 mixed hypogonadism. The mean age was 42±13 years (min.: 15, max: 72). **Results:** Mean weight (kg) decreased from 100.8±11.8 to 86.5±9.4. Mean waist circumference (cm) decreased from 113.2±11.1 to

96.4±8.5. Mean BMI decreased from 31.1±5.1 to 26.7±3.3 (p<0.001 as ANOVA for last observation carried forward (LOCF) for all parameters). Mean fasting glucose decreased from 108.9±29.6 to 94.7±15.3 mg/dl. Total cholesterol decreased from 239±35 to 172±22, LDL from 161±30 to 111±19, triglycerides from 201±35 to 148±20, and HDL increased from 36.3±9.4 to 52.7±11.6 mg/dl (p<0.001 as ANOVA for LOCF for all parameters). Systolic blood pressure decreased from 150±14 to 131±11, diastolic from 99±11 to 82±10 mmHg (p<0.001 as ANOVA for LOCF for all parameters). The proportion of men fulfilling the Harmonized Criteria for the metabolic syndrome decreased from initially 87% to 51% within 2 years and to 43 % within 4 years (Chi-square for trend: p<0.001). **Conclusions:** Correcting hypogonadism by testosterone treatment in hypogonadal men resulted in significant and sustained improvements in waist circumference and weight and all other parameters of the metabolic syndrome.

T-750-P

Effects of Long-Term Treatment with Testosterone Undecanoate on Excessively Obese, Hypogonadal Men – An Observational Study

Farid Saad *Berlin, Germany*; Ahmad Haider *Bremerhaven, Germany*

Background: Obesity can cause hypogonadism, and hypogonadism promotes further accumulation of fat mass in a vicious cycle. In excessively obese men (defined by BMI ≥ 40 kg/m2) awaiting bariatric surgery, a 75% prevalence of hypogonadism was found [1]. Testosterone treatment has been shown to improve body composition and reduce weight [2]. We studied the effects of normalising testosterone in hypogonadal men with excessive obesity. **Methods:** Cumulative, prospective, observational registry studies of 561 men from two cohorts with testosterone levels below 12.1 nmol/L receiving testosterone undecanoate injections for up to 75 months. We selected a subgroup of 46 men with excessive obesity. **Results:** Average weight decreased from 129.02 kg to 105.59 kg. The average weight loss was 23.43 kg. The magnitude of weight loss was dependent on treatment duration, i.e. the longer the treatment, the greater the weight loss. Minimum weight loss was 5 kg in a subject who had received 15 months of treatment, maximum weight loss of 41 kg was observed in a man who had been treated for 69 months. No subject gained weight, and the weight loss was progressive over time. Average waist circumference decreased from 118.41 cm to 106.91 cm. The average reduction was 11.43 cm. The greatest reductions of 19 cm each were observed in two men who had been treated for 69 and 72 months, resp. **Conclusions:** Treating hypogonadism by testosterone replacement in hypogonadal men with excessive obesity resulted in sustained improvements in weight and waist circumference in all subjects. The magnitude depended on treatment duration. [1] Luconi M et al., Fertil Steril 2013; 99:1872–1879 [2] Saad F et al., Obes, published online 22 Apr 2013, doi: 10.1002/oby.20407

T-751-P

Two Hundred Seven Obese Hypogonadal Men Treated with Testosterone Undecanoate Up to 72 Months Progressively Lose Weight: An Observational Registry Study

Farid Saad *Berlin, Germany*; Ahmad Haider *Bremerhaven, Germany*; Gheorghe Doros, Abdulmaged Traish *Boston, MA*

Background: Obesity induces male hypogonadism at all ages by various mechanisms affecting the hypothalamic-pituitary-gonadal axis. Low testosterone promotes further accumulation of fat mass thus creating a vicious circle. We analysed the effects of normalising testosterone in obese hypogonadal men. **Methods:** Cumulative, prospective, observational registry study of 207 obese men with testosterone levels below 12.1 nmol/L and a body mass index (BMI) of ≥30 kg/m2 received parenteral testosterone undecanoate 1000 mg/12 weeks following an initial 6-week interval for up to six years. **Results:** At the end of the observation period, mean weight (kg) decreased from 113.33±11.63 to 91.59±8.14. This decrease was statistically significant vs baseline (p<0.0001) and each year compared to previous year. The mean change from baseline was -20.68±0.4 kg. Mean waist circumference (cm) as a measure of abdominal fat decreased from 110.57±7.3 to 99.35±7.11. This decline was statistically significant vs baseline (p<0.0001) and each year compared to the previous year except the last year where statistical significance was approached (p=0.0564). The mean change from baseline was -10.48±0.28 cm. BMI (kg/m2) decreased from 36.3±3.69 to 29.69±2.6. This change was statistically significant vs baseline (p<0.0001) and each year compared to previous year. The mean per cent weight loss (%)

was 5.39%±0.24 after 1 year, 9.41±0.25 after 2 years, 12.02±0.26 after 3 years, 14.39±0.26 after 4 years, 16.93±0.28 after 5 years and 18.15±0.33 after 6 years. **Conclusions:** Raising serum testosterone to normal resulted in loss of weight and waist circumference. Improvement in weight was progressive over the full 6 years of the study, improvement in waist circumference was progressive over 5 years and still approached significance at 6 compared to 5 years.

T-752-P

Liraglutide 3.0 mg Effects Similar Degree of Weight Loss Irrespective of Baseline BMI in the SCALE™ Maintenance Trial

Samuel Klein *St Louis, MO*; Vincent Woo *Winnipeg, Canada*; Anjun Cao, Boris Stevenin *Princeton, NJ*; Thomas A. Wadden *Philadelphia, PA*

Background: In the randomized, double-blind, placebo-controlled SCALE Maintenance trial, obese/overweight adults (BMI ≥30 kg/m² or ≥27 kg/m² with comorbidities) who lost ≥5% of initial body weight (BW) during a 4-12 week run-in period with low calorie diet (1200-1400 kcal/day), had further decreases in BW of (mean, % ±SD) 6.2±7.3% with liraglutide 3.0 mg/day (n=194) and 0.2±7.0% with placebo (n=188) after 56 treatment weeks. Randomized participants were also on a 500 kcal/day deficit diet and were encouraged to exercise. Transient gastrointestinal disorders were more common with liraglutide than placebo. The effect of baseline BMI on weight loss response to liraglutide is not known. **Methods:** The percentage change in fasting BW from baseline (randomization, following ≥5% BW loss) to week 56 for 4 fasting baseline BMI categories (<30 kg/m², ≥30 to <35 kg/m², ≥35 to <40 kg/m², ≥40 kg/m²) was evaluated post-hoc using ANOVA with treatment, gender, country, co-morbidities stratification, baseline fasting BMI category and interaction between baseline fasting BMI category and treatment as fixed effects. **Results:** For all baseline BMI categories, participants treated with liraglutide 3.0 mg lost a greater percentage of BW than those treated with placebo (p<0.002 for all). Placebo-adjusted weight loss in liraglutide-participants with baseline BMI <30 kg/m², ≥30 to <35 kg/m², ≥35 to <40 kg/m² and ≥40 kg/m² and corresponding baseline mean BW of 79.7, 90.6, 104.7, 127.7 kg, was (mean,%±SE) 6.5±1.9% (n=59), 5.6±1.2% (n=152), 6.8±1.5% (n=94) and 5.2±1.6% (n=77) of baseline BW, respectively, after 56 treatment weeks. Treatment effect (% BW loss at week 56) was similar across the 4 BMI categories (p=0.87). **Conclusions:** Percent BW loss induced by liraglutide 3.0 mg/day plus diet therapy is similar across all baseline BMI categories.

T-753-P

Health-Related Quality of Life in Overweight and Obese Patients Treated with Lorcaserin

Zhixiao Wang, Xuan Li, Annette Powers *Woodcliff Lake, NJ*; Ken Fujioka *La Jolla, CA*

Background: Obesity increases risk for multiple comorbid conditions and is detrimental to patient's health-related quality of life (HRQOL). Lorcaserin is a pharmacotherapy approved in the US for chronic weight management in obese (BMI≥30) and overweight (BMI 27-29.9 and ≥1 weight-related comorbidity, WRC) adult patients. The impact of lorcaserin on HRQOL was evaluated in phase 3 studies. **Methods:** BLOOM and BLOSSOM enrolled overweight (BMI 27-29.9 with ≥1 WRC) and obese (BMI 30-45) patients (18-65 years) without diabetes. The Impact of Weight on Quality of Life–Lite questionnaire (IWQOL-Lite) was used in both studies and data were pooled for the analysis. Patients were categorized by baseline IWQOL-Lite total scores (no/mild/moderate/severe impairment) and 52-week weight change (weight gain, 0-4.9%/5-9.9%/≥10% weight loss). Percentage of patients achieving clinically meaningful improvement (CMI) in each category was reported. Multivariate regression was used to assess the effect of lorcaserin on HRQOL. **Results:** 55% of patients receiving lorcaserin reported CMI at 52 weeks compared to 48.8% in the placebo group. In patients receiving lorcaserin who achieved ≥5% weight loss at 12 weeks (12-week responders), 63.7% reported CMI at 52 weeks. Baseline HRQOL and weight, and 52-week weight change were significantly associated with change in HRQOL (p<0.0001). After controlling for age, gender, baseline HRQOL and weight, and 52-week weight change, the effect of lorcaserin on HRQOL vs. placebo was not significant. **Conclusions:** This analysis suggested that weight loss could potentially improve patients' HRQOL. More patients using lorcaserin in conjunction with diet and exercise improved HRQOL than those with diet

and exercise alone. The benefit in HRQOL of lorcaserin seems attributable to weight loss.

T-754-P

Weight Changes At 6-Month Follow-Up After Discontinuation of Double-Blind Drug Intervention or Placebo

Jin Hee Shin, Kishore M. Gadde *Durham, NC*

Background: Although it is generally believed that obese patients who lose weight with pharmacotherapy tend to regain their lost weight soon after discontinuation of the intervention, follow-up data from clinical trials are sparse because patients are seldom followed beyond the intervention period. **Methods:** In a previously reported clinical trial, 225 obese patients were randomly assigned to treatment with daily placebo, zonisamide 200 mg, or zonisamide 400 mg for 1-year, at which point the study interventions were discontinued. A total of 154 (93 women, 61 men) of the 218 patients who completed the original 1-year study returned for 6-month follow-up visit to provide weight; they also completed a brief questionnaire. For data analysis, we defined weight-maintainers as who lost weight or gained <2% (n=88 [57%]) and weight-gainers as those who gained ≥2% weight (n=66 [43%]) during the follow-up period. **Results:** For this cohort of 154 patients, mean weight changes at 12-months were -3.8% for placebo (n=53), -3.8% for zonisamide 200 mg (n=49), and -8.4% for zonisamide 400 mg (n=52); corresponding weight changes at 6-month follow-up off-treatment were 0.3 %, 1.3 %, and 3.3%, respectively (P<.001). Greater proportion (77%) of weight-gainers reported increased appetite at 6-month follow-up compared with weight-maintainers (54%; P<0.01). **Conclusions:** Patients assigned to zonisamide 400 mg achieved greater weight loss than placebo at 1-year. Weight regain for zonisamide 400 mg patients was greater than for placebo patients at 6-month follow-up, which may be attributable to return of the previously suppressed appetite.

T-755-P

Effects of Icosapent Ethyl (Eicosapentaenoic Acid Ethyl Ester) on Pharmacokinetic Parameters of Rosiglitazone in Healthy Subjects

Rene Braeckman *Bedminster, NJ*; William Stirtan, Paresh N. Soni *Groton, CT*

Background: Icosapent ethyl (IPE; formerly AMR101) is a high-purity prescription form of eicosapentaenoic acid (EPA) ethyl ester approved in the United States as an adjunct to diet to reduce triglyceride levels in adults with severe (>=500 mg/dL) hypertriglyceridemia. Candidates for triglyceride-lowering therapy include patients with type 2 diabetes mellitus who may be receiving rosiglitazone, a thiazolidinedione antidiabetic agent and cytochrome P450 (CYP) 2C8 substrate. The purpose of this study was to assess the effects of IPE on the pharmacokinetics (PK) of rosiglitazone. **Methods:** Subjects received a single 8-mg oral dose of rosiglitazone alone and with oral IPE 4 g/day in this open-label, crossover, drug-drug interaction study. Primary and secondary PK end points included area under the concentration-versus-time curve from time zero to infinity (AUC_{0-inf}; primary) and maximum plasma concentration (C_{max}; secondary) for rosiglitazone with and without IPE. **Results:** Of the 30 patients enrolled, 28 completed the study. IPE 4 g/day at steady state did not significantly change the single-dose AUC0-inf or Cmax of rosiglitazone at 8 mg. Least squares geometric mean ratios (90% confidence interval) for AUC_{0-inf} and C_{max} of rosiglitazone given with IPE versus rosiglitazone alone were 0.90 (87.00-93.40) and 1.01 (92.02-109.9), respectively. No serious adverse events were reported and no subject discontinued this study due to an adverse event. **Conclusions:** At steady-state concentrations, IPE did not inhibit the metabolism of rosiglitazone, a CYP2C8 substrate. Co-administration of IPE and rosiglitazone was safe and well tolerated in this PK study of healthy adult subjects.

T-756-P

Five-Year Maintenance Results of an Obesity Drug Following a Very Low Calorie Diet (VLCD)

Judy F. Loper, Rich Lutes, Edward Baltes, John T. Broyles, Robert May *Gahanna, OH*

Background: Long-term weight maintenance needs to be improved. The purpose of the study was to examine the effects of using a combination of treatments (VLCD and phentermine) to help subjects maintain their weight lost. **Methods:** Three hundred, ninety-six subjects (326 females and 70 males) enrolled in an open-label study, and used either OptifastTM 800 or

regular food (800 calories) for a minimum of eight weeks. Following the VLCD, subjects were prescribed phentermine HCL (18.75-37.5 mg/day) and their diets adjusted to low calorie diets (LCD) for the duration of the study. Each subject had the ability to follow the protocol for five years. Treatment included an individual visit with the physician and registered dietitian every 2-4 weeks. In addition, subjects were offered group classes on lifestyle change, nutrition education, and physical activity. **Results:** The age range of the subjects was 20-75 years with a mean age of 47.9. Mean initial BMI was 38.84, and following the VLCD was 33.2. Mean baseline weight was 240.8 lbs, 206.3 lbs at the end of the VLCD, 194.1lbs after 1 year, 199.2 lbs after 2 years, 201 lbs after 3 years, 190.4lbs after 4 years, and 200.4 lbs after 5 years. The mean last recorded weight including dropouts was 206.3 lbs. The drop out rate before year 2 was 266 subjects or 68%. Reasons for the drop outs were: elevated BP-5, heart racing-4, and agitation-3. Other side effects noted were stomach cramps, sleep disturbances, and dry mouth. **Conclusions:** Subjects enrolled in the combination therapy showed a 15% reduction in body weight (taking the last recorded weight). Despite the high drop-out rate, those continuing in treatment continued to do well. Thus, VLCD and phentermine were effective in helping subjects keep off excess body weight long-term. Frequent office visits, phentermine, and VLCD may all have contributed to the positive results.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Clinical Practice Based Trials

T-757-P[DT]

Outcome of a Primary Care Based Intervention to Prevent Obesity in Young Children: Steps to Growing Up Healthy

Michelle M. Cloutier, James Wiley *Hartford, CT*; Dominica B. Hernandez *Storrs, CT*; Annamarie Beaulieu, Autherene Grant *Hartford, CT*; Amy A. Gorin *Storrs, CT*

Background: Obesity disproportionately affects low-income children and begins early in life. The goal of Steps to Growing Up Healthy is to decrease obesogenic behaviors and prevent/reverse obesity in low-income Hispanic and Black children ages 2-4 years. **Methods:** The intervention utilized brief motivational counseling delivered by primary care clinicians and nurses with telephone follow-up 5-7 days after the clinic visit. During each routine clinic visit, the medical team facilitated the selection of a specific goal (e.g., reduce juice/SSB) that was meaningful to the mothers, taught mothers simple behavioral strategies (e.g., self-monitoring) and together created a written action plan. BMI%tile and obesogenic behaviors were monitored at baseline and 12 months and were compared to a historical control group from the same clinic of similar age and ethnicity. **Results:** 232 mothers and children (86% Hispanic, 50%F, 35.4 ± 8.7 months, 17% overweight, 28% obese) participated; 12-month data were available in 197 (85%). Participants reported multiple obesogenic behaviors at baseline and received 2.8 ± 1.3 (mean ± SD) intervention doses (range 1-7) over the intervention period. There was no significant change in BMI%tile in study completers (75.9 ± 24.8 to 75.6 ±25.7, change -0.2 ± 20.1%tile) at 12 months (p=0.87). In contrast, BMI%tile increased 8.3 ± 25.7 %tile at 12 months in the historical control group as compared to intervention participants (p<0. 001). **Conclusions:** A brief intervention delivered at routine clinic visits by primary care clinicians and nurses over a 12 month period blunted BMI%tile increases in low-income Hispanic and Black children.

T-758-P

What's Diet Got to Do with It? Examining the Relationship between Food Security, Dietary Intake and Child BMI

Christine M. Trapp *Hartford, CT*; Amy A. Gorin *Storrs, CT*; James Wiley, Georgine Burke *Hartford, CT*; Dominica B. Hernandez *Storrs, CT*; Rebecca E. Crowell, Autherene Grant, Annamarie Beaulieu, Michelle M. Cloutier *Hartford, CT*

Background: Food insecurity has been associated with child obesity in the literature. This study examines the association between household food security, dietary intake and BMI in low-income preschool children at risk for obesity. **Methods:** Caregivers (N=226) with children aged 2-4 years were enrolled in an urban primary care-based obesity prevention study (Steps to

Growing Up Healthy) between October 2010-December 2011. At baseline, demographic data, household food security status (U.S. Household Food Security Instrument) and dietary intake (Children's Dietary Questionnaire) were collected. BMI was calculated from anthropometric data. **Results:** Participating children were primarily Hispanic (89%; 50%F; 35+8.6 months; 18% overweight; 29% obese). Forty-five percent of households reported food insecurity, which was not associated with child age, sex or ethnicity. No direct relationship was seen between household food insecurity and BMI. In food secure homes, obesity rates increased with increasing age (15%, 38% and 50% for 2, 3, and 4 year olds, respectively)(p<0.005) and were associated with greater soda consumption at 4 years compared to younger ages (P=0.05). This linear increase in weight was not observed in the food insecure group and children at 4 years from food insecure households did not increase their consumption of soda. No other differences in diet were observed between the two groups. **Conclusions:** Food insecurity is common among low-income children. Food secure households have higher rates of obesity with increasing age, which are associated with increased soda consumption. This association is not seen in food insecure homes. These data support a complex relationship between food security, dietary intake, and child BMI.

T-759-P
Factors Associated with Unsuccessful Weight Loss at 3 Years After Bariatric Surgery in a Mediterranean Population

Violeta Moize, Alba Andreu, Ferran Torres, Lilliam Flores, Emilio Ortega, Lucia Rodriguez, Josep Vidal *Barcelona, Spain*

Background: Bariatric Surgery (BS) is the most effective weight loss (WL) therapy for morbid obesity. However, insufficient WL and weight regain are commonly seen at long term follow up. **Methods:** We evaluate the prevalence of WL failure (% Excess Weight Loss<50%) at 3 years (y) after BS, and its relationship with eating behaviour (Binge Eating Disorder (DSM-IV) and Three Factor Eating Questionnaire (TFEQ)), and quality of life (QoL) (by Moorehead-Ardelt QoL Questionnaire) in a Mediterranean cohort. 240 individuals (male: 22%; age: 46.2±11y, BMI: 47.4±6.2 kg/m2), undergoing gastric bypass (GBP, 85%) or Sleeve Gastrectomy (SG,15%) at a single-center were prospectively assessed before surgery and yearly thereafter up to 3 y. **Results:** At 3 y, failure rate was 15% and did not differ between surgical groups (BPG: 80% vs SG: 20%; p=ns)). Baseline BMI was comparable between WL-failure(F) and WL-success(S) groups. WL-F tended to be more frequent in women than men (67% vs. 33%; p=0.07). Age >50, and menopausal status at the time of surgery were associated with higher prevalence of WL-F (respectively, p=0.01 and p=0.04) 63%). %EWL at 12 months was lesser in the WL-F relative to the WL-S group (50±10% vs 76±16%, p<0.001). Likewise, estimated daily Kcal intake at 12 months was higher in the WL-F than in the WL-S group (1742±489 vs 1332±468 kcal; p<0.001). Failure at 3 y was more prevalent in individuals with BED at 12 months (11% vs 2%; p=0.04) and in those who scored higher on the TFEQ total score (20±6 and vs.17±5; p=0.006). QoL score at 3 y was higher in the WL-S as compared to the WL-F group (1.14±1 and 0.28±1p=0.01). **Conclusions:** At 3 years follow up, the rate of WL-F does not differ between RYGBP and SG. WL-F is associated with unfavourable eating behavior and higher energy intake at 12 months, and has negative impact on QoL.

T-760-P
Alterations in Diabetic Medications and Resultant A1C Values among Patients with Diabetes Enrolled in a 1-Year Behavioural Program with Meal Replacement– Observations from the CORE Program at the Ottawa Hospital Weight Management Clinic

Judy Shiau, Mary-Ellen Harper, Ruth McPherson, Robert Dent *Ottawa, Canada*

Background: Diabetic (DM) patients undergoing weight loss may experience hypoglycemia and require medication alteration. There is a paucity of data on DM medication alteration and its effect on glycemic control in this population. **Methods:** A retrospective cohort study was conducted on consecutive patients enrolled from 1992 to 2009 in a year-long behaviour program which uses the Optifast 900* meal replacement for the first 6-12 weeks. Baseline and 6 month DM medications and glycemic profile were collected. Patients with DM medication regimens associated with weight gain (group A) were compared to those solely on the weight neutral medication regimens (metformin or alpha-glucosidase inhibitors (AGI)) (group B). **Results:** Overall, glycemic data was available for 2744 patients, with 456(20.1%)identified

as DM and 91(3.3%) as having impaired fasting glucose (IFG). Among DM patients: 95 (20.8%) were not on medications, 269(59.0%) were in Group A and 92(20.2%)in Group B. Baseline medications by % DM treated include: 34.3% sulfonurea (SU), 16.7% thiazolidinediones (TZD), 19.7% insulin,1.7 % meglitinides, 0.6% DPP-4 inhibitors (DPP4), 56.4% metformin and 1.9% AGI. Decrease or discontinuation of medications over 6 months occurred in: 81.5% SU, 68.4% TZD, 25% meglitinides, 33.3% DPP4, 28.8% metformin and 88.9% AGI. Baseline vs. 6 month A1C by groups were: 0.075 vs. 0.079 (NS) for Group A and 0.067 vs. 0.058 (NS) for Group B. **Conclusions:** Reduction or discontinuation of DM medications is common among patients enrolled in a meal replacement program. This practice appears safe with no significant compromise of A1C levels, irrespective of DM medication regimen.

T-761-P
Psychosocial Symptoms and Health-Related Quality of Life in Children at a Tertiary Care Obesity Program

Rose L. Schroedl, Amy E. Baughcum, Rosanna Watowicz, Andrea Spitnale, Travis Gallagher, Alexis Klenke, Carrie A. Tolman, Cynthia Yensel, Ihuoma Eneli *Columbus, OH*

Background: Obese youth experience poor health-related quality of life (HRQOL) and are at increased risk for psychological problems. The relationship between these constructs in obese youth is not well understood. The purpose of this project was to investigate the relationship between psychosocial symptoms and HRQOL in obese youth. **Methods:** A chart review was conducted for 226 patients aged 8 to 18 seen in a tertiary-care obesity center from January -December 2011. Referral to the center requires a BMI ≥ 95%ile. HRQOL was assessed with the Pediatric Quality of Life Inventory 4.0 (PedsQL 4.0). Higher scores represent better HRQOL. Mental health symptoms with the Pediatric Symptom Checklist (PSC), a brief mental health screener consisting of a total score and three subscales (internalizing, externalizing, and attention). **Results:** Participants were 52% Caucasian, 44% male, 35% over age 12 and mean BMI z-score of 2.29. Mean total PedsQL 4.0 score was 67.5 for parents and 75.1 for children. Youth with BMI >99th%ile (49%) experienced poorer quality of life compared to youth with BMI 95-99th%ile, as reported by children (χ2(1, 226)= 9.86, p<0.01) and parents (χ2 (1, 226)= 12.5, p<0.01). Of the 226 subjects, 26% had an abnormal PSC total score (≥15), with internalizing symptoms (26%) most common, followed by externalizing (15%) and attention symptoms (8%). Youth with BMI >99th%ile reported more internalizing symptoms compared to youth with BMI 95-99th%ile (p<0.02). In regression analysis, controlling for age, gender, race and insurance type, higher total PSC scores were predictive of lower parent and child total PedsQL scores (p<0.01). **Conclusions:** A BMI>99th%ile was associated with poorer HRQOL and greater psychosocial problems. Given the relationship between psychosocial symptoms and HRQOL, a greater emphasis on behavioral intervention may be needed for obese youth.

T-762-P
Primary Care Providers Who Convey Negative Weight-Related Attitudes Influence Patients' Weight Loss

Kimberly Gudzune, Wendy L. Bennett, Lisa A. Cooper, Sara N. Bleich *Baltimore, MD*

Background: Obese patients often report negative experiences with healthcare providers. It is unclear how provider attitudes influence weight loss. We examined the association between weight loss and negative primary care provider (PCP) attitudes about weight. **Methods:** We conducted a national, internet-administered survey of 600 adults with BMI≥25kg/m2 who visited their PCP within the last 12 months. Our weight loss outcomes were 1) attempted weight loss and 2) reported a 10% weight loss in the last 12 months. Our independent variable was "feeling judged about my weight by my PCP," dichotomized as "often or sometimes judged" vs. "never." We examined an interaction between being judged and PCP discussing weight loss as an independent variable. Using survey weights, we performed multivariate logistic regression adjusted for age, sex, race, BMI, PCP relationship duration, PCP race and PCP BMI. **Results:** Mean age was 47.4 years, 48% were female, and 21% reported that their PCP judged them about their weight. Patients who felt judged were significantly more likely to attempt weight loss [OR4.67, p<0.01]. However, they were not more likely to achieve a 10% weight loss [OR0.87, p=0.69]. As compared to patients who were not judged

and whose PCP did not discuss weight loss, those who were not judged and whose PCP did discuss weight loss were significantly more likely to achieve a 10% weight loss [OR4.36, p<0.01]. In contrast, those who felt judged, regardless of whether or not their PCP discussed weight loss, were not more likely to achieve this weight loss goal [Judged+Not Discussed: OR1.71, p=0.51; Judged+Discussed: OR2.70, p=0.06]. **Conclusions:** While PCP attitudes may prompt weight loss attempts, our results suggest that patients may be more successful losing weight if PCP weight loss counseling occurs within relationships free from judgment about being overweight.

T-763-P

Human Chorionic Gonadotropin (HCG) Administration Prevents Muscle Mass Loss, a Randomized Double-Blinded, Controlled Clinical Trial

Sheri Emma *Brick, NJ*

Background: This controversial topic has been under investigation for over sixty years. Repeated clinical trials have failed to show any significant difference in weight loss between HCG and placebo. The proposed theory is that HCG is not producing weight loss but serves to counteract muscle catabolism during a calorie-deprived state. **Methods:** 59 females between 20 and 55 were randomized to HCG or Placebo Study Groups. Recorded variables: weight, body composition, blood pressure, blood labs (CBC, complete metabolic panel, thyroid panel, and B-HCG). All were placed on a 500 calorie diet (50% protein, 50% complex carbohydrates). Subjects injected 200-300 IU subcutaneously daily for 4 weeks. Weekly follow-up visits recorded weight, blood pressure, and medical evaluation. Blood was taken every 2 weeks for electrolyte and lipid monitoring. **Results:** Mann-Whitney U Test Median Comparison: HCG vs. placebo. Muscle retention was greater in HCG group (p=0.0303). No significant difference in weight loss (p=0.5521) or fat mass loss (p=0.4189). **Conclusions:** HCG acts on LH receptors, creating an increase in anabolic hormones thereby preventing muscle breakdown during a very low calorie diet (VLCD). It is proposed that rather than HCG being perceived as a weight loss hormone, it should be considered an adjunct during a VLCD to prevent sarcopenia which can aid rapid weight loss methods, including weight reduction surgery. More research is warranted in this area.

T-764-P

Are There Differences between Presurgical and Nonsurgical Patients in a Multidisciplinary Medical Weight Management Program?

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Background: Insurance requirements for bariatric surgery often include 3-6 months of medically supervised weight loss. According to NIH Obesity Guidelines, approximately 8% weight loss is expected in 6-12 months of medical treatment for obesity. **Methods:** A retrospective chart review of presurgical patients (N=707) and nonsurgical patients (N=237) in a multidisciplinary medical weight loss program at the St. Vincent Carmel Bariatric Center of Excellence included those beginning treatment between 8/2/2005 and 2/19/2013. At 6 months, presurgical patients attended up to 7 sessions and nonsurgical patients 18. **Results:** Patients included 742 females and 202 males aged 44.6 years. Presurgical patients entering medical weight management had significantly higher weights and BMIs (299.2 lbs and 48.2 units, respectively) than nonsurgical patients (254.4 lbs and 40.9 units, respectively). At 3 months, nonsurgical patients (N=146) had significantly greater percent weight loss (6.2%) than presurgical patients (N=509; 1.0%). Similarly, at 6 months, nonsurgical patients' (N=85) percent weight loss (9.8%) was significantly greater than presurgical patients' (N=331; 1.4%). **Conclusions:** Nonsurgical patients lost more weight in a medical weight loss program than presurgical patients. Only nonsurgical patients' weight loss at 6 months met NIH Obesity Guidelines. Treatment intensity, with nonsurgical patients attending more sessions than presurgical patients at 6 months, may contribute to differences. Alternatively, nonsurgical patients may be more motivated to adhere to a medical weight loss program, whereas presurgical patients anticipate significant weight loss post-surgery. Presurgical patients may be less motivated to lose weight because participation is an insurance company requirement and not necessarily voluntary.

T-765-P

Medical Weight Loss Versus Bariatric Surgery: Does Method Impact Body Composition and Weight Maintenance After 15% Reduction in Body Weight?

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Background: This study investigated body composition changes in fat mass (FM) to lean body mass (LBM) ratios following 15% body weight loss (WL) in both integrated medical treatment and bariatric surgery groups. **Methods:** Obese patients, BMI=46.6±6.5 kg/m2, who underwent laparoscopic gastric bypass surgery (BS), were matched with 24 patients undergoing integrated medical and behavioral treatment (MT). The BS and MT groups were evaluated for body weight, BMI, body composition, and waist circumference at baseline and after 15% WL. **Results:** Following 15% body WL, there were significant decreases in %FM and increased %LBM (p<0.0001). Additionally, both groups saw 76% of WL from FM, and 24% from LBM indicating a 3:1 ratio of FM to LBM loss during the first 15% reduction in body weight. Lastly, no significant differences (p=0.103) between groups for maintenance of weight loss at one year were found. For both groups, baseline FM was found to be negatively correlated with percentage of weight regained (%WR) at one year post-WL (r=-0.457, p=0.007). Baseline waist circumference and rate of weight loss to 15% were significant predictors of %WR only in the BS group (r=0.713, p=0.020). **Conclusions:** If followed closely by professionals during the first 15% body weight loss, patients losing 15% weight by either medical or surgical treatments can attain similar FM:LBM loss ratios and can maintain weight loss for one year.

T-766-P[DT]

Barriers to Initial Behavior Change in a Primary Care-Based Obesity Prevention Program for Young Children

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Background: Children of color are disproportionately affected by obesity creating a need for effective prevention programs. This study investigated a first dose response to a pediatric primary care-based obesity prevention program (Steps to Growing Up Healthy) targeting Hispanic and Black children. We examined whether mothers experienced barriers to behavior change and if maternal, child, environmental, or intervention variables predicted barrier status. **Methods:** Hispanic and Black mothers and their children (N=234; 51%F; 88.9%Hispanic; 35.4+8.7months) were recruited from an urban primary care clinic. The intervention utilized brief motivational counseling delivered by clinicians and nurses with the goal of reducing obesogenic behaviors. During a routine clinic visit, the medical team facilitated the selection of a specific goal (e.g., reduce SSB) that was meaningful to the mothers and taught mothers simple behavioral strategies (e.g., self-monitoring). Study staff conducted follow-up phone calls 5-7 days after the visit, reviewed the selected goal, and assessed whether the mother experienced a barrier to behavior change. **Results:** 16.8% of mothers experienced a barrier to behavior change in the week following the first intervention dose. Logistic regression models identified mothers' confidence (p<.05) and child sex (p<.01) as predictors of barrier status. Mothers who were "somewhat" or "not confident" were 6.21 times more likely to report a barrier than mothers who were very confident and mothers were .351 times more likely to identify a barrier if their child was male. **Conclusions:** Obesity prevention programs may be well served to address maternal confidence levels especially with regard to their son's obesogenic behaviors.

T-767-P

Practice Patterns for Managing Patients Who Are Obese: Primary Care Physicians (PCP), Cardiologists (CARD), Endocrinologists (ENDO) and Bariatricians (BARI)

Terry A. Glauser, Nancy Roepke, Benjamin Whitfield *Birmingham, AL*; Boris Stevenin, Anne Marie Dubois, Soo M. Ahn *Plainfield, NJ*

Background: 35.7% of U.S. adults are obese. What do physicians know and do to manage these patients? **Methods:** CE Outcomes sent a survey to 1,640 US physicians to assessed practice patterns of PCP, CARD, ENDO and BARI managing obesity to identify educational need. **Results:** 100 PCP, 70 CARD, 100 ENDO, 30 BARI responded. 20% of PCP, CARD and ENDO did not see obesity as a disease. 18% PCP, 27% CARD, and 36% ENDO did

not think they could help obese patients achieve a healthy weight. Half or fewer of BARI were very familiar with USPSTF, NHLBI, AACE, ICSI guidelines. ENDO (40%) and PCP (28%) were very familiar with AACE, USPTF guidelines, respectively. Few CARD were familiar with guidelines. More than 20% ENDO, 30% BARI, 70% CARD and 80% PCP could not identify a hormone that increases food intake. Initial management varied; most suggested eschewing high calorie drinks, engaging in aerobic exercise. Reasons to start weight-loss medication: comorbidities, BMI ≥ 30 kg/m2, failure to lose weight after lifestyle advice but lacked consensus. PCP (62%), CARD (60%) and ENDO (30%) expected more weight loss in the 1st year of medication use than is achievable or were unsure. One year after Roux-en-Y, 74% PCP, 68% CARD, 51% ENDO and 33% BARI expected less excess weight loss than is actually achieved or were unsure **Conclusions:** 1/5 of PCP, CARD and ENDO do not see obesity as a disease, feel they cannot help obese patients achieve a healthy weight. No specialty was very familiar with any obesity guidelines. There may be gaps in knowledge of obesity pathophysiology. All lack consensus on how to initially help with weight loss, reasons to start medication. Majority are unsure or overestimate weight loss from medications and are unsure or underestimate weight loss from surgery. There is a need for education about obesity to physicians caring for these patients.

T-768-P
Use of Electronic Health Records for Addressing Overweight and Obesity in Primary Care: Preliminary Results from a Cluster-Randomized Controlled Trial

Heather J. Baer, Deborah H. Williams, Christina C. Wee, David W. Bates *Boston, MA*

Background: Primary care clinicians often fail to diagnose overweight or obese patients or counsel them about weight loss. Electronic health records (EHRs) could assist clinicians with diagnosis and management of overweight and obesity. **Methods:** We conducted a cluster-randomized controlled trial in primary care practices at Brigham and Women's Hospital. We developed several new features within the EHR, including reminders to measure height and weight (Stage 1); alerts to add overweight or obesity to the problem list, and patient-specific management recommendations (Stage 2). We randomized 23 clinical teams to have access to the new features (intervention group) or not (control group). We examined changes in documentation of body mass index (BMI) and diagnosis of overweight and obesity in the EHR during the 6 months before and after the intervention. **Results:** A total of 65,278 patients had visits during Stage 1 and 58,647 patients had visits during Stage 2. During Stage 1, documentation of BMI increased from 91.0% to 93.8% in the intervention group and from 87.3% to 91.1% in the control group (p = 0.15). During Stage 2, diagnosis of overweight or obesity on the problem list for patients with BMI ≥ 25 increased from 18.1% to 55.4% in the intervention group and from 15.0% to 20.7% in the control group (p < 0.0001). A sample of 2400 overweight or obese patients were mailed a survey after their primary care visit and 619 patients completed it; 60.7% of intervention vs. 53.9% of control patients reported that their clinician recommended that they lose weight (p = 0.03), and 17.5% of intervention vs. 13.3% of control patients said that their clinician helped them set a specific weight loss goal (p = 0.05). **Conclusions:** These findings suggest that features within EHRs may lead to improvements in diagnosis and management of overweight and obesity.

T-769-P
Association of Obese-Asthma Phenotype in Children with Peri-Operative Respiratory Adverse Events

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Background: Perioperative respiratory adverse events (PRAE) are responsible for a majority of pediatric morbidity. Childhood obesity and bronchial asthma are known risk factors for PRAE. The concomitant increase in the prevalence rates of these two chronic disorders would indicate that an increasing proportion of children presenting for anesthesia and surgery will belong to the obese asthmatic phenotype. Because obesity and asthma are known to be associated with PRAE, one can speculate that children with the obese-asthma phenotype would have increased rates of PRAE compared to their peers. Therefore, this study tested the hypothesis that compared to their lean peers; children with the obese-asthma phenotype have higher rates of PRAE. **Methods:** Using prospectively collected clinical and anthropometric

data; children aged 6-18yr who underwent elective non-cardiac surgeries were classified into 2 groups: obese-asthmatic (ObA) vs. non-obese, non-asthmatic (NONA). Rates of PRAE were compared between the two groups. **Results:** Among 675 children, 107 (15.9%) were ObA. Although there was no significant difference in age or mode of induction of anesthesia between the groups, ObA children were more likely to be male, be habitual snorers and have a positive history of obstructive sleep apnea. Rates of PRAE were significantly higher in the ObA compared to controls (21.5% vs. 6.3%, p = 0.001). In a multivariate logistic regression model adjusted for ObA phenotype, age, gender, mode of induction of anesthesia and presence of OSA, presence of the ObA phenotype was the most consistent predictor of PRAE in this cohort (OR =4.0; 95% CI = 2.2-7.4, p <0.001). **Conclusions:** Obese asthma phenotype is an independent risk factor for PRAE in children undergoing elective operations. Mechanism(s) underlying propensity to PRAE deserve further elucidation.

T-770-P
Maternal Self-Efficacy and Health Behaviors

Kathy S. James *San Diego, CA*; Panagiotis Matsangas *Athens, Greece*; Cynthia D. Connelly *San Diego, CA*

Background: Understanding contributors to family health is important in practice. Family health is a system comprised of routines or habitual practices. Among numerous facets of everyday life, it may include nutrition, activity, smoking, or sleeping habits. Mothers have a large influence on their children. As part of a study regarding family nutrition and activity patterns, we investigated the association between maternal self-efficacy, family nutrition and physical activity patterns, and self-reported sleep patterns, in a sample of overweight mothers. **Methods:** In a descriptive, quasi-experimental study, ninety eight females completed Family Nutrition and Physical Activity (FNPA) and a Self-efficacy survey which assessed family behaviors predictive of childhood obesity and how sure the mothers were that they could motivate themselves to carry out healthy promoting behaviors. **Results:** The majority of children (n=171) had healthy weight (n=89, 53.6%), 15 were underweight (9.04%), 23 overweight (13.9%), and 39 obese (23.5%). Mothers with normal weight had increased confidence scores (p = .062). Maternal confidence score was associated with the FNPA total score and with family and meal patterns (p=0.037), restriction/ reward (p=0.002), screen time behavior and monitoring (p=0.006), family activity involvement (p=0.006), and family routine (p=0.077). Analysis of children's sleep and maternal confidence showed that mothers who reported their children (5 to 10 years old) getting at least 10 of hours of daily sleep have increased confidence scores (p=0.026). **Conclusions:** The study emphasizes the significance of positive confidence and role modeling healthy behaviors that prevent obesity. Correlation does not indicate cause and effect but an awareness of maternal influence on family habits is important.

T-771-P
The Evaluation of a Non-Invasive Respiratory Volume Monitor in Obese Patients

Jonathan Lee *Waltham, MA*; Diane Ladd *Morgantown, WV*; Adam Glasgow *Norwood, MA*

Background: Obese patients have a greater risk of post-surgical respiratory complications. Pain management with opioids, a leading cause of postoperative respiratory compromise, is especially challenging in obese patients because of physical and anthropomorphic differences. Respiratory monitoring has previously been suboptimal in non-intubated patients. A novel, non-invasive Respiratory Volume Monitor (RVM) has been shown to provide accurate, continuous, real-time measurements of minute ventilation (MV), tidal volume (TV) and respiratory rate (RR) in postoperative patients. **Methods:** Digital respiratory curves were collected during 1-minute breathing tests (1740 tests, 66 visits) from obese subjects (age 19-79yrs; BMI 35.0-60.5kg/m2) at Mass Weight Loss, Norwood, MA with an impedance based RVM system (ExSpiron, Respiratory Motion, Waltham, MA) and a spirometer during normal, deep and shallow breathing. After calibration, accuracy & precision of RVM measurements of MV, TV & RR were compared to spirometry values. **Results:** RVM volume data correlated strongly with spirometric data, with median correlation across all subjects of r=0.97. The average MV & TV measurement accuracy error was 12.6%±4.3% and 12.3%±4.1%, respectively (mean ±SEM) and the RR error was 2.5%±0.3% across all subjects. The measurement bias in all 3 metrics was less than 1% on average.

Precision for MV, TV & RR was 10.5%±4.1%; 10.2%±4.0%;1.6% ±0.2%. **Conclusions:** RVM accurately measures MV,TV & RR in the obese population. RVM provides quantitative volume data, otherwise unavailable in non-intubated patients, with sufficient accuracy to be used in postoperative monitoring of obese patients at risk for obstructive sleep apnea or opioid induced respiratory depression. RVM has the potential to optimize pain management, improve patient safety in this at risk population and become a new standard of care.

T-772-P
Survey of Weight Program Participants Indicates Improvement in Quality of Life
Christine Weithman, Linda Gotthelf *Boston, MA*

Background: It is well established that obesity can impact quality of life including physical functioning and emotional well-being. There is a growing recognition of the importance of assessing quality of life after weight loss in addition to traditional medical measures. **Methods:** 706 patients responded to a quality of life survey that was posted on an online newsletter from Health Management Resources® (HMR®). 63.9% of respondents were either previously in an HMR Program, had used HMR meal replacements, or were doing the program on their own. 44.3% had lost ≥ 50 lbs. and 61.3% of them had lost that weight more than 1 year ago. **Results:** 70.9% (n=590 respondents) rated their overall health as much or somewhat better now in comparison to before they started losing weight with HMR. The top 10 areas where people noted an improvement (n=556) since losing weight were: self-esteem (68.3%), level of energy (68.3%), climbing stairs (66.7%), walking (66.2%), self-confidence (60.1%), intentional physical activity (59.5%), emotional outlook (55.6%), bending, kneeling or stooping (51.8%), sleeping (46.2%), breathing (43.7%), and lifting or carrying items, such as groceries (43.7%). Additionally, 62.6% (n=582 respondents) said their weight management has helped to inspire some family and/or friends to address their own health issues. Only 12.6% indicated that their overall health was somewhat or much worse than before. 166 of 225 (73.8%) of additional comments referred to various areas of increased quality of life whereas only 8.9% referred to weight regain. **Conclusions:** Participants, including previous patients, recognize the positive impact of weight loss on quality of life, such as physical abilities, increased self-esteem, self-confidence and improved breathing and sleep. Improved quality of life is an important and meaningful but overlooked outcome of weight loss.

T-773-P
Improving Maintenance of Lost Weight Following a Commercial Liquid Meal Replacement Diet: A Preliminary Study
Gretchen E. Ames, Roshni H. Patel, Jillian McMullen, Scott A. Lynch, Colleen S. Thomas, Julia E. Crook *Jacksonville, FL*; Lesley D. Lutes *Greenville, NC*

Background: Clinic-based liquid meal replacement (800 kcals/day) programs (LMR) produce substantial weight loss. Nevertheless, long-term maintenance remains a challenge. A limitation of maintenance programs is that they continue to promote large behavior changes that are initially required to induce weight loss which may be unsustainable long-term. The primary aim was to conduct a preliminary assessment of the effectiveness of a small change maintenance intervention (SCM) for 30 patients who completed a 21-week LMR. **Methods:** The 20-session SCM delivered over 52 weeks offered no prescribed changes or preset goals for maintenance behaviors. All changes were self-selected and considered relative to pre weight loss behaviors vs. restrictive dieting during LMR. Participants had a median BMI of 41.0 kg/m2 and weight of 111 kg at the start of LMR. At LMR completion, they lost a median of 18% (23kg) of body weight. **Results:** The SCM was completed by 22 patients (73%); 18 completers (82%) attended > 17 of 20 sessions with a median satisfaction rating of 9 (on a scale of 1 to 9). Completers were asked to record self-selected maintenance behaviors daily (median 351 days recorded). The most commonly reported daily behaviors were self-weighing (73%), use of meal replacements (71%) and step counting (93%). Median caloric intake was 1556 kcal/day (week 52). Median percent regain at week 52 was 14% (2.8 kg) of lost weight (Range: -42 to 74%), significantly less than a median of 56% (11kg) percent regain of lost weight (Range: -78% to 110%) in a demographically equivalent historical control group with no maintenance intervention 52 weeks after LMR completion (P<.001). **Conclusions:** SCM holds promise for improving weight maintenance after

large weight loss. Future research should compare SCM to standard maintenance programs that promote large program-directed changes.

T-774-P
Encouraging Realistic Expectations for Body Weight After Large Weight Loss: A Preliminary Study
Gretchen E. Ames, Roshni H. Patel, Jillian McMullen, Scott A. Lynch, Colleen S. Thomas, Julia E. Crook *Jacksonville, FL*; Lesley D. Lutes *Greenville, NC*

Background: Unrealistic expectations do not appear to have deleterious effects on weight loss for patients participating in clinical trials or undergoing bariatric surgery. However, for patients paying for treatment in "real world" medical settings, little is known about the long-term effects when weight loss falls short of expectations. This study examined whether 30 patients who completed a liquid meal replacement program (LMR) modified their weight expectations to reflect actual progress during participation in a 52 week maintenance intervention. **Methods:** Participants' median weight at the start of LMR was 111 kg and they lost 18% of body weight during LMR. All participants were encouraged to focus on weight maintenance, particularly those who had lower metabolic rates (median RMR 1355). Participants then rated current satisfaction with body weight and expectations for weight loss over the next year (If you are trying to lose more weight, how many pounds do you think you can lose?). **Results:** Favorable satisfaction ratings were observed before starting the maintenance intervention (7; 1 = "not at all satisfied" 9 = "extremely satisfied"), yet 15 participants with an RMR < 1355 desired to lose 6% and 15 participants with RMR > 1355 desired lose 12% of current weight over the next year. Participants who completed the intervention (N = 22) had regained 14% (2.8 kg) of lost weight at week 52 (Range: -42-74%) and desired to lose 9.6 % (range: 0-20%) of current weight while median satisfaction rating remained favorable (median = 7; range: 4-9). **Conclusions:** Thus, participants did not appear to adjust weight expectations to reflect actual outcome. There was a trend that participants with greater weight loss expectations regained more weight (Kendall's tau= 0.22, 95% CI: -.08 to 0.52; p =.095). These findings warrant further examination in a larger sample.

T-775-P
Use of Hand Held Indirect Calorimetry (HHIC) in a Multi-Specialty Obesity Practice: Setting Expectations and Validation in Clinical Practice - Beyond Technical Variation
Sasha Stiles *Honolulu, HI*

Background: Purists dismiss the use of indirect calorimetry assessments of resting energy expenditure in routine clinical practice, citing result variability. In fact Hall et al describes disappointing utility for state of the art calorimetry done in a research setting for predicting live-time energy expenditure. However the use of HHIC, from the clnician and patient point of view is strategic and motivating. The clinical use of a less judgemental parameter than weight is refreshing. **Methods:** During a one year period at NYU Langone Program for Weight Management, 350 HHIC were performed. The NYU program consisted of 4 bariatric surgeons and one bariatrician. The bariatrician administered HHIC at various points in a patient's surgical or nonsurgical weight loss career: as initial assessment upon entering the program and as a validation of why weight loss may have stalled. Clinical catagories of usage, retention and weight loss are reviewed. **Results:** Usage of HHIC became routine as an initial assessment of the Quick 20 LCD program 100 of 125 patients. Retention in this group of patients averaged 6.8 visits. Weight loss improved with use of RMR at the onset and during weight loss plateaus. Weight loss of 25.32 pounds in this group was linked to frequency of visits over a 6-9 month period. Patients who were seen > 10 times over 6-9 months lost 29.40 pounds. **Conclusions:** The data suggests mechanisms for patient retention in an organized LCD Program. One bariatrician saw all patients, developing a supportive relationship utilizing HHIC as a way of translating dietary and lifestyle information into strategies for weight loss, especially when the scale says otherwise. The use of HHIC is key for patient education, hope and clinical management. HHIC use, when the scale discourages, keeps people hopeful and engaged.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Clinical Studies on Mechanisms, Including Imaging

T-776-P

The Power of Food: Relationships between Delay Discounting and Eating Behavior

Stephanie P. Goldstein, Stephanie M. Manasse, Evan M. Forman, Laura A. Berner, Meghan L. Butryn, Andrew F. Frohn *Philadelphia, PA*

Background: A growing line of research has shown that there are several neurocognitive processes that are associated with obesity. In particular, overweight and obese individuals have a tendency to undervalue postponed rewards in favor of smaller immediate rewards (i.e., delay discounting; DD) when compared to normal weight individuals. It stands to reason that those with low appetitive responses do not view food as much of a reward to delay as those with high appetitive responses, thus individuals with high appetitive response and steeper DD might struggle more with weight control behaviors. The current study sought to investigate the relations between DD, appetitive responses, and weight and eating behavior. **Methods:** Participants were 107 overweight or obese (BMI 27-45) adults being screened for a behavioral weight loss study. Participants were administered a monetary DD task and a mock taste test as a behavioral measure of disinhibited eating. Self-report measures, including a measure of food responsivity (Power of Food Scale; PFS), were also administered. **Results:** When controlling for age, IQ, and income, food responsivity (PFS) was a significant moderator of the relation between DD and BMI (B= -.25, F $(5,74)$ = 1.24, p=.04), such that individuals with greater responsivity and steeper discounting of delayed reward were higher in BMI. Food responsivity was also a significant moderator for the relationship between DD and amount of food consumed on the mock taste test (B= .29, F $(5, 71)$ = 1.35, p =.02), such that individuals with greater food responsivity and steeper discounting ate more on the mock taste test. **Conclusions:** Results indicate that for those who are highly susceptible to food cues in the environment, practicing delay of reward could be critical for weight control.

T-777-P

Two-Year Changes in Body Mass Index, Waist Circumference and Adiposity in Normal Weight and Overweight Adults

Peter T. Katzmarzyk, Claude Bouchard *Baton Rouge, LA*

Background: The degree to which changes over time in total body fat and fat stored in specific depots can be predicted from BMI and waist circumference is not clear. The purpose of this study is to compare changes in these measurements with changes in fat mass (FM) and abdominal visceral adipose tissue (VAT) over two years in normal weight and overweight adults. **Methods:** The sample included 33 men and 43 women 20 to 36 y of age (mean± SD: 27.0±4.6 y) with a BMI between 18 and 27 kg/m2 at baseline. BMI and waist circumference were measured using standard protocols, while FM and VAT were measured using whole-body dual-energy x-ray absorptiometry (Hologic 4500A). All measurements were made at baseline and repeated after two years. **Results:** Over two years both BMI and waist circumference increased by 2.3% (0.5 kg/m2 and 1.6 cm, respectively), while FM increased by 11% (1.5 kg) and VAT increased by 9% (3.3 cm2). However, there was great heterogeneity in the changes, ranging from -16% to +27% for BMI, -12% to +26% for waist circumference, -46% to +87% for FM, and -83% to +60% for VAT. Two-year changes in FM were highly correlated (p<0.0001) with changes in BMI (r = 0.88) and waist circumference (r=0.78). Changes in VAT were most highly correlated with changes in FM (r=0.62; p<0.0001) followed by changes in BMI (r =-0.55; p<0.0001) and waist circumference (r=0.52; p<0.0001). The correlation patterns were almost identical when stratified by sex. **Conclusions:** Changes over two years in BMI and waist circumference were highly correlated with changes in total adiposity but only moderated correlated with changes in VAT. The results suggest that tracking changes in VAT using measures such as BMI and waist circumference is not an accurate approach either for scientific research or clinical applications.

T-778-P

A Descriptive Study of Body Composition Abnormalities and Health Risks in Patients with Obesity

Jingjie Xiao, Robert Thornberry, Michael J. Ormsbee, Angelina Cain, Jeong-Su Kim, Dawn Smith, Robert J. Contreras, Carla M. Prado *Tallahassee, FL*

Background: Body composition (i.e. the proportions of fat and fat-free tissues) is highly heterogeneous in contemporary populations and likely a better predictor of health risk compared to body weight or body mass index (BMI). **Methods:** Adult patients seeking weight loss treatment at a local center in Tallahassee, FL with available baseline bioelectrical impedance analysis (BIA) data were included. The gender-specific median of the ratio between fat mass index [FMI, defined as fat mass (kg)/height (m)2] and fat free mass index [FFMI, defined as FFM (kg)/height (m)2] was selected to evaluate body composition. A ratio above the median was used to depict a phenotype associated with lower muscularity (LM). Medical records were reviewed for metabolic profile and health status. **Results:** Ninety-one obese patients (BMI 46.4 ± 7.6 kg/m2; age 57 ± 11years) were included. The FMI/FFMI ratio was extremely variable ranging from 0.35 to 2.46 kg/m2 and this variability was independent of body weight and BMI. The gender-specific FMI/FFMI ratios were ≥1.05 kg/m2 in women, and ≥0.78 kg/m2 in men. Plasma albumin concentration was lower in patients with LM compared to their counterparts (p = 0.032). A LM phenotype was the strongest predictor of low back pain (OR = 2.3, 95% CI = 1.01-5.41, p = 0.048). Similarly, the prevalence of alcoholism and sexual dysfunction were significantly greater among patients with LM (p = 0.026 and p = 0.030, respectively). **Conclusions:** A wide distribution of body composition was observed, independent of BMI. A LM phenotype was associated with higher health risks.

T-779-P

The PNPLA3 NAFLD Risk Allele is Associated with Worsening Liver Histology Following Bariatric Surgery

Sagar Mehta, Peter Benotti, Xin Chu, G. Craig Wood, Anthony T. Petrick, Jon Gabrielsen, William Strodel, David Rolston, Christopher Still, George Argyropoulos, Glenn Gerhard *Danville, PA*

Background: The aim of this study was to determine whether the PNPLA3 NAFLD risk variant was associated with a change in liver pathology in patients undergoing primary bariatric surgery and subsequent revision surgery. **Methods:** A retrospective review from September 2002 to January 2012 was performed to identify bariatric surgery patients with paired liver biopsies at the time of initial and revision surgery. Wedge liver biopsy results were reviewed and categorized as normal, steatosis without fibrosis, and any fibrosis. PNPLA3 risk allele was genotyped. Patients with any PNPLA3 risk alleles were compared with patients without any risk alleles. **Results:** The PNPLA3 group had worse liver pathology at the time of bariatric surgery. Regardless of genotype, few patients with normal liver at primary surgery had worsening pathology at revision (0% in PNPLA3 group vs 11% in no PNPLA3 group, p=0.999). When limiting to those with steatosis (without fibrosis) at primary surgery (n=7 in both genotype groups), patients without PNPLA3 alleles were more likely to have improved pathology at revision surgery (without PNPLA3: 57% improved, 0% worsened; with PNPLA3 14% improved, 57% worsened, p=0.047). For those with fibrosis at primary surgery, PNPLA3 was not significantly associated with improvement in liver pathology at revision surgery (67% in PNPLA3 group vs 40% in no PNPLA3 group, p=0.513). **Conclusions:** In bariatric patients with steatosis, the presence of a PNPLA3 allele was significantly associated with an increased risk of progression of liver pathology despite significant weight loss. This indicates that genetic susceptibility may determine the effect of bariatric surgery on the progression of NAFLD to NASH. Further studies will need to be performed to determine the mechanism of this increased risk.

T-780-P

Psychiatric Disorders and Gestational Weight Gain among Former Smokers

Michele D. Levine, Jennifer D. Slane, Marsha D. Marcus, Melissa A. Kalarchian *PIttsburgh, PA*

Background: Excessive gestational weight gain (GWG) predicts postpartum weight retention and has a deleterious effect on pregnancy outcomes and neonatal health. Demographic and behavioral factors including prepregnancy weight, lower income, smoking cessation, poor dietary quality and limited

physical activity have been associated with GWG. However, little is known about the role of psychosocial factors in GWG. We examined the relationship between psychiatric disorders and GWG among pregnant women enrolled in an ongoing trial for postpartum smoking relapse prevention. **Methods:** Participants, all of whom quit smoking as a result of the current pregnancy (n=111), were interviewed during the third trimester of pregnancy using the Structured Clinical Interview for DSM-IV Disorders. Women self-reported height and GWG was calculated from self-reported prenatal weight. **Results:** On average, women were 25.3±6.0 years old, with a pre-pregnancy BMI of 26.9±7.8. Many (45.0%) had graduated from high school and 44% were African American. On average, GWG was 15.7±9.6 kg, at 36.1±2.2 weeks gestation. Multivariate general linear models controlling for prepregnancy BMI, weeks of gestation, nicotine dependence and income were conducted to examine the relationship between psychiatric disorder and GWG. Meeting criteria for a psychiatric disorder was associated with larger GWG (p=.01). In addition, lifetime history of anxiety (p=.001) and bipolar disorder (p =.02) were associated with increased GWG. **Conclusions:** These data, which require replication in larger samples using measured GWG, suggest that psychiatric disorders, particularly bipolar and anxiety disorder, increase the risk of excessive GWG. Additional research on the role of psychiatric symptoms and psychotropic medications on GWG is needed.

T-781-P
Sensory Dysfunction in Adolescents with Co-Occurring Obesity and Chronic Pain
Keri Hainsworth, Pippa Simpson, Omar Ali, XueCheng Liu, Lynn M. Rusy, Jaya Varadarajan, Steven Weisman *Milwaukee, WI*

Background: Obesity is related to the occurrence of debilitating pain conditions, such as osteoarthritis and fibromyalgia. Although studies of the sensory basis exist for adults, and although obese youth also experience pain conditions, no studies have examined sensory functioning in obese youth. The current study utilized Quantitative Sensory Testing (QST) to examine pain thresholds in youth with obesity alone (O), chronic pain alone (CP), and co-occurring obesity and chronic pain (OCP). **Methods:** Participants (13-17 years, M 16; 65% Female; 47% African American, 41% Caucasian) were recruited from a pediatric weight management clinic (n=15), and a chronic pain clinic (healthy weight, n=12; overweight/obese, n=19). Patients abstained from analgesics for 24h prior to testing. The testing site was the thenar eminence of the non-dominant hand. Thermal stimulation was delivered by a TSA-II NeuroSensory Analyzer. Each trial began at 32 degrees C, and increased at a rate of 1 degree C/second. Using the method of limits, participants stopped each trial at the point of discomfort. The Heat Pain Threshold (HPT) was defined as the average of 5 trials. **Results:** Mean HPT for each group was compared with reference values reported for adolescent girls by Blankenburg et al. (2010). Each group differed significantly from the other, and all groups differed significantly from normative levels. Mean values ±SD in order of decreasing sensitivity were: 42.1 ±3.29, 44.3 ±4.05, 45.3 ±3.32, 47.6 ±3.44, for Normal < O < PC < OPC, respectively. 1-tailed p values ranged from <.02 - .001. **Conclusions:** This study is the first to provide somatosensory reference values for obese youth and shows that sensory dysfunction may be related to obesity and pain in adolescents. It is critical that we work to understand the sensory mechanisms underlying the pain experience in obese youth.

T-782-P
Postprandial Microvascular Dysfunction Is Present in Obese Women
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Background: Postprandial lipemia is related to metabolic and vascular damage. The aim of this study was to assess microvascular reactivity in obese women before and after fat overload. **Methods:** Of the 37 participants, 19 were obese with BMI of 32.3 ± 1.5 kg/m2 (mean±SD), 30.8 ± 4.7 years and 18 healthy volunteers with BMI of 21.8 ± 1.8 kg/m2, 27.9 ± 5.4 years. Participants had the microcirculation examined by two methods: dynamic video-capillaroscopy using the nailfold bed to assess functional capillary density (FCD), red blood cell velocity in control conditions (RBCV) and peak (RBCVmax) and time (TRBCVmax) to reach it after 1 min arterial occlusion and the finger dorsum to assess FCD. Blood sampling was performed to de-

termine total cholesterol (TC), HDL-c, LDL-c, free fatty acids (FFA), glucose and insulin. **Results:** After measurements at rest, participants received a fat overload and 30, 60, 120 and 180 min after its ingestion exams were performed again. Obese participants, after meal, presented values significantly lower than at rest with respect to: RBCV [0.30±0.01 vs. 0.29±0.02s; p=0.0005], RBCVmax [0.33±0.02 vs.0.33±0.01s; p=0.005], HDL-C [51.0±11.0 vs. 47.6±11.1mg/dl; p=0.03], LDL-C [110.8±23.6 vs. 99.3±23.8mg/dl; p=0.0021] and FFA [0.57±0.14 vs. 0.44±0.2mmol/l; p <0.0001] and higher values for: TRBCVmax [5.5±1.3 vs. 6.0±1.4s; p=0.0010), glucose [91.5±7.6 vs. 105.7±13.9mg/dl; p<0.0001], insulin [12.1±5.9 vs. 23.4±15.0mU/ml; p<0.0001] and TG [121.4±49.6 vs. 183.2±73.9mg/dl; p<0.0001]. **Conclusions:** Our results strongly suggest that high fat meal further increases microcirculatory dysfunction and metabolic abnormalities already present in obese women.

T-783-P
Third Trimester Cholesterol Predicts Infant Gain in Adiposity During the First 3 Months of Life
Paula C. Chandler-Laney, Joseph R. Biggio, Britney F. Blackstock, Melissa S. Mancuso, Barbara A. Gower *Birmingham, AL*

Background: Rapid infant weight gain is associated with greater risk for childhood obesity. However, few predictors of rapid infant weight or body fat gain have been identified. The objective of this study was to test the hypothesis that gestational glucose, insulin, or lipid concentrations would be positively associated with infant rate of body fat gain during the first 3 months of life. **Methods:** Healthy African American women underwent a fasting blood draw to assess lipid profile and a 75-gram oral glucose tolerance test to assess post-challenge glucose response at 32-35 weeks' gestation. Body composition of infants was measured at 2-weeks (N=27) and 3-months (N=24) by air displacement plethysmography. **Results:** In simple correlations, maternal post-challenge glucose area under the curve and triglyceride concentrations were associated with infant %fat at 2-weeks (P=0.05), but these associations had diminished by 3-months. Maternal total cholesterol was associated with infant %fat at 3-months (P<0.01). Results of multiple linear regression modeling showed that maternal cholesterol was associated with rate of infant fat mass gain from 2-weeks to 3-months (partial r = 0.495, P<0.05), independent of infant gender and rate of fat free mass gain. **Conclusions:** Results extend the existing literature by showing that maternal postprandial glucose in late pregnancy is predictive of adiposity only in the neonatal phase, while maternal cholesterol may be predictive of longer-term susceptibility to adiposity gain during infancy. Although the mechanism for this association is not known, if replicated, these findings may suggest a novel target for intervention during pregnancy to prevent rapid infant body fat gain.

T-784-P
Anthropometric Health Risk Stratification in Young Reproductive-Age Females
Lorraine M. Lanningham-Foster, Randal Foster *Ames, IA*

Background: Individuals with a normal body mass index (BMI) and excessive body fat (normal weight obesity) may be at greater metabolic risk. The purpose of the study was to compare various anthropometric markers for health (BMI, waist circumference, hip circumference, and body fat percentage) in young reproductive-age females. **Methods:** Forty-seven young women (age 24 ± 5 years, BMI 21.7 ± 2.5 kg/m²) had anthropometric values measured by trained staff according to NHANES III procedures (height, weight, waist and hip circumferences). Body composition was measured using bioelectrical impedence analysis (BIA). The "Healthy" stratification criteria were: BMI (18.5 – 24.9 kg/m²), waist circumference (WC, ≤ 88 cm), waist:hip ratio (WHR, ≤ 0.85), and body fat percentage (BF%, 12-32%). Using these criteria, each mode was examined using contingency analysis, and ROC curves were created to find more accurate stratification criteria for this sample, using BF% as a reference standard. Current and novel criteria were analyzed using Chi square tests. **Results:** Body fat measures stratified 39 of the women into the "Healthy" group and 8 into the "At Risk" group. BMI, WC, and WHR measures agreed significantly with BF% stratification into the "Healthy" and "At Risk" groups: BMI 38 "Healthy" and 3 "At Risk" agreed, Phi=0.471, P < 0.005, WC 39 and 3 agreed, Phi=0.577, P <0.0001, WHR 29 and 6 agreed, Phi=0.391, P < 0.01. In this pool, the Matthews Correlation Coefficient was optimized at BMI = 24 kg/m² and a waist circumference = 82 cm (BMI 36 and 6 agreed, Phi = 0.643, P < 0.0001, WC 35 and 6

agreed, Phi = 0.595, P < 0.0001). **Conclusions:** Health risk stratification may be improved by further optimization. A combination of measures and an adjustment of the stratification criteria may provide more accurate and informative anthropometric markers, especially in women.

T-785-P
Subjective and Objective Methods to Examine Sleep Amount in Free-Living Families

Shiny Parsai, Randal Foster, Lorraine M. Lanningham-Foster *Ames, IA*

Background: Obesity and sleep insufficiency appear to be linked, possibly due to excess energy intake during wake time contributing to weight gain. To better understand the relationship between insufficient sleep and obesity, we need accurate and practical tools to quantify sleep. The purpose of this study was to compare two objective tools and one subjective tool to study sleep in free-living families. **Methods:** The study included 18 families (10 men, 17 women, 11 boys, and 5 girls). Subjects participated in a week-long study to monitor their sleep using an accelerometer (MSR145), a pattern-recognition system (SenseWear WMS® Mini armband), and sleep logs. BMI was calculated using height and weight and body composition was measured using air displacement plethysmography (BOD POD®). The objective tools were compared to the sleep log using regression analyses. Post-hoc tests were used with ANOVA and ANCOVA with a Bonferroni correction applied to give an overall significance level of P < 0.05. **Results:** Results The objective tools estimated similar sleep duration data from the subjects when compared with the sleep log. The accelerometer had a better correlation than the pattern-recognition system when compared with the sleep log (0.399 vs. 0.1785, respectively). Sleep duration was inversely correlated with age for all measurement tools. **Conclusions:** Future additional studies targeting free-living families to study sleep amount and obesity using these objective tools would be beneficial. It is also possible that the relationship between sleep duration and obesity may be explored in existing data sets where these objective measurement tools have been employed for other purposes such as physical activity assessment.

T-786-P
Associations of Infant Feeding Practices with Change in Infant Percent Fat

Desti N. Shepard, Britney F. Blackstock, Joseph R. Biggio, Paula C. Chandler-Laney *Birmingham, AL*

Background: Feeding practices may be important determinants of infant weight gain, and rapid infant weight gain is associated with childhood obesity. Feeding on a schedule, as opposed to on-demand feeding, and the use of food to soothe an infant, are practices that may undermine an infant's ability to self-regulate intake, and therefore may contribute to excess weight gain during infancy. The objective of this study was to test the hypotheses that scheduled feeding and the use of food to soothe an infant are associated with greater infant total %fat gain during the first 3 months of life. **Methods:** Twenty-three African American mothers completed The Infant Feeding Practices questionnaire to assess scheduled feeding and the use of food to soothe the infant at 2-weeks of age. Infant body composition was measured at 2-weeks and 3-months by air displacement plethysmography. Associations between feeding practices and infant total body %fat were assessed with simple and partial correlations. **Results:** Scheduled feeding and the use of food to soothe were not associated with infant %fat at 2-weeks of age. In separate analyses, scheduled feeding (r=-0.42, P=0.05), and the use of food to soothe the infant (r=0.43, P<0.05), were associated with infant %fat at 3-months of age after adjusting for %fat at 2-weeks. **Conclusions:** In this cohort of predominantly formula-fed infants, feeding on a schedule and the use of food to soothe the infant was associated with greater body fat gain. It is not known whether these same associations are found among breast-fed infants. Future follow-up with this cohort will examine whether these feeding behaviors are associated with body weight gain into early childhood.

T-787-P[DT]
Atherogenic Risk in Obesity Phenotypes in Black and Hispanic Adolescents

Unab Khan, Judith Wylie-Rosett, Robert Kaplan, Meredith Hawkins *Bronx, NY*

Background: In adults, obesity phenotypes, based on insulin resistance, show a difference in cardiovascular disease (CVD) risk marker levels, and atherosclerosis. We examine these differences in obese insulin sensitive (obese-IS) and insulin resistant (obese-IR) black and Hispanic adolescents. **Methods:** A prospective study comparing anthropometrics, blood pressure, lipids, glucose and intima media thickness [in common carotid (CCA-IMT), internal carotid (ICA-IMT), & carotid bulb (bulb-IMT)]. Using HOMA values from 300 obese adolescents, we categorized subjects as obese-IR if in the highest HOMA tertile (≥ 4.39) and obese-IS if in the lower two tertiles. T-test and chi-square to compare differences between obesity phenotypes. Linear regression models are constructed to examine associations of carotid artery segments with CVD risk markers and obesity phenotypes. **Results:** To date, 66 of 200 adolescents (61% female; 58% Hispanic, 42% black; age: 14.2 ± 1.8 yrs.; 31 obese-IR and 35 obese-IS) have completed baseline evaluation. Obese-IR group is heavier (BMI: 38.3 ± 7.3 vs.34.9 ± 4.7; p: 0.03); and has higher triglyceride levels (86 ± 40 vs. 64± 20: p: 0.02). There are no differences in IMT between the phenotypes. ICA-IMT is associated with age (β: 0.01; 95% CI: 0.002, 0.02; p: 0.014), black race (β: 0.047; 95% CI: 0.019, 0.075; p: 0.001); and HDL-C (β: 0.005; 95% CI: 0.0005, 0.01; p: 0.03) but not with obesity phenotypes. **Conclusions:** Black race associated with increased ICA-IMT regardless of obesity and obesity phenotype. Absence of differences in IMT measures between obesity phenotypes cannot be commented on due to low sample size at present.

T-788-P
A Pathogenic or Protective Role for BMAT During Growth-Obesity May Be the Director

Krista Casazza, Lynae J. Hanks, Anna L. Newton, Stephenie Wallace *Birmingham, AL*

Background: While pathogenic attributes of bone marrow adipose tissue (BMAT) described in the older adult population could contribute to the prominent sequelae of various chronic diseases its appearance in long bones during arguably the most critical period in skeletal and metabolic programming (i.e., puberty) challenge this notion. The objective of this study was to test the hypothesis that obesity accelerates the size of the marrow compartment at the expense of quality components of bone, ultimately compromising bone material properties and structural design. Further, as muscle and bone adapt in parallel we also aimed to evaluate qualitative and quantitative aspects of skeletal muscle and the relationship with BMAT. **Methods:** Subjects were 46 overweight/obese girls age 7-12 years. Bone and muscle parameters were evaluated by MRI, pQCT and DXA and associations were tested by partial correlation. **Results:** BMAT was positively associated with quantitative aspects of bone and muscle (i.e., greater bone mineral content and density). However, bone marrow density, a representation of hematopoietic capacity and thus qualitative attribute of the composite bone, was inversely associated with cortical bone density and marginally inversely associated with cortical bone area. Further, muscle density was positively associated with quantitative aspects of bone and muscle, yet any association with qualitative skeletal measures was not detected. **Conclusions:** During puberty, obesity may negatively influence musculoskeletal development. The inverse association between cortical bone attributes and marrow density, while seemingly counterintuitive represent a chronology associated with progressive bone development. In obesity accelerated periosteal expansion occurs at the expense of coupling processes required to support quality of bone.

T-789-P
Systematic Review of Clinical Studies Related to Pork Intake and the Risk or Management of Diabetes, Metabolic Syndrome or Its Components

Nicolas Stettler, Mary M. Murphy, Leila M. Barraj, Kimberly M. Smith *Washington, DC*; Rexford S. Ahima *Philadelphia, PA*

Background: Globally, both the incidence of type 2 diabetes and the consumption of pork have increased significantly. Processed meats, which include many pork products, have been associated with an increased risk for

diabetes in observational studies. The goal of this systematic review was to assess experimental human studies of the impact of pork intake, compared to other protein sources, on early markers for the development of diabetes: insulin resistance, glucose intolerance, and components of the metabolic syndrome. **Methods:** Systematic review searching PubMed and EMBASE and using the Cochrane and PRISMA guidelines. **Results:** 8 studies were eligible and critically reviewed. 5 were based on a single meal / day exposure to pork, compared to other protein sources. The glucose-insulin response after pork did not differ from beef, shrimp, or mixed sources of protein. However, as compared to eggs, ham (processed) led to a larger insulin response and, as compared to whey, led to a smaller insulin response and a larger glucose response. This glucose response suggests a possible mechanism for the association between processed meat and diabetes. Non-processed pork was not compared to eggs or whey. The 3 longer interventions (11 d - 6 m) with mostly non-processed pork did not show a significant impact of pork consumption on components of the metabolic syndrome, with the exception of a possible benefit on waist circumference and HDL cholesterol (one study each, with significant limitations). **Conclusions:** In general, the literature on the topic is limited and important research gaps exist to clarify a possible link between pork meat intake and diabetes. Considering recent trends and projections for diabetes and pork intake, this is an important global public health question that requires more attention in order to provide improved evidence-based dietary recommendations.

T-790-P

Changes in Food Intake After Short-Term Anorexiant Administration Use Predict Later Weight Loss

Laurel Mayer *New York, NY*; Bjorn Carlsson, Cecilia Karlsson *Molndal, Sweden*; Carla Wolper, Simona C. Kaplan, Julia Weigel, Juli A. Goldfein, Richard Foltin, B. Timothy Walsh, Rudolph Leibel *New York, NY*

Background: Few reliable predictors of weight loss exist. We aim to examine whether short-term anorexiant administration is associated with changes in food intake, and if those changes are predictive of later weight loss. **Methods:** Healthy, obese (BMI between 30-40kg/m2) individuals were recruited for a double-blind, crossover, medication study followed by open treatment. Participants were randomized to one week of medication (37.5 mg phentermine) and placebo. At the end of each week, as part of a larger protocol, participants were fed a laboratory lunch meal. Gram weight and kcal were calculated for all food consumed. Upon completion of the testing procedures, participants were offered 6 months of phentermine and behavior-assisted weight loss. Weight lost and rate of weight loss were determined. Data were analyzed using SPSS (IBM Corp, version 20). **Results:** Participants were 7 women and 1 man, with a mean($\pm$SD) age of 45$\pm$15 yrs and a mean BMI 35.80$\pm$2.9 kg/m2. Mean intake at the laboratory meal was 830$\pm$680 kcal on phentermine and 870$\pm$459 kcal on placebo. For some patients meal intake was greater on phentermine compared to placebo, thus full interpretation of the mean intake is limited. Two participants have completed, and six remain in active weight loss. Mean number of weeks completed to date is 15$\pm$7 weeks, and mean total weight loss is -7.6$\pm$4.3 kg. Mean rate of weight loss is -0.64$\pm$0.43 kg/wk. The correlation between the drug-placebo difference in food intake and rate of weight loss was r=0.83 (p<0.013). That is, the larger the decrease in meal intake between placebo and drug conditions, the greater the rate of weight loss during treatment. **Conclusions:** After only 1 week of administration of an anorexiant (phentermine), significant changes in food intake can be detected, and the magnitude of those changes is strongly correlated with subsequent weight loss.

T-791-P

Arterial Elasticity Predicts Central and Subjective Fatigue in Overweight Older Women

William H. Neumeier, Gary Hunter, C Scott Bickel, John P. McCarthy, Gordon Fisher, Paula C. Chandler-Laney, Stephen P. Glasser *Birmingham, AL*

Background: Obesity is associated with reduced arterial elasticity (AE), which itself increases risk for cardiovascular disease. Reduced AE may also contribute to fatigue, particularly during exercise, by impairing circulation and delivery of nutrients to the brain. The purpose of this study was to determine whether AE is related to central and subjective fatigue. **Methods:** Subjects were 91 overweight women aged >60 years (BMI = 27.2 ± 4.4; % Fat = 42.8 ± 6.0) without diagnosed health conditions. Large vessel AE was deter-

mined using non-invasive radial artery pulse wave analysis over the brachial artery and based on the modified Windkessel model. Central fatigue was measured during two 30 repetition isometric tests for the knee extensor muscles and defined as a ratio between maximum voluntary contraction and maximum contraction with stimulation. Subjective fatigue was assessed using questions about "loss of energy" and "tiredness or fatigue" from the Beck Depression Inventory. Multiple regression was used to evaluate AE relationships with fatigue measures, adjusted for confounders. **Results:** Large AE was inversely associated with central fatigue (partial r = -0.42, p<0.01) after adjusting for VO2max and knee extension strength. Subjective fatigue at rest was also inversely related to large AE after adjusting for race (partial r = -0.29, p<0.02). **Conclusions:** AE is independently related to fatigue in this sample of older overweight women. This is especially apparent in the central nervous system where AE is independently related to perceptions of fatigue at rest and central fatigue during 30 maximal contractions. These results suggest arterial health may be involved with central fatigue and subjective fatigue in overweight women, independent of other known predictors.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Population Based Intervention Studies

T-792-P

DietBet, Inc: Web-Based Social Gaming and Financial Incentives for Weight Loss

Tricia M. Leahey *Providence, RI*; Jamie Rosen *New York, NY*

Background: Web-based commercial weight loss programs are increasing in popularity. Despite their significant public health potential, there is limited research on the effectiveness of such programs. This study examined weight losses produced by DietBet.com and explored whether baseline variables and engagement parameters predicted weight outcomes. **Methods:** DietBet.com is a social gaming website that uses financial incentives and social influence to promote weight loss. Players bet money and join a game. Games consist of 2 or more players. All players have 4 weeks to lose 4% of initial body weight. At enrollment, players can choose to share their participation on Facebook. During the game, players interact and report weight losses on the DietBet platform. At game end, those who lose 4% are declared winners and split the pool of money bet at game start. Official weigh-in procedures are used to verify weights at game start and game end. **Results:** From December 2012 to April 2013, 25,808 players (83% Female; 89.1±22.3kg) competed in 1,356 games. Average amount bet was $28±27. A total of 90% completed. Mean weight loss was 3.1±2.0%. Those who won their game (N=11,355) won $60±42 and lost 4.9±1.0% of initial body weight, with 31% losing ≥5%. Betting more money, sharing on Facebook, completing more weigh-ins, and having more social interactions during the game predicted greater weight loss and greater likelihood of winning (p's<.001). In addition, weight loss clustered within games (p<.001), suggesting that players influenced each others' weight outcomes. **Conclusions:** DietBet.com, a social gaming website, reached over 25,000 individuals in just 5 months and produced excellent 4-week weight losses. Given its potential public health impact, future research may consider examining whether a longer program further enhances weight outcomes.

T-793-P

Psychosocial Status in Relation to Ethnic Differences in Weight Loss of Severely Obese Women: The Heads Up Project

Robert L. Newton, Meredith E. Shapiro, William D. Johnson *Baton Rouge, LA*; Valerie Myers *Golden, CO*; Phillip J. Brantley *Baton Rouge, LA*

Background: Examined potential ethnic differences in associations between psychosocial indices and weight loss following a 16-week very low calorie diet **Methods:** Participants were women (n = 134; mean BMI = 46.5; mean age = 50.0; 47% African American, AA) insured by the Louisiana Office of Group Benefits, a state-managed health insurer and sponsor of this study. Participants completed the Impact of Weight on Quality of Life (IWQOL), Questionnaire on Eating and Weight Patterns, Eating Inventory, and Beck Depression Inventory-II before enrolling in a 16-week low calorie program. **Results:** AA women scored higher on all IWQOL subscales and the total score (p values < 0.05) compared to Caucasian (CA) women, indicating

poorer quality of life. AA women also displayed higher levels of restrained eating (p < 0.001), and CA women displayed greater levels of disinhibition of eating and hunger (p values < 0.001). Binge eating and bulimic symptomatology were greater (p values < 0.001) in CA compared to AA women with a BMI > 45.5. AA women aged < 45 with a BMI > 45.5 lost less weight (13.8 vs. 19.6 kgs; p = 0.05) compared to CA women and AA women with a BMI <45 tended to lose less weight (p<0.09), regardless of age. Regression analyses revealed that greater weight loss in the initial two weeks and lower scores (better quality of life) on the IWQOL self-esteem subscale (p values < 0.039) were associated with more weight loss in AA women, while only initial weight loss was associated with weight loss in CA women (p = 0.047). **Conclusions:** Findings reveal ethnic differences in psychosocial responses and weight loss that are dependent on age and degree of obesity. Obesity researchers may find it productive to address the etiology of these differences as this may enhance future weight loss efforts.

T-794-P
Improved 3D Stimuli: A Novel and Innovative Approach to Perceptual Body Image Assessment
Stephen Wohlgemuth, Ninoska D. Peterson *Norfolk, VA*

Background: Examining body image in obese patients is challenging with current measures. Perceptual body image has traditionally been assessed using singular shape, two dimensional drawings scaled between very thin to very obese figures that do not accurately reflect varied body shapes of people. This lack of shape variety makes it difficult for the subject to objectively associate their perceived body shape within the given figural stimuli range. The current study creates an accurate and representative body shape scale and a series of figural stimuli for an obese population using cutting-edge technology. **Methods:** 500 morbidly obese bariatric surgical candidates were scanned using a 3D body scanner (Mean age = 42.5, Mean BMI = 46, Mean waist circumference = 48 inches, Mean waist-to-hip ratio = 0.85) Body volume, surface area and body shape were derived from the 3D scans. Subtraction algorithms and predictive modeling were used to create 3D models based on the preoperative scans that predicted a patient's appearance after various amounts of weight loss. **Results:** A mathematical Shape Descriptor formula was used to generate seven shapes: Hyper-Gynecoid, Gynecoid, Mixed Gynecoid, Mixed, Mixed Android, Android and Hyper-Android. These shapes have unique characteristics that make them easily identifiable, and each shape has its own subsequent underlying range of figures, thus creating a new set of scaled figural stimuli more identifiable to patients. **Conclusions:** Seven key shapes have been statistically generated to create an assessment tool that more accurately represents body types. This new scale demonstrates promise as a clinical screening measure for assessing perceptual body image. It also may provide patients with a clearer idea of corresponding weight loss and weight gain for their individual body shape. Further psychometric evaluation is warranted.

T-795-P
Impact of a Multi-Level, Cluster-Randomized Environmental Obesity Intervention for Youth in Baltimore City
Elizabeth Anderson Steeves, Ahyoung Shin, Anastasia Coutinho, Joel Gittelsohn *Baltimore, MD*

Background: Obesity rates among low-income, minority youth are disproportionately high. **Methods:** Baltimore Healthy Eating Zones (BHEZs), a multi-level, cluster-randomized environmental obesity intervention targeted low-income, urban, African American youth ages 10-14. The intervention included environmental changes in small stores and carry-out restaurants as well as programming delivered in recreation centers by study staff and peer educators, in efforts to promote achievement of a healthy weight status among youth. **Results:** Initial results of the BHEZ intervention were promising, with a 2.23 percentile reduction (p=0.04) in BMI seen in youth who received the intervention and no significant difference in BMI percentile among comparison youth. Further sub-group analyses revealed that select sub-groups of the intervention sample drove the reduction in BMI, while other sub-groups had no reduction in BMI. The intervention had the biggest impact on girls with BMIs above the 85th percentile at baseline (n=28, reduction in BMI percentile -3.16, p=0.03), with the strongest effects seen in girls with BMIs above the 85th percentile who received high exposure to the intervention (n=22, reduction in BMI percentile -3.10, p=0.01). The BHEZ intervention did not significantly impact the BMI percentiles of the majority of

the intervention sample, including normal weight and overweight boys or normal weight girls. **Conclusions:** Reviewing BHEZ impact findings provides insight on the weaknesses of the intervention (for example, differing levels of intervention exposure among the measurement sample) and opportunities for scaling up multi-level approaches in future studies. The positive strategies identified in the review of the BHEZ intervention will be incorporated into our new trial, B'More Healthy Communities for Kids.

T-796-P[DT]
Placement Strategies to Enhance the Sale of Healthier Products in Supermarkets in Low-Income, Ethnically-Diverse Neighborhoods: A Randomized Controlled Trial
Gary D. Foster, Alexis Wojtanowski, Karen Glanz, Allison Karpyn, Stephanie M. Weiss *Philadelphia, PA*; Jeffrey Brown *Edison, NJ*; Patrick J. Burns, Carly Spross, Erica Davis, Wensheng Guo, Colleen M. Brensinger, Ann Tierney *Philadelphia, PA*; Donna Leuchten *Westville, NJ*

Background: The greater presence of supermarkets in low-income, high minority neighborhoods has the potential to positively affect diet quality among those at greatest risk for obesity. Little research has evaluated the effects of in-store placement strategies on the sales of healthier items in low-income areas. We evaluated the effects of in-store marketing strategies to promote the purchase of specific healthier items in supermarkets. **Methods:** This was a cluster randomized controlled trial conducted from 2011-2012. Eight urban supermarkets in low-income, high-minority neighborhoods were the unit of randomization, intervention, and analysis. Stores were matched on percent of subsidized sales and store square footage, and randomly assigned to Intervention or Control. Intervention stores (n = 4) employed in-store marketing strategies focused on increasing product availability and providing optimal placement in five food and beverage categories: (milk; ready-to-eat cereal; frozen meals; in-aisle beverages; checkout beverage coolers). The intervention lasted six months. Control stores (n = 4) served as assessment-only controls. The main outcome measure was store-level weekly sales data for each of the targeted products. **Results:** Intervention stores showed significantly greater sales of skim and 1% milk, water (in aisle and at checkout) and selected frozen entrees than did control stores. There were no differences between the stores in cereal, soft drinks or diet soft drinks. **Conclusions:** These data suggest that straightforward placement strategies can significantly enhance the sales of healthier items in several food and beverage categories. Such strategies show promise for significant public health impact in communities at most risk for obesity.

T-797-P
Evaluation of a Validated Clinical Biomarker of Added Sugar Intake Compared to the Healthy Eating Index and Dietary Records in a Community-Based, Rural Sample
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Background: Common dietary assessment methods, such as dietary recalls, present numerous challenges to obtaining accurate dietary information due to the subjective and resource-intensive nature of these self-reported measures. However, dietary biomarkers can provide objective measures of dietary intake without the associated high participant burden. While a novel biomarker, the $\delta 13C$ value of human blood, is an established added sugar (AS) intake biomarker for adults in clinical settings, no free-living community-based assessments have been conducted. Objective: to determine the relationships between $\delta 13C$ values, 24-hour recalls, Healthy Eating Index scores (HEI), and SoFAAS scores (AS/solid fat HEI component) in community-based samples of adults in rural health-disparate regions. **Methods:** Adults (n=157; 124 F) >18 yrs underwent assessments of BMI, dietary intake using 24-hour intake records, and provided a fingerstick blood sample. Statistical analyses included descriptives, bivariate correlations and independent sample t-tests. **Results:** Among participants (aged 41 ± 14 yrs; BMI 32.7 ± 11 kg/m^2), AS mean daily intake=105 ± 92 g; mean $\delta 13C$ value= -18.85 ± 0.7‰ (high $\delta 13C$ values reflect high 13C/12C and high AS intake); mean HEI scores=52 ± 10. $\delta 13C$ value was associated with HEI (r=-0.36), SoFAAS (r=-.38), and AS (r=0.25), all P<0.01. HEI scores were different for upper and lower $\delta 13C$ value tertiles (48 ± 10; 56 ± 11, P<0.001) and middle and lower tertiles (52 ± 8; 56 ± 11, P=0.012). **Conclusions:** Because AS intake is a suggested contributor to the development and progression of obesity and related co-morbidities,

these findings may help further AS research in that fingerstick δ13C value can be a minimally invasive, low-burden method of assessing AS intake in community settings. Thus, associations of δ13C value to overall dietary quality and USDG adherence may be assessed.

T-798-P

Effect of Menopause Transition on Muscle Fat Content: A MONET Group Study

Joseph Abdulnour, Éric Doucet *Ottawa, Canada*; Isabelle J. Dionne, Martin Brochu *Sherbrooke, Canada*; Jean-Marc Lavoie, Remi Rabasa-Lhoret *Montréal, Canada*; Denis Prud'Homme *Ottawa, Canada*

Background: High muscle fat content and area of low muscle density have been associated with cardiometabolic deterioration in both lean and obese women. Purpose: To investigate Intra-muscular adipose tissue (IMAT) and muscle density in women going through menopausal transition. **Methods:** Statistical analyses were performed using data of 102 healthy premenopausal women (age: 49.9±1.9 y; BMI: 23.3±2.2 kg/m2) who participated in the MONET (Montreal, Ottawa, New Emerging Team) study on the effect of menopause transition on body composition and cardiovascular risk factors. Outcomes: IMAT, subcutaneous adipose tissue (ScAT) and the areas of muscle density of the thigh were measured by CT scan, fasting plasma lipids, glucose and insulin levels, HOMA-IR and VO2 max. **Results:** Repeated measures ANOVA revealed significant increases for IMAT (20.7±7.5 to 32.2±9.7 cm2; P<0.001) and the area of low muscle density (42.7±9.3 to 55.8±10.0; P<0.001); as well as a significant decrease for the area of high muscle density (167.9±23.5 to 142.9±22.5 cm2; P<0.001) between year 1 and year 3. Also, a significant effect for "menopausal status" was observed for the area of high muscle density (premenopausal: 162.3±30.5 cm2; peri-menopausal: 153.8±23.0 cm2; postmenopausal: 143.9±18.9 cm2; P<0.05). After adjusting for VO2 peak, the effect of "time" and "menopausal status" were no longer significant for the area of low muscle density and the area of high muscle density respectively. Finally, no correlation was observed between changes in muscular fat content or low muscle density with changes in cardiometabolic markers. **Conclusions:** Our results suggest that women going through the menopause transition showed increases muscle fat content. However, changes were not accompanied by cardiometabolic deteriorations in our population.

T-799-P

Initial Findings of the Impact of Long-Term Sugar Reformulated Product Exchange Intervention on Traditional and Novel Cardiovascular Risk Factors: The REFORM Study

Oonagh Markey, Julie A. Lovegrove *Reading, United Kingdom*

Background: In the context of today's obesity and CVD pandemic, dietary factors which may be associated with increased adiposity warrant attention. Reformulation of sugar-containing processed products has been recommended as a strategy for reducing non-milk extrinsic sugars (NMES) to less than 11% of food energy intake. The impact of a long-term sugar reformulated product exchange intervention on BMI, blood pressure (BP) and novel risk factors for CVD was thus investigated. **Methods:** Fifty healthy volunteers (16m/34f, Age: 31.3±9.6 yrs, BMI: 24.0±3.3 kg/m²) were allocated to a reformulated or unmodified dietary exchange, in a double-blind, randomised, crossover design with sequential 8-wk dietary intervention periods separated by a 4-wk washout. The minimum 38g/d NMES target difference between the unmodified and reformulated products was achieved by exchanging one drink (e.g. soft drinks, juice) and one food item (e.g. pasta sauce, chocolate, muesli, sweets) from the volunteers' habitual diet, on a daily basis, with reformulated or unmodified study products. BMI, BP and novel CVD risk factors (fasting C-reactive protein (CRP), stiffness index (SI) determined from digital volume pulse analysis, and augmentation index (AIX) by radial artery pulse wave analysis) were measured at baseline and following each dietary exchange period. **Results:** BMI and BP were similar after each dietary exchange period. When age- and gender-adjusted, there were no significant differences in CRP, SI or AIX between interventions. **Conclusions:** When consumed as part of an habitual diet, long-term sugar reformulated product exchange had no effect on traditional or novel markers of CVD in healthy volunteers. Future work will determine if energy compensation occurred whilst consuming sugar-reduced products.

T-800-P

Effect of Treatment Regimen on Weight Loss in Response to Energy Restriction in Patients with Type 2 Diabetes (T2DM): Lessons from the Ottawa Hospital Weight Management Clinic (OHWMC) Database of 3314 Patients

Robert Dent, Mary-Ellen Harper, Ruth McPherson, Majid Nikpay *Ottawa, Canada*

Background: Background: Treatment of patients with T2DM with insulin or insulin secretagogues is commonly associated with weight gain but it is not known if these agents alter the response to dietary restriction. **Methods:** Methods: The OHWMC is a year-long behavioral program for the treatment of obesity which uses the Optifast 900* meal replacement for the first 6-12 wks. From 1992 to2009, 3,314 (F = 2407) were treated with this standard protocol and data captured on all participants (Dent et al 2002). We compared the rate of weight loss in the first 6 wks of Optifast 900* meal replacement as described previously (Harper et al,2002; Gerrits et al, 2010) for 4 groups of subjects: A) patients without diabetes, n= 2,197 B) impaired fasting glucose, n=90 C) patients with DM2 treated with no medication or with metformin and/or acarbose, n=188 D) Patients with DM2 treated with insulin and/or SUs, n= 290 BMI, initial weight and rate of weight loss were adjusted for the effect of sex and age. **Results:** Results: Initial weight, BMI and age were similar among groups B, C and D but lower for group A (P < 4 × 10-5). The rate of weight loss for groups A, B and C were not different. However, group D patients lost weight significantly more slowly as compared to group A (P = 0.0075). **Conclusions:** Conclusions: Treatment of patients with T2DM with insulin or insulin secretagogues may impair weight loss response to energy restriction.

T-801-P[DT]

Patterns of Food Consumption Are Related to Obesity and Self-Reported Diabetes and Cardiovascular Disease in Five American Indian Communities

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Background: Relationships between dietary patterns and chronic disease are underexplored in American Indian (AI) populations. We examined the relationship between patterns of food consumption and obesity, self-reported diabetes, hypertension and cardiovascular disease in five rural AI communities in New Mexico and Michigan. **Methods:** Patterns of consumption were estimated using a food frequency questionnaire of 45 commonly eaten foods (n=424 AI adults). Four food scales were identified through factor analysis: Healthy Foods (low sugar cereals, vegetables, fruits), High-Fat Foods (hot dogs, fried potatoes, fried eggs), Animal Flesh foods (chicken, game meat, fish), and Unhealthy Snacks (candy, chocolate, chips). **Results:** The majority of participants were obese (53.6%) or overweight (30.0%). Diets characterized by greater consumption of high fat foods and animal flesh foods were associated with a greater risk for cardiovascular disease (ORhigh fat foods = 4.28, CI=1.84-9.90; ORanimal flesh food= 2.84, CI= 1.30-6.18) and diabetes (ORhigh fat foods = 10.12, CI=2.19-46.71; ORanimal flesh food= 4.03, CI= 1.03-15.70). Unhealthy snacks were highly associated with increased risk for cardiovascular disease (ORunhealthy snacks = 5.84, CI=1.46-23.33), but with decreased risk for obesity (ORunhealthy snacks = 0.41, CI=0.17-0.96). **Conclusions:** Specific patterns of food consumption are related to chronic disease in AI communities. This information has been incorporated into an ongoing obesity and chronic disease prevention program.

T-802-P

An Innovative Weight Loss Program for Adolescents with Intellectual and Developmental Disabilities

Lauren T. Ptomey, Jeannine R. Goetz *Kansas City, KS*; Jaehoon Lee *Lawrence, KS*; Debra K. Sullivan, Joseph E. Donnelly *Kansas City, KS*

Background: Adolescents with intellectual and developmental disabilities (IDD) are at an increased risk of obesity with up to 55% considered overweight and 31% obese. Yet, there has been minimal research on weight management strategies for adolescents with IDD. The purpose of this study was to compare the effectiveness of two weight loss diets, an enhanced Stop Light Diet (eSLD) and a conventional diet (CD) diet, and to determine the feasibility of using tablet computers as a weight loss tool in overweight and obese

adolescents (11-18 yrs.) with IDD. **Methods:** A 2-month pilot intervention was conducted. Participants were randomized to either the eSLD or CD, and were given a tablet computer with diet applications, which they used to track daily dietary intake and physical activity. They met weekly with a health educator via video chat on the tablet computer to receive diet and physical activity feedback and education. **Results:** 20 participants (45% female, 14.9 ± 2.2 yrs. old) were randomized and completed the intervention (10 eSLD, 10 CD). Participants on both diets were able to lose weight, and there were no significant differences between the eSLD and CD (-4.6 ± 2.1% vs. -3.3 ± 2.2%; respectively p=0.1307). There was a significant decrease in sedentary activity time (p=0.0280) and energy intake (P=0.0001) in both groups. Participants tracked their dietary intake 83.4 ± 21.3% of possible days, physical activity 60.0 ± 34.3% of possible days, and attended an average of 80.0 ±19.6% of video chat meetings. All participants reported enjoying the use of the tablet computer and applications, and 95% reported they were "easy" to use. **Conclusions:** Both dietary interventions appear to promote weight loss in adolescents with IDD, and the use of tablet computers appears to be a feasible tool to deliver and monitor a weight loss intervention in adolescents with IDD.

T-803-P
The Role of Peer Eating and Physical Activity in the Prevalence of Obesity among Appalachia Children
Liang Wang, Jodi Southerland, Deborah L. Slawson, Diana Mozen *Johnson City, TN*

Background: Diet and physical activity (PA) are established risk factors of childhood obesity, but few studies have examined the influence of social support for healthy eating and PA on obesity risk, particularly in rural areas. This study aimed to examine the role of social support for healthy eating and PA in the prevalence of obesity among Appalachian children. **Methods:** Waves 1 (n=544) and 2 (n=965) baseline data collected between 2011–2012 were used from the Team Up for Healthy Living Project, a cluster-randomized trial targeting obesity prevention in adolescents through a cross-peer intervention among Appalachian school children. Adolescents completed a survey battery including the Index of Social Support for Healthy Eating and the Social Support for Physical Activity measure. Height and weight were also measured using a standard protocol. Multiple logistic regression was used for analysis, adjusted for sex, race, parents' education level, family income, and school characteristics. **Results:** Greater social support for PA rather than for healthy eating was associated with a lower prevalence of childhood obesity (OR=0.95, 95% CI=0.93-0.97). However, when stratified by sex, only male children with increasing support for PA were less likely to be obese (OR=0.92, 95% CI=0.90-0.95). **Conclusions:** Support for PA was associated with a lower prevalence of childhood obesity in the present sample. Strategies targeting increasing family and peer support for PA may be an effective method for reducing obesity rates particularly among male children. However, further longitudinal studies are warranted to examine the long-term effect of support for PA on the risk of childhood obesity.

T-804-P
Determining the Effectiveness of a National Weight Loss Program Over Seven Years
Nia S. Mitchell, Brenda Beaty, Ariann F. Nassel *Aurora, CO*

Background: Take Off Pounds Sensibly (TOPS) is a national, nonprofit, low-cost weight loss program. We analyzed data from all TOPS members in the US to determine the real-world effectiveness of the program over seven years. TOPS participants renew their memberships annually. The primary aim was to determine weight change among US TOPS members who remained in the program for at least one year. The secondary aim was to determine yearly retention. **Methods:** Study participants were those aged 18 and over who joined TOPS from Jan. 1, 2005 to Dec. 31, 2011. There were 213,356 eligible participants, and they were analyzed for each renewal. Data were analyzed using mixed-effects repeated measures models with individual random intercepts. **Results:** The number of participants by years of renewal is as follows: 1 yr, N = 72,717; 2 yrs, N = 36,879; 3 yrs, N = 21,062; 4 yrs, 12,396; 5 yrs, N = 7,379; 6 yrs, N = 4,291; and 7 yrs 2,323. The mean weight change as a percentage of initial weight by years of renewal is as follows: 1 yr, -5.9%; 2 yrs, -6.9%; 3 yrs, -7.1%; 4 yrs, -7.3%; 5 yrs, -7.6%; 6 yrs, -8.0%; and 7 yrs, -8.2%. The percentage of participants whose weight loss was ≥5% of initial weight at each interval is as follows: 1 yr, 49%; 2 yrs, 55%; 3 yrs, 56%; 4

yrs, 58%; 5 yrs, 60%; 6 yrs, 62%; and 7 yrs, 62%. The retention by years of renewal is as follows: 1 yr, 34.1%; 2 yrs, 19.5%; 3 yrs, 13.0%; 4 yrs, 9.4%; 5 yrs, 7.3%; 6 yrs, 6.1%; and 7 yrs, 6.3%. **Conclusions:** Individuals who participated in TOPS for at least one year lost a significant amount of weight and those who remained in the program maintained the weight loss for up to seven years. This degree of weight loss is clinically important and is comparable to more expensive commercial weight loss programs. The retention in TOPS is higher than published results for a more expensive national commercial program.

T-805-P
Effects of Short-Term Resistance Training Program on Vascular Reactivity in Obese Non-Diabetic Adolescents
Ingrid B. Dias, Paulo T. Farinatti, Maria das Graças C. Souza, Erick Balthazar, Diogo G. Panazzolo, Diogo P. Manhanini, Diego M. Dantas, Priscila Maranhão, Eduardo H. Pinto, Eliete Bouskela, Luiz Guilherme Kraemer-Aguiar *Rio de Janeiro, Brazil*

Background: Aerobic exercise is considered an effective tool for the improvement of forearm blood flow (FBF) and vascular conductance (VC) in healthy subjects helping to prevent cardiovascular diseases. However, effects of isolated resistance training exercises (RT) are still unclear in obese adolescents. **Methods:** We have aimed to evaluate the effects of RT on vascular reactivity in obese non-diabetic adolescents. The intervention was performed three times/week solely with RT during three months, including 24 sedentary obese non-diabetic adolescents (17 girls/7 boys; 14.1±1.0 y; 87.8±11.3 kg; 32.1±3.6 kg/m2; Z-IMC 2.6±0.3).Venous occlusion plethysmography was used to assess muscular FBF at resting and after 3 min ischemia (post-occlusive reactive hyperemia – PORH). FBF was normalized to flow per unit of blood pressure (forearm VC) as follows: VC = (FBF/mean blood pressure) X 1000. All volunteers were evaluated before and after RT. **Results:** No change in body mass (87.8±11.3 vs. 87.2±11.5 Kg, NS) was observed after the isolated and regular RT program, but improvements on VC at resting (18.3[13.0-24.8] vs. 25.2[16.3-37.3] FBF/mmHg; P<0.05), during PORH (45.2[31.7-54.5] vs. 64.3[39.1-84.0] FBF/mmHg; P<0.05) could be observed. **Conclusions:** Our results suggest that a 3-month program solely of RT could improve vascular reactivity, independently of weight loss in obese non-diabetic adolescents.

T-806-P
Who Loses Weight in MOVE? Lifestyle Change in a Large National Healthcare System
Sandra L. Jackson, Mary Rhee, Solveig A. Cunningham, Darin E. Olson, Christine Jasien, Phyllis Watson-Williams, Anne Tomolo, Lawrence S. Phillips *Atlanta, GA*

Background: Most studies of lifestyle change have utilized subjects who "volunteered," but little is known about the outcomes that can be obtained within healthcare systems – where participation is "recommended" by providers. The VA's MOVE program (Managing Overweight and/or Obesity for Veterans Everywhere) is the largest lifestyle change program in the US, with over 400,000 participants since 2005. **Methods:** We used the VA Informatics and Computing Infrastructure (VINCI) to examine patients who would be eligible: obese (BMI ≥30) or overweight (BMI ≥25) with a weight-related health condition; with ≥3 years of outpatient care in the VA between 2005-2012; age 18-75; and with no acute or chronic exclusionary conditions. We compared 285,460 participants and 2.2 million nonparticipants who met these criteria. **Results:** Participants were more likely than nonparticipants to be female, African American, have service-connected disabilities, have comorbidities, and live closer to facilities offering MOVE. Participants were also more likely to take medications for weight loss, take medications with a risk of weight gain, and had more visits/year in the VA system. Veterans who had "intense and sustained" participation (≥8 sessions within 6 months, and ≥129 days between first and last sessions) had significantly greater weight loss at 3 years than less-active participants and nonparticipants (-2.3% vs. -0.68% and +0.26, respectively, p<0.01). Among patients without diagnosed diabetes at baseline, greater weight loss at 6 months was associated with less risk of incident diabetes over 3 years (p<0.01). **Conclusions:** The VA's MOVE program demonstrates that weight loss can be achieved in a large scale healthcare setting. Further research is needed to determine the impact on veterans' health and the VA health system, and how best to encourage active participation.

T-807-P[DT]

The Impact of a 12 Week Lifestyle and Diet Intervention Program on African American Women

Tiffani L. Grant *Canton, MS*; Jacinda Roach *Madison, MS*

Background: Mississippi has historically led the nation in obesity rates. African American women represent a subgroup of the population in the state that ranks the highest for obesity. Mortality rates due to heart disease and hypertension indicate significant health disparities for this subgroup. **Methods:** The Healthy Families Movement (HFM) was designed to address the population's major modifiable risks for heart disease and obesity. One hundred and thirty participants worked with a physician, dietitian, personal trainer and behavioral health specialist to develop and adhere to individualized wellness plans through the twelve-week program. The program incorporated nutrition counseling, increased physical activity and stress management weekly. Training in deep breathing, guided imagery, journaling and coping skills was provided to participants using the Bright Futures Guide to Emotional Wellness (US HRSA). Extensive support including one-on-one time with a provider, cooking classes, grocery store tours, family activities and case management assisted participants in achieving and maintaining goals. All participants (n=130) completed a nutrition knowledge questionnaire, a perceived stress survey and a fitness test initially and at program conclusion. Weights were also measured at these intervals. **Results:** T-tests were conducted to determine differences between initial and final data for questionnaires. Results concluded significant improvements in nutrition knowledge (p < 0.001) and perceived stress (p < 0.01). Analysis of mean scores for weights and fitness tests indicated improvements in both areas. Average weight loss for participants was 8.5 pounds. **Conclusions:** The positive outcomes of this study can be used to effectively develop lifestyle interventions for other high risk populations.

T-808-P

5th Gear Kids: A Multi-Level Childhood Obesity Prevention Program for 5th Graders in Colorado

Thrudur Gunnarsdottir, Michelle Cardel, Jimikaye Beck, Kenny Webb *Aurora, CO*; Megan Mistler-Jackson *Greenwood Village, CO*; John C. Peters, James Hill *Aurora, CO*

Background: A number of school-based obesity programs have been implemented around the world but few have linked interventions in schools with interventions in communities or at home. The 5th Gear Kids Program (5GK) is both theory- and evidence-based. It is aimed at empowering fifth-graders with knowledge and skills needed to manage their weight and avoid excessive weight gain, while at the same time encouraging them to become ambassadors for healthy living. **Methods:** At school, fifth-graders learn about the science of energy-balance through curriculum and supporting activities. Parent engagement is encouraged through monthly newsletters and participation with their child in our 5GK community-wide rewards-system, an 'ecosystem' of food and physical-activity partners, providing improved access and decreased cost of healthy eating and physical-activity. Through participation in the 'ecosystem' kids put their energy-balance skills to the test while they and their family earn points and redeem prizes for making healthy choices. **Results:** We piloted the program with a diverse sample of fifth-graders (n=6679) from two school districts in CO in 2012-2013 (complete data available for publication: fall of 2013). At baseline, 42.5% of children report meeting guidelines for 30 min/day of vigorous physical-activity. Only 31.5% of children met daily recommendations for fruits/day and 19.2% for vegetables/day, and 89.7% of children drink sugar-sweetened beverages on a regular basis (self-reported). The combined overweight and obesity prevalence among this group was 25.6%. **Conclusions:** It is possible to deliver a multi-level obesity prevention program that engages private sector partners and links school with home and community. This program is highly acceptable to students, schools and parents. Time will tell whether it is effective in reducing excessive weight gain.

T-809-P[DT]

Evaluation of Comadres de Salud - An Intervention to Address Obesity in Latino Women

Martina R. Gallagher, Tracey Ledoux, McClain Sampson *Houston, TX*

Background: The purpose of this pilot study was to evaluate participant acceptability of a culturally sensitive, multi-component, community-based intervention aimed addressing obesity in low-income Latino women of childbearing age. The intervention is innovative in that it incorporates education on healthy sleep as a way of enhancing adherence to lifestyle change recommendations. **Methods:** 29 Latino women between the ages of 21-35, who were mothers of children enrolled in a public Pre-Kinder in Houston, TX, were recruited and randomized into control and intervention group. At the end of the 12 week intervention, 4 focus groups were conducted. **Results:** Qualitative analysis of focus group data revealed that participation in the study was facilitated by 1) having intervention sessions early in the morning in the Pre-Kinder, the interactive group sessions, and 3) the interaction with other women. Some of the difficulties they encountered during the study were 1) achieving their goal, and 2) following some of the study protocols, such as keeping track of their food intake. The participants suggested that involving other family members and incorporating group exercise would improve the study. **Conclusions:** Including other family members in future studies will enhance the concept of familism, would increase the culturally sensitivity. Goal setting was challenging for this group of women. Further research to examine the how to enhance adherence to goals with this group of women is needed.

T-810-P

Barriers to Diagnosing and Treating Obesity at a Major Medical Center: Results of a Survey of Internal Medicine Providers

Katlyn E. Cook, Matthew S. Salerno, Brandon J. Williams, Kim M. Klauer, Donald D. Hensrud, Maria L. Collazo-Clavell, Robert A. Wermers, Esayas B. Kebede, Paul S. Mueller *Rochester, MN*

Background: Past research has shown that health care providers under diagnose obesity. However, evidence also suggests that obese patients are more likely to attempt weight loss efforts when providers identify and share the diagnosis with them. The goal of this study was to determine barriers to diagnosing and treating obesity. **Methods:** Based on a literature review and the results of a qualitative study at our institution, we developed a 13 item survey (including 10, 5 point Likert scales and 3 free text questions),which in turn was distributed to 698 health care providers (i.e., physicians, nurse practitioners and physician assistants) in the Department of Medicine (DOM) at Mayo Clinic in Rochester, Minnesota. **Results:** Overall, 471 (67%) providers responded to the survey. Providers "agreed" or "strongly agreed that the following are barriers to diagnosing and treating obesity: perceived patient motivation (86%), patient knowledge/self-awareness (73%), ability to follow up with the patient (69%), lack of a standard management process (68%), lack of time to address obesity during a patient encounter (68%), patient sensitivity to the diagnosis (67%), provider unpreparedness to diagnose and discuss obesity (63%), provider motivation/sensitivity regarding the topic (46%), and insurance/billing issues (37%). **Conclusions:** In this large single institution survey, internal medicine providers identified multiple barriers to diagnosing and treating obesity. Most of these barriers are related to provider-patient communication and the topic of obesity as well as a lack of standardized care processes in managing obesity. Medical centers should address these barriers in order to optimize the diagnosis and treatment of patients with obesity. These findings should be correlated with patients' perspectives on the diagnosis and management of obesity.

T-811-P

Barriers to Diagnosing Obesity at a Major Medical Center: Results of a Qualitative Study of Internal Medicine Physicians

Matthew S. Salerno, Katlyn E. Cook, Brandon J. Williams, Kim M. Klauer, Donald D. Hensrud, Maria L. Collazo-Clavell, Robert A. Wermers, Esayas B. Kebede, Paul S. Mueller *Rochester, MN*

Background: Past research has shown that physicians under-diagnose obesity. However, obese patients are more likely to attempt weight loss efforts when physicians identify and share the diagnosis with them. The goal of this qualitative study was to determine barriers to diagnosing and treating obesity. **Methods:** Internal medicine physicians were invited to participate in 2 separate 60-minute focus groups (n=12, n=11) to discuss barriers to diagnosing and treating obesity. Focus groups were audio recorded and transcribed. Qualitative (thematic) analyses of the transcripts were performed. **Results:** Qualitative analysis revealed 10 themes regarding barriers to diagnosing and treating obesity: lack of physician time ("[I] don't have time when I am with the patient"), physician motivation to address patients' obesity, patient knowledge about obesity ("there's a disconnect between excess body weight

and disease risk…people don't take their weight seriously"), and perceived patient motivation to make behavior and lifestyle changes ("neither patients nor physicians believe that people can lose weight"). Additional themes were patient sensitivity about obesity ("when you use [the term] "obese," patients become offended…that makes things ten times harder"), clinical priorities ("the [patients'] other issues tend to be more pressing"), ineffective treatment and referral ("we don't have one place with all the options to make a referral"), lack of reimbursement ("a barrier is how to get insurance coverage"), psychological barriers (depression, eating as a coping mechanism, etc.), and socioeconomic factors. **Conclusions:** In this qualitative study, internal medicine physicians identified multiple barriers to diagnosing and treating obesity. These barriers should be prioritized and addressed in order to optimize diagnosis and management of patients affected by obesity.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Nutritional Epidemiology

T-812-P
Trends in Beverage Consumption among U.S. Infants and Toddlers, NHANES 2001 to 2010

Yu Wang, Maurissa Mesirow, Jean A. Welsh *Atlanta, GA*

Background: Sugar-sweetened beverage consumption has decreased among older children but little is known about beverage trends among US infants and toddlers. **Methods:** One 24-hour dietary recall from children <2 years in the National Health and Nutrition Examination Survey 2001-2010 (five 2-year cycles) was used to assess beverage intake, including: milk (breast milk, formula, plain, flavored and alternative milks); sugar-sweetened beverages (SSBs; regular carbonated sodas, fruit flavored, sport, and energy drinks); low/no-calorie drinks; coffees and teas; juices (fruit and vegetable juices); and water (flavored and plain). Consumption prevalence among all (n=3733) and % total energy from each beverage among breast milk non-consumers (n=2980) were calculated. Analysis was done using complex survey methods, sample weights, and chi-square tests for trend. **Results:** Between 2001-2002 and 2009-2010, consumption prevalence decreased for: all SSBs, 25.0% to 14.6% (p for trend<0.001); sodas, 11.6% to 4.1% (p<0.001); and fruit-flavored drinks, 15.2% to 8.3% (p<0.001). Fruit juice consumers also decreased from 43.2% to 37.3% (p=0.02). Low/no-calorie drinks consumers increased from 1.1% to 4.8% of children (p=0.004) and plain water consumers decreased from 45.9% to 40.1% (p=0.045). Though among non-breast milk consumers, the % energy from all beverages was unchanged, 54.5% to 56.2% (p=0.15), % energy from SSBs and fruit juice decreased from 3.0% to 1.8% (p=0.009) and 5.1% to 4.3% (p=0.0499), respectively. Milk increased from 46.4% to 49.6% of energy (p=0.01). **Conclusions:** The contribution of liquid calories, specifically SSBs and fruit juices, to the diets of US infants and toddlers has decreased, while milk and low-calorie drink consumption has increased.

T-813-P
Added Sugars Consumed in Beverages Are Associated with Larger Waist Circumference among Adolescent Females in the NGHS Cohort

Alexandra K. Lee, Ritam Chowdhury, Miriam B. Vos, Jean A. Welsh *Atlanta, GA*

Background: Sugar-sweetened beverage consumption and abdominal adiposity are both independently associated with increased cardiovascular risk. Research suggests that liquid sources of fructose-containing sugars increase visceral adipose tissue due to rapid digestion and subsequent activation of lipoprotein lipase facilitating uptake of circulating triglycerides into abdominal tissue. This analysis investigated the effect of added sugars consumed in beverages on waist circumference among adolescent females. **Methods:** NHLBI's Growth and Health Study was a 10-year cohort study of Caucasian (n=1,166) and African-American girls (n=1,213) aged 9 and 10 years at baseline, recruited from three sites in the US in 1987-88. Minimum waist circumference was measured annually except at baseline. Diet was assessed using a three-day food record in eight of ten years; nutrient content was determined using the Nutrient Data System for Research. Girls' added sugar consumption from sodas, fruit-flavored beverages, energy drinks, and sweetened milk

drinks was categorized by percentage of total energy. Longitudinal mixed models were used for testing the effect of added sugars consumed as liquids on waist circumference. **Results:** After controlling for age, race, physical activity, maturation stage, total energy intake and nutrient residuals for intake of: added sugar from food sources, total fat, fiber, and protein, consumption of 5-<10%, 10-<15%, and ≥15% liquid added sugar was positively associated with a 0.24cm, 0.27cm, and 0.46cm increase in waist circumference compared to the referent, <5% energy from liquid added sugar, (p = 0.008, 0.010, and <0.001, respectively). **Conclusions:** Increased consumption of sugar-sweetened beverages is associated with larger waist circumference among adolescent females.

T-814-P[DT]
100% Fruit Juice as an Alternative to Sugar-Sweetened Beverages: Perceptions and Practices of Hispanic Parents of Young Children

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Background: Concerns have been raised about the impact of children's sugar-sweetened beverage (SSBs) on obesity and chronic disease risk. While the nutrient content is similar, current guidelines identify 100% fruit juice (juice) as a healthy alternative to SSBs but suggest that consumption be limited. The purpose of this study was to assess juice consumption perceptions and practices among Hispanic parents with young children. **Methods:** Between May and June 2013, surveys were administered to 113 parents of children aged 1 to five years at a pediatric clinic waiting room to assess their knowledge and practices regarding their child's beverage consumption. **Results:** One-quarter of the parents reported that juice was the beverage most commonly consumed by their young children at meals; compared to water (43.8%), juice-flavored drinks (15.2%) and milk (10.7%). 13.3% of parents reported juice as the most commonly consumed beverage in-between meals compared to water (18.9%), fruit-flavored drinks (9.0%), and milk (42.3%). When asked about their choice of healthy alternative to SSBs, 16.1% of parents identified juice as the top choice and 63.8% identified juice as one of their top 3 choices. Less than half were aware of any existing recommendations pertaining to children's juice consumption; only 34.5% responded that consumption should be limited. **Conclusions:** 100% fruit juice is commonly consumed among young Hispanic children during and between meals yet few parents are aware of recommendations to limit this consumption. Further study is needed to determine if perceptions and practices related to juice consumption are similar across race/ethnic and other demographic subgroups.

T-815-P
Change in Beverage Consumption Patterns among Overweight Adolescents Participating in Camp Strong4Life

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Background: Beverage consumption patterns are associated with obesity risk. Camp Strong4Life is a summer camp program designed to promote healthy dietary habits through education and positive role modeling in a fun and supportive environment. The purpose of this study was to determine if participation in Camp Strong4Life is associated with changes in beverage consumption patterns among overweight youth and their parents. **Methods:** In 2012, 48 overweight youth (BMI > 85th percentile) age 9 to 15 years (campers) and 34 parents participated in Camp S4L including: Family Welcome Weekend (spring), Camper Week (summer; youth only), and Family Reunion Weekend (fall). Campers and their parents were informed about the health risks associated with sugar-sweetened beverage (SSBs) intake and the benefits of water and low-fat milk. A validated 15-item beverage questionnaire (BevQ) was completed by participants at the Welcome and Reunion weekends. Mean change in consumption was calculated for each beverage and for all SSBs combined. Statistical significance was assessed using paired t-tests. **Results:** Sugar-sweetened soda consumption among youth (mean age 12.3 y; BMI percentile 98.7) decreased 5.6 ounces/day (p=0.02) between baseline and the follow-up weekends (range 13 to 28 weeks). Reduction in all SSBs (-11.1 ounce/day) and increase in diet beverages (+2.6 ounces/day) approached significance (p=0.06 and 0.08. respectively) but there was no change in other beverages (p> 0.10). Campers' mean body fat decreased 2.9%. (p<0.001). Parent beverage consumption patterns did not change. **Conclusions:** Youth but not parent participants in the Camp Strong4Life pro-

gram reduced their usual sugar-sweetened beverage consumption. Further study is needed to assess the long-term impact of the program.

T-816-P

Participation in a Healthy Lifestyle Camp Program Is Associated with Positive Changes in the Food Options Available in the Homes of Overweight Children

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Background: The home environment is associated with child obesity risk. The purpose of this study was to assess the effect of a healthy lifestyle camp program for overweight children and their parents on the in-home availability of foods and beverages believed to modify this risk. **Methods:** The Strong4Life Camp program was developed using Social Cognitive Theory to promote healthy lifestyle change among overweight youth (9 to 15 years) and their families in a fun and supportive environment. In 2012, 67 overweight youth and 65 parents/guardian participated in the Strong4Life program including: Family Welcome Weekend (spring), Camp Week (summer, youth only), and Family Reunion Weekend (fall). Thirty-one parents/guardians completed a validated Home Environment Survey (HES) during the Welcome and Reunion Weekends providing a measure of usual availability of fruits, vegetables, sugar-sweetened beverages, and sweets/desserts. We assigned a score of 1 to 5 to each of the Likert scale responses ranging from "Never" to "Always" and calculated a composite mean score (CS) to quantify the availability of foods and beverages within each category. Paired t-tests were used to assess the statistical significance (p<0.05) of the change in CS. **Results:** The mean (standard deviation) CS for the availability of fruits and vegetables increased 0.3 (0.5) and 0.3 (0.4), respectively (p=0.002 for both) and decreased 0.4 (0.6) for sweets/deserts (p=<0.001) over the study period (mean 4.7 months). Availability of sugar-sweetened beverages was unchanged. **Conclusions:** Participation in Camp Strong4Life was associated with improvements in the food environment in the homes of overweight children. Further research is needed to assess the sustainability of these changes.

T-817-P

Glycemic Index, Glycemic Load and Their Relations with Adiposity Over a 6-Year Period in the Quebec Family Study (QFS)

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Background: Associations between glycemic index (GI), glycemic load (GL) and adiposity could be confounded by misreporting of dietary intake. We examined associations between GI, GL and adiposity while accounting for energy under-reporting (UR). **Methods:** GI and GL were determined using 3-day dietary records and GI value tables in 794 non-diabetic participants including 272 with data obtained on two occasions over a 6 year follow-up period. Body mass index (BMI), fat mass (FM), waist circumference (WC) and visceral fat (VF) were evaluated at both times. Associations between GI, GL and obesity were tested using chi-square tests and Pearson correlations. ANOVA was used to compare changes in adiposity over time among tertiles of ΔGI and ΔGL. Goldberg cut-off (1991) was used to determine under-reporters and plausible reporters among participants. **Results:** Differences in GI and GL (p < 0.005) were observed between obese and non-obese women, with higher GI and GL being associated with higher values of adiposity ($0.10 < r < 0.20$; $p < 0.01$), and these associations remained significant after exclusion of under-reporters (23.5 % of women). A positive association was also found between obesity and GL ($\chi 2 = 6.96$; p= 0.03) in women. Moreover, an increase in GL over a 6-year follow-up period was significantly associated with gains in BMI (p= 0.005), FM (p= 0.03), and WC (p= 0.006) in women after adjustment for covariates. However, when accounting for UR, these associations remained significant for under-reporters (n=42) but not for plausible reporters. **Conclusions:** Our results suggest that GI and GL are associated with obesity in women, and that an increase in the GL of their diet is associated with gains in adiposity over a 6-year follow-up period, which could be explained, in part, by UR.

T-818-P

Adherence to the 2010 Dietary Guidelines for Americans and the Relationship to Adiposity in Young Women

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Background: The dietary guidelines for Americans were developed for Americans ages two and older and contain authoritative advice on diet intended to decrease risk of disease and maintain a healthy weight. To date, no studies have examined how adherence to the 2010 Dietary Guidelines relates to adiposity. The purpose of this study was to determine the relationship between adherence to the 2010 Dietary Guidelines for Americans and adiposity in young women with and without statistical adjustment for physical activity. **Methods:** The study was cross-sectional. Three hundred and twenty-four apparently healthy young women were recruited to participate (ages 17-25). Dietary intake was measured using the Dietary History Questionnaire (DHQ) and diet quality was determined using the 2010 Healthy Eating Index (HEI-2010). Percent body fat was assessed using the BOD POD. Physical activity was measured using accelerometry over seven days. **Results:** The average HEI-2010 score was 65.9 ± 10.7 out of 100. Women in the top quartile of HEI-2010 had significantly lower percent body fat than women in the lowest three quartiles (F = 3.36, P = 0.0359). Controlling for objectively measured physical activity weakened this relationship by 20%. These young women also had 0.37 (95% CI: 0.16-0.85) odds of having a body fat greater than 32%. Stepwise regression of the 12 components of the HEI-2010 demonstrated that only the density (equivalents per 1000) of dairy (inverse) and percent of energy from empty calories were predictive of percent body fat. **Conclusions:** Young women whose diets more closely meet the 2010 dietary guidelines for Americans tend to have lower adiposity. Specifically, consuming higher levels of dairy and a lower percent of dietary energy from empty calories is predictive of lower adiposity in young women.

T-819-P[DT]

Adiposity in Children is Dependent on the Interaction between Lactose Consumption and Genetic Background

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Background: Evidence suggests that specific micro and/or macronutrients in the diet can play a significant role in body composition. Our team has previously shown that adiposity levels in children are in part dependent on lactose consumption and the presence of a lactase gene polymorphism. In this study, we evaluated if the interaction of African ancestral genetic background (AFADM) with lactose consumption contributed to levels of adiposity. **Methods:** A sample of 288 European American (EA), African American (AA), Hispanic American (HA) and mixed ethnicity children were evaluated in the study. Lactose consumption was obtained from two 24-hour dietary recalls, total body fat was measured by DXA, and AFADM was estimated from 140 ancestry informative markers. Mean comparison across racial/ethnic groups were compared using ANOVA, and multiple regression models were used to evaluate the association of fat mass index (FMI = total fat/height squared) with lactose, AFADM and their interaction, after controlling for standard covariates. **Results:** Differences in levels of lactose adjusted by total energy intake were observed between EA-AA and between AA-HA (p < .05). Lactose consumption was positively associated with FMI (p=0.0055), but the interaction of lactose-by-AFADM was negatively associated with FMI (p=0.0350). **Conclusions:** Our results show that the contributions of lactose consumption to adiposity in children are complex and may in part depend on individual genetic background. Although further research in this area is needed to understand the mechanisms underlying nutrigenetic relationships, our study provides further evidence that a one-size-fits-all approach to dietary recommendations is not appropriate when attempting to improve health and reduce obesity in the pediatric population.

T-820-P

Early Introduction to Solid Foods and Risk for Overweight/Obesity in National Cohort of U.S. Children

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Background: To examine the relations between early introduction to solid foods and risk for overweight/obesity across 5 yrs of life. **Methods:** The Early Childhood Longitudinal Study-Birth Cohort is a nationally representative sample of approximately 10,700 families, studied at 9m, 2, 4, and 5 yrs.

Early introduction to solid foods (< 4 mos; parental report) and child anthropometry (measured) were collected. The proportion of children with BMI-for-age ≥ 85th percentile was calculated using WHO growth standards. A longitudinal approach was applied (GEE) to a multivariable logistic model to examine weighted relations (accounting for sampling design and non-response) between early introduction to solid foods and odds of being ≥ 85th percentile, adjusting for race/ethnicity, maternal education, child's birth weight. **Results:** At baseline (9m), 35% of children had BMI ≥ 85th percentile, increasing to 50% by 2 yrs, and returning to 36% by years 4 and 5. Children exposed to solid foods before 4 mos (23%) experience 33% greater odds of being ≥ 85th percentile at 2 yrs compared to those given solid foods ≥ 6 mos (OR=1.33, 95%CI=1.02-1.75). By 5 years, children given solid food before 4 mos showed 62% greater odds of being ≥ 85th percentile than those given solid foods ≥ 6 mos (OR=1.62, 95%CI=1.24-2.12). Children given solid foods between 4 -5.9 mos showed 29% higher odds of being ≥ 85th percentile at 2 yrs compared to those given solid foods ≥ 6 months (OR=1.29, 95%CI=1.03-1.61), but no significant difference between the two groups existed at yrs 4 and 5. **Conclusions:** The risk for overweight/obesity begins early in life, and may be even greater among children exposed to solid foods before 4 months of life.

T-821-P

Heavier Adults Who Drink Diet Beverages Consume More Food Than Sugary Beverage Drinkers

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Background: Little is known about consumption of diet beverages (artificially sweetened no calorie drinks) among American adults overall and by body weight status. **Methods:** Analysis of 24-hour dietary recall data obtained from the National Health and Nutrition Examination Survey 1999-2010 (N=23,965). **Results:** Overall, 11% of healthy weight, 19% of overweight, and 22% of obese adults drink diet beverages (p < 0.05). Total caloric intake was higher among adults consuming sugar-sweetened beverages (SSBs) as compared to diet drinks (2351 kcal/day vs. 2203 kcal/day, p =0.005). However, the difference was only significant for healthy weight adults (2302 kcal/day vs. 2095 kcal/day, p < 0.001); the patterns were similar among overweight (2266 kcal/day vs. 2196 kcal/day, p = 0.15) and obese adults (2305 kcal/day vs. 2280 kcal/day, p = 0.57). Among overweight and obese adults, solid food consumption was higher among diet as compared to SSB drinkers (overweight: 1965 kcal/day vs. 1874 kcal/day, p = 0.03; obese: 2058 kcal/day vs. 1897 kcal/day, p < 0.001). The net increase in solid food consumption associated with consuming diet beverages was 88 kcal/day for overweight and 194 kcal/day for obese adults. **Conclusions:** Overweight and obese adults drink more diet soda than healthy weight adults, consume significantly more calories from solid food than overweight and obese adults who drink SSBs, and consume a comparable amount of total calories as overweight and obese adults who drink SSBs. Heavier American adults who drink diet soda will need to reduce their consumption of solid food calories in order to lose weight.

T-822-P[DT]

Neighborhood Availability of Convenience Stores and Diet Quality: Findings 13 Years Apart in the Longitudinal CARDIA Study

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Background: High prevalence of neighborhood convenience stores may lead to poorer diet quality, but their temporal associations have not been studied extensively. **Methods:** In a biracial cohort of young adults, we quantified the associations between convenience store density (percent of all food stores and restaurants in a 3-km street-based buffer around participant homes) and snack consumption, sugar-sweetened beverage (SSB) intake, and diet quality. We created a dietary pattern, the a priori diet quality score, to reflect the consumption of 46 food groups ranked in terms of hypothesized health effects, with higher scores indicating more healthful diets. We used linear regression to assess cross-sectional associations (1992-93, ages 25-37, n=3,777; and 2005-06, n=3,089) between convenience store percent and diet variables, adjusting for participant race, age, gender, study center and education; and

neighborhood SES, population density, cost-of-living, and total food outlets. We tested for interaction by age, race, and gender. **Results:** In 1992-93, the a priori diet quality score (mean±SD: 66.8±12.2) was differentially associated with convenience store percent by race (p, interaction <0.01). In whites, a ten percentage point increase in convenience store density was associated with a 0.8 lower diet quality score (95% CI: -1.3, -0.3). In blacks, there was no association (0.2; -0.6, 0.6). Convenience store percent was not associated with snack or SSB intake in 1992-93, or with any diet measure in 2005-06. **Conclusions:** Our findings suggest that more convenience stores, relative to other food establishments, is associated with lower overall diet quality among white young adults, but not with consumption of hypothesized dietary components. The relationship is not evident in blacks and may become less salient in later years.

T-823-P

Evaluation of Existing Equations for the Estimation of Body Fat from Anthropometric Measures in Adults: NHANES 1999 - 2004

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Background: Equations that estimate percentage body fat (PBF) from anthropometrics are widely used although most were developed in small non-representative samples. No study has examined the generalizability of these equations in a nationally representative population. The goal of this study was to evaluate the validity of 27 sets of published equations for PBF estimation in American adults aged ≥ 20 years using data from the NHANES 1999-2004 (n =9,934). **Methods:** Equations were evaluated against dual-energy X-ray absorptiometry (DXA) using R2, root mean square error (RMSE) and mean signed difference (MSD). We also compared the MSD by obesity status. **Results:** Most equations included demographic variables and more than one anthropometric assessment using only linear functional forms. In subsamples matched to the range of age, gender and race/ethnicity in which equations were derived most equations had R2 values between 0.7 and 0.8, but the RMSE estimates were between 3.5 and 4.5 percentage points. Analyses in subsamples stratified by gender, age, obesity status or race/ethnicity showed that discrepancies in MSD of more than 2 percentage points in obese compared to normal weight adults indicated important differential bias in 20 of the 27 equations (p < 0.05 for all). Equations that included WC performed the best in males, and those that included BMI performed best in females. Equations using skinfold thickness performed less well in older or obese adults. **Conclusions:** Published PBF equations had moderately strong R2 values in a representative sample of American men and women, but both non-differential and differential biases were substantial for most equations. Future work is needed to examine whether incorporation of population-specific anthropometrics, nonlinear terms and interaction terms could improve the performance of PBF prediction equations.

T-824-P[DT]

Glycemic Load - A Predictor of Insulin-Related Outcomes in African- and Hispanic- American Children

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Background: The glycemic index (GI) and glycemic load (GL) of foods are designed to serve as proxies for glycemic response to carbohydrate intake and have been associated with insulin-related measures. Given the interest in maintaining healthy levels of insulin as a preventative strategy for diabetes and the recent climb in pediatric diabetes prevalence, this study tested whether GI and GL were associated with insulin-related outcomes in children and if this differed by race/ethnicity. **Methods:** In a cohort of 322 multiethnic children ages 6 – 12, we employed multiple regression analyses to test for associations between GI, GL and insulin-related outcomes. Models were adjusted by relevant covariates and evaluated according to race/ethnicity (European Americans: EA; African Americans: AA; and Hispanic Americans: HA). **Results:** In the overall sample, there were no significant associations between GI, GL and insulin-related outcomes. However, a significant negative association was found between GI and acute insulin response to glucose (AIRg) (p=0.0187) in EA children. In AA, GL was positively associated with fasting insulin (p=0.0034) and negatively associated with insulin sensitivity (p=0.0281). GL was also positively associated with glucose tolerance (p=0.0272) and AIRg (p=0.0380) in HA children. **Conclusions:** In conclusion, the associations between GI and GL with insulin-related outcomes differed between EA, AA and HA children. GL appeared to be a better predictor

of insulin-related measures in AA and HA children, but the measures showing significance varied between these two races/ethnicities. Our results reflect differences in glycemic response between children of different racial/ethnic groups and suggest that low GI and GL diets may not result in desired effects across races/ethnicities - an important consideration in nutrition education settings.

T-825-P
Development and Validity of a 3-Day Smartphone-Assisted 24-Hour Recall to Assess Beverage Consumption in a Chinese Population

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Background: In China, diet data shows that sugar sweetened beverage (SSB) consumption remains low despite increases in SSB sales, suggesting that the predominant diet assessment method, a 3-day written-record assisted 24-h recall (WA-24R), inadequately captures beverage intake. Our aim was to develop and validate a 3-day smartphone-assisted 24-h dietary recall method (SA-24R) to enhance recall of beverage intake in a Chinese population. **Methods:** Participants were 112 healthy adults age 25-35 from urban and rural regions around Shanghai, China. Using a randomized crossover design, participants completed a 3-day SA-24R using a video diet record and ecologic momentary assessment to enhance recall and a 3-day WA-24R, using written notes to assist recall. Descriptive statistics (mean ± SE) include average daily consumption (grams and kcal) of total beverages and beverage categories, including SSBs. Pearson correlation coefficients are used to compare mean energy intake and grams consumed of total beverages and SSBs between the 3-day SA-24R and the 3-day WA-24R. To assess validity, in a subset (n=47) total volume (mL) of beverage intake in each method was compared to total urine volume measured in 24-h urine samples. **Results:** Preliminary results from rural participants (n=54) show that total beverage intake was significantly correlated between the 3-day SA24-R and the 3-day WA-24R with a correlation coefficient of 0.56 (p<0.01). Over half (57%) of participants reported drinking a SSB during the study. There was no significant difference in energy reported from SSBs during the 3-day SA-24R (49 kcal ± 15) compared to the 3-day WA-24R (51.4 kcal ± 16) (p=0.56). **Conclusions:** Amongst rural Chinese adults, use of a 3-day SA-24R provides a valid estimate of total beverage and SSB consumption compared to a 3-day WA24R.

T-826-P[DT]
Addressing Missing Dietary Recall Data for Young Children in Childcare

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Background: Parent reported 24-hour diet recalls are an accepted method of estimating total energy intake in young children. An often overlooked issue, however, is that many preschool-age children eat meals/snacks at childcare making it difficult for parents to accurately report what or how much their child consumed. **Methods:** The goal of this study was to develop models to predict full-day intake by imputing missing lunch and daytime snack data for childcare children using data from My Parenting SOS project (n=308 2-5 year old children, 870 24-hr diet recalls). Among childcare children's recalls, only 5 provided weekday lunch (used to assess construct validity) and only 24% included daytime snacks. Mixed models were used to simultaneously predict breakfast plus dinner (B+D), lunch and daytime snacks for all children after adjusting for age, gender and BMI. From these models we imputed the missing weekday childcare lunches by interpolation using the midpoint between the mean lunch intake to B+D ratio among non-childcare children on weekdays and the lunch intake to B+D ratio for all children on weekends. All available daytime snack data were used to impute snacks. **Results:** The reported mean (standard deviation) weekday intake was 725 (324) kcals for childcare children compared to 1048 (463) kcals for non-childcare children, while weekend intake for all children was 1173 (427) kcals. After imputation, weekday caloric intake for childcare children was 1218 (418) kcals. The construct validity found protein and fat intake from weekday childcare lunches (n=5) were within the 95% confidence interval (CI) of the imputed childcare lunch intakes; while, total energy, sugar, fiber and carbohydrates were outside

the 95% CI for one recall. **Conclusions:** This work indicates that imputation is a promising method for improving the precision of nutrient data from young children.

T-827-P
Dietary Fiber Linked to Decreased Inflammation in Overweight Minority Youth

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Background: Few studies have examined the relationship between diet and inflammation in children. This study examines the relationship between dietary intake and inflammatory markers in overweight minority youth. **Methods:** A cross-sectional analysis of 159 overweight ($\geq$85th BMI percentile) Hispanic and African American youth (14-18 years) with the following measures: height, weight, BMI, dietary intake via multiple 24-hour dietary recalls, and inflammation markers (Interleukin-1, IL-6, IL-8, leptin, adiponectin, HGF, NGF, plasminogen activator inhibitor-1 [PAI-1], resistin, and TNF-α) from fasting blood draws utilizing a multiplex panel. Partial correlations and ANCOVAs were run to examine the relationship between dietary variables and inflammation parameters, with the following *a priori* covariates: Tanner stage, ethnicity, sex, total body fat, and total energy intake. **Results:** Partial correlations found total dietary fiber to be inversely related to PAI-1 and resistin (R= -0.22, p=0.01, R= -0.26, p<0.01). ANCOVAs showed that the highest tertile of dietary fiber (>21 g/d) versus the lowest tertile of total fiber (<7.5 g/d) was associated with 33% lower PAI-1 (102.3 ng/mL vs. 152.6 ng/mL, p=0.04) and 34% lower resistin (29.5 ng/mL vs. 44.6 ng/mL, p=0.02). Similar results were seen for insoluble fiber. Of note, no other dietary variables were linked to any other inflammation markers. **Conclusions:** These results suggest that increases in dietary fiber of 14 g/d, which is closer to the U.S. dietary fiber recommendation of 26-38 g/d for adolescents, could play an important role in lowering inflammation and therefore metabolic disease risk in high-risk minority youth.

T-828-P
Use of a Novel Food Diversity Index to Assess the Role of Dietary Variety in Body Adiposity: Findings from the National Health and Nutrition Examination Survey (2003-2006)

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Background: Dietary variety in an obesogenic environment may promote food consumption and contribute to excess adiposity. To clarify these associations, we developed the novel U.S. Healthy Food Diversity(HFD) Index to measure dietary variety alongside dietary quality and proportionality. The objective of this study was to examine the associations between the U.S. HFD with measures of body adiposity in a nationally-representative sample. **Methods:** Data from non-pregnant, non-lactating adults ages 20+y with 2 complete 24-hour recalls from the cross-sectional National Health and Nutrition Examination Survey(NHANES) 2003-2006 were used(n=7,460). The odds of excess adiposity as measured by BMI, waist to height ratio(WHtR), android:gynoid(A:G) ratio, fat mass index(FMI) and percent body fat were assessed across U.S. HFD quintiles. Multivariate logistic regression adjusted for demographic factors, smoking, energy intake, screen time, and leisure activity were used to compute odds ratios(OR) and 95% confidence intervals(CI)(SAS v9.3). **Results:** Higher U.S. HFD scores, reflective of more healthful varied diets, were inversely associated with all measures of adiposity among women in age-adjusted analyses(p<0.05). After multivariate adjustment, the odds of overweight, WHtR$\geq$0.5, and AG ratio>1 were 23-49% lower(p-trend<0.01) in Q5 vs.1 of the U.S. HFD. Among men, the odds of obesity and high FMI in Q5 vs.1 were 43-45% lower(p-trend<0.01) in fully adjusted models. Non-significant protective trends were observed for other measures of adiposity in both sexes. **Conclusions:** Higher U.S. HFD scores were inversely associated with body adiposity measures in both sexes, indicating that greater variety within healthful foods may protect against excess adiposity. This study explicitly recognizes the potential benefits of dietary variety in obesity and chronic disease management.

T-829-P

Association of Gestational Diabetes (GDM) and Breastfeeding (BF) Practices on Obesity Prevalence in Low-Income Youth

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Background: Few studies have assessed the effects of GDM and BF on obesity prevalence in offspring, particularly in minority youth. Current studies show either a protective or non-protective effect on offspring. The goal of this study was to examine if BF duration by GDM status impacted the prevalence of obesity in offspring. **Methods:** GDM and infant feeding data were obtained from a 2011 phone survey with caregivers of low-income children (2-4 y) participating in the Women, Infants and Children (WIC) program in Los Angeles County. The final sample included 2295 children, 84% Hispanic and 48% female. Chi-square and binary logistic regression were used to assess GDM status and BF duration on the prevalence of obesity, with the following a priori covariates: child's ethnicity, birth weight, age in months, and sex. BF and GDM were significantly associated with obesity prevalence (*P< 0.01*). **Results:** Using GDM and no BF as the referent category, non-GDM offspring who were BF 1 day to <6 months, 6- <12 months, and ≥12 months had a 66%, 71%, and 79% decrease in obesity prevalence (Adjusted Odds Ratio (AOR)=0.34, CI 0.92-0.04, *P= 0.04*; AOR=0.29, CI 0.29-0.79, *P=0.02*; AOR=0.21, CI 0.21-0.57, *P< 0.01*). Only GDM offspring who were BF ≥ 12 months had a 72% decrease in obesity prevalence (AOR=0.28, CI 0.89-0.03, *P= 0.05*), whereas the other BF duration groups in GDM offspring were not significant. **Conclusions:** These findings suggest that >12 months of BF duration in the GDM group and any duration of BF in the non-GDM mothers is needed to reduce obesity levels in a primarily Hispanic population.

T-830-P

Changes in Waist Circumference Relative to BMI in Chinese Adults from 1993 to 2009

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Background: Body mass index (BMI) and waist circumference (WC) have increased in China in recent decades. This study examines how WC relative to BMI has changed over the past two decades with rapid increase in obesity in adults from 1993 to 2009. **Methods:** Data on adults aged 20-59 years from 3 waves (1991, 1993 and 2009) of the China Health and Nutrition Survey (CHNS) (1991 n=6,839; 1993 n=6,165; 2009 n=6,656) are used. Stratifying by gender, BMI was regressed on age using quantile regression to examine distributional changes in BMI (1991 vs. 2009). Then, in sex-stratified models, WC was regressed on BMI, including terms for survey year and the interaction of BMI and survey year, controlling for age, using linear regression (1993 vs. 2009). **Results:** Increases in BMI across the full BMI distribution were observed over time. For example, based on our model predictions, at the 85th percentile of the sample BMI distribution, 40 year-old males had a BMI of 27.2 in 2009 compared to a BMI of 24.3 in 1991, while females had a BMI of 26.6 in 2009 compared to a BMI of 25.2 in 1991. Further, we found increases in WC at a given BMI value over time. For example, model predictions indicate that for a BMI of 28, 40 year-old males had a WC of 94.7 cm in 2009 compared to 90.5 cm in 1993. For the same BMI and age, females had a WC of 89.6 cm in 2009 compared to 87.1 cm in 1993. **Conclusions:** Average WC for BMI has changed in China over the past two decades. Not only has the BMI distribution shifted rightward, but at each BMI unit, WC has increased significantly. Chinese adults may be at increased cardiometabolic risk stemming from increased WC, even at equivalent BMI.

T-831-P

Trends in Consumption of Ultra-Processed Foods and Obesity in Sweden Since 1960

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Background: Processed foods and drinks, i.e convenience or junk food with low nutritional content from industrial manufacturing, may play a major role in the obesity epidemic. We aimed to investigate how the consumption of ultra-processed foods has changed in Sweden in relation to the increased prevalence of overweight and obesity. **Methods:** National trends in per capita food consumption from 1960 to 2010 were investigated using data from the Swedish Board of Agriculture. Food items were classified as group 1 (unprocessed or minimally processed), group 2 (culinary/food industry ingredi-

ents) or group 3 foods (ultra processed food products) as proposed by Monteiro et al (2010). Secular trends in consumption were compared to changes in prevalence of overweight and obesity in Sweden during the corresponding period. **Results:** During the study period consumption of group 1 foods (minimal processing) increased by 2%, while consumption of group 2 foods (processed ingredients) decreased by 25%. Consumption of group 3 foods (ultra-processed) rose by 252% reaching almost the same per capita intake as group 1 foods in 2010 (343 vs. 377 kg/capita, respectively). In parallel, rates of adult obesity increased significantly from 5% of Swedish adults in 1980 to over 11% in 2010. **Conclusions:** The consumption of ultra processed foods has increased dramatically in Sweden since 1960, which closely tracks the increased prevalence of obesity, suggesting a possible causal link. Future research is needed to clarify the potential role of ultra processed foods in obesity and public health.

T-832-P

Comparisons of Total and SSB-Specific Calorie Intake in Adults: The New York City 24-Hour Dietary Recall Study

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Background: Sugar-sweetened beverages (SSBs) are linked with obesity, diabetes, and other noncommunicable diseases. In addition to added calories from SSB sources, total daily caloric intake typically increases with sugary drink consumption as they do not satiate like other foods. We analyzed the impact of sugary drinks on caloric intake using a population-based dietary recall of New York City residents, the first representative recall conducted in the city. **Methods:** The 2013 NYC 24-Hour Dietary Recall Study was a cross-sectional study in a representative sample of adults age 18 and over. Participants for the dietary recall were recruited from a random digit dial telephone survey. 2,172 surveys and 488 recalls were completed. We analyzed differences in total caloric intake between SSB and non-SSB consumers as well as beverage, SSB, and food-specific calories. We also determined the distribution of SSB portion sizes. Regression models were used to predict SSB and total caloric intake by demographic subgroups and lifestyle. **Results:** Adult SSB consumers had an average intake of 2,181 k/cal per day, compared to 1,609 for non-SSB consumers. SSBs contributed 193 kcal/day. SSB drinkers also consumed more daily food calories (1,838 vs. 1,462). SSB drinkers were typically younger, from minority groups, considered their overall diet to be less-healthy, and were less physically active. 38% of adults reported having an SSB on the previous day. Average total SSB intake among consumers was 1.8 drinks per day. **Conclusions:** SSBs continue to be a large contributor to individual diet, being responsible for 40% of overall daily drink-specific caloric intake. Among SSB consumers, sugary drinks contributed 60% of drink-specific calories. Efforts to limit sugary drink consumption may have benefit beyond simply reducing calories from sugary drinks.

T-833-P[DT]

The Effect of Food Variety on Reporting Error and Body Mass Change

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Background: The prevalence of obesity is increasing worldwide and may be attributed to increased energy intake (EI). Recent evidence suggests dietary variety (DV) may contribute to increased EI. Capturing EI, is however, prone to dietary reporting errors (DRE). Using data from the Modeling the Epidemiologic Transition Study (METS), we explored the association between DV, DRE, and body mass (BM). **Methods:** 258 Subjects underwent DLW analysis, to determine total energy expenditure (TEE). True average EI, over one year, was calculated using change in fat mass and fat free mass, and TEE at baseline, using a published equation. EI and DV was captured from two 24 hr recalls and using NDSR. For DV, NDSR reports 168 ingredient level categories and is defined as the number of NDSR categories a subject ate during 1 day. We used linear regression to explore the associations between BM, DV, reported EI, true EI, DRE, and BM change over one year. **Results:** We found positive associations between BM and true EI 7(r= 8.985, p<.001), BM and DRE (r=11.819, p<.001), as well as DV and reported EI (r=73.212, p<.001). The association between BM and DRE were no longer significant after adjusting for true EI (p=.398). There was a negative association between

DV and DRE (r=-37.242, p<.001) and no associations between DV and true EI, BM and reported EI, or BM and DV or BMI change. **Conclusions:** Our data reinforces associations between BM and EI, as well as EI and DRE, indicating that DRE is due more to EI than BM. We observed an association between DV and reported EI, but not between DV and true EI. We also found a new association between DV and lower DRE. Future studies are needed; longer studies may show larger changes in BM that have significant associations not found here. It is also important to determine if the way DV is defined will affect its relationship with true EI.

T-834-P
Behavioral Correlates of Adult Daily Consumers of Sugar-Sweetened Beverages, 2011 Behavioral Risk Factor Surveillance System

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Background: Excess intake of sugar-sweetened beverages (SSB) is linked to weight gain. Although recently SSB intake has been decreasing, it still remains high among some U.S. adults. There is limited information on behavioral factors associated with SSB intake among U.S. adults. **Methods:** The 2011 Behavioral Risk Factor Surveillance System data for 38,978 adults (≥18 years) from 6 states were used. The outcome variable was SSB intake (2 questions: regular soda and fruit drinks). Multivariate logistic regression was used to estimate adjusted odds ratios (OR) and 95% confidence intervals for characteristics associated with SSB intake. **Results:** Overall, 23.8% of adults reported drinking SSB ≥1 time/day with 10.7% doing so ≥2 times/day. Adjusted odds for drinking SSB ≥1 time/day were significantly greater among younger adults, males, non-Hispanic blacks, adults with lower education levels, those with lower household income or with missing income data, adults with whole fruit intake of <1 time/day (vs. ≥1 time/day), those who were physically inactive (vs. highly active), current smokers (vs. nonsmokers), and adults who lived in Delaware, Iowa, and Wisconsin (vs. Minnesota). The factor most strongly associated with daily SSB intake was age; the OR compared to adults aged ≥70 years decreased as age increased (OR ranged from 3.37 for 18- to 29-year-olds to 1.37 for 50- to 59-year-olds). However, odds for drinking SSB ≥1 time/day were significantly lower among adults with 100% fruit juice of <1 time/day (OR=0.73; vs. ≥1 time/day) and adults who consumed alcohol (OR=0.81 for any drinking and OR=0.66 for heavy drinking; vs. no drinking). **Conclusions:** These findings can help public health professionals and health care providers identify adults most in need of counseling and prevention efforts to decrease SSB intake and increase healthier beverage intake.

T-835-P[DT]
What Factors Promote a Healthy Home Food Environment?

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Background: The foods available in the home are associated with child diet and obesity. To understand the full impact of this food environment it is critical to determine the factors that influence the foods available in the home. **Methods:** Using objectively collected exhaustive home food inventories from 80 African American first time mothers, we determined associations of 8 predictors including shopping habits, eating out, food security and weight status of household members on the foods in home. We used generalized estimating equations controlling for household size and composition and other covariates. **Results:** Households with recent (<=7 days) large shopping trips, or frequent trips (bi-weekly) had more calories and grams of fat available in the home, and energy density did not differ. Eating out for breakfast, lunch or dinner had little impact on the food composition in the home. However, households eating out for snacks 3-8 times/month had significantly more calories, and fat, percent energy from fat and percent energy from non-oil fat than those who ate out more or less frequently for snacks. Food insecure homes had 49,348 fewer kCal than food secure homes (p=0.03). They also had significantly less total fiber, total fat, and total non-oil fat than food secure homes, while energy density and number of food items did not differ. Additionally, we observed that households with obese mothers had 65,958 more kCal than households with normal weight mothers (p<0.01), similar trends were seen for total fat. Households with overweight children had significantly more kCals, fiber, and fat than households with normal weight children. **Conclusions:** This study addresses an important gap in our understanding of the factors that influence foods available in the home and will inform in-home obesity prevention strategies and interventions.

T-836-P[DT]
Obesity in South African Women Linked to Food Insecurity During Childhood and Sedentary Behaviour

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Background: In South Africa more than 50 percent of adult women and 30 percent of adult men are either overweight or obese. Against this backdrop, 20% of adults are estimated to be HIV-positive, and 1 in 5 children (<5yrs) is stunted. We examined the interaction between current BMI and physical inactivity, food security and childhood hunger in a sub-sample of South African men and women, from a disadvantaged urban community. **Methods:** The 166 individuals (aged 25-45, 69 men, 97 women) formed part of the 1 year follow-up sample in South Africa, as part of the METS Study (Modeling the Epidemiologic Transition), a longitudinal study, in 5 countries in populations of African origin. One year measurements included: BMI, body composition, self-report physical activity, an urban food security household survey, and a childhood hunger index (early life experience of food insecurity). We used logistic regression to model obesity, taking into consideration gender, sedentary behaviour, household food security, and childhood hunger. **Results:** The mean BMI for men was 23.7 (SD 4.6) compared to 32.9 (SD 9.2) for women. The odds for obesity were significantly higher in women (P < 0.0001) and in relation to levels of self-reported physical inactivity (P<0.04). Current household food insecurity was inversely associated with obesity in women (P < 0.0001) and childhood hunger was positively associated (interaction with gender) with obesity in women (P < 0.00001). These same relationships were not shown in men. **Conclusions:** These preliminary data highlight the complex relationships between obesity and food security, particularly in communities in transition, and may help to inform policy and programs to prevent obesity in lower and middle income countries.

T-837-P[DT]
Impact of Immigration to the U.S. on BMI Patterns in Asians

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Background: In the US, Asians are an understudied population in relation to disease risk, yet in recent years they represent the largest group of new immigrants. Exposure to a Western environment, especially at younger age, is hypothesized to lead to increases in BMI among Asians after immigration. **Methods:** We examined whether the age-BMI association differs by place of residence using data on 1,549 1st generation Asian American men living in the US for <25 years and enrolled in the Kaiser Permanente California Men's Health Study. Participants were 44-71 years old at baseline (2002-2003) and reported weight history and current height which were used to calculate BMI (kg/m^2) at ages 30, 40, 50 and 60 years. Place of residence (US or Asia) at these ages was determined by age at baseline minus length of US residence. The data were analyzed using Generalized Estimating Equation models adjusted for baseline age, education and income. **Results:** At age 30, mean BMI was significantly lower among Asians living in the US than among those living in Asia (US: 21.3, 95% confidence interval: 20.9-21.7; Asia: 21.7, 21.6-21.9). However, at ages 40, 50 and 60 mean BMI was significantly higher among Asians in the US; mean BMI in the US ranged from 23.3 (23.1-23.4) at age 40 to 24.9 (24.7-25.1) at age 60, while in Asia the corresponding values were 23.0 (22.8-23.2) to 24.1 (23.6-24.7). Between ages 30-40, 40-50 and 50-60 the 10-year increase in BMI was 0.7 (0.3-1.1), 0.1 (-0.2-0.4), and 0.4 (-0.1-0.9) kg/m^2 more among US Asians compared to those living in Asia, respectively, with only the change between 30-40 years being significantly different by place of residence. **Conclusions:** Our results support the hypothesis that younger age at immigration yields larger increases in BMI. Exposure to Western culture appears to be obesogenic.

T-838-P

Hypovitaminosis D and Obesity: Serum 25-hydroxyvitamin D [25(OH)D] Levels, BMI z-score and Obesity Related Co-Morbidities in Obese Children and Adolescents Seeking Treatment

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Background: Obesity is a risk factor for low 25(OH)D. However it is not known exactly how obesity contributes to hypovitaminosis D or if the degree of obesity influences 25(OH)D levels. **Methods:** Retrospective chart review of children and adolescents evaluated in a comprehensive obesity clinic (n = 379). Demographic data, height, weight, 25(OH)D and other fasting laboratory values and obesity-related diagnoses were extracted from the EHR and BMI and BMI z-score calculated. Pearson's or Spearman's rho correlation coefficient, chi-square tests, independent samples t-tests and one-way ANOVA were employed where appropriate. **Results:** Total 25(OH)D levels were > 30 ng/ml in 12.7%, 20-30 ng/ml in 39.3%,< 20 ng/ml in 48%, < 15 ng/ml in 25.3% and < 10 ng/ml in 8.4% of patients. Alkaline phosphatase (AP) was elevated in 16.8% of samples. African American race and winter season were associated with lower 25(OH)D levels. Alanine aminotransferse and triglyceride levels displayed a weak positive relationship with 25(OH)D. No significant relationship between 25(OH)D and age, gender, snoring, joint complaints, hsCRP, AP, HDL, LDL or non-HDL cholesterol was found. A weak, but non-significant positive correlation between 25(OH)D and BMI z-score was observed. 25(OH)D2 was detected in only 3.5% of patients. **Conclusions:** A majority (87.3%) of patients were 25(OH)D insufficient or deficient. There was no correlation between the extent of obesity and 25(OH)D levels. Hence simple partitioning of 25(OH)D into adipose tissue is not likely the exclusive mechanism for obesity-related hypovitaminosisD. Low 25(OH)D was associated with bone demineralization as indicated by elevated iPTH, therefore the lack of a relationship between AP and 25(OH)D levels was surprising and may indicate that elevated AP is of hepatic origin. Diet was not a significant source of 25(OH)D in 96.5% of patients.

T-839-P[DT]

Healthy Obesity Is Not Associated with Food Intake in White and Black Women

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Background: Metabolically healthy obesity may confer lower risk for adverse health outcomes compared to abnormal obesity. Diet is postulated to influence the phenotype but its role is insufficiently understood. Race may in turn modify the relationship between diet and healthy obesity but the inter-relationships of diet and race on the phenotype are unclear. **Methods:** We tested the hypothesis that healthy obesity is associated with higher consumption of healthy foods (such as vegetables, fish) and lower intakes of less healthy foods (such as processed meat, sugar-sweetened beverages) than abnormal obesity but similar food intakes as healthy normal weight in a cross-sectional study of 6,964 disease-free women aged ≥45 years of the REasons for Geographic And Racial Differences in Stroke study. Body mass index (BMI) phenotypes were defined using metabolic syndrome and homeostasis model assessment of insulin resistance (HOMA-IR) criteria. Food intake was estimated using a food frequency questionnaire. Mean differences in food intakes among BMI phenotypes were compared using ANCOVA. **Results:** Diet interacted with race (P<0.05). In age-adjusted analyses, white and black healthy obese and normal weight women, defined by both criteria, had lower soda consumption compared to abnormal obese women (P<0.05). White healthy normal weight and obese women, based on HOMA-IR criteria, also had higher fruit and low-fat dairy intakes than abnormal obese women (P<0.05). Results became insignificant in multivariable-adjusted models. **Conclusions:** Our findings do not support the hypothesis that healthy obesity is associated with a healthy diet. Additional research using prospective models and dietary patterns, a better indicator of usual diet, is needed.

T-840-P

Consumption of Processed Foods and Its Effects on Children's Lipid Profiles

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Background: Cardiovascular disease risk factors start in childhood and feeding practices are one of the main concern factors. The objective of this study was to evaluate the association between processed foods intake at preschool age and serum lipids at school age. **Methods:** Cohort study conducted with 345 children of low socioeconomic status from São Leopoldo, Brazil aged 3-4 years and 7-8 years. Blood tests were done to measure lipid profile. Dietary data were collected through two 24-hour recalls and children's processed foods intake was assessed. Adjusted linear regression analysis was used to assess the effect of processed foods intake at 3-4 years on unit changes in lipoprotein concentrations from preschool to school age (Δ lipoprotein concentrations). **Results:** The percentage of daily energy provided by processed foods was 42.3±14.6 at preschool age and 48.6±15.5 at school age, on average. Processed foods intake at preschool age was a predictor of higher increase in total cholesterol (β=0.270; P<0.001), LDL-cholesterol (β=0.220; P=0.004), and non-HDL-cholesterol (β=0.250; P=0.001) from preschool to school age. Children in the second, third and fourth quartiles of percentage of energy from processed foods had Δ total cholesterol, Δ LDL-cholesterol, and Δ non-HDL-cholesterol that were an average of 0.216 to 0.326 mg/dl higher than children in the first quartile (<32.3%). **Conclusions:** Consumption of ≥32.5% of energy from processed foods was associated with modified serum lipids profile. These findings add new evidence to the limited literature available with children on the role that processed foods may play in relation to cardiovascular risk factors. Support: CNPq and CAPES, Brazil (F.R. doctoral fellowship, proc. no. 9853-11-1).

T-841-P

Gestational Weight Gain Increases Risk of Overweight for Brazilian Women of Low Socioeconomic Status

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Background: Pregnancy weight gain may lead to long-term increases in maternal BMI for some women. The objective of this study was to evaluate the nutritional status of women before pregnancy and twelve months postpartum and to identify factors related to postpartum weight retention. **Methods:** A cohort study of pregnant women visiting primary care units in Porto Alegre, Brazil. Pregnant women were first interviewed during the third trimester of pregnancy and pre-pregnancy weight was self reported. Follow-up included home visits twelve months postpartum and anthropometric measurements were taken. Nutritional status was assessed using the Body Mass Index (BMI) and women with BMI ≥ 25 kg/m2 were classified as overweight. **Results:** At six and twelve months postpartum, 633 and 545 women were assessed, respectively. Women were more likely to be overweight twelve months postpartum compared to the pre-pregnancy period (52.9% vs. 36.7%; P <0.001) and weight retention in the twelve months postpartum was more than 10 kg in 29.7% (n=102) of the women. Weight retention in the postpartum period was higher among women who were overweight compared to those who were of normal weight in the pre-pregnancy period (9.98±7.50 vs. 6.23±3.67; P = 0.013). Nutritional status before pregnancy (β = 0.209; P ≤ 0.001), gestational weight gain (β = 0.376; P ≤ 0.001), maternal age (β= -0.179; P = 0.003) and schooling (β = -0.112; P = 0.044) were associated with gestational weight retention twelve months postpartum. **Conclusions:** Nutritional status before pregnancy and gestational weight gain are determining factors increasing the prevalence of overweight twelve months postpartum among women of low socioeconomic status.

T-842-P

Health Literacy and the Attitudes and Behaviors of Hispanic Parents Regarding the Diet and Nutrition of Their Children

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Background: The attitudes and behaviors related to diet and nutrition are known to influence the risk of obesity. Research indicates that health literacy is a key factor in establishing these dietary habits. While prevalence of obesity is higher among Hispanic children than Caucasian or African American children, little is known about the relationship between health literacy and at-

titudes and behaviors among parents regarding the diet and nutrition of their children. **Methods:** In spring 2013, 107 Hispanic parents/primary caregivers (mean age 32 years) of children aged 6 months to 6 years attended a pediatrics clinic and completed a waiting room survey that assessed the attitudes and behaviors of parents regarding the nutrition of children. The survey included the Newest Vital Sign, a validated measure of health literacy in English and Spanish. The proportion of healthy attitude and behavior choices were compared to health literacy scores. **Results:** The large majority of parents/caregivers (89.7%) were women, 90.5% of low family income, and 47.2% had received prior training about nutrition. A large proportion of the parents were of very low health literacy (76.4%), with 21.8% of limited literacy and 1.8% of adequate literacy. 58.7% of parents were considered to have unhealthy behaviors and 18.3% had unhealthy attitudes regarding the decisions made for the nutrition of their child. **Conclusions:** There is a strong discrepancy between the attitudes and behaviors of parents regarding the diet and nutrition of their children, most prevalent among those with poor health literacy. In our analysis, health literacy was not a significant predictor of health attitudes or health behaviors alone. Larger studies among Hispanics are needed to more closely assess this trend.

T-843-P

Knowledge and Behaviors Related to U.S. Dietary Guidelines and Recommended Child Feeding Practices among Hispanic Parents of Young Children: A Cross-Sectional Study

Jeffrey Holzberg, Jessica Cruz, Monica Griffin, Ruba Cheaib, Jean A. Welsh *Atlanta, GA*

Background: Parental awareness of dietary recommendations is known to influence the diet of the children which in turn has a large effect on their risk for obesity in childhood. While the prevalence of obesity is higher among Hispanic children than white or black children, the extent to which their parents are knowledgeable about and seek to comply with current dietary recommendations is unknown. **Methods:** In spring 2013, 107 Hispanic parents/primary caregivers of children aged 6 months to 6 years attended a pediatrics clinic and completed a waiting room survey designed to assess the feeding practices of their child. The survey also estimates the parent's knowledge about U.S Dietary Guidelines related to the intake of fruits and vegetables, whole grains, sugar-sweetened beverages and milk. The proportion of parents who respond correctly to each item was calculated. **Results:** The majority of parents/caregivers (89.7%) were women, 90.5% of low family income, and 47.2% had received prior nutrition training. Among them: 41.3% knew that it is recommended that half of children's meals should be fruits and vegetables; 36.4% thought that fruit-flavored drinks, Gatorade or soda was a healthy alternative to beverages high in sugar. The majority of parents (83.2%) knew that children often need to try a new food multiple times before learning to like it but over half (52.3%) believed that it was OK to make their child something else if they rejected the meal that had been served. **Conclusions:** Many Hispanic parents of young children lack knowledge of and/or failed to comply with current child nutrition and feeding practice recommendations. Studies to determine if programs designed to improve child nutrition knowledge among these parents are effective in modifying behaviors.

T-844-P

Habitual Coffee Consumption and Incidence of Central Obesity in Chinese-Taichung Community Health Study (TCHS)

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Background: Coffee consumption is inversely associated with the risk of cardiovascular disease. We investigated the relationship between coffee consumption and incidence of central obesity in a population-based cohort of middle-aged Chinese. **Methods:** A total of 2332 subjects aged ≥ 40 years were recruited as baseline in 2004 in Taiwan. Of these, 1076 baseline non-central obese subjects with a mean 2.8 years follow-up, 495 of whom exhibited incident central obesity. Multiple logistic regression analyses were used to evaluate the relationship between coffee consumption and incidence of central obesity **Results:** After adjustment for age, gender, body mass index, calorie intake, smoking, alcohol drinking, betel nut chewing, physical activity, education level, and income level, coffee consumption was inversely associated with incident central obesity. Habitual coffee drinkers had 25%

lower risk of incident central obesity than non-drinkers. Compared to non-drinkers, the adjusted relative risks (RRs) for incident central obesity according to subjects with habitual coffee consumption (<1, ≥ 1 times per week) were 0.79(95% CI: 0.57-1.10), and 0.72(0.52-0.995), respectively. The decreasing RRs indicate a dose-response effect of coffee consumption on the likelihood of having incident central obesity ($p < 0.05$). **Conclusions:** Coffee intake is inversely associated with incident central obesity in Chinese. Coffee may be a protective agent for central obesity in Chinese.

T-845-P

The Healthy Beverage Index: A Tool to Measure Overall Beverage Intake Quality in U.S. Adults

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Background: Epidemiological studies suggest that energy intake is lower (~9%, 194 kcal/d) in water drinkers compared with those who do not drink water, and that sugar-sweetened beverage (SSB) consumption is associated with weight gain and obesity. Although the 2010 Dietary Guidelines recommend drinking water instead of sugary drinks, no tools currently exist which measure overall beverage intake quality. **Methods:** A scoring algorithm, similar to that of the Healthy Eating Index-2010, was developed using the beverage intake recommendations of the Beverage Guidance Panel (Popkin et al, 2006), total beverage energy recommendations, and meeting fluid requirements. Multivariable poisson regression models were used to examine the association between the healthy beverage index (HBI) and cardiovascular outcomes, adjusting for important sociodemographic factors. **Results:** The ten item index had a mean (SD) score of 65.6 (0.22) from a possible 100 points. Four components of the scoring algorithm considerably differentiated individuals in the four quartiles of the HBI score: meeting requirements for total fluid intake, % energy from beverages, and water and SSB intake (20-50% and 0-8% of fluid needs, respectively). Each 10 point higher HBI score was associated with reduced risk (Risk Ratio [95% Confidence Interval]) for high cholesterol (0.98 [0.97, 1.00]), low HDL-cholesterol (0.97 [0.95, 0.99]), fasting insulin (0.97 [0.95, 0.99]), and high CRP (0.94 [0.92, 0.97]). **Conclusions:** The Healthy Beverage Index could be used to evaluate overall beverage intake quality, and to determine if changes in beverage intake patterns are associated with improvements in health outcomes such as weight loss and chronic disease risk.

T-846-P

Eating Well, Not Less, Protects Fire Fighters from Obesity

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Background: Approximately 80% of the 1.1 million US fire fighters (FF) are overweight or obese. Despite these staggering rates, no study has evaluated the association of diet and obesity among FF. We describe dietary patterns and the relationship with BMI in FF. **Methods:** Principal component analyses (PCA) derived dietary patterns from the average intake of 37 food groups reported in two, 24-hour dietary recalls of 642 male FF. The top five PCA dietary patterns were used to score how closely FF's food intake aligned with each diet pattern. Quartiles of FF scores on each pattern were created and the variation in BMI explained by each of the dietary patterns was determined using multiple linear regression adjusting for ethnicity, age, energy intake, and physical activity. **Results:** Higher score on a nutrient rich dietary pattern consisting of milk/dairy, fruits/juices, nut butters, whole grain cereals, vegetables, and deli meats/sausages/bacon had a significant inverse relationship with BMI in adjusted models (p-for trend 0.001). FF in the lowest quartile of this pattern had an adjusted BMI 1.48 kg/m2 (95% CI: 0.50-2.46) greater than FF in the highest quartile. FF in the highest quartile also had higher energy intakes than those eating a diet less consistent with the pattern. The other 4 dietary patterns not significantly associated with BMI consisted largely of sweets, sugar-sweetened beverages, breads, pastas, oils, condiments, starchy vegetables, salty snacks, red meat, and alcohol. **Conclusions:** The nutrient rich, high energy diet pattern of some FF should be explored to develop an approach to address FF obesity.

T-847-P
On-The-Road Weight Loss for Professional Truck Drivers

Peter Vash, Ann Marie Coppen, Kathy Ayres *Costa Mesa, CA*

Background: Obesity is a major medical problem, yet a large segment of the obese working population, professional truck drivers, are an underserved, untreated group because of limited access to care, unhealthy food options and severe schedule constraints. Their sedentary, stressful jobs create increased risks for chronic diseases, loss of employment and danger to themselves and other motorists. The driving industry suffers from 11 times greater fatality rates than any other industry. Due to stricter federal Department of Transportation health exam guidelines for the industry and concerns about obesity, Lindora Clinic established a partnership with a national trucking association, the Truckload Carriers Association, to promote weight loss through an innovative coaching program. **Methods:** The Trucking's Weight Loss Showdown was developed as a weight loss contest designed to motivate and engage obese drivers to lose weight. Participants were given a structured, calorie restricted, low fat, and moderate carbohydrate diet with behavior modification techniques for a period of ten weeks. Support was given through dietary education and guidance via weekly telephonic coaching and an online program. **Results:** A total of 134 drivers, with an average BMI was 40.2, started the program. 73% of drivers were able to lose 5% or more of their beginning body weight and 36% were able to lose 10% or more. An average weight loss of 8.3% was achieved with an average BMI reduction of 3.2 units. **Conclusions:** The Lindora Showdown program showed that a weight loss intervention for difficult to reach, underserved, high risk populations can be implemented through mobile technology to produce promising and significant results.

T-848-P
Non-Supplemental Nutrient Intake During Pregnancy and 3 Months Postpartum

Nicole M. Wedick, Barbara Olendzki, Katherine Leung, Hyung-joo Kang, NingNing Zhang, Silvia Corvera, Mary M. Lee, Tiffany A. Moore Simas, Milagros Rosal *Worcester, MA*

Background: Among pregnant or postpartum women, relatively few data have been published on macro- and micronutrient adequacy excluding the use of diet supplements. **Methods:** Using data collected from 24 hour dietary recalls, we evaluated the nutrient intake during pregnancy and follow-up (3-months postpartum) in 110 women without gestational diabetes. We then compared the intake levels to the dietary guidelines from both the American College of Obstetricians and Gynecologists 2012 and the USDA's 2010 Dietary Guidelines for adult women less than 50 years. **Results:** The mean age was 29 (19-43) years, 62% White, and the majority of participants reported education beyond high school. The pre-pregnancy BMI was 27.2±6.1 kg/m2 and 52% were overweight or obese. At baseline, the total carbohydrate, protein and fat were all within recommended ranges. Looking more closely however, saturated fat exceeded <10% (11.1%), and dietary fiber (16.3 g/d) was lacking. Micronutrient inadequacy was observed for calcium, iron, magnesium, folate and potassium. Mean sodium intake was 3221.9 mg/d, exceeding the limit of <2300 mg/d. B-vitamin intake fell within recommended ranges, possibly indicating consumption of fortified foods. Similar patterns were observed at the follow-up visit with the exception of total energy intake which was expectedly higher during pregnancy (mean=2019.4 kilocalories) compared to 3 months postpartum (mean=1837.4 kilocalories). **Conclusions:** These observations indicate that while macronutrient requirements are being met, diet quality is at risk, with vital micronutrients crucial to fetal development and health of the mother below recommended levels. Efforts to educate and encourage women to consume a balanced and nutritious diet should be emphasized during all life stages.

T-849-P
Food Marketing at Children: Does It Hold the Balance of Power?

Dario Gregori *Padova, Italy*; Simonetta Ballali, Maria Gabriella Vecchio, Federica Zobec *Trieste, Italy*; Cecilia Bahamonte Perez *Santiago de Chile, Chile*

Background: Childhood obesity is a well-established phenomenon affecting both developed and developing countries. The study was aimed, in a controlled condition, at evaluating the effect on the amount of snacks eaten of (i) having food presented with toys in the package, (ii) being exposed to TV when snacking, (iii) without or with advertising (at an increasing intensity during TV exposure). **Methods:** 80 children (balanced according to gender and age groups, 3-6 and 7-10 years old) were randomised in two schools of Santiago de Chile (Chile) to be exposed in an experimental setting to snacks, alone or associated with toys. Children were asked to eat ad libitum for 20 minutes during the afternoon break. In the TV group, children were in addition randomized to be exposed to three increasing levels of exposure to commercial advertising (1, 2 or 3 times during the TV session). Anthropometrics and socio-demographic data were recorded. Brand awareness was evaluated prior to the study. **Results:** No significant differences emerged between NoTV and TV groups. Registered energy intake and glycemic load showed respectively a median value of 233.26 kcal and 12.71, corresponding to a median of 2 snacks for each child. No significant association between energy intake and gadget was found (p= 0.924). Also when evaluated energy intake after movie and advertising exposure, no significant association was found (p= 0.541). **Conclusions:** The hypothesis that toys might have an effect on increasing energy intake in children was not confirmed. The median consumption was not significantly different in the two subgroups, Toy and NoToy. Results did not confirmed neither the boosting effect of TV exposure and advertising on energy intake.

T-850-P
Effect of the U.S. School Lunch Program on Metabolic Parameters in Obese Children in Dallas, Texas

Madeline Hommel, Charles E. McConnel, Jon Oden, Ximena Lopez *Dallas, TX*

Background: More than one-third of children and adolescents in the U.S. are currently overweight or obese, and the nutritional standards of the National School Lunch Program have come under scrutiny as a possible contributing factor to the child obesity epidemic. The effect on metabolic parameters is largely unknown. **Methods:** We conducted a retrospective review of electronic medical records from patients ages 4-17 referred for obesity to a pediatric multidisciplinary obesity clinic at Children's Medical Center in Dallas. Multiple regression and ANCOVA analyses were performed to find an association on eating school-provided meals with metabolic parameters that included: fasting glucose, fasting insulin, HOMA-IR, 2 hour glucose after a standardized oral glucose tolerance (OGTT), HgbA1c, triglycerides, LDL, HDL, non-HDL cholesterol, ALT, AST and vitamin D25OH levels. **Results:** Data from 758 patients were analyzed. Mean age was 11.6 ± 3.0, 47% were male, 49% Hispanic, 27% Caucasian and 17% African American. Mean BMI Z-score was 2.3 ± 0.35. 81% had government insurance. 54% were eating school lunch and 33% both school breakfast and lunch. Using a model that adjusted for age, ethnicity, insurance status, BMI Z-score, skipping meals, fasting insulin and eating school lunch only, we found that eating the school-provided breakfast and lunch had a statistically significant independent positive association with the 2 hour blood glucose (p <0.03, model R2=.07, p<.0001), and with the HgbA1c concentration (p<0.013, model R2 =.14, p<.0001). No correlations were found for other metabolic parameters. **Conclusions:** In this population, children who consumed school-provided breakfast and lunch had higher 2 hour glucose and HgbA1c levels and might be at higher risk for type 2 diabetes than children who ate one or no school-provided meal.

T-851-P
Normal Weight Obesity and Risk of Disability in the Older Adults: Data from NHANES III

John A. Batsis *Lebanon, NH*; Karine Sahakyan, Virend K. Somers *Rochester, MN*; Stephen J. Bartels *Hanover, NH*; Francisco Lopez-Jimenez *Rochester, MN*

Background: Body mass index (BMI) strata likely misrepresent the accuracy of true adiposity in elders. Elders with normal BMI but elevated body fat are at higher metabolic risk but whether it impacts function is unknown. **Methods:** Subjects aged ≥60years from National Health and Nutrition Examination Surveys III (1988-1994) were included. Normal weight obesity (NWO) was determined using tertiles of %body fat (BF%). Overweight and obese BMI subjects were also stratified by tertiles. Data on functional impairments (FI), instrumental (IADL) and basic activities of daily living (BADL) were obtained. Multivariate logistic regression modeling (referent=lowest tertile) was used to model disability adjusted for age, sex, and race, with and without lean mass (LM) in our models. **Results:** Of 4398 subjects (2259

(51.8%) female), 1528 (34.7%) had a normal BMI. Normal BMI in the highest tertile of body fat [n=505(29.9%)] had similar rates of CHF, MI, Stroke and COPD compared to the lowest or middle tertiles. LM was lower in NWO compared to those in the middle or lowest BF% tertiles (42.6 vs. 44.9 vs. 45.8kg ;p<0.001). NWO subjects had greater functional impairment [OR 1.62 (95%CI:1.11-2.36)] compared with the lowest tertile. Adjusting for LM, FI was similar in NWO subjects [OR 1.46 (0.99-2.15)]. Overweight and Obese subjects (respectively) in the highest BF% tertile had higher risk of FI after adjusting for LM [OR 1.73 (1.17-2.56) and 1.97 (1.19-3.26)]. Only obese subjects in the highest BF% tertile were associated with elevated risk of IADL and BADL impairments [OR 1.89 (1.08-3.32) and 2.32 (1.50-3.58)]. **Conclusions:** Older adults with NWO may not be at increased risk for impairment in disability. Our results suggest that the effect is attenuated after adjusting for LM highlighting the interplay between muscle and adipose tissue on function in older adults.

T-852-P

Adiposity and Risk of Disability in Older Americans: Data from NHANES III

John A. Batsis *Lebanon, NH*; Karine Sahakyan, Virend K. Somers *Rochester, MN*; Stephen J. Bartels *Lebanon, NH*; Francisco Lopez-Jimenez *Rochester, MN*

Background: Current body mass index (BMI) strata likely misrepresent the accuracy of true adiposity in elders.Whether adiposity measured by body fat % (BF%) is associated with functional outcomes requires further study. **Methods:** Subjects aged ≥60years with a BMI≥18.5kg/m2 with anthropometric and bioelectrical impedance measures from NHANES III(1988-1994) were included. We created sex-specific tertiles of BF%. Data on functional impairments (FI), instrumental (IADL) and basic activities of daily living (BADL) were obtained. Comparative rates among each tertile group using multivariate logistic regression modeling (referent=lowest tertile) were assessed. Base model adjusted for age, sex, fat-free mass and race, separately adjusting for BMI as a categorical and continuous variable. Results were weighted using NHANES methodologies. **Results:** The final sample included 4,484 subjects, mean age 69years. Lean mass was higher in the elevated BF% group than the other subgroups (52.5 vs 50.7vs 47.2;p<0.001). Subjects in the highest BF% tertile had higher risk of FI than the referent category, although using BMI as a continuous variable as compared to a categorical variable attenuated the association with BF% [OR 1.65(1.16-2.35) and OR 2.08(1.50-2.86)], respectively. Subjects in the highest tertile had higher risk of IADLs and BADLs using BMI as a categorical variable [OR 1.65(1.12-2.43) and 2.02(1.36-2.99), respectively]. Using BMI as a continuous variable attenuated the effect on both IADLs and BADLS [OR 1.12(0.77-1.63) and 1.58(1.11-2.27)]. **Conclusions:** Elevated BF% is likely associated with increased risk of impairment in older adults. Our results highlight the importance of recognizing that obesity is associated with disability in older adults, but that incorporating standard BMI categories into our analyses may overinflate estimates and need re-visiting in older adults.

T-853-P

Intervention Programs to Improve the Quality of the School Lunch Packs: Systematic Review

Ernestina Santillana, Montserrat Bacardi-Gascon, Arturo Jimenez-Cruz *Tijuana, Mexico*

Background: School lunch packs (LP) have been found to be unhealthy. It is recommended that a healthy LP should include fruits, vegetables and whole grains. Several studies have explored the efficacy of promoting the inclusion of fruits and vegetables in the LP. The purpose of this study was to analyze randomized intervention trials assessing the effect of programs addressed to improve the quality of the LP. **Methods:** an electronic search was conducted in MEDLINE/PubMed, and Ebsco data base, of RCT published from January 1996 to April 2013. **Results:** Five studies were reviewed, which included 2.5 to 11 years old children. The time of intervention ranged from 0.5 to 33 months, and the retention rate was ≥ 75%.In all the studies it was observed a significant increase in the consumption of fruits and vegetables in the intervention group compared with the control group. **Conclusions:** This review shows a consistent positive effect of intervention programs addressed to improve the quality of the LP and the consumption of fruits and vegetables among school age children.

T-854-P^DT

Nutrition and Physical Performance in Athletes with Intellectual Disability and the Knowledge Level of Their Caregivers

Blanca E. Hernandez Martinez, Ana O. Caballero Lambert *Leon, Mexico*; Martha L. Guevara Sangines *Guanajuato, Mexico*; Judith Orozco Mendez, Ana K. Estrada Salas *Leon, Mexico*

Background: Population with intellectual disability presents risk factors to health and nutrition; there are only few studies that characterize this problematic situation. **Methods:** The objetive of this study was to determine food intake, nutrition diagnosis, physical performance and hydration status in 179 athletes with intellectual disability belonging to a Mexican Special Olympics organization, as well as knowledge level and hydration habits of parents or caregivers. A descriptive study was conducted. Food intake was obtained through a validated semi-quantitative questionnaire (SNUT); nutrition diagnosis was determined by anthropometry; physical performance was evaluated by DIDEFI® tests; hydration status was determined by urinary density; and parents or caregiver s knowledge level and habits of hydration and nutrition were evaluated by two validated questionnaires. **Results:** Age group 11-20 y presents the highest calorie and macronutrient intake. Nutritional assessment shows that 43.6% of the participants are overweight and 4.5% low weight. Findings in physical tests show a tendency to monotonic growth in the strength of the hand and abdominals per minute, a parabolic tendency in the horizontal jump and a hazardous representation in the flexion of the trunk. 56.42% of the athletes presented dehydration. Analyzing the parents/caregivers questionnaires, we found that the knowledge one had a statistically significant higher grade than the questionnaire regarding hydration habits. **Conclusions:** Athletes with intellectual disabilities are a risk group because they present factors such as lower weight and overweight and dehydration; their parents or caregivers lack knowledge in nutrition and good hydration habits, factors which could put them in health and physical performance risk.

T-855-P^DT

Breakfast Patterns among Low-Income, Ethnically Diverse Elementary School Children in an Urban Area

Hannah G. Lawman, Stephanie S. Vander Veur, Heather M. Polonsky, Timothy A. Sanders *Philadelphia, PA*; Lisa Bailey-Davis *Danville, PA*; Janet Ng *Hartford, CT*; Gary D. Foster *Philadelphia, PA*

Background: School breakfast has been advocated to prevent childhood obesity. Students' breakfast patterns at and outside of school are not known raising the possibility of multiple breakfasts that would have negative consequences for energy intake and obesity. The aim of the current study was to describe morning food and drink consumption patterns among low-income 4th-6th graders in 3 schools in an urban public school district. **Methods:** Youth (n=650; 51.7% female; 61.2% African American, 10.7 years old) completed surveys at school (>94% of schools' students eligible for free/reduced meals) and self-reported all locations and foods eaten that morning. Height and weight were collected by trained research staff. **Results:** 16.4% of youth reported eating no breakfast, 48.3% reported one breakfast, 24.4% reported two breakfasts, and 10.9% reported > 3 breakfasts. Among those who did not eat breakfast, reasons included not being hungry (36.7%), not having time (47.5%), not having food (1.7%) or money (3.3%), or disliking available foods (10.8%). Overweight/obese youth reported consuming significantly fewer breakfasts compared to healthy weight youth (mean=1.2 vs. 1.4, p<.05). Gender, grade, ethnicity and previous night dinner consumption were not associated with the number of breakfasts consumed. **Conclusions:** Youth are eating breakfast at multiple locations. These findings may have implications for school breakfast policies, childhood obesity, and food insecurity.

T-856-P^DT

The Comparative Validity of Interactive Multimedia Questionnaires to Paper Administered Questionnaires for Beverage Intake and Physical Activity

Shaun K. Riebl, Allyson C. Paone, Valisa E. Hedrick, Jamie Zoellner, Paul Estabrooks, Brenda M. Davy *Blacksburg, VA*

Background: Brief, valid and reliable dietary and physical activity assessment tools are needed, and computerized assessments can reduce burdens related to administration, scoring, and increase response accuracy. The purpose of this investigation was to evaluate the comparative validity and reliability of interactive multimedia (IMM) versions of the validated beverage intake

questionnaire (BEVQ-15) and Stanford Leisure-Time Activity Categorical Item (L-Cat); a secondary purpose was to evaluate results across two education attainment levels. **Methods:** Adults (n=60) aged 21+ years were recruited to complete three laboratory sessions, with the following assessments: demographic information, two IMM and one paper-based (PP) version of the BEVQ-15 and L-Cat, health literacy, and an IMM usability survey. **Results:** Responses across beverage categories from the IMM-1 and PP versions (validity; r=0.34-0.98) and the IMM-1 and IMM-2 administrations (reliability; r=0.61-0.94) (all P<0.01) were significantly correlated. Paired t-tests revealed significant differences in sugar-sweetened beverage (SSB) grams and kcal (both P<0.05) and total beverage kcal (P<0.05) on IMM-1 and IMM-2; however, comparative validity was demonstrated between IMM-2 and the PP version suggesting familiarization with the IMM tool may increase response accuracy (mean differences: SSB grams, 63±87, P=0.52; SSB kcal, 21±33, P=0.48; total beverage kcal, 65±49, P=0.19). Similar findings were noted for the L-Cat, and for responses within educational categories. In general, less educated participants consumed more total beverage and SSB energy, and reported less engagement in physical activity. **Conclusions:** The IMM BEVQ-15 and L-Cat appear to be valid and reliable measures to assess habitual beverage intake and physical activity, although software familiarization may increase response accuracy.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Imaging and Biomarkers

T-857-P
Increased Central and Peripheral Adiposity in Large for Gestational Age Neonates Exposed to Excessive Gestational Weight Gain

Holly Hull *Kansas City, KS*; John C. Thornton, Charles W. Paley, Khursheed Navder, Dympna Gallagher *New York, NY*

Background: To investigate neonate body composition and fat distribution (central versus peripheral fat mass (FM)) by birth weight category (<10th percentile, small for gestational age (SGA); 10-90th percentile, appropriate for gestational age (AGA) and >90th percentile, large for gestational age (LGA) and gestational weight gain (GWG; appropriate versus excessive). **Methods:** Body composition was assessed in 292 neonates using air displacement and skinfolds (SKF) (subscapular, biceps and triceps) at 1-3 days. Peripheral FM was calculated as the sum of biceps and triceps SKF/2 and central FM was represented by the subscapular SKF. ANCOVA was used to investigate the main effects of birth weight and GWG categories and their interaction on infant body composition and FM distribution. **Results:** A significant interaction between birth weight and GWG categories was detected for central and peripheral FM but not infant body composition. Within the LGA group, infants from mothers that gained excessively had greater central FM (appropriate: 4.3 mm; excessive: 5.2 mm, p=0.004) and peripheral FM (appropriate: 4.1 mm; excessive: 5.0, p=0.001) than offspring from mothers that gained appropriately. No differences were found within SGA or AGA for central or peripheral FM. A description of mothers of LGA neonates found the following: 50 % were normal weight, 43% were overweight and 7% were obese with the following mean GWG for those classified as excessive: 20.0 kg, 16.5 kg and 20.7 kg, respectively. **Conclusions:** Greater central and peripheral FM is found in LGA infants born to mothers that gain excessively.

T-858-P
Noninvasive Biomarkers for Monitoring Cardiometabolic Risk in Children

Jill Cochran, Hillary Anderson, Jennifer A. Hoke, Kenslea Ratliff, Tamara Sharp, Maria Soukup, Michelle Vanoy-Warner, Kristie G. Bridges *Lewisburg, WV*

Background: Screening for complications of obesity in children is necessary but many parents do not comply with referrals for phlebotomy. The purpose of our study was to address this barrier by identifying salivary biomarkers associated with cardiometabolic risk factors in children. **Methods:** Children participating in CARDIAC Boot Camp, a program for patients who are overweight or obese or have other risk factors, were recruited for this study. After obtaining parental consent and assent from the child, blood pressure, height,

weight and waist circumference were measured. Saliva samples were collected and tested for uric acid using enzymatic methods. Salivary insulin and adiponectin were measured using a multiplexed bead assay. Information including blood lipid and glucose levels was obtained from the medical record of the visit resulting in referral to Boot Camp. **Results:** 32 patients participated in the study (mean age 9.2 years). 83% were obese, 42% were hypertensive, and 35% had acanthosis nigricans. Only 54% had blood test results available in the medical record illustrating the lack of compliance with fasting blood draw in children. Uric acid, adiponectin and insulin could all be detected in the saliva samples. Salivary uric acid was higher in those with hypertension (systolic or diastolic BP ≥95th percentile) than those without (p = .043). Salivary insulin was higher in patients with acanthosis (p = .027). **Conclusions:** Several serum biomarkers associated with cardiometabolic risk can be measured in the saliva of children. Additional studies are needed to investigate their predictive value. The ability to monitor changes in cardiometabolic health without requiring blood sampling could increase risk awareness in parents resulting in greater motivation to make lifestyle changes.

T-859-P
Body Composition Agreement between the GE Lunar iDXA, BOD POD Gold Standard and InBody 720

Bruce W. Bailey, Gabrielle L. Grimmer, Tim Hope, Mathew Bell, James D. LeCheminant *Provo, UT*

Background: The purpose of this study was to evaluate the agreement between the GE Lunar iDXA, BOD POD Gold Standard and InBody 720 for body composition assessment. **Methods:** Participants included both men and women and were age 18-55. Body fat was assessed in triplicate on each participant for each machine. Participants were in standardized tight fitting swimwear. Participants were also instructed to abstain from food and caffeine for 6 hours and to not exercise or consume alcohol for 12 hours prior to the assessment. Assessments were done in random order. **Results:** Eighty participants completed all aspects of the study (37 women, 43 men). The average age was 31.4 ± 10.7. The average BMI was 26.9 ± 5.3 kg m-2. The intraclass correlation was 0.975 between GE iDXA and BOD POD®, 0.877 between GE iDXA and InBody and 0.914 between BOD POD® and InBody 720. However, both the BOD POD® and InBody 720 were significantly lower than the iDXA. Using all 240 paired assessments, the mean difference between iDXA and BOD POD® was 1.78 ± 2.23 percentage points, between the iDXA and the InBody 720 was 5.94 ± 3.37 percentage points and the mean difference between the BOD POD® and the InBody 720 was 4.16 ± 4.06 percentage points. The difference between the three different measures of body fat was similar for men and women. In addition, the difference between the measures of body fat did not change based on the order of the assessments. The difference between machines was greater for those with lower BMIs and narrowed progressively as BMIs increased. **Conclusions:** The agreement between the three measures of body composition could be improved. This is specifically true for the InBody 720, which was much lower than either the BOD POD or iDXA. Regression equations could be developed to improve agreement.

T-860-P
Novel Image Analysis Method for Assessing Body Composition in Humans: A Pilot Study

Olivia Affuso, Chengcui Zhang *Birmingham, AL*; Wei-Bang Chen *Petersburg, VA*; Song Gao, Karen D. Keating, Dwight W. Lewis, David B. Allison *Birmingham, AL*

Background: Clinical practice and epidemiological studies often rely on body mass index (BMI) as a marker of obesity in spite of its limited ability to accurately predict body fat. Research has shown that trained observers can accurately estimate percent body fat in humans from which fat mass and fat-free mass can be determined using body weight. The purpose of our study was to develop a computer algorithm to accurately assess body fatness from digital photographs. **Methods:** Our sample included 24 boys aged 6-10 (mean 8.0±1.5 yrs) with a wide range of shapes and sizes (mean BMI: 17.4 ±2.7 kg/m²). Measured height (cm) and weight (kg) were used. Dual energy x-ray absorptiometry (DXA) was used as the criterion method for body fatness from which body density (BD_{dxa}) was back-calculated. Three digital images (front, side, back) of the participants were used to derive photographic models of BD_{photo} and body volume (BV_{photo}). The best photographs of 15 participants with 10-fold cross validation were used to evaluate the Support Vec-

tor Machine (SVM) learning algorithm. SVM maps a set of x input features onto a higher m-dimensional space using fixed nonlinear mapping, and then performs a linear regression between input features in. We used 5 input features to predict BD_{dxa} including age, height, weight, BD_{photo} and BV_{photo}. **Results:** Mean BD_{dxa} and BD_{photo} were 1.04±0.02 and 0.86±0.02, respectively. The cross validation models after controlling for age, weight, and height, and BV_{photo} explained an additional 9% of the variance in BD_{dxa} (total R2 =0.86) in this analysis. **Conclusions:** Our preliminary findings suggest that a computer image analysis algorithm can be used to accurately predict body fatness in humans from digital photographs. However, further research is needed to refine this image analysis approach and to extend this method to the broader population.

T-861-P
Accurate and Rapid Identification of Neutralizing Antibodies to Adipogenic Adenovirus Ad36

Olga Dubuisson *Baton Rouge, LA*; Cynthia L. Chappell, R. S. Day *Houston, TX*; Nikhil V. Dhurandhar *Baton Rouge, LA*

Background: Infection due to Ad36, a specific serotype of human adenoviruses, is linked with increased adiposity, better glycemic control and lower hepatic lipids causatively, in animals, and correlatively in humans. Serum neutralization assay (SN), -the gold standard that detects neutralizing antibodies (NA), is used to specifically detect Ad36 infection. However, SN needs 14d, and considerable training. We evaluated the accuracy of available Enzyme-immuno assay (EIA) kits to detect NA to Ad36. A modified SN assay that is less subjective and faster is presented. **Methods:** Sera of 31 subjects who were seropositive (n=15) or seronegative (n=16), by SN were tested for antibodies as follows: 1) A repeat SN to test reproducibility; 2) A non-Ad36 specific EIA to detect antibodies to all human adenoviruses (NS-EIA)(Abcam 108705); 3) Ad36 antibody specific EIA (Ad36-EIA) (My-BioSource, #MBS705802); 4) a novel combination of SN and immune staining (SN-IS) kit (Cell BioLabs, #VPK-111). **Results:** Repeat SN showed exact reproducibility. As expected, about 94% samples tested by NS-EIA showed antibody presence, probably to other human adenoviruses. All seronegative samples (by SN) were false positive by Ad36-EIA. SN-IS showed fidelity with SN assay for 97% of the samples, in identifying Ad36 NA status. **Conclusions:** The EIA kits tested are not suitable for detecting NA to Ad36. The use of SN with immune-staining preserves the accuracy of detection, eliminates subjectivity in screening and reduces the assay time to 5 d.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Statistical Methods

T-862-P
Development of a Pregravid Weight Calculator: Insights Into the Validity of Self-Reported Pregravid Weight in Overweight and Obese Pregnant Women

Diana Thomas, Mirna W. Halawani *Monclair, NJ*; Suzanne Phelan *San Luis Obispo, CA*; Nancy F. Butte *Houston, TX*; Leanne Redman *Baton Rouge, LA*

Background: Gaining weight within the Institute of Medicine (IOM) guidelines leads to healthy pregnancy outcomes. To calculate gestational weight gain, clinicians and researchers need an accurate measurement of pregravid weight. Moreover, since the IOM guidelines differentiate weight gain recommendations based on pregravid body mass index (BMI) classifications, prescribing the correct amount of weight gain is dependent on accurate knowledge of pregravid weight. Unfortunately, in most cases, pregravid weight is self-reported which can be an unreliable measure. **Methods:** After testing the validity of self-reported pregravid weight, four models were constructed using two comprehensive clinical databases containing weight directly measured before pregnancy and during the first trimester. Maternal age, race, height, and both gestational age and measured weight at the earliest first trimester visit, were used to predict pregravid weight. Each model was validated on independent data not used for model development. Bland-Altman analysis was performed to test the validity of each model. **Results:** Self-reported pregravid weight correlated remarkably well with measured weight (R2=0.98); however, the Bland-Altman analysis suggested a mean bias (-0.62

kg), indicating increased underreporting of pregravid weight with higher BMI classifications. The developed models validated well, demonstrating good agreement and low bias: (R2=0.96, Bias =0.06, confidence intervals [-5.46, 5.58]). **Conclusions:** The developed models provide an alternative method for health care providers and researchers to determine pregravid weight and appropriately classify women into the correct set of BMI-specific IOM gestational weight gain guidelines. The models have been extended to an online tool for use in clinical research and prenatal care.

T-863-P
Identifying Measurement Error in Body Mass Index (BMI) Data for Children: Alternative Approaches to the Biologically Implausible Centers for Disease Control and Prevention (CDC) Growth Chart Flags

Sophia E. Day, Kevin Konty *Long Island City, NY*; Stuart H. Sweeney *Santa Barbara, CA*; Cathy A. Nonas, Tiffany G. Harris *Long Island City, NY*

Background: CDC growth charts are commonly used to define childhood obesity and include an indicator for biologically implausible values (BIV) in BMI data. We evaluated the accuracy of these BIVs and examined alternative methods for defining implausibility. **Methods:** CDC's growth charts were used to obtain BMI z-scores (BMIz) and CDC-defined BIVs for all student observations. We used the 2006-10 BMI data as a reference population to create empirically-defined BIV cut-points ($\mu \pm 4\sigma$) by age and sex and used the same criteria for students with 2 consecutive measurements to define cut-points for implausible changes in BMIz (BMIzΔ). We applied all cut-points to the 2010 school year and compared CDC-defined BIVs with empirically-defined BIVs, implausible BMIzΔ and longitudinal growth curve models using quantile regression. To account for systematic errors, we identified schools with abnormally large BMIzΔ using composite percentiles (cp) of BMIzΔ and flagged schools with >30% of students in the top or bottom 10% of cp. **Results:** In 2010, 14,176 students were CDC-defined BIVs. 50% (n=7,066) of these students are determined plausible using empirically-defined BIVs and 5,431 additional students were identified BIVs from implausible BMIzΔ. Using model defined BIVs resulted in less stringent criteria and only removed 0.5% of the records; 3.4% of students were newly identified BIVs at the school-level. **Conclusions:** CDC-defined BIV rely on the distribution in the tails of the reference data (from 1963-1994) and may not reflect the current obesity epidemic. The empirical cut-points may offer a better method for identifying BIVs since it uses a current population and may have more observations in the tails of the underlying distribution. Further, to improve childhood obesity estimates, longitudinal data can be used to establish BIVs and to identify schools with systematic problems.

T-864-P
The Impact of Implementing Self-Calibrating, Digital Scales That Include Stadio-Meters on Childhood Obesity Estimates in NYC Public Schools, Grades K-8, 2010-2011

Kevin Konty, Sophia E. Day, Tiffany G. Harris *Long Island City, NY*

Background: Annual height and weight measurements have been collected for all New York City (NYC) public school children since 2005. In 2011, self-calibrating, standardized scales with stadio-meters were installed. This analysis quantifies the impact of the new scales on obesity estimates. **Methods:** Age- and sex-specific percentiles, z-scores, and Biologically Implausible Values (BIVs) were created using CDC growth charts (obesity defined as BMI≥95th percentile). A repeated cross-sectional trend model was used to quantify the impact of the new scales while controlling for demographic characteristics. Additionally, we identified 3 non-mutually exclusive mechanisms by which the new scales may have impacted obesity estimates: improved height measurements, reduction in BIVs, and reduction in entries ending in 0 or 5, indicating rounding. **Results:** The direct estimate of obesity increased by 0.4 percentage points (pp) from 20.7% in 2010 to 21.1% in 2011. Based on model estimates, 0.12 pp (~15%) of the increase was due to new scale use. Improved height measurements resulted in 0.2% more students shrinking from 2010 to 2011 than in previous years, which accounted for 0.3 pp (~75%) of the obesity increase. The percent of BIVs decreased from 1.6% to 1.4%. This accounted for ~10% (0.04 pp) of the increase. For grades 6-8, the direct estimate of obesity increased by 0.8 pp and 0.5 pp of this increase (~60%) can be accounted for by decreased rounding in 2011. **Conclusions:** Use of self-calibrating, standardized scales improved obesity

estimates by decreasing measurement error and indicate that previous estimates may have been low, especially in grades 6-8. The previous underestimation and the new scales accounting for most of the observed increase in obesity suggest that obesity actually decreased from 2010 to 2011.

T-865-P
Modeling Obesity Associated Years of Life Lost: A Significance Test to Compare Predictive Accuracies of Non-Nested Models
Tapan Mehta, David B. Allison *Birmingham, AL*

Background: Predicting median longevity associated with obesity and estimating the years of life lost (YLL) compared to normal weight is an important public health question for the policy makers. Federally defined broad BMI categories are commonly used in obesity-mortality studies. However, previously it has also been reported that inverted BMI is a more suitable predictor instead of BMI. And yet there are many other forms of continuous BMI (polynomial, fixed knot spline, free knot spline etc.) that may statistically significantly improve predicting YLL associated with obesity. Statistically, this reduces to evaluating the predictive accuracy of non-nested models. **Methods:** We used an approach analogous to leave one out cross-validation and estimated errors defined by a quadratic loss function in a test sample. These errors are predictive accuracy measures of a parametric survival regression model and describe the variation explained by the model. A significance test was proposed and evaluated to test for differences in the predictive accuracies of two competing non-nested models. Finally, we illustrated the method with an analysis of an obesity dataset. **Results:** Simulation results indicate that our proposed test that evaluates differences in predictive accuracies, based on a quadratic loss function, is valid even in presence of up to 50% random censoring. **Conclusions:** Our proposed significance test provides a simple and valid framework to evaluate competing non-nested models. Analysts can use this approach to compare alternate functional forms of BMI while predicting obesity associated YLL.

T-866-P
Comparing Three Analytical Approaches to the Study of Dietary Patterns Over Time Using Multiple Cross-Sectional Data Sets
Chris N. Ford, Patrick T. Bradshaw, Shu Wen W. Ng *Durham, NC*

Background: Amid increasing interest in modeling dietary patterns over time, this analysis contrasts three approaches to modeling dietary patterns using multiple nationally representative cross-sectional diet surveys. **Methods:** We included 11,444 children ages 2-6y from three nationally representative US dietary surveys: the Nationwide Food Consumption Survey 1977-1978; the 1994-1998 Continuing Survey of Food Intakes by Individuals; and the National Health and Nutrition Examination Survey, years 2007-08 and 2009-10. Diet data were grouped into categories and normalized percent of daily calories from each were calculated. Principal components analysis was used to determine independent dietary patterns and, in one approach, these factors were subsequently grouped by k-means cluster analyses to create disjoint categories of dietary behavior. Three patterns emerged from this approach, and subsequent approaches were constrained to three patterns for continuity. The factors were also used independently in the second approach, and cluster analyses was performed directly on the normalized intakes for the third approach. **Results:** Combined factor and cluster analyses yielded three patterns: sandwiches, fast food and prudent. Factor analysis alone yielded three patterns: prudent, sandwich and Midwestern. Cluster analysis alone resulted in high-fat, prudent, and sandwich patterns. 'Sandwich' and 'prudent' patterns were common to all approaches; the 'fast food', 'Midwestern' and 'high-fat' patterns were unique to only one approach. **Conclusions:** Although two dietary patterns were common to all approaches, each one identified a pattern uncommon to the others. Future work should explore the properties of these methods in data sets with known dietary patterns, such as through simulation studies.

T-867-P
Waist-to-Height Ratio – A Better Index Than BMI to Diagnose Obesity & Estimate Body Fat
Grant Zhao *Sugar Land, TX*

Background: Body mass index (BMI) is the most widely used measure to diagnose obesity. However, it is simply scaled from body weight and contains less information about excess body fat distributions. The waist-to-height

ratio (WHtR), instead, has potential to be a better indicator of excess fat. **Methods:** Using US population survey data (NHANES 1999-2004), a total of 12,581 subjects (age 20-85 years, 6320 men and 6261 women) were used for comparative statistical analyses, including sensitivity and specificity in diagnosing BF%-defined obesity by WHO standards, as well as univariate and multivariate regression models for BF% estimation. **Results:** WHtR outperformed BMI in the following respects: (i) In diagnosing WHO-defined obesity (BF%>25% for men and BF%>35% for women), WHtR showed a sensitivity of 96% in men and 92% in women vs. BMI's sensitivity of 37% in men and 44% in women; (ii) Univariate regression analyses showed WHtR has better correlations with BF% than BMI in men (WHtR R2=0.72 vs. BMI R2=0.54) and almost equal in women (WHtR R2=0.595 vs. BMI R2=0.600); (iii) A new multivariate regression model based on logarithms of weight (Wt), height (Ht), waist circumference (WC), and age demonstrated superior performance to estimate BF% in various statistical metrics (R2=0.75, SSE=3.03, Sensitivity=0.93, Specificity=0.74 in men; R2=0.70, SSE=3.59, Sensitivity=0.95, Specificity=0.67 in women) compared to the BMI-based model by Jackson et al. (R2=0.65 and SSE=4.73 in men and R2=0.66 and SSE=5.93 in women). **Conclusions:** WHtR performed significantly better than BMI as an index in diagnosing obesity. A multivariate regression model including WHtR showed improved performance compared to a commonly used BMI-based regression model for BF% estimation. These results can be helpful in both diagnosing obesity and predicting BF%.

T-868-P
Coordinating Sensor and Subjective Data in mHealth Studies
Jared D. Sieling *St Louis Park, MN*; Dale Bond, Graham Thomas *Providence, RI*; Jon Moon *St Louis Park, MN*

Background: In research to understand and influence behavior, a key use of objective sensors should be to offload burden from participants - freeing them to provide valuable subjective and timely responses. Data from multiple sensors must be integrated during over extended periods. **Methods:** To support behavioral studies we are building a flexible data management system. It automates acquisition, quality assessment, initial processing, imputation and segmentation, and presentation from multiple disparate sensors in real time. Analysis can be generalized as applying processing to continuous time series (accelerometers and other streams), periodic (inputs triggered by time), and asynchronous data (triggered by device or user status, location patterns). Multi-tasking smartphone can perform preliminary processing sufficient to prompt subjective actions and responses. **Results:** The system is supporting current trials. One at Brown University is a cross-over study on 40 patients after bariatric surgery. It examines the timing and content of motivational messages delivered to promote PA after durations of inactivity for 3 weeks. Raw acceleration data recorded with a smartphone is processed in 1 min epochs to PA criteria which trigger requests to the participants and display progress indicators. All the data are uploaded every 30 min and integrated to provide the researcher with a view of phone/software status, subject actions, and compliance. The remote system reconfigures the smartphone software at cross-over and applies updates. The process, including data uploads, has been successful for thirteen participants enrolled. **Conclusions:** Researchers need systems that allow them to integrate disparate sensor, software and algorithms that minimize burden on participants.

Friday, November 15, 2013
Posters on Display: 10:00 AM – 3:30 PM
Location: Exhibit Hall A

Population Health - Other

T-869-P
Assessing Consumer Acceptability and Purchase Intent of Sugar Reformulated Foods
Oonagh Markey, Julie A. Lovegrove, Lisa Methven *Reading, United Kingdom*

Background: Over the past fifty years, global consumption of sugar has increased three-fold; this trend is mirrored by rising levels of obesity and its co-morbidities. Reformulation of sugar-containing processed foods is considered a promising vehicle for reducing sugar intake. This study evaluated consumer acceptance and purchase intent of sugar-reduced reformulated products, when compared to their unmodified counterparts. **Methods:** A se-

ries of five unbranded paired (unmodified and reformulated) commercially-available baked beans (BB), milk chocolate (MC), cola drink (CD), cranberry juice and strawberry jam (SJ) product samples were presented to 116 healthy, non-smoking consumers (55m/61f, age 33±9 years, BMI 25.7±4.6 kg/m²) in a double blind, balanced randomized order. Hedonic category scales were employed to assess consumer liking (9-point scale), purchase intent (5-point scale) and product replacement (5-point scale) ratings for each of the 10 samples. **Results:** Significantly higher mean ratings of liking, purchase intent and product replacement were evident for unmodified BB, MC and CD samples. Hierarchal cluster analysis of consumer liking data identified three consumer clusters. One cluster (28% of consumers) had no significant difference in their liking of all of the unmodified and reformulated products. Cluster three (45%) rated all reformulated products significantly lower than unmodified products, except for SJ. **Conclusions:** This research suggests that reformulated products may be an accepted vehicle to reduce sugar consumption by some consumers. However, improvements need to be made to sensory qualities of reformulated products before they will be accepted by all consumers, and the effects of branding on the reformulated products must also be considered.

T-870-P
Contribution of Maternal Overweight and Obesity, Excessive Gestational Weight Gain and Gestational Diabetes Mellitus to Large Birth Size, Florida 2004-2008

Shin Kim, Andrea Sharma *Atlanta, GA*; William Sappenfield *Tampa, FL*; Hoyt G. Wilson *Atlanta, GA*; Hamisu Salihu *Tampa, FL*

Background: Individual effects of maternal body mass index (BMI), gestational weight gain (GWG), and gestational diabetes (GDM) on fetal growth are well documented. However, timing and complexity of interventions aimed at reducing these risks differ and few studies describe the potential impact on large-for-gestational age (LGA) infants if one or more of these risks is removed. We estimate the percentage of LGA infants attributable to these risk factors—both individually and in combination—across different race/ethnicity groups. **Methods:** We analyzed 2004-2008 linked birth certificate and maternal hospital discharge data of live, singleton deliveries in Florida. We used logistic regression to assess the independent contributions of mother's prepregnancy BMI, GWG, and GDM status on LGA (birth weight-for-gestational age >90th percentile) risk, by race/ethnicity, while controlling for maternal age, nativity, and parity. We then calculated the adjusted population attributable fraction (PAF) of GDM cases attributable to each of these exposures. **Results:** LGA prevalence was 5.7% among normal weight women with adequate GWG and no GDM. Among women with GDM, excess GWG, and BMI ≥25, LGA prevalence was 17.3%, 13.5% and 12.6%, respectively. Depending on race/ethnicity, a reduction of 46.8% to 61.0% in LGA prevalence would result if women had none of the three exposures. For all race/ethnicity groups, GDM contributed the least to LGA with PAF ranging from 2.0% to 8.0% and excessive GWG contributed the most ranging from 33.3% to 37.7%. **Conclusions:** Overweight and obesity, GDM and excessive GWG all contribute to LGA; however, preventing excessive GWG has the greatest potential to reduce LGA prevalence. Weight management strategies during pregnancy are warranted.

T-871-P
Association of Childhood Obesity and Bisphenol-A: Role Played by Race, Birth Weight and Maternal Smoking During Pregnancy

Sunil Mathur, Akhilesh Kaushal *Memphis, TN*

Background: The prevalence of childhood obesity has more than doubled in children (2-11 years old) and tripled in adolescents (12-19 years old) in past 30 years. Bisphenol-A (BPA), a chemical, can be present in many consumer products, including polycarbonate water bottles and food storage boxes. Several studies have shown that prenatal and early postnatal BPA exposure is associated with increased body weight and fat deposition in children. There is a pressing need to possess a clear understanding of the link between BPA and childhood obesity. This study explores the association of BPA and obesity among children and examines the moderating role of birth weight, race and maternal smoking during pregnancy. **Methods:** This study uses National Health and Nutrition Examination Survey (NHANES) 2009-2010 dataset in which 387 respondents, out of 1878 respondents, were obese (>=95th percentile, age and sex specific). We used multivariate statistical analysis to analyze the data. **Results:** The childhood obesity was significantly associated

with BPA, and birth weight, race, mothers' smoking status during pregnancy (p value < 0.0001). Non-Hispanic whites respondents with birth weight between 2500 and 4100g, and Urinary-BPA greater than 5.4 ng/mL had very high chance (odds ratio=5.19, p value < 0.0048) of becoming obese. Respondents whose mothers smoked during pregnancy and had urinary-BPA at 1.5-2.7 ng/ML had high chance of becoming obese (odds ratio=1.56, p value<0.0001). **Conclusions:** There is a clear association between childhood obesity and BPA which necessitates designing of specifically tailored intervention programs for different races and for effectively controlling exposure to BPA and maternal smoking during pregnancy.

T-872-P
The Utility of BMI Percentile to Identify Cardio-Metabolic Risk among Middle School Students

Katherine W. Bauer *Philadelphia, PA*; Marsha D. Marcus *Pittsburgh, PA*; Laure El Ghormli *Washington, DC*; Cynthia L. Ogden *Hyattsville, MD*; Gary D. Foster *Philadelphia, PA*

Background: Although body mass index (BMI) is positively correlated with cardio-metabolic risk among children, there is a paucity of research exploring the utility of BMI as a screening tool to identify youth with elevated cardio-metabolic risk factors. The purpose of this study was to determine the optimal BMI percentile cut points associated with increased cardio-metabolic risk in a select sample of low-income, multi-ethnic, middle school-aged children from 42 schools. **Methods:** A cross-sectional analysis of data from 6097 youth ages 10-13 who participated in the baseline assessment for the HEALTHY study was conducted. Receiver operating characteristic curves were used to determine the discriminatory ability of BMI percentile to identify children with elevated risk factors. **Results:** BMI percentile performed from poor to fair (Area Under the Curve (AUC) .57 to .75) in identifying youth with elevated glucose, total cholesterol, low-density lipoprotein, blood pressure, triglycerides, and high-density lipoprotein, and ≥1 or ≥2 risk factors. Discriminatory ability was good (AUC > 0.80) for the outcomes of elevated insulin and clustering of ≥3 risk factors, with optimal BMI percentile cut points of 96 and 95 respectively. The positive predictive values at these cut points were low (21.6% and 18.4% respectively). **Conclusions:** The current definition of obesity among children (BMI percentile ≥ 95) performs well at identifying youth with elevated insulin and ≥3 risk factors, although a large number of youth without current cardio-metabolic risk will be identified using this definition. BMI percentile did not exhibit high discriminatory ability for the majority of risk factors examined. Future studies are needed to explore whether alternative screening methods can better identify youth with current cardio-metabolic risk factors.

T-873-P
Developmental Trajectories of Body Mass Index from Birth to 18 Years of Age: Prenatal and Postnatal Determinants

Ali Ziyab *Columbia, SC*; Wilfried Karmaus *Memphis, TN*; Ramesh J. Kurukulaaratchy *Southampton, United Kingdom*; Hongmei Zhang *Columbia, SC*; Hasan S. Arshad *New Port, United Kingdom*

Background: Although the epidemic of obesity and overweight among children and adolescents is substantial, our understanding of their developmental trajectories is limited. Our objective was to identify trajectories of body mass index (BMI) from birth to 18 years of age and assess their associations with prenatal and postnatal exposures. **Methods:** Participants of the Isle of Wight birth cohort (n = 1,456) were assessed at ages 1, 2, 4, 10, and 18 years. A semiparametric mixture model was applied to identify BMI trajectories. Multinomial logistic regression was used to estimate associations between prenatal and postnatal exposures and BMI trajectories. **Results:** Four BMI trajectories were identified: normal, early persistent obesity, delayed overweight, and early transient overweight. The early persistent obesity trajectory was characterized by childhood obesity that persisted into late adolescence. In contrast, the delayed overweight trajectory showed increasing trend and crossed the overweight threshold at age 10. Maternal pre-pregnancy overweight and gestational smoking were associated with the early persistent obesity trajectory (OR = 3.80 and OR = 2.70, respectively) and the delayed overweight trajectory (OR = 2.86; and OR = 1.95, respectively). Elevated birth weight (> 4.0 kg) was associated with the early transient overweight trajectory (OR = 1.76). A reduced risk for the early transient overweight trajectory was seen for breastfeeding ≥ 24 weeks (OR = 0.55). **Conclusions:** Modifiable prenatal and early postnatal exposures are important factors in

priming long-term trajectories of BMI. The four BMI trajectories were initiated and can be identified in the first four years of life. Therefore, prevention and intervention efforts should target the first four years of life when patterns of BMI are set until adult life.

T-874-P
Accelerometer Determined Sedentary and Light Physical Activity Levels and Depot-Specific Adiposity

Deirdre M. Harrington, Peter T. Katzmarzyk *Baton Rouge, LA*

Background: This analysis investigated associations of accelerometer-determined sedentary time and LPA with abdominal visceral (VAT) and subcutaneous (SAT) adipose tissue and total fat mass (FM). **Methods:** Overall, 88 non-obese (mean: 22.9 kg/m2) adults, aged 20-36 (mean: 27 y) wore an Actigraph GT3X accelerometer for 1 week and sedentary (<100 counts/min), LPA (500-2019 counts/min) and moderate-to-vigorous physical activity (MVPA; ≥2020 counts/min) variables were derived. VAT and SAT areas and FM were estimated from DXA (Hologic QDR4500, Bedford, MA) using recently validated Apex 4.0 software. Associations between sedentary time, LPA and depot-specific adiposity were assessed using general linear models. Model 1 included age, race and accelerometer wear-time. Model 2 also included body mass index and MVPA as covariates. **Results:** Sedentary time was positively associated with SAT (Model 1; β= 0.41; p= 0.009. Model 2; β= 0.27; p= 0.044) and LPA was inversely associated with SAT (Model 1; β = -0.63; p= 0.017. Model 2; β= -0.42; p= 0.048) in males only. Neither sedentary time nor LPA was associated with VAT. Sedentary time was positively associated with FM in both males (Model 1; β= 0.02; p= 0.015) and females (Model 1; β= 0.03; p= 0.035. Model 2; β= 0.02; p= 0.020). LPA was inversely associated with FM (Model 1; β = -0.03; p= 0.039) in males. **Conclusions:** Associations between sedentary time and SAT in males and sedentary time and FM in females persisted, even after controlling for MVPA.

T-875-P
Food Reinforcement Pathology: Demand for Food and Delay Discounting Interact to Predict BMI in Female Family Shoppers

Leonard H. Epstein, Noelle M. Jankowiak, Kelly D. Fletcher, Katelyn A. Carr *Buffalo, NY*

Background: Food reinforcement and delay discounting represent concurrent versus intertemporal aspects of choice that are independently related to obesity. Recent research suggests that these two processes interact to predict energy intake and weight loss, which has been labeled food reinforcement pathology. However, no research has yet examined whether food reinforcement pathology predicts BMI, and whether delay discounting is the only measure of impulsive decision making that interacts with food reinforcement. **Methods:** The relative reinforcing value of high (RRV_{HED}) and low-energy dense food (RRV_{LED}), delay discounting of $10 ($DD_{10}$) and $100 ($DD_{100}$) reward values, and response inhibition, using the GoStop impulsivity paradigm, were measured in a sample of 198 female shoppers of varying BMI levels. **Results:** Results showed that RRV_{HED} (p = 0.017), DD_{10} (p = 0.004) and DD_{100} (p = 0.003) were independent predictors of BMI. In addition, RRV_{LED} interacted with DD_{10} (p = 0.02) and DD_{100} (p = 0.003), and RRV_{HED} interacted with DD_{10} (p = 0.01) and DD_{100} (p = 0.003) to predict BMI, controlling for age, education, and self-report measures of disinhibition and dietary restraint. No independent effects or interactions with response inhibition were observed. **Conclusions:** This study provides additional support for the construct of reinforcement pathology as important for obesity.

T-876-P
Maternal Obesity: Shifting the Context of Fetal Growth and Early Life Programming of Obesity

Janne Boone-Heinonen, Lynne C. Messer *Portland, OR*

Background: Maternal obesity stimulates numerous alterations to fetal development that can result in either small or large birth size, both linked to early life programming of obesity. Furthermore, physiologic dysfunction induced by maternal obesity may alter the etiology of other fetal growth restriction processes. Maternal obesity may compete with or magnify the effects traditional risk factors for small birth size, but such interactions have not been studied. **Methods:** We used data from the Oregon Pregnancy Risk Assessment Monitoring System (2004-2007; n=6,302) and linked birth records.

Using multinomial logistic regression, we estimated effects of two known risk factors for fetal growth restriction (prenatal smoking and gestational hypertension) on small- or large- (compared to appropriate) for gestational age (SGA, LGA, AGA) within pre-pregnancy BMI categories (underweight, normal weight, overweight, obese class I, obese class II-III). Models excluded women with gestational diabetes or multiple births and controlled for pregnancy weight gain, parity, and sociodemographic characteristics. **Results:** Prenatal smoking and gestational hypertension were associated with elevated risk of SGA in normal and overweight women [Odds Ratio (OR) (95% CI) range: 2.6 (1.4, 4.5) to 5.1 (2.6, 10.0)]. Gestational hypertension, but not smoking, also predicted elevated SGA risk in women with class II-III obesity [OR (95% CI): 4.9 (1.8, 13.0)]. Prenatal smoking and gestational hypertension were negatively associated or unrelated to LGA at all BMI levels. **Conclusions:** Extreme maternal obesity and gestational hypertension may induce common processes leading to SGA, while competing fetal under- and over-growth may be involved in smoking effects and in LGA. Investigation of physiologic mechanisms that underlie these associations is needed.

T-877-P
Adiposity Predicts Self-Reported Frequency of Poor Health Days among Male Firefighters

Austin L. Brown, Michelle L. Wilkinson *Houston, TX*; Walker S. Poston, Christopher K. Haddock, Sara A. Jahnke *Leawood, KS*; R. S. Day *Houston, TX*

Background: Increased adiposity is associated with injuries, absenteeism, disability, and adverse cardiovascular profiles among firefighters and likely contributes to cardiovascular events. Past research indicates self-rated health status is an important marker for problematic health behaviors, morbidity, mortality, and weight status, but has not been examined in the fire service. This study quantifies the association between three measures of adiposity and self-reported frequency of poor health days in the previous month among male firefighters. **Methods:** This study was conducted in a national sample of 1,002 male firefighters. Participants reported the number of poor health days in the past 30 days. Anthropometric measures were assessed for body mass index (BMI), waist circumference (WC), and percent body fat (PBF). Zero-inflated negative binomial models were constructed and fractional polynomial plots generated to describe the relationship between each adiposity variable and the frequency of poor health days, adjusting for demographic characteristics and health behaviors. **Results:** Information on the number of poor health days in the previous month was available for 943 (94.1%) firefighters with 418 (41.7%) reporting at least one poor health day in the past month (mean: 3.29). BMI (Rate Ratio [RR]: 1.037), WC (RR: 1.012), and PBF (RR: 1.021) were significant predictors of poor health days. Fractional polynomial plots of each adiposity variable revealed slightly curvilinear dose-response relationships between adiposity and number of poor health days. **Conclusions:** Obese (BMI≥30kg/m2) firefighters reported approximately 44% more poor health days than normal weight (BMI<25kg/m2) firefighters. Future efforts to improve health among firefighters should emphasize reductions in adiposity.

T-878-P
Conversations with Adult Weight Loss Maintainers: A Narrative Analysis

Rebecca A. Stametz *Danville, PA*

Background: Little is know about the experience of individuals who maintained weight loss considering the multi-dimensional viewpoints of obesity. This study explores: (a) the experience and meaning-making processes of individuals who have maintained weight loss and (b) how this learning manifested in weight loss maintenance and improved self-identity despite cultural stressors. The study is grounded in three intersecting theories including: Transtheoretical Model, Transformative Learning and informed by critical media literacy and critical public pedagogy. **Methods:** Narrative inquiry highlighted stories to bring meaning to the weight loss maintenance experience. Un-structured interviews elicited stories from 9 adult participants enrolled in a medical weight management program who successfully maintained a weight loss of 10-20% for at least one year. **Results:** Collective analysis resulted in four main themes: motivation, learning processes, identity and hegemony, and obesity posititionality. Integrating circumstances, disorienting dilemmas, and good learning triggered all individuals to want to lose weight. Changes in cognition and learning processes were evident and

largely centered on non-formal, self-directed learning. Little variation was seen in self-identity; weight loss was perceived primarily as a physical transformation motivated by health and vanity. Challenges surfaced regarding critical reflection on cultural/social factors; a pivotal aspect to perspective transformation. Majority of participants continue to engage in the dominant discourse, little acknowledgement to the role of advertising, and participants continued to have an obesity positionality with overtones of personal responsibility. **Conclusions:** This study offers theoretical implications for adult learning and practical implications for strengthening subsequent intervention design.

T-879-P
Pre-Health Professionals' Perceptions of Overweight and Obesity
Christy Greenleaf, Lori A. Klos, Natalie Paly *Milwaukee, WI*

Background: Clinical definitions of underweight (BMI < 18.5), normal weight (BMI 18.5 – 24.9) overweight (BMI 25.0-29.9), and obese (BMI ≥ 30.0) are clearly delineated by the World Health Organization and Centers for Disease Control and Prevention. This study explored perceptions of overweight and obesity among undergraduate students in health-related majors. **Methods:** Participants (n = 261), as part of a larger study, were asked to report their current height and weight, and the weight at which someone of their height would be considered (a) overweight and (b) obese. **Results:** Based upon self-reported height and weight, 1.7% of participants had BMI values classified as underweight, 68.8% as normal, 26.3% as overweight and 4.2% as obese. Weights reported as overweight for someone of their height would result in 23.7% of participants being classified as normal weight, 55.7% as overweight, and 20.5% as obese. Weights identified as obese for someone of their height would result in 2.4% of participants being classified as normal weight, 37.5% as overweight and 60.1% as obese. Participants' weight status was associated with their definitions of overweight and obesity; participants with lower BMIs identified lower weights for overweight and obese than those with higher BMIs (p < .001). **Conclusions:** Discrepancies exist between pre-health professionals' perceptions of overweight and obesity and clinical definitions (i.e., BMI). Significant proportions of participants both under- and over-estimated the weight at which someone of their height would be overweight. A significant percentage underestimated the weight at which someone of their height would be obese. Additional research is needed to determine the mechanisms underlying the inaccuracy of weight classification and to explore the potential implications such misclassifications may have in health and fitness settings.

T-880-P[DT]
Adipocytokines and Obesity-Related Hormones Profiling in Africans
Ayo P. Doumatey, Hanxia Huang, Jie Zhou *Bethesda, MD*; Duncan Ngare *Eldoret, Kenya*; Olufemi Fasanmade, Thomas Johnson *Lagos, Nigeria*; Johnnie Oli, Godfrey Okafor *Enugu, Nigeria*; Benjamin Eghan, Kofi Agyenim-Boateng, Joseph Acheampong *Kumasi, Ghana*; Jokotade Adeleye, Williams Balogun, Clement A. Adebamowo *Ibadan, Nigeria*; Albert Amoah *Accra, Ghana*; Adebowale Adeyemo, Charles N. Rotimi *Bethesda, MD*

Background: Despite the increasing prevalence of obesity and its co-morbidities in Africa, most of the research activities in African populations remain focused on infectious diseases. This singular focus on communicable diseases has led to a poor understanding of the scope and determinants of non-communicable diseases such as obesity and diabetes in African populations. Here, we present the first study to systematically investigate the concentrations of adipocytokines and hormones in Africans and to determine their associations with obesity. **Methods:** We measured 11 adipocytokines and hormones in 920 Africans using the BIO-Plex array from Bio-RAD. Spearman's rank correlations was used to assess the associations between Body mass index (BMI), Waist circumference (WC) and percentage fat mass (PFM), and the measured biomolecules. Categorical analyses were performed to investigate the association between these biomolecules in non-obese (BMI< 30 kg/m2) and obese (BMI>=30 kg/m2) individuals; the medians between the two groups were compared and tested by Mann-Whitney U test. **Results:** The prevalence of obesity in this study was 22%. All 3 obesity measurements were positively associated with all adipokines and hormones except glucagon, resistin, and visfatin. Insulin was positively associated with GIP, GLP-1, leptin, PAI-1, visfatin and adipsin. GLP-1, leptin, PAI-1, adipsin, insulin and C-peptide were statistically higher in obese than non-

obese. **Conclusions:** The results of this study suggest a positive relationship between adiposity and serum adipokines and hormones that are not only related to obesity but also to type 2 diabetes in other populations. Further investigations are needed to better understand the biological significance of these associations in Africans.

T-881-P
The Association of "Food Addiction" with Body Mass Index and Pathological Eating in a Community Sample
Ashley N. Gearhardt *Ann Arbor, MI*; Rebecca G. Boswell, Marney A. White *New Haven, CT*

Background: Evidence is growing that addictive processes may be involved in the development of obesity and disordered eating behavior. However, the current literature has examined these relationships in non-clinical samples composed of normal weight participants or in samples in which all participants were obese. This novel study examined the association of "food addiction" with body mass index (BMI) and eating psychopathology in a large community sample. **Methods:** Eight-hundred and thirteen participants were recruited from online advertisements nationwide. Participants completed measures related to "food addiction", BMI, weight history, and disordered eating. **Results:** Addictive-like eating was associated with elevated current/lifetime BMI and eating pathology, including frequency of binge eating and purging. "Food addiction" continued to be related to clinically relevant variables even outside of the context of other eating disorders, especially elevated BMI. The co-occurrence of "food addiction" with eating disorders appears to be associated with a more severe variant of eating pathology. **Conclusions:** These results suggest that an addictive-type response to highly palatable food may be contributing to eating-related problems, especially obesity and binge eating. Further examination of "food addiction" may be important in understanding and treating certain types of problematic eating behavior, such as high rates of relapse following weight-loss treatments in obesity.

T-882-P
The Contribution of Emotional Eating and Emotion Regulation to the Prediction of Binge Eating and Weight Status
Ashley A. Wiedemann, Tamara M. Loverich, Karen K. Saules *Ypsilanti, MI*

Background: Research suggests that emotion regulation deficits may contribute to the tendency to overeat in response to negative affect (Whiteside et al., 2007), yet virtually no studies have examined possible mediation by emotion regulation in the relationship between negative affect and binge eating and weight status. **Methods:** Undergraduate students (n=614) competed an online survey that included assessment of self-reported height and weight, binge eating (Questionnaire of Eating and Weight Patterns-Revised), emotional eating (Emotional Eating Scale: EES), and emotion regulation (Difficulties in Emotion Regulation Scale: DERS). Logistic regression analysis tested whether emotion regulation (DERS score) mediated the relationship between (a) emotional eating and binge eating and (b) binge eating and BMI. **Results:** Emotional eating was significantly and positively associated with BMI (r = .092; p<.05), binge eating (r = .326; p<.01), and the DERS (r= .33; p<.01). Emotion regulation partially mediated the relationship between emotional eating and binge eating, collectively accounting for 20% of the overall variance in binge eating in the final model. The DERS did not, however, mediate the relationship between binge eating and BMI. Although binge eating did significantly predict BMI, it contributed to just 1.9% of the overall variance. **Conclusions:** Findings suggest that negative affect and deficits in emotion regulation significantly contribute to binge eating. Given the well documented relationship between binge eating and overweight, however, future research should explore more complex models to better understand how and under what conditions emotion regulation and emotional eating may interact to impact weight, either through binge eating or via some other mechanism.

T-883-P

Weight Loss in a Health Care System: A Population Health Approach

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Background: Aurora Health Care® is an integrated health system with over 30,000 employees serving 31 counties and 90 communities. Employee Wellness Initiatives include smoke-free campuses, HRA's, preventative care, healthier cafeteria options, and mandatory flu shots. Given that obesity negatively impacts employee health and health plan costs as well as the ability to model healthy behaviors, the 2013 focus was on lowering employees' BMI. **Methods:** 62% (n=17,704) of Aurora employees were screened for BMI by April 2013. The 35.3% with a BMI ≥30 kg/m2 were offered an incentive on health care premiums if they joined 1 of 5 weight-loss options. This study assessed the initial outcomes of 2 Health Management Resources® (HMR®) programs that were offered: a clinic and a phone program (HMR/Healthy Solutions® at Home). **Results:** Data reported reflect the first 14 weeks of both of these ongoing treatment programs. The clinic achieved greater average weekly weight losses than the phone program (2.7 vs. 2.2 lbs). Nearly four times more employees, however, were participating in the phone program at week 14. Participants in both options were highly compliant with weekly attendance: average 97.1% in clinic, 89.6% in phone. Both options reported substantial changes in lifestyle behaviors: 100% of clinic and 89.6% of phone patients were eating ≥ 35 full-cup servings of fruits & vegetables/wk. Clinic patients reported greater average physical activity (3334 vs 1683 kcal/wk). Aurora estimated the implementation of a high impact wellness program (including lowering BMI) would avoid $97,987,691 in costs over 6 years. **Conclusions:** Employers concerned about the impact of obesity on health-care costs are incenting employees to manage their weight. Programs that are offered must demonstrate effective weight-loss outcomes in order for health and economic objectives to be reached.

T-884-P

Micro-Analysis of Mother-Toddler Feeding in the Home Environment

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Background: About one in four U.S. children two to five years old are overweight or obese. Evidence supports the importance of the mother-child dyad as a focus for investigation; however, limited research has focused specifically on maternal-toddler feeding interactions, focusing instead on infants (< 12 months of age) and school age children. Purpose: To describe a new approach to coding and micro-analysis of mother-toddler feeding interactions in the home environment. **Methods:** A sample of mothers of children 1-3 years of age (n=7) were provided with small, tripod mounted video cameras and asked to record at least 6 feeding episodes over the course of a week. Each mother collected approximately two hours of usable videos of 6 or more feeding interactions. **Results:** Videos were reviewed and discrete interaction episodes (n=202) were identified. Both mother and child behaviors within each interaction segment were coded using 18 categories of behavior (e.g., offers food, praise, pretends to eat) for mothers and 12 categories of behavior for toddlers (e.g., crying, eating, playing with food). The emotion of the mother and toddler were coded as positive, negative and neutral for each episode. Temporal information was captured allowing us to estimate the length of each interaction segment. A Visual Basic program was developed to create transitional probability matrices for sequential analysis. Matrices are generated describing mother behavior and child response, and child behavior followed by mother response. Mother-toddler behavior patterns are identified by examining transitional probabilities that differ significantly from behavior base rates. **Conclusions:** It was possible to collect, code, and analyze mother-toddler feeding interactions to identify mother behaviors associated with successful and unsuccessful child feeding strategies.

T-885-P

Prevalence of Healthy Weight Maintenance and Reversal of At-Risk Weight Patterns During School-Age: A Longitudinal Analysis from the ECLS-K Cohort

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Background: How often early childhood obesity is "reversed" in later childhood has received limited study despite a growing epidemic. Characteristics associated with favorable growth patterns such as healthy weight maintenance (HWM) or return to healthy weight (RHW) could provide insights into potential protective factors surrounding childhood obesity. We thus sought to describe the proportion of pre-pubertal children demonstrating these growth patterns during school-age. **Methods:** We analyzed a nationally representative cohort with child height and weight data from K-5th grades (n=9,416). Measures included BMI, race/ethnicity, gender and socio-economic status (SES). BMI patterns were identified and described using 4 data waves (grades K, 1st, 3rd and 5th) and categorized as 1) HWM: BMI ≥5th to <85th percentile at every wave and, 2) RHW: BMI ≥85th ("at-risk") in prior wave with subsequent transition to healthy weight. Analyses were weighted according to ECLS-K procedures. **Results:** Among school-age children, 48% had a HWM growth pattern and 17% of those at-risk in a prior wave (27% of entire sample) had a RHW pattern. In addition, 18% transitioned from healthy to at-risk, 3% transitioned from healthy to underweight and 3% were underweight always/almost always between K-5th grade. Background characteristics associated with HWM included being female and being white (all p's ≤.005) which persisted after controlling for SES. There were no background characteristics associated with RHW. **Conclusions:** Less than 1 in 5 at-risk children are able to "outgrow" their weight risk. HWM is the most prevalent growth pattern during school age. Future work should explore additional individual, contextual and behavioral factors associated with weight trajectories including favorable growth patterns such as return to healthy weight.

T-886-P

Obesity Is Negatively Associated with Sarcopenic Obesity in Chilean Older People

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Background: Several studies have underlined the significance of sarcopenic obesity in older people raising both metabolic and functional risks. The aim of the present study is to determine the frequency of sarcopenic obesity and its association with nutritional state in Chilean older adults. **Methods:** Cross-sectional study in 753 community-living subjects (66.9% women) aged 61-99 years (mean ± SD: 71.5 ± 7.0 years) residing in Santiago, Chile. Physical performance, anthropometry, dynamometry and dual-energy x-ray absorptiometry (DXA) scan were performed. Participants were classified as sarcopenic using the skeletal muscle mass index (SMI), calculated as appendicular skeletal muscle mass/height^2 (kg/m^2) based on sex-specific lowest 20%. Sarcopenic obesity was defined has being over the 60th percentile of fat mass % (≥32% in men and ≥44% in women) and under 20% of SMI (7.1 kg/m^2 in men and 5.6 kg/m^2 in women). **Results:** The frequency of obesity was 32.3% and abdominal obesity 54.1%. Sarcopenia was present in 29.2% of the sample with a decreasing trend according BMI categories: 66.8% in people with BMI<25, 26.3% in overweight people and 4.9% in obese (p<0.001). Sarcopenic obesity was present only in 5.7% of the sample from which 24% had sarcopenic obesity. From the total of sarcopenic subjects (179), 24% were identified as sarcopenic obesity. After logistic regression the age, gender and mobility adjusted OR of having sarcopenic obesity was associated negatively with obesity (OR= 0.18; 95%CI 0.05-0.67, p<0.01). **Conclusions:** The results demonstrate a negative association of obesity with sarcopenia. Moreover, obesity is negatively associated with sarcopenic obesity in Chilean older people. Funded by FONIS Grant SA12I2337

T-887-P

Osteoporosis, Oxidative Stress and Body Fat Distribution in Chilean Older People

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Background: Oxidative stress is a risk factor for osteoporosis. Our aim is to evaluate the relationship between presences of osteoporosis/osteopenia, biomarkers of oxidative-antioxidative stress (OAS) and fat mass (FM) distribution. **Methods:** Cross-sectional study of 229 subjects (70.7% women) of medium-high socioeconomic level from Santiago, aged 60-83y. The subjects were recruited to determine osteoporosis/osteopenia and its components according to FM. Body composition was determined by dual-energy x-ray absorptiometry (DXA). To classify people as having OAS were measured reduced-glutathione (GSH), thiobarbituric-acid-reactive substances (TBARS) and conjugated-dienes (CD) as well as enzymatic-activity of superoxide-dismutase (SOD), catalase (CAT), gluthathione-S-tranferase (GST) and glutathione-peroxidase (GPx) . The relationship between Android and Gynoid fats and biomarkers of OAS was studied through Canonical Correlation (CC). Association between presence of osteoporosis/osteopenia with OAS and FM was estimated by logistic regression. **Results:** Osteoporosis/osteopenia was presented in 60.4% of the subjects (67.6% women). FM correlated negatively with SOD and CAT. The linear-combinations for CC showed positive association for Gynoid fat and negative for Android fat with GSH (CC=0.28), GST (CC=0.18) and TBARS (CC=0.13). After adjustment for age, sex and BMI, the presence of osteoporosis/osteopenia is associated with HPT (OR=0.89; 95%CI:0.80-0.99) and Gynoid fat (OR=1.24; 95%CI:1.07-1.44). **Conclusions:** These results suggest that osteoporosis/osteopenia is closely related with the increment in Gynoid fat. On the other hand, osteoporosis/osteopenia was associated to antioxidative stress suggesting that is due to a response from the organism to the high concentration of several oxidative markers that were related with the Gynoid fat in Chilean older people.

T-888-P

Simple Cooking with Heart: Nutrition Education and Improving Diet Quality Through Culinary Skill-Based Education

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Background: Meals eaten away from home, particularly at fast-food restaurants, tend to have more calories, saturated and trans fats, and sodium and fewer fruits, vegetables, and whole grains than meals prepared at home, this contributes to higher body mass indexes in children and adults. The objective of the American Heart Association's Simple Cooking with Heart program is to improve the diet quality of Americans through increased consumption of home-prepared meals with culinary skill based nutrition education providing tools, recipes, instruction and basic skill building for preparing low-cost, heart healthy meals. The theoretical framework for this program is based upon the Socioecological Model and Social Cognitive Theory of behavior change, both proven to be successful in diet and lifestyle interventions. Primary program targets are low-income families, specifically women (moms) ages 29-54. The program includes experiential skill acquisition through "live" cooking demonstrations and a robust program website which includes tools, low cost recipes and instructional skill videos. **Methods:** A third party 2-year program evaluation has measured program impact on skill acquisition, attitudinal change, change in intent, and consumption pattern change. **Results:** Participation in "live" cooking demonstrations was associated with positive attitudinal change and was effective in improving knowledge and skills. The program website and materials are effective interventions to improve culinary skill, attitudinal change and efficacy/confidence, and increase frequency of home prepared meals. An increase in fruits, vegetables and whole grains consumption was also observed. **Conclusions:** Implications include support for using culinary skill development programs as an effective intervention to improving diet quality and nutrition education.

T-889-P

Understanding the Impact of Obesity Stigma on Weight Control Actions: Development of the Thoughts about Body Size (TaBS) Measure in England

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Background: Patient non-attendance to weight control programmes after referral is an important problem. The influence of obesity stigma should be investigated further. The Thoughts about Body Size (TaBS) Study aimed to develop and validate a short questionnaire suitable to facilitate patient assessment and further research about attendance variables. **Methods:** In depth interviews with 52 patients mean age 56.9 years and all with BMI > 30 identified aspects of sensitivity to obesity stigma influencing weight control actions. Question stems (items) covering these issues were developed and reduced over several iterations. The final TaBS questions were employed in population (n = 237) and treatment attending (n = 133) samples (overall n = 370; mean age = 53.99; mean BMI = 36.14; women 64.3%). **Results:** Three distinct subscales emerged: Sensitivity (six items, Cronbachs α = 0.91); Resistance (3 items, α = 0.75) and Opposition reaction (3 items, α = 0.73). These were correlated (0.22 - 0.49) but not overlapping constructs. The TaBS Measure was related with age in both samples (older adults less sensitive) but otherwise relationships differed between samples. **Conclusions:** The TaBS Measure shows promising psychometric properties and potential to be employed to study programme attendance. It contributes to an emerging theoretical model of how awareness of and psycho-social reactions to stigma influence weight control actions.

T-890-P

Nutritional Intake, Overweight and Obesity among Person's Living with HIV/AIDS in Atlanta Georgia

Dominica B. Hernandez, Seth Kalichman *Storrs, CT*

Background: Overweight and obesity is becoming more prominent in person's living with HIV/AIDS (PLWHA). The aim of this study was to examine nutritional intake, body weight and body composition in PLWHA in Atlanta Georgia. **Methods:** PLWHA were recruited from a holiday food basket charity in Atlanta Georgia. Participants (n= 533; 158F, 354M) were asked to partake in this study upon picking up their basket; baskets are given out annually. Intakes of fiber, percentage of fat and fruit and vegetables were measured using the Multifactor Screener, body composition and body weight were measured using a Tanita BIA scale. HIV status was self-reported. **Results:** Body composition and body weight were collected on 468 participants (137F, 478M); 27% of the participants were overweight [BMI >25 kg/m2}, with 29.1% obese [BMI >30 kg/m2]. More females were overweight and obese than males (p=.000, η2=.138). Percentage of fat was comparable for both males (M=37.79, SD=4.9) and females (M=37.09g, SD=5.19); however, males had a higher intake of fiber (M=19.07g, SD=11.26) and servings of fruits and vegetables (M=2.26, SD=1.14) than females (M=15.68, SD=8.39; M=2.0, SD=1.06), respectively. Overall, all participants daily fat percentage intake were shown to be above national recommended standards of 30%; fiber was found to be below 20g; and fruits and vegetables were also shown to be below 5 servings. **Conclusions:** Results suggest that overweight and obesity may be affecting PLWHA in Atlanta Georgia. Nutritional analysis suggests PLWHA may not be meeting their recommended nutritional standards, which may be detrimental to the care of these individuals.

T-891-P[DT]

Prevalence of Overweight in Deaf Children and Adolescents Living in the Midwest

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Background: Children and adolescents with special needs and disabilities are at increased risk for overweight in comparison to youths without disabilities. Currently, minimal research has explored the prevalence of overweight among deaf children and adolescents. **Methods:** Anthropometric and demographic data were collected from 544 students (M age = 13.93 yrs, SD = 4.02, range 9 - 19) attending schools specifically for deaf children and adolescents in 4 Midwest states (i.e., Illinois, Minnesota, Kansas, Missouri). Body Mass Index (BMI) z-scores were calculated from anthropometric data and used in analyses. Prevalence of overweight and obesity in the sample and

factors related to prevalence were explored. **Results:** Average BMI z-score for the sample was .38 (SD = 1.13), corresponding to the 60.84 percentile. Overweight youth comprised 15.26% of the sample, and 2.21% were obese. BMI z-scores were related to state of residency, F (3, 540) = 3.10, p = .03, and gender, F (1, 542) = 5.43, p = .02. Rates of overweight were lower among males and students living in Minnesota. BMI z-scores were not related to student age, ethnicity, or residence (i.e., on or off campus housing). **Conclusions:** Results suggested that deaf children and adolescents attending a specialized school for the deaf are at less risk for obesity than the national average, although the prevalence of overweight and obesity differs by state of residency. Males were also less at risk for overweight than females. Results indicate that attending a state school for the deaf does not seem to increase the rates of pediatric obesity as has been found in other special needs populations.

T-892-P
Say It Isn't Soda? Maternal Sugar-Sweetened Beverage Intake During Pregnancy Is Positively Related to 4-6-Year Old Children's BMI Z-Score

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Background: Maternal diabetes and over-nutrition have been associated with increased risk of childhood obesity. Consequently, studying the relationship between maternal intake of sugar-sweetened beverages during pregnancy and childhood obesity is warranted. **Methods:** Mothers, whose children (n=81, mean ± SD age = 5.04 ± 0.77 y.) participated in 4 multi-item test meals, reported food and beverage intake during pregnancy as well as intake for their children using food frequency questionnaires. Mother's self-reported height and weight was converted into maternal BMI (mean± SD= 29.01 ± 6.97 kg/m2). Children's anthropometrics were measured and converted into child BMI z-score (mean± SD=1.0 ± 1.02). Secondary analyses are reported using linear regressions, with child BMI z-score as the dependent variable and mother's reported sugar sweetened beverage (SSB) and soda intake during pregnancy as independent variables. Models were adjusted for ethnicity and maternal BMI. **Results:** Maternal SSB intake during pregnancy was positively associated with child BMI z-score at age 4-6 years (p<0.02). Inclusion of maternal BMI resulted in stronger prediction of child BMI z-score (p<0.004), though maternal SSB intake was no longer significant (p=0.26). Maternal soda intake during pregnancy was a stronger predictor of child BMI z-score (p<0.02) than child's soda intake. Again, maternal BMI inclusion (p<0.004) removed the effect due to maternal soda intake (p=0.50). **Conclusions:** Nearly half of mothers (48.8%) consumed soda during pregnancy. Determining the causal relationship between maternal intake of SSB during pregnancy, maternal BMI and child weight status is important for understanding the impact of maternal diet on future development of obesity in children.

T-893-P
To Eat It or Not to Eat It, Why Is the Question: How Do Adolescents Perceive "Healthy Food"?

Stephanie Hasty, Eliana M. Perrin, Asheley C. Skinner *Chapel Hill, NC*

Background: Efforts to tackle the growing epidemic of childhood obesity typically focus on the need to maintain a "healthy" diet, but how adolescents perceive and understand "healthy" is not well studied. Our objective was to examine the perceptions of adolescents about which foods they perceive as "healthy" and "unhealthy." **Methods:** We developed a survey including 35 snack food and beverage items and asked respondents to rank from 1-7 how healthy they thought each item was. We assessed healthiness of items using Nu-Val scores, which use nutrient and calorie content to rate foods. We administered the survey to middle school students in a diverse North Carolina County school. **Results:** 41 adolescents ages 11-12 years responded. Perceived healthiness for most food items was ranked appropriately, particularly fruits and vegetables. Items marketed as healthy ranked higher despite lower Nu-Val scores (e.g. sweetened yogurt, Nutrigrain bars, and Cheerios were ranked healthy by 85%, 66%, and 83% respectively). In contrast, beverage items, specifically those with high sugar content, were rated healthier than was appropriate. 88% rated orange juice and apple juice as healthy. Adolescents rated both regular soda (85%) and diet soda (78%) unhealthy. In contrast, 27% rated sweet tea as unhealthy. **Conclusions:** Adolescents have a

good understanding of foods that are healthy and unhealthy, particularly for fruits and vegetables. However, they over-rate the value of low-nutrient foods marketed as healthy. Also, they identify soda as unhealthy, regardless of calorie content, and identify other beverages with high sugar content as healthy. Adolescents may need more education about examining calorie content in beverages and assessing marketing claims of healthiness.

T-894-P
Development of the National Cancer Institute's Family Life, Activity, Sun, Health and Eating (FLASHE) Study

Linda Nebeling, April Oh, Heather Patrick, Erin Hennessy *Rockville, MD*; Amy L. Yaroch *Omaha, NE*

Background: Understanding correlates of obesity and cancer are a scientific priority. Families and the home environment are the keystone of socio-environmental influences with a mediating, and moderating role on children's health and development. Parents directly determine their child's physical and social environment and indirectly influence their behaviors, habits and attitudes. Few studies have evaluated both parenting styles and practices within the context of children's diets, physical activity and other cancer preventive behaviors, utilizing a dyadic approach. **Methods:** The design of NCI's FLASHE study, a web-based survey, is reviewed. The sampling design will select parent-adolescent dyads (n=2500) to collect data on multiple domains, including neighborhood/community and home environment, parenting relationships, psychosocial factors and behaviors. A conceptual model was developed, with constructs identified through a comprehensive literature review. Scientific conferences were held to review current research methodology. Opinion surveys with teams of scientific experts (n = 516) external to NCI were conducted in October 2011 to identify priority research areas and gaps. Cognitive testing was used to test and refine new questions developed for this survey. **Results:** The highest priority research domains identified in diet include: home food, community and school environment; psychosocial correlates of dietary behaviors; and parenting styles and practices related to diet behaviors. In contrast, the highest priority research domains in physical activity include: community environment with neighborhood access and policy influences; school and home environment; sedentary behaviors; and parenting styles and practices. **Conclusions:** These results strengthen the scientific purpose and survey goals of the FLASHE study.

T-895-P
Validating a Measure for Obesity Related Knowledge in Adolescents

Elaine Rutkowski *Fullerton, CA*

Background: Despite comprehensive campaigns geared toward the individual, family and community concerning the risks of obesity, the number of adolescents and adults who meet the criteria for obesity continues to rise. Knowledge of risks continues to be an area that is important to examine when studying health behaviors. Multiple studies found in the literature demonstrate that lack of knowledge concerning obesity risks does indeed exist even at a time when public campaigns dedicated to education on this topic are extensive and inclusive. **Methods:** The current study was initiated in January, 2010 and was completed in May, 2011. There are four phases to the study. Mixed methods were included. Phase one: A focus group was conducted with 20 adolescents as a means of "translating" the instrument (ORK-10) into language easily comprehended by 12-15 year olds. Phase two: (Pilot study) ORK-10R data collected from students (N = 110) attending 2 southern California middle schools. Phase three: Content experts reviewed responses and instrument reworded to reflect age-appropriate verbiage. Phase four: ORK-10R completed by focus group of 33 adolescents. **Results:** Statistical analysis was completed in Phase four to determine reliability/validity level of this measure including stability among subjects with resulting Chronbach's alpha = .70. **Conclusions:** The plan is to place this tool in primary healthcare settings to be used by family nurse practitioners, pediatric nurse practitioners, family practice physicians, pediatricians, pediatric endocrinologists, etc. as a means of establishing a baseline of knowledge regarding the patient and the parent's level of obesity risk knowledge. This will, in turn, will assist the practitioner in establishing a plan of care addressing the issues of overweight and obesity.

T-896-P[DT]

One-Year Changes in Relative Weight in Urban Youth

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Background: Recent cross sectional data indicate that the rates of childhood obesity are plateauing. Few large-scale longitudinal datasets exist, particularly in low-income and minority youth. Such data allow for a more precise assessment of the factors influencing any change in overall prevalence (e.g, incidence, remission). The purpose of the current study was to describe longitudinal changes in measures of relative weight in a large sample of diverse, low-income youth over a one-year period. **Methods:** Participants were students from 56 K-8 schools in urban, low-income environments. Measured height and weight were collected in n=17,727 first through sixth graders at baseline and 16,050 first through seventh graders at follow-up (approximately 65% African American and 52% male). Within those samples, longitudinal data were available for n=13,305 youth. **Results:** Among the cross-sectional samples, the prevalence of overweight (39.9 to 39.3%) and obesity (22.7 to 22.2%) was stable from baseline to follow-up. Among the longitudinal sample, 86.2% of youth remained in the same weight category as baseline, 6.6% improved weight category (remission) and 7.2% worsened weight category (incidence). Longitudinal data showed that over the course of one-year, youths' BMI percentile (95% CI: -1.61 – -0.20) and BMI z-score (95% CI: -0.05 – -0.003) were significantly lower compared to baseline. At baseline, females and Hispanics showed a significantly higher prevalence of obesity, and longitudinally, Asians gained significantly less weight compared to other racial groups. **Conclusions:** These data indicate that the relative weight status of youth in an urban city is showing signs of small but significant improvement over a one-year follow-up period. However, the rates of childhood obesity remain remarkably high.

T-897-P

Medicaid and Bariatric Surgery: Differing Demographics with Comparable Weight Losses

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Background: Relatively little is known about how Medicaid bariatric patient outcomes compare with other insurer groups. Additional information about Medicaid bariatric patients is important to help physicians, insurers, and patients make informed decisions regarding surgery. **Methods:** Data were examined from 2,553 consecutive gastric bypass patients (M age=45.9+11.2; 80.5% female; 97.1% Caucasian). The majority of patients were privately insured (62.9%; 21.0% Medicare; 16.1% Medicaid). Time from consultation to surgery, pre-surgical weight loss, length of hospital stay (LOS), and percent of excess weight loss nadir were compared between three insurance groups. **Results:** Medicaid patients were the youngest and most diverse with regard to sex and race. Time to surgery was significantly longer for Medicaid (M days=368.7+220.1) and Medicare (M days=344.3+213.8) patients compared with privately insured patients (M days=320.0+176.3), F(2, 2552)=11.7, p<.001. Medicare patients' length of post-surgical stay (M days=3.2+4.6) was significantly longer than privately insured patients (M days=2.44+3.1), F(2, 2549)=10.2, p<.001; no differences were observed between Medicaid patients and the other groups. No between group differences were observed for pre-surgical weight loss and percent of excess weight loss nadir. **Conclusions:** Medicaid patients, although demographically different from their privately insured and Medicare counterparts, experience comparable pre- and post-surgical weight losses. Surgeons, physicians, and policy makers alike should consider the significant benefits of bariatric surgery for Medicaid patients when making policy decisions.

T-898-P[DT]

Obesity Is Under Estimated by Health Care Providers in Younger Women: Racial-Ethnic Disparities in the Diagnosis of Obesity

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Background: Health care providers commonly under diagnose obesity. While there are racial-ethnic disparities in obesity prevalence, it is not clear if there are similar disparities in the diagnosis of obesity. Our objectives are 1) To determine if there are differences in obesity rates in women when obesity is defined by provider assigned ICD9 code compared to objective determination by recorded body mass index (BMI); 2) To determine if there are racial-ethnic differences these obesity rates. **Methods:** Premenopausal women age 18 to 50 seen at Boston Medical Center in 2011 without PCOS (due to their disproportionately high obesity rates) were identified through a clinical research database (n=22,037). Race-ethnicity was self-reported and classified as follows: Black, Hispanic, white, Asian/Pacific Islander, Native American or Other. Obesity was determined by ICD9 code and by BMI (≥30 kg/m2) in the subset with a recorded BMI (n=19,731, 90%). Comparisons were by Chi2, alpha<0.05, SASv9.2. **Results:** Mean (± SD) age 37 ± 11 years, BMI 31 ± 8 kg/m2. The overall prevalence of obesity by ICD9 code was 26% (n=5234) compared to 46% by BMI (n=9006). Obesity rates varied by race-ethnicity (p<0.0001, for both ICD9 and BMI) and were under estimated by ICD9 code compared to BMI measure across all race-ethnicities (ICD9 vs BMI): Black 31 vs 52%, Hispanic 33 vs 53%, White 18 vs 33%, Asian 3 vs 10%, Native American 20% vs 37%, Other 22% vs 43% (p<0.0001, for all). **Conclusions:** Obesity rates were 1) under estimated by 20% in premenopausal women, and 2) under coded in all race-ethnic groups. Black and Hispanic women had the highest obesity rates (52%) and the highest rates of undiagnosed obesity by ICD9 code. This suggests that health care providers are not adequately addressing obesity as a serious health problem in younger women, particularly black and Hispanic women.

T-899-P

How Do Field Measures of Adiposity Compare among Preschool-Aged Children?

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Background: Childhood obesity studies often use BMI, waist circumference (WC), or skinfold thickness to approximate adiposity. It is important to consider differences in these measures, especially across age, sex, and race, when studying body composition in young children. **Methods:** Families (n=253) with at least one child 2-5 y were recruited for a larger intervention study. Child height, weight, WC, triceps and subscapular skinfolds (TSF and SSF respectively) were measured by trained staff, and BMI was calculated. NHANES reference data were used to determine cutoffs for the 85th percentile for each measure. Children were categorized into two groups: <85th and ≥ 85th percentile. Then, percent agreement was calculated for each pair of measures by cross-tabulation across age, sex, and race. **Results:** Agreement between each pair of measures ranged from 68% to 93%. Comparisons with TSF had the lowest agreement (73-76% vs. 80-86% for all other pairs). Higher agreement was observed among measures of African-American children compared to other races – 85% vs. 68% for BMI-TSF agreement and 93% vs. 84% for WC-SSF agreement. Also, agreement between measures was higher for males compared to females – 77% agreement between TSF-BMI and TSF-WC for males compared to 71% for females. There were some inconsistencies in agreement across age groups. BMI-WC was higher for 3 and 4 year olds (87% and 85%, respectively) vs. 2 year olds (74%), but other pairs had similar agreement between ages. **Conclusions:** Theoretical and logistic differences in BMI, WC, and skinfolds contribute to the disagreement between these measures. Anthropometric measures should be chosen knowing that each may identify different children as overweight based on child age, sex, and race. Future studies are needed to aid in selecting appropriate field adiposity measures or combinations of measures for young children.

T-900-P

Moving HyOb Research Forward: The International Registry for Hypothalamic Obesity Disorders (IRHOD)

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Background: Hypothalamic obesity (HyOb) disorders are rare, heterogeneous, and biologically complex conditions with adverse health effects. More research is needed to understand weight gain, behavioral aspects, and treatment effects. Access to cohorts of sufficient size to facilitate such research is difficult. The International Registry for Hypothalamic Obesity Disorders (IRHOD) was created as a case-finding resource for researchers seeking to study HyOb. **Methods:** A publicly available website, www.irhod.org, was created to provide information about HyOb and function as a registry entry

portal. Registrants provide medical history and other case details and indicate interest in future research. **Results:** By May 2013, a total of 22 participants had registered. Registrants were primarily female (80%), Caucasian (93.3%), and Non-Hispanic (100%) from 4 countries. Median age was 26.2 years (range: 4.0-54.5), median weight 88.0 kg (range: 15.0-209.0), and median BMI 34.1 kg/m2 (range: 13.8-66.0). The most common self-reported diagnosis was craniopharyngioma (66.7%), and five registrants reported multiple contributing diagnoses. Twenty-five providers/researchers from 6 countries and 21 different institutions also registered as HyOb professionals. The professional make-up of this group is medical (13), neurological (1), surgical (5), and other (6). **Conclusions:** This innovative, web-based approach to registration of potential research participants with a relatively rare condition has potential to improve the quantity of future HyOb research, exploring various aspects of this complex and debilitating form of obesity. Investigators whose research could benefit from this resource are encouraged to register and inquire about mechanisms for cohort access.

T-901-P

The Relationship of A Body Shape Index and Body Mass Index with Health-Related Quality of Life among African Americans: A Study from Fit Body and Soul

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Background: Obesity, typically measured by body mass index (BMI), has variable association with health-related quality of life (HRQoL) in African Americans. This study aims to: A) assess the relationship of obesity defined by a new measure that takes into account waist circumference, A Body Shape Index (ABSI), with HRQoL among overweight and obese African-American congregants seeking weight reduction and B) compare that relationship with BMI and HRQoL in the same sample. **Methods:** Baseline data were collected on participants in the Fit Body and Soul study, a single-blinded, cluster randomized, community trial to test the effectiveness of the faith-based adaptation of Group Lifestyle Balance with non-diabetics. SF-12 and EQ-5D were completed by 601 participants having data available to calculate ABSI. Hierarchical multivariate regression analyses were used to assess associations between obesity, ABSI and BMI, and HRQoL controlling for socio-demographics. **Results:** Mean age was 46 years (SD 11); 84% were female; 51% were college graduates; 52% were married; and 80% were employed. Mean BMI was 35.7 (SD 7.2); mean waist circumference was 107.7 (SD 15) cm; and the mean ABSI was .0774 (SD.0047). Neither SF-12, nor EQ-5D significantly added to the variance in ABSI. SF-12 general health, physical summary component, and mental summary components added significantly (6.7%) to the variance in BMI. **Conclusions:** Assessing the relationship between ABSI and HRQoL, we might conclude that there is not an association; however, nesting of employed and educated participants in faith-based communities could be significant. Future studies should examine comparisons of those in similar supportive communities with those who are not, as well as examine weight reduction interventions with reductions in ABSI for improvement in HRQoL.

T-902-P[DT]

Effects of Depression and Insulin Resistance on Self-Efficacy for Weight Loss Intervention among Obese African American Adolescents

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Background: Adolescent self-efficacy is an important predictor of weight loss. However, adolescents with insulin resistance (IR) may perceive themselves as having less control with regard to their weight. Depression has also been found to be related to treatment outcomes in adults and may have its effects through reducing self-efficacy for weight loss. This study used baseline data from a clinical trial providing weight loss interventions to obese African American (AA) adolescents. It was hypothesized that depression and IR would have main effects on self-efficacy for weight loss; depression was also expected to moderate the effects of IR on self-efficacy. **Methods:** Participants were 113 obese AA adolescents (BMI>95th percentile). Self-efficacy for weight loss was measured by the Confidence Ruler. Depression was measured using the youth PROMIS scale. IR was assessed using HOMA-IR. A multiple regression was conducted, with self-efficacy as the independent variable, and depression, IR, and the depression x HOMA interaction term as

dependent variables. **Results:** Depression (β=-.19, P=.049) and the depression x HOMA interaction (β=-.25, P=.016) were significant predictors of self-efficacy (R=.27, P=.046). Moderating effects of depression were further explored in bivariate correlations between HOMA and self-efficacy at various levels of depression. At high levels of depression, higher IR was related to lower self-efficacy (r=-.44, P≤.05). At low and moderate levels of depression, these relationships were n.s. or weakly positive. **Conclusions:** Results suggest adolescents with more depression and IR may be vulnerable to beliefs that they cannot effectively engage in weight loss behaviors and may require different behavioral interventions.

T-903-P

Assessing the Costs and Benefits of a School- and Community-Based Obesity Prevention Program

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Background: Evidence regarding the efficacy of multi-component school- and community-based obesity prevention interventions is building. Little is known, however, about their economic costs and benefits. This study assesses the short- and long-term cost-effectiveness ratios and net benefits of Shape Up Somerville (SUS)—a multifaceted school and community-based intervention designed to prevent overweight (OW) and obesity (OB) among elementary school children. **Methods:** Previous research found that children enrolled in SUS schools experienced less undesirable weight gain relative to children attending control schools. From this result, the number of overweight and obese (OW/OB) cases averted through SUS were predicted at ages 8-18, 19-39, and 40-64 using a lifetime obesity progression model. The number of cases averted served as the effectiveness measure in the model. The model's cost estimates included: SUS intervention costs, per case health care costs associated with OW/OB for each age group, and the per case cost of the productivity loss associated with OW/OB for the adult age groups. Cost-effectiveness ratios (net intervention costs to the number of cases averted) and net benefit calculations (costs averted minus intervention costs) were estimated for each age group. **Results:** Excluding other possible community and household benefits (i.e. weight loss of observations' caregivers), preliminary results demonstrate that SUS is a cost saving program. **Conclusions:** A range of cost-effectiveness and net benefit calculations are presented, which provide information to stakeholders to evaluate the feasibility of implementing SUS in their communities.

T-904-P

Dietotherapic Approaches Comparison in Obese Adolescents: Dietary Intake Recall and Equivalent Caloric Counting

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Background: Our aim was to compare the Z-BMI variation in obese adolescents submitted to two distinct dietotherapic approaches: a 3-day dietary intake recall (DIR) and equivalent caloric counting (ECC) and evaluate the correlation between Z-BMI variation with anthropometric and metabolic variables dietery intakes and the influence of self-monitoring. **Methods:** In our work, were included obese adolescents attended in the Childhood Obesity League. Patients followed up for 24 weeks, with regular evaluation by a nutritionist. Participants were randomly sorted in two groups; each group received a different nutritional approach (DIR or ECC). Patients had anthropometric, clinical, laboratorial and dietary intake variables assessed. Statistical analysis were performed using paired t-test, independent samples t-test, Mann Whitney Test and Pearson's and Spearman's correlation Test, with statistical significance level set at p<0.05. **Results:** The concluded treatment group was composed by 45 patients (64% girls; 14.3±0.6 years), being 25 patients in the DIR group and 20 patients in the ECC group. Patients presented weight loss and significant improvement in metabolic parameters during treatment. No differences were observed among the DIR and ECC groups regarding to Z-BMI variation (-0.18±0.20 vs. -0.24±0.19, p=0.26, respectively). In addition, no differences were found comparing blood pressure percentiles, HDL-cholesterol, glucose and insulin levels and dietary intake. A positive correlation was found between Z-BMI decrease and self-monitoring index in the ECC (r=0.453, p=0.04). **Conclusions:** The nutritional intervention in obese adolescents lead to weight loss independently of the dietotherapic approach. Patients tended to present a greater weight loss proportionally to self-monitoring index.

T-905-P
The Effect of Availability of School Sports Teams on Weight Trajectories from Adolescence to Adulthood in the National Longitudinal Study of Adolescent Health

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Background: Sports participation is associated with increased physical activity and improved weight status. However, little is known about availability of sports teams in schools and its impact on weight gain trajectories as adolescents age in to adulthood. **Methods:** We used the multi-level model for change to analyze 44,840 observations from 14,530 students nested in 81 schools from Waves I-IV of the National Longitudinal Study of Adolescent Health, limiting our sample to youth attending public schools with at least 2 waves of data available. The primary outcome was body mass index (BMI; kg/m2), the time variable was age of respondent, the individual-level primary predictor was race/ethnicity, and the primary school-level predictor was the number of school sports teams available as reported by school administrators to the federal Office of Civil Rights via an annual school reporting instrument. Models were adjusted for individual- and school-level household income and parental educational attainment. The intercept for BMI was set at age 20. **Results:** In gender-stratified models, Black females and Hispanic males compared to same gender White peers had higher BMI at age 20 (black female: gamma0,1=1.78, p<0.001, Hispanic male; gamma0,2=0.34, p<0.001) and higher rate of BMI change (black female: gamma1,1=0.71, p=0.004, Hispanic male: gamma0,2=0.049, p=0.071). Female students attending schools with a higher number of sports teams had a lower BMI at age 20 (female: gamma06=-0.025, p<0.001) and a lower rate of weight gain from adolescence to adulthood (female: gamma16=-0.0010, p=0.036) compared to their female peers attending schools with lower number of sports teams; there was no effect in males. **Conclusions:** The number of sports teams available in schools appears to decrease weight gain trajectories and may minimize racial/ethnic differences in BMI among females.

T-906-P
Health Expenditures in Overweight and Obese Children and Adolescents: A National Study Exploring Socio-Demographic Disparities

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Background: The healthcare expenditure burden of childhood obesity is uncertain. We examined, in children and adolescents, (1) the associations between healthcare expenditures and being overweight or obese, (2) how these associations vary by socio-demographics (age-group, race/ethnicity, income, insurance status, and region), and (3) secular changes in these associations. **Methods:** We analyzed healthcare expenditure and socio-demographic data on children (aged 6-12) and adolescents (aged 13 to 20) in the 2000-2010 Medical Expenditures Panel Surveys (N=37,920). **Results:** Overall, obese children and adolescents had 19.1% (95% confidence interval [CI] = 3.2%, 37.5%) higher healthcare expenditures than normal weight individuals. The difference was limited to adolescents - overweight and obese individuals had higher total healthcare expenditures, respectively 17.8% (95% CI = 1.1%, 37.3%) and 35.3% (95% CI =12.9%, 62.0%), than normal weight adolescents. In further stratified analyses: insured obese (compared with normal weight) children and adolescents had 22.8% (95% CI = 5.9%, 42.5%) higher expenditures, whereas uninsured obese (compared with normal weight) children and adolescents had 43.3% (95% CI = 27.4%, 55.6%) lower expenditures; and, minority (compared with white) overweight adolescents had 35.0% (95% CI = 16.6%, 47.5%) lower expenditures. There were no other significant socio-demographic associations or secular trends. **Conclusions:** Overweight and obesity in adolescents was associated with higher expenditures. Stratified analyses identified healthcare expenditure disparities affecting the uninsured overweight and obese and as well as overweight adolescent minorities.

T-907-P
Why Patients Seek Bariatric Surgery: Does Insurage Coverage Matter?

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Background: Despite increasing prevalence of bariatric surgery, little is known about why patients undergo this treatment option. Heads Up is an observational study sponsored by a large insurance organization that examines surgical and nonsurgical approaches to weight management in severely obese adults. Winners of a lottery who met study criteria chose either bariatric surgery (approved by a medical panel) or intensive medical obesity management paid for by their insurance company. This present study examined patients' reason for choosing surgery, specifically to determine if insurance coverage was a deciding factor. **Methods:** The patient sample was 142 adult obese patients seeking bariatric surgery: Caucasian (63%), African American (35%), female (90%). The mean age was 44.4 years (SD=9.95) and mean BMI was 48.0 kg/m2 (SD=5.56). Participants rank ordered their top three reasons (of 8 options presented) for choosing surgery. **Results:** The top three reasons were concerns regarding deteriorating health and shortened life span (54%), current obesity-related medical conditions (31%), and improved physical fitness (30%). Overall, 15% endorsed insurance coverage as one of their top three choices. There was no difference in ratings between men and women or between African Americans and Caucasians. **Conclusions:** Although insurance coverage was a top reason endorsed by few, health concerns were the major reasons reported for obese adults undergoing bariatric surgery. Findings should be tempered by the fact that participants have been obese for several years, yet surgery was sought when offered as a benefit by the insurance program.

T-908-P
Predictors of Lowest Weight and Long-Term Weight Regain among Weight Loss Surgery Patients

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Background: Over time, weight loss surgery (WLS) patients often regain weight and may experience associated declines in health-related quality of life. Unfortunately, variables related to long-term WLS outcomes are poorly understood. We evaluated the relationship of standard (e.g., health, diet, physical activity, etc.) and novel (addictive elements of food and substances) variables to lowest post-WLS weight (nadir) and weight regain (WR) thereafter. **Methods:** A preliminary sample of 45 (data collection ongoing) post-WLS patients ($M_{time\ since\ surgery}$ = 8.34 yrs, SD = 4.41 yrs) were surveyed about pre- and post-WLS health, weight, self-management, alcohol problems, and clinical syndromes. **Results:** There was a mean of 42% (SD = 9%) of total weight loss at nadir, but 24% (SD = 22%) of weight was regained from nadir. Eating fruits, vegetables, and whole grains was the only significant predictor of nadir weight. However, adhering to other recommendations (e.g., adequate protein intake, physical activity) was associated with less WR. Significant WR ($\geq$ 20% from nadir) was associated with similar practices, plus nocturnal eating syndrome, depression, and problematic alcohol use. In regression modeling, fruit, vegetable, and whole grain intake (β = -.51, $p < .01$) and nocturnal eating (β = .36, $p < .01$) were associated with significant WR, accounting for 38.1% of the variance (R^2 = .42, $F(2,34)$ = 12.10, $p < .001$). **Conclusions:** Nadir weight is related to following recommended post-WLS behaviors, whereas significant WR is associated with additional variables that may reflect features of addiction (i.e., alcohol abuse, awakening at night because of urges to eat, suggestive of "withdrawal", and depression, which is commonly comorbid with addiction). Future research on the relationship between aspects of food and substance "addiction" and long-term WLS outcomes is warranted.

T-909-P[DT]
Obesity Epidemic Has Fully Emerged among Urban Nigerians

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Background: Data from the WHO shows that the prevalence of overweight and obesity increased by ~20% between 2002 and 2010 in Nigeria. We con-

ducted this study to examine the determinants of this fast growing epidemic. **Methods:** We conducted a cross-sectional study among a random sample of 1058 adults at a government worksite, in Abuja, an urban city in Nigeria. The study participants had varying socio-economic status and a wide range of occupations, including skilled labor and professionals. Log-binomial regression models were used to estimate the multivariable-adjusted associations of potential determinants with the prevalence of overweight and obesity. **Results:** The mean age and body-mass index of the study population were 42 years ± (9.3) and 27 kg/m2 ± (4.8). The overall prevalence of overweight or obesity (body-mass index ≥ 25kg/m2) was 64% (74% for women and 56% for men). For women compared to men, the prevalence ratio (PR) and (95% confidence interval, CI) was 1.24 (95% CI 1.08, 1.43, p=0.004), for overweight, and 2.54 (95% CI 2.08, 3.10, p=<0.0001), for obesity. The peak age of overweight [1.45(95% CI 1.07, 1.97), p for trend=0.002] or obesity [8.07(95% CI 3.01, 21.66), p for trend=<0.0001] was 40 – 49 years. Compared to individuals in the lower socio-economic status, the PR for obesity among those in the middle and high socio-economic statuses, were 1.39 (95% CI 1.13, 1.72) and 1.24 (95% CI 0.97, 1.59) respectively, p for trend=0.003. **Conclusions:** About two-thirds of urban, Nigerian adults in this sample were either overweight or obese. The prevalence of overweight and obesity among this population of adult Nigerians, was as high or higher, as it is in the United Kingdom. Female gender and older age were independent predictors of overweight and obesity; while middle or high socio-economic status were independently associated with obesity.

T-910-P[DT]
Occupational Activity and Obesity among Recently Immigrated Mothers in Greater Boston
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Background: Duration in the US has been associated with increased BMI and with declines in occupational activity (OA) among immigrant populations. The relationship between OA and obesity among new immigrants remains underexplored. **Methods:** Cross-sectional data was derived from Live Well, a community-based participatory-research intervention to prevent weight gain among recent immigrant mothers (<10 years in the US). At baseline, 385 participants reported socio-demographics, lifestyle changes, and types of physical activity (PA) (Pregnancy PA Questionnaire; PPAQ). PPAQ responses were scored per protocol, ranked within domain, and categorized into tertiles. Researcher-measured height and weight were converted to BMI (obese: BMI>30.0). Logistic regression models estimated the likelihood of obesity from OA adjusting for sedentary behavior, household composition, and changes in diet and PA. A sensitivity analysis among those employed part-time/full-time was conducted to confirm that OA, rather than employment, drove the association with BMI. **Results:** Overall, 37% were obese. Occupations in the highest OA tertile include housecleaners and nursing assistants. Unadjusted models showed a 46% lower likelihood of obesity (95% CI: 0.42-1.15) for women in the highest OA tertile vs. the lowest. After adjustment, women in the middle OA tertile were 50% less likely to be obese (95% CI: 0.28-0.92)and women in the highest OA tertile were 54% less likely (95% CI: 0.25-0.85) to be obese, compared to the lowest tertile. The sensitivity analyses confirmed a significant inverse, stepwise, relationship between OA and BMI. **Conclusions:** OA may protect against obesity among new immigrant mothers. When switching to less physically demanding jobs, women may need to reduce their caloric intake or increase their leisure-time caloric expenditure in order to avoid weight gain.

T-911-P
Stress, Diet, and Lifestyle in College Students: Analysis of the YEAH Study
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Background: Stress may negatively impact health behaviors that form in young adulthood and have weight and health implications through life. Relationships between stress and behavior are complicated by differences in perceived stress by sex and stress management skills. **Methods:** The Young Adults Eating and Active for Health (YEAH) study was conducted to test a web-based health intervention on college students. A subsample of baseline participant data was analyzed to explore associations among tertiles of Cohen

Perceived Stress Scale, measured BMI, waist circumference (WC), and related health behaviors. **Results:** The sample (N=1116) was primarily female (70%) and white (75.1%) age 18-19 (59.2%) with mean BMI of 24.0+4.3kg/m^2. Stress-by-sex analyses of variance revealed that students in the highest perceived stress tertile had greater BMI (0.8kg/m^2 males; 1.1kg/m^2 females) and WC (2.6cm males; 3.5cm females)(p<.05) than those in the lowest tertile. Students who reported practicing effective stress management had lower BMI (1.9kg/m^2 males; 1.6kg/m^2 females) and WC (5.2cm males; 3.1cm females)(p<.001) compared to those who were not. Effects of perceived stress tertile on BMI and WC were no longer significant when controlling for stress management (p=.389). Both males and females in the highest stress tertile had the greatest emotional and externally-cued eating scores, and males also had the greatest restraint scores (all p<.05). **Conclusions:** These findings suggest higher stress and less effective stress management practices are related to higher body weight and altered health behaviors, but effects differ by sex.

T-912-P
Association between Prenatal Participation in WIC and Rapid Infant Weight Gain Is Mediated by Breastfeeding Duration and by Birth Weight for Gestational Age
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Background: Rapid infant weight gain is an established risk factor for childhood obesity. The objective of this study was to assess the relationship between mothers' prenatal enrollment in WIC and infant weight gain from birth through 12 months of age. **Methods:** This prospective cohort study included WIC enrolled infants born during 2008 - 2009 in New York State (n=155,601). Infants were linked to maternal WIC participation records. Outcomes were compared for infants of mothers who enrolled in WIC prenatally (early enrollees) to the infants of women who delayed enrollment until the postpartum period (late enrollees). Multiple logistic regressions assessed the association of early enrollment with rapid infant weight gain defined as a 12 month change in weight-for-age z-score > 0.67. **Results:** Logistic regression analysis, adjusted for infant and maternal demographics, showed a reduced odds of rapid weight gain (OR: 0.85; 95% CI: 0.82, 0.87) among infants of early vs. late maternal enrollees. The addition of birth weight-for-gestational age and breastfeeding for at least 6 months to the model provided evidence of nearly complete mediation suggesting that early WIC enrollment has a positive effect on both birth weight-for-gestational age and breast feeding for 6 months which were associated with a reduced risk of rapid infant weight gain. **Conclusions:** These findings suggest that by improving birth outcomes, an established effect of prenatal WIC participation, and improving breast feeding behaviors, the benefits of prenatal WIC enrollment may extend to protecting infants from experiencing rapid weight gain during the first year of life.

T-913-P
AIM for Fitness: Baseline Results from an Urban Public School District's Physical Education Program Grant
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Background: Physical Education Program (PEP) grants are awarded each year by the U.S. Department of Education to enhance PE curricula, nutrition policies, and the health of students nationwide. AIM for Fitness is a 3-year PEP project conducted in collaboration with a large urban public school district. The goals of this project are to implement a comprehensive, enhanced physical education curriculum throughout the district's 46 elementary schools and to evaluate its impact on student health, fitness, and lifestyle behaviors. **Methods:** Year 1 participants included 1045 students (50.4% girls, 83.7% black, 95.1% free/reduced lunch status, age 10.1 ± 0.8 y [mean±SD]) in grades 4 and 5 attending 15 schools. Outcome measures are body composition using Tanita IronKids BF-2000, BMI from measured weights and heights, cardiorespiratory fitness from the 20-meter PACER test, daily pedometer step counts for 3 weeks, and fruit/vegetable intake on 3 occasions using the SPAN questionnaire. **Results:** Body fat averaged 26.9 ± 9.7% in girls and 21.0 ± 9.1% in boys; the prevalence of "overfat" or "obese" categorization was 40.4% in girls and 31.4% in boys. Based on BMI-for-age percentile, 43.3% of girls and 34.8% of boys were categorized as overweight or obese. Among an age-eligible subsample for the PACER test, 56.3% of stu-

dents did not achieve Healthy Fitness Zone® standards. Daily step counts were 7174 ± 2611 among students with ≥4 days of plausible pedometer data. Fruit and vegetable intake averaged 2.0 and 3.2 servings/day, respectively. **Conclusions:** The relatively high prevalence of excess adiposity, over-weight/obesity, low cardiorespiratory fitness, and low physical activity observed in these urban public schools highlight the importance of curricular enhancements and novel approaches for promoting physical activity during the school day as well as before and after school.

T-914-P

Who Thinks Fast Food Is Healthy? Demographics and Purchasing Patterns of Families at a Fast Food Restaurant

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Background: The relationship between higher levels of fast food intake and obesity has been established. However, there is limited data on the perceived healthiness of fast food among consumers. The primary aim of this study is to describe demographic factors and purchasing patterns of subjects rating a fast food restaurant as healthy. **Methods:** Survey and receipt data was collected from 542 families with children aged 2-18 years who purchased lunch at a fast food restaurant over a 6-week period. The survey included questions on demographics and perceived healthiness of the restaurant (5 point Likert scale; 1 = very unhealthy, 5 = very healthy). Calories purchased to daily caloric requirement (CPDCR) ratio was calculated from annotated receipt data based on the age and gender of each individual. Univariate analysis was used to identify variables significantly associated with rating the restaurant healthy. Only variables with significant associations were included in the multivariate logistic regression model. **Results:** Hispanic was the most frequently reported ethnicity (50%) followed by White (32%), Black (5%), Asian (4%), and other (4%). The majority of the sample rated the restaurant neutral/unhealthy (87%) versus healthy (13%). Only Hispanic ethnicity and income below the median ($40,000/yr) remained significantly associated with a healthy rating in multivariate logistic regression (OR 4.8, (CI 1.8-12.9) and OR 3.0 (CI 1.5-6.0) respectively). There was no difference in mean CPDCR ratio between subjects rating the restaurant healthy versus unhealthy. **Conclusions:** While there are many public health programs educating consumers on healthier food choices, this study highlights a need for public education on the healthiness of fast food, particularly within low income and Hispanic communities.

T-915-P[DT]

Social Environmental Predictors of BMI, Waist Circumference and BMI-Waist Circumference Composite in Underserved African-American Adults

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Background: African Americans have the highest rates of obesity in the United States relative to other ethnic minorities. Ecological factors including social and environmental factors play an important role in understanding obesity, especially in underserved populations. The purpose of this study was to examine social and environmental factors that best predict weight-related outcomes, including waist circumference (WC), Body Mass Index (BMI), as well as a BMI-WC composite (BWCC). **Methods:** This study used baseline PATH randomized trial data, which collected bioecological data from 434 African Americans who lived in one of three low-income communities matched based upon US census information. Participants provided demographic, anthropometric, and 7-day accelerometer-assessed moderate-to-vigorous MVPA data, and completed psychosocial questionnaires. In separate multiple regressions models, each of the three weight-related outcomes (WC, BMI, BWCC) were regressed on covariates (age, sex, MVPA) and five psychosocial variables representing places for walking and cycling, neighborhood satisfaction, neighborhood social life, social support from friends, and self-efficacy. **Results:** Overall multiple regression models predicting BMI, WC, and BWCC were significant, with significant associations of each outcome variable with average daily MVPA (B =-0.08,-0.04,-0.13, p<0.05, respectively) and neighborhood social life (B =-0.37,-0.15,-0.52, p<0.05, respectively). **Conclusions:** These results show that as neighborhood social life increase, weight related outcomes decrease. Findings in the present study are consistent with a growing literature, which shows that social environment is critically linked to weight related outcomes. Future prevention and inter-

vention efforts should continue investigating social life factors, particularly longitudinally.

T-916-P

Preschool Children Influence on Maternal Purchasing Decisions of Sugar-Sweetened Beverages (SSB) and Fruit Juice (FJ)

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Background: Children are recognized to influence parental purchasing decisions. This study explores to what degree preschool children's influence on maternal purchasing decisions of SSB and FJ and maternal characteristics associated with yielding to the child. **Methods:** Low-income mothers (N=66) of preschool children participating in a study assessing family psychosocial correlates of SSB and FJ purchasing behaviors. Mothers reported whether they take their child grocery shopping, whether the child helps select SSB (soda, juice drinks, and sports drinks) and FJ, and whether the child influences SSB and FJ purchases. Responses ranged from "always" to "never" on a Likert scale. Separate SSB and FJ questions allowed the creation of two composite scores for children's influence on maternal purchasing of SSB and FJ. Iteratively reweighted least squares regression analysis was used to test the independent effect of demographic covariates on the composite scores **Results:** Sixty-four percent of mothers "always" or "almost always" brought their child grocery shopping; 41% and 30% of mothers "sometimes" let the child help select what SSB and FJ to buy, respectively. Children influenced 26% of SSB purchases "sometimes" and 67% influenced FJ purchases "always" or "almost always". In the regression models, only maternal education was inversely associated with SSB (mother lets child help select and influence SSB purchases) and FJ (mother lets child help select and influence FJ purchases) composite scores (p≤0.001). **Conclusions:** At an early age children accompany mothers while grocery shopping and are able to influence maternal purchasing behaviors of SSB and FJ. Although mothers yielded to the child's influence to purchase FJ more frequently than SSB, children's influences on maternal purchases of SSB and FJ was associated with maternal education.

T-917-P

Purchasing Behaviors of Sugar-Sweetened Beverages (SSB) and Fruit Juice (FJ) of Low-Income Fathers of Preschool Children

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Background: Although mothers are seen as the main shoppers, availability of SSB and FJ in the home purchased by fathers/partners is important to explore to characterize sources, composition and amount of beverages that can potentially affect consumption. The study examined the purchasing behavior of fathers/partners living in the home of preschool children in relation to the purchase of SSB (soda, juice drinks, and sports drinks), diet soda, and FJ. **Methods:** Low-income multicultural mothers (N=118) of preschool children participated in a study that assessed family psychosocial correlates of availability of SSB and FJ in the home. Mothers provided demographics and information on type of beverages purchased for the household by preschool children's fathers/partners. Responses were tabulated for each survey item, and chi-square tests were used to determine whether the distribution of responses were the same across categories. **Results:** Forty five percent of mothers were enrolled in SNAP. Sixty five percent of mothers were married/partnered but 58% reported two adults living at home. Fathers/partners were the second main purchaser of beverages for the home (46%) after the mother. Among beverages purchased by fathers/partners, 85% and 11% were SSB and FJ, respectively (p<0.0001). Few parents purchased diet soda (4%). Among SSB types, fathers/partners purchased significantly more soda and sports drinks than juice drinks and diet soda (p<0.0001). **Conclusions:** Fathers/partners seem to be a considerable source of SSB availability. Information is lacking on the relationship of male figures and the availability of high-caloric foods. Targeted approaches to addressing family obesogenic behaviors should account for fathers' role modeling and their contribution to availability of foods at home that can influence young children's dietary behaviors.

T-918-P[DT]

Continued Emphasis on Dietary Quality Is Important for Obese Minority Youth Following a Diet Plan

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Background: Minority youth remain in need of effective strategies to engage in weight loss behaviors such as healthy eating. Supporting autonomy during weight loss, particularly during adolescence, may help. **Methods:** We examined how the youth's choice of diet plans, either a total calorie goal (TCG, tracking all kcals) or a 500 calorie deficit (CD, cutting 500 kcals), affected the intake of obese African American adolescents (oAAA) participating in a 6-month sequential multiple assignment randomized trial (SMART) for weight loss. The Block food frequency questionnaire was completed at baseline, 6, and 9 months with 52% choosing the TCG and 48% choosing the CD plan. **Results:** The AAO sample (BMI=38.27±7.52, age=13.80±1.30 yrs, 65% female) was 65 and 57 for 6M and 9M respectively after excluding reported intakes of <500 kcals or >3500 kcals. No differences were found in total kcals consumed and percentage of kcals from macronutrients (p> 0.05) between the two diet plans. At 6M regardless of diet plan oAAA reported a significant decrease in total kcals (1383±623 to 1067±483; p<0.001) with decreases in grams of fat, fiber and protein (p<0.01), servings of grain, meat and dairy (p<0.05), and sodium and cholesterol (p<0.01). At 9M these significant findings were maintained with the exception of servings of diary (p = 0.1) and cholesterol (ns). Additionally at 9M, grams of carbs and servings of fruit decreased (p < .01). No differences were found at either time point for kcals from sweets. **Conclusions:** Both diet plans appear to decrease overall self-reported energy intake and offering a choice of diet plans to support autonomy may be beneficial for this population. However, increased emphasis on decreasing unhealthy food choices when decreasing calories may be necessary to improve dietary quality in weight loss programs for minority youth.

T-919-P

The Relationship Between Body Mass Index (BMI), Body Fat Percentage, Waist and Hip Measurements and Weight and Height Estimation Errors

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Background: People underreport their body weight, and this self-reporting bias is more prevalent in people who are overweight or obese (e.g., Villanueva, 2001). Most studies with this finding were retrospective data reviews and previous studies did not include waist and hip measurements in the analysis. The purpose of this study was to replicate this finding in a prospective sample and examine if a person's gender, BMI, body fat percentage, hip, and waist measurements would predict weight and height estimation errors. It was hypothesized that greater BMI, body fat percentage, hip, and waist measurements would lead to greater estimation error. **Methods:** Two hundred eighty participants were recruited for a study on eating behavior. For this study, they were asked to report their weight and height via an online questionnaire. Participants came into the lab and had weight, height, BMI, body fat percentage, hip, and waist measurements recorded. Estimation error was calculated with the absolute value of the difference between reported and measured weight and height, respectively. Pearson's correlations were calculated between weight and height estimation error and all variables. Gender was coded using 0 for males and 1 for females. **Results:** Weight estimation error shared a significant moderate correlation with gender ($r = .127$, $p = .034$), height estimation error ($r = .155$, $p = .009$), BMI ($r = .258$, $p < .001$), hip measurement ($r = .265$, $p < .001$), and waist measurement ($r = .325$, $p < .001$), and was not significantly correlated with body fat percentage ($r = .099$, $p = .099$). Height estimation error shared a significant correlation with body fat percentage ($r = .123$, $p = .040$) and weight estimation error. **Conclusions:** These results indicate higher BMI scores, hip, and waist measurements may be related to poor nutritional estimations beyond energy intake.

T-920-P

Anthropometric Variables and Fat Mass As Predictors of Cardiometabolic Risk Factors

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Background: Cardiovascular disease is a leading cause of death and disability at adult age. Overweight and obese children/adolescents are an especially at-risk population. Our aim was to evaluate the association between anthropometric and body composition parameters and cardiometabolic risk factors (CM-RF). **Methods:** Overweight and obese children/adolescents with complete evaluation for CM-RF – blood pressure, fasting glucose and lipids – were included. Cut-off points were set according to the recommendations of the 2011 Integrated Pediatric Guidelines for Cardiovascular Risk Reduction (Pediatrics, 2011). BMI z-score, waist/height ratio (w/h) and fat mass percentage (In Body®) were collected. Statistical analysis was performed using t-test and binary logistic regression. Statistical significance was set at 0.05. **Results:** 88 patients were included (53 female; 91% obese) with mean age 10,8 years (SD 2,9). Mean BMI z-score was 2,6 (SD 1,0), mean ratio w/h 0,6 (SD 0,1) and mean fat mass percentage 40,4 (SD 7,1). BMI z-score was significantly different in the group with CM-RF (2,3+0,7 vs 2,9+1,2; p = 0,005). Values for w/h ratio and fat mass (%) were 0,6+0,1 vs 0,6+0,2 (p=0,613) and 38,8+7,3 vs 41,4+6,8 (p=0,131) for the group without and with CM-RF, respectively. Only BMI z-score was a significant predictor of the presence of CM-RF (p=0,046) in multivariate analysis. **Conclusions:** In our population of overweight and obese patients, BMI z-score was a predictor of the presence of CM-RF. A non-significant trend towards higher fat mass percentage in the group with risk factors was also observed. Further studies with larger samples are required.