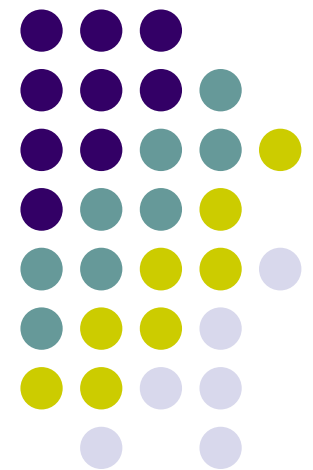


# Metabolic Syndrome

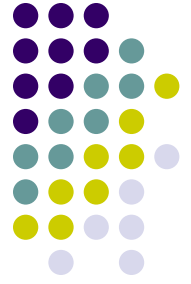
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Prevention and Intervention

Anita Giraldo RD,LDN

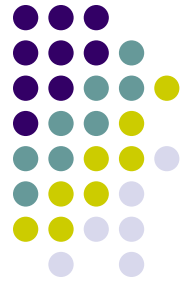


# What is Metabolic Syndrome?

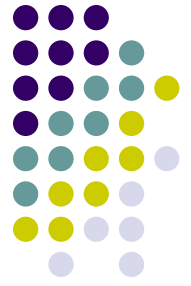


- Also referred to as Syndrome X or Insulin Resistance Syndrome in the past.
- Describes a cluster of unique symptoms associated with CVD risk factors & metabolic alterations.
- The most important risk factors of metabolic syndrome are abdominal obesity and insulin resistance.

- Other risk factors are dyslipidemia, elevated triglycerides, elevated low-density lipoprotein [LDL] and decreased high-density lipoprotein [HDL] cholesterol levels), elevated blood pressure, and elevated plasma glucose.
- Other conditions that may promote metabolic syndrome include aging, hormonal imbalance, and genetic or ethnic predisposition.
- An atherogenic diet (a diet rich in saturated fat and cholesterol) can increase risk for developing cardiovascular disease in people with metabolic syndrome.

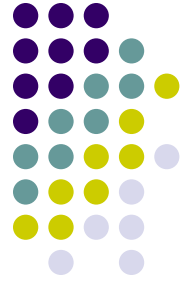


# Clinical Identification of Metabolic Syndrome



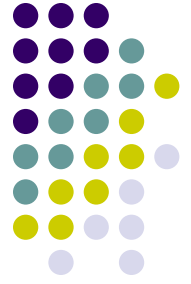
- Abdominal Obesity (waist circumference)
  - Men >40 in (102 cm)
  - Women >35 in (88 cm)
- Triglycerides  $\geq 150$  mg/dl
- HDL (High-Density Lipoprotein)
  - Men <40 mg/dl
  - Women <50 mg/dl
- Blood Pressure  $\geq 130/85$  mm Hg
- Fasting Glucose  $\geq 110$  mg/dl

# The Role of Obesity



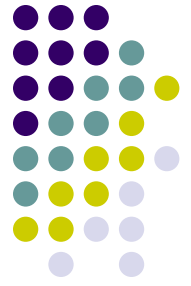
- The driving forces behind metabolic syndrome are obesity and a sedentary lifestyle.
- More than 50% of the U.S. population is overweight or obese.
- At least 300,000 premature deaths and at least \$90 billion in direct healthcare costs annually in the United States alone result from obesity and sedentary lifestyle.
- The spread of obesity among adults also affects children, showing increasing signs of metabolic syndrome earlier in life.

# Insulin Resistance as the essential cause of Metabolic Syndrome



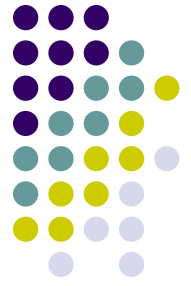
- According to experts, the increasing burden of obesity and insulin resistance in the United States is the driving force behind the rising prevalence of metabolic syndrome.
- The majority of individuals who are insulin resistant are clinically obese and predominantly have upper body fat distribution.
- Upper-body obesity correlates strongly with insulin resistance

# Weight issues increasing among the Pediatric population



- The incidence and degree of overweight in children and adolescents has tripled over the last three decades.
- Nearly 30% of adolescents who are overweight in the United States meet criteria for metabolic syndrome.
- Persistence of obesity in childhood makes it more difficult to reverse obesity later in life.
- The incidence of type 2 diabetes in adolescents has increased by a factor of 10 in the past 15 years.

# CDC-Centers for Disease Control and Prevention



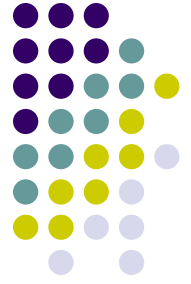
- More than nine million children and teenagers are overweight, and childhood obesity is responsible for 50% of new cases of pediatric obesity, sleep apnea, hypertension and CVD.
- Centers for Disease Control and Prevention (CDC) reports indicate that today's youth may have a shorter lifespan than their parents due to the health consequences of obesity.

# Changing Demographics



- Our country's changing demographics are reflected in the increases of diabetes and metabolic syndrome.
- The disease burden caused by obesity falls disproportionately on African American, Hispanic, and American Indian minorities, especially those in impoverished circumstances.
- The second most rapidly growing segment of our population is women between 65 to 75, becoming predominate developers of metabolic syndrome.

# We are what we eat?



- Many healthcare professionals have linked additives such as Excitotoxins and High Fructose Corn Syrup (HFCS) to the rise of obesity.
- Both Excitotoxins and HFCS are common taste enhancing additives found in a variety of foods and beverages.
- Experts believe these additives may stimulate the appetite more than suppress it.
- Excessive intake of these products contribute to the obesity epidemic, especially in the adolescent population.

# What are Excitotoxins?



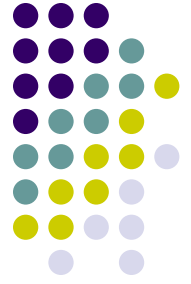
- Acidic amino acids that react with specific brain receptors, transmitting nerve impulses.
- In high doses, neurons begin to “fire abnormally.”
- Over stimulated brain cells undergo delayed cell death known as “Excitotoxicity”, that is, they are excited to death.
- Effecting nerve impulses on the pancreas which over stimulate extra insulin to be secreted. Perhaps also effecting Liptin?

# Excitotoxins-”The taste that kills?”



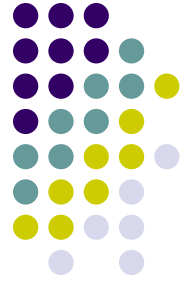
- Examples of common Excitotoxins:
  - MSG
  - Glutamate
  - Aspartame
  - Hydrolyzed Vegetable Protein
  - L-Cysteine
  - Homocystine
- These are found in almost all processed foods, soups, chips, gravies, fast foods, frozen foods, salad dressing and croutons.

# Disguised forms of Excitotoxins



- Excitotoxins are being added under disguised forms such as:
  - Natural flavorings
  - Spices
  - Yeast extract
  - Textured or soy protein
  - Liquid forms of artificial flavorings (found in soups, gravies and diet soft drinks.)
- Liquid form of this additive is most toxic than the solid form because it is absorbed more rapidly.

# High Fructose Corn Syrup and Obesity

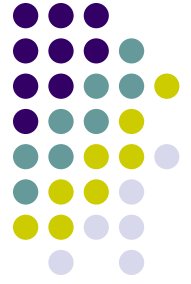


- HFCS is manufactured from corn using a variety of enzymes to yield glucose.
- It's profitable for companies to replace sucrose with inexpensive sweet, corn-based syrups.
- HFCS mixes easily, extends shelf life and prevents freezer burn.
- Foods that contain HFCS:
  - Breads and cereals
  - Cookies and granola bars
  - Canned fruits
  - Jams, jellies, ketchup and other condiments
  - Added to all caloric sweeteners



- Fructose produces low levels of Leptin & Insulin, decreasing satiety.
- HFCS increases Ghrelin, a hormone that causes hunger and increases appetite.
- Decreased Ghrelin is found in obese patients but in normal-weight patients.
- Using glucose in place of fructose decreases the tendency to over eat.
- Fructose is converted to fat by the liver, resulting in elevated levels of fat in the bloodstream in the form of triglycerides.

# The International Diabetes Federation (IDF) & AHA



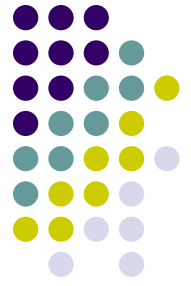
- In 2005, the International Diabetes Federation (IDF) modified the ATP III criteria.
- IDF also recognized and emphasized ethnic differences in the correlation between abdominal obesity and metabolic risk factors.
- Also in 2005, the American Heart Association
- supported the ATP III criteria.
- These included defined abnormalities in three of five clinical measures: waist circumference, elevated triglyceride levels, high-density lipoprotein cholesterol levels, blood pressure levels, and fasting glucose levels.

# Managing Metabolic Syndrome



- The primary goal of clinical management in persons with metabolic syndrome should be to reduce their risk of cardiovascular disease.
- The first line of therapy should be directed toward the major risk factors: lowering LDL cholesterol, decreasing blood pressure, and preventing type 2 diabetes.
- Consideration should be given to modifying the underlying risk factors of obesity, physical inactivity, and a diet high in saturated fat through lifestyle changes.

# Goals for Managing Metabolic Syndrome



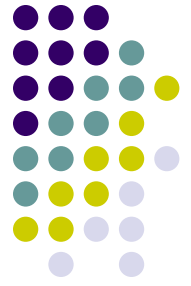
- Goals for lifestyle intervention for abdominal obesity are:
  - to reduce body weight by 7% to 10% during the first year of treatment and continued weight loss thereafter to achieve desirable weight (body mass index < 25 kilograms per millimeters).
  - A waist circumference of less than 40 inches for men and 35 inches for women.

# Diet and Activity Guidelines



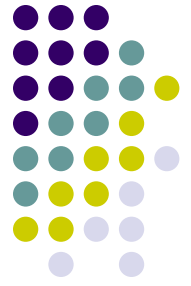
- Moderate total fat and change the type of fat (decrease saturated and trans fats and increase monounsaturated fat).
- Increase intake of dietary fiber (whole grain breads and cereals, as well as fresh fruits and vegetables).
- Moderate sodium intake (avoid salt in cooking and use of salt shaker at the table; limit use of high-sodium snack foods).
- Moderate use of alcohol (one drink per day for women, two per day for men).

# Diet and Activity Guidelines



- Eat less.
- Current recommendations for physical activity include accumulation of > 30 minutes of moderate-intensity exercise, such as brisk walking, on most days of the week.
- Sixty minutes or more of continuous or intermittent aerobic activity on most days of the week will promote weight loss or weight-loss maintenance.

# Omega 3 Fatty Acids



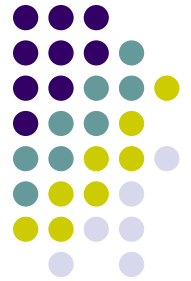
- Increase intake of omega-3 fatty acids (two to three servings of fish per week; add nuts such as walnuts, almonds, and flaxseed).
- Omega 3 has shown to decrease triglyceride levels, blood pressure and coronary death by 36%.
- Goal is 2 servings of fish per week but may also be substituted by using Flaxseed oil- 1 teaspoon per day.

# Other Benefits



- MVI containing Folic Acid along with B-Complex (vital for Homocysteine metabolism).
- Green Tea
  - High in antioxidants
  - Contains polyphenols that prevent to oxidation of LDL, Cholesterol and inhibiting formation of atherosclerotic plaque.

# Disease Prevention



- Community, school or church based programs to help promote healthy lifestyles.
- Dietitians are trained and prepared to assist in the promotion and sustainability of lifestyle change in persons with metabolic syndrome. They are also in an ideal position to take the lead in changing the food and physical activity environment.
- A combination of people or a team approach is necessary to address the complex aspects of metabolic syndrome that are impacting many sectors of our society.



**The most sustainable solutions will result when we all join forces to support the individual.**