

Promotion of Healthy Childhood Weight

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Obesity

- Early onset childhood obesity
- Biology of obesity
- Effectiveness of interventions by age and severity of obesity



From: **Trends in Obesity Prevalence Among Children and Adolescents in the United States, 1988-1994 Through 2013-2014**

JAMA. 2016;315(21):2292-2299. doi:10.1001/jama.2016.6361

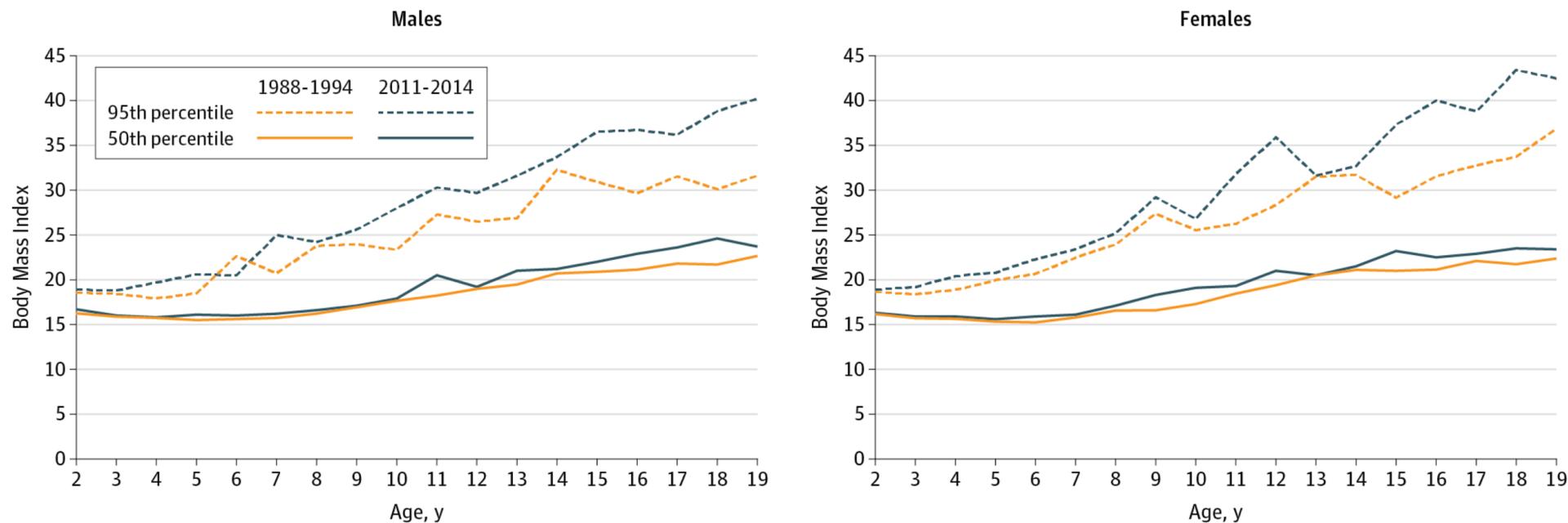


Figure Legend:

Weighted Estimates for US Children and Adolescents Aged 2 to 19 Years in the 50th and 95th Percentiles of Body Mass Index From 1988-1994 and 2011-2014 Data are from the National Health and Nutrition Examination Surveys.

From: **Prevalence of obesity and severe obesity in US children, 1999-2014**

Obesity (Silver Spring). 2016 May;24(5):1116-23

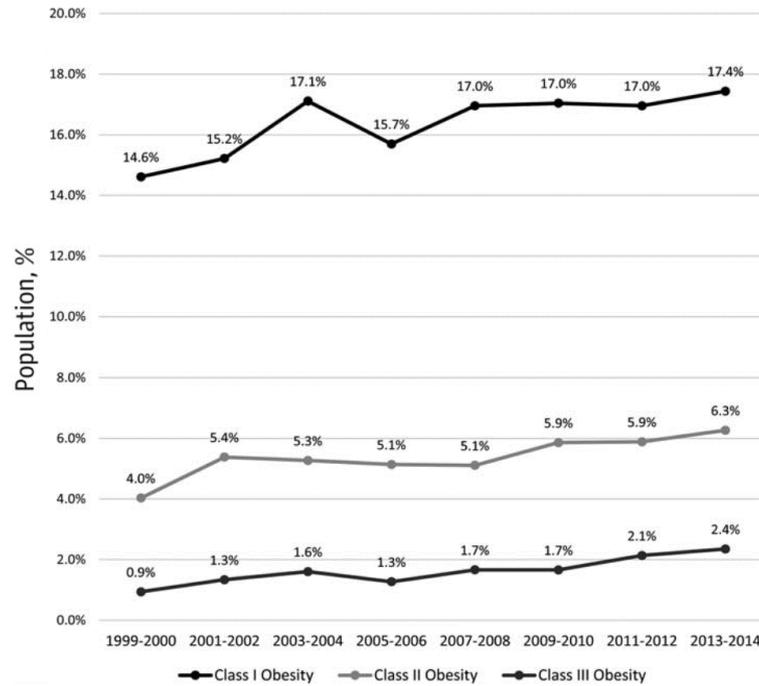
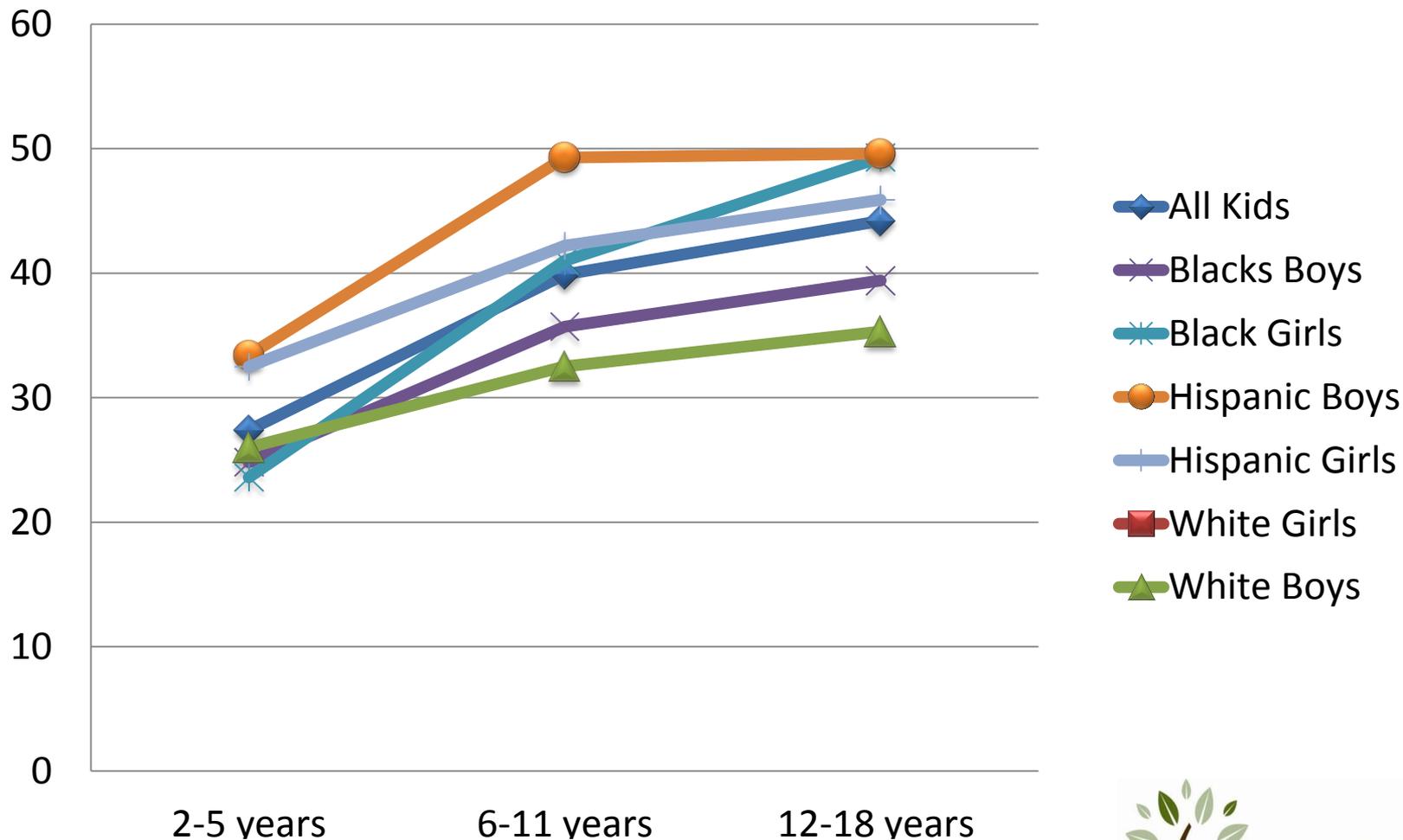


Figure Legend:

Prevalence of Overweight, Obesity, Class 2 Obesity, and Class 3 Obesity Among Children in the United States by Year

Children's Mercy Clinics-Well Child Check % Children Overweight and Obese, 2011-12



Why do we need to start early?

(Cunningham et al. 2014 NEJM)

- Followed children from kindergarten to 8th grade (K entry 1998)
- Early Childhood Longitudinal Study (n = 7738)
- K Entry 14.9% overweight; 12.4% obese
- 8th grade 17% overweight; 20.8% obese
- Evaluated factors related to overweight/obesity at 8th grade



Longitudinal Results

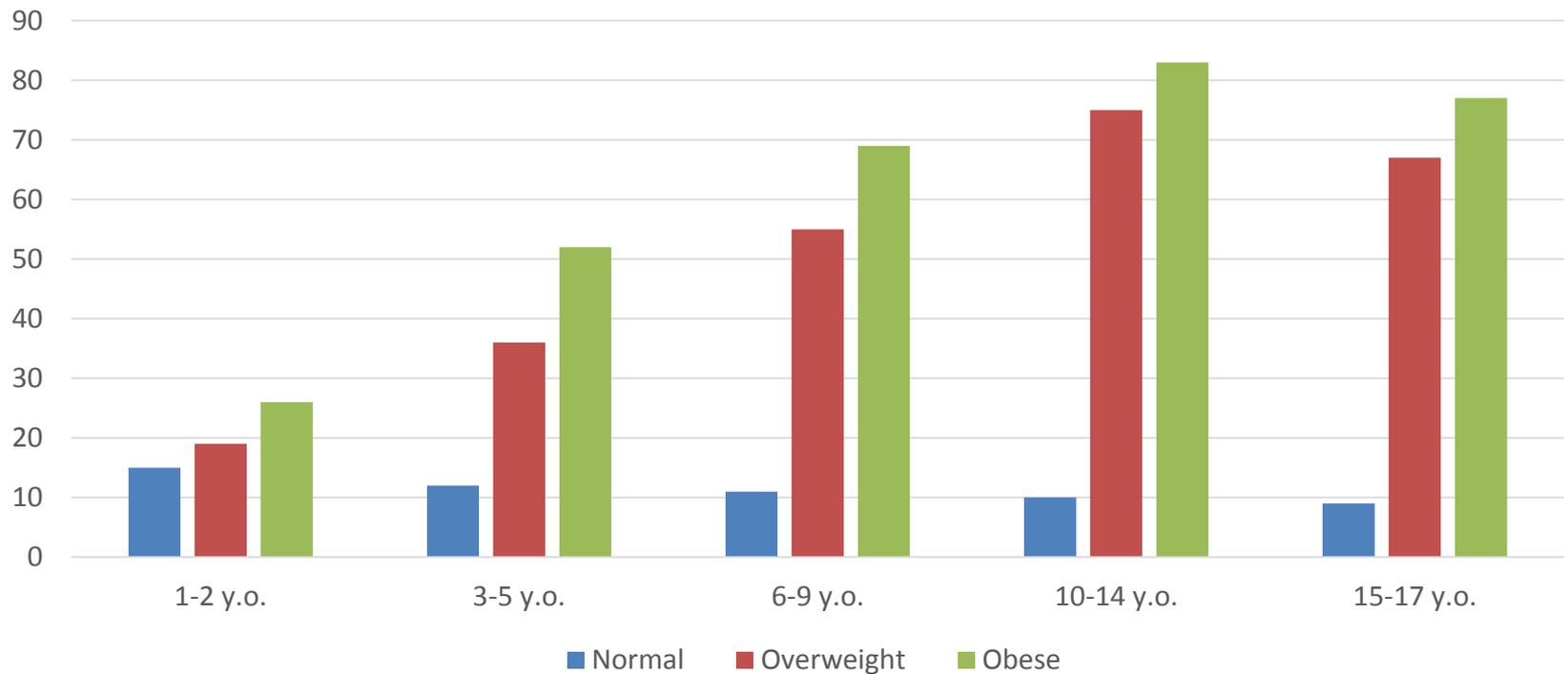
(Cunningham et al. 2014 NEJM)

- Children who were overweight in K were **4 times** as likely to be obese in 8th grade than typical weight peers.
- Higher rates among children who were Hispanic at all ages; African American at 3rd grade and older
- Highest prevalence in the 2nd lowest quintile for income, lowest for highest quintile
- High birth weight predicted obesity
- Greatest increase in for all children between 1st and 3rd grades



Predicting Obesity in Young Adulthood from Childhood BMI Percentiles (Freedman et al. 1997)

Weight Status at Ages 21-27 Years

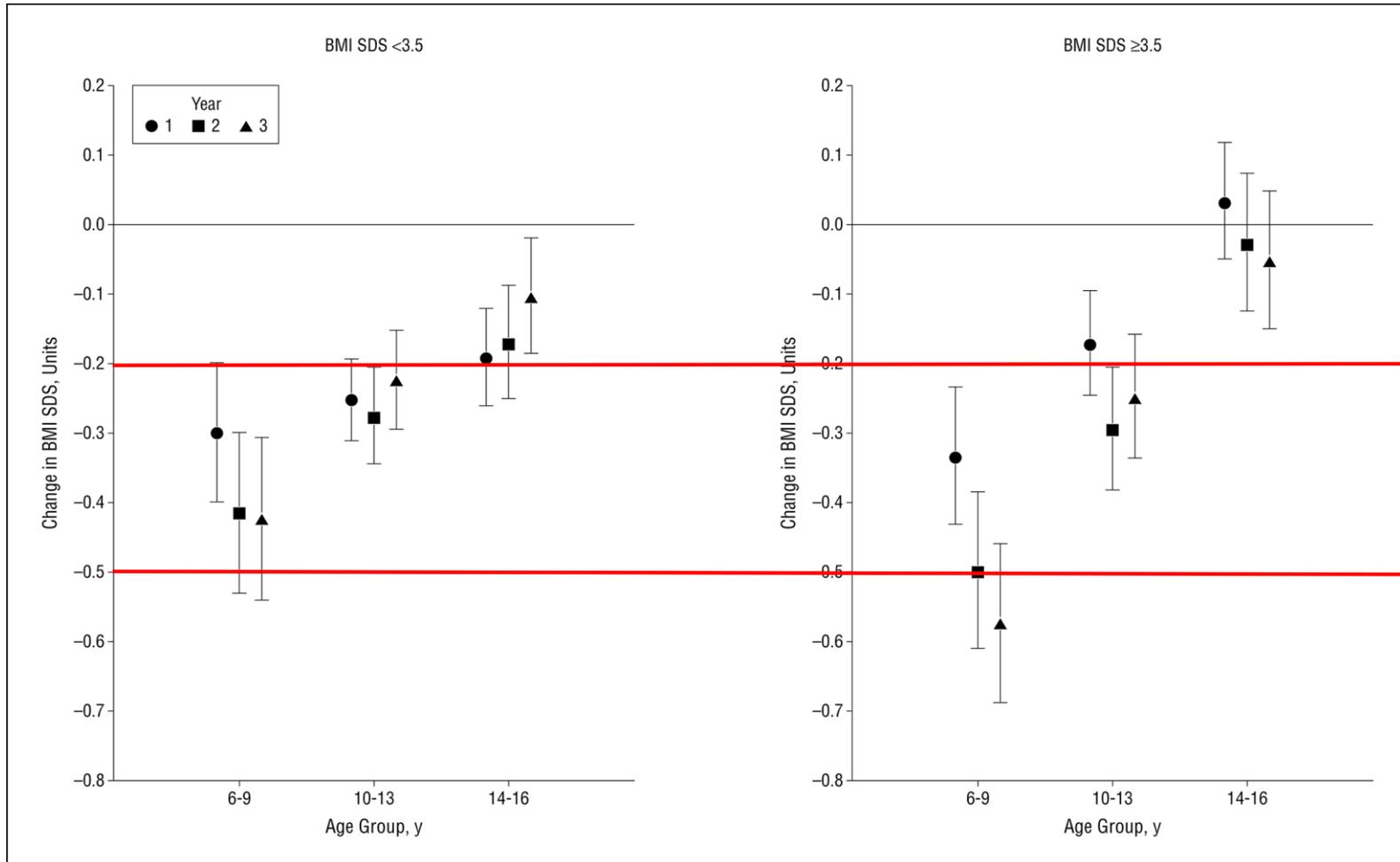


BMI Tracking

- Children with severe obesity become adults with severe obesity:
- Bogalusa Heart Study:
 - 100% developed adult BMI ≥ 30 kg/m²
 - 88% developed adult BMI ≥ 35 kg/m²
 - 65% developed adult BMI ≥ 40 kg/m² !!!

Freedman, DS et al. J Pediatr 2007

Lifestyle Modification Therapy



Danielsson et al. Arch Pediatr Adoles Med. 2012

Can we be effective at later ages/ severity levels? (Knop et al., 2013)

- 1 yr intensive lifestyle intervention + 1 yr. f/u
- Adolescents were defined as > 10 years
- Obesity severity defined as BMI SDS > 2.3 (between 98th and 99th percentile)
- Intervention worked significantly better for children with severe obesity (-.24) than obesity (-.16), but the same results were not seen for adolescents (-.05 severe; -.15 obesity)



What's the problem?

Exercise Needed to Burn Off a Serving of French Fries



Average Serving of French Fries:
610 Calories
6.9 Ounces

Running at 5 MPH



1:05^{hrs}
150 lb Adult



0:49^{hrs}
200 lb Adult

Swimming



1:32^{hrs}
150 lb Adult



1:09^{hrs}
200 lb Adult

Leisure Bicycling



2:14^{hrs}
150 lb Adult



1:41^{hrs}
200 lb Adult

Walking at 2 MPH



3:13^{hrs}
150 lb Adult



2:24^{hrs}
200 lb Adult

Singles Tennis



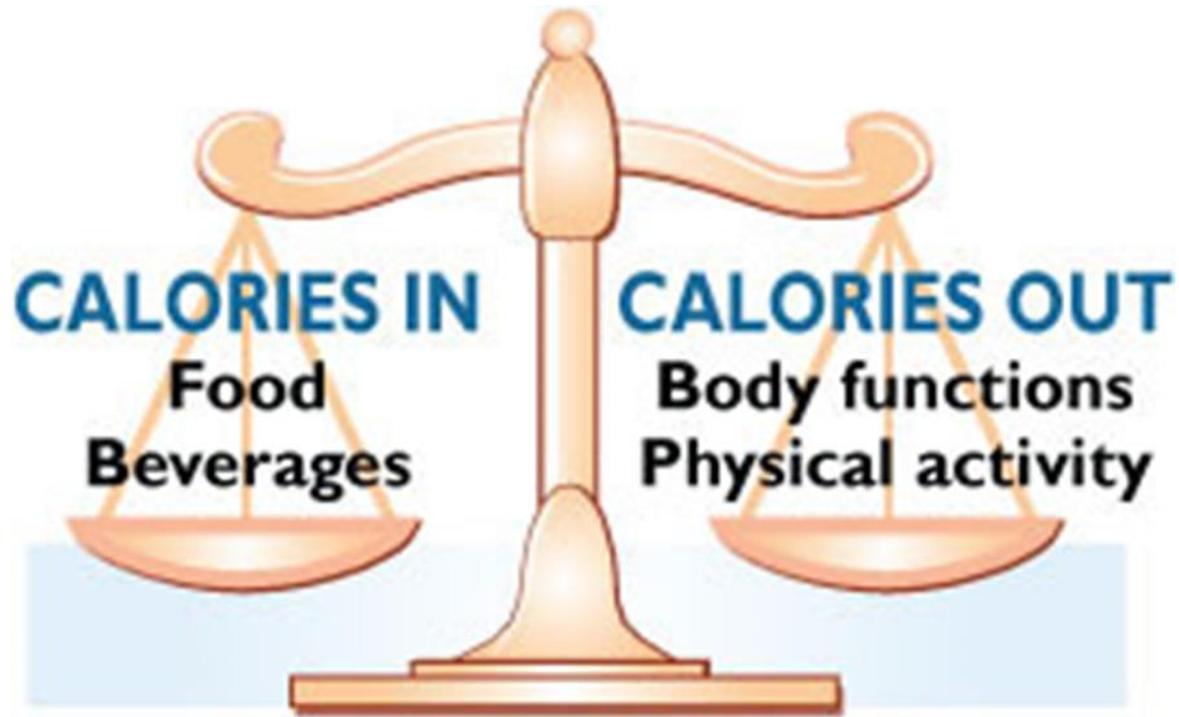
1:07^{hrs}
150 lb Adult



0:50^{hrs}
200 lb Adult



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OBESITY



Obesity

- Genetic Factors
- Complicated Physiology
 - Not a single disorder
 - Over 100 clinically distinct subtypes
- Huge burden of associated illness
 - 60+ medical disorders
 - Including 12 types of cancer

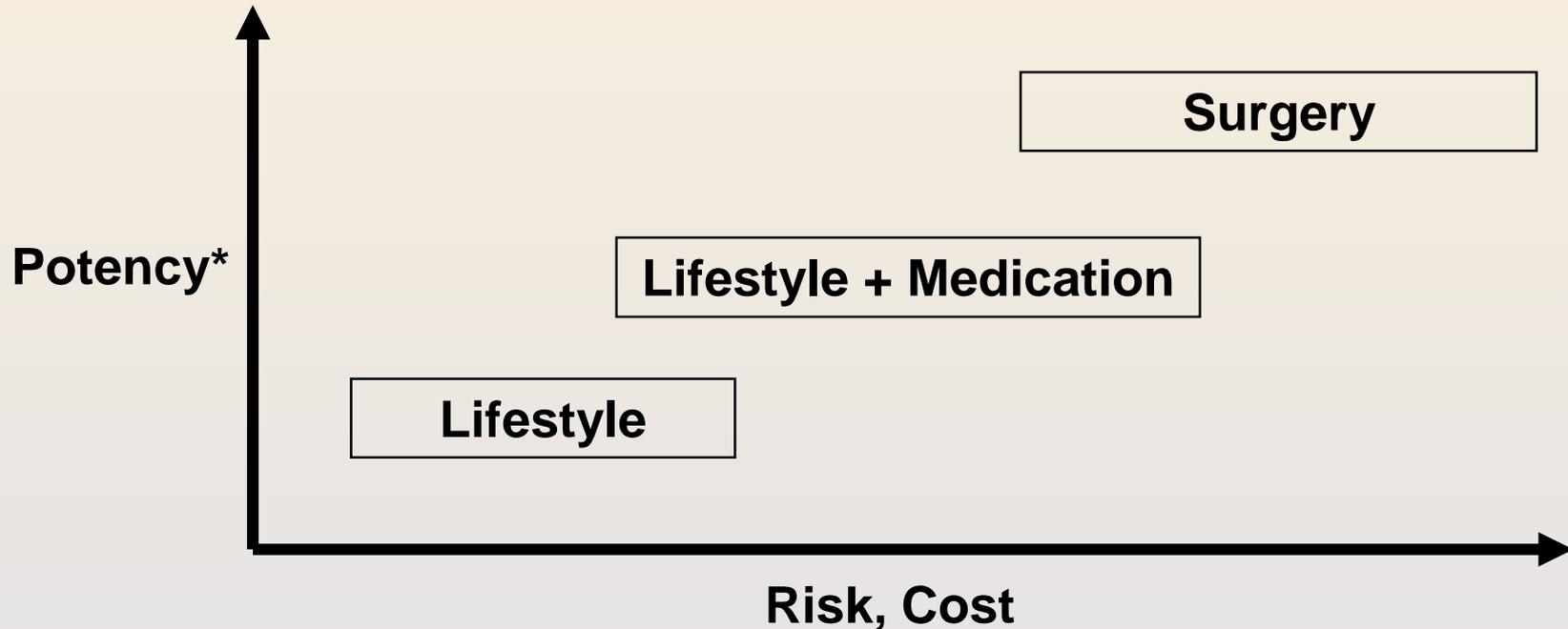


Severe Obesity

- Treatment Resistant
- Need a continuum of care
 - Intensive lifestyle management
 - Increase intensity as needed
 - Adult world more clearly delineated



Current Treatment Options for Obesity



Lifestyle: Includes nutrition, exercise, behavioral programs

Lifestyle + Medication: May include Lifestyle, VLCDs w supplements, and weight loss medications

Surgery: (in order of lowest risk/cost and potency): Gastric Banding < Gastric Sleeve < Gastric Bypass (Roux-en-Y)

* Potency includes many factors such as the amount, rate and sustainability of weight loss, and long-term resolution of adiposopathy and fat mass disease. Potency varies greatly for each individual: long-term adherence to a lifestyle program can be as potent as gastric bypass surgery.

Table 3. Probability of Obesity in Eighth Grade, Spring Semester (Mean Age, 14.1 Years), According to z Score and Percentile of Body-Mass Index at Earlier Ages.*

Weight Category and z Score	Percentile of Body-Mass Index	Probability of Obesity in Eighth Grade, Spring Semester					
		Kindergarten, Fall Semester: Mean Age, 5.6 Yr	Kindergarten, Spring Semester: Mean Age, 6.1 Yr	First Grade, Fall Semester: Mean Age, 6.6 Yr	First Grade, Spring Semester: Mean Age, 7.1 Yr	Third Grade, Spring Semester: Mean Age, 9.1 Yr	Fifth Grade, Spring Semester: Mean Age, 11.1 Yr
<i>percent</i>							
Normal weight							
0.00	50	6	6	5	5	2	<1
0.25	60	9	9	8	8	3	1
0.52	70	13	13	12	12	5	1
0.84	80	19	20	19	19	11	4
Overweight							
1.04	85	25	25	25	24	16	7
1.28	90	33	34	33	33	25	16
Obese							
1.64	95	47	49	48	48	44	39
2.33	99	72	75	75	76	80	87

* Data are from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999.*

Cunningham et al. 2014



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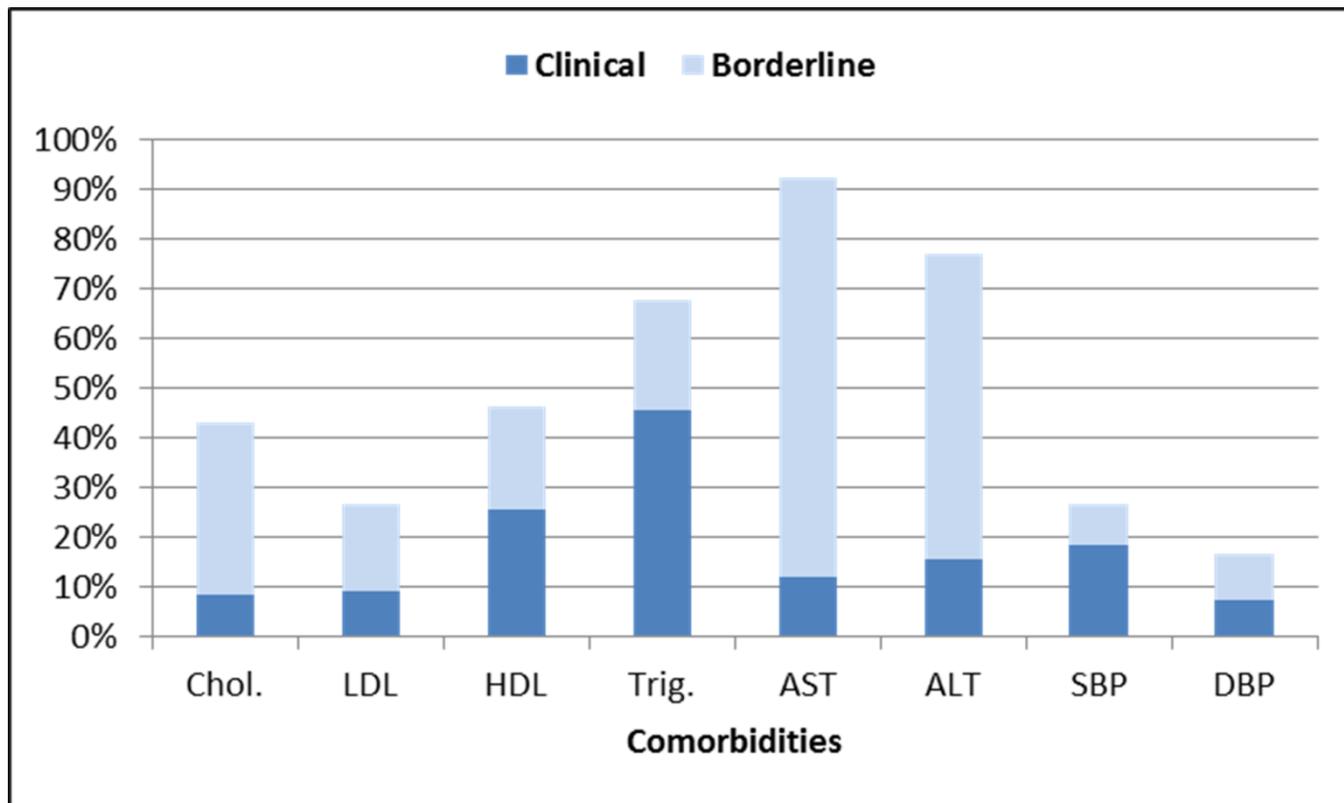
Prevention

- Prevention is KEY
 - Begins at birth
 - Teaching children to like healthy foods
 - Creating an environment for active play



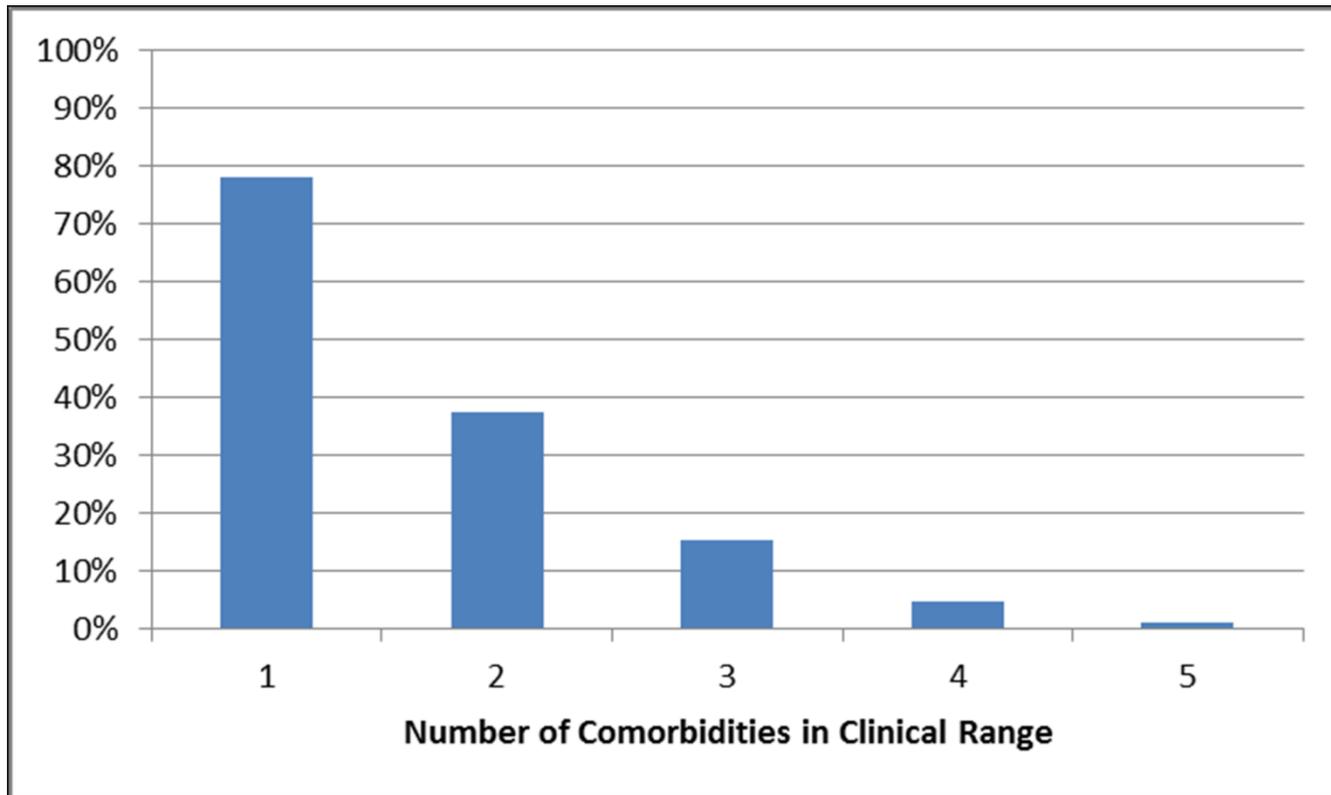
Comorbidities at Baseline 2-8 year olds

(Dreyer Gillette et al., 2016)



Comorbidities Continued

(Dreyer Gillette et al. 2016)



Mission

CMH's Weight Management Program treats children, educates families and leads community efforts to end childhood obesity



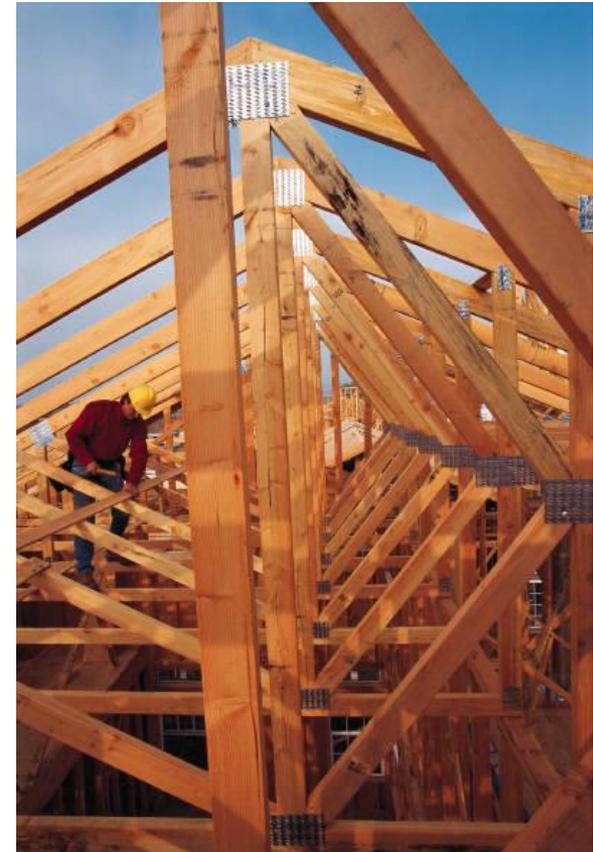
Healthy Lifestyles Initiative

1. Identify Partners, plan and track progress
2. Consistent message
3. Consistent assessment of weight and behaviors
4. Customized healthy weight plan for all
5. Align resources to build capacity in Kansas City
6. Influence policies that enable healthy eating and active living

www.collaborateforhealthyweight.org



Framework for Change



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Toddler Feeding

- Daily grains by 15-18 mo.
 - 25% sweetened cereal, 10% cereal bars
- Daily drinks by 15-18 mo.
 - 58% juice, 39% fruit drinks
 - 11% soda
 - 74% water
- Daily sweets by 15-18 mo.
 - 88% any dessert



Skinner

Vegetables

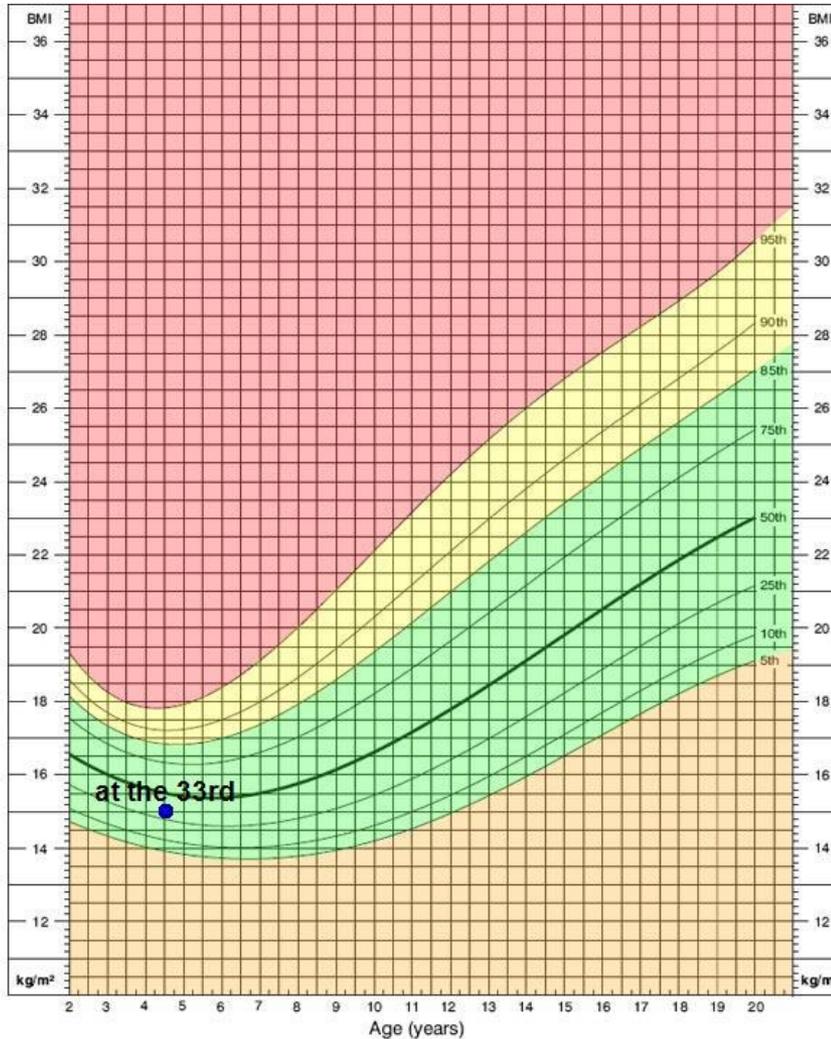
- Dark green vegetables
 - <10% toddlers
- Deep yellow vegetables
 - 39% at 9 months
 - 14% at 18 months
- Potatoes
 - 42% daily by 15-18 mo.
 - By 24 months, 25% eat fried potatoes on any day



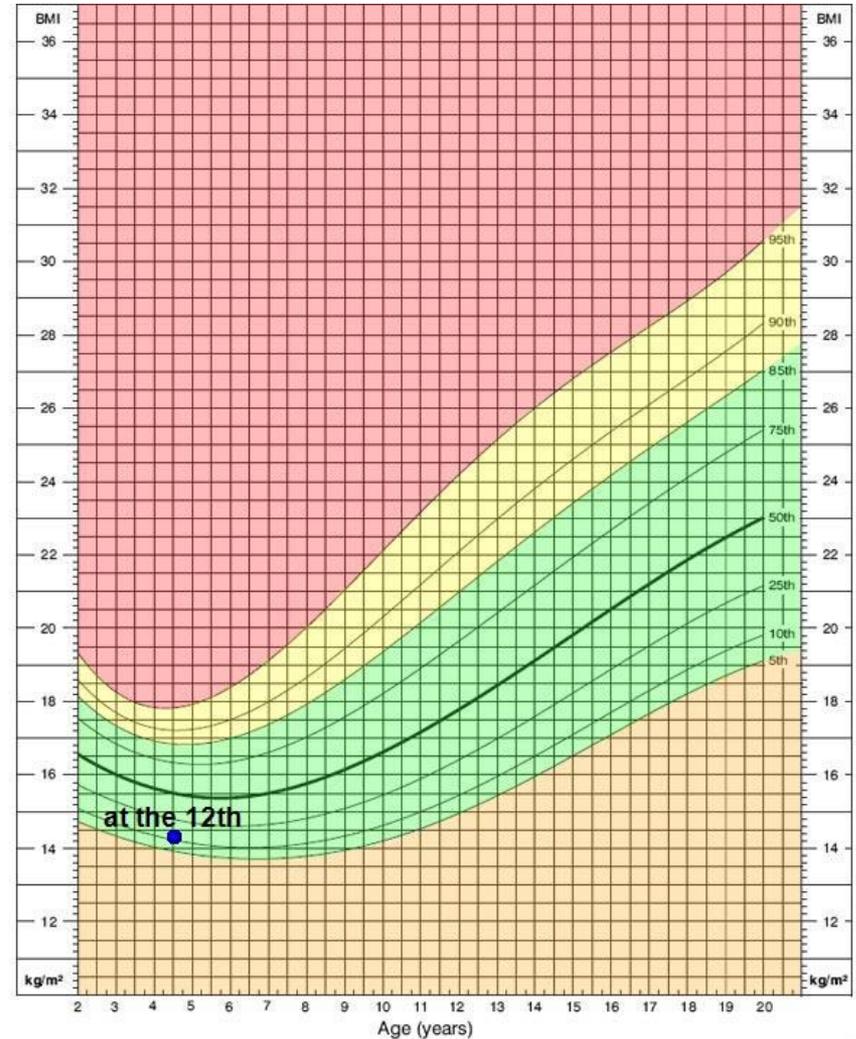
Accurate Measurement is Essential

4.5 y.o. boy

Shoes off



Shoes on



Eyeball test

- Why is it so hard to recruit at the 85th percentile for intervention programs?
- How well can you pick out overweight in the early childhood/toddler period?



What does the 85th percentile look like?



“Visual impression”- how good is it?



“Visual impression”- how good is it?



BMI ~98th Obese



BMI ~93rd Overweight



BMI ~12th Healthy

Overweight, Underweight, or Healthy Weight?



Underweight, Overweight, or Healthy Weight?



0.4

 **Children's Mercy**
KANSAS CITY



91.3

KU MEDICAL
CENTER
The University of Kansas



56.2



4.4



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Courtesy Maureen Black, PhD

Create a Consistent Message

Safe Sleep
For Your
Baby

Reduce the Risk of Sudden
Infant Death Syndrome (SIDS)



HELP US PROTECT
THE POLAR BEAR'S ARCTIC HOME

JOIN US

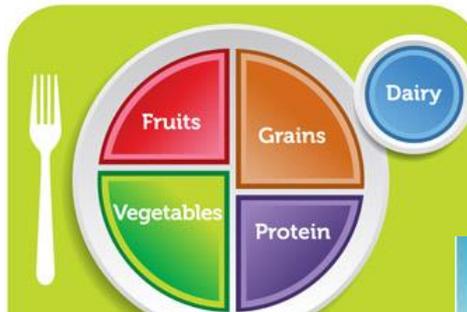
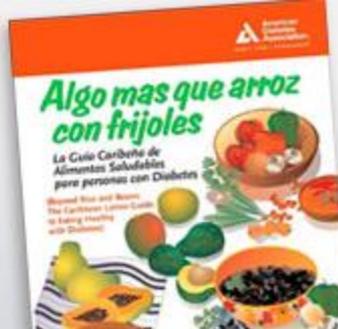


plate.gov

LET'S MOVE
Outside

EAT. DRINK.
GET LOOT.

EAT
MORE
KALE



This Dawg Needs
A Workout!

Help Chicken Dawg pop
bubbles and get some exercise.

Start Now

Bubble
Rubble

TIME
1:59
LEFT



Are You More
of a Chicken or
a Cucumber?

Play 'What Food Am I' here!

Start Now



's
&

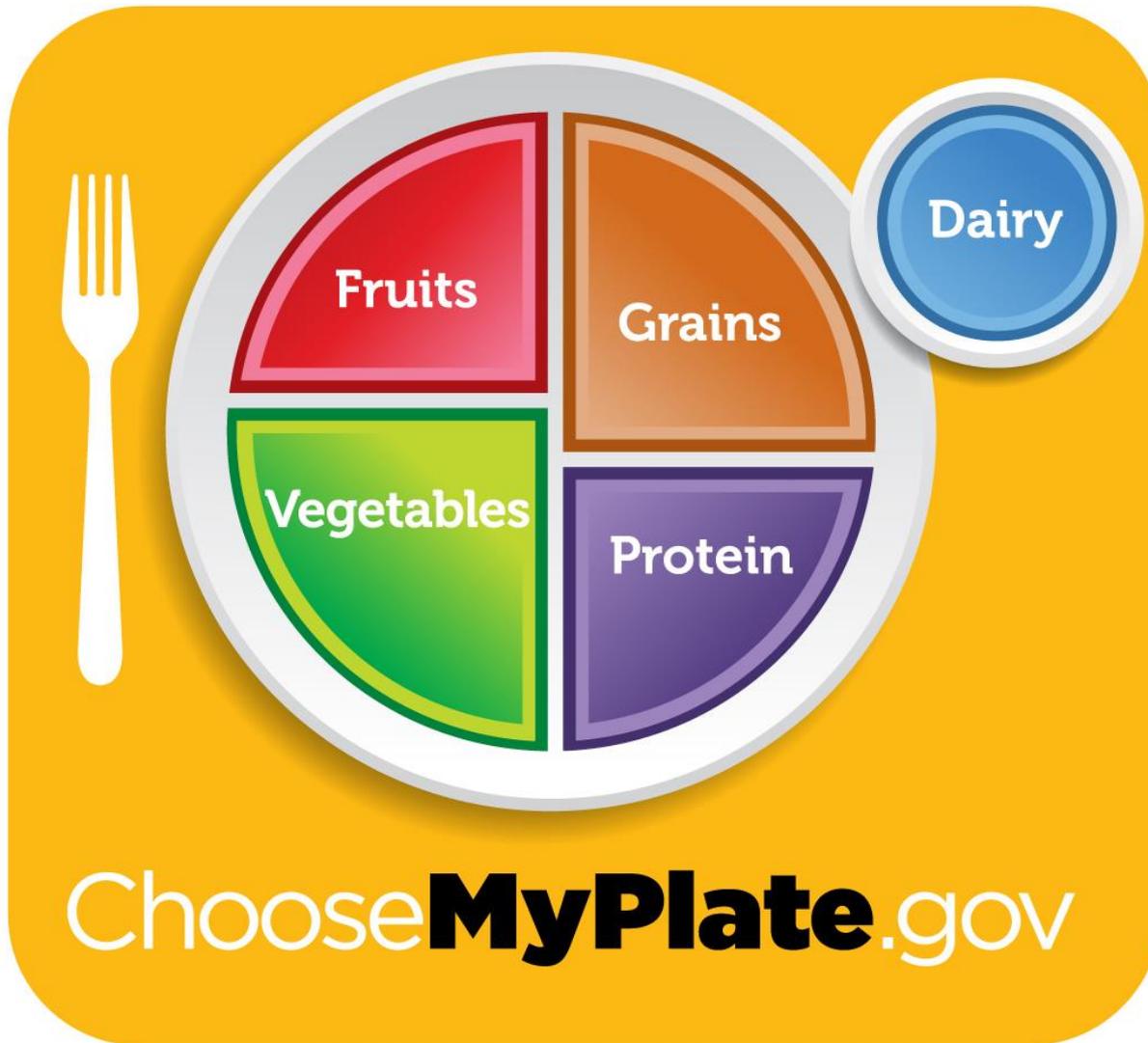
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- Questions?

