

Childhood Obesity


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Defining the problem:



▶ What is obesity?

- It refers to an excess of body fat.
 - How can we measure it and be precise??? (can be difficult in a typical clinic)
- More conveniently measured using **Body Mass Index (BMI)**
 - BMI refers to a height versus weight index to indirectly assess one's body fat
 - BMI is a formula: *kg/meters squared* or *lbs X 703/inches squared*

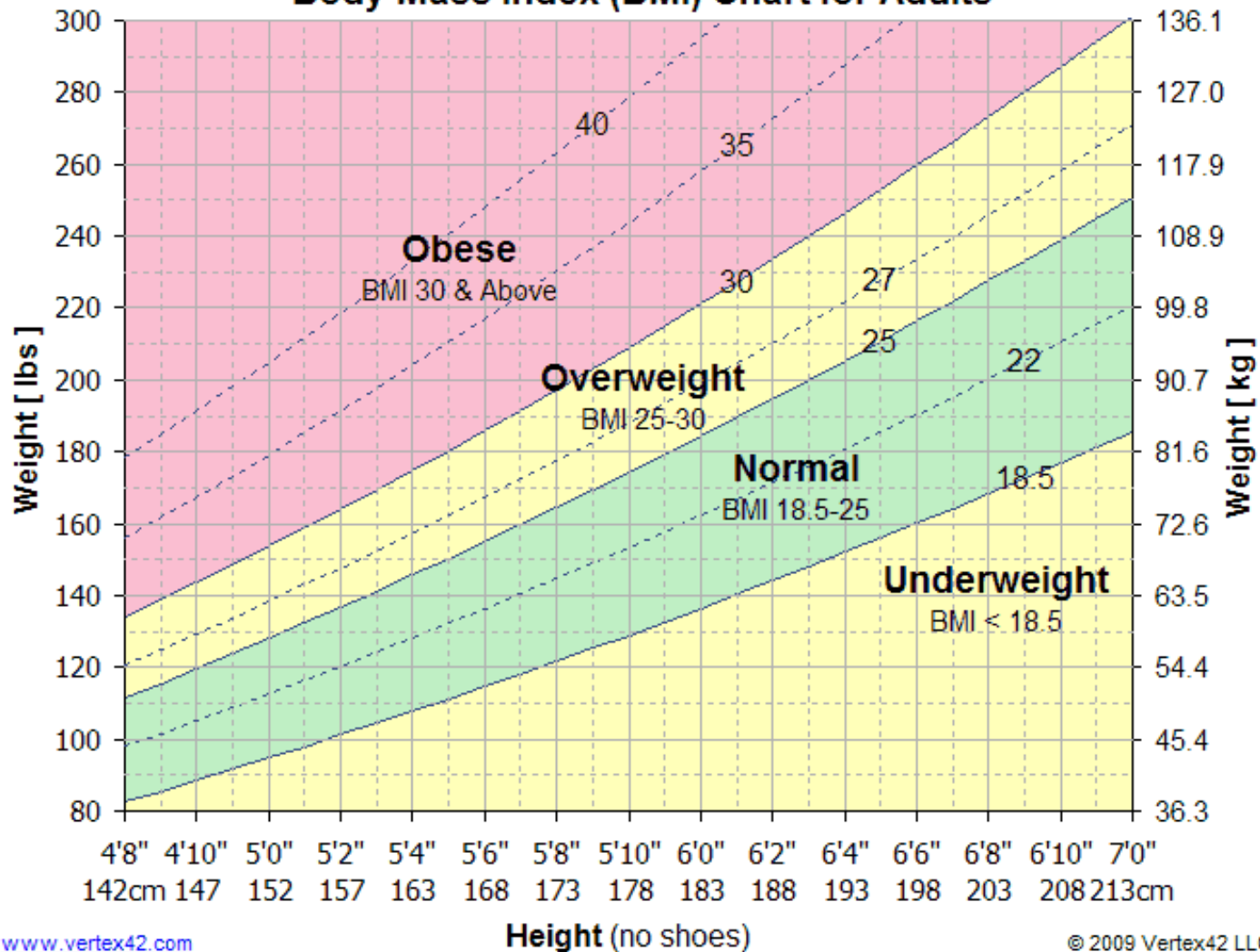

$$\text{BMI} = \frac{\text{Weight} \times 703}{\text{Height} \times \text{Height}}$$

- It is considered to be an accurate measure starting at age 2yo

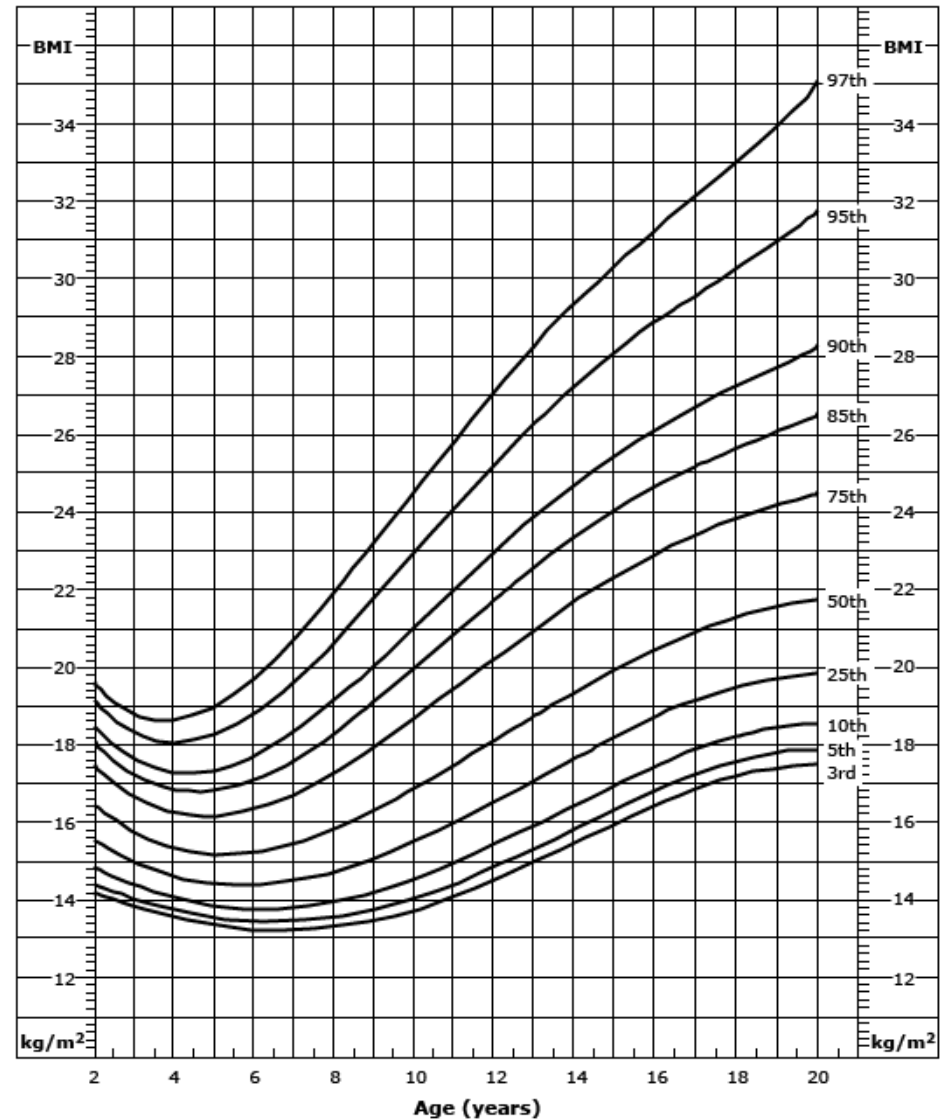


- ▶ **Adults** with a BMI between 25 and 30 kg/m² are considered overweight; those with a BMI ≥ 30 kg/m² are considered to be obese. Obesity in adults is subcategorized as class I (BMI ≥ 30 to 35), class II (BMI ≥ 35 to 40), and class III (BMI ≥ 40).
- ▶ Because **children** grow and change in height as well as weight, the norms for BMI in children vary with age and sex. In 2000, the National Center for Health Care Statistics and the Centers for Disease Control (CDC) published BMI reference standards for children between the ages of 2 and 20 years.

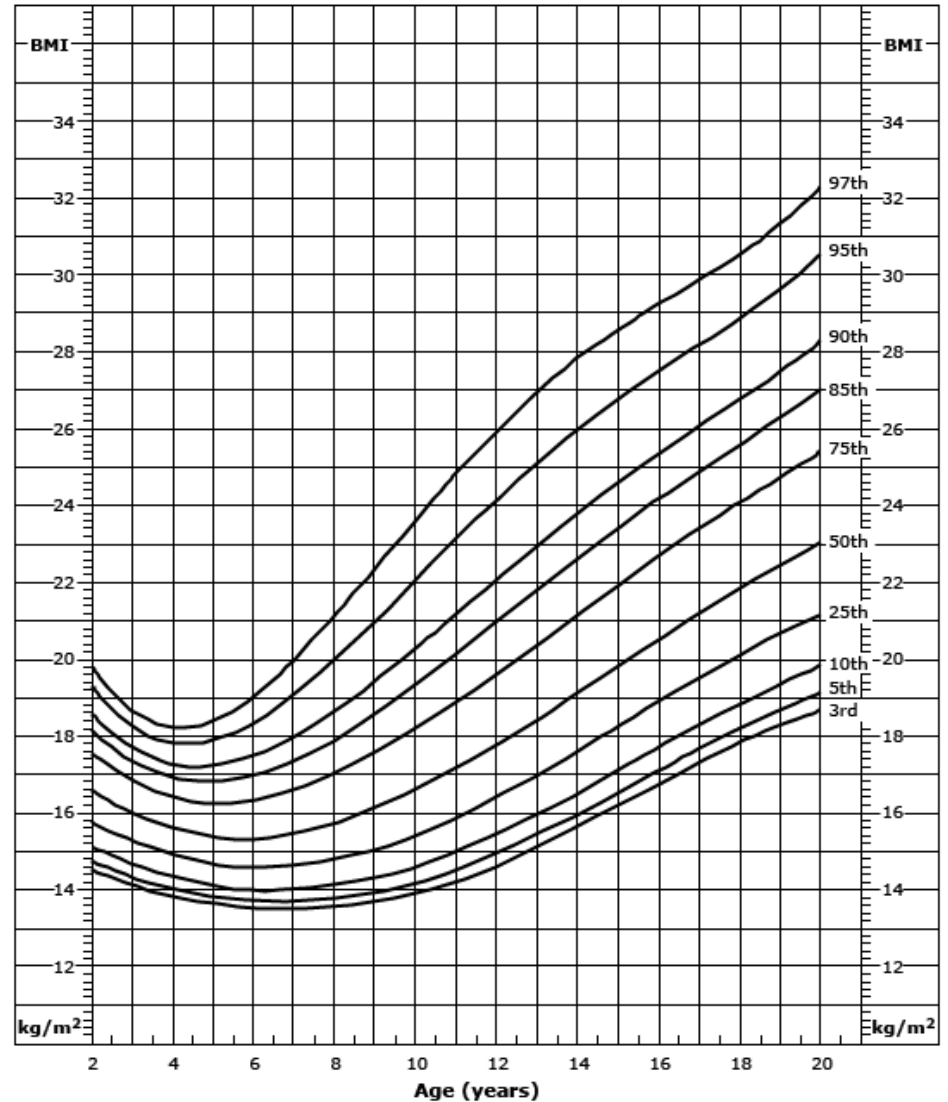
Body Mass Index (BMI) Chart for Adults



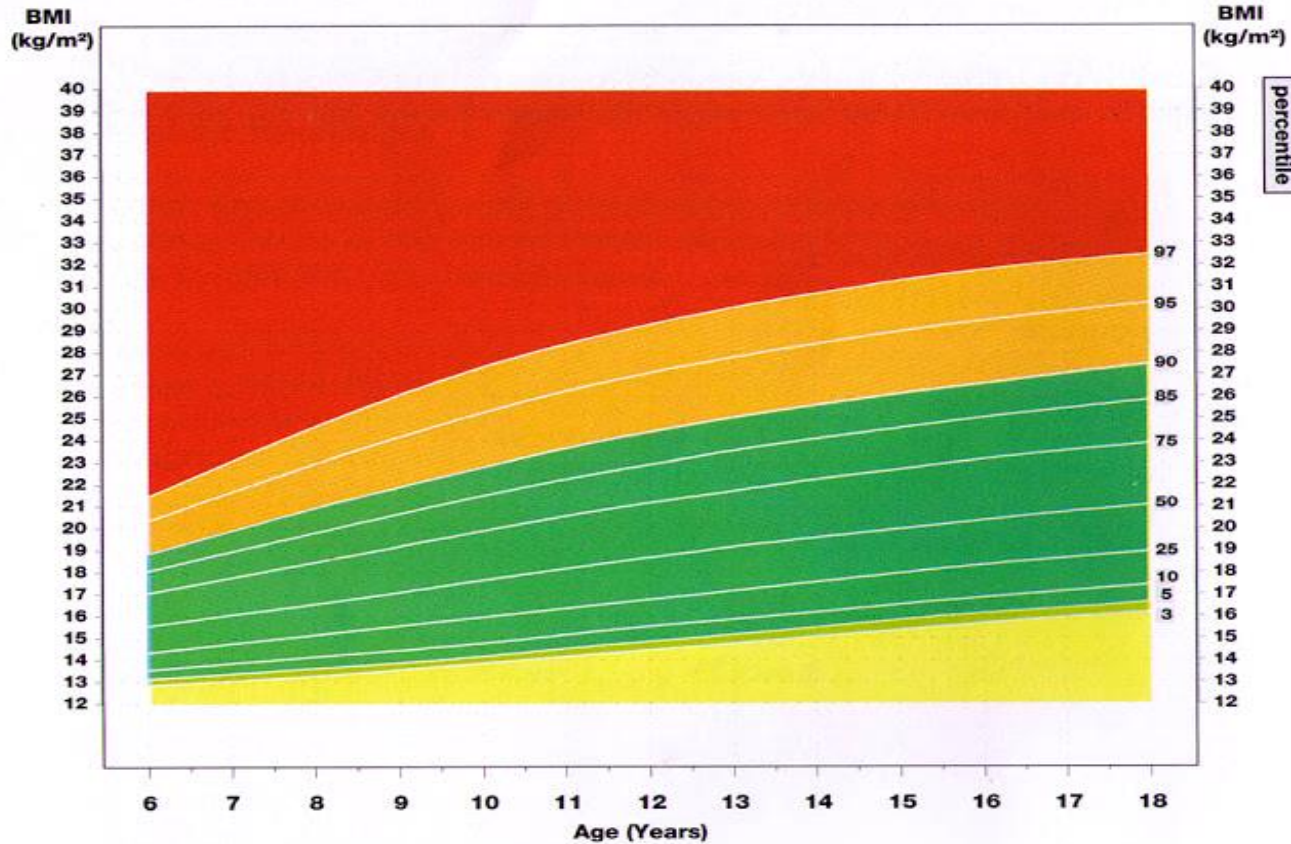
BMI chart for Girls



BMI chart for Boys



Body Mass Index–For–Age Percentiles: Boys (6 – 18 years old)



Weight Status	Percentile/ Percentile Range
Severely Overweight	≥97 th percentile
Overweight	90 th to <97 th percentile
Acceptable Weight	5 th to <90 th percentile
Underweight	3 rd to <5 th percentile
Severely Underweight	<3 rd percentile



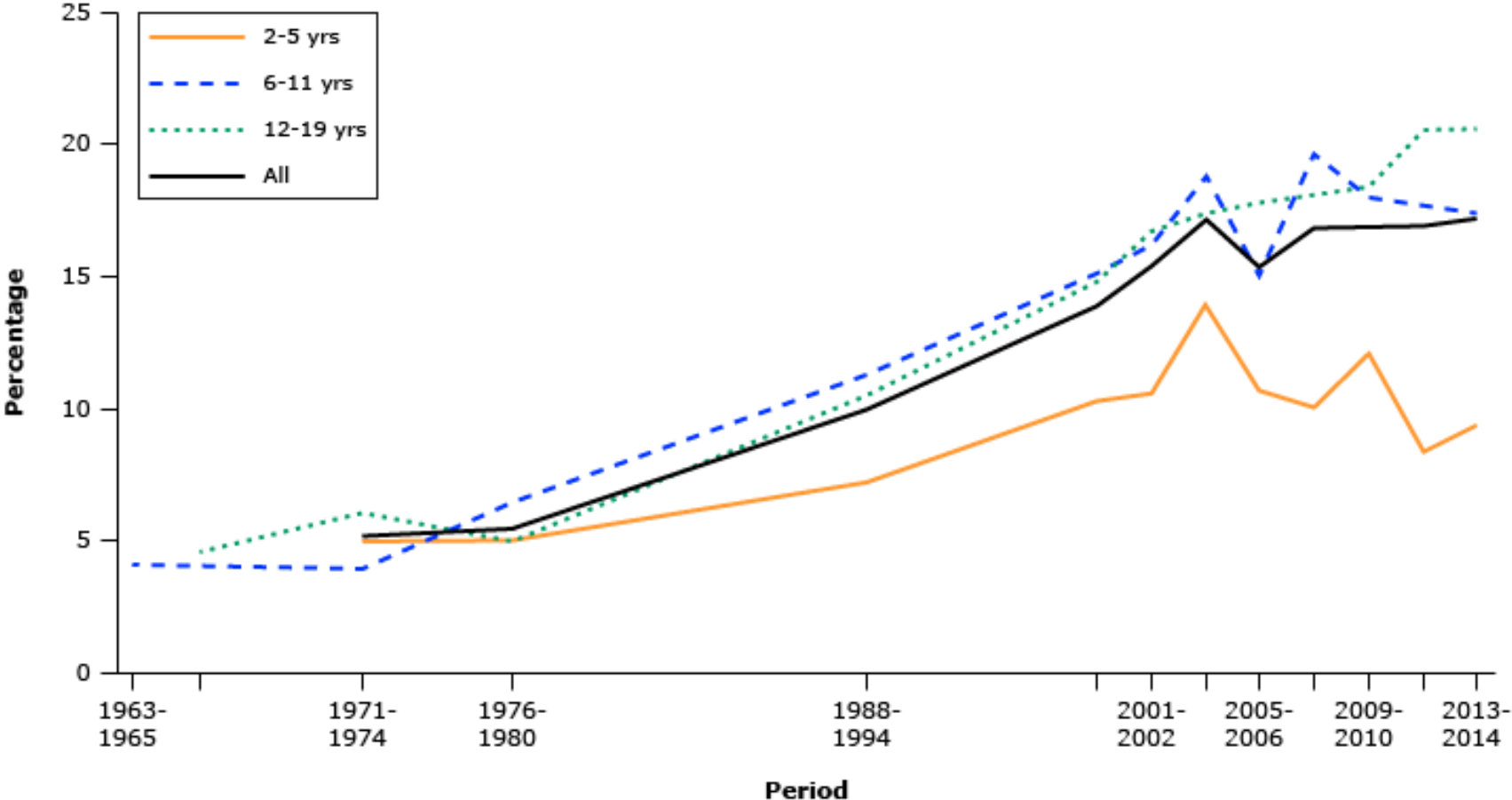
► *Why are we here today to discuss this topic???*

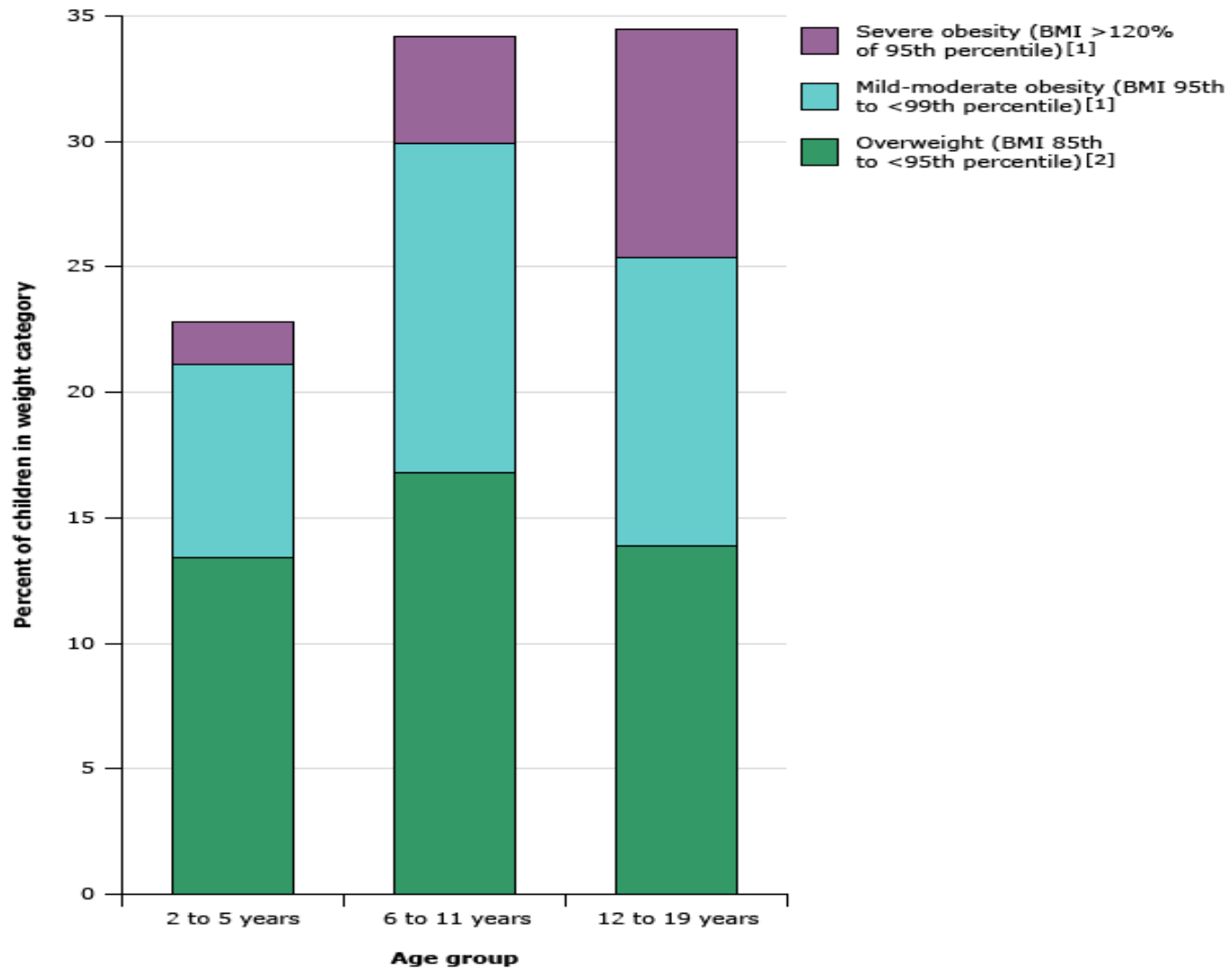
- We recognize there is a problem: 40% overweight or obese
- We are concerned about the health of the children in our community...(((read: *precious resources*)))



Obesity Trends in the U.S. through the years

Fryar et al. CDC





Obesity in children and adolescents 2012-2014

Ogden et al, JAMA 2016

COST of obesity is high

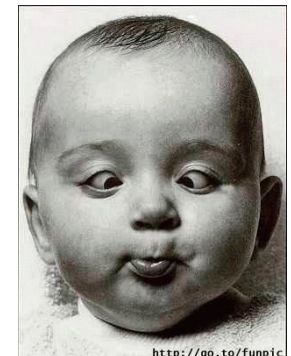


- ▶ The estimated annual health care costs of obesity-related illness are a staggering \$190.2 billion or nearly 21% of annual medical spending in the United States. Childhood obesity alone is responsible for \$14 billion in direct medical costs.
- ▶ Don't forget the psychological cost



Childhood obesity affects **ALL** children.....

- More common in Hispanic, African-American and Native American populations (~21% versus ~15% CDC stats).
- More common in lower income families.
- The prevalence of childhood overweight and obesity is high in most resource-rich countries worldwide (Lancet 2017)



With childhood obesity comes risk...

▶ Pediatricians continue to report increases in:

- Type 2 Diabetes
- Hypertension
- Abnormal lipid panels
- Asthma
- Psychological issues



We can fix this.....



WE NEED TO CATCH IT EARLY

- ▶ Among children who had **mild** obesity at entry into kindergarten: **47%** remained obese in 8th grade.
- ▶ Among those who had **severe** obesity in kindergarten: **>70%** remained obese in 8th grade. (NEJM 2014)



Nutrition Basics 101



▶ Is it just matter of simple math???

- Calories in – calories out = *weight gain/weight loss*
->(metabolic factors?) * (genetic factors?) *
(environmental factors?)
- Carbs, sugars, fats, salt ---- *read nutrition labels*
- Sugary beverages: soda/pop, juices, sports drinks, smoothies
- Fast Foods
- Pre-packaged meals/snacks
- “Low fat” can mean high sugar or high salt
- There is no healthy potato chip – sorry ☹️



PARENTAL INFLUENCE



- ▶ *Among obese 6 year old children with an obese parent: 50 percent remained obese as adults*
- ▶ *Among obese 10–14 year old children with an obese parent: 80 percent remained obese as adults (NEJM 1997)*
- ▶ *Having one obese parent increases the risk of obesity by 2 to 3-fold and up to 15-fold if both parents are obese. (NEJM 1997)*
- ▶ *Parental physical fitness influences their child's physical fitness (multiple studies)*


Physical activity:

- ▶ *Try for 60 mins/day*
- ▶ *20 mins/day vigorous*




Are there other influences?



- ▶ HERITABLE FACTORS — Studies of twins, adoptees, and families all suggest the existence of genetic factors in humans with obesity. The heritability of obesity estimated from twin studies is high, ranging from 60 to 90 percent, with only slightly lower values in twins raised apart compared with those raised together. Similarly, in adoptees, the body mass index (BMI) correlates with that of their biologic parents rather than that of their adoptive parents. (AJClinNut 2008) 
- The genes that contribute to obesity have been a challenge to identify.
- Environmental factors appear to modify the known genetic associations with BMI ******(picture single mom working 2 jobs versus affluent family)******
- Researching the issues: very difficult to put together a study that equalizes environmental factors across many families >>>> think diets, access to food (food insecurity), access to playgrounds, family resources for sports teams and equipment, is the neighborhood safe.....

Things that can help I:

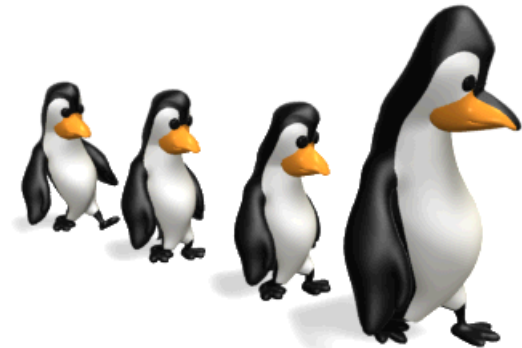


- ▶ Despite research limitations, meta-analyses conclude that interventions to prevent childhood obesity are *generally effective* 
- ▶ The best supported strategies were school-based programs that enhance physical activity (*(((hug your school's PE teacher)))*), nutrition education, and quality of food served at school
- ▶ Discouraging access to sugar-sweetened beverages in schools, including soft drinks and beverages marketed for rehydration during sports. Substantial improvements have been made in school-based meal programs and nutritional environment since 1995. As an example, there has been an 88 percent reduction in total calories shipped to schools by beverage companies. (Pediatrics 2014, 2015)

Things that can help II:



- ▶ Parent-based interventions have been shown to help as well...
- ▶ Parents that exercise regularly were more likely to have children that exercise regularly (*multiple studies*). Parents who took more steps during the day had children who did the same... (JofPhysActivity2012)
- ▶ Parents that eat a healthy diet influence their children's diet in both the short term and long term... 'a significant association between healthy behavior in children and a healthy home environment and parental role modelling'. (InterJofObes 2013)



SCREEN TIME

Things that hurt ☹



- **Television viewing** is perhaps the most strongly established environmental influence on the development of obesity during childhood.
- Reducing television viewing and computer use among overweight 4–7yo children was effective in reducing both BMI and calorie intake during the two-year intervention, without apparent changes in physical activity (ArchPedAdolMed 2008)
- Use of **Electronic Games** also has been associated with obesity during childhood (ObesRes 2004)
- Recommend no more than **2hrs/day**



More TV = More Obesity Risk

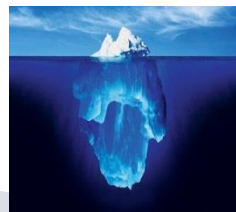


- ▶ (1) increased sedentary activity and displacement of more physical pursuits; (2) unhealthy eating practices learned from both the programming and the advertisements for unhealthy foods; (3) increased snacking behavior while viewing; and (4) interference with normal sleep patterns. Most researchers now agree that the evidence linking excessive TV-viewing and obesity is persuasive.

(JChildMedia 2007)

- ▶ A cross-sectional study of 2761 parents with young children in New York found that 40% of the 1 to 5 year-olds had a bedroom TV, and those who did were more likely to be overweight or obese.
- ▶ Teenagers with a bedroom TV spent more time watching TV, less time being physically active, ate fewer family meals, had greater consumption of sweetened beverages, and ate fewer vegetables than did teenagers without a bedroom TV. (Pediatrics 2008)

- ▶ Uhg! What about those cellphones!



Sleep Time Matters Too...



- ▶ Mounting evidence suggests an association between shortened sleep duration and obesity. This association has been shown in multiple studies (>50 studies to date).
- ▶ <6hrs/night increases risk of obesity (EndoDevlop 2010)
- ▶ The mechanism for an association between sleep duration and obesity has not been established, but may include alterations in serum *leptin* and *ghrelin* levels, both of which have been implicated in the regulation of appetite. *Insulin* levels involved as well.
- ▶ Screen time at bedtime.....try to keep track



LET'S WORK TOGETHER PEOPLE

- ▶ Multiple studies over multiple years in a variety of countries with a variety of kids have shown that interventions can help.
 - Starts at home:
 - Eating together as a family. Discussing what good nutrition really means.
 - Exercising regularly whether via sports or individually. Parents can role model this behavior.
 - Continues at school:
 - Regular PE classes that get them moving
 - Healthy food options. Less access to sugary beverages, etc.
 - Touched by community:
 - Events promoting healthy activities, etc.



Working together we can make a difference...

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