Objectives

- Identify current trends and causes of pediatric obesity
- Recognize treatment efforts to combat pediatric obesity
- Understand nutrition intervention strategies for overweight/obese pediatric patients
- Make a plan to be part of the resolution

Outline

- Defining Pediatric Obesity
- Reviewing Statistics and Trends
- Understanding Co-Morbidities
- Recognizing Causes
- Exploring Treatment
- Building Effective Nutrition Intervention

Pediatric Obesity

- BMI 85th to 95th%tile = overweight
- BMI > 95th%tile = obese

A Startling Reality

- Childhood obesity is now the No. 1 health concern among parents in the United States, topping drug abuse and smoking.
A Startling Reality

“Because of the increasing rates of obesity, unhealthy eating habits and physical inactivity, we may see the first generation that will be less healthy and have a shorter life expectancy than their parents.”

Statistics and Trends

Prevalence of overweight among children and adolescents in the US has increased dramatically during the past few decades.

Since the 1970s, rate of overweight children has:
- More than doubled among young children aged 2–5 years
- Almost tripled among school-aged children aged 6–19 years

Data from NHANES I (1971–1974) to NHANES 2003–2004 show increases in overweight among all age groups:
- 10% of infants 6mo to 23mo were >95th%
- Preschool-aged children (2–5 yrs) increased from 5.0% to 13.9%
- School-aged children (6–11 yrs) increased from 4.0% to 18.8%
- School-aged adolescents (12–19 yrs) increased from 6.1% to 17.4%

Prevalence

Has not changed significantly from 2003-2004 to 2011-2012
- Remains at ~17% (12.7 million children)
- Among 2-5 years old, obesity has declined (NHANES data)
  - 13.9% in 2003-2004 to 8.4% in 2011-2012

Racial Disparities

Significant racial disparities in obesity prevalence remain:
- Hispanics 22.4%
- Non-Hispanic black youth 20.2%
- Non-Hispanic white youth 14.1%
- Non-Hispanic Asian youth 8.6%
**Age Disparities**

- Significant age disparities in obesity prevalence remain
  - 8.4% of 2- to 5-year-olds
  - 17.7% of 6- to 11-year-olds
  - 20.5% of 12- to 19-year-olds


**Socioeconomic Status Disparities**

- Obesity prevalence on the basis of family income (for 2-4 year-olds)
  - 14.2% among children in families with an income-to-poverty ratio of less than or equal to 50%
  - 14.5% with ratio of 51–100%
  - 13.4% with ratio of 101–130%
  - 12.4% with ratio of 131–150%
  - 11.8% with ratio of 151–185%

Centers for Disease Control and Prevention. The prevalence of obesity among low-income children aged 2 through 4 years, by state and income, 2011.

**Education Level Disparities**

- Obesity prevalence among children whose adult head of household completed college compared to those who did not complete high school (1999-2010)
  - 9% vs 19% among girls
  - 11% vs 21% among boys

Centers for Disease Control and Prevention Mortality and Morbidity Weekly Report (MMWR).

**More Than Genetics**

- A child with 1 obese parent has a 3 fold chance of becoming an obese adult.
- A child with 2 obese parents has a 10 fold chance of becoming an obese adult.

American Academy of Pediatrics.

**Statistics and Trends**

- Before the age of 4, the risk is 20% that an overweight child will become an obese adult.
- As an adolescent this risk increases to 80%

American Academy of Pediatrics.

- About one in three children and teens in the U.S. is overweight or obese.
- Overweight kids have a 70–80% chance of staying overweight their entire lives.
- Obese and overweight adults now outnumber those at a healthy weight.
  - ~7 in 10 US adults are overweight or obese.

American Heart Association.
Pediatric Obesity: The Big Picture

- What does the future hold for these kids?

Co-Morbidities

- Sexual changes/maturity
  - Precocious puberty
  - PCOS
  - Advanced bone age
  - Increased growth

- Endocrine
  - Insulin resistance
  - Impaired glucose tolerance
  - Type 2 Diabetes

- Cardiovascular
  - Hyperlipidemia
  - High triglycerides
  - Hypertension

Cardiovascular Disease

- Children ages 7-13 who are overweight are at an increased risk of developing heart disease beginning at age 25.

- Teens who are obese and who have high triglyceride levels have arteries similar to those of 45-year-olds.
Psychological Health

- Being overweight can have a negative impact on a child's
  - Self esteem
  - Behavior
  - Friendships
  - Academic performance


Type 2 Diabetes

- As many as 45% of newly diagnosed diabetes cases in children are Type 2.

- At least 65% of people with diabetes die of some form of heart disease or stroke when the disease is left untreated.


Basic Causes of Pediatric Obesity

- Old school thought
  - Eating too much
  - Moving too little

- New reality
  - Complex causes
    - Psychosocial
    - Genetics
    - Environment

Causes

- Excessive energy intake with a lack of energy expenditure
  - Excessive fat intake
  - Excessive intake of carbohydrates

- Nutrition knowledge deficit

- Physical inactivity

- Parenting

Excessive Energy Intake

- Portion distortion
- Unstructured meal schedule
- Grazing
- Nighttime eating
- Skipping meals and compensating later
- High sugary beverage intake
- Emotional eating/binging
- Unstructured mealtime environment leads to overeating
**Excessive Energy Intake**

- Contributing factors to emotional eating
  - Abuse
  - Traumatic events
    - Divorce, death, illness
  - Sensitivity
    - Taking blame for negative events
    - Learned from parents: food = comfort
      - For example: food as reward or after upsetting event
    - Inability to express emotions
    - Boredom
    - Depression

**Nutrition Knowledge Deficit**

- Lack of fruits and vegetables
- Inadequate fiber intake
- Excessive liquid calories
- High fried food and fast food consumption
- Large portion sizes
- Loss of hunger and fullness cues

**Physical Inactivity**

- Schools
  - Physical education, recess
- Home environment
  - Safe neighborhoods or parks
- Excessive screen time
  - Video games, TV, computer, cell phones

**Parenting**

- No structured meal plan
- No limit to snacks
- Denial of weight problems
- Negative role modeling
- Giving in to demands
  - Especially for children with diagnosed behavioral issues
- Emotionally unavailable to care or initiate lifestyle change
- Blaming child for being overweight or nagging them about intake
- Dealing with own feelings of guilt for child’s health status
- Nutrition knowledge deficit

**Stretch Break**

- Alphabet exercises:
  - Arm circles
  - Bird arms
  - Crazy knees
  - Darting front punches
  - Elephant trunk
  - Fantastic squats
  - Gigantic front kicks
  - Hippity side bends
  - Intense running in place

- Jumping jacks
- Knee lifts
- Love those lunges
- Michael’s moonwalk
Treatment Approaches
- Pills
- Diets
- Surgery
- Healthy eating
- Exercise
- Behavior modification

Basic Treatment of Pediatric Obesity
- Eat healthier, eat less
- Move more

Treatment Approaches
- 2007 Expert Committee Guidelines
- Stages of Treatment
  - Stage 1: Prevention Plus
  - Stage 2: Structured Weight Management
    - Referral to dietitian
  - Stage 3: Comprehensive Multidisciplinary Intervention
    - Registered Dietitian
  - Stage 4: Tertiary Care Intervention
    - Registered Dietitian


Staged treatment for 6- to 11-year-old youth.
Treatment Clinics

- Arkansas Children's Hospital, Little Rock, AR
- Children's Hospital and Research Center, Oakland, CA
- Lurie Children's Hospital at Northwestern University, Chicago, IL
- Children's Hospital and Clinics, Minneapolis, MN
- Children's National Medical Center, Washington, DC
- Children's Hospital Boston, Boston, MA
- Floating Hospital for Children at Tufts Medical Center, Boston, MA
- Mt. Washington Pediatric Hospital, Inc., Baltimore, MD
- C.S. Mott Children's Hospital, Ann Arbor, MI
- Helen DeVos Children's Hospital, Grand Rapids, MI
- Children's Mercy Hospital and Clinics, Kansas City, MO
- Children's Hospital and Medical Center, Omaha, NE
- Cincinnati Children's Hospital Medical Center, Cincinnati, OH
- Nationwide Children's Hospital, Columbus, OH
- Doernbecher Children's Hospital at Oregon Health Sciences University, Portland, OR
- Dell Children's Medical Center, Austin, TX
- Seattle Children's, Seattle, WA
- American Family Children's Hospital, Madison, WI

Treatment Programs in North Carolina

- Duke Children's Hospital
  - Healthy Lifestyles Program
    - [http://www.dukechildrens.org/services/nutritional_disorders_and_obesity](http://www.dukechildrens.org/services/nutritional_disorders_and_obesity)

UVA Children's Fitness Clinic

- Mission: Promoting a healthy lifestyle among children and decreasing childhood obesity through nutrition and activity goals
- The CFC was the first multi-disciplinary weight-management clinic in the state of Virginia
- Staff: Nurse Practitioners Registered Dietitian, Outreach Coordinator

Children's Fitness Clinic

- Supported by the UVA Department of Pediatrics
- Over 5000 patients have been seen since the CFC’s inception in Fall 2003

Program Design

- 6-month long behavior modification program for children, age 2-21, who are at or above the 85th percentile in BMI
- Children are referred by their PCP
  - For BMI above the 85th percentile
  - For elevated insulin, cholesterol, triglycerides
  - At-risk children with strong family histories of Type 2 DM, early-onset heart disease, hypertension, or other weight-related diseases
Program Design

- Patients come with their family for an initial visit
  - Fasting labs are drawn
    - Lipid Profile
    - Insulin
    - Comprehensive Metabolic Profile
    - Glucose
    - Hemoglobin A1c
    - Others, as needed (Uric Acid, Magnesium, Thyroid Stimulating Hormone, Thyroxine, Bioavailable Testosterone, etc.)
- Patients meet with Nurse Practitioner and Registered Dietitian individually
- Patients and their family attend 6 follow-up visits
  - Meet with at least two team members at each visit
  - Fasting labs are drawn at final visit

Staff Responsibilities

- **Nurse Practitioner** covers medical management of patients, physical, explanation of labs, initiation of prescription medication, sub-specialty referrals as needed, parenting tips, activity goals, education of appropriate activity, scheduling activity, and overcoming barriers
- **Registered Dietitian** provides nutrition education and intervention in setting goals regarding dietary concerns
- **Physical Therapist** completes full evaluation and provides education of appropriate activity, addresses any physical limitations, and negotiates activity goals
- **Outreach Coordinator** coordinates all collaborations with UVA and the community

The Average CFC Patient

- **Gender**
  - 57% Female
  - 43% Male
- **Race**
  - 55% Caucasian
  - 35% African American
  - 10% Other
- **Mean Age**
  - 10.8 years
- **Mean BMI**
  - 34.7 for females
  - 35.8 for males
  - Both greater than the 95th percentile
  - The average patient referred to the CFC is already obese.

The Average Patient

- **Medical Evaluation**
  - Has elevated cholesterol, insulin, and/or triglycerides
  - Many also have acanthosis nigricans
  - Some females have PCOS
  - Asthma, allergies, and sleep problems are also common
  - Most likely takes more daily medications than you or I do
- **Activity**
  - Has at least 4 hours of screen time per day
  - Has P.E. 2-3 times/week
  - Participates in little leisurely activity
  - Would rather watch TV or play video games than go for a walk
The Average Patient

- **Nutrition**
  - Drinks far too many sugary beverages
  - Eats very large portions
  - Skips meals
  - Eats many high-fat and processed foods
  - Consumes few servings of fruits and vegetables on a daily basis

Goals of Treatment

- Stabilize or improve BMI
  - maintaining weight for many kids is the key while linear growth continues

- Increase physical activity
  - decrease sedentary time

- Improve dietary habits
  - Optimize HEALTH

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Dietary Recommendations

*(American Heart Association)*

- Appropriate calories to meet needs for growth and development
- Serving sizes appropriate for age
- Low saturated fat and trans-fat
- Low sodium intake
- Limited intake of sugar
- Variety

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RDI for Children

- **Calories**
  - WHO standards for age
  - Adjustment for body weight?

- **Protein**
  - Age 1-3: 5-20% of kcals
  - Age 4-18: 10-30% of kcals

- **Fat**
  - Age 1-3: 30-40% of kcals
  - Age 4-19: 25-35% of kcals

- **Carbohydrates**
  - 45-65% of kcals
- **Fiber**
  - Age in years + 5 grams

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Estimating Calories

- How do you calculate calories for a growing, obese child?

- Varying factors
  - Growth period
  - Puberty
  - Activity level
  - Weight
  - BMI
Nutrition Intervention

- Inventory unhealthy behaviors and attitudes relating to food
- Rate patient and family’s willingness to change in specific areas
- Prioritize topics that need to be addressed
- Provide education, while further investigating issues
- Recognize patient’s willingness to change
- Guide patient/family in setting goals

Nutrition Education

- Portion control
- Sugary beverage intake
- Following meal schedule
- Eating more fruits and vegetables
- Eating healthy when eating out
- Healthy snack options
- Using whole grains
- Healthy cooking, grocery shopping, etc.
- Packing and picking a healthy lunch

Nutrition Intervention

- Keys to Success
  - Get parents to buy in to what you are teaching
  - Educate the family, not just the patient
  - Hook children on nutrition
  - Allow the child to take ownership of goals
  - Reinforce your main points
  - Hold child and parents accountable
  - Make fun goals!

Nutrition Education

- What works?
  - Food diaries?
  - Meal plans?
  - Calorie limits?

Addressing Weight

- Stating the obvious: NEVER use the word fat
- Approach in a medical fashion
  - Use BMI charts to show patients where they are and where you would like them to be
  - Explain what an elevated BMI means
- Educate them on the methods you plan to use to get them where they need to be
- Talk about overall health and wellness of the entire family
- Do not single out the patient
Make Food Fun

How can you relate to kids?
- Throw away the science
- Don't bother mentioning adult diseases
- Find silly, interesting, fun ways to establish common ground

Make Food Fun

Translate teaching into something memorable to your patient
- Eating breakfast every day
- Snack and meal size
- Balancing meals
- Choosing healthy foods when eating out
- Reading nutrition labels

Make Food Fun

Use demonstration whenever possible to accommodate visual learners
- Display recommended serving size
- Practice meal time procedures

Keys to Remember

Create a positive learning environment
- Be positive! Have fun!
- Kids don't want to be treated like kids
- Remind them they are smart enough, mature enough, and fully capable to reach their goals

Provide opportunities for patients to demonstrate what they have learned
- Quiz them
- Ask them to become the teacher
- Practice goal rehearsal

Keys to Remember

Provide options. Avoid telling them they have to do something
- Don't be their mom 😊
- Empower them to have a choice in their nutrition plan
- Encourage personal ownership of goals
Keys to Remember

- Educate the parent on how to play an active role
  - Give the child the tools; give the parent the building plan
  - Promote a working environment where each person does their job
  - Encourage healthy conversations about food at home

Stretch Break

- Alphabet exercises:
  - Nasty monster creeping
  - Outstanding ankle circles
  - Perky plies
  - Quirky hip shakes
  - Rise and shine
  - Sassy sprinkler
  - Toe touches
  - Ultimate kickboxing
  - Very fast clapping

Questions?

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CHILDHOOD OBESITY