Childhood obesity --- is primary prevention the key to decreasing the prevalence and co-morbidities of obesity even into adulthood?

Objectives for childhood obesity prevention

• Recognize how the prevalence of childhood obesity has changed over time.
• Identify what factors impact obesity on a community level, and individual level and why we eat.
• Name risks associated with overweight and obesity and link to adult onset disease.
• Identify early abnormal growth trends in terms of obesity risk.
• Discuss opportunities for prevention of obesity prenatally and in childhood.
• Outline existing community resources and how to access them in your local area.

The problem

• Overweight and obesity are terms used to describe fat storage which is frequently complicated by co-morbidities such as metabolic syndrome, diabetes, cardiovascular diseases and other chronic diseases (Haslam & James, 2005).

• Pediatric obesity is a worldwide multifactorial problem which has significant health and economic consequences.

• In the past 20 years there has been a dramatic rise in obesity among infants as well as the general pediatric population (Kim et al., 2006; Ogden et al., 2014).

• It is estimated that one-third of our children are overweight or weight or obese and that 30% of obese children will be obese adults (Ogden et al., 2014).

• The critical point to remember: is that children must grow and it is customary that pediatric growth is a marker of nutritional status. In fact nutrition actually fuels growth.
More to think about:

- Unhealthy diet and lack of exercise are two factors affecting the prevalence of pediatric obesity in the United States.
- Weight discrimination is a socially acceptable injustice in our world (Carter S. et al. 2010).
- Weight based stereotypes:
  - Lazy
  - Gluttonous
  - undisciplined
- Overweight and obese children often have self esteem issues and lower cognitive performance
- Obese adolescents are less likely to be accepted to more competitive colleges.
- If carried into adulthood, there is documented discrimination
- We must be careful that our public health intervention efforts do NOT contribute to any stereotyping or discrimination

Evidence suggests that a healthy diet/exercise can benefit both cognitive and school achievement in normal weight children (Martin A. et al. 2014).

Definitions

- Accelerated growth: Unusual crossing of 2 or more weight-for-length percentiles in infancy.
- Anthropometrics: A set of non-invasive, quantitative techniques for obtaining physical measurements of an individual. Measurements are used as part of a nutritional assessment include: height and weight, head and chest circumference, and body mass index.
- CDC: Center for Disease Control and Prevention (http://www.cdc.gov/growthcharts)
- Developmental programming: That early nutrition and lifestyle factors have long terms effects on health and risk of common non-communicable disease
- Normal weight: 10th percentile to <85th percentile
- Overweight: 85th to <95th percentile
- Obesity: ≥95th percentile to <120%
- Severe obesity: ≥120% to <140%
- Morbid obesity: ≥140% or BMI > 40

- Velocity: The rate of growth or change in growth measurements over a period of time.
- WHO: World Health Organization: (www.who.int)
- *Based on the 2000 CDC Growth Charts

Evidence to ponder:

- Environmental
- Behavioral
- Personal/collective responsibility
- Genomics

The impact of both the environment and culture significantly contribute to our pediatric obesity problem.
Think about -

Early life intakes:
- High protein intake \( \geq 1\)g/d
  - Short term effects
    - (Accelerated growth, early adiposity rebound)
  - Increased risk of adult obesity
- Fat restriction \( \rightarrow \) early leptin
  - Long term effects
    - Early leptin \( \rightarrow \) leptin resistance \( \rightarrow \) adult obesity and body fat

0 2 yea 8 yea Adult age
Plasticity vs mismatch \( \rightarrow \) Inadequate response to new challenge

Role of epigenetics

Adiposity rebound  perinatal

Hi/age & wt/age
Why does increased fat mass increase risk?

• Adipocytes are biologically active—not just fat storage, but endocrine organs.
• Adipocytes ‘sense’ the body’s energy state and sends signals to many organs—coordinating their function.

Fat cells -Adipocytes

• Fat cells expand (hypertrophy) as they fill with fat ----> hyperplasia.
• Note: fat cells can shrink in size with weight loss, but the number stays the same!
• So, PREVENTION of obesity is important during infancy, childhood and pre-puberty

Clinical Evaluation – History

• Ask about medical and family history
• Ask about recent or past weight changes
• Ask a brief diet and physical activity history
• Ask about the family schedule, who are the caregivers? Who does the shopping?

– (therefore is the “gate keeper”. What are the typical meals they cook? or even if they cook).
Clinical Evaluation –

• Follow growth charts! Ht/age; wt./age, wt./ht; BMI
• Get a brief history of typical dietary intake
  Lipid panel
• Fasting glucose
• Highly sensitive C-reactive protein (hs-CRP)
• Consider CMP, HgBA1c

The role of exercise……

• Skeletal muscle is the most insulin-sensitive tissue in the body and is a primary target for impacting insulin resistance.
• Physical training has been shown to reduce skeletal muscle lipid levels and insulin resistance, regardless of BMI

The role of exercise cont’d

– The impact of exercise on insulin sensitivity is evident for 24 to 48 hours and disappears within three to five days.
– Thus, regular physical activity should be a part of any effort to reverse the effects of insulin resistance.
• A combination of resistance and aerobic exercise is best!
• Patients who have been sedentary need to start with walking and gradually increase duration and intensity
Food plays many roles in our lives:

- To sustain life and provide for health
- To provide pleasure
- To meet cultural needs
- To fulfill spiritual needs
- To provide comfort
- Others???

Views on food are as varied as people themselves

There are many drivers of our food choices
What about diet for infants and young children?

• Discussion

What about the Diet?

• No single diet is currently recommended for young children who are overweight/obese and at potential risk for comorbidities
• The primary goals of dietary change in pediatrics is to alter the growth velocity in terms of weight and allow the child to “grow into” weight balance.
• Note – exercise alone will not lead to weight loss!
• Diet composition will also impact the distribution of body fat.

DASH diet

• Emphasizes fruits, vegetables, low-fat dairy foods, whole grains, poultry, fish, and nuts, while reducing saturated fats, red meat, sweets, and sugar-containing beverages.
• Reducing sodium intake can further reduce blood pressure or prevent the increase in blood pressure that may accompany aging
Mediterranean diet

• Shown to improve markers of vascular inflammation
• Improves endothelial dysfunction
• Improves insulin resistance

It places an emphasis on fruits, vegetables, whole grains, fish, little red meat and moderate amounts of alcohol.

A new paradigm: Defensive nutrition—a plant based diet! (does not necessarily need to be vegetarian)

• Goal = is to prevent disease and promote wellness by optimizing our nutrition
  • It is a food program that emphasizes plant-based foods, combined with regular exercise, maintenance of a healthy weight.
  • Plant base foods provide nutritional support for our organ systems that help defend the body against chronic disease.
  • What we eat is very intimate and personal! There really is rarely a completely right or wrong… often minor tweaks it all that is required to make a healthier plate.
    – Why do you choose that plate?
Education: Must start where your patient is at!

- It is important to assess your patients’ or their families knowledge about the relationship of their lifestyle to their health

- Try to help patients identify short- and long-term goals and barriers to change. This can help to identify effective next steps for patients.

  - Questions such as: “How do you think that your diet (or exercise level) affects your health?”
  
  - “What problems did you encounter in trying to change your diet (or level of activity)?”
Follow Up

- Frequent reassessment, follow-up and continuity of care are a necessity to achieve an optimal clinical outcome!!
  - At least every 4 to 6 weeks initially
- Effective management can be delivered by a variety of healthcare professionals with diverse skills working as a team!
  - But all must “sing the same song” and have good listening and observation skills
- Your team should include: the patient/family, a dietitian, nurse, PT, school personal and coaches, fitness trainer etc..

What is the role of our schools?

- Children spend about a third of the day at school- and often eat breakfast and lunch at school. Several schools in the Upstate also provide evening meal in districts with a high poverty level.
- The National School lunch program (NSLP) was established in 1946
- Currently students have “freedom of choice” so they can choose what they want to eat from the options available.
- In 2012 the U.S. Department of Agriculture issued new standards for nutrition for the NSLP.
- The 504 plan requires substitutions to the standard meal patterns for persons who are handicapped (if it restricts their diet), and permits substitutions medical reasons or other special dietary needs.
- NOTE – overweight/obesity is often not accepted as a medical need for diet modification even with a physician’s order!
- Rather it is looked at as a “personal/family responsibility” not the school’s. They will only respond if a co-morbidity has already occurred like: type 2 diabetes, fatty liver disease, high blood pressure...

Ethics

- Body weight is an ethically charged issue – because it is associated with
  - Personal identity
  - Our intrinsic worth
- Historically, in the U.S.A. prevention and intervention efforts have focused on the individual – their “chosen” diet, exercise habits and weight status.
- People are responsible for their own situation – Max Weber’s Protestant work ethic – hard work, determination and self discipline create success. Failure is a result of personal weakness.
- Public health efforts blend collective responsibility and individual choices
- The “right” of good health is widely accepted at a fundamental “right”. Obesity threatens this right!
- This health threat (overweight/obesity) requires collective action — to both support and encourage individual responsibility. (paternalism/asymmetric paternalism)
- It is a social justice issue (sharing of both advantages and burdens).
References:


