

BMI among transit workers who spend most of their workday outside the worksite. Obesity prevention strategies that target transit workers may need to focus on policy changes that address infrastructure issues including work schedules and break policies.

366-P
A Dietary Intervention to Improve Metabolic Outcomes and Decrease Adiposity in Overweight Peri-Pubertal African American Girls: Does Macronutrient Profile Matter?

Krista Casazza, Michelle Cardel, Lynae J. Hanks, Akilah Dulin-Keita, Stephenie Wallace, Barbara A. Gower, Jose R. Fernandez *Birmingham, AL*

Obesity prevalence among African American girls (AA) is higher than that of other groups. As typical calorie restriction obesity treatment strategies have met with limited success, alterations in macronutrient composition might effectively improve metabolic outcomes and impact future body composition trajectories in this population. The study objective was to examine the effectiveness of a 16-week dietary intervention to improve metabolic profile and promote weight-loss in 24 overweight AA aged 9-14y. Girls were assigned to either a reduced-carbohydrate diet (SPEC: 42% CHO, 40% fat; n=10) or a standard diet (STAN: 55% CHO, 27% fat; n=14). The study included two phases: eucaloric (5-week) and hypocaloric (11-week; 1000kcal deficit). Energy requirements were determined by indirect calorimetry and all meals were provided accordingly. Meal tests were performed for metabolic analyses and DXA was used for body composition assessment. Girls on the SPEC diet had significantly lower triglycerides ($p<0.001$) and marginally decreased leptin ($p=0.10$). Girls on both diets had marginally decreased LDL cholesterol ($p=0.07$) and increased adiponectin ($p=0.06$). Although the meal test indicated improved glucose/insulin homeostasis, girls on the SPEC diet also had higher fasting insulin ($p=0.02$). SPEC resulted in marginal reduction in lean mass during the eucaloric phase ($p=0.11$), that rebounded during the hypocaloric phase. Overall, both groups had reductions in weight and adiposity although there were no group-differences in weight/body composition at the end of the intervention. Carbohydrate reduction influences metabolic parameters but may elicit a compensatory change in fuel utilization in AA. Future research is needed to determine long-term effectiveness on weight/fat-loss and metabolism.

367-P
Elementary School-Based Obesity Prevention Intervention Effect on Waist Circumference Among Multiethnic 6-13 Year Olds

Danielle Hollar, Gabriela Lopez-Mitnik *Miami, FL*; Lucas Hollar *Nacogdoches, TX*; Arthur Agatston *Miami Beach, FL*; Michelle Lombardo *Duluth, GA*; Sarah Messiah *Miami, FL*

Background: Childhood onset obesity and related health consequences continue to be major clinical and public health issues in the U.S. Schools provide an opportunity to implement obesity prevention strategies to large and diverse pediatric audiences. Healthier Options for Public Schoolchildren (HOPS) was a school-based obesity prevention intervention with both nutrition and physical activity components implemented in the elementary school setting targeting 6-13 year olds. Methods: HOPS was a quasi-experimental elementary school-based obesity prevention intervention targeting ethnically diverse 6-13-year-olds (Kindergarten-6th). Over two school years (August 2004-June 2006), six elementary schools (four intervention; one control, N=3,183, 48% Hispanic) in Osceola County, Florida participated in the study. Waist circumference (WC) data was reported in the Fall of 2005 and Spring of 2006 only and these one year results are reported here. Results: Among boys, the mean incremental change in WC (measured in centimeters [cm]) increase was significantly less in the intervention (1.35 cm +/- 0.88 [SD]) versus control schools (3.83 cm +/- 0.94) ($P<0.0001$). Among girls the mean incremental change in WC increase was significantly less in the intervention (1.20 cm +/- 0.84) versus control schools (4.17 cm +/- 0.89) ($P<0.0001$). Similarly, waist-to-height ratio results showed that the intervention group mean incremental change was significantly less versus the control group for boys ($P=0.0002$) and girls ($P<0.0001$). Conclusions: Elevated WC is strongly correlated with cardiometabolic disease risk factors and should be monitored in young children as such. School-based obesity prevention interventions show promise in improving weight and potentially cardiometabolic health in elementary-school aged children.

368-P
Variability in Middle Schools' Implementation of a Multi-Component Obesity Prevention Program Linked With Three-Year Changes in Behaviors and Weight Status

Karen E. Peterson *Ann Arbor, MI*; Jennifer Spadano-Gasbarro, Mary Greaney, Henry A. Feldman, Tracy Richmond, Solomon Mezgebu *Boston, MA*; Anne T. Hunt *Logan, UT*; Emily Blood, Stavroula Osganian, Christine M. Horan, Maria Bettencourt, S. Bryn Austin *Boston, MA*

Successful dissemination of multi-component interventions shown to improve youth dietary, physical activity (PA) and sedentary behaviors requires new data on effects of specific program activities and intervention dose in different school settings. The Massachusetts Healthy Choices (HC) evaluation documented three-year changes in school-level behaviors among approximately 20,000 adolescents in 45 middle schools and body mass index (BMI) in 7th graders in 35 schools, adjusting for school % free/reduced price lunch, % white, % female and mean age. Intervention dose was estimated by summing types of activities (curriculum, promotions, before/after school programming, environmental and policy change, HC implementation team) supporting HC 5-2-1 daily behavioral goals: > 5 fruit and vegetables (FV), < 2 hours TV viewing, 1 hour PA. Principal components analysis yielded three factors each related to the 5, 2, 1 components and four global implementation factors. From Fall 2005 to Spring 2008, the adjusted mean school percent of students achieving HC behavioral goals increased from 16.4 to 19.4% for FV ($p=.00001$), from 53.4 to 58.2% for TV ($p=.00003$) and from 37.1 to 39.9% for PA ($p=.02$). Mean school prevalence of BMI \geq 95th percentile fell from 22.4 to 20.0% ($p=.045$). Change in mean BMI percentile was inversely associated with higher factor scores for implementation of PA lessons ($p=0.01$), school reach (number 5-2-1 promotions, number teachers trained) ($p=.07$), but positively related to TV lessons ($p=.002$). Findings suggest interventions by school personnel can foster healthier behaviors and reduce high BMI through substantial organizational commitment to curricular and other school-wide activities.

369-P
Two-Year School-Based Obesity Prevention Program in Chilean Children: Differential Effect According to Baseline Nutritional Status and Gender

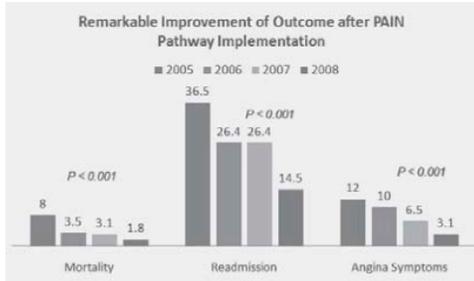
Juliana Kain, Barbara Leyton, Fernando Concha, Gabriela Salazar, Luz Lobos, Fernando Vio *Santiago, Chile*

Objective: to determine the effect of an obesity prevention program implemented for 2 years on 4 and 5y olds and 1st to 3rd grade schoolchildren, according to baseline nutritional status and gender. Methodology: in 2007 and 2008, we implemented this program in all public schools from one district of Santiago (741 low SES children in 7 schools). Non-randomized, no-control study (not possible otherwise) including nutrition education and increased PE classes. Weight and height were measured. BMI, BMI Z and nutritional status (low weight, normal, overweight and obese) were determined using WHO 2006/2007. The effect of the intervention was determined by comparing a) BMI Z change in OW (overweight + obese) and N (low + normal weight) by gender using Wilcoxon test and b) change in % obesity by gender (Mc Nemar test). Results: at baseline, BMI Z for OW was 2.1 and 1.9 for boys and girls respectively; for N it was 0.16 for both genders; 21.5% boys and 18.8% girls were obese. At follow-up, BMI Z for OW was 1.85 and 1.7 and for N, 0.11 and 0.19; 21% of boys and 15.4% girls were obese. A significant difference was found in BMI Z for N boys, OW boys and OW girls ($p=0.02$, <0.0001 , <0.0001 respectively). The % change in obesity was significant only in girls ($p=0.01$) Conclusion: this intervention was effective in reducing BMI Z in overweight children, more so in girls. BMI Z also decreased in N boys but remained within normal range.

370-P
Effect of One-Year Randomized Controlled Family Based Lifestyle Intervention (FBI) on Total and High Molecular Weight Adiponectin and Their Ratio in Obese Children

Prabhakaran (Babu) Balagopal, Amanda Lochrie, Jason Lang, Karl Mann, Atilio Canas, Tim Wysocki *Jacksonville, FL*

It has been suggested that high molecular weight (HMW) adiponectin is important for vascular protection. Although we and others have shown beneficial effects of physical activity-based lifestyle intervention on total (T) adiponectin in adolescents, the long-term effects on T and HMW



9:30 a.m.

Results: Repeated measures analysis showed that over a three year study period the HOPS intervention Z weight scores decreased significantly among boys (0.81 to 0.71, P<0.001) with a trend among girls (0.56 to 0.51, P < 0.07). Within ethnicity, a significant decrease in Z weight score for Hispanics (0.66 to 0.59 P <0.01) and whites (0.62 to 0.54, p< 0.02) was shown. Over the same time period, FCAT math scores improved significantly among girls (308 to 319, p<0.001) and reading scores improved significantly among boys (299 to 307, P<0.01). Within ethnicity, Hispanics significantly improved both their FCAT math (298 to 309, p<0.001) and reading (286 to 301, p<0.0001) scores.
Conclusions: School-based obesity prevention interventions that use both nutrition and physical activity components show promise in improving health and academic performance in elementary-aged children, and among Hispanics in particular.

9:30 a.m.

1046-09

The Effect of Human Unrestricted Somatic Stem Cells on Swine After Acute Myocardial Infarction: Insight into Xenogenic Model in Cell Therapy Research

Guilherme Silva, Yi Zheng, Marlos R. Fernandes, Cristiano Cardoso, Fred Baimbridge, Amir Gahremanpour, Maria G. Cabreira, William L. Fodor, Joseph Laning, Maria Giovino, Melissa White, Deborah Vela, Maximilian Buja, James T. Willerson, Emerson C. Perin, Texas Heart Institute, Houston, TX

Background: It is debatable if xenograft models should be used to assess safety and efficacy of stem cell therapy. We studied the results of endocardial delivery of CD34/CD45 negative human unrestricted somatic stem cells (USSC) into swine model of acute myocardial infarction (MI).

Methods: Thirty pigs underwent LAD balloon occlusion for 90 min. Ten days post MI, NOGA guided transendocardial injections (TE) were performed into the infarct border zone. Animals were randomized to receive either $302 \pm 23 \times 10^6$ USSC or saline, divided in 15 injections of 0.2cc. Oral cyclosporine 7.5 to 15 mg/kg bid was used to reach serum levels of 100 to 300 ng/ml 3 days before cell injection. Angiographic LVEF, IgG and IgM human antibodies serum titers were measured at baseline, injection, 2, 4 and 8 weeks post injection

Results: There were no peri-procedural complications. The rise of IgG and IgM antibody titers and the presence of granulomas at the injection sites confirm an immune response to USSC (figure 1). Immunohistochemical staining with human anti-mitochondrial antibody failed to detect implanted USSC. However treated pigs had significantly higher LVEF at 4 weeks (Δ EF: 10.9 ± 2.6 vs -2.3 ± 1.9 p=0.025).

Conclusions: Human USSC induced immune rejection in pig hearts even though immunosuppression reached therapeutic level. This may introduce confounding factors that in turn might lead to misinterpretation of data. The use of xenograft models might impair the assessment of safety and efficacy of new stem cell types such as USSC.

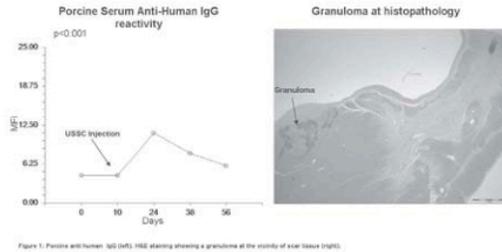


Figure 1. Porcine anti-human IgG (anti-IgG) staining showing a granuloma at the vicinity of scar tissue (right).

9:30 a.m.

1046-11

Relative Risk Is a Better Discriminator Than Absolute Risk When Estimating Ten-Year Risk of Coronary Heart Disease in Young Adults

Geir Hirlekar, Thor Aspelund, Thorarinn Gudnason, Vilundur Gudnason, Karl Andersen, Icelandic Heart Association, Kopavogur, Iceland

Background: European society of cardiology (ESC) guidelines on cardiovascular disease (CVD) prevention suggest the use of relative risk (RR) in young adults instead of absolute risk (AR) in assessing the risk of developing CVD over a 10-year period. No data is available comparing AR to RR in 10-year coronary heart disease (CHD) risk assessment. Our aim is to compare AR to RR in estimating 10-year risk of CHD in a population based study.

Methods: Data from the prospective Reykjavik study of 15763 participants without clinical heart disease were used to estimate the 10-year risk of CHD morbidity in Iceland. The event of CHD was defined as having had myocardial infarct, coronary artery bypass grafting or coronary angioplasty. Sensitivity and specificity were used for diagnostic accuracy.

Results: A total of 188 (2%) women and 679 (9%) men experienced CHD within 10 years. Among women aged 34-50 years, 34 (1%) women experienced CHD within 10 years. Among men younger than 40 years, 21 (3%) experienced CHD within 10 years. Current 10 year risk threshold for CHD is 10% absolute risk and has only 8% sensitivity and 98% specificity for women compared to 70% sensitivity and 60% specificity in men. For women younger than 50 years and men younger than 40 years the sensitivity is 0%. Using 3.5 in RR as a diagnostic threshold for women younger than 50 years results in 59% sensitivity and 89% specificity. Using 3.5 in RR as a diagnostic threshold for men younger than 40 results in 57% sensitivity and 82% specificity.

Conclusions: RR is a more sensitive diagnostic method than AR in 10 year CHD risk assessment for women younger than 50 years and men younger than 40 years.

9:30 a.m.

1046-12

Innovative Multidisciplinary Approach to Consultative Cardiovascular Services: A Retrospective Analysis Comparing two Models of Care

Carolyn Lekavich, Michael Blazing, Daniel Mark, Duke Hospital, Durham, NC

Background: This study was designed to retrospectively evaluate the effect of the operational changes implemented to the pre operative cardiology consult clinic. This retrospective study will compare the practice model of medical student/Attending to NP/PA /Attending MD on the quality, safety, patient satisfaction and financial outcomes of patients evaluated in the Pre Operative Cardiology Consult Clinic.

Methods: A retrospective analysis was completed evaluating using the Duke Heart Database, Scheduling and Press Gainey Patient Satisfaction systems to objectively evaluate a. clinical safety; 30 post operative mortality, rehospitalization, MI b. patient satisfaction c. finance data/consult billing/downstream revenue.

Results: Clinical quality demonstrated 2 deaths not associated with consult process Patient and Customer Satisfaction rated as excellent Patient Volume increased 215% Finance Billing increased 261%

Conclusions: Through a collaborative MD/NP/PA Pre Operative Consult Practice Model the Division of Cardiovascular Medicine was able to implement an operational change that significantly improved the clinical quality, patient satisfaction and finance.

9:30 a.m.

1046-10

School-Based Obesity and Related Cardiovascular Disease Prevention Intervention Effect on Weight and Academic Performance: Three Year Results

Danielle Hollar, Sarah Messiah, T. Lucas Hollar, Gabriela Lopez-Mitnik, Arthur S. Agatston, Agatston Research Foundation, Miami Beach, FL

Background: Childhood onset obesity and related health consequences continue to be major clinical and public health issues in the US. Healthier Options for Public Schoolchildren (HOPS) is a school-based obesity prevention intervention with both nutrition and physical activity components implemented in the elementary school setting and targeting 6-12 year olds. The overall goal of HOPS is to reduce childhood obesity rates and improve overall health status using strategies that can be easily replicated and integrated in other public school settings.

Methods: HOPS was implemented in August, 2004 and includes approximately 3,200 children (48% Hispanic) attending four elementary schools in central Florida. Demographic, anthropometric (height, weight, body mass index [BMI]) and academic (Florida Comprehensive Assessment Test [FCAT]) were collected during the school year. The HOPS intervention included modified dietary offerings, nutrition and lifestyle educational curricula, school gardens, and other school-based wellness projects. We hypothesized that the HOPS intervention would improve weight and FCAT scores in HOPS intervention participants.

1046-13

Use of Platelet Transfusion to Facilitate Surgery in Patients on Clopidogrel and Aspirin Therapy After Drug-Eluting Stent Percutaneous Coronary Intervention

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Background: Surgery in patients on clopidogrel and aspirin after drug-eluting stents (DES) is often declined by surgeons, unless clopidogrel and aspirin are withheld for 5-7 days. The AHA/ACC/SCAI/ACS/ADA Scientific Advisory Committee recommends "Elective procedures for which there is significant risk of perioperative or postoperative bleeding should be deferred until patients have completed an appropriate course of thienopyridine therapy (12 months after drug-eluting stent DES implantation). For patients treated with DES who are to undergo subsequent procedures that mandate discontinuation of thienopyridine therapy, aspirin should be continued if at all possible and the thienopyridine restarted as soon as possible after the procedure because of concerns about late-stent thrombosis."

Methods: We tested a strategy of prophylactic single donor platelet transfusion immediately prior to surgery or procedures that were deemed by the surgeon as otherwise unacceptable to undertake without interrupting clopidogrel and aspirin in a group of patients who had undergone drug-eluting stent (DES) percutaneous coronary

11 Dietary Intake Modifies the Effect of Leukotriene A4 Hydrolase Gene on Subclinical Atherosclerosis

Jinying Zhao, Emory Univ Sch of Med, Atlanta, GA; Jack Goldberg, Vietnam Era Twin Registry, Seattle, WA; J D Bremner, Linda Jones, Mark Bouzyk, Weining Tang, Viola Vaccarino; Emory Univ Sch of Med, Atlanta, GA

Background: Atherosclerosis is an inflammatory disease with a strong genetic component. Leukotrienes are inflammatory mediators generated from arachidonic acid, and genetic polymorphisms involved in leukotriene metabolism are implicated in atherosclerosis. **Objective:** To examine whether dietary intake of competing leukotriene substrates modifies the genetic effects of leukotriene polymorphisms on atherosclerosis. **Methods:** Early atherosclerosis was assessed by common carotid intima-media thickness (IMT) using ultrasound. Sequence variants within arachidonate 5-lipoxygenase activating protein and leukotriene A4 hydrolase genes were analyzed with 29 single nucleotide polymorphisms (SNPs) in 180 male middle-aged twin pairs from the Vietnam Era Twin Registry. The modifiable effects of dietary intake of omega-3 or omega-6 fatty acids on the association between genetic polymorphisms and early atherosclerosis were examined by generalized estimating equation controlling for potential confounders. **Results:** A six-SNP haplotype in the leukotriene A4 hydrolase gene showed a significant protective association with carotid IMT ($P=0.001$) after adjusting for traditional risk factors. Moreover, dietary intake of polyunsaturated fatty acids strongly augmented the anti-atherogenic effect of this haplotype ($P=0.03$ for omega-3 fatty acids, $P=0.006$ for omega-6 fatty acids), independent of established cardiovascular risk factors. **Conclusion:** This study is the first to demonstrate that dietary intake of polyunsaturated fatty acids strongly modulates the genetic effects of the leukotriene A4 hydrolase gene on early atherosclerosis, independent of traditional coronary risk factors. If replicated, these findings could potentially lead to individualized dietary and molecular strategies for the prevention and treatment of cardiovascular disease.

This research has received full or partial funding support from the American Heart Association, "AHA National Center."

12 Baseline C-Reactive Protein Influences Lipid Responses to Low-Fat and High Polyunsaturated Fat Diets

Marie-Pierre St-Onge, Columbia Univ, New York, NY; Sijian Zhang, Betty Darnell, David Allison; Univ of Alabama at Birmingham, Birmingham, AL

Baseline serum C-reactive protein (CRP) levels have been shown to play a role in the lipids response to diet. However, very little is known about the influence of baseline CRP levels on changes in lipid levels from a Western, moderate fat diet (WD) to a low-fat or a moderate fat, high-polyunsaturated fat diet. This study was a randomized, cross-over controlled feeding study with 3 phases of 25 d each aimed at determining whether baseline CRP concentrations influence the serum lipid response to diets differing in fat type and quantity. Subjects were adult men and women, age 19–65 y, with low-density lipoprotein cholesterol (LDL) concentrations 130–180 mg/dL. All subjects consumed 3 diets differing in the type of snack, either low or moderate in fat: low-fat (30.8% of energy), moderate in fat and saturated fat (37.9 and 11.4% of energy, respectively), or moderate in fat and polyunsaturated fat (36.3 and 9.7% of energy, respectively). Using baseline CRP as a continuous variable, CRP by diet interactions on change in lipoprotein_a ($P=0.045$) and high-density lipoprotein cholesterol (HDL; $P=0.056$) were observed. When previously established categories to define CRP levels (low <1 mg/L; intermediate 1–3 mg/L; or high >3 mg/L) were used, we found a CRP by diet interaction on change in triglyceride levels ($P=0.026$) and trends for CRP by diet interaction on change in LDL ($P=0.059$) and total cholesterol (TC; $P=0.066$). If replicated, these results suggest that considering baseline CRP concentrations may be useful when prescribing dietary interventions for lowering lipid concentrations. Individuals with high baseline CRP concentrations may benefit from shifting their diets from a WD to a moderate fat, high polyunsaturated fat diet whereas those with low baseline CRP concentrations may obtain greater lipid-lowering benefits from shifting their diet from a WD to a low-fat diet.

13 Visceral Obesity, Cardiorespiratory Fitness, and Blood Pressure in Healthy Middle-Aged Men and Women

Caroline Rheaume, Family Medicine Unit, Hopital Laval Rsch Cntr, Quebec, Canada; Benoit J Arsenault, Hopital Laval Rsch Cntr, Quebec, Canada; Stephane Belanger, Family Medicine Unit, Hopital Laval Rsch Cntr, Quebec, Canada; Louis Perusse, Angelo Tremblay, Universite Laval, Quebec, Canada; Claude Bouchard, Pennington BioMed Rsch Cntr, Baton Rouge, LA; Paul Poirier, Jean-Pierre Despres; Hopital Laval Rsch Cntr, Quebec, Canada

Background: It is well-recognized that individuals with low cardiorespiratory fitness levels (unfit individuals) have increased systolic (SBP) and diastolic blood pressure (DBP) than fit individuals. Recent studies have also showed that individuals with an increased visceral adipose tissue (VAT) accumulation have higher SBP and DBP. The objective of the present study was to test the hypothesis that the relationship between low fitness levels and increased SBP and DBP is attributable, to a certain extent, to the increased VAT accumulation of unfit individuals. **Methods and Results:** VAT accumulation was measured by computed tomography and fitness levels were measured by a progressive submaximal physical working capacity test in a sample of 184 healthy men and 223 healthy women (men BMI = 26.1 ± 5.7 kg/m² and mean age = 36.7 ± 13.6 years). Participants in the highest VAT accumulation tertile had the highest SBP and DBP whereas participants in the highest fitness tertile had the lowest SBP and DBP ($P<0.001$). When participants were classified into fitness tertiles and further reclassified on the basis of VAT (high vs. low), we found that independently from fitness category,

participants with a high VAT accumulation had the highest SBP and DBP ($P=0.01$). Linear regression analyses showed that age, VAT, but not fitness predicted SBP [$r^2=0.11$ ($P<0.001$), 0.12 ($P<0.001$) and 0.01 (NS), for age, VAT and fitness, respectively] and DBP [$r^2=0.17$ ($P<0.001$), 0.14 ($P<0.001$) and 0.01 (NS), for age, VAT and fitness, respectively]. **Conclusions:** The relationship between low fitness levels and increased blood pressure appears to be attributable to an increased VAT accumulation, an atherogenic phenotype often observed in unfit individuals.

14 Brown Adipose Tissue, Body Mass Index, and Glucose in Humans

Nicole Mihalopoulos, Paul Young, Richard Holubkov, John M Hoffman; Univ of Utah, Salt Lake City, UT

Background: Adipose tissue is composed of a mixture of brown (BAT) and white components. BAT, whose primary function is non-shivering thermogenesis, is more metabolically active. In rodents, ablation of BAT by genetic manipulation results in obesity and glucose intolerance, suggesting that a higher proportion of BAT could reduce the risk of obesity and glucose intolerance in humans. BAT can be assessed in humans by positron emission tomography-computerized tomography (PET/CT) using the standard tracer ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG), an imaging technique used for cancer diagnosis or screening. We hypothesized that BAT would be associated with lower BMI and improved glucose tolerance as reflected by the serum glucose. **Objective:** Determine the relationship between BAT, BMI and serum glucose in humans. **Methods:** Cross-sectional analysis of oncology patients who underwent ¹⁸F-FDG PET/CT between 2004 and 2006. We performed t-tests and chi-square analyses to determine the association between BAT and serum glucose concentrations and BMI. We performed multiple linear regression to assess the BAT-glucose relationship while accounting for the effects of BMI on serum glucose. **Results:** Of the 4110 patients who underwent ¹⁸F-FDG PET/CT, 68 had BAT. We excluded 10 patients with BAT and 768 without BAT due to missing glucose, height, weight or age documented in the PET/CT database. The mean BMI in subjects with BAT was 24.3 ± 5.1 kg/m² compared with 26.8 ± 6.3 kg/m²; in those without BAT ($P<0.01$). BAT subjects also had lower mean glucose values (91.4 ± 14.8 mg/dL vs. 98.7 ± 21.7 mg/dL; $P<0.001$). After adjusting for BMI, glucose was 5.7 mg/dL lower in people with BAT, but the relationship between BAT and glucose remained significant ($P<0.05$). BAT was found in 2.6% of normal weight (BMI <25 kg/m²) subjects compared with 1.0% of overweight or obese (BMI >25 kg/m²) subjects ($P<0.001$). **Conclusion:** Using a standard technique that minimizes BAT uptake of ¹⁸F-FDG, the presence of BAT was inversely related to BMI and serum glucose. These results suggest that BAT may be important in weight and glucose regulation. Further study of this relationship using imaging that maximizes BAT uptake in non-cancer patients is clearly warranted.

15 Elementary-Aged Children Lose Weight and Blood Pressure Improvements (Achieved During the School Year) During Summer Vacation

Danielle Hollar, Agatston Rsch Foundation, Miami Beach, FL; Sarah E Messiah, Gabriela Lopez-Mitnik, Univ of Miami, Miller Sch of Medicine, Miami, FL; Theodore L Hollar, Arthur S Agatston; Agatston Rsch Foundation, Miami Beach, FL

Background: School-based obesity-prevention interventions have been effective during the school year at improving overall health, yet many benefits are lost during summer. Healthier Options for Public Schoolchildren (HOPS), an elementary school-based obesity prevention intervention with nutrition and physical activity components, targets multiethnic 6–12 year olds. **Hypothesis:** We hypothesized that intervention children would maintain improvements in body mass index (BMI) and systolic and diastolic blood pressure (SBP, DBP) achieved during the school year during summer vacation better than controls. **Methods:** HOPS includes 3,700 children (50% Hispanic) attending 5 elementary schools (4 intervention; 1 control) in central FL. Demographic, anthropometric and SBP/DBP data were collected at baseline (August 2004) and follow-up (May 05, 06, August 05). The intervention included modified dietary offerings, nutrition and lifestyle educational curricula, and physical activity and school-based wellness projects. **Results:** Prior analyses showed decreases in zBMI, zweight scores and blood pressure during the school year in the intervention group compared to controls. Repeated measures analysis showed that over the summer among females (1) incremental zweight scores increased significantly less in the intervention group (0.52 to 0.54) compared to controls (0.75 to 0.78) ($P<0.05$); (2) the intervention group had significantly less of an increase in DBP (59.22 to 60.05 mm Hg) compared to the control group (59.19 to 62.93 mm Hg) ($P<0.01$); and (3) SBP significantly increased in the control group (98.17 to 101.44 mm Hg) but remained stable in the intervention group (98.5 mm Hg) ($P<0.0001$). Among boys (1) DBP changes were less in the intervention group (59.64 to 60.95 mm Hg) compared to controls (59.64 to 61.78 mm Hg) (NS); and (2) both the intervention and control groups had significant SBP increases (100.86 to 101.98 mm Hg, 99.49 to 102.03 mm Hg, respectively) ($P<0.01$). **Conclusions:** School-based obesity prevention programs can be effective in weight and blood pressure maintenance during the school year. However, intervention models should consider year-round intervention models as the positive intervention effects are lost during this time.

16 Association of Aspartame and Aspartic Acid Intakes with Body Mass Index Among US Adults: The INTERMAP Study

Chiang-Ching Huang, Northwestern Univ, Chicago, IL; Ka He, Univ of North Carolina, Chapel Hill, NC; Martha Daviglus, Linda Van Horn, Kiang Liu, Jeremiah Stamler, Northwestern Univ, Chicago, IL; the INTERMAP Rsch Group

Background: Aspartame, a non-caloric sweetener composed of approximately 40% aspartic acid, apparently breaks down in vivo into byproducts that may be neurologically toxic and relate

Hollar D, Messiah SE, Lopez-Mitnik GL, Hollar TL, Almon M, Agatston AS. (2008, October). Effect of an Elementary School-Based Obesity Prevention Intervention on Weight and Academic Performance among Low Income Children. 2008 Annual Scientific Meeting of The Obesity Society, Phoenix, AZ.

Effect of an Elementary School-Based Obesity Prevention Intervention on Weight and Academic Performance among Low Income Children

Danielle Hollar, PhD^{1,2}
Sarah E. Messiah, Ph.D., MPH³
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T. Lucas Hollar, PhD⁴
Marie Almon, MS, RD¹
Arthur S. Agatston, MD^{1,2}

¹The Agatston Research Foundation, ²University of Miami Miller School of Medicine, Department of Medicine, ³University of Miami Miller School of Medicine, Department of Pediatrics, ⁴Florida Atlantic University School of Public Administration

Background: Childhood onset obesity and related health consequences continue to be major clinical and public health issues in the US, particularly among those of low socioeconomic status. Healthier Options for Public Schoolchildren (HOPS) is a school-based obesity prevention intervention implemented in the elementary school setting targeting 6-12 year olds. The overall goal of HOPS is to reduce childhood obesity rates and improve health status using strategies that can be replicated easily in other school settings.

Methods: HOPS was implemented in August 2004 and includes approximately 3,200 children (48% Hispanic) attending six elementary schools (4 intervention; 2 control) in central Florida. Demographic, anthropometric (height, weight, body mass index [BMI]), clinical (systolic and diastolic blood pressure), and academic (Florida Comprehensive Assessment Test) data were collected during the 2-year study period (2004-05). The HOPS intervention included modified dietary offerings, nutrition and lifestyle educational curricula, physical activity, and other school-based wellness projects.

Results: A total of 1,197 children who qualified for free/reduced school lunch were used for this analysis (68% Hispanic, 9% black, 15% white, 8% other; mean age 7.84 ± 1.67). Repeated measures ANOVA found children in the intervention schools were significantly more likely to reduce their body mass index Zscore ($p < 0.01$) and their weight Zscore ($p < 0.05$) versus those children in the control schools over the 2-year intervention. After controlling for race, repeated measures ANOVA found that in both study years, Hispanic and white children in intervention schools were significantly more likely to have higher FCAT math scores ($p < 0.001$). While not significant, intervention children had higher FCAT reading scores in both years of the intervention versus controls.

Conclusions: School-based obesity prevention interventions with nutrition and physical activity components show promise in improving health and academic performance, particularly among elementary-aged children from low-income backgrounds. In light of the current obesity epidemic, these findings are promising given that many children from low-income backgrounds receive a significant proportion of their daily nutrition requirements at school.

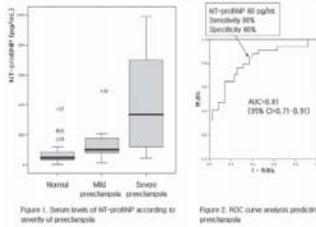


Figure 1. Serum levels of NT-proBNP according to severity of aortic stenosis. Figure 2. ROC curve analysis predicting aortic stenosis.

2:00 p.m.

1028-185 Impact of Prescription of Classes of Antihypertensive Medications on Blood Pressure Control in the Metabolic Syndrome

Oreste Arcucci, Giovanni de Simone, Raffaele Izzo, Marcello Chinali, Maria AE Rao, Francesco Rozza, Nicola De Luca, Bruno Trimarco, Federico II University, Naples, Italy

Background. We have recently reported that metabolic syndrome (MetS) is associated with insufficient blood pressure (BP) control, despite use of greater number of combined medications. There is no information on whether efficacy of BP control is also associated with the classes of prescribed antihypertensive medications in relation to the presence or absence of MetS. Thus, we evaluated whether uncontrolled BP in a tertiary-care Hypertension Center is related to classes of prescribed drugs, in relation to the presence or absence of MetS.

Methods. We studied 4551 hypertensive patients without prevalent cardiovascular disease (43.4% women; 51±12 years). MetS was defined according to modified ATP III-criteria (no waist girth; BMI>30 kg/m²). At the last available visit, BP was considered uncontrolled when systolic BP>140mmHg and/or diastolic BP>90mmHg. Class of prescribed medications and their numbers were evaluated in relation to BP control and presence of MetS, by logistic regression adjusting for age and sex.

Results: MetS was found in 1444 subjects (32%; 45% women, p=ns vs without MetS). BP was less controlled in MetS (p<0.0001), despite the significantly more frequent prescription of ACE-inhibitors (ACEi), β-blockers (BB), Ca⁺⁺-channel blockers (CCB) and diuretics (DRT) (all p<0.01). MetS was associated with 41% increased probability of uncontrolled BP, whatever drug class was considered (all p<0.0001). When each class of medications was tested separately, DRT were less likely (OR=0.83 [95%CI 0.74-0.94]) and CCB more likely to be prescribed (OR=1.31 [95%CI 1.15-1.50]; both p<0.005) when BP was uncontrolled, without differences in the other classes of drugs (ACEi, ARB, BB and alpha+alpha/beta blockers). These results were confirmed in a logistic model including all classes of medications. Conclusions: MetS is at high risk of uncontrolled BP, despite the use of more antihypertensive medications. Among antihypertensive drugs, less prescription of DRT is significantly associated with a higher probability of uncontrolled BP. In contrast, CCB appears to be more prescribed when BP is uncontrolled.

2:00 p.m.

1028-186 A Novel Marker, Urinary Liver-Type Fatty Acid Binding Protein, for the Detection of Renotubular Damage in Acute Decompensated Heart Failure

Naoki Sato, Masataka Kamiya, Asuka Yoshida, Takeshi Yamamoto, Yu-ki Iwasaki, Yasuhiro Hirasawa, Koji Kato, Yukichi Tokita, Koji Murali, Kyoichi Mizuno, Keiji Tanaka, Intensive and Cardiac Care Unit, Nippon Medical School, Tokyo, Japan, Internal Medicine, Nippon Medical School, Tokyo, Japan

Background/Goal:

In acute decompensated heart failure (ADHF), renoprotection is reportedly important, because worse renal function during hospitalization is associated to short-term outcome. Serum creatinine is the most common marker for renal damage, but it is not enough for the evaluation of renal function. Recently, several studies have demonstrated that urinary liver-type fatty acid binding protein (L-FABP), which is expressed in the proximal tubules, is a good marker for renotubular damage in chronic renal disease and the development of its rapid-kit has been planned. In ADHF, it is known that hypoxia and pre-renal mechanisms damage not only glomerulus and also renal tubulus, especially proximal tubulus. However, it is not well clarified whether or not renotubular damages exist and urinary L-FABP is a useful marker for the detection of renotubular marker in ADHF.

Methods: Urinary L-FABP levels were measure at admission by a specific ELISA in thirty ADHF patients (age 73±8 years, male/female=22:8) admitted to Nippon Medical School hospital. Serum creatinine and urinary beta2-microglobulin (B2MG) and N-acetyl-D-glucosamidase (NAG) were also measured.

Results: Urinary B2MG was high, 434.8±695.1 (normal: <230) µg/L. Urinary NAG and serum creatinine levels were 6.6±6.2 (normal <6.0) U/L, 0.81±0.24 (normal: <0.79) mg/dl, respectively. Urinary L-FABP levels were 110±312 ng/ml, which were higher than normal value, i.e., <4 ng/ml, in 90% ADHF patients, which suggested that proximal tubular damages were common in ADHF. Urinary L-FABP levels were significantly correlated to urinary B2MG levels in 93 samples (y=0.0029x + 15.427, r=0.58, p<0.001), but not correlated to NAG levels and serum creatinine.

Conclusions: Thus, in ADHF, renotubular damages were common and urinary L-FABP might be a useful marker for the detection of renotubular marker, suggesting that a rapid-kit for L-FABP will shed a light on the management of ADHF in terms of renal protection.

1028-187 Risk Factors for Recurrence of Sirolimus-Eluting Stent Restenosis: Insights From J-CYPHER Registry

Takuya Taniguchi, Mitsuru Abe, Nobuhito Yagi, Nobuaki Kokubu, Yoichiro Kasahara, Yu Kataoka, Yuji Yasuga, Yoritaka Otsuka, Atsushi Kawamura, Hiroshi Nonogi, Takeshi Morimoto, Kazuaki Mitsudo, Takeshi Kimura, on behalf of the J-CYPHER registry investigators, National Cardiovascular Center, Osaka, Japan

Background: Sirolimus-eluting stents (SES) have dramatically reduced restenosis in various lesion subsets, however, recurrence of SES restenosis has remained a critical issue. Because there are few reports on risk factors for recurrence of SES restenosis, elucidating those factors will help interventional cardiologists to take preventive measures for high risk patients.

Methods: Design of J-CYPHER registry was multi-center prospective enrollment of consecutive patients receiving SES from 41 centers in Japan. From August 2004 to April 2006, 8752 patients (12938 lesions) were successfully treated with SES. Among 639 restenotic lesions after SES implantation, we identified 313 lesions retreated with SES and investigated risk factors in initial procedures.

Results: During a median follow-up of 183 days, target lesion revascularization (TLR) occurred in 9.6% (30/313). After adjustment for other factors, in-stent restenotic lesion [odds ratio (OR), 4.00; 95% confidence interval (CI), 1.64-9.59], usage of two-stent strategy [OR, 3.90; 95% CI, 1.08-12.7], and lesion length >30mm [OR, 2.39; 95% CI, 1.03-5.50] were demonstrated as independent risk factors for recurrence of SES restenosis (Table).

Conclusions: In our study population, recurrence of SES restenosis occurred in 9.6%. In-stent restenotic lesion, usage of two-stent strategy, and lesion length >30mm were revealed as the independent risk factors in initial procedures.

Risk factors for Recurrence of SES restenosis		
Variable	Odds Ratio	95% CI
In-stent restenotic lesion	4.00	1.64-9.59
Usage of two-stent strategy	3.90	1.08-12.7
Pre-PCI lesion length>30mm	2.39	1.03-5.50
Usage of IVUS	1.96	0.84-4.81
Diabetes Mellitus	1.48	0.65-3.48
Age>75	0.50	0.15-1.38
BMI>25	0.47	0.17-1.14

2:00 p.m.

1028-188 School-Based Obesity and Related Cardiovascular Disease Prevention Interventions Improve Diastolic and Systolic Blood Pressure in Elementary-Aged Children

Danielle Hollar, Agatston Research Foundation, Miami Beach, FL

Background: Childhood onset obesity and related health consequences continue to be major clinical and public health issues in the US. Healthier Options for Public Schoolchildren (HOPS) is a school-based obesity prevention intervention with both nutrition and physical activity components implemented in the elementary school setting and targeting 6-12 year olds. The overall goal of HOPS is to reduce childhood obesity rates and improve overall health status using strategies that can be easily replicated and integrated in other public school settings.

Methods: HOPS was implemented in August, 2004 and includes approximately 3,200 children (48% Hispanic) attending six elementary schools (4 intervention; 2 control) in central Florida. Demographic, anthropometric (height, weight, body mass index [BMI]) and clinical (systolic and diastolic blood pressure) data were collected at baseline and follow-up. The HOPS intervention included modified dietary offerings, nutrition and lifestyle educational curricula, school gardens, and other school-based wellness projects. We hypothesized that the HOPS intervention would improve diastolic and systolic blood pressure in study participants versus a control group.

Results: Over a two year study period, repeated measures analysis showed the HOPS intervention significantly decreased systolic blood pressure in females (P = 0.02). There was also a trend in females for a decrease in diastolic blood pressure (P = 0.09). No significant change was found for males for either systolic or diastolic blood pressure. Repeated measures analysis also showed that the intervention significantly decreased z score for weight (p<0.01) and ZBMI scores in females (P<0.01), but again, no significant change was noted in males when comparing the intervention and control groups.

Conclusions: School-based obesity prevention interventions that use both nutrition and physical activity components show promise in improving health, particularly among elementary-aged females. If overweight children can lower their blood pressure from an early age, via prevention programs such as HOPS, they will be less likely to develop cardiovascular disease in early adulthood.

ORIGINAL CONTRIBUTIONS: STRATEGIES FOR LIFESTYLE CHANGES (PART 1): SCHOOL-BASED PROGRAMS

Title: THE EFFECT OF SUMMER VACATION ON WEIGHT AND BLOOD PRESSURE IN MULTIETHNIC ELEMENTARY AGED CHILDREN PARTICIPATING IN A SCHOOL-BASED WELLNESS AND NUTRITION PROGRAM

Author(s): D. Hollar,¹ S. E. Messiah,² G. Lopez-Mitnik,² T. L. Hollar,¹ A. S. Agatston¹; ¹Agatston Research Foundation, Miami Beach, FL, ²Clinical Pediatrics, University of Miami Miller School of Medicine, Miami, FL

Learning Outcome: Describe summer effects on weight- and blood pressure-related health outcomes of children participating in a school-based obesity and related cardiovascular disease prevention program.

Text: School-based obesity-prevention interventions have been shown to improve health measures of children during the school year. However, recent studies report children lose health benefits during summer. Healthier Options for Public Schoolchildren (HOPS) is a school-based obesity prevention intervention including nutrition education, rigorous dietary interventions, and physical activity components implemented in schools targeting multiethnic 6-12 year olds. The goal is to reduce childhood obesity rates and improve health status using strategies replicable in other schools. HOPS includes approximately 3,200 children (48% Hispanic) attending 6 elementary schools (4 intervention; 2 control) in central Florida. Demographic, anthropometric (height, weight, body mass index [BMI]) and clinical (systolic/diastolic blood pressure) data were collected at baseline and follow-up. While HOPS showed health improvements during the school year, repeated measures analysis showed summer vacation significantly increased zBMI scores in both genders ($P < 0.0001$) and in both intervention and control groups. Among females, systolic blood pressure significantly increased ($P < 0.0001$) during summer in the control group (98.37 to 101.44 mm Hg) but remained stable in the intervention group (98.5 mmHg), yet among males both the intervention and control groups had significant increases during summer ($P < 0.0001$, 100.83 to 101.94 mmHg, 99.28 to 101.93 mmHg, respectively). Significant increases in diastolic blood pressure were seen during summer in both genders and in both intervention and control groups ($P < 0.0001$). School-based obesity prevention programs can be effective in weight and blood pressure maintenance during the school year. However, intervention models should consider including summer as the positive intervention effects are lost during this time.

Funding Disclosure: Private/foundation

Hollar D, Messiah SE, Lopez-Mitnik GL, Hollar TL, Almon M, Agatston AS. The Effect of Summer Vacation on Weight and Blood Pressure in Multiethnic Elementary Aged Children Participating in a School-based Wellness and Nutrition Program. *JADA*. 2008;Suppl 3,108(9):A12.

Shapeup with a train the trainer approach. Twenty-four high school students participated, 19 of which had BMI's above the 85th percentile. Students attended eleven nutrition classes taught by a team, which included a Registered Dietitian. Adult mentors worked in table groups of 5-6 high school students and lead interactive activities. Students learned key nutrition concepts, tried healthy foods, and completed an advocacy project (PhotoVoice). PhotoVoice provided an opportunity for students to photographically document community barriers to healthy behavior and present their displays to key leaders and advocate for necessary change. Having the high school students serve as mentors at a nearby elementary school and participating in a similar series of nutrition classes further reinforced nutrition concepts. Additionally, the high school students were offered opportunities to exercise 60 minutes twice a week as part of the after-school program. High school students received service-learning credit for mentoring elementary students. Gift certificates were provided for attendance, participation in exercise, mentoring of elementary students, and completion of a PhotoVoice project. Students' BMI decreased after the program, and they demonstrated an increase in nutrition knowledge, increased consumption of fruits and vegetables and decreased consumption of unhealthy snacks. The mentor model appears to be an innovative and viable program to address childhood obesity by reinforcing healthy lifestyle habits through mentoring.

Funding Disclosure: Grant

Title: PROJECT HEALTHY SCHOOLS - A COMMUNITY/UNIVERSITY COLLABORATIVE

Author(s): C. M. Fitzgerald,¹ C. S. Goldberg,² L. Palma-Davis,³ K. A. Eagle,⁴ J. E. DuRussel-Weston,¹ S. Aaronson,¹ L. R. Mitchell,¹ B. Rogers,⁵ R. Gurm,⁶; ¹MFIt Health Promotion Division/Project Healthy Schools, University of Michigan Health System, Ann Arbor, MI, ²Pediatrics, Communicable Disease and Surgery, University of Michigan Health System, Ann Arbor, MI, ³MFIt Health Promotion Division, University of Michigan Health System, Ann Arbor, MI, ⁴Internal Medicine, University of Michigan Health System, Ann Arbor, MI, ⁵MCORRP (Cardiology), University of Michigan Health System, Ann Arbor, MI

Learning Outcome: Participants will identify 3 main program components that make the program successful.

TEXT: Project Healthy Schools (PHS), a school-based program for sixth graders decreases heart disease risk factors through education, environmental changes and measurement. Program goals, presented using socio-cognitive and ecological approach, are eating more fruits/vegetables; making wiser beverage choices; getting at least 150 minutes of exercise/week, eating less fast/fatty food; spending less mindless time in front of screens. Students participate in 10 interactive activities, motivational assemblies, incentive programs to reward behavior-change achievements, and PE classes that expose students to new activities. Environmental changes occur by partnering with key individuals to upgrade food choices in cafeteria, school store and vending machines. A student, parent, and staff focused communication campaign includes newsletter articles; report card inserts; in-school TV programming; school events participation; staff/parent screenings; colorful school displays. Outcome measures include pre/post voluntary screenings that include BMI; BP; finger-stick cholesterol panel; random glucose; 3 minute fitness test, behavioral and process surveys. Data from three years indicates a significant decrease in total and LDL cholesterol and glucose measures for year one and two. Surveys show increases in activity, fruit and skim milk consumption. Unique features include university students; parents and teachers leading the classroom activities; university students assisting with screenings; identifying wellness champions to facilitate communication and an insiders view; a strong steering committee with school, community and university members; parents receive screening results letters; a pediatric cardiologist phoning parents to discuss screening results outside the normal range; community partners providing student rewards.

Funding Disclosure: Private donors, grants from public and corporate sources

Title: IMPLEMENTATION OF A HEALTHY EATING AND PHYSICAL ACTIVITY CAMPAIGN IN RURAL ELEMENTARY SCHOOLS

AUTHOR(S): J. S. Pelkki, V. L. James; Daughters of Charity Services of Arkansas, Dumas, AR, Healthy Kids Challenge Program, Dighton, KS

Learning Outcome: To identify the use of Social Cognitive Theory and Social Marketing Approaches in an effective school nutrition and physical activity promotion campaign by using Hear, See and Do Activities with elementary aged children, their teachers and families.

Text: This project was designed to help create a school environment which supports healthy eating and regular physical activity. The program impacted 965 children and their parents and 128 teaching personnel at Central and Reed Elementary Schools in rural Dumas, Arkansas. School personnel were provided with 3 in-services on creating a healthier school environment which supports high quality education. A team of 5 teachers was selected to design programs which focused on improving healthy eating and physical activity practices. Goals of the monthly meetings these 5 teachers held were to increase the number of healthy eating messages and physical activity opportunities provided at school. Resulting activities included fitness tips read during daily announcements, "Walk at Recess" day, nutrition activities at Parent Night and Parent-Teacher conferences, planned physical activities for students with positive behavior reports on Fridays, a cooking contest for faculty, bulletin boards promoting physical activity, and a "MyPyramid" Field Day.

Pre and post intervention data show no statistically significant improvement ($p > .05$) in the amount of physical activity students reported ($n = 232$). However, because physical activities were incorporated into the core curriculum, students may not have recognized these activities as increases in motion. Students did report a statistically significant increase ($p < .05$) in the number of healthy eating messages received at school. ($n = 425$).

These results show that a campaign to improve the healthy eating and physical activity environment of schools can be effective and sustainable. Results will be used to encourage further school wellness activities in rural Arkansas.

Funding Disclosure: Daughters of Charity Foundation Grant

Title: HEALTHIER EXTRA FOOD ITEMS SALES EFFECT ON REVENUE AND STUDENT ENERGY CONSUMPTION IN SCHOOLS

Author(s): B. C. Barlow,^{1,2} D. M. Brown³, ¹Child Nutrition, Bay-Waveland School District, Waveland, MS, ²Bay Waveland School District, Waveland, MS, ³Nutrition and Food Systems, The University of Southern Mississippi, Hattiesburg, MS

Learning Outcome: Describe the financial and nutrient impact of changes made to foods offered for extra food sales in K-12 school settings.

Text: To purpose of the study was to compare the sales of extra food sales before and following implementation of more healthful extra food sales. Extra food sales financial and nutrient data were collected in one school district prior to and following a change in extra food sales offered to children. Changes were made to comply with state regulations mandating the nutrient content, portion size, and total calories permitted for sale. Extra food sales were analyzed for both breakfast and lunch meals and by school. Initial extra food sales increased during the first month new choices were introduced, but were not sustained during the first five months of the school year. A decline of \$3,936 was noted. During breakfast increased sales of extra foods were sustained for five months; lunch sales increased the first month declined over the next four months. Extra food sales at breakfast contributed less than \$200 compared to more than \$24,000 of sales during lunch. Changing food choices resulted in a 12% reduction in the calories and a 78.5% reduction in fat purchased by students. Extra food choices increased the availability of iron and vitamin C but decreased the availability of vitamin A. Lower calorie and fat foods affected the financial position of a school district in the short term. Marketing and education may offset these initial financial challenges. The improved nutrient profile, particularly reduction of calories and fat should encourage Child Nutrition Program directors to adopt more healthful food choices for extra food sales.

Funding Disclosure: None

Title: THE EVALUATION OF DIETARY PROGRAMMING OF THE HEALTHIER OPTIONS FOR PUBLIC SCHOOLCHILDREN STUDY - A SCHOOL-BASED HOLISTIC NUTRITION AND HEALTHY LIFESTYLE MANAGEMENT PROGRAM FOR ELEMENTARY-AGED CHILDREN

Author(s): J. Wooley, M. Almon, A. Agatston, D. Hollar, J Stark; Agatston Research Foundation, Miami Beach, FL

Learning Outcome: To evaluate the feasibility of expanding a school dietary program into new school districts and how districts vary in their ability to menu nutritious items, particularly in an elementary school setting of racially and ethnically diverse children.

Text: One of purposes of the Healthier Options for Public Schoolchildren (HOPS) Study is to test the feasibility and impact of implementing nutritious modifications to school-based meal offerings in elementary schools. The dietary programming is part of a larger set of lifestyle interventions that evaluate the efficacy of an integrated program of dietary offerings, nutrition and lifestyle educational curricula, increased levels of physical activity, and other school-based wellness projects with the goal of improving the well-being of children in a replicable manner. Currently, HOPS includes 21 racially and ethnically diverse public elementary schools (17 intervention and four control) - a target population of approximately 13,916 students aged 5-11, including many who qualify for Free or Reduced Priced Meals in USDA's National School Lunch Program. Dietary programming, which models classroom-based nutrition education, includes modified breakfast, lunch, and snack menus focusing on more whole grains, less saturated fat, more fresh fruits and vegetables, and less added sugars, while working within the confines of a traditional budget and existing food distribution networks. All HOPS menus meet USDA guidelines for school food service provision. To evaluate the feasibility of replicating and expanding HOPS dietary programming into new school districts, time it takes to successfully implement changes, and how districts vary in their ability to menu nutritious items, one month of menus (production records) from schools in three different districts were analyzed using Nutrikids software. Nutritional analyses of HOPS schools versus traditional district menus and key nutritional variations between the sets of menus will be presented.

Funding Disclosure: The Healthier Options for Public Schoolchildren Study is funded by the Agatston Research Foundation, Miami Beach, FL

Title: NUTRITIONAL CONTENT AND PRODUCTION EFFICIENCY OF SCHOOL LUNCH PROGRAMS IN ILLINOIS SCHOOLS

Author(s): B. K. Jones; Animal Science/Food and Nutrition, Southern Illinois University, Carbondale, IL

Learning Outcome: After viewing my poster session on the topic of nutritional content and production efficiency in school lunch programs, the learner will be able to list three factors that can affect compliance with USDA standards for the NSLP.

Text: Research clearly shows children's dietary intakes are not consistent with USDA Dietary Guidelines, and while other factors are involved, school food environment is a key influence. The purpose of this research was to analyze data collected by the Illinois School Meals Initiative Review (SMIR) to ascertain significant relationships between School Food Authorities (SFA) and specific areas in which they do not adhere to USDA National School Lunch Program (NSLP) guidelines (as indicated by SMIR citations). Schools were grouped according to size (< or > 400 students), menu planning type ("traditional", "enhanced", or "NuMenus"), geographic location (region of state), and use of self-operated or outsourced food service management. Data were analyzed using Mann-Whitney to determine if significant relationships exist between school size, menu planning type, geographic location, and type of food service management and number of citations given through SMIR. Spearman's rank correlation was used to determine if a correlation existed between citation areas (component [meat/meat alternative, fruit/vegetable, serving, grain/bread serving & milk serving], nutrient, production, & recipe). Results indicated several significant findings (p=.05) including better utilization of production records by smaller schools, NuMenus planning method yielded significantly less citations than food-based planning methods, and outsourced food service management had significantly less citations than school-managed foodservice. Moderate correlations were found between production and recipe citations, component and recipe citations, and component and nutrient citations indicating non-compliance with one area can lead to larger issues. SFAs utilizing outsourced foodservice providers or NuMenus planning approach appeared to be more compliant with USDA regulations.

Funding Disclosure: None

Title: EFFECTIVENESS OF USING A TOUCH SCREEN KIOSK FOR POINT OF SALE IN A HOSPITAL FOODSERVICE OPERATION

Author(s): M. K. Morrissey; Food and Nut. Services, Kittitas Valley Comm. Hospital, Ellensburg, WA

Learning Outcome: Participants will be able to identify one method for improving customer service through use of a self-serve touch screen kiosk to price hospital cafe food choices, and expedite payment through electronic payroll deduction.

Text: Mealtime for staff in hospitals is limited due to commitment to patient care. Long cafeteria lines are undesirable, and perceived as poor customer service. Managers want to provide quality food expediently. Consistent food pricing through use of a computerized point of sale touch screen system provides accurate income projection. This program was started in July, 2007 at a Public District, Critical Access Hospital, centrally located in Washington State. A Point of Sale Cash Register System was implemented using Cash Register and Self-Serve Kiosk. Employees have the option to payroll deduct foods using bar-coded badges and a pin number. This method of payment can be done at the main cash register or touch screen kiosk. The kiosk is pre-programmed with meals and snacks available. At the kiosk, customers can use a tare weight scale to weigh salad bar items and deli sandwiches, which are pre-priced per ounce, thus relieving lines at the main cash register. Pricing is built in through a PLU (Price Locator Unit) system, and payroll deducted each pay period. Café Surveys are conducted yearly since 2006 for quality assurance. Customer service along with café food quality is surveyed using a rating scale. A majority of the survey participants rated the kiosk as quick and easy to use with an 80% rating. Ongoing evaluation will determine future improvements for training staff in more diversified use of the self-serve kiosk. This will include pre-ordering of grill items and sandwiches to increase efficiency and customer satisfaction.

Funding Disclosure: None

Hollar D, Hollar TL, Agatston AS (2007, February-March). School-based Early Prevention Interventions Improve Body Mass Index Percentiles: Preliminary Results of the HOPS Study. 47th Annual Conference on Cardiovascular Epidemiology and Prevention, American Heart Association. Orlando, FL.

**School-based Early Prevention Interventions Improve Body Mass Index Percentiles:
Preliminary Results the HOPS Study**

Danielle Hollar, PhD^{1,2} T. Lucas Hollar, Doctoral Candidate^{1,3} Arthur S. Agatston, MD^{1,2}

¹The Agatston Research Foundation, ²University of Miami Miller School of Medicine, ³Florida Atlantic University School of Public Administration

Introduction: The Healthier Options for Public Schoolchildren (HOPS) Study aims to understand the efficacy of prevention efforts that address nutrition and physical activity implemented in the elementary school setting.

Hypothesis: We assessed the hypothesis that HOPS Study interventions reduce obesity rates more so than traditional school-based dietary and physical activities.

Methods: The HOPS Study was implemented in fall 2004 and includes approximately 3,200 children (48% Hispanic; 1,549 out of 3,247) attending six elementary schools (4 intervention; 2 control). Data are collected at baseline/fall and follow-up/spring (demographic information, height, weight, BMI percentiles, sedentary behavior and food consumption data). HOPS Study interventions include modified dietary offerings, nutrition and lifestyle educational curricula, school gardens, and other school-based wellness projects, with the goal of reducing childhood obesity rates in a manner that is replicable in other public school settings.

Results: Overall, 2005-2006 data show statistically significant differences between treatment groups with respect to changes in BMI age- and gender-specific z-scores.

	Changes in BMI Z-Scores mean (SD)
Intervention (n=2,135)	-.07 (.64)
Control (n=1,112)	-.02 (.44)
p-value	.004*

Analyses of subgroups show statistically significant differences between intervention groups for BMI risk groups as well as some quintiles, when controlling for one control school with a particularly rigorous physical activity program.

	Changes in BMI Z-Scores by Risk Group mean (SD)			Changes in BMI Z-Scores by Quintile mean (SD)				
	Normal (< 85%)	At Risk (≥ 85% - <95%)	Overweight (≥95%)	1 st Quintile	2 nd Quintile	3 rd Quintile	4 th Quintile	5 th Quintile
Intervention (n=2,135)	-.03 (.77)	-.14 (.44)	-.13 (.34)	.14 (1.00)	-.095 (.58)	-.13 (.58)	-.15 (.48)	-.13 (.26)
Control (n=559)	.08 (.39)	-.02 (.29)	-.04 (.20)	.23 (.44)	.01 (.34)	-.002 (.34)	-.01 (.28)	-.05 (.20)
p-value	.001*	.001*	.003*	.388	.016*	.018*	.000*	.002*

Conclusions: Early results show HOPS Study interventions improve BMI percentiles of elementary-aged children. Additional data collection and analyses, over time, will provide important data to inform school-based obesity prevention strategies.

ages 4 to 8 years ($p = 0.002 - 0.04$). When using CVD-risk cutoffs, the proportion of children with elevated WC was significantly greater among HR than LR children at all ages, except for yr 5 ($p = 0.057$), but only when using the 71 cm criterion ($p = 0.001 - 0.03$). For all cutoffs, the proportion of children with elevated WC was significantly greater among HROW than HRNW or LR children at most years. The average percentage of children who tracked across adjacent years was 95 percent (LR children) and 90 percent (HR children). Interestingly, 67 percent (6 of 9) of HROW transitioned from a WC <85th percentile at age 3 (national norms) to $\geq 85^{\text{th}}$ percentile at age 4. After age 4, 80% to 100% of these children tracked their WC in subsequent years. **Conclusion:** In conclusion, obesity predisposition predicts elevated child WC, when using normative or select CVD-risk cutoffs. WC tracks over time, although a transition from normal to elevated WC between ages 3 to 4 years may foreshadow subsequent childhood obesity.

How Do Barriers to Healthy Eating Impact Weight Loss?

Lora Burke, Mindi Styn, Okan U Elci, Edvin Music, Melanie Warziski, Univ of Pittsburgh, Pittsburgh, PA

Background: A variety of issues, such as resisting temptation, meal planning, portion control, and affordability of food, may thwart weight loss and weight maintenance efforts. Identification of such factors and understanding their effect on success in weight loss programs may help improve future treatment protocols. Participants in PREFER, a randomized clinical trial, received standard behavioral therapy for weight loss while following one of two calorie- and fat-restricted diets: standard or lacto-ovo-vegetarian. Dietary treatment assignment was made with or without regard to the participant's preference (Preference-Yes vs. Preference-No). Intervention sessions were held weekly for 6 months, biweekly and monthly the second 6 months followed by a 6-month maintenance phase. **Objective:** The present study assessed whether participants' perceived barriers to healthy eating differed by treatment and/or preference group and how reported barriers were related to weight loss. **Methods:** The Barriers to Healthy Eating (BHE) Questionnaire has established psychometric properties and consists of three subscales: emotions, daily mechanics, and social support. The BHE was administered and body weight measured at baseline, 6, 12, and 18 months. **Results:** Participants ($N = 176$) were 44.0 ± 8.8 years old with 15.2 ± 2.5 years of education and were predominantly Caucasian (70%), female (87%), employed (93%) and married (63%). Across all groups, participants' overall perceptions of barriers decreased significantly ($P < .01$) from baseline to 6 months with nonsignificant increases in BHE scores from 6–12 and 12–18 months. The reported barriers were a consistent predictor of change in weight at all time points (Baseline–6 and 6–12 months, $P < .01$; 12–18 months, $P = .014$). The emotions and daily mechanics subscales followed patterns similar to the total score with a significant decrease in barriers from baseline to 6 months and nonsignificant increases between later time points; nonsignificant differences were seen in reported social support across time and between groups. **Conclusions:** These findings suggest that continual emphasis on how to overcome the identified emotional and logistical barriers for the long-term may improve weight loss maintenance.

Waist Circumference Is More Strongly Associated with Cardiometabolic and Global Cardiac Risk Among Women than Body Mass Index

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Background: To determine if waist circumference (WC) or body mass index (BMI) is more strongly associated with major cardiometabolic risk factors in free living women stratified by race/ethnicity and to evaluate inter- and intra-rater reliability of WC measurements taken by trained health professionals and participants. **Methods:** Weight, WC, BMI, blood pressure (BP), total cholesterol (TC) and high density lipoprotein (HDL)-cholesterol were systematically measured among 846 women (mean age 53 years, 32% white) who attended a free public health outreach event in February 2006. Height was self-reported. Global risk was calculated using the Framingham function. **Results:** The prevalence of risk factors by WC and BMI levels is shown in Table 1. White women ($n = 199$) with a WC ≥ 35 inches were more likely to have low HDL (OR = 1.98, $p = 0.03$) compared to those with a WC ≤ 35 . Black and Hispanic women ($n = 389$) with a WC ≥ 35 were more likely to have hypertension (OR = 3.62, $p < 0.01$) and global risk $> 20\%$ (OR = 2.91, $p = 0.01$) vs those with a WC ≤ 35 . Multivariable regression analysis adjusted for age, race/ethnicity, education, personal history of heart disease/risk equivalent, medication use and smoking showed WC to be a stronger correlate of hypertension (OR = 2.35, $p < 0.01$) and low HDL (OR = 1.62, $p = 0.01$) compared to BMI. WC was also a stronger correlate of a global risk $> 20\%$ vs BMI in a model adjusted for race/ethnicity and education (OR = 2.60, $p < 0.01$). Having both a WC ≥ 35 and BMI ≥ 25 kg/m² had the strongest association with cardiometabolic risk. Inter- ($r = 0.97$, $p < 0.01$) and intra- ($r = 0.99$, $p < 0.01$) rater reliability was high. **Conclusions:** Increased WC was a stronger indicator of cardiometabolic risk than BMI and specific risk factors associated with WC varied by race/ethnicity. WC is a simple, reliable and inexpensive index that should be more widely utilized to identify persons at increased cardiometabolic risk.

Table 1.

	Smoking	BP $\geq 140/90$ mmHg	TC ≥ 200 mg/dL	HDL < 50 mg/dL	Cardiac Risk* $> 20\%$
WC (≥ 35 in)	6%	60%	46%	36%	2%
BMI (≥ 25 kg/m ²)	4%	50%	45%	32%	2%
BMI (≥ 30 kg/m ²)	7%	63%	45%	37%	2%
Both WC ≥ 35 and BMI ≥ 25 kg/m ²	6%	60%	47%	37%	2%

Note: * = Framingham score $> 20\%$ or personal history of

The Impact of the Obesity Epidemic on Access to Diagnostic Medical Imaging for United States Adults

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The prevalence of obesity (body mass index ≥ 30 kg/m²) in the United States has increased tremendously over the past several decades, with 31.1% of men and 33.2% of women being obese in 2003–2004. The radiological cradle weight limit is 300 pounds for several diagnostic imaging procedures including computed tomography, nuclear stress test equipment, dual energy x-ray absorptiometry, and magnetic resonance imaging. Data from the National Health and Nutrition Examination Surveys in 1988–1994 and 1999–2004 were used to determine trends in the prevalence and number of US adults with a body weight 300 pounds or greater, and thus ineligible for many imaging procedures. Additionally, the prevalence of hypertension, diabetes mellitus, and elevated LDL cholesterol among this group was determined. The percentage of US adults who weigh 300 pounds or greater increased from 0.79% to 1.54% between 1988–1994 and 1999–2004 ($p < 0.001$). This represents an increase of 1.63 million US adults (from 1.39 to 3.02 million US adults). A majority of adults weighing more than 300 pounds had at least one additional major cardiovascular disease risk factor. Specifically, 60.8% had hypertension, 35.0% had diabetes, and 27.3% had an LDL cholesterol ≥ 130 mg/dL. In addition to higher cardiovascular disease, cancer and mortality risk, the obesity epidemic is precluding a large segment of US adults from receiving useful diagnostic imaging tests. The inability of diagnostic equipment to accommodate adults with body weights above 300 pounds may limit the ability of these high risk individuals to receive optimal medical care.

A Family-Based Intervention to Promote Healthy Lifestyles in an Aboriginal Community in Canada

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Context: Obesity is a major public health problem among aboriginal people. We hypothesized that a culturally sensitive household-based intervention designed to improve dietary intake and increase physical activity may help prevent weight gain. **Objective:** To determine the feasibility of household-based lifestyle interventions designed to reduce energy intake and increase energy expenditure compared to usual care in a high-risk community. **Design, Setting, and Participants:** Randomized open trial of 57 Aboriginal households recruited between May/04–April/05 from Six Nations Reserve in Ohsweken, Canada. **Intervention:** A 6 month household-based intervention in which Health Counsellors made regular home visits assisting families in setting dietary and physical activity goals. Filtered water was provided to each intervention household weekly, an after-school physical activity program was available for children/adolescents, and events to learn about meal preparation and grocery shopping were organized. **Main Outcome Measures:** The primary outcomes were change in energy intake, macronutrient composition, dietary components, and leisure time physical activity. Dietary intake and physical activity were assessed at baseline and after 6 months. **Results:** 57 households involving 174 individuals were randomized 1:1 to intervention or usual care between April/04–March/05. Intervention household's decreased consumption of fats, oils and sweets compared to usual care households (-4.9 svgs/d vs -3 svgs/d $P = 0.006$), and reduced trans fatty acids intake (-0.2 vs $+0.6$ g/d, $P = 0.02$). Water consumption increased ($+0.3$ vs -0.1 svgs/d, $P < 0.04$), soda pop consumption decreased (-0.3 vs -0.1 , $P = 0.02$) in intervention families compared to usual care. No changes in energy intake or leisure activity was observed, although sedentary behaviours such as television or computer use decreased in intervention compared to usual care households (-0.6 hrs/day vs -0.1 hrs/day; $P = 0.01$). **Conclusions:** A household-based intervention to improve lifestyle practices is feasible, and is associated with some positive changes in dietary practices and activity patterns. Larger and longer term studies are needed to determine the impact on body weight.

School-Based Early Prevention Interventions Improve Body Mass Index Percentiles: Preliminary Results of the HOPS Study

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Introduction: The Healthier Options for Public Schoolchildren (HOPS) Study aims to understand the efficacy of prevention efforts that address nutrition and physical activity implemented in the elementary school setting. **Hypothesis:** We assessed the hypothesis that HOPS Study interventions reduce obesity rates more so than traditional school-based dietary and physical activities. **Methods:** The HOPS Study was implemented in fall 2004 and includes approximately 3,200 children (48% Hispanic; 1,549 out of 3,247) attending six elementary schools (4 intervention; 2 control). Data are collected at baseline/fall and follow-up/spring (demographic information, height, weight, BMI percentiles, sedentary behavior and food consumption data). HOPS Study interventions include modified dietary offerings, nutrition and lifestyle educational curricula, school gardens, and other school-based wellness projects, with the goal of reducing childhood obesity rates in a manner that is replicable in other public school settings. **Results:** Overall, 2005–2006 data show statistically significant differences between treatment groups with respect to changes in BMI age- and gender-specific z-scores. Analyses of subgroups show statistically significant differences between intervention groups for BMI risk groups as well as some quintiles, when controlling for one control school with a particularly rigorous physical activity program. **Conclusions:** Early results show HOPS Study interventions improve BMI percentiles of elementary-aged children. Additional data collection and analyses, over time, will

Intervention (n=2,135) Control (n=1,112) p-value	Changes in BMI Z-Scores mean (SD)									
	Changes in BMI Z-Scores by Risk Group mean (SD)			Changes in BMI Z-Scores by Quintile mean (SD)						
	Normal (<85%)	At Risk (>=85% <95%)	Overweight (>=95%)	1 st Quintile	2 nd Quintile	3 rd Quintile	4 th Quintile	5 th Quintile		
	.03 (.77)	.14 (.44)	.13 (.34)	-.14 (1.00)	.095 (.58)	.13 (.58)	.15 (.48)	.13 (.26)		
	-.08 (.39)	.02 (.29)	.04 (.20)	-.23 (.44)	-.01 (.34)	.002 (.34)	.01 (.28)	.05 (.20)		
p-value	.001*	.001*	.003*	.388	.016*	.018*	.000*	.002*		

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Prediction of the Framingham Risk Score and Coronary Heart Disease Risk in Extremely Obese Individuals

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The Framingham Risk Score (FRS) is widely used as a 10-year estimate of an individual's risk of death due to myocardial infarction (MI) and coronary heart disease (CHD). The variables in the FRS include age, total cholesterol (TC), HDL cholesterol (HDL), systolic blood pressure (SBP), treatment for hypertension, and cigarette smoking. Current thinking alludes to the development of CHD through risk factors associated with the Metabolic Syndrome (MetS), i.e., elevated triglycerides (TG), waist circumference (WC), blood pressure (BP), glucose (BG) and decreased HDL. In addition to the FRS, the ratio of TC to HDL cholesterol has been validated to estimate 10-year coronary heart disease risk (CHDR). The purpose of this study was to explore the relationship between MetS risk factors, FRS, and CHDR in individuals classified as extremely obese (EO). Seventy-three EO individuals (Age = 48 ± 9 yr; BMI = 40.7 ± 8.8) randomly selected to participate in a weight loss program were used in this study. Multiple biometric measures, including those variables for MS and FRS were measured or calculated. The data were analysed by multiple stepwise regression. Triglyceride (TG) was the best predictor of FRS from a subset of MetS variables (Model 1; F_{1,30} = 40.41, p < 0.00), however, it was a poor fit (R²_{adj} = 36%). The inclusion of HDL, TG, and WC produced the best fit for CHDR (Model 2; F_{3,68} = 26.35, p < 0.00) from the subset of MetS variables and accounted for slightly half of the variance (R²_{adj} = 52%). Although both Model 1 and Model 2 were highly significant, they were not able to explain 64% and 48% of the model variance, respectively. Despite the MetS risk factors being implicated in the development of CVD and CHD, these results suggest that using MetS variables to predict the 10-year risk of dying from MI and CHD is not warranted.

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Baseline Associations Between Aortic Pulse Wave Velocity and Adiponectin, Leptin, Ghrelin, and CRP: The Woman on the Move Through Activity and Nutrition (WOMAN) Study

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Background: Ghrelin, C-reactive protein (CRP) and the adipocytokines, adiponectin and leptin, are associated with obesity and insulin resistance - important predictors of arterial stiffness and may have vascular effects. Therefore, we hypothesized that adiponectin, leptin and ghrelin would be inversely associated and CRP would be positively associated with aortic pulse wave velocity (aPWV), a validated marker of arterial stiffness, among postmenopausal women aged 52-62, with a BMI of 25-40 kg/m². **Methods:** At baseline, adiponectin, leptin, ghrelin, and CRP were measured with standard methods on a subset (n=201) of 508 overweight postmenopausal women enrolled in a randomized clinical trial of weight reduction on cardiovascular risk factors. aPWV was measured using the carotid and femoral arteries. All measures were available for n=190. **Results:** At baseline, the women were predominantly white (86%), on hormone therapy (HT:80%); mean age: 57 years, mean waist circumference (WC): 106 cm (86-139), and 26% were using anti-hypertensive medications (htnmeds). Mean aPWV was 879 cm/sec (S.D.=205) and was higher among black women. Higher aortic PWV was correlated with higher age (spearman rho (ρ) = .11), systolic BP (ρ = .20), heart rate (ρ = 0.16), BMI (ρ = .10), and fasting insulin (ρ = .14), and lower adiponectin (ρ = -.15) and ghrelin (ρ = -.23), p < 0.05 for all. In this sample of overweight, large-waisted women, aPWV was not significantly associated with WC, weight, leptin or CRP. With linear regression, ln(adiponectin) and ln(ghrelin) were each significantly associated with lower aPWV after adjustment for age, race, BMI, WC, ln(HOMA), SBP, heart rate, HT use, and htnmeds. An increase of 1 standard deviation in adiponectin (8.75 ng/ml), or ghrelin (340 pg/ml), was associated with a decrease in aPWV = 40 or 44 cm/sec, respectively. Race interactions were not significant, and results were similar for HT only or no htnmeds analyses. **Conclusion:** Among overweight, large-waisted postmenopausal women, adiponectin and ghrelin were significantly associated with aPWV independent of body size, insulin sensitivity, and CVD risk factors, suggesting that these hormones may have direct vascular effects that contribute to arterial stiffening in obesity.

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Influences of Age and Gender on Cardiovascular Disease Risk Factor-Associated Inflammation

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Epidemiologic evidence indicates the rising prevalence of obesity & other cardiovascular disease risk factors (CVDRF) in nearly all segments of the population, including subgroups of

the association of traditional CVDRF with a chronic, sub-acute inflammatory state. It is unclear how such an inflammation changes between traditional CVDRF or across age & gender boundaries. To better evaluate these relationships, plasma samples from 245 human participants in a community-based study were analysed using multi-plexed assay technology. In addition to anthropometric measurements (incl. height, weight, blood pressure, estimate of % body adiposity (%BA) using body impedance analysis), multiple markers of inflammation were obtained from blood plasma. Table 1 summarizes results from univariate analysis. Leptin, fibrinogen, and haptoglobin were consistently different across phenotypic groups, with other markers differing depending upon the stratification. To better understand variable interactions & *ceteris paribus* effects, a series of multiple linear regression analyses were performed modelling the inflammatory marker as a function of %BA, total cholesterol (TC), gender, & age; results shown in Table 2. After accounting for simultaneous effects, age, %BA, and TC but not gender were important predictors of multiple markers. These results suggest future work to understand the effects of aging on CVDRF-related inflammation, & highlight the importance of more complex statistical modeling. table (7D3A9C72-4E2D-4A46-A242-B914345F7925)\$S

Table 1. Summary of Univariate Results (ANOVA, p < 0.05)

Type of Marker	Differs Across Adiposity Groups	Differs Across Cholesterol Groups	Differs Across Age Groups	Differs by Gender Category	Differs by Age & Gender Category
	< OR > = 30 %BA	< OR > = 240 mg/dl	< 16 OR 16-50 OR > = 50	Male OR Female	Age X Gender Groups
Endocrine	c-Peptide	NONE	GLP-1	Leptin	GLP-1 Leptin
Adipokine	Leptin MCP-1	tPAI-1	MCP-1 Resistin	NONE	MCP-1
Cytokine	NONE	NONE	tPAI-1 NONE	NONE	EGF IFN-g IL-13 IL-1a MIP-1b
CVD / Other	CRP Fibrinogen Haptoglobin sVCAM-1	Fibrinogen Haptoglobin MMP-9 MPO	sE-Selectin Fibrinogen Haptoglobin MMP-9	Fibrinogen Haptoglobin	Fibrinogen Haptoglobin sVCAM-1

Table 2. Results of Regression Analysis

Predicted Marker	Model Significant	Gender	Age	Total Cholesterol	% BA
	F Statistic	NS: p > 0.05 s: p < 0.05	p > 0.05 s: p < 0.05	p > 0.05 s: p < 0.05	p > 0.05 s: p < 0.05
c-Peptide	Yes	NS	NS	S	NS
CRP	Yes	NS	NS	NS	S
MMP-9	Yes	NS	NS	S	NS
tPAI-1	Yes	NS	S	NS	p = 0.059
Fibrinogen	Yes	NS	NS	S	p = 0.068
GLP-1	Yes	NS	S	NS	NS
Haptoglobin	Yes	NS	S	S	S

Models Not Significant: IFN-g, sE-Selectin, EGF, IL-10, IL-13, IL-1a, MIP-1b, MPO, sVCAM-1

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Impact of Overweight on Linear Growth in Children and Adolescents

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Background: Overweight in childhood has been associated with accelerated linear growth in pre-pubertal children. Childhood obesity increases the risk for adult short stature. **Objectives:** To compare stature in a group of overweight children and adolescents with CDC 2000 growth charts for normal weight. **Methods:** This study includes baseline anthropometric data from 416 patients with a body mass index ≥ 95th, in good health except for their obesity, referred to our lifestyle modification program. Study population was divided in two age groups, A: 8 to 11 years, and B: 12 to 16 years. Stature-for-age z-score (zstature) from CDC 2000 charts was used for comparisons. **Results:** Group A was composed of 206 subjects, mean age: 10.2 ± 1.1 years, and group B of 210 subjects; both groups were similar in ethnic distribution (Hispanic: 53%, Caucasian: 24%, African-American: 11% and other races: 12%). Boys and girls from group A were significantly taller than their normal weight peers. In group B only boys were significantly taller than their normal weight peers. Data are summarized in table. **Conclusion:** In these overweight pediatric patients the mean stature-for-age z-score for height was statistically higher in all sub-groups except in girls 12 to 16 years, suggesting that body mass index is not negatively impacting the linear growth.

	8 to 11 years		12 to 16 years	
	Girls n = 92	Boys n = 114	Girls n = 90	Boys n = 120
BMI-Zscore	2.33 ± 0.29	2.34 ± 0.25	2.32 ± 0.30	2.46 ± 0.29
zstature	1.15 ± 0.83 *	1.14 ± 0.91 *	0.18 ± 0.91	0.53 ± 1.06 *

* p < 0.001

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Elevated BMI Does Not Discriminate Between Body Fat and Lean Mass in the US Population

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Background: The association between body mass index (BMI) with mortality and cardiovascular events is not linear, suggesting a high noise-signal ratio in the normal-mildly elevated BMI ranges. We hypothesized that BMI does not adequately discriminate between body fat percent (BF%) and lean mass (LM%) in the normal-mildly elevated BMI ranges. **Methods:** This

POSTER SESSION: SCIENCE/EDUCATION/MANAGEMENT/FOODSERVICE/CULINARY/RESEARCH

Title: THE CONTINUATION AND EXPANSION OF DIETARY INTERVENTIONS OF THE HEALTHIER OPTIONS FOR PUBLIC SCHOOLCHILDREN STUDY - A SCHOOL-BASED HOLISTIC NUTRITION AND HEALTHY LIFESTYLE MANAGEMENT PROGRAM FOR ELEMENTARY-AGED CHILDREN

Author(s): J. Gonzalez, M. Almon, A. Agatston, D. Hollar; Agatston Research Foundation, Miami Beach, FL

Learning Outcome: To understand the results of a rigorous dietary intervention over a two-year period, and how intervention results in more nutritious elementary school meals (including higher fiber, lower fats, and more fresh fruits and vegetables) served to approximately 15,000 children.

Text: The Healthier Options for Public Schoolchildren (HOPS) Study tests the feasibility of a holistic nutrition and healthy lifestyle management program in the elementary school setting. Central to the study are dietary interventions, which include rigorous modifications to school-based reimbursable meals and extended-day snack offerings, that model the nutrition education taking place in the classrooms. The overall goal is to examine the efficacy of this integrated program that can be replicated on a larger scale. The study design includes 17 public elementary schools (13 intervention and four control) - approximately 15,000 students aged 5-11. During HOPS, breakfast, lunch, and snack menus are modified to include more whole grains, less saturated fat, fewer trans-fats, more fresh fruits and vegetables, and less added sugars, while working within the confines of a traditional school budget and using existing food distribution networks. The goals of this research are two-fold: to examine the longitudinal effects of dietary interventions on the nutrition composition of HOPS menus (previous HOPS nutrition analysis showed 28% less fat and two times more fiber in HOPS versus control menus); and to understand the "entry" effects for brand new HOPS school cafeterias just completing their first year of interventions. Accordingly, results of nutritional analyses (using Nutrikids® software) of six weeks of menus from schools that have been in HOPS for three years, as well as menus of new HOPS schools will be presented. Additionally, anthropomorphic findings will be presented (including statistically significant differences in body mass index percentiles between intervention and control children).

Funding Disclosure: The Healthier Options for Public Schoolchildren Study is funded by the Agatston Research Foundation, Miami Beach, FL.

Title: Gonzalez J, Almon M, Agatston A, Hollar D. The continuation and expansion of dietary interventions of the Healthier Options for Public Schoolchildren Study - a school-based holistic nutrition and healthy lifestyle management program for elementary-aged children. *JADA*. 2007;Suppl 3,107(8):A76.

and 30% (w/w). The total moisture content of the muffins was found to increase with increasing levels of SPI supplementation. This was confirmed by preliminary in-house sensory tests which revealed that SPI substitutions up to 20% improved panelists' scores for moistness, taste and texture of the sorghum based muffins. Addition of SPI had a progressively negative impact on crumb color possibly due to decreased browning. Texture analysis of the muffins was done using the TA.XT Plus Texture Analyzer (Texture Technologies Corp., Scarsdale, NY). Uniaxial compression was performed with a 25 mm cylindrical probe and the resulting force-deformation curve was analyzed to quantify stiffness, toughness and tenderness. It was found that even though SPI addition increased the toughness and stiffness of the muffins, moisture retention in the SPI supplemented products was enhanced, thereby improving the sensory scores of the muffins. Muffins with 12.5% SPI supplementation scored the highest for overall acceptance. Further work needs to be done to improve the textural attributes of sorghum based gluten-free muffins. Development of such products is essential to cater to the nutritional needs of celiac patients.

Funding Disclosure: None

Title: COMPARISON OF THE EFFECT OF USING HAZELNUT OIL (HO) VERSUS SOYBEAN OIL (SO) ON THE LIKEABILITY OF BAKED PRODUCTS

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Learning Outcome: To become aware of the differences in the vitamin E (VE) content of vegetable oils and sensory parameters assessed when determining the impact of replacing one oil with another in a food product.

Text: The median VE intake in the U.S. is well below the RDA. SO is the most widely consumed oil in the U.S. However, the VE concentration of SO (12 mg per 100 g) is lower than that of other vegetable oils, including HO (35 mg per 100 g). Replacement of SO with HO in food products, such as baked goods, could be a feasible way to increase VE intake, provided that the overall likeability of these products is not reduced. The feasibility of using HO to replace SO was investigated using four baked products. These were carrot muffins (CM), cornbread (CB), banana muffins (BM), and chocolate chip cookies (CCC). Subjects (n=80) were asked to rate the products using a standard Likert scale (1=dislike extremely; 9=like extremely). Sensory parameters assessed were appearance, texture, taste, and overall likeability. With the exception of values for appearance, taste, and overall likeability being higher for the CB made with SO than for the corresponding product made with HO, no significant between-group differences were found. Mean values for the overall likeability of products made with SO versus ones made with HO were: 6.0 versus 5.7 for CM; 5.0 versus 3.9 for CB; 7.0 versus 6.8 for BM; and 6.2 versus 6.2 for CCC. Thus, for three out of four products, replacement of SO with HO did not affect overall likeability, and the use of HO rather than SO in muffins and cookies maybe a feasible way to increase VE intake.

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Title: MODIFYING VEGETABLE TASTES TO IMPROVE LIKING

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Learning Outcome: To increase the awareness of modifiers that can suppress bitterness and enhance sweetness of vegetables to improve vegetable liking as well as the impact of genetic variation in taste on effectiveness of these modifiers.

Text: Dietary guidance encourages increased vegetable consumption to prevent disease, yet intakes fall below recommendations. Taste sensations influence vegetable acceptance: bitterness hinders while sweetness facilitates liking (Dinehart et al, 2006). In two experiments, we tested the impact of additives on vegetable tastes and liking. Experiment-one, a repeated-measures-design in 29 adults, involved adding tastants known to suppress bitterness (aspartame (3.2mM), sodium acetate (NaOAc, 1.33M), and NaCl (10,32mM)) to Brussels Sprouts, asparagus and kale. Propylthiouracil (PROP) bitterness (taste genetics probe) formed nearly equal nontaster, medium- and supertaster groups. In ANOVA (p≤0.05), additive effects were vegetable-specific and varied with PROP-status. By imparting sweetness, aspartame reduced bitterness and improved liking for B.Sprouts and asparagus, PROP-status independent. For Kale, bitter suppression occurred in medium- and supertasters with gains in liking most apparent in medium-tasters. NaOAc increased saltiness and suppressed vegetable bitterness for medium- and supertasters. The NaOAc-related taste changes only improved B.Sprouts liking, adding sourness/astringency to Kale. The NaCl showed least ability to modify tastes, improving B.Sprouts liking without taste changes and Kale liking for medium- and supertasters with minimal bitterness reduction. These results suggested that aspartame afforded the most hedonic gains by reducing bitterness. In experiment-two, we assessed preschoolers' responses to broccoli, spinach and collard greens lightly misted with 3.2mM aspartame. In blind forced-choice testing on separate days, approximately two-thirds of 20 preschoolers preferred aspartame-added over plain vegetables (2AFC binomial, p≤0.05). In summary, these laboratory and preliminary-field studies suggest that, within the context of taste genetics, additives can improve vegetable liking through suppressing bitterness/enhancing sweetness.

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P19 School-based Nutrition Education Improves Body Mass Index Percentiles: Preliminary Results the HOPS Study

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The Healthier Options for Public Schoolchildren (HOPS) Study aims to understand the efficacy of nutrition education programming coupled with modified dietary offerings in the elementary school setting. Assessing the efficacy of school-based nutrition education programming, via evidence-based methodologies, will help nutrition educators choose programming most likely to improve the health, well-being, and academic achievement of children. HOPS utilizes an intervention-control group design, including approximately 4713 children (48% Hispanic) attending six elementary schools (4 intervention; 2 control). Interventions include nutrition and lifestyle educational programming for students, staff, and parents coupled with modified breakfast, lunch, and extended day snack offerings provided by school cafeterias. Variables, measured twice each school year (baseline/fall and follow-up/spring), include demographic, anthropomorphic, activity level, and food consumption variables. Statistically significant differences for changes in body mass index (BMI) for age and gender z-scores from baseline to follow-up were found between intervention (mean=.07, std=.64) and control (mean=.02, std=.44) schools ($p=.004$). Similarly, statistically significant differences for changes in BMI z-scores between intervention groups were found for BMI risk groups: normal intervention (mean=.03, std=.77) v. normal control (mean=-.08, std=.39) ($p=.001$); at risk intervention (mean=.14, std=.44) v. at risk control (mean=.02, std=.29) ($p=.001$); overweight intervention (mean=.13, std=.34) v. overweight control (mean=.04, std=.20) ($p=.003$), when controlling for a high-physical activity school. Results suggest that nutrition education coupled with dietary changes improve BMI percentiles of elementary-aged children in a replicable manner. Additional data collection and analyses will provide important data to inform school-based obesity prevention strategies. Study funded by: Agatston Research Foundation

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The Child and Adult Care Food Program (CACFP) provides meals to low-income children by reimbursing eligible childcare centers. Besides setting food standards, CACFP suggests feeding guidelines, which are congruent with childhood overweight prevention recommendations and support Satter's division of responsibility. However, little is known about feeding environments at CACFP-funded centers. Licensed centers from California, Colorado, Idaho and Nevada were surveyed (About Feeding Children project). Responses from centers serving low-income children (203 directors [93 CACFP-funded, 110 non-funded] and 567 staff [278 funded, 289 non-funded]) were used for this study. SUDAAN was used for all statistical analyses. CACFP centers were significantly more likely ($p<.05$) to use family style meal service (93% vs. 45%) and to report appropriate practices than non-funded centers. However, only ~1/4 of CACFP-funded staff received child feeding training yearly. By using feeding guidelines and providing more training, CACFP-funded centers could serve as a model in preventing childhood overweight.

Selected Practices as reported by Childcare staff	CACFP-	Non-
	funded ¹	funded
	%	%
Sit at the table with children	75%*	50%
In the room but don't sit with children	2%**	16%
Often encourage children to eat the amount of food they think children need	13%*	24%
Somewhat agree that if children put food on their plate, they should eat it	22%***	45%
Have children eat nutritious foods before "junk foods"	66%**	91%

¹Differences are statistically significant: * $p<0.05$; ** $p<0.01$, *** $p<0.001$

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2007;116:II_843-II_844.)

Lifestyle, Behavior, ECG

Abstract 3711: School-based Early Prevention Interventions Decrease Body Mass Index Percentiles During School Year, but Children Experience Increase in Percentiles During Summer

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Introduction: The Healthier Options for Public Schoolchildren (HOPS) Study aims to understand the efficacy of early prevention efforts addressing nutrition and physical activity in elementary school setting during the school year.

Hypothesis: We assessed the hypotheses:

1. HOPS interventions improve age and gender-specific body mass index (BMI) percentiles more so than traditional dietary and physical activities;
2. intervention children maintain healthier BMI percentiles during summer vacation compared to controls.

Methods: HOPS, in its 3rd year, includes approximately 3,200 children (48% Hispanic) in six elementary schools (4 intervention; 2 control). Data are collected in fall and spring. Interventions include modified dietary offerings, nutrition and lifestyle curricula, school gardens, and other wellness projects, with the goal of reducing childhood obesity rates in a manner that is replicable in other public school settings.

Results: Overall, data for the academic year 2 show statistically significant differences between treatment

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groups with respect to changes in BMI percentiles. Analyses of subgroups show trends towards greater improvements for intervention children, but only those classified as normal and in the 3rd quintile at study baseline experienced statistically significant improvement. Data analyzed for summer vacation time show increases in BMI percentiles for both intervention and control children with the exception of intervention children classified as overweight or in the 5th quintile at study baseline. Control children classified as at risk or overweight as well as those in the 3rd, 4th, and 5th quintiles experienced greater increases in their BMI percentiles during summer.

Conclusions: Early results show HOPS interventions improve BMI percentiles of elementary-aged children during the school year. However, all children appear to be losing ground during summer vacation as their BMI percentiles increase during this time.

Changes in BMI Percentiles during School Year

	mean (SD)	Risk Group mean (SD)			Quintile mean (SD)				
	Overall	Normal (< 85%)	At Risk (>= 85% - <95%)	Overweight (>=95%)	1 st Quintile	2 nd Quintile	3 rd Quintile	4 th Quintile	5 th Quintile
Intervention	-1.73 (13.55) n=2,135	-1.18 (16.06) n=1,273	-4.14 (10.75) n=376	-1.33 (6.02) n=486	4.29 (15.87) n=438	-2.97 (16.36) n=440	-5.04 (13.85) n=433	-3.92 (10.89) n=421	-1.10 (4.44) n=403
Control	-.47 (12.09) n=1,112	.72 (13.80) n=639	-3.08 (11.30) n=205	-1.32 (6.81) n=268	5.79 (14.63) n=213	-1.39 (14.01) n=219	-2.30 (10.74) n=222	-3.21 (12.10) n=239	-.81 (3.60) n=219
p-value	.007*	.007*	.27	.99	.247	.20	.005*	.438	.415
Changes in BMI Percentiles during Summer Vacation									
	mean (SD)	Risk Group mean (SD)			Quintile mean (SD)				
	Overall	Normal (< 85%)	At Risk (>= 85% - <95%)	Overweight (>=95%)	1 st Quintile	2 nd Quintile	3 rd Quintile	4 th Quintile	5 th Quintile
Intervention	3.98 (16.96) n=1,080**	6.27 (20.09) n=657	1.10 (12.94) n=177	-0.05 (5.47) n=246	10.56 (21.48) n=229	5.38 (20.03) n=203	2.68 (17.89) n=224	1.19 (12.06) n=210	-0.27 (5.48) n=214
Control	3.35 (21.08) n=501**	3.61 (24.50) n=319	5.40 (18.02) n=69	1.37 (8.68) n=113	5.65 (27.90) n=96	2.35 (22.88) n=110	3.10 (23.00) n=113	4.16 (16.65) n=84	1.82 (9.05) n=98
p-value	.525	.072	.038*	.061	.088	.227	.855	.090	.037*

*p<.05. **Summer sample size smaller due to high mobility of students.

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STANLEY WALLACH LECTURESHIP AWARD

Abstract 24

HISTORY OF PARENTERAL NUTRITION

Stanley J. Dudrick, MD, FACS, FACN, CNS Professor of Surgery, Yale University, Saint Mary's Hospital, Waterbury, CT.

The concept of feeding patients entirely parenterally by injecting nutrient substances or fluids intravenously was advocated and attempted long before the successful practical development of total parenteral nutrition (TPN) four decades ago. Realization of this 400 year old seemingly fanciful dream initially required centuries of fundamental investigation coupled with basic technological advances and judicious clinical applications. Most clinicians in the 1950's were aware of the negative impact of starvation on morbidity, mortality, and outcomes, but only few understood the necessity for providing adequate nutritional support to malnourished patients if optimal clinical results were to be achieved. The prevailing dogma in the 1960's was that, "Feeding entirely by vein is impossible; even if it were possible, it would be impractical; and even if it were practical, it would be unaffordable." Major challenges to the development of TPN included: (1) formulate complete parenteral nutrient solutions (did not exist), (2) concentrate substrate components to 5-6 times isotonicity without precipitation (not easily done), (3) demonstrate utility and safety of long-term central venous catheterization (not looked upon with favor by the medical hierarchy), (4) demonstrate efficacy and safety of long-term infusion of hypertonic nutrient solutions (contrary to clinical practices at the time), (5) maintain asepsis and antisepsis throughout solution preparation and delivery (required a major culture change), and (6) anticipate, avoid, and correct metabolic imbalances or derangements (a monumental challenge and undertaking). To comply with editorial convention, the important, meticulous, and relentless pursuits and resolution of the many details essential to the successful development of TPN were "sanitized" prior to publication. This presentation will recount approaches to, and solution of, some of the daunting problems as really occurred in an "un-sanitized" and more comprehensive, precise, and useful history of parenteral nutrition.

SYMPOSIUM VII: PREVENTING AND TREATING CHILDHOOD OBESITY: SUCCESSFUL, EVIDENCE BASED METHODOLOGIES

Abstract 25

THE PREVALENCE OF THE METABOLIC SYNDROME IN US YOUTH. **Messiah SE.** Department of Pediatrics, University of Miami Miller School of Medicine, Miami, FL.

Recent studies have reported an association between childhood obesity and the development of a cluster of cardiometabolic disease risk factors characterized by variable combinations of insulin resistance, dyslipidemia, and hypertension, which some authors have termed "metabolic syndrome". In turn, this clustering is associated with the onset of type 2 diabetes and long-term atherosclerotic cardiovascular complications in both childhood and adulthood. Analysis of the National Health and Nutrition Examination Surveys (NHANES) 1999-2006 found that nearly one million adolescents aged 12 to 19 years in the US, or about 4% of the population in this age range, have the metabolic syndrome. Among overweight adolescents, the prevalence is nearly 30%. Among 8- to 11-year-olds, national prevalence estimates of metabolic syndrome risk factors ranged from 2% to 9%.

Identifying children at the earliest stages of chronic disease onset should be the goal of clinical practice, yet there have been no clear guidelines established in terms of what defines metabolic syndrome risk as well as appropriate risk factor cut-off thresholds among young adolescents. If young adolescents are identified early in the disease process, lifestyle and/or clinical interventions can be instituted when they are potentially more effective. Only continued longitudinal follow-up of well characterized pediatric cohorts into adulthood will provide sufficient information on cardiovascular risks in childhood.

Abstract 26

A SCHOOL-BASED COMPREHENSIVE INTERVENTIONAL PROGRAM FOR CHILDHOOD OBESITY **Michelle A. Lombardo, DC,** Project Director, HOPE, HOPE2, MS Food Network/OWG Inc.

The OrganWise Guys (OWG) Comprehensive School Program (CSP), which synergizes the intervention models used in the proven-effective Healthier Options for Public Schoolchildren (HOPS) Study and the W.K. Kellogg Foundation (WKKF) Delta HOPE Tri-State (LA, AR, MS) Initiative's Healthy Options for People through Extension (HOPE) Initiative, thematically integrates an evidence-based set of interventions including nutrition and lifestyle educational curricula focusing on core principles of healthy living and eating nutritious dietary offerings in school cafeterias that model classroom-based and parent nutrition education via the U.S. Department of Agriculture (USDA) feeding and nutrition education programs, increased physical activity, and other school-based projects in a proven-effective manner. Results from studies of HOPE indicate health improvements: a 1400-student subset of participants showed a reduction in the percentage of students in the overweight and obese categories, and an increase in the percentage of students in the healthy weight category over the 3-year period. HOPE evaluation data also show that this school-based resource increased parents' engagement with their children's healthy food choices.

The OWG CSP model is a successful tool for creating sustainable partnerships among land grant University Cooperative Extension Services (UCES), as well as other health-providing entities, and the communities they serve. UCES partners with the USDA, which administers the Supplemental Nutrition Assistance Education Program (SNAP-ed), which allows UCES to use non-federal resources to leverage federal matching dollars when OWG nutrition and physical education science-based programming is formally adopted as part of their statewide plan.

Abstract 27

LONGITUDINAL PROGRAM ASSESSMENT: Statistically Significant Improvements in Weight and Blood Pressure Measures, as well as Academic Achievement, of Elementary Children in a Two-year Period of a School-based Prevention Intervention. **Hollar D, PhD**, Research Advisor, Institute for Obesity Research and Program Evaluation, AgriLIFE Research, TX A&M University System/Principal Investigator, HOPE2 Project. Miami, FL.

The OrganWise Guys (OWG)/The Healthier Options for Public Schoolchildren (HOPS) Study was an innovative feasibility study that took place in 53 elementary schools (42 intervention schools; 11 control schools) in Florida, Mississippi, New York, North Carolina, and West Virginia, including approximately 24,000 ethnically and racially diverse children. The study, which began in a set of six schools in central Florida in the fall of 2004, tested the feasibility of a holistic nutrition and healthy lifestyle management program implemented in the elementary school setting *that is modeled every day in each school cafeteria*. As such, through the study interventions, we sought to thematically integrate healthy dietary offerings, nutrition and lifestyle educational curricula, increased levels of physical activity, and other school-based projects, such as school gardens, with the goal of improving the health and academic performance of elementary-aged children in a manner that is replicable in other public school settings. All 53 schools participated in twice-yearly data collection activities (fall/baseline data collection and spring/follow-up data collection). This quasi-experimental study showed statistically significant improvements in program children's weight and blood pressure measures, as well as their academic test scores, as compared to outcomes of children in non-program schools. If healthy weight and blood pressure can be maintained from an early age via prevention programs such as OWG/HOPS, children may be less likely to develop cardiovascular disease in early adulthood, and find more success in academic endeavors.

Abstract 28

NUTRITION EDUCATION COLLABORATIVE: University Extension, School Nurses, Teachers, Children, and Parents Working Together to Improve the Health and Academic Achievement of Elementary Children. **Rowe, B, MS-University of Florida Extension in St. Johns County**.

The OrganWise Guys (OWG)/The Healthier Options for Public Schoolchildren (HOPS) Study utilized a "nutrition education collaborative" approach to teach children, parents, and school staff about good nutrition and healthy living. The implementation model brought together many partners, including elementary schools/staff, County Extension, School Foodservice personnel, and trainers from a nonprofit foundation. St. Johns County Schools joined the Study in the fall of 2006, led by a USDA Extension Nutrition Educator, School Nurse, and Elementary School Principals. Nutrition and healthy living curricula, in the form of The OrganWise Guys, was matched to state standards and thus easy to implement in classroom settings with ongoing assistance from Extension. Nutrition lessons, including cooking experiences, gardening activities, and food tastings, took place throughout school campuses teaching children and staff in an experiential manner. St. Johns' experience is the model upon which a large expansion is based which will commence in over 200 schools in FL beginning Fall 2009 through UF Extension, the FL Department of Education, and private partner the Blue Foundation for a Healthier Florida.

SYMPOSIUM VIII: NUTRACEUTICAL AND FUNCTIONAL FOODS REGULATIONS AROUND THE WORLD

Abstract 29

REGULATIONS ON NUTRACEUTICALS AND FUNCTIONAL FOODS IN THE UNITED STATES
George A. Burdock, Ph.D., Burdock Group, Orlando, FL.
Introduced by Debasis Bagchi, sponsoring member.

Nutraceuticals and functional foods have become critical players in our health care and food industries. However, marketing language and consumer desires result in confusion over how a substance is regulated. Manufacturers must be mindful on not just what is stated on the label, but as much on the consumer's perception of what he has purchased and why. Now, with an ageing population and a dissatisfaction with the US healthcare system, functional foods and nutraceuticals are taking a more drug-like turn in functionality and market claims.

In contrast to the expectations of consumers, FDA does not recognize the terms "nutraceuticals" or "function foods" as having any meaning in regulation or in the law. In its most charitable of times, FDA may regard these names as "fanciful," or least charitably, as mis-labeled drugs. To FDA, there are no gray areas. This seemingly inflexible posture by FDA is the result of the mandate to the Agency from Congress to protect an unsuspecting public. The speaker will describe the law and regulations governing these areas and his success in determining the boundaries for perspective products.

Abstract 30

THE CANADIAN PERSPECTIVE FOR REGULATING NUTRACEUTICALS AND FUNCTIONAL FOODS
Nestmann, E.R. Cantox Health Sciences International, Mississauga, ON, Canada

The increasing popularity of nutraceuticals and functional foods among health-conscious consumers, as evidenced by their availability within global markets, has prompted several governments to regulate these products to ensure consumer safety. In Canada, the Natural Health Product Regulations, promulgated in 2004, categorized such products as natural health products (NHPs) and established premarket licensing requirements for the safety, efficacy, and quality of the final product. With more than 40,000 NHPs available within the Canadian market, the Natural Health Products Directorate (NHPD) has faced numerous challenges in its goal to ensure compliance with the regulations. As a result, the policies and practices of the NHPD within Health Canada are continually changing to address scientific, jurisdictional and workload issues. On the other hand, functional foods generally remain subject to the authority of the various regulations for foods. Since certain functional foods contain ingredients (e.g., phytosterols, probiotics) that otherwise would be NHPs, however, provisions more recently have been introduced for food-form NHPs to be evaluated and licensed under the NHP Regulations. This presentation includes an outline of the basic principles and requirements of the regulations that pertain to nutraceuticals and functional foods in Canada.