

## Proceedings of the IV International Conference on Obesity and Chronic Diseases (ICOCD-2019)

### Keynote Presentations

#### Soy Protein Diet and Non-Alcoholic Fatty Liver Protection; Role of Methylation and Oxidative Stress

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#### Abstract

The obesity epidemic is in the United States and world for past two decades. There is a link between obesity and chronic diseases development such as diabetes, cardiovascular disease, certain types of cancers and liver including non-alcoholic fatty liver disease (NAFLD). Obesity has a significant impact on the metabolic profiles for a variety of cellular-tissue-organ levels in animals and humans. Previously, we reported that obesity caused 1) a significant oxidative/nitrosative stress and these changes may contribute to the development of NAFLD and 2) a significant increase NAFLD and 3) feeding soy protein isolate (SPI) reduced NAFLD. The mechanism of SPI protection on NAFLD is less known. In current study, we hypothesize that SPI diet will reduce the development of NAFLD caused by obesity in part by changing oxidative stress and methylation. After one week of acclimation, five weeks old female lean and obese Zucker rats (n = 8/group) were randomly fed AIN-93-G diet with either casein (CAS as control) or SPI as source of protein for 22 weeks. Rats were weighted twice per week. Liver sample metabolites concentrations were measured using HPLC with Electrochemical Detection and LC-MS.

Our results show that:

1. Obesity increased significantly ( $P < 0.001$ ) body weight for both CAS and SPI diets.
2. Obese SPI-fed rats significantly ( $P < 0.001$ ) reduced NAFLD compared to obese CAS-fed rats.
3. Obesity in both diets significantly modify liver methylation and oxidative stress status.
4. Lean SPI-fed rats significantly ( $P < 0.025$ ) increased SAM/SAH "methylation ratio" compare to lean CAS-fed rats.
5. Obese SPI-fed rats significantly ( $P < 0.001$ ) decrease level of Homocysteine in liver and increase significantly ( $P < 0.001$ ) Methionine/Homocysteine ratio compared CAS obese rats.
6. Obesity caused a significant increase in oxidative stress (GSH/GSSG ratio decrease) in liver for both CAS ( $P < 0.004$ ) and SPI ( $P < 0.01$ ) diets.
7. Obese SPI fed rats significantly ( $P < 0.02$ ) decreased oxidative in liver (GSH/GSSG ratio increase) compared to obese CAS fed rats.

In summary, we showed that SPI diet can reduce NAFLD by changing methylation status, improve metabolism of Homocysteine, toxic intracellular compound, and improving redox environment in liver triggered by obesity.

## Metabolic Surgery: Successes, Yes... but There Are Also Adverse Events

**Walter J. Pories**

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### Abstract

Bariatric surgery has produced outcomes previously considered impossible. With relatively simple and safe operations that redirect the flow of food in the foregut, the procedure lead to full, rapid and durable remission of type 2 diabetes and its comorbidities including hypertension, dyslipidemias, NASH, PCOS, pseudotumor cerebri as well as reversals of atherosclerotic plaques in carotid arteries, long-term loss of 1/3 of the original weight. The prevalence of solid cancers is reduced by over 60%. The operations not only lead to marked decreases in morbidity and mortality but also return these unfortunate patients to far better quality of life and function.

Remarkably, these procedures are now delivered throughout the United States with 90-day mortality rates of 0.2% only double that of a normal delivery and similar to a routine cholecystectomy, often with same day or one day admissions.

Even so, these procedures also have adverse effects. This presentation will address these, including 1) anastomotic leak as well as four late complications that include 2) internal hernia, 3) episodic hypoglycemia, 4) malnutrition and 5) emotional issues.

Caring for bariatric patients requires a multidisciplinary team, similar to the care required for cancer and heart disease. The development of Metabolic Centers now offers the structure needed for the most effective and efficient care of these patients.

## Obesity and Pregnancy: A Dangerous Duo

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### Abstract

Quite remarkably, it was recently noted that for the first time in human history, obese individuals outnumber those who are underweight. In the United States and in other parts of the world, nearly 40% of women of reproductive age are obese, with >10% noted with class III obesity. The general negative health implications associated with obesity are well known, however most women are unaware of the adverse impact obesity has with respect to pregnancy outcomes; surely a concern given essentially all adverse pregnancy outcomes are more likely to occur when pregnancy is complicated by obesity. Unfortunately, just 45% of women begin pregnancy with a normal weight. Population studies and meta-analyses have consistently demonstrated increased risk for fetal death, infant death, congenital malformations (including neural tube defects, preterm birth, cardiovascular abnormalities and cleft lip and palate), hypertensive disorders and gestational diabetes and cesarean delivery among obese gravidae. Complications of cesarean section are significantly greater, including the life-threatening risks of hemorrhage, venous thrombosis and infection. There are also formidable technical challenges that must be overcome when performing cesarean section on women with severe obesity. As such, nearly every aspect of pregnancy care must be modified to achieve the very best pregnancy outcomes possible for this unique patient population. This presentation will provide a state-of-the-art review of obesity in pregnancy with respect to epidemiology, perinatal implications, population attributable risk for adverse outcomes, prenatal care modifications, cesarean surgical approach and possible strategies for increasing the number of women beginning pregnancy with normal weight.

## Symposium

### Skeletal Muscle Lipid Dysregulation: A Tale of Two Organelles

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#### Abstract

This symposium will present current knowledge of mitochondrial Acyl-CoA Synthetases and Peroxisomal Biology as they relate to lipid metabolism in human skeletal muscle and disease.

1) Long-chain acyl-CoA synthetases (ACSL) catalyze the ligation of Co-A to long-chain fatty acids which are partitioned to the mitochondria for oxidation via CPT-1 or triacylglycerol synthesis. In addition to declines in mitochondrial content, skeletal muscle lipid oxidation could be reduced by impaired ACSL function, leading to accumulation of lipid intermediates that downregulate insulin signaling. Total ACSL activity has been previously reported in obese women, yet isoform-specific function within HSkM has not fully elucidated. 2) This symposium will also describe novel studies that demonstrate peroxisomes may be linked with mechanisms of metabolic dysregulation in HSkM: 1) Studies in liver demonstrate that lipid oversupply is relieved by peroxisomal proliferation because acylcarnitine derivatives of long and very-long chain fatty acids can enter the mitochondrial matrix independent of CPT-1, thereby increasing mitochondrial fatty acid oxidation/disposal. We will suggest that peroxisomal abundance is increased in HSkM under conditions of lipid oversupply (obesity and high fat diet) to increase lipid disposal 2) We will also propose that peroxisomal activity increases in HSkM to serve as an additional source for lipid derived free radical buffering. Furthermore, we will describe PGC1 $\alpha$  as a common nexus of control for both mitochondrial and peroxisomal biogenesis in HSkM and how our understanding of peroxisomal biology in HSkM will aid in the treatment of metabolic diseases such as obesity and type 2 diabetes.

## Workshop

### Advances in Nutritional Science to Live Healthfully Past 100

Joel Fuhrman

Nutritional Research Foundation, NJ, USA

#### Abstract

This lecture reviews the basic principles of longevity science and the scientific evidence showing we can win the war on cancer with adherence to a diet-style rich in anti-cancer phytochemicals; which also prevents against dementia. A Nutritarian diet refers to a diet comprehensively rich in micronutrients including protective antioxidants and phytochemicals, which also guards against excess caloric intake.

**Learning Objectives Include:** Use Nutrient per Calorie Density to structure dietary recommendations and understand how nutritional science can impact the aging process and prevent disease. Understand the differences between various high-carbohydrate foods that affects their influence on health. Identify foods that positively and negatively affect hormones that contribute to disease and premature aging. Identify the foods with the most powerful effects to prevent cancer and how to incorporate those foods into one's dietary portfolio.

#### Most Critical Concepts:

##### A. Micronutrient excellence prevents excess caloric intake

My health equation  $H = N/C$

This means--Healthy Life Expectancy is predicted by the nutrient per calorie density of one's diet. Almost all Americans are micronutrient deficient due to lack of produce, especially raw green vegetables. Striving for micronutrient adequacy--exposure to all nutrients humans needs in adequate amounts not only prevents disease and extends lifespan but it also reduces hunger signaling.

#### **B. A hormonally favorable diet (Excess insulin, IGF-1 and Estrogen Accelerate aging)**

High glycemic load foods, that promote excess insulin, contribute to not just obesity and diabetes, but also to cancer. Dairy products and higher intake of animal protein also drive IGF-1 into unfavorable levels and the link between IGF-1 and cancer is well-established. High protein diets demonstrate increased risk of cancer, cardiovascular death and overall mortality in long-term studies.

#### **C. Therapeutic effects of a nutritarian diet**

Research data and clinical cases evaluate the benefits of a Nutritarian diet for cholesterol lowering, CAD reversal, resolving type 2 diabetes, normalizing blood pressure and achieving permanent weight loss.

## Featured Presentations

### **Obesity and Vitamin D Deficiency are Risk Factors in Chronic Diseases**

**Afrozul Haq**

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#### **Abstract**

Obesity is a significant health problem world-wide and the increase in obesity rates presents a major public health concern. Global estimates from 2008 show that 1.5 billion adults, 20 years and older, were overweight, and of these over 200 million men and nearly 300 million women were obese. Overweight and obese individuals have an increased risk of developing a number of chronic diseases, which can lead to further morbidity and mortality such as type 2 diabetes, cardiovascular disease (CVD) and cardiovascular risk factors, respiratory diseases musculoskeletal disorders such as osteoarthritis and low back pain, several cancers, and depression. Vitamin D deficiency is another pandemic and has been implicated in several diseases including obesity, cardiovascular risk, metabolic syndrome and many skeletal and non-skeletal diseases. The role of vitamin D in calcium and bone metabolism is well established. Hypovitaminosis D is well-documented in those who have had bariatric or gastric bypass procedures, in which a malabsorptive state is deliberately induced, but there is no evidence that obesity itself results in reduced absorption of dietary vitamin D. Given that vitamin D is fat-soluble and that calcium absorption has been shown to be increased in diets high in fats, it is unlikely that obesity affects vitamin D-calcium homeostasis through altered gut absorption. The association between reduced 25(OH)D concentrations and obesity is well established. Correction of low 25(OH)D concentrations in obese individuals requires higher doses than those often advocated for the general population (may be the Endocrine Society Guidelines for Vitamin D Supplementation). There are plausible mechanisms and some *in vitro* evidence supporting a role for vitamin D in weight reduction, with the proviso that it may be difficult to determine which effects are due to vitamin D itself and which are mediated via calcium. There is a clear need for adequately-powered, prospective interventions which include baseline measurement of 25(OH)D concentrations and involve adequate doses of supplemental vitamin D. Until such studies have been reported, the role of vitamin D supplementation in obesity prevention remains uncertain.

### **Understanding the Relationship of the Resolution Response to the Development of Chronic Disease**

**Barry Sears**

*Inflammation Research Foundation, Peabody, MA, USA*

#### **Abstract**

Chronic disease is considered idiopathic, meaning of unknown origin. However, it is realized that increased inflammation has a significant correlation with virtually all chronic diseases. This correlation can be better understood by understanding the role of Resolution Response in the healing of tissue damaged by external or internal injury. The Resolution Response is tightly orchestrated series of genetic (NF- $\kappa$ B and AMP kinase) and hormonal (eicosanoids and resolvins) responses that are the result of the reduction of diet-induced inflammation, resolution of the remaining levels of unresolved inflammation, and finally followed by the repair of the damaged tissue. If any one of these three distinct components of the Resolution Response

are inhibited, then unresolved cellular inflammation continues to increase eventually causing enough organ damage to cause loss of function that results in chronic disease. One of the first signs of blocked Resolution Response is the development of obesity. Examples will be shown how optimizing the Resolution Response can have significant therapeutic benefits in the areas of severe brain trauma, optical nerve damage, and treatment of type 1 diabetes.

## Gut Microbiome and Obesity

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### Abstract

Obesity is a major health problem worldwide. The global epidemic of obesity results from a combination of several factors including genetic susceptibility, increased availability of high-energy foods, increased exposure to environmental obesogens, and decreased requirement for physical activity. The human intestine harbors a complex and diverse microbial ecosystem referred to as gut microbiome. The gut microbiome varies between individuals and can fluctuate over time. Its diversity is influenced by host genetics, early microbial exposure, environment, diet, and medication. Gut microbiome is mainly composed of bacteria but also fungi, archaea, and viruses. Gut microbiome is involved in protection against pathogens, regulation of immune system, metabolism, and gut-brain axis. Firmicutes and Bacteroidetes are the predominant bacteria (90%) of the gut microbiome. Profound changes affecting the diversity and the abundance of gut microbiome are associated with several disorders including obesity. A decrease in microbiome diversity and an increase in the ratio of Firmicutes to Bacteroidetes have been reported in obese subjects. This ratio decreases with weight loss. The gut microbiota can be manipulated to change the host metabolism and treat obesity. Potential interventions include diet (fiber, complex carbohydrates), probiotics (non-pathogenic organisms), prebiotics (chemicals inducing growth and/or activity of bacteria), bariatric surgery, and fecal microbiota transplantation (through colonoscopy, esophagogastroduodenoscopy, or oral capsule). Well-designed clinical studies are urgently needed in this new field. A better understanding of the interactions between different diets and gut microbiome should help the development of new guidelines for the prevention and treatment of obesity.

## Weight Loss, Macronutrient/Nutrient Intakes and Healthy Eating Index of Dietary Intakes of Individuals in the POUNDS LOST Trial

Catherine M. Champagne<sup>1</sup>, Derek C. Mketinas<sup>2</sup>, Frank M. Sacks<sup>3</sup> and George A. Bray<sup>1</sup>

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### Abstract

The best weight loss diet in terms of macronutrient percentages continues to be debated, both on effectiveness and health promotion. POUNDS LOST, a randomized clinical trial, examined four calorie-restricted diets of varying macronutrient composition on weight loss in free-living adults with obesity. Participants were randomized to receive one of four diets: low or high fat (LF 20%; HF, 40%) and average or high protein (AP, 15%; HP, 25%), at a 750 kcal/d energy deficit. The objective of this analysis was to identify possible predictors of 6-month weight loss and whether dietary intakes were healthy based on the Healthy Eating Index (HEI). Three hundred forty-five participants (54.8% female; 86.5% Caucasian, 12.4% African American, and 1.1% other) who provided baseline and 6-month follow-up data were included in the analyses. Stepwise regression and cross-validation techniques were used to model weight loss as a function of all possible predictors: age, dietary adherence, energy density change, and fiber intake. Dietary adherence was defined as consuming within  $\pm 5\%$  of the target macronutrient composition for fat and protein. Mean weight loss was  $-8.4 \pm 5.0$  kg and did not vary across diet-type. Energy density change positively associated with weight change while age, dietary adherence, and fiber intake inversely associated with weight change. Fiber intake was the strongest predictor; on average, a 10 g increase in fiber intake was associated with 2.2 kg decrease in body weight. HEI scores for diets consumed by participants were: LF/AP,  $74.8 \pm 9.7$ ; LF/HP,  $73.8 \pm 12.4$ ; HF/AP,  $73.4 \pm 13.0$ ; and HF/HP,  $74.2 \pm 9.8$  (out of 100 as the target), compared to a national average of 59. These findings provide evidence that diets varying in fat and protein can promote weight loss, that modifying dietary components like fiber and energy density can positively influence weight loss and these diets can indeed be healthy.

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## Low-Carb Diets in the Treatment of Obesity - History and Actual Situation

**Udo Rabast**

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### Abstract

Low carbohydrate diets are a matter of controversy for more than one century. From time to time this kind of diets are highly popular. In between also opponents are seeing this therapeutic option is not only negative. Low-carb-diets are associated with the name of Atkins and his treatment method with an unlimited supply of fat and protein combined with the extreme reduction of carbohydrates. Initially only 20 g of carbohydrates are allowed. Although energy supply is unlimited obese people will lose weight. - If one main nutrient (carbohydrates or fat) are eliminated in the daily diet, it will be impossible to have the same energy intake as usual. So, a caloric restriction of 600-800 kcal/day will result. Supporter of low-carb-diets don't see this as the only reason for the weight reduction. In own comparative studies with energetically limited, isoenergetically diets we found the higher weight reduction with the low- carbohydrate- in comparison with the high carbohydrate diets. Newer studies confirmed the results. Some metabolic effects are positive (decrease of insulin and triglycerides, increase of HDL-concentration). Negative effects are the increase of ketone bodies and uric acid. Under discussion are the risks for uric acid-and oxalic-acid stone formation in the kidney. - There is no ideal solution for the treatment of obesity. Low-carbohydrate diets are only one therapeutic option. Positive is the high value of satiety. This improves the adherence to the diet and compared to other dietetic treatments a more pronounced weight loss can be expected.

Low Carb diets are one treatment option for the therapy of obesity. A permanent use of a low carbohydrate, high fat diet (carbohydrate consumption (<40%)) should be avoided as well as the permanent high carbohydrate consumption (>70%). The lowest health risk seems to be given with a diet with 50-55% carbohydrate.

## Cellular Magnesium as a Regulator of Glucose Homeostasis and Insulin Mediated Signaling and Cellular Metabolism

**Andrea Romani**

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### Abstract

The last thirty years have registered a progressive and dramatic increase in the incidence of obesity and type 2 diabetes mellitus world-wide. Metabolic Syndrome, one of the most commonly conditions associated with obesity and insulin resistance, has also increased considerably. The latest releases from the WHO estimate that approximately 1 billion people worldwide are obese, and more than 500 million are diabetic or pre-diabetic. Interestingly, increasing evidence suggest that our current western diet is hypercaloric but hyponutritive, as it is lacking essential micronutrients and minerals. Our laboratory has focused on the possible role of reduced cellular magnesium levels in the dysregulation of cellular and systemic glucose homeostasis. Experimental data obtained in animal and cellular models, including cells of human origin support the conclusion that cellular magnesium regulates transmembrane glucose transport as well as its utilization, and neosynthesis in gluconeogenic tissues, by modulating the activity of specific cellular enzymes and insulin-mediated signaling. Regardless of the tissue considered, decreased cellular and serum magnesium levels impact the proper operation of Glut 4, and Glut 2 transporters, thus limiting the ability of tissues like heart, muscles, liver, and possibly beta-islets, to effectively transport glucose into the cell to support glycolysis, ATP production, and ultimately storage as glycogen. As a consequence, gluconeogenesis becomes erroneously activated, further enhancing the circulating levels of glucose and resulting in the dysregulation of fatty acids, cholesterol, and protein degradation, to support gluconeogenic activity through increased cortisol production and insulin resistance. Also, decreased cellular magnesium levels appear to contribute directly to increased basal inflammation within tissues, further impairing insulin responsiveness and systemic metabolic homeostasis.

Altogether, our results argue for the necessity to better understand the role that micronutrients play in modulating both organ-specific and systemic metabolism and inflammation, to ultimately identifying more effective therapeutic and dietary approaches.

## Keynote Presentations

### Is There an Ideal Diet: Lessons from the POUNDS Lost Study?

**George Bray**

*Pennington Biomedical Research Center, LA, USA*

#### Abstract

Many different diets that have been recommended to the public as a means of losing weight. This dietary advice has been available for over 200 years. Two recurring themes appear more often than others. The first is the low-carbohydrate diet and the second is the low-fat diet. Whether either of these diets are really better than the other is still being debated. This is what opened the door for The POUNDS Lost Study which tested the effect of 4 diets differing in macronutrient composition in a 2-year randomized controlled trial. The diets had either 20% or 40% fat and 15% or 25% protein which provided a 2x2 factorial design. At the end of 6 and 24 months there were no differences in weight loss between the 4 diets. However, there was a wide distribution of weight loss which offered the opportunity to examine genetic and metabolic factors that might influence weight loss. A total of 19 genes were examined. Most of these genes interacted with diet in producing changes in body weight, body composition, and changes in cardio-metabolic risk factors. Of these 19 genes, two had effects on body weight and body composition that were independent of diet. Of the remaining 17, 11 interacted with dietary fat, 3 interacted with protein and 3 with carbohydrate. In addition, the baseline level of free triiodothyronine and free thyroxine predicted changes in body weight and energy expenditure. In addition to the POUNDS Lost diet, the DASH (Dietary Approaches to Stop Hypertension) diet and the Mediterranean Diet can be highly recommended. They were at the top of the list in the US News & World Report summary of good dies in their report issued in January 2019. These diets along with the diets used in the POUNDS Lost study provide guidance for a healthy diet that can be improved by using the genetically identified factors that affect the response to diet.

### The COCCI Syndemic and Residual Cardiovascular Risk

**Michael Clearfield**

*Touro University, CA, USA*

#### Abstract

Despite the progress made in the prevention, detection and treatment of cardiovascular disease over the past half century, cardiovascular disease still remains the number one cause of mortality both in the United States as well as globally. Since life-threatening cardiovascular events continue to occur despite control of conventional risk factors, other risk factors contribute to a residual cardiovascular risk that sustains cardiovascular disease's vaulted position.

This presentation will review a concept of residual Cardiovascular risk created by Obesity, Climate Change and Inflammation titled the COCCI Syndemic. In developing the framework for the COCCI Syndemic, we will demonstrate how these apparently disparate entities interact to augment cardiovascular risk around the globe and how health care providers can help address this growing concern.

### Body Weight Effect: Modern Pharmacotherapy in Type 2 Diabetes

**Edita Stokic**

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#### Abstract

Obesity is linked to the development of insulin resistance, cardiometabolic syndrome and progression to Type 2 Diabetes (T2D), as well as increased risk of morbidity and mortality, including atherosclerotic cardiovascular disease, in patients with T2D. As many as 80–90% of patients with T2D are overweight and obese, the problem of weight gain becomes even more complicated as contemporary pharmacotherapy goes in the direction to achieve intensive, better, metabolic control. Consequently, guidelines from the American Diabetes Association and the American Association of Clinical Endocrinologists/American College of Endocrinology recommend that weight loss should be considered for any patient with T2D who is overweight or obese. Newer therapies for T2D, including glucagon-like peptide-1 (GLP-1) receptor agonists, dipeptidyl peptidase-4 inhibitors, sodium-

glucose cotransporter-2 inhibitors, and amylin mimetics, may be applied for overweight and obese patients because they provide adequate, intensive glycemic control while having either or neutral effect on body weight or weight reduction effect. Nowadays, the GLP-1 RA is the most mentioned in the new 2018 ADA/EASD algorithm. GLP-1 is released in response to food intake, it increases satiety and reduces hunger and lowers blood glucose by increasing insulin and reducing glucagon levels at the same time. Study on SUSTAIN 3 has demonstrated that semaglutide was superior to exenatide ER in improving glycemic control and reducing body weight. Weight gain with insulin therapy in patients with T2D is a well-known problem in clinical practice. Study on SUSTAIN 5 has found that mean body weight decreased with semaglutide 0.5 and 1.0 mg in combination with basal insulin vs placebo from baseline to end of treatment: 3.7, 6.4, and 1.4 kg. In making the best options of pharmacotherapy, the impact on weight should be considered at all steps of the type 2 diabetes treatment modality.

## References

1. Ahmann AJ, Capehorn M, Charpentier G, Dotta F, Henkel E, et al. 2018. Efficacy and safety of once-weekly Semaglutide Versus Exenatide Er in subjects with type 2 diabetes (SUSTAIN 3): A 56-week, open-label, randomized clinical trial. *Diabetes Care*. 41(2): 258-266. <https://doi.org/10.2337/dc17-0417>
2. Rodbard HW, Lingvay I, Reed J, de la Rosa R, Rose L, et al. 2018. Semaglutide added to basal insulin in type 2 diabetes (SUSTAIN 5): A randomized, controlled trial. *J Clin Endocrinol Metab*. 103(6): 2291-2301. <https://doi.org/10.1210/jc.2018-00070>

## A Metabolic Score to Aid the BMI-Based Indications for Bariatric Surgery: Realistic or Wishful Thinking?

**Antonio Gangemi**

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### Abstract

Many studies have shown that, when compared to conventional medical therapies, bariatric surgery provides more significant positive outcomes. This includes a greater reduction of body weight in obese patients, a decrease in the risks of cardiovascular disease (CVD) and the prevention of Diabetes Mellitus Type II (DM2) [1-3].

Current guidelines implemented by the NIH, established in 1991, indicate that bariatric surgery can only be performed on obese individuals belonging to class 2 & 3, whose BMI readings are greater than or equal to 35 with at least two comorbidities (i.e. Diabetes Mellitus Type II, Hypertension, Hyperlipidemia, etc.) or greater than or equal to 40 without any comorbidities.

These guidelines leave behind a wide group of obese individuals who do not meet the criteria to be eligible for metabolic surgery based on their BMI alone but are still at risk for or have already developed the associated complications of obesity; an example of this would be an individual whom has a BMI that is between 30-39.9, fulfilling the obesity criteria, but only having one comorbidity, in this case DM2, which would therefore not fill the necessary criteria outlined by the NIH guidelines and would therefore not qualify that individual to be eligible for bariatric surgery [6].

In recent years, the medical community has been trying to find comprehensive and accurate parameters to establish more inclusive indications for bariatric (weight loss) surgery as opposed to relying on BMI alone. A metabolic risk score (MetScore) that is calculated on clinically used components of metabolic syndrome such as waist circumference, triglycerides, HDL, blood pressure and fasting blood sugar is one way to reduce this limitation. The equation to compute a gender- and race-specific MetScore score has been developed using structural equation modeling technique. The MetScore can be used to infer postoperative metabolic improvements after bariatric surgery which is a limitation of the BMI-only based criteria.

BMI is an indirect measure of metabolic changes as it simply measures the relationship between body weight in kilograms and body height in meters. It does not directly measure the metabolic status of patients, pre and post-operatively [7].

The ability of the newly created MetScore to predict the mortality rate related to major cardiovascular disease such as heart attacks or strokes in patients with metabolic syndrome has already been investigated by two large scale studies (National Health and Nutrition Examination Survey III and SHIELD) [8, 9].

These studies indicated that the MetS components associated with CVD mortality were Systolic Blood Pressure (hazard ratio 5 1.50, 95% confidence interval 5 1.14-1.96), Diastolic Blood Pressure (1.48, 1.16-1.90), and Triglycerides (1.15, 1.12-1.16). Rather than modeling the individual components of metabolic syndrome, the MetScore provides a unified tool to study the overall health effect of these components [10].

We investigated the association between MetScore and the outcomes of bariatric surgery in our patient population. We hope that the results of our retrospective study are promising enough to spur the further employment of this method in clinical trials to accurately determine how effective it would be to select candidates for bariatric surgery based on their metabolic status, rather than their BMI alone.

## Session On: Childhood Obesity: Treatment and Prevention

### **A Two-Generation (2GEN) Approach to Improving Children's Physical and Emotional Health to Reduce Overweight Problems**

**Marie Leiner**

*Texas Tech University Health Sciences Center, TX, USA*

#### **Abstract**

Prior to 1961, "health" was defined simply as the absence of disease. Dunn challenged this definition by asserting that health encompasses physical, mental, and social wellbeing, and in doing so, introduced the concept of wellness. The basis of this concept resides in the consideration that wellness is a way of life intended to attain optimal health and wellbeing of the body, mind, and spirit.

The disadvantages confronted by many families, challenge their opportunities to provide the resources/support their children need to develop at their maximum potential. Even those that do not confront disparities lack the ability to provide their families with wellness. Mental health services, including prevention, detection, referral, and treatment, are often described as inadequate among families that do not attain optimal health and wellbeing of the body, mind, and spirit. As a result, early detection of emotional and behavioral problems may be impeded due to reduced opportunities to access early intervention efforts.

One promising strategy for intervening to improve children's health is the 2GEN approach proposed by the ASPEN Institute (2011), which focuses on addressing the needs for both children, and the adults in their lives. Emerging data using this approach suggests that this approach is particularly effective for families with lower socio-economic status.

**Objective:** To present different strategies used in schools, pediatric clinics and hospitals to improve children's emotional and physical health by addressing the wellness of the parents with the intention of reducing overweight problems.

### **Weight Status Among Children of Mexican Farmworkers: A View from the Central Coast**

**Eivis Qenani, Soma Roy and Marianne Wolf**

*California Polytechnic State University, San Luis Obispo, CA, USA*

#### **Abstract**

Childhood obesity is considered a critical public health threat in the United States due to rapidly increasing prevalence among children and adults over the past three decades. The risks of childhood obesity are greatest in lower socioeconomic groups and certain population subgroups, such as migrant and indigenous children, are at a particularly high risk of becoming obese (WHO, 2016). Among all US children, those identified as Hispanic are at the greatest risk for overweight/obesity and subsequent adverse health outcomes (McLeod et al., 2017). Childhood obesity poses both intermediate and long-term health risks, leading to debilitating and life-threatening conditions, as well as considerable economic costs. Understanding the factors that contribute to this elevated risk is critical to combatting this epidemic among Hispanic children (McLeod et al, 2017). The health consequences of childhood obesity suggest that prevention could have significant impacts on major causes of disease across the lifespan.

The goal of this study is to examine the prevalence of childhood obesity in a sample of Hispanic farmworker population in California. We estimate the impact of various risk factors associated with childhood obesity in this farmworker community.

**Data and Methods:** Information on household and individual characteristics of the sample was obtained using a survey during spring 2013 and summer 2014. Interviews with parents included an extensive array of socio-demographic, lifestyle and health behaviors questions. In addition, anthropometric data were collected for both parents and children.

Child BMI –for age were calculated to establish the prevalence in childhood obesity. Multivariable analyses indicate that child's age, family income and level of education of the mother are strong predictors of obesity in children.

The high prevalence of obesity among children of farmworkers underscores the urgent need to develop and implement obesity preventive interventions. This study will help the development of such appropriate policies.

## References

1. World Health Organization (WHO). 2016. Report of the Commission on Ending Childhood Obesity.
2. McLeod DL, Bates CR, Heard AM, Bohnert AM, and C. DeCarlo Santiago. 2017. Parent perceptions of child weight status in Mexican-origin immigrant families: an investigation of acculturation, stress, and coping factors. *J Immigr Minor Health* 20(2): 441-447. <https://doi.org/10.1007/s10903-017-0569-5>

## Children's Awareness of Body Size and Weight: A Longitudinal Investigation

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### Abstract

The study explored children's perceptions about body size and their strategies for altering body size across different age groups of children. It utilized an exploratory study that is mixed methods in research design and longitudinal in scope. Thirty-four children participated. Results indicated that majority of children were aware of the connection between food, exercise, and body size. Social factors were found to be influential on children's body size perception. There were significant age and gender influences on body size choices. This study highlighted a need to increase children's awareness in the effects of diet and exercise in wellness, and longevity rather than appearance. It also provided recommendations to guide appropriate education on children's learning about food, weight, and body size.

## Top 10 Lessons Learned from Project Healthy Schools

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### Abstract

Childhood obesity is increasing in the United States; obese children are more likely to become obese adults with obesity-associated health issues. Effective programs designed to reduce the prevalence of childhood overweight and obesity are needed. We sought to review one such program, Project Healthy Schools (PHS), for key findings. Project Healthy Schools is a health curriculum that includes educational lessons, school environment changes, and health measurement. Data have shown improvement in numerous metrics after the program, including positive changes in physiologic measures and healthier lifestyle behaviors. The school's socioeconomic status has been shown to correlate with baseline and follow-up measures, and gender differences exist. Additionally, school environmental changes support improved health behaviors. The collaborative effort and support of various stakeholders have led to the success of this health education program, resulting in numerous physiologic and behavioral benefits in middle school students throughout Michigan, and providing a replicable, real-world approach to combating childhood obesity.

## Session On: Chronic Diseases Linked to Obesity

### Relationship Between Sleep, Insulin, and Cortisol in Adolescents

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### Abstract

**Background:** Pediatric obesity continues to be ongoing with treatments finding mixed results. In addition to increased caloric consumption and decrease caloric output, cortisol, insulin, and lack of sleep have been identified as factors leading to obesity. Sleep deprivation is suspected to negatively influence the levels of cortisol and insulin in adolescents.

**Objective:** The aim of this project was to explore the relationship between sleep, insulin, and cortisol among adolescents who are normal weight compared to adolescents who are obese.

**Methods:** This exploratory study consisted of a convenience sample 30 adolescent participants chosen based on their Body Mass Index (BMI). Participants had BMIs that fell between 10-84% or  $\geq 95\%$  on growth chart for sex and age. The study population consisted of participants wearing an accelerometer for seven days and collecting hormone levels through saliva and fasting blood samples.

**Results:** A significant correlation was found between sleep duration and insulin. There was no significant difference found between cortisol and sleep duration. Additionally, there was no correlation between insulin, cortisol and BMI.

**Conclusion:** Sleep can negatively impact levels of insulin. This preliminary study indicates the need for further studies to be conducted on adolescents and how sleep duration can have negative impacts on their future health outcomes.

## **Helicobacter pylori, Obesity and Asthma & Allergy**

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### **Abstract**

**Objective:** Whether the decreasing prevalence of *H. pylori* infections is associated with the increase in obesity and asthma and allergy is unknown. In this study, we assessed if obesity plays an intermediate role between *H. pylori* infections and allergy.

**Design:** A population-based nested case-control study of 10,005 participants within the second Nord-Trøndelag Health Study (HUNT2), Norway, performed in 1995-1997. The presence of *H. pylori* was tested by an enzyme immunoassay Pyloriset EIA-IgG, and weight, height, and waist circumference were measured. Body mass index (BMI) and waist circumference were used as measures of general and abdominal obesity, respectively. Self-reported asthma and allergic diseases were collected through questionnaires. The odds ratios of *H. pylori* relative to asthma and allergic diseases were estimated by logistic regression models stratified by waist circumference categories.

**Results:** *H. pylori* infection was present in 31%, ever asthma was reported in 10.4% and allergic rhinitis in 16.2%. The mean BMI was 26.4 kg/m<sup>2</sup> and the mean waist circumference was 86.6 cm. *H. pylori* infection was neither associated with asthma nor allergic diseases. However, when stratified by waist circumference, *H. pylori* infection was associated with 30-40% reduced odds of asthma and 25% reduced odds of allergic diseases in individuals with abdominal obesity (waist circumference  $\geq 86$  cm in women and  $\geq 96$  cm in men).

**Conclusion:** *H. pylori* infection is associated with reduced risk of asthma and allergy in individuals with abdominal obesity, suggesting a possible causal pathway from reduced *H. pylori* infections through obesity to increased risk of asthma and allergy.

## **Effects of DPA Supplementation on Tissue Phospholipid Composition in High Fat Fed Animals - A Lipidomics Approach**

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### **Abstract**

Dietary supplementation with n-3 fatty acids eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) has shown to reduce the accumulation of lipids and alter the fatty acid composition of PL molecular species in high fat fed (HFD) animals. However, it is not known if docosapentaenoic acid (DPA) has the same effect. The aim of this study was to investigate the changes in lipid composition in the liver tissue of rats that were either fed a chow diet (control), HFD, or HFD with 600 mg/kg/day of EPA, DPA or DHA for 4 weeks (n = 6 per group). Total liver TAG content was measured and lipidomic

analysis of tissue PL molecular species was performed using the liquid chromatography-mass spectrometry. Four weeks of high fat feeding led to significant ( $p < 0.05$ ) increase in body mass (by 23%), adipose tissue mass (by 47%) and total liver TAG content in the HFD animals compared with controls. Four weeks of n-3 fatty acid feeding did not prevent the increase in any of the above parameters. The lipidomics analysis showed that high fat diet feeding reduced the total phosphatidylcholine (PC) content (by 16%) compared with control animals. A similar but non-significant reduction was also observed in total phosphatidylethanolamine (PE) content with HFD. This reduction in both PC and PE was normalized by DPA and DHA supplementation but not by EPA, suggesting the metabolic effects of DPA and DHA are different to that of EPA. Further analysis of changes in individual PL molecular species is currently underway.

## Characterization of Active Constituents in *Pyracantha fortuneana* Fruit Extract and their Effects on Hyperlipidaemia, Obesity, Oxidative Stress in Rodents

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### Abstract

Obesity has become a serious health problem worldwide. Diet supplements containing phytochemical extracts are effective against obesity without perceptible adverse effects. *Pyracantha fortuneana* fruit is a potential source of nutraceutical and therapeutic agents. We investigated the effects of *P. fortuneana* fruit extract (PFE) on hyperlipidaemia, obesity, and oxidative stress in rodents. PFE significantly decreased body weight, triacylglycerol, total cholesterol, low-density lipoprotein-cholesterol, and malondialdehyde levels. By contrast, PFE elevated high-density lipoprotein-cholesterol levels, glutathione peroxidase, and superoxide dismutase activities in both preventive and therapeutic rodent groups. These results indicate that the amelioration of PFE on hyperlipidaemia and obesity was highly associated with the improvement of endogenous antioxidant activity. Polyphenols and saponins were quantified by spectrophotometric and HPLC methods. Several new saponin compounds were identified by liquid chromatography and tandem mass spectrometry as ursolic acid (UA) derivatives. The quercetin, rutin, and procyanidin treatments in HepG2 cells showed increases in low-density lipoprotein receptor activity and apolipoprotein-A1, but UA less affected these protein activities. Therefore, PFE could be promising in ameliorating chronic metabolic diseases via multiple constituent synergies.

## Prevalence and Risk Factors of Obstructive Sleep Apnea Syndrome in a Saudi Arabian Population

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### Abstract

**Background:** Obstructive sleep apnea (OSA) is a common disorder worldwide; however, epidemiological studies on its prevalence lack in Saudi Arabia. This study aimed to determine the prevalence and risk factors of OSA in Saudi Arabia.

**Methods:** The study was performed from 2013 to 2015 in two stages. The screening stage was first; a random sample of Saudi employees ( $n = 2682$ ) 30–60 years of age completed a survey that included the Wisconsin questionnaire. According to these data, the subjects were categorized as habitual, moderate, or nonsnorers (NSs). The confirmatory second stage was a case-control study conducted on 346 individuals selected from each group using polysomnography (PSG).

**Results:** In the first stage, the prevalence of habitual snoring was 23.5%, moderate snoring was 16.6%, while 59.9% of the sample was NSs. Among the 346 individuals who underwent PSG, a total of 235 (67.9%) subjects had OSA with an apnea-hypopnea index (AHI) of  $\geq 5$ ; 76 (22.0%) had OSA syndrome (OSAS), defined by an AHI of  $\geq 5$  plus daytime sleepiness; and 227 (65.6%) had clinically diagnosed OSA syndrome (COSAS), as defined by the American Academy of Sleep Medicine. A conservative estimate of at least 8.8% (12.8% in men and 5.1% in women) was calculated for the overall prevalence of OSA. Similarly, the overall estimated prevalence of OSAS and COSAS was 2.8% (4.0% in men and 1.8% in women) and 8.5% (12.4% in men and 4.8% in women), respectively. A multivariate analysis revealed age, gender, obesity, and hypertension as independent risk factors of OSA.

**Conclusion:** Our study demonstrated that the rate and risk factors of OSA in the Saudi population are similar to those observed in Western studies.

**Keywords:** Daytime sleepiness, Obstructive sleep apnea, Prevalence, Risk factors, Syndrome

## A Multi Analytical Approach to Evaluate the Association of 55 SNPs in 28 Genes with Obesity Risk in North Indian Adults

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### Abstract

**Objectives:** The aim of the study was to investigate the association of 55 SNPs in 28 genes with obesity risk in a North Indian population using a multi-analytical approach.

**Methods:** Overall, 480 subjects from the North Indian population were studied using strict inclusion/exclusion criteria. SNP Genotyping was carried out by Sequenom Mass ARRAY platform (Sequenom, San Diego, CA) and validated Taqman<sup>®</sup> allelic discrimination (Applied Biosystems<sup>®</sup>). Statistical analyses were performed using SPSS software version 19.0, SNPStats, GMDR software (version 6) and GENEMANIA.

**Results:** Logistic regression analysis of 55 SNPs revealed significant associations ( $P < .05$ ) of 49 SNPs with BMI linked obesity risk whereas the remaining 6 SNPs revealed no association ( $P > .05$ ). The pathway-wise G-score revealed the significant role ( $P5.0001$ ) of food intake-energy expenditure pathway genes. In CART analysis, the combined genotypes of FTO rs9939609 and TCF7L2 rs7903146 revealed the highest risk for BMI linked obesity. The analysis of the FTO-IRX3 locus revealed high LD and high order gene-gene interactions for BMI linked obesity. The interaction network of all the associated genes in the present study generated by GENEMANIA revealed direct and indirect connections. In addition, the analysis with centralized obesity revealed that none of the SNPs except for FTO rs17818902 were significantly associated ( $P < .05$ ).

**Conclusion:** In this multi-analytical approach, FTO rs9939609 and IRX3 rs3751723, along with TCF7L2 rs7903146 and TMEM18 rs6548238, emerged as the major SNPs contributing to BMI linked obesity risk in the North Indian population.

**Keywords:** Obesity, Genetic association, SNP, Genotype score, Linkage disequilibrium

## Risk and Early Changes of Left Ventricular Structure and Function in Young Obesity

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### Abstract

**Aim:** The increased adipose tissue in obesity had an extensif capillary vessels, secretes mediators that could influence left ventricular (LV) functions directly. Previous study mostly showed normal ejection fraction in obesity. Compare with strain methods, peak systolic velocity is a non load-dependent echocardiography technique that strongly related with contractility.

**Methods:** This was a cross sectional analytic study, taken at Dr. Kariadi Hospital, Semarang, Indonesia. Subjects had Body Mass Index (BMI)  $\geq 18,5$  kg/m<sup>2</sup>, 15-40 years old age, without any co-morbid. Subjects categorized as an obese (BMI  $\geq 27$  kg/m<sup>2</sup>) and non-obese (BMI  $< 27$ ).

**Results:** The study enrolled 110 subjects, 63 (57%) of them were obese. In LV structure, obese subjects had a higher RWT and LVMI (0,34 vs 0,45;  $p = 0,00$  and 73,38 vs 99,02 g/m<sup>2</sup>;  $p = 0,00$ ). In LV systolic function, there was no difference in LVEF, but obese subjects had a significant lower Sm (68,87 vs 70,81 %;  $p = 0,120$  and 4,72 vs 3,62 cm/s;  $p = 0,00$ ). In LV diastolic function, obese subjects had a lower Em (8,84 vs 7,05 cm/s;  $p = 0,00$ ), a higher E/e' ratio and LAVI (7,59 vs 10,03 ms;  $p = 0,00$  and 15,39 vs 19,00 ml/m<sup>2</sup>;  $p = 0,00$ ). Obese subjects had 1,36 times higher to develop abnormal structure; 1,22 times higher to develop early systolic dysfunction and 1,33 times higher to develop diastolic dysfunction.

**Conclusion:** In young isolated obesity, although with normal ejection fraction, we found higher risk and early changes of

left ventricular structure, and early dysfunction both on systolic and diastolic function.

**Keywords:** Obesity, LV structure, Tissue velocity echocardiography

## Transition from Cardiometabolic Adaptation to Maladaptation in Obesity: Role of Apelin

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### Abstract

**Background/Objectives:** Altered metabolism is a key characteristic feature of obesity-related heart failure. Apelin, an adipocyte-secreted factor, plays an important role in regulating *cardiovascular and metabolic* homeostasis. Here we explore the role of apelin in the transition from metabolic adaptation to maladaptation of the heart in obese state.

**Methods:** Adult male C57BL/6J, apelin knock-out (KO) or wild-type mice were fed a high-fat diet (HFD) for 18 weeks. To induce heart failure, mice were subjected to pressure overload after 18 weeks of HFD. Long-term effects of apelin on fatty acid (FA) oxidation, glucose metabolism, cardiac function and mitochondrial changes were evaluated in HFD-fed mice after 4 weeks of pressure overload. Cardiomyocytes from HFD-fed mice were isolated for analysis of metabolic profile.

**Results:** Pressure overload-induced transition from hypertrophy to heart failure is associated with reduced FA utilization ( $P < 0.05$ ), accelerated glucose oxidation ( $P < 0.05$ ) and mitochondrial damage in HFD-fed mice. Treatment of obese mice with apelin for 4 weeks prevented pressure overload-induced decline in FA metabolism ( $P < 0.05$ ) and mitochondrial defects. In addition, apelin treatment lowered fasting plasma glucose ( $P < 0.01$ ), improved glucose tolerance ( $P < 0.05$ ) and preserved cardiac function ( $P < 0.05$ ) in HFD-fed mice subjected to pressure overload. In apelin KO HFD-fed mice, spontaneous cardiac dysfunction is associated with reduced FA oxidation ( $P < 0.001$ ) and increased glucose oxidation ( $P < 0.05$ ). In isolated cardiomyocytes, apelin stimulated FA oxidation in a dose-dependent manner and this effect was prevented by small interfering RNA sirutin 3 knockdown.

**Conclusion:** These sets of data suggest that apelin could be a potential therapeutic treatment option for obese patients with heart failure.

## Expression of p27Kip1 in Obesity, Diabetes and Cancer: A Novel Signal Transduction Pathway

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### Abstract

The p27Kip1 is a cell cycle repressor protein that regulates primarily the cell cycle transition from G1 to S phase and hence the DNA replication in the S phase and cell division in the M phase. Expression of p27Kip1 protein has dual roles in both cancer prevention and promotion. For example, numerous nutritional and chemo preventive anti-cancer agents specifically increase the expression of p27Kip1 protein without directly affecting the expression of any other cell cycle regulatory proteins. On the other hand, pro-cancer agents (like glucose, insulin and other growth factors frequently seen in obesity and/or diabetes) specifically decrease the expression of p27Kip1 protein without directly affecting the expression of any other cell cycle regulatory proteins.

Unlike expression of any other cell cycle regulatory proteins, expression of p27Kip1 protein is very unusual. The mRNA of p27Kip1 has a very long and unusual 5'-untranslated region (from -575 to -1 in human). It appears that the 5'-untranslated regions of p27Kip1 mRNA forms two alternative secondary structures, one increases the expression of p27Kip1 protein when anti-cancer agents are added, and another decrease the expression of p27Kip1 protein when pro-cancer agents are added. For this presentation, Dr. Albert Einstein's "visualized thought experiments (German: Gedankenexperiment)" will be used as a fundamental tool for understanding how either anti- or pro-cancer agents bring the primary structure of the 5'-untranslated region of p27Kip1 mRNA into two alternative secondary structures, thereby either increasing or decreasing, respectively, the translation initiation of p27Kip1 protein.

The dual roles of p27Kip1 in both cancer prevention and promotion suggest that it is necessary to look beyond the impact of individual foods or nutrients on obesity, diabetes and cancer, and take a more holistic approach, considering dietary patterns across the lifespan ("Total Diet" as per an email from National Cancer Institute 10/25/2018).

## Adolescent Risk Factors and Incident Cancer of the Cervix in Midlife: A Nationwide Study of One Million Women

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### Abstract

**Background:** Cervical cancer (CC) presents significant global health burden. Human papillomavirus infection, a necessary but insufficient etiologic factor, often firstly occurs at adolescence.

**Aim:** To identify adolescent sociodemographic and anthropometric characteristics associated with midlife CC risk.

**Methods:** The study cohort included 969,123 Israeli women examined and anthropometrically measured at age 17 between 1967 and 2011. Data on CC were obtained from the national cancer registry by linkage. Cox proportional hazards regression models were applied, adjusted for origin, measured body mass index, height, education, dwelling type, birth year and age at examination.

**Results:** In total, 5,953 incident CC cases were diagnosed during a median follow up of 17.6 years (range: 1-45). The risk for CC was origin-dependent, with hazard ratios (HRs) of 1.29 (95% confidence interval, CI 1.12-1.49), 1.23 (95%CI 1.03-1.45) and 0.10 (95%CI 0.03-0.42) for examinees of North African, Israeli and Ethiopian origin, respectively, compared to European origin. Adolescent overweight (HR = 0.86, 95%CI 0.79-0.94) and obesity (HR = 0.61, 95%CI 0.49-0.77) were associated with reduced midlife CC incidence. Tallness, lower education, urban dwelling and older age at enrolment were associated with higher CC risk. Most of these associations were evident also in *in-situ* tumors, whereas only the associations with origin, birth year, height and education persisted in invasive CC.

**Conclusion:** Ethnic background and lower education play a role in midlife CC incidence in general while adolescent overweight and obesity are inversely associated with midlife *in-situ* CC incidence. These characteristics may assist in better identifying population at risk and designing appropriate interventions.

## Identification of Series of Novel Benzimidazole Quinazolones as Antihyper Lipidemic and Antiadipogenic Agents through HMG-CoA Inhibition by Using Molecular Approach

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### Abstract

The medicinal application of the quinazolone and benzimidazole derivatives have been well documented. This nucleus had caused universal concern due to their diverse pharmacological activities such as antimicrobial, antimalarial, antidiabetic etc. Anti-obesity activity was also demonstrated by quinazolones and benzimidazoles. In the view of above observations our previously synthesized novel benzimidazole quinazolones as possible antimicrobial and anticancer agents (International Journal of Chemistry Vol. 2, 392-397, 2013) were evaluated as Antiadipogenic and Anti-obesity agents by pharmacophore modeling. The pharmacophore model was developed using the known compounds from the dataset of 10 patent compounds with activity range between  $IC_{50}$  1900-5 nM and previously developed pharmacophore model was used to predict the antihyperlipidemic activity. In this study we reported a novel benzimidazole quinazolone derivatives using the Hip-hop module of catalyst software. The fit value criteria for the basis of selection is ranged from 3-5. Compounds were showing good to moderate activity predicted as anti-hyperlipidemic through HMG-CoA inhibition.

The standard molecule taken for comparison is Rosuvastatin, its docking score is 448.288 and the fit value is 4. The docking score of benzimidazole quinazolones is ranged from 410.054 to 455.35. Some compound may be the good candidate leads for further studies.

## A Maternal High-Fat Diet Disrupted the One-Carbon Metabolic Process and the Methyltransfer Process in Offspring Male Mice during Non-Alcoholic Fatty Liver Disease

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### Abstract

Pregnant women may transmit their metabolic phenotypes to their offspring, enhancing the risk for non-alcoholic fatty liver disease (NAFLD) in the next generation; however, the molecular mechanisms remain unclear. In the present study, we used offspring mice exposed to either a maternal normal-fat diet (NF group), or a maternal HF diet (HF group), or an early transition to a maternal NF diet before pregnancy (H9N group), or a maternal methyl donor supplement (H1S or H2S group). The offspring mice were then exposed to a postweaning HF diet to promote NAFLD. The HF offspring displayed obesity, glucose intolerance and hepatic steatosis; the H9N offspring avoided all of these symptoms. Analysis from the RNA-Seq data suggested a disruption of lipid homeostasis associated with disrupted one-carbon metabolism in the HF offspring, which was completely avoided in the H9N offspring. Consistently, in the HF offspring but not in the H9N offspring, a disruption of the methionine cycle was observed that resulted in changes of SAM activity associated with DNA hypermethylation, the depletion of L-carnitine and inhibited fatty acid oxidation. These was not present in the H9N offspring. Furthermore, the H1S and H2S diets prevented hepatic steatosis, although obesity and glucose intolerance still presented in the offspring. This phenotype was associated with the normalization of the methionine cycle and the restoration of L-carnitine and fatty acid oxidation, while not affecting DNA hypermethylation in the offspring liver. Thus, we demonstrated that a maternal HF diet disrupted the methionine cycle and further led to methylation changes associated with mitochondrial dysfunction and fatty acid oxidation that resulted in NAFLD in the offspring. Our study provides a novel mechanism for understanding the transgenerational metabolic phenotypes caused by maternal HF diets. More importantly, it suggests a potentially effective diet intervention strategy to reduce the risk of NAFLD in offspring.

## Psychological Symptoms is a Determinant of Body Mass Index Among Patients with Musculoskeletal Pain: A Link to Vitamin D and Calcium

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### Abstract

**Introduction:** A high prevalence of psychological symptoms and vitamin D among patients with musculoskeletal pain (MSP) and obesity has been observed. People complaining of anxiety and depression are having frequent weight change compared with those without such symptoms. To date, most of the published studies, examined the co-prevalence of chronic pain, psychological symptoms and weight gain, although the loss of appetite also can occur when anxiety is high.

**Objective:** To investigate the association between body mass index and psychological symptoms among patients with MSP in relation to vitamin D and calcium.

**Methods:** A total of 207 participants with MSP were involved. The Hospital Anxiety and Depression Scale (HADS) were used to assess psychological symptoms. Participants' dietary habits and vitamin D were measured. The relation between their food appetite and anxiety level were recorded.

**Results:** Participants with MSP had a high prevalence of vitamin D deficiency (85.5%), anxiety (52.7%), and depression (39.1%) markedly. There was a significant relation between the pattern of appetite and anxiety ( $p = 0.024$ ), which reflected by

significant changes in BMI ( $p = 0.013$ ). BMI tend to fluctuate (increase or decrease) depending on the influence of anxiety on appetite. Spearman correlation analyses show that anxiety is negatively associated with daily calcium intake and age ( $r = -0.124$ ,  $p = 0.038$ ,  $r^2 = -0.227$ ,  $p = 0.001$ , respectively), and positively associated with depression ( $r^2 = -0.613$ ,  $p = <0.001$ ).

**Conclusion:** The result of the current study showed that anxiety which negatively correlated daily calcium intake is a determinant of BMI among patients with Musculoskeletal Pain through its influence on appetite.

## Session On: Chronic Diseases Linked to Obesity

### **Academic-Community Partnership Development to Enhance Program Outcomes in Underserved Communities: A Case Study**

**Nick Harris\*, Meg Skizim, Claudia Leonardi and Richard Scribner**

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#### **Abstract**

A community-academic partnership was developed to assess community needs and restructure a variety of community-based programs that provide services to underserved communities in New Orleans, Louisiana. The community and academic partners utilized five phases to assess community needs and restructure programs:

1. Meetings
2. Narrowing the scope of community programs
3. Data collection and analysis
4. Emphasizing target programs
5. Improving sustainability through grant submissions

### **Social Support and its Impact on the Pregnant Woman Who is Obese**

**Mary Beth McCloud**

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#### **Abstract**

**Objective:** The objective of this study is to explore how pregnant women who are obese relate with their identified support systems prior to and during pregnancy.

**Design:** A qualitative descriptive design was used for this study to allow women who are obese to explore their experiences with their social support system during pre-pregnancy and pregnancy timeframes.

**Setting:** The study participants were recruited from various obstetric and gynecologic offices in a rural setting.

**Participants:** A purposive sampling technique was used to recruit a sample of 20 women. The following inclusion criteria were applied: pregnant women ages 18-35 with a pre-pregnancy BMI of  $>30 \text{ kg/m}^2$ , in the third trimester of the pregnancy (28-40 weeks gestation) and receiving prenatal care from a licensed provider.

**Results:** The data were analyzed utilizing a concentric approach by identifying those members of the participants' social support system who had impacted their feelings regarding their weight and pregnancy changes. Eighteen of the participants felt supported by their prenatal care provider and had no issues discussing weight, weight change, and body image with their providers during prenatal visits. The women identified negative events from their families' experiences related to their weight and pregnancy changes. Four of the participants also identified negative experiences with friends and coworkers that occurred prior to and during the pregnancy.

**Conclusion:** Women who are obese have a variety of social support members who can impact how they feel about their bodies and weight changes associated with the pregnancy.

## Determining the Impact from Sugar Overconsumption in Overweight and Obese

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### Abstract

Excess sugar consumption has been shown to contribute directly to weight gain, thus contributing to the growing worldwide obesity epidemic. The modern diet has become highly sweetened, resulting in unprecedented levels of sugar consumption, particularly among adolescents. While chronic long-term sugar intake is known to contribute to the development of metabolic disorders including obesity and type II diabetes, little is known regarding the direct consequences of long-term, binge-like sugar consumption on the brain. Interestingly, increased sugar consumption has been shown to repeatedly elevate dopamine levels in the nucleus accumbens (NAc), in the mesolimbic reward pathway of the brain similar to many drugs of abuse. We report that varenicline, an FDA-approved nicotinic acetylcholine receptor (nAChR) partial agonist that modulates dopamine in the mesolimbic reward pathway of the brain, significantly reduces sucrose consumption, especially in a long-term consumption paradigm. Similar results were observed with other nAChR drugs, namely mecamylamine and cytisine. Furthermore, we show that long-term sucrose consumption increases  $\alpha 4\beta 2$  \* and decreases  $\alpha 6\beta 2$ \* nAChRs in the nucleus accumbens, a key brain region associated with reward. Because sugar can cause the release of dopamine in the nucleus accumbens (NAc) similarly to drugs of abuse, we investigated changes in the morphology of neurons in this brain region following short- (4 weeks) and long-term (12 weeks) binge-like sucrose consumption using an intermittent two-bottle choice paradigm. We used Golgi-Cox staining to impregnate medium spiny neurons (MSNs) from the NAc core and shell of short- and long-term sucrose consuming rats and compared these to age-matched water controls. We show that prolonged binge-like sucrose consumption significantly decreased the total dendritic length of NAc shell MSNs compared to age-matched control rats. We also found that the restructuring of these neurons resulted primarily from reduced distal dendritic complexity. Conversely, we observed increased spine densities at the distal branch orders of NAc shell MSNs from long-term sucrose consuming rats. Combined, these results highlight the neuronal effects of prolonged binge-like intake of sucrose on NAc shell MSN morphology. Taken together, our results suggest that nAChR drugs such as varenicline may represent a novel treatment strategy for reducing sugar consumption.

## Food Insecurity: How You Can Help Your Patients

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### Abstract

Food Insecurity (FI) is defined as the limited availability of nutritionally adequate and safe food or the inability to acquire these foods in socially acceptable ways. The Rate of FI was 12.3% (almost 16 million American households) in 2016. Obesity is associated with FI, especially in children and women and in persons with diabetes mellitus, hypertension, dyslipidemia, or depression. This presentation enables providers to improve the health of patients who experience FI by following the SEARCH (screen, educate, adjust, recognize, connect, help) mnemonic. We will present a case from our Interprofessional Diabetes Clinic to describe assessment and impact of food insecurity on a patient's overall health and how the healthcare providers' recognition of food insecurity changed the management of a patient with type 2 diabetes mellitus, obesity, and depression. Healthcare professionals should screen all patients for food insecurity, educate patients to use appropriate coping strategies, adjust medications to minimize adverse effects, recognize that food insecurity is cyclical for most, connect patients with community resources, and advocate for services in clinics and hospitals. Our efforts lead to formation of a Medical Food Pantry by Vidant Health Center and Brody School of Medicine in Greenville, NC in community partnership with the Food Bank of Central and Eastern NC.

### References

1. Patil S, Craven K, Kolasa K. 2018. Food insecurity: how you can help your patients. *Am Fam Physician* 98(3): 143-145.
2. Patil S, Craven K, Kolasa K. 2017. Food insecurity: it's more common than you think. Recognizing it can improve the care you give. *Nutrition Today*. 52(5): 248-257.

## Why Obesity Should Not Be Classified as a Disease

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### Abstract

The decisions by the American Medical Association and other medical organizations to designate obesity a disease raise a host of ethical and policy questions that deserve careful consideration. For example, should we send “get well” cards to the 78 million US adults and 12 million children who were instantly classified as ill? Without doubt, obesity is associated with increased risk for a number of diseases, and classifying it as a disease may, over time, increase financial resources for combatting it. Yet some people whose BMI qualify them as obese – such as LeBron James – are in fact quite healthy, and other people whose BMIs are within normal limits may suffer from a variety of diseases. This presentation will provide a critical review of the definition of obesity, explore a number of pressing difficulties concerning the classification of obesity as a disease, and offer several alternatives for addressing obesity that do not generate such difficulties.

## How India Can Adapt the Learning from the National Diabetes Registry in Sweden?

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### Abstract

**Aim:** Review of Sweden’s NDR to propose preventive healthcare for Diabetes in India.

**Background:** India has approximately 73 million people diagnosed with diabetes. Type 2 forms 85-90% of this and 8.8% prevalence in adults. Deaths due to diabetes have shown an annual increase of 2.7% from 1990, affecting majorly people in working age group. In 2015, out of 70 million diabetics, 36 million remained undiagnosed. Inadequate Public Primary Healthcare network, less focus on screening makes diabetes care high priority for India. In Sweden patients are managed in primary health care centers; given annual checkups; risk factors and complications like cardiac, renal, hyperlipidemia, and physical activity levels are recorded. This data is recorded electronically and linked to the national diabetes register. NDR has enhanced diabetes care in Sweden.

**Method:** Literature review of National Diabetes Registry in Sweden, implementation challenges and achievements to manage Diabetes as a disease by Sweden were reviewed from secondary research to propose new strategies for diabetes management in India.

**Results:** Swedish NDR proves that measurement and public reporting of patient results in the single most important step in reforming health care systems. It is the obvious part of diabetes care in Sweden. Along with patient screening and do continuous follow-up of guidelines, treatments and complications, NDR’s original purpose is to monitor the results of health centers and to compare these with national and regional means. Foreseeing India’s future as a Global Diabetes Capital, current efforts to curtail the disease seems not enough.

**Conclusion:** With Ayushman Bharat and an active screening of Diabetes at primary level, there is scope for India to learn from Swedish NDR. Through one single data source for identifying, screening the diabetics and management, it would also help answer India’s specific research questions and help policy makers understand the diseases pattern and burden systematically.

## Linkage of Obesity with Pathological Hallmarks of Neurodegenerative Diseases

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### Abstract

Increased consumption of high fat with sugar (HFS) leads to obesity and increase the risk of Alzheimer’s disease (AD). Diet having high fat causes cognitive impairment and increased pathological indicators in transgenic mouse model of AD. This study was designed to evaluate the relationship between obesity and different conformation toxic species on amyloid- $\beta$  (pathological hallmark of Alzheimer’s disease) in C57BL/6NHsd male mice. We observed a significant decrease in expression level of one

of the main glucose transporter marker (GLUT4) in brain of mice fed with HFS as compared to control mice. To understand systemic contributors to insulin signaling we found that the expression levels of both insulin resistance substrate (IRS-1) and IR were significantly increased by HFS. Soluble supernatant of brain homogenate from mice fed with HFS diet showed significant increase in expression levels of various apoptotic markers like Caspase-3, caspase-7 and caspase-9. To understand systemic contributors to nerve damage and neurodegeneration by HFS, various conformational species of A $\beta$  were evaluated. Mice fed with HFS displays significant deposition of conformational species of A $\beta$  as compared to control diet mice. Significant increases in autophagy and ubiquitinated proteins were also observed in brains of mice fed with HFS diet as compared to control mice. In conclusion, our studies suggest that HFS leads not only to obesity linked insulin resistance Type II diabetes, but also caused accumulation of toxic conformational species of amyloid-  $\beta$  (A $\beta$ ) as well as dysregulates apoptotic pathway and plays a critical role in pathogenesis of AD.

## Background of Severe Obesity: A Case Control Study

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### Abstract

This study was focused on the background factors of severely obese individuals using the case-control method with a psychiatric interview.

**Materials and Methods:** The group consisted of 112 patients (81 women and 31 men) received a disability pension due to obesity. Control subjects were selected from the same area and received a disability pension due to a different primary illness. The controls were matched with the subject group according to place of residence and gender. The matching process also considered age, time of pension granting, and occupation. The controls were selected by random sampling. The male and female controls were selected separately. Three controls were selected for each female subject, and five controls were selected for each male subject. For the interview, an attempt was made to include at least two controls for each female subject and three for each male subject. Overall, the study enlisted 510 persons, of whom 112 were subjects and 398 were controls. The statistical methods used in this study included  $\chi^2$ -tests, t-tests and conditional logistic linear models. We analyzed the data with figures and percentages and through calculations of the means for the subjects and controls. These two groups were then compared using t-test for paired variables. The risk ratios (RRs) and upper and lower confidence limits were calculated for parameters that remained significant in the conditional logistic linear analysis.

**Results:** In the study group the BMI was highest in point  $\geq 40.0$ . The relationship with the parents was different between the groups. The study group experienced more abandonment experiences and more developmental and psychological disturbances during childhood and youth. Diabetes was a high risk factor which effected in early retirement. 68 of study group participant have first additional disease and 27 have also second additional disease.

## Obesity as a Risk Factor for Acute Pancreatitis Patients

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### Abstract

Obesity plays an important role in increasing risks of cardiovascular, metabolic diseases and death. Controversy still exists on the effect that obesity influences the mortality and morbidity in severe acute pancreatitis.

The reports about the findings of 384 consecutive acute pancreatitis patients were calculated and analyzed in a prospective trial. Ranson's scores, Acute Physiology and Chronic Evaluation II scores and computed tomography severity indexes were calculated. Patients were categorized by BMI and waist circumference for the analysis. The aim of this study was to investigate the influence of obesity on local and systemic complications, and on mortality in severe acute pancreatitis patients.

Severe acute pancreatitis was confirmed in 91 (23.7%) patients. Local and systemic complications were recorded in 64 (16.7%) and 51 (13.3%) patients, respectively. Obesity calculated by BMI was found as a significantly risk factor for local and systemic complications ( $p < 0.002$  and  $p < 0.001$ , respectively). Moreover, in this study obesity was categorized by waist circumference, in which the risk factor for local and systemic complications was confirmed ( $p < 0.002$  and  $p < 0.002$ , respectively). The overall mortality rate was 2.4%, i.e. 9 patients died. This study indicates that obesity can have a statistically significant influence on the mortality of severe acute pancreatitis patients.

The presence of obesity has a negative impact on the survival rate of severe acute pancreatitis patients. Obese patients have higher incidence of local and systemic complications. Obesity seems to be a negative prognostic factor in severe acute pancreatitis patients.

## Suicide Risk of Chronic Diseases Both Individually and in Pair: A Case-Control Data Linkage Study in Korea

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### Abstract

Chronic diseases including mental illness have been associated with suicide but limited to only preselected small number of diseases or broad categories of diseases. We explored the association between a wide range of chronic diseases and suicide.

A data-linkage between death registry and Korean National Health Insurance data were conducted using national identification number. Suicide cases (n = 65,751) between 2009 and 2013 were 1:4 matched to alive control (n = 263,004). A total of 93 major diseases of 10 broad categories were identified from a primary or a secondary diagnosis of insurance claims data. Conditional logistic regression was applied to assess the associations, adjusting for mental illness, Charlson comorbidity index and socioeconomic status.

There were increasing trend of suicide risk with greater number of diseases but also with types of diseases. Mental and behavioural disorders showed the highest suicide risk (OR = 4.16, 95% CI = 4.09-4.23) followed by cardiovascular (OR = 2.91, 95% CI = 2.85-2.96) and diabetes and endocrine disorder (OR = 2.49, 95% CI = 2.45-2.54). For individual disease, drug use disorders showed the highest risk, while extrapyramidal disorder showed the highest among general diseases. Suicide risk was stronger in the disease pairs co-occurring with mental diseases but weaker with cancer. Odds for any kind of mental illness alone were smaller than that of some types of combined chronic diseases (e.g., cardiovascular and digestive disorder).

Besides mental illness, other chronic diseases showed strong associations with suicide. Suicide prevention policy needs more attention to general medicine to fill the shortage of mental health professional in Korea.

## Non-Alcoholic Fatty Liver Disease as an Additional Factor of Cardiovascular Risk in Patients with Hypertension Disease with Different Body Mass

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### Abstract

According to the study results of 170 patients with essential hypertension (EH) of the second stage (98 (57.6%) were women and 72 (42.4%) - men), mean age 49.3 ± 0.5) it was found that the diagnosis of non-alcoholic steatohepatitis (NASH) was confirmed in 109 (64.1%) patients (SteatoTest - 0.41 units (S1-S2) ("FibroMax", BioRredictive, France)). The study did not include patients with signs of steatohepatitis and body mass index (BMI) greater than 40.0 kg/m<sup>2</sup>. The NASH was detected in 40.0% of patients with hypertension, in 54.1% of patients with excess body weight, in 65.5% of patients with obesity of the first degree, in 86.7% of patients with obesity of the second degree. The analysis in the subgroups of patients with EH of the second stage with the same degrees of BMI increase, depending on the presence of concomitant NASH, showed that in patients with comorbidity of hypertension and liver steatosis (p = 0.01) the higher values of systolic blood pressure, the violation of the daily profile ("nondipper" in 63.3%, p<0.05), the increase in the value of arterial stiffness on the background of a decrease in the incidence of endothelial dysfunction (by 15.7% and 12.3%, respectively, p<0.05) were found. A comparative analysis of the abovementioned indices in patients with comorbidity of EH and NASH with different BMI did not reveal any significant differences. It is possible that concomitant NASH could affect hemodynamic state in patients with hypertension and increase the overall cardiovascular risk.

## Session On: Weight Management | Obesity Prevention and Control | New Directions in Obesity Treatment

### Multisectoral Lessons from Healthy Communities

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#### Abstract

Reviewing the healthy communities' movement can provide insight into population health efforts in the United States to reduce the prevalence of chronic disease and obesity. Whether at the level of personal decision, corporate practice, or collaborative partnership, building a healthier community has become an expressed priority across the country. There is emphasis on multisector partnerships that focus on improving the health, well-being, and quality of life for people and addressing the social determinants of health to reduce inequities using a social ecological approach that touches people and communities where they live, work, learn, and play. Themes have emerged indicating successful community programs include: 1) implementing a focused intervention with specific measures, 2) measuring small wins and expanding focus to keep partners motivated and engaged, and 3) holding organizations accountable to their commitments. Some of the most effective programs involve community resident generated solutions and coalitions that help mobilize resources and influence systems to serve as catalysts for changing policies, programs, and practices that meet resident's needs. Evaluating the effects of community programs on population health has been challenging for several reasons. Recent attention on population health metrics is beginning to create a coalesced set of indicators that will make evaluations of population-based chronic disease interventions more effective.

### Acute Care Surgery in Populations with Obesity: Does Bariatric/Minimally Invasive Surgical Training Impact Outcomes?

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#### Abstract

**Background:** It is becoming more common for surgeons to manage people with obesity in the acute setting, and it is unclear if bariatric surgical training impacts outcomes in non-bariatric emergencies. We sought to evaluate our experience in the obese population requiring acute surgery, and to compare outcomes based on surgeon expertise in bariatric surgery versus surgeons without bariatric surgery training.

**Methods:** A retrospective chart review was performed between January 2013-January 2014. Adult patients requiring acute surgical intervention were included in the study. The surgeons were classified as bariatric surgeons (B, n = 2) versus non-bariatric surgeons (NB, n = 4). Patient demographics, BMI, ASA scores, Charlson comorbidity index scores, and outcomes including OR times, hospital length of stay (LOS), 30-day readmission, and mortality were documented. Outcomes based on surgeon training (B vs. NB) were also compared.

**Results: Demographics:** A total of 203 patients were studied. The overall BMI was  $37 \text{ kg/m}^2 \pm 6$ , and there were n = 60 patients with a BMI  $\geq 40 \text{ kg/m}^2$ . The age was  $37 \pm 14$  and the majority were male, n = 110. The majority of procedures were for standard acute laparoscopic cases (cholecystectomies n = 75, appendectomies n = 45). Non-routine laparoscopic cases accounted for the remaining and were; intestinal obstructions n = 9, incarcerated hernias n = 17, traumatic injuries n = 48, and intestinal ischemia or perforation n = 9.

**Bariatric vs. Non Bariatric Surgeons:** Bariatric surgeons performed 35% of the cases vs. 65% for NB. Both groups operated on patients with similar risk: A BMI of  $\geq 40$  was 35% B vs. 26% NB, P = 0.19. Patients with an ASA $\geq 3$  were, 50% B vs. 50% NB, P = 1.0. A Charlson comorbidity index of 2-5 was 4% B vs. 10% NB, P = 0.11. A Charlson comorbidity index of  $\geq 6$  was 2% B vs. 2% NB, P = 1.0.

**Operative Data:** Laparoscopic cholecystectomy operative times were similar (B; 80 min.  $\pm 25$  vs. NB; 82 min.  $\pm 29$ ). This pattern was also demonstrated for laparoscopic appendectomy, (63 min.  $\pm 21$  vs. 64  $\pm 26$ ).

In non-routine laparoscopic cases, operative times were also similar at 80 min.  $\pm 43$  B vs. 83 min  $\pm 43$  NB. When comparing the number of cases in the non-routine laparoscopic group that were done laparoscopic, the bariatric surgeons performed the majority, (7% B vs. 2% NB, P = 0.001).

**Outcomes:** Surgical Site infections were low, (2% B vs. 4% NB,  $P = 0.4$ ). Re-exploration was required 2% and similar in both groups. Early readmission at 30 days was 6% B vs. 7% NB,  $P = 1.0$ . Overall hospital LOS was higher in the NB group at 9 days  $\pm$  9 vs. 5 days  $\pm$  4 B,  $P = 0.05$ . Mortality for this series was 5% and similar between the groups.

**Conclusion:** Acute surgical procedures were performed obese patients with low morbidity and mortality, despite risk factors such as morbid obesity, high ASA scores and high comorbid indices. Bariatric surgical expertise seemed to favorably impact hospital LOS and the application of more minimally invasive approaches in cases not routinely done laparoscopic. Further study is warranted to determine if acute care surgeons would benefit from bariatric or other minimally invasive training.

## Sugammadex is Associated with Better Respiratory Recovery than Neostigmine Following Reversal of Anaesthesia-Associated Neuromuscular Blockade in the Morbidly Obese Patients Following Elective Laparoscopic Surgery

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### Abstract

Complete and reliable neuromuscular reversal is important to successful anaesthetic recovery in the morbidly obese patient undergoing laparoscopic surgery. Obesity is associated with multiple comorbidities and Respiratory system is among one of worst affected. Our goal was to determine whether Sugammadex, a selective reversal agent is associated with better respiratory recovery than neostigmine following the reversal of anaesthesia-associated neuromuscular blockade by rocuronium in the morbidly obese. Peak Expiratory Flow Rate a surrogate marker for respiratory function, was the primary outcome measured and secondary outcome measures included post-operative nausea and vomiting, pain and head lifting. We found that patients reversed with Sugammadex had a significantly higher post-operative PEFr as compared to those reversed with neostigmine and glycopyrrolate group.

## Effect of Long Lifestyle Modification for Prevention of Secondary Risk Factors of Coronary Artery Diseases in Patients Undergoing Coronary Artery Bypass Grafting

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### Abstract

Adherence to healthy lifestyle is important for Secondary prevention of secondary risk factors of coronary artery diseases after coronary bypass grafting (CABG). The present research was a case-control, pre-post research conducted on 100 patients undergoing CABG at Fortis Escorts Hospital, Jaipur, India. The main objective was to study the impact of long-term lifestyle modification on prevention of secondary risk factors of coronary artery disease in patients who have undergone CABG. The duration of intervention was one year. Data on lipid profile, blood glucose level, blood pressure, anthropometric measurements, frequency of consumption of heart healthy and heart unhealthy foods, physical activity pattern, tobacco and alcohol consumption were collected at baseline, at regular interval of 3 months and at the end of intervention i.e. after 12 months. Standard tools and techniques were used for data collection. Long term lifestyle modification included maintenance of body weight, correction of faulty food habits, increase in physical activity level and cessation of tobacco consumption. IEC material in the form of a booklet was developed and given to all patients in experimental group along with personalized counseling different interval. Counseling was given in groups as well as to individuals. Statistical analysis methods were applied to assess the significance of effects.

Adherence to healthy diet and increased physical activity were observed in majority of patients due to intervention. The intervention of long-term lifestyle modification caused significant reduction in BMI, LDL cholesterol, TC/HDL-C ratio and LDL-C/HDL-C ratio, waist circumference, fasting blood sugar and total cholesterol levels. The HDL cholesterol increased due to lifestyle modification.

## Impact of Bio-Active Phenolics on Medical Nutrition Therapy and Obesity

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## Abstract

The obesity is one of the main health problems due to its negative consequences observed in human body. Obesity is a chronic disease developed by overweight, associated with a position of subclinical inflammation, led by an increased secretion of adipokines which modulate some responses in the body with high prevalence. Totally, the huge amount of adipokines studied have effect on the development of chronic diseases such as obesity leading insulin resistance, high blood pressure, high amount of lipids in blood, elevated inflammatory response, and thrombus settlement.

Adipose tissue has been accepted as a region responsible from energy storage. This tissue is also called as an endocrine organ based on paracrine compounds secreted, named adipokines. In addition to the adipocytes, the specific cells are available in adipose tissue that release active compounds involved in metabolic cycles, such as macrophages. Furthermore, the adipose tissue has receptors for transmitted messages emitted by other endocrinal organs, enabling a communication with the central nervous system. This can be explained with a complex interaction involved in a network including activity of adipose tissue among neuroendocrine, energy metabolism and immune system.

Polyphenols are a sub-group of natural phytochemicals, of which some such as anthocyanins, catechins, resveratrol and curcumin have been found to regulate physiological and molecular mechanisms that are available in adiposity, energy metabolism and obesity. The health benefits of these polyphenols on adiposity and obesity as integrative compounds in the up regulation of energy consumption have been observed by *in vivo* researches implemented in cell cultures, animal tests of obesity and in some human clinical and epidemiological studies. The polyphenol content can also be increased by enrichment to obtain functional or medicinal foods.

The phenolics such as epigallocatechin-3-gallate, kaempferol and quercetin were determined to have inhibitory effect on pancreatic lipase. Some herbal extracts including green tea and grape seed also caused significant inhibitory effect. However, inhibitory mechanism of the pancreatic lipase was not solved clearly. There are controversial findings arise from the multi-component interactions. For instance, lipolysis of triolein can be changed based on the unidentified interactions.

In this study, the effects of the major bio-active phenolics in the plant-based foods on the obesity and metabolism will be investigated. The current findings on preventing overweight by bio-active phenolic food components and the metabolic pathways involved in will be presented.

## Health Benefits of Kombucha Tea Enriched with Olive Leaf and Honey

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## Abstract

Kombucha is a fermented beverage that is produced by fermenting tea and beet sugar solution under aerobic conditions by adding symbiotic culture (yeasts and acetic acid bacteria) named as SCOBY. The health benefits of Kombucha are mainly associated with the phenolic content of substrate and the microbiota of Kombucha cultures. Olive leave and honey contain various antioxidant phytochemicals and have been used as folk medicine for long time in the form of infusion or can also be used directly. Phenolic compounds play role as antioxidant to reduce cardiovascular and neurodegenerative diseases. They also cause to weight loss, reduce the dimension of adipose tissue and blood triglyceride level, promote digestion, and lower the inflammation.

The main objective of this research was to develop a beverage using dried olive leaf (0-5%) and honey (20 °Brix) as an alternative to beet sugar required for the Kombucha fermentation. The total phenolic content, antioxidant capacity and their bioaccessibility of Kombucha tea supplemented with dried olive leaves or honey produced by domestic Kombucha starter cultures were investigated. The different extraction procedures to analyze the total phenolics (extractable and hydrolyzable) by Folin-Ciocalteu method, and antioxidant activity by ABTS method have used. The samples were treated by an *in vitro* digestive enzymatic extraction which mimics the conditions in the gastrointestinal tract to determine bioaccessibility.

Phenolic contents of extractable and hydrolysable extracts and the antioxidant activity of the fermented Kombucha beverages supplemented with beet sugar were higher following to the fermentation. The maximum phenolic contents were determined at the 12<sup>th</sup> day. However, the bioavailability of phenols in the beverages supplemented with honey and olive leaves was much higher than the samples supplemented with beet sugar only.

## Inverse Relationship Between Body Mass Index and Mortality in Medical Intensive Care Patients

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### Abstract

**Background:** Obese patients are more likely to have a burden of comorbid medical disorders but may affect reduced physiologic reserve to cope with acute stress in critical disease. However, the studies on the relationship between mortality and body mass index (BMI) in medical intensive care patients for an Asian population were scant. Therefore, we conducted a retrospective observation study to investigate relationship between body mass index (BMI) and mortality in the medical intensive care patients in a regional hospital of the central Taiwan.

**Methods:** All patients aged 18 years and older admitted to the medical intensive care units in a regional hospital from July 1, 2016 to Dec 31, 2017. We excluded those who requested discharge against medical advice after admission to ICU (N = 30). The patients with complete data on BMI and recordings of Acute Physiology and Chronic Health Evaluation (APACHE II) in ICU admission were contained (N = 1200). We used Cox proportional hazard models to estimate the effect of BMI on mortality in patients admitted to the ICUs by adjusted hazard ratio (aHR) and 95% confidence interval (CI).

**Results:** A total of 711 men and 489 women were included. The mean age of the study patients were  $72.6 \pm 16.5$  years. The survived patient exhibited a significantly higher BMI than did the deceased ( $22.8 \pm 5.8$  vs  $21.3 \pm 4.1$ ,  $P = 0.004$ ). The mortality rate was 15.8%, 12.8%, 9.2%, and 5.4% in patients with underweight, normal weight, overweight, and obesity respectively. After adjustment for potential covariates, obese patients showed a 0.49-fold risk of mortality compared with those with normal weight (aHR = 0.49, 95% CI = 0.24-0.98). APACHE II showed an independent risk factor of mortality in ICU patients (aHR = 1.05, 95% CI = 1.03-1.08).

**Conclusion:** Our findings indicate that obese is a protective factor of mortality in medical intensive care patients.

## Poster Presentations

### The Relationship of Total Hip and Knee Replacement and Use of DMARDs in Patients with Rheumatoid Arthritis

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### Abstract

**Background:** The progress of rheumatoid arthritis (RA) may lead to unremitting hip and knee joint pain. Evidence showed total hip and knee replacement can reduce hip and knee pain. Disease-modifying antirheumatic drugs (DMARDs) are commonly prescribed to slow rheumatoid arthritis (RA) progression. The purpose investigated the effect of DMARDs use on the risks of total hip replacement (THR) and total knee replacement (TKR) in Taiwan.

**Methods:** We identified the patients aged 20 years and older with a new diagnosis of RA between 2000 and 2011 as a RA nested cohort by using the National Health Insurance Research Database. Patients with RA who had THR and TKR comprised the joint replacement group, and patients with RA who did not have THR and TKR comprised the control group. The controls were selected at a 4:1 ratio of the case group by a propensity score matching. DMARDs were categorized into conventional synthetic DMARDs (csDMARDs) and biological DMARDs (bDMARDs). Logistic regression models were used to calculate the odds ratio (OR) and 95% confidence interval (CI) to evaluate the effect of DMARD use on the risk of THR and TKR in patients with RA.

**Results:** In total, 3461 RA patients received THR and TKR (women were 80.5% and mean ages were  $60.7 \pm 12.0$  years) and 13610 controls were enrolled respectively. After adjustment for covariates, the adjusted ORs of THR or TKR in patients with csDMARDs and bDMARDs use were 1.52-fold (95% CI = 1.36-1.69) and 2.56-fold (95% CI = 2.22-2.94) compared with the counterparts, respectively. The risk of THR and TKR increased following the cumulative exposure days of csDMARDs

and bDMARDs.

**Conclusion:** Use of DMARDs remains associated with risk of THR and TKR in patients with RA.

## Risk of Acute Coronary Syndrome in the Middle-Aged and Older Patients with Osteoarthritis

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### Abstract

**Objectives:** Osteoarthritis (OA) is related to inflammation and atherosclerosis. Studies evaluating the incidence and risk of acute coronary syndrome (ACS) in middle-aged and older patients with OA are limited. Therefore, we conducted a population-based cohort study to investigate the relationship between ACS and OA in the middle-aged and older people.

**Methods:** Using Taiwan's Longitudinal Health Insurance Database 2000 (LHID 2000), we enrolled aged 50-90 years who were newly diagnosed with OA between 2002 and 2003 as the OA cohort. One control without OA was frequency-matched to each OA patient in LHID 2000 based on sex, age, and index year. The follow-up period ran from the index date of OA until the diagnosis of ACS, withdrawal from the NHI program, death, or the end of 2010. We used Cox models to measure the crude and adjusted hazard ratios (HR) of ACS, with 95% confidence intervals (CI).

**Results:** A total of 35,529 OA patients and 35,529 non-OA patients, and their mean age was  $66.4 \pm 9.5$  years. The OA patients exhibited a significantly higher prevalence of comorbidities including hypertension, diabetes, hyperlipidemia, stroke, and congestive heart failure than did the non-OA patients. The OA patients showed a significantly increased incidence rate of developing ACS compared with that in the non-OA patients (6.62 vs 5.51 per 1,000 person-y). After we controlled for sex and comorbidity, a 1.11-fold adjusted HR of developing ACS was present in the OA patients compared with that in the non-OA patients (95% CI = 1.04-1.11).

**Conclusion:** The middle-aged and older people with OA were at an increased risk of developing ACS compared with the counterparts without OA.

## Classification and Treatment of Obesity Disease in Cat

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### Abstract

Obesity is a serious public health problem all over the world. It was estimated that over 1.9 billion adults were overweight (39% of adults were overweight worldwide), of which more than 650 million, ~13%, were obese, in 2016. Prevalence of obesity dogs and cats has increased in these years as in human. Cats are easy to become obese compared to dogs owing to their own characteristics in glucose and lipid metabolism. Prevalence of obesity in cats is assumed to be 30 to 40%. Obesity accompanied by visceral fat accumulation causes insulin resistance and is a risk factor for metabolic syndrome, diabetes mellitus, hypertension, dyslipidemia and some types of cancer, and overweight and obesity are usually related to poorer cognition across lifespan. Obesity is classified into two types with and without health issues. Obesity with health issue caused by visceral fat accumulation is defined as obesity diseases (pathological obesity). In cats with obesity diseases, lipotoxic, fatty liver, increases in circulating non-esterified fatty acids (NEFA) and inflammatory cytokines were remarkable. Visceral adipose tissue is more active compared to subcutaneous adipose tissue, and  $\beta$ -oxidation of fatty acid is accelerated and excessive amount of reactive oxygen species (ROS) is produced. Such overproduced ROS is attributed to one of the pathogens for obesity and its associated diseases. To treat obesity diseases in cats, continuous supplementation with antioxidant and anti-inflammatory substance is very effective. Body weight is not changed; however, lipid metabolism is remarkably ameliorated in cats with obesity diseases.

## Changes in Plasma Metabolites Concentrations in Healthy and Obese Dogs Supplemented with Astaxanthin

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### Abstract

Prevalence of obesity has increased remarkably in dogs as in human. Obesity is a risk factor for various metabolic disorders and characterized by low-grade inflammation based on oxidative stress by excessively produced ROS. In this study, we evaluated the effects of astaxanthin (ASX) supplementation in healthy and obese dogs since ASX has potent-anti oxidative effects with inhibitory action of lipid peroxidation and singlet quenching activity in human. Ten healthy beagle dogs and 5 clinically obese dogs were enrolled in this study. In 5 healthy dogs, after 6 weeks of ASX supplementation, plasma triglyceride (TG) and malondialdehyde concentrations and lactate (LDH) dehydrogenase activities significantly decreased while there was no significant difference in 5 control dogs. In clinically obese dogs, plasma TG concentrations decreased after 8 weeks of ASX supplementation and plasma alanine aminotransferase and LDH activities clearly decreased in all 5 dogs and 4 dogs out of 5 dogs, respectively. ASX supplementation (0.3 mg/kg body weight/day) for 6 weeks in healthy dogs and 8 weeks in obese dogs induced elevation of antioxidant function and liver function by ameliorating lipid metabolism.

## Prevalence of Vitamin D Deficiency and its Associated Factors in Three Regions of Saudi Arabia: A Cross-Sectional Study

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### Abstract

**Objectives:** To measure prevalence of vitamin D deficiency in Saudi Arabia, unveil the lifestyle, nutritional habits and status, as well as identify the potential risk factors.

**Method:** School-based survey targeting Saudi school students and employees was conducted during the period from 2013-2014 using multistage cluster random sample in central, western and eastern regions. Prevalence of vitamin D deficiency and difference between various population subgroups were calculated. Logistic regression analysis was used to detect impact of potential risk factors.

**Results:** Prevalence of vitamin D deficiency was 49.5% in students and 44.0% in employees. Lifestyle was not adequate to protect against vitamin D depletion. Unhealthy nutritional habits were widespread, some manifested in childhood while others manifested later in life. Living in eastern region, females, 16-19 year of age, low economic class, obese and lack of omega 3 supplements were risk factors in students. Still, employees living in the eastern region, females, middle-income class, coca cola consumers and lack of multivitamin supplements were at higher risk.

**Conclusion:** Vitamin D deficiency is health threat in the Kingdom. Those living in the eastern region, children, females and low-income individuals require special attention. There is a need for a health awareness program built on research evidence of current knowledge and practices. Screening for early detection and correction of the condition should be proposed to be part of the national health strategy. There is need for identifying the burden of vitamin D deficiency on other diseases to control and improve the prognosis of these conditions.

## Glucose and Insulin Response During OGTT in Subjects Consuming High-Fructose Corn Syrup, Sucrose, and Aspartame Sweetened Beverages for 2 Weeks

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## Abstract

Our objective was to compare response to oral glucose tolerance tests (OGTT) in subjects consuming sucrose-, high-fructose corn syrup (HFCS)-, or aspartame sweetened beverages (SB) for 2 weeks. 75 healthy adults (18-40 yr; BMI 18-35 kg/m<sup>2</sup>) were assigned to consume 3 SB/day containing either aspartame (n = 23) or 25% of energy requirement (Ereq) as sucrose (n = 24) or HFCS (n = 28) for two weeks with their normal ad-libitum diet. Standard 3-h OGTTs were performed at the end of a 3.5-d baseline inpatient period and 15 days later at the end of a 3.5-d intervention inpatient period. During the baseline inpatient period all subjects consumed standardized meals containing 55% Ereq as complex carbohydrate. During the intervention inpatient period subjects consuming 25% Ereq as sucrose- or HFCS-SB consumed meals that provided 30% Ereq as complex carbohydrate.

The changes in body weight were not significantly different among the 3 groups of subjects (Sucrose: +0.5 ± 1.3 kg; HFCS: +0.8 ± 1.4 kg; Aspartame: -0.05 ± 1.0 kg; P = 0.08, effect of group, ANCOVA). Subjects consuming sucrose- and HFCS-SB for 2 weeks exhibited an increase in the 3-h OGTT glucose (Sucrose: 5.5 ± 2.4%, P = 0.02; HFCS: 6.2 ± 2.2%, P = 0.01) and insulin AUC (Sucrose: 25.4 ± 6.7%, P = 0.002; HFCS: 22.3 ± 6.3%, P = 0.005), and a decrease in insulin sensitivity (Matsuda index--Sucrose: -10.0 ± 4.4%, P = 0.003; HFCS: -8.0 ± 4.2%, P = 0.007, Turkey's post-test) compared with subjects consuming aspartame-SB. These differences were not attenuated in statistical models that included adjustment for changes in body weight.

Compared with the consumption of aspartame-sweetened beverage, 2-weeks consumption of both sucrose- and HFCS-SB at 25% Ereq caused undesirable effects on glucose tolerance and insulin sensitivity in healthy adults.

## Prevalence of Obesity and Overweight and Associated Factors Among Financial Institution Workers in Accra Metropolis, Ghana: A Cross Sectional Study

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## Abstract

Certain professions are associated with low physical activity. Workers in such professions spend the most part of their adult working lives less engaged in physical activity if they don't consciously exercise outside of working hours. This increases their risk of obesity and its associated diseases. This study determined the prevalence of obesity and overweight and associated factors among workers of a financial institution in Accra Metropolis, Ghana.

A cross-sectional study was conducted among 180 workers of a financial institution in Accra using the World Health Organization's STEPS (STEP wise approach) instrument for noncommunicable disease risk factor surveillance. Relevant socio-demographic information was recorded, and BMI was computed for each respondent.

The overall prevalence of obesity and overweight among the bank workers was 55.6% (17.8% obese and 37% overweight). After adjusting for other variables, physical activity (OR = 0.34, 95% CI = 0.13-0.89, p = 0.03), alcohol consumption (OR = 3.00, 95% CI = 1.35, 6.68, p = 0.007), marital status (OR = 2.74, 95% CI = 0.96-7.85, p = 0.04), sex (OR = 2.78, 95% CI = 1.23-6.33, p = 0.01), and age (OR = 1.10, 95 % CI = 1.01-1.20, p = 0.036) were significantly associated with obesity and overweight.

Being physically inactive, consumption of alcohol, being married and a female, in addition to old age, increase the risk of obesity and overweight significantly. These factors should inform policy makers in developing strategies to reduce the burden of obesity and overweight among this category of workers.

## Endothelial Nitric Oxide Gene Polymorphisms and the Risk of Metabolic Syndrome in General Population and Patients with Schizophrenia

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## Abstract

**Background:** Patients with schizophrenia are at greater risk for obesity and metabolic syndrome (MetS) than other individuals due to factors including inactive lifestyle and side effects of antipsychotic medications. The aim of the work was to examine the association of endothelial nitric oxide synthase (NOS<sub>3</sub>) gene polymorphisms (T-786C, G894T, and C774T) with MetS in general population and patients with schizophrenia.

**Subjects and Methods:** We conducted two case-control studies. The first case-control study enrolled 70 schizophrenia patients with MetS and 190 schizophrenia patients with normal weight. A total of 155 patients with MetS and 100 normal weight subjects from general population were included in the second genetic association analysis. Clinical, anthropometric and biochemical measurements were assessed in all samples.

**Results and Conclusion:** NOS<sub>3</sub> 774T/894T haplotype was found to be associated with higher risk of MetS (odds ratio (OR) = 2.18; 95% confidence interval (CI) = 1.4-3.37, P = 0.0004), while the most common 774C/894G haplotype was associated with a decrease in MetS risk (OR = 0.61; 95% CI 0.41-0.9; P = 0.013) in general population. The rare NOS<sub>3</sub> T-786C genotype was associated with a lower risk of MetS in schizophrenia (OR = 0.45; 95% CI 0.25-0.82; P = 0.008). Schizophrenia patients with the TT genotype of T-786C polymorphism exhibited lower serum total cholesterol levels than carriers of the CC genotype (P = 0.016). In conclusion, our findings suggest the potential implications of NOS<sub>3</sub> haplotypes composed of G894T and C774T genetic variants on MetS in general population, whereas T-786C polymorphism is associated with a protective effect against MetS in patients with schizophrenia.

## Regular Aerobic Exercise Improves Lipolysis and Cognitive Function in High-Fat Diet Induced Obese Young Mice

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## Abstract

**Background:** The purpose of this study was to determine the proper intensity of aerobic exercise to improve lipolysis and cognitive function in high-fat diet-induced obese mice.

**Methods:** Forty 4-week-old male C57BL/6 mice were divided into normal diet (CO, n = 10) and high-fat diet (HF, n = 30) group to induce obesity using high-fat diet for 8 weeks. Subsequently, HF group was subdivided equally into HF group, HF + Low intensity training group (HFLT) and HF + High intensity training group (HFHT), and the mice in the training groups underwent a treadmill training for 8 weeks. Protein levels in adipose tissue and hippocampus were analyzed after Y-maze test.

**Results:** Following 8-week training intervention, the body weight and fat mass in the exercise groups had significantly lower than that in the HF group (P<0.05). Adipose tissue ATGL, HSL, and MGL were significantly higher in the training groups than in the HF group (P<0.05), and the levels of ATGL and HSL were significantly higher in the HFHT group than those in the HFLT group (P<0.05). As a result of Y-maze test, the training groups showed higher total number of entries and % Alternation than HF group (P<0.05). Hippocampal NGF, BDNF, and NT-3 in the training group were significantly higher than those of the HF group (P<0.05). However, there was no significant difference according to the exercise intensity.

**Conclusion:** This study suggests that low-intensity aerobic exercise is effective enough to improve lipolysis and cognitive function in high fat diet induced obese young mice.

**Keywords:** Neurotrophins, NGF, BDNF, NT-3

## Interactions Between Gut Microbiota and Probiotic

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## Abstract

The most of the living microorganisms have the interesting diversity in the human body and are present in the gut including probiotic bacteria and pathogens. Probiotic bacteria in the gut plays role to stimulate the immune system and support the suppression of pathogens.

The interactions between probiotics and the microbiota are able to explained by the production of some metabolites such as SCFA (short chain fatty acids) in the gut. The SCFAs has the specific functions on some cells and tissues as the natural ligands and receptors to signall between the host and the gut microbiota. The SCFAs play role as receptor (FFAR 2 and 3) in some specific cells such as immune and enteroendocrine cells. SCFA is the major carbon source for the microbiota in the gut and has regulatory activity in the local, intermediary and peripheral metabolisms. Furthermore, SCFAs including acetate, propionate, and butyrate can cause the activation of G-coupled-receptors, inhibit the enzyme histone deacetylases, and act as energy producing components.

In some animal models, it has been found that the macrophage phagocytic activity increased parallel to IgA<sup>+</sup> cells in the small intestine and IgA antibodies fighting against the pathogenic microorganisms. The expression of toll-like receptors 2 and 5 and the secretion of the cytokines including interleukin (IL)-6, IL-8, IL-12, IL-18, tumor necrosis factor gamma, and interferon gamma act to control these processes.

The gut epithelial cell layer can be damaged by the invasive pathogens due to disintegration of the intercellular junction points and thus the pathogens are able to entry into the host tissue. The genera *Lactobacillus* and *Bifidobacterium* have been found to decrease the damage on the cultured epithelial cells caused by enteropathogenic bacteria such as *Salmonella Enteritidis* and *Escherichia coli* O157:H7. The immune reactions and the activities regarding disease prevention can be explained by the interactions taking place between the probiotics and the gut microbiota.

**Keywords:** Gut microbiota, Probiotics, Short chain fatty acids, Gut metabolites, Immune response

## Pill-Packing Intervention on Medication Adherence and Health Outcomes Among Obese and High-Risk Patient Population

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## Abstract

**Introduction:** Non-adherence to medications contributes to adverse treatment outcomes, higher morbidity, and additional hospitalizations. 1. Pill packaging provides a mechanism for patients with polypharmacy to take all medications at designated times. 2. A meta-analysis in 2014 on the benefit of pill packing revealed adherence to medications increased from 63% to 71%. 3. This study aims to evaluate the impact of pill packing intervention on health outcomes among obese and high-risk patients.

**Method:** An in-depth chart review from 2016 to 2018 was performed for each patient at Ochsner MedVantage Clinic (MVC), with forty patients met inclusion criteria. We compared health markers from six (6) months prior to and following the PP intervention. Repeated measure ANOVA was used for statistical analysis.

**Result:** Statin adherence is 100%. The percentage of MVC patients with controlled blood pressure (BP  $\leq$  140/90) increased from 50% before PP to 83% after PP ( $p < 0.001$ ). Mean values and interquartile ranges of low-density lipoprotein (LDL), hemoglobin A1c (HbA1c), and body mass index (BMI) all decreased respectively (93 to 81 with  $p = 0.053$ , 7.7 to 7.3 with  $p = 0.109$ , 33.2 to 32.6 with  $p = 0.179$ ). The percentage of MVC patients with at least one (1) emergency department (ED) visit in 6 months decreased from 48% before PP to 28% after PP ( $p < 0.005$ ).

**Conclusion:** Pill-packing intervention increased medication adherence and improved health outcomes among obese and high-risk patients. There is a significant increase in BP control and reduction in ED utilization.

## Reduced miR-181d Level in Obesity and Its Role in Lipid Metabolism via Regulation of ANGPTL3

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## Abstract

Obesity impacts the endocrine and metabolic functions of the adipose tissue. There is increasing interest in the role of epigenetic factors in obesity and its impact on diabetes and dyslipidemia. One such substance, miR-181, reduces plasma triglyceride levels in mice by targeting isocitrate dehydrogenase 1. In the other hand, the adipocyte differentiation and lipid regulating hormone angiopoietin-like 3 (ANGPTL3) is a known regulator of circulating apolipoproteins through its inhibition of the lipoprotein lipase activity. We aimed to study the miR-181d expression in the blood and adipose tissue in a cohort of obese and non-obese people, assessing its possible role in obesity. We also aimed to confirm whether miR-181d can bind and regulate ANGPTL3. miR-181d expression levels were investigated in 144 participants, 82 who were non-obese (body mass index [BMI] < 30) and 62 who were obese (BMI > 30). miR-181d levels in plasma and adipose tissue were measured by RT-PCR. Hepatocyte cell cultures were assessed by overexpression and 3'-UTR-luciferase assays for miR-181d binding to its target protein and its effect on the protein. The plasma levels of ANGPTL3 were also measured by ELISA. The miR-181d levels were significantly lower in obese than in non-obese individuals. *In vitro* analysis confirmed miR-181 binding to and repression of the ANGPTL3 transcript. Obesity leads to alterations in miR-181d expression. Its downregulation in obese humans was inversely correlated with ANGPTL3, a protein involved in adipocyte differentiation and lipid metabolism. miR-181d can be used as an inhibitor of ANGPTL3 to reduce the TG plasma level.

## Protection of Dopaminergic Neuron in the Brain by Insulin: Potential Role Against Obesity

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## Abstract

It has been suggested that obesity is an important risk factor for many diseases such as type II diabetes and neurodegenerative diseases. Dopamine plays a significant role in obesity by affecting energy intake as well as Parkinson's disease in which there is a serious defect in dopaminergic neuron. These findings suggest that protecting dopaminergic neuron could be a promising strategy for the prevention of obesity and Parkinson's disease. We explored to determine if insulin could protect dopaminergic neuron by employing MPP<sup>+</sup>-induced Parkinson disease model *in vitro*. Parkinson's disease (PD) is the second most common neurodegenerative disease in the elderly caused by dopaminergic neuronal cell death. In the present study, pretreatment of insulin inhibited MPP<sup>+</sup>-induced cell membrane damages and also resulted in inhibition of the COX-2 and  $\alpha$ -synuclein levels. In addition, insulin enhanced the autophagy. Furthermore, MPP<sup>+</sup>-induced neurotoxicity inhibited the expression of integrins  $\beta$ 3,  $\alpha$ V and induced the syndecan-1 and -3. Insulin pretreatment stimulated the phosphorylation of integrin-linked kinase and further induced the integrin and syndecan molecules. Interestingly, insulin stimulated a number of neurogenesis related genes such as mitogen-activated protein kinase kinase 1, neurotrophin 3 and bone morphogenetic protein 7 etc, indicating insulin may play an important role in regenerating dopaminergic neurons. These findings suggest that insulin prevents MPP<sup>+</sup>-induced  $\alpha$ -synuclein apoptosis through the activation of integrin and syndecan pathways in SH-SY5Y + RA cells. Taken together, insulin protects dopaminergic neuron in the brain, and thereby it could potentially play a role in the regulation of obesity.

## E-Poster

## Assessment of the Decrease in Seated Hours in Obese People and People with Fibromyalgia

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## Abstract

**Introduction:** Sedentary behavior has negative impact on health and is associated with cardiovascular disease, obesity, cancer and osteoporosis. Sedentary lifestyle is one of the most prevalent modifiable health risk factors. The aim of this study is to assess the effectiveness of the reduction in sitting time hours in people with obesity and fibromyalgia.

**Methods:** The study was a randomized clinical trial. 84 patients (38 Control Group and 46 Intervention Group) between ages 25 and 65 years with a diagnosis of obesity and fibromyalgia who seated for more than 6 hours a day participated (Marshall Questionnaire). Exclusion criteria: a) contraindication of physical activity; b) not understanding the language. The selected patients were fitted twice with an inclinometer (activPAL); for one week at the start of the study and 9 months later. Both groups were given recommendations on the Mediterranean diet and only in the intervention group, according to the evolution of stage of change (Prochaska and DiClemente's Stages of Change Model), were given telephone and face-to-face control to reinforce the reduction in seating time hours. The evaluation was carried out at 9 months from the start of the study.

**Results:** Seating hours decreased in the intervention group, diastolic blood pressure values improved significantly ( $p = 0.018$ ) and body mass index decreased by 0.16 in the intervention group ( $p < 0.001$ ).

**Conclusion:** The reduction of sitting hours in patients with overweight and fibromyalgia can be considered in the treatment of both chronic pathologies.

**Keywords:** Obesity, Seating time, Fibromyalgia

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