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# Managing the Pediatric Diabetes Patient

**0915-1030**  
**10 April 2020**



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# *Learning Objectives*

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At the conclusion of this knowledge-based activity, participants will be able to:

1. Describe the obesity epidemic in the US and the world
2. Define obesity in children and how to make the diagnosis
3. Evaluate a pediatric patient with overweight/obesity for secondary causes and co morbidities
4. Discuss and apply techniques utilizing motivational interviewing in the encounter with an overweight/obese patient
5. Summarize the Primary Care role in the management of the pediatric diabetes patient

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# Managing the Pediatric Obesity Patient



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**Candace Percival, MD**  
**Lieutenant Colonel, USAF, Medical Corps**  
**Medical Director, Healthy Habits Clinic**  
**Program Director, SAUSHEC Pediatrics Residency**  
**San Antonio Military Medical Center**  
**JBSA-Ft Sam Houston, TX**

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# Key Takeaways

- Current height and weight to calculate a BMI; plot BMI percentile
- Focused history/physical exam to evaluate for co-morbidities/ causes of secondary obesity
- Utilize Motivational Interviewing
- Primary care provider has important role in the prevention/ diagnosis/management of obesity in children



<https://www.cdc.gov/obesity/data/obesity-among-WIC-enrolled-young-children.html>

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# Pediatric Obesity: Where do we fit in?



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<http://www.jowohealth.com/2017/11/body-fat-by-measurements.html>

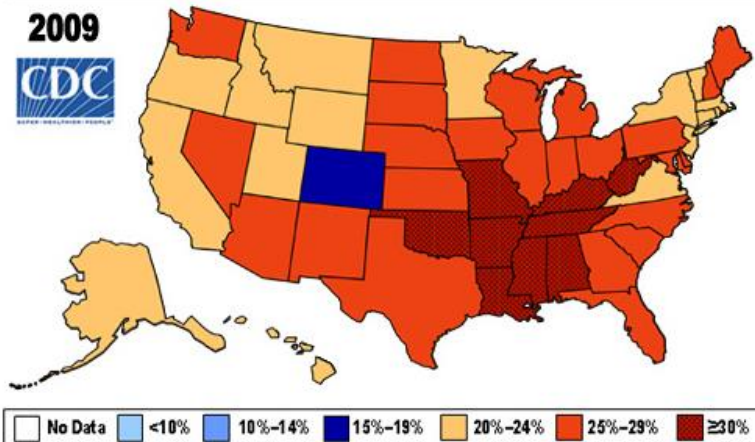
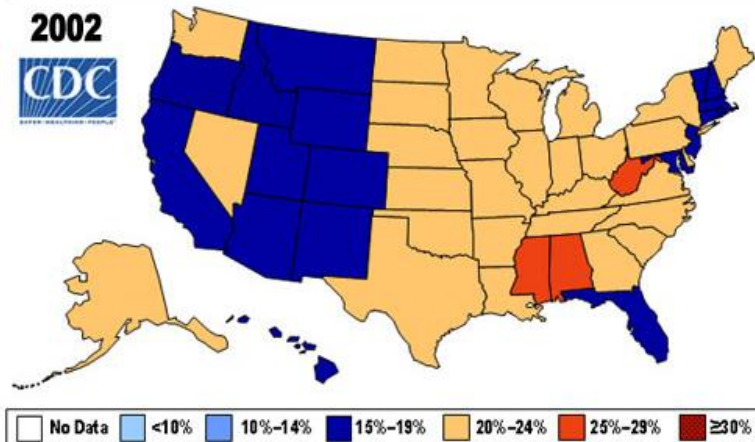
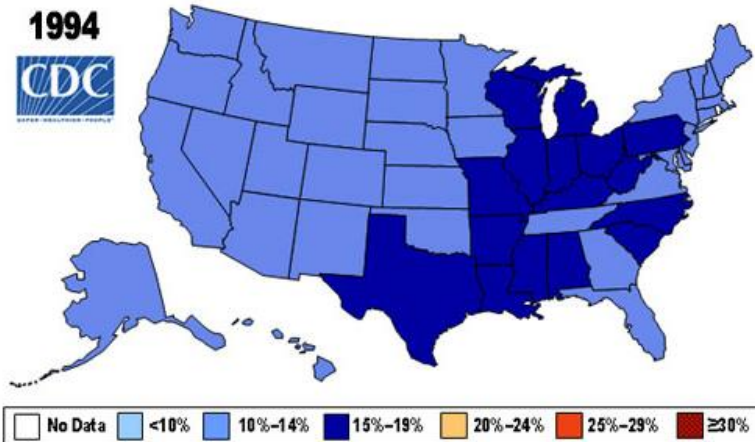
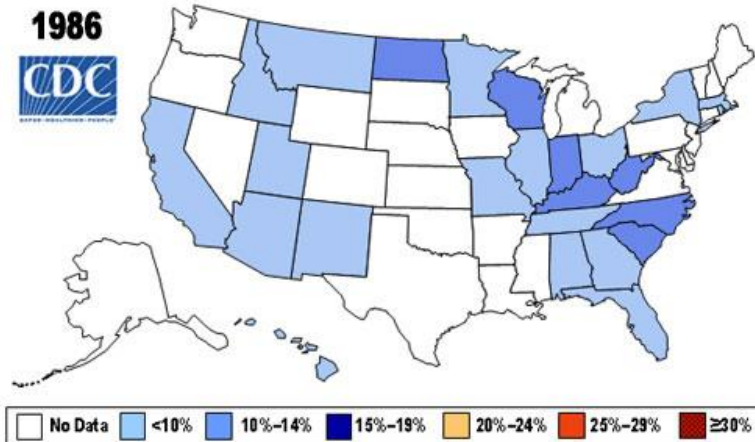




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# Increasing Rates of Obesity



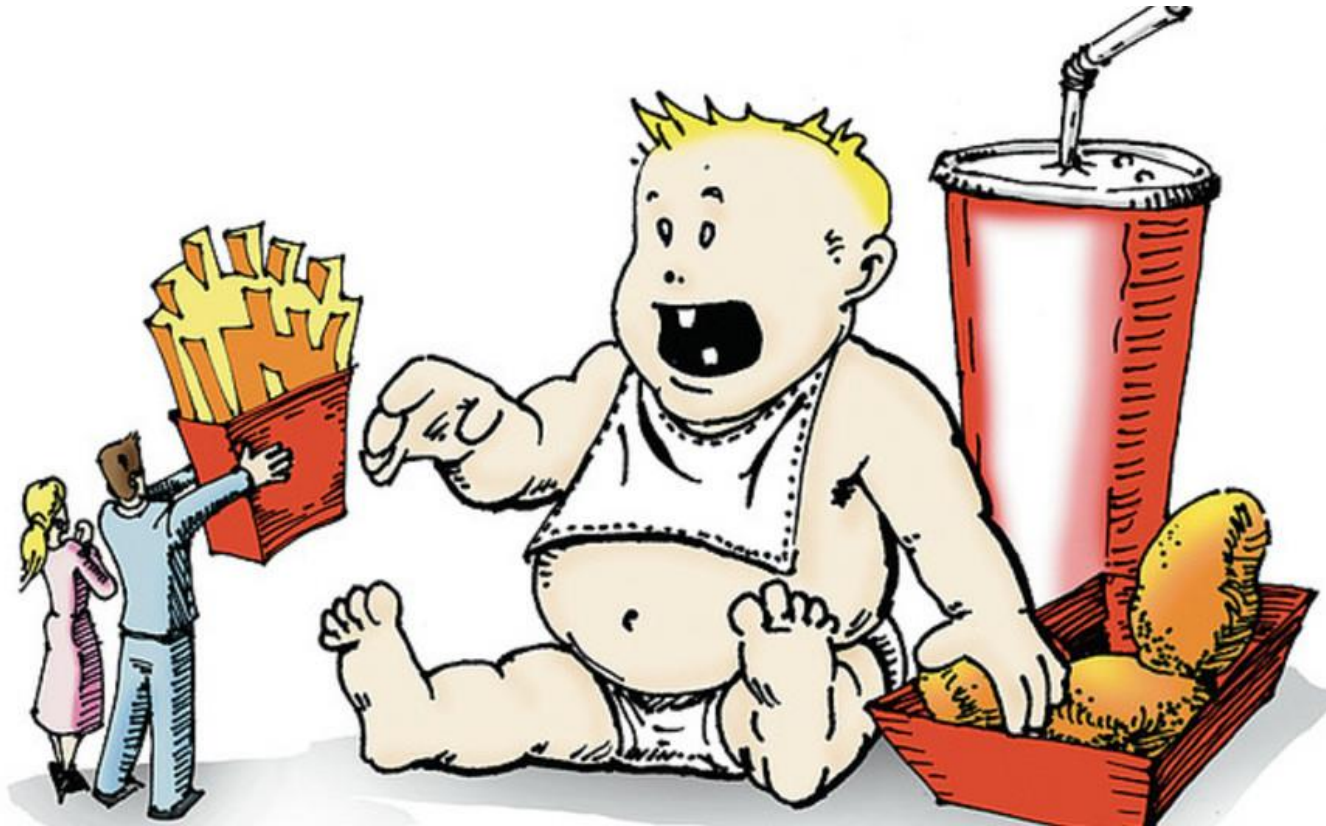
<https://www.cdc.gov/obesity/data/prevalence-maps.html>

## Genetic Link – cell “antenna”



[https://www.google.com/search?q=images+of+childhood+obesity+i+nclip+art&tbn=isch&ved=2ahUKEwiN6LPvtMfnAhXLEVMKHZBrDeQQ2-cCegQIABAA&oq=images+of+childhood+obesity+i+nclip+art&gs\\_l=img.3...21851.25026..26098...0.0..180.1010.11j1..0...1..gws-wiz-img.....0i30.byO\\_U1R2r0w&ei=74VBXs20C8ujzAKQ17WgDg&bih=844&biw=1156&client=firefox-b-1-d#imgcr=g1QCI36q9PcKnM](https://www.google.com/search?q=images+of+childhood+obesity+i+nclip+art&tbn=isch&ved=2ahUKEwiN6LPvtMfnAhXLEVMKHZBrDeQQ2-cCegQIABAA&oq=images+of+childhood+obesity+i+nclip+art&gs_l=img.3...21851.25026..26098...0.0..180.1010.11j1..0...1..gws-wiz-img.....0i30.byO_U1R2r0w&ei=74VBXs20C8ujzAKQ17WgDg&bih=844&biw=1156&client=firefox-b-1-d#imgcr=g1QCI36q9PcKnM)

# Childhood Obesity



[https://www.google.com/search?q=images+of+childhood+obesity+i+nclip+art&tbm=isch&ved=2ahUKEwiN6LPvtMfnAhXLEVMKHZBrDeQQ2-cCegQIABAA&oq=images+of+childhood+obesity+i+nclip+art&gs\\_l=img.3...21851.25026..26098...0.0..0.180.1010.11j1.....0....1..gws-wiz-img.....0i30.byO\\_U1R2r0w&ei=74VBXs20C8ujzAKQ17WgDg&bih=844&biw=1156&client=firefox-b-1-d#imgsrc=PA\\_q8ADdfVeqdM](https://www.google.com/search?q=images+of+childhood+obesity+i+nclip+art&tbm=isch&ved=2ahUKEwiN6LPvtMfnAhXLEVMKHZBrDeQQ2-cCegQIABAA&oq=images+of+childhood+obesity+i+nclip+art&gs_l=img.3...21851.25026..26098...0.0..0.180.1010.11j1.....0....1..gws-wiz-img.....0i30.byO_U1R2r0w&ei=74VBXs20C8ujzAKQ17WgDg&bih=844&biw=1156&client=firefox-b-1-d#imgsrc=PA_q8ADdfVeqdM)

# Childhood Obesity

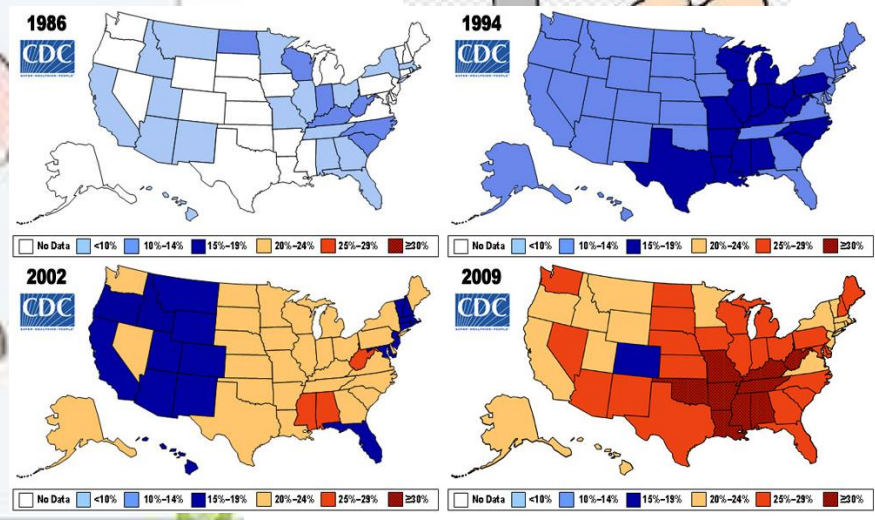
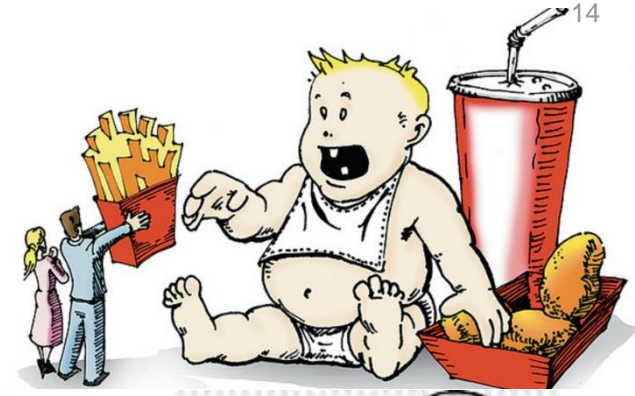


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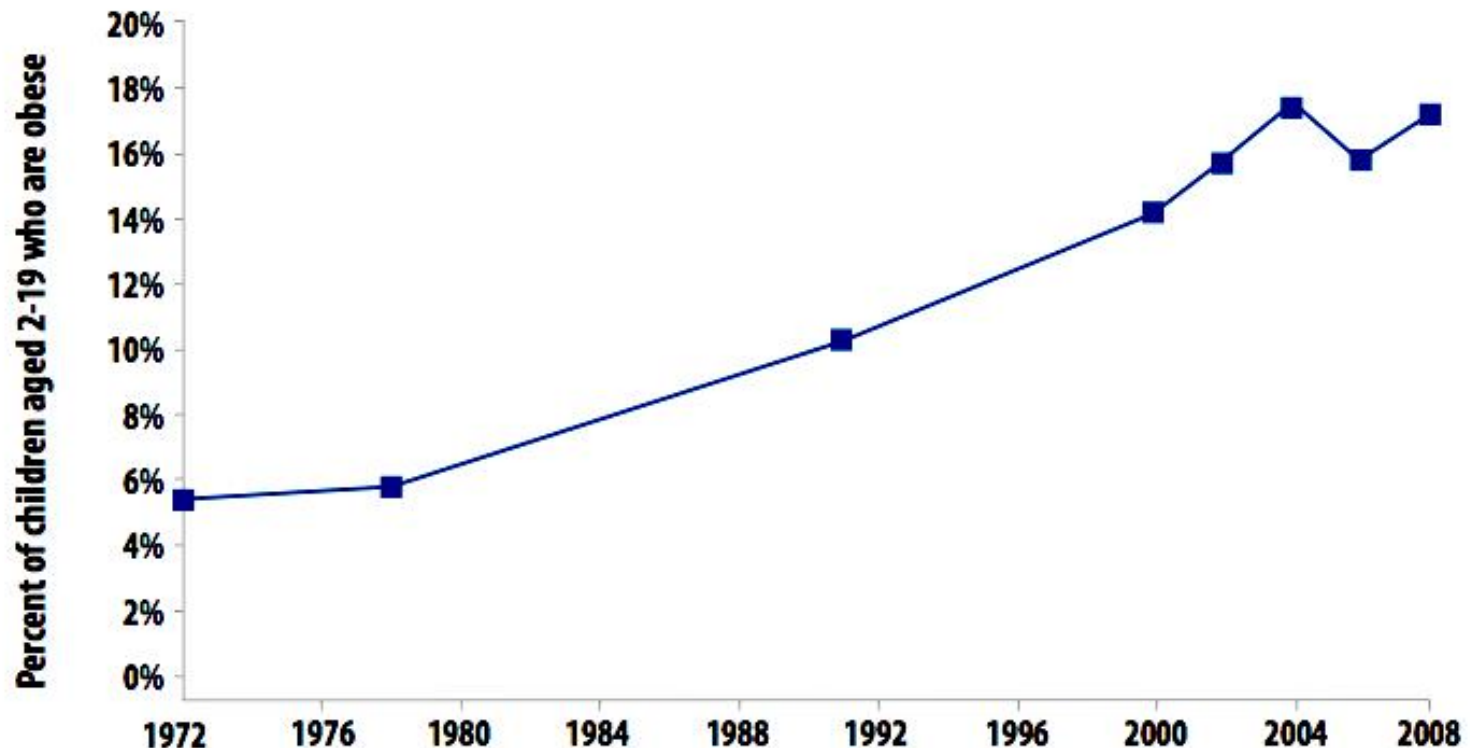


[https://www.google.com/search?q=Clip+art+child+refusing+to+eat+healthy+foods&tbm=isch&ved=2ahUKEwi-lcW\\_usfnAhUKWIMKHVXVDzkQ2-cCegQIABAA&oq=Clip+art+child+refusing+to+eat+healthy+foods&gs\\_l=img.3...126810.143254..144246...2.0..3.111.6610.61j11.....0...1..gws-wiz-img.....10..35i39j0i8i30j35i362i39j0i67j0i10.4hDx\\_IARN1U&ei=1YtBXv7WGYq0zQLVqr\\_IAw&bih=844&biw=1156#imgcr=b64czdAt0yhxZM/](https://www.google.com/search?q=Clip+art+child+refusing+to+eat+healthy+foods&tbm=isch&ved=2ahUKEwi-lcW_usfnAhUKWIMKHVXVDzkQ2-cCegQIABAA&oq=Clip+art+child+refusing+to+eat+healthy+foods&gs_l=img.3...126810.143254..144246...2.0..3.111.6610.61j11.....0...1..gws-wiz-img.....10..35i39j0i8i30j35i362i39j0i67j0i10.4hDx_IARN1U&ei=1YtBXv7WGYq0zQLVqr_IAw&bih=844&biw=1156#imgcr=b64czdAt0yhxZM/)



# Childhood Obesity

## Growth in Childhood Obesity, 1971 to Present

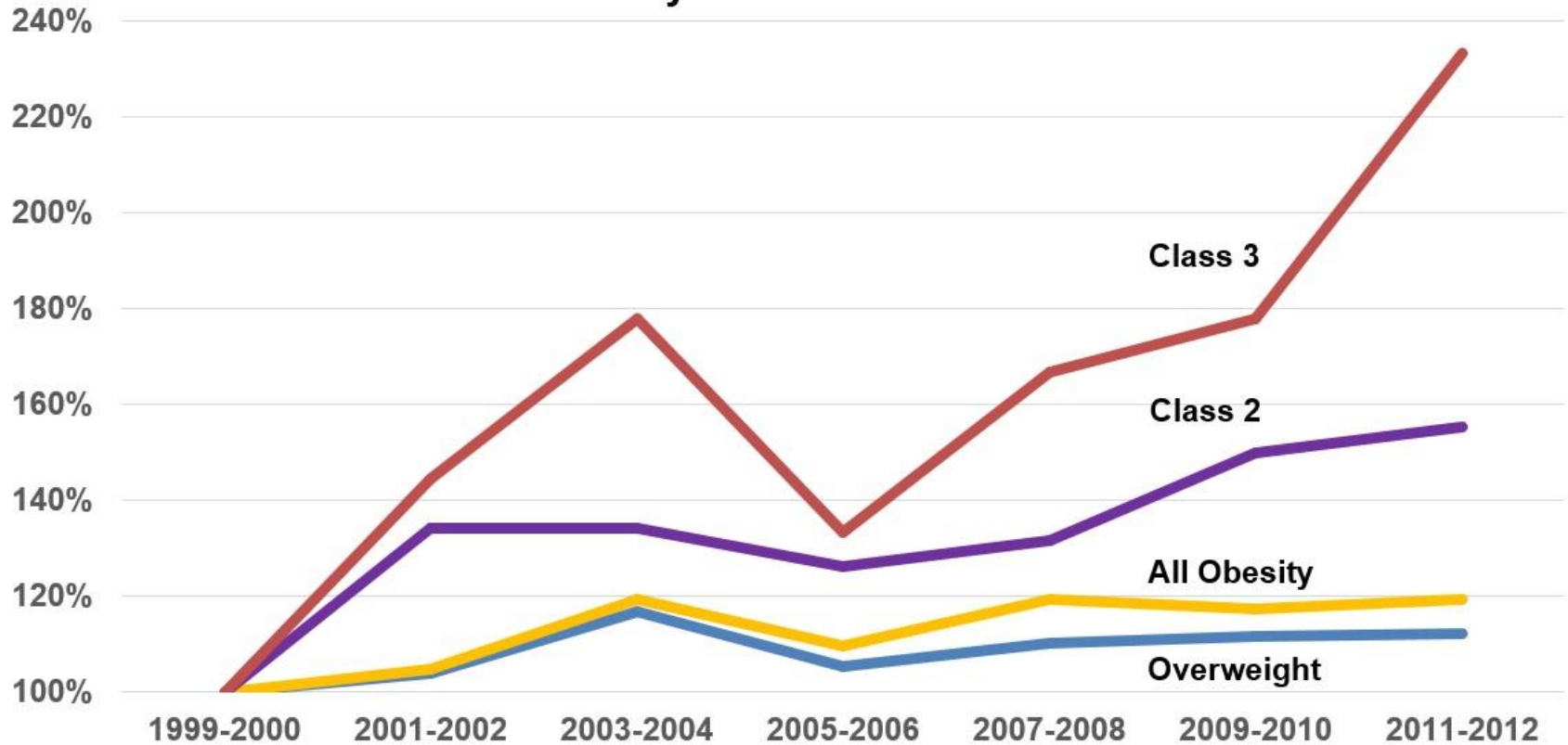


Source: CDC, National Center for Health Statistics, National Health and Nutrition Examination Surveys.

Note: Obesity is defined as BMI  $\geq$  gender- and weight-specific 95th percentile from the 2000 CDC Growth Charts

# Rates of Childhood Obesity

## Growth in Childhood Obesity Rates



Adapted from: <https://jamanetwork.com/journals/jamapediatrics/fullarticle/1856480>

Prevalence and Trends in Obesity and Severe Obesity Among Children in the United States, 1999-2012

[Asheley Cockrell Skinner, PhD<sup>1</sup>](#); [Joseph A. Skelton, MD, MS<sup>2,3</sup>](#)

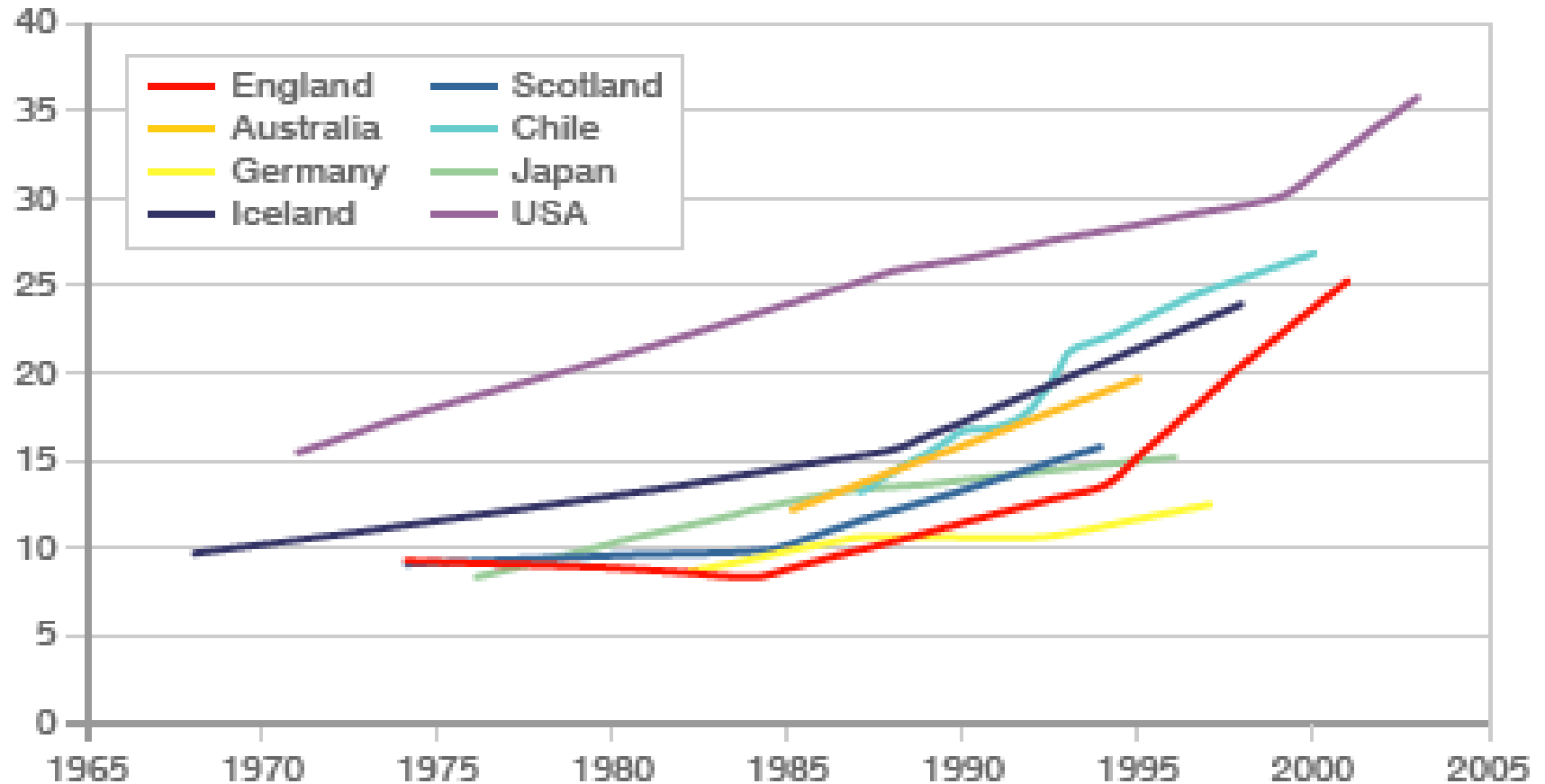
JAMA Pediatr. 2014;168(6):561-566. doi:10.1001/jamapediatrics.2014.21



# Rates of Childhood Obesity

## INCREASING NUMBER OF OVERWEIGHT CHILDREN AROUND THE WORLD

Percentage overweight

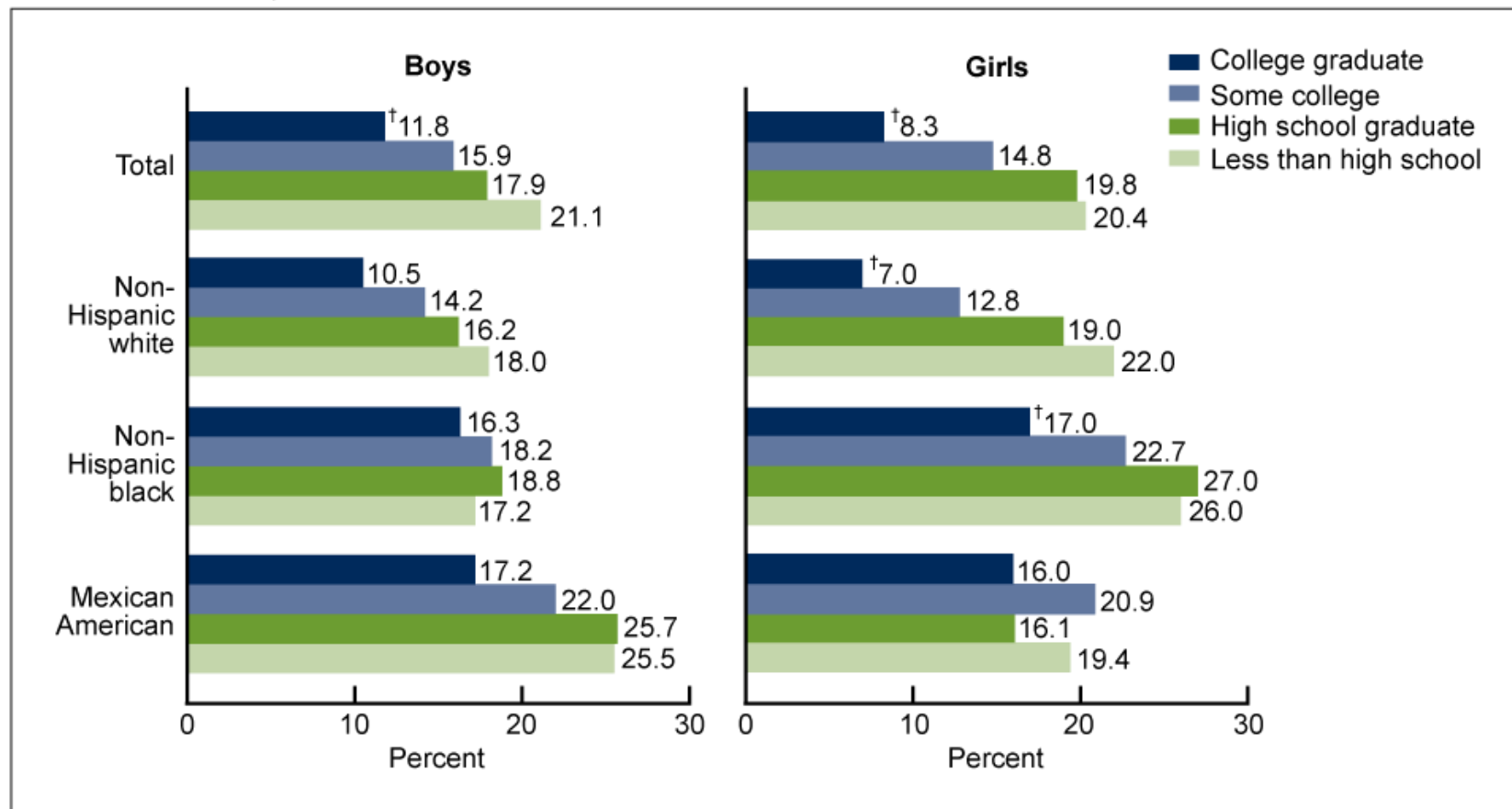


SOURCE: Government Office for Science

<http://www.dietexerciseyoga.com/wp-content/uploads/2012/11/ob-child.png>

# Rates of Childhood Obesity

Figure 3. Prevalence of obesity among children and adolescents aged 2–19 years, by education of household head, sex, and race and ethnicity: United States, 2005–2008

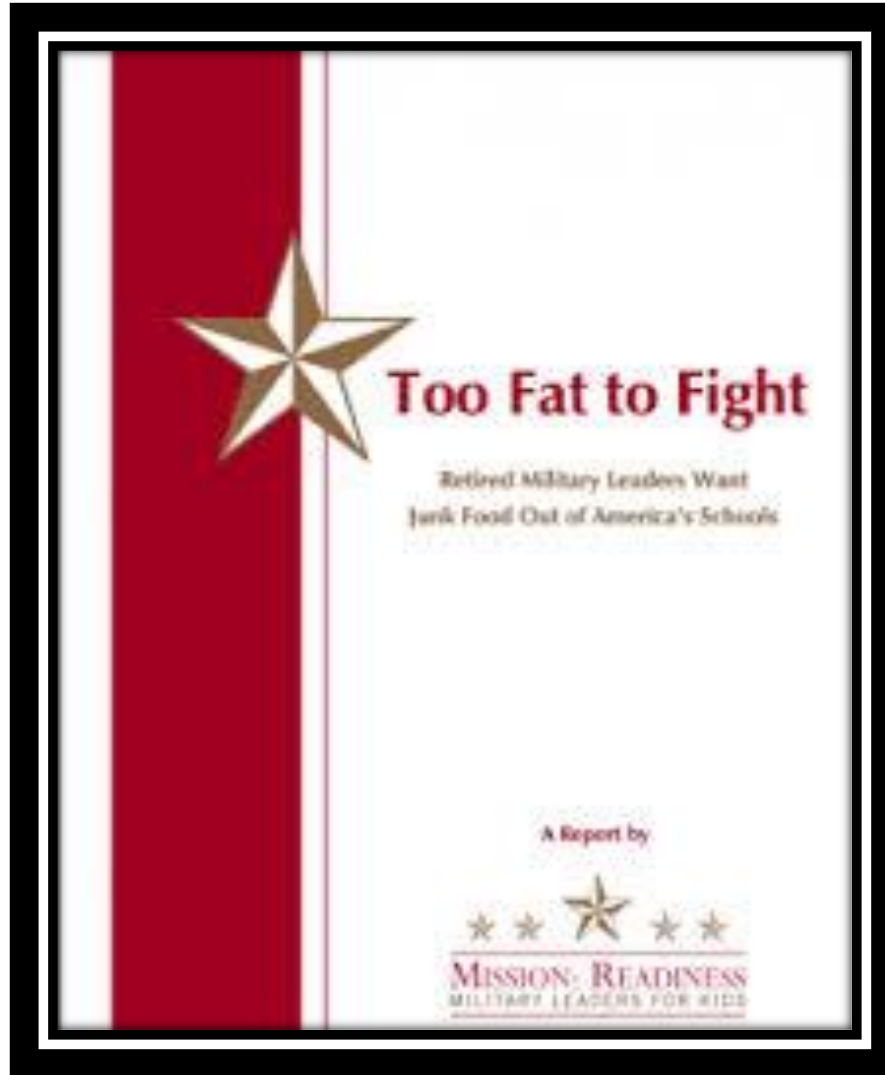


†Significant trend.

NOTE: Persons of other race and ethnicity included in total.

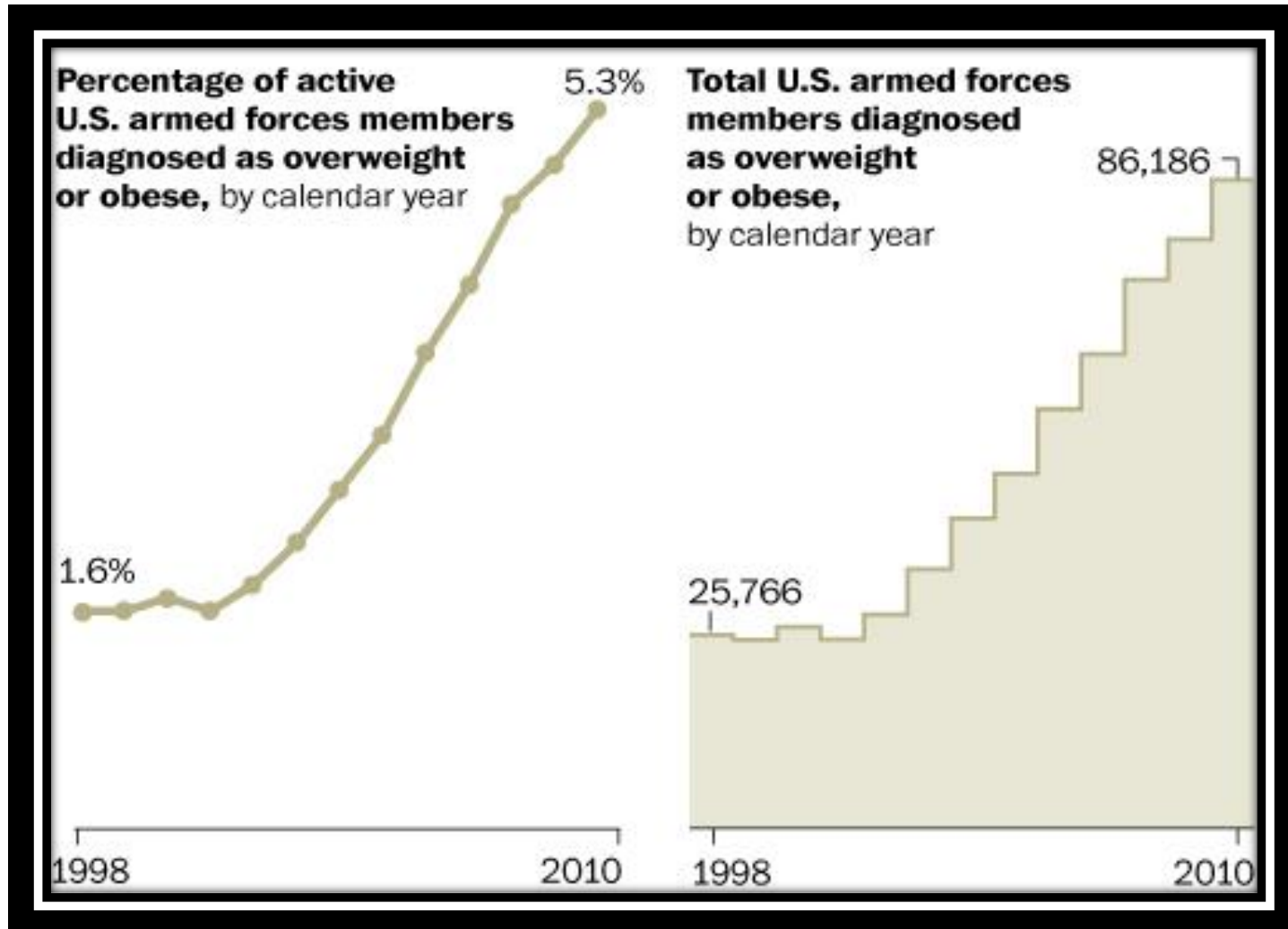
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2005–2008.

# *Too Fat to Fight*



Too Fat to Fight: The Military Urges America to Slim Down So It Can Suit Up, The Solutions Journal, Volume 1, Issue 4, July 2010.  
<https://www.thesolutionsjournal.com/article/too-fat-to-fight-the-military-urges-america-to-slim-down-so-it-can-suit-up/>

# Too Fat to Fight



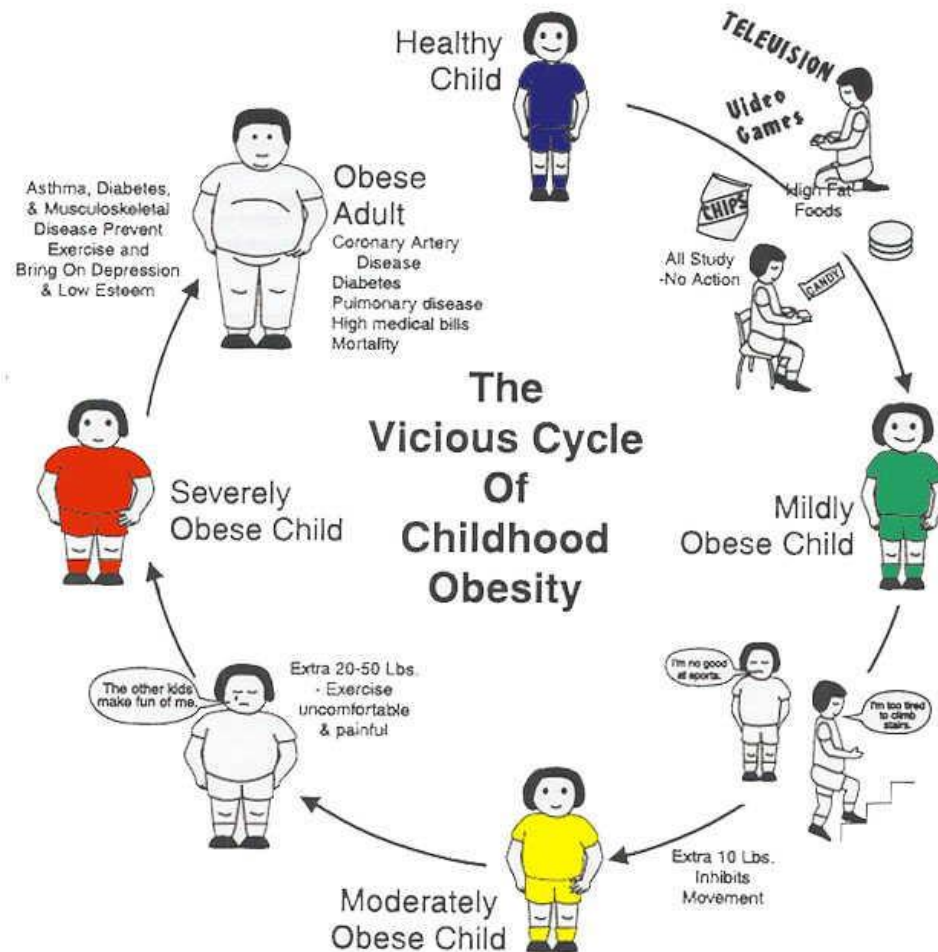
[https://sites.psu.edu/mszczesniateportfolio/obesity-issue-brief/#\\_edn14](https://sites.psu.edu/mszczesniateportfolio/obesity-issue-brief/#_edn14)

# *Why the Sudden Change?*

- Human physiology is skewed towards conservation of energy, hence weight gain
- Sedentary lifestyle
  - Little exercise
  - Lots of screen time!
- Energy dense diet
  - Natural preference for “rapid energy”
  - Food that is easy, available, and advertised
- Genetic influence
  - Polygenic changes common
  - Epigenetics (“grammar” vs. “letters”)

[Int J Obes \(Lond\)](#). 2015 Aug; 39(8): 1188–1196. 2015 May 26.doi: [10.1038/ijo.2015.59](https://doi.org/10.1038/ijo.2015.59)

# Cycle of Childhood Obesity



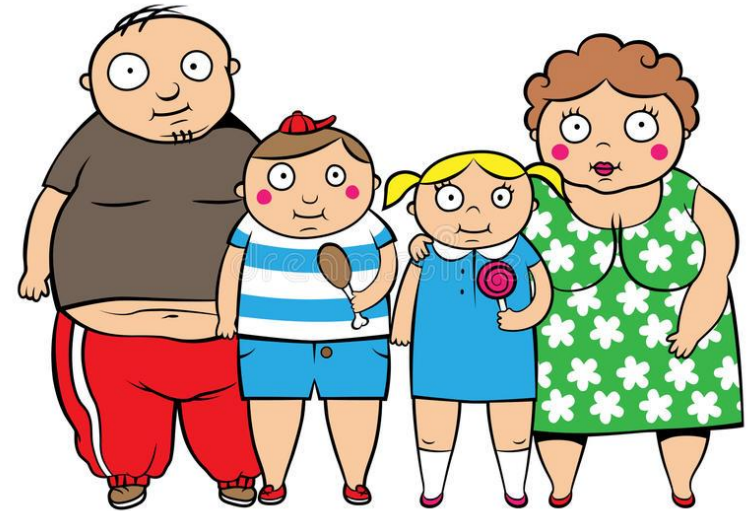
# *Why is this so important?*

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Obesity and associated comorbidities have become a:

- Threat to Economic Well-Being
- Threat to National Security
- Threat to Life Expectancy/Quality
- Alterations in Epigenetics
  - Threat to Future Generations

**This is the first generation of US children expected to have a shorter life spans than their parents.**



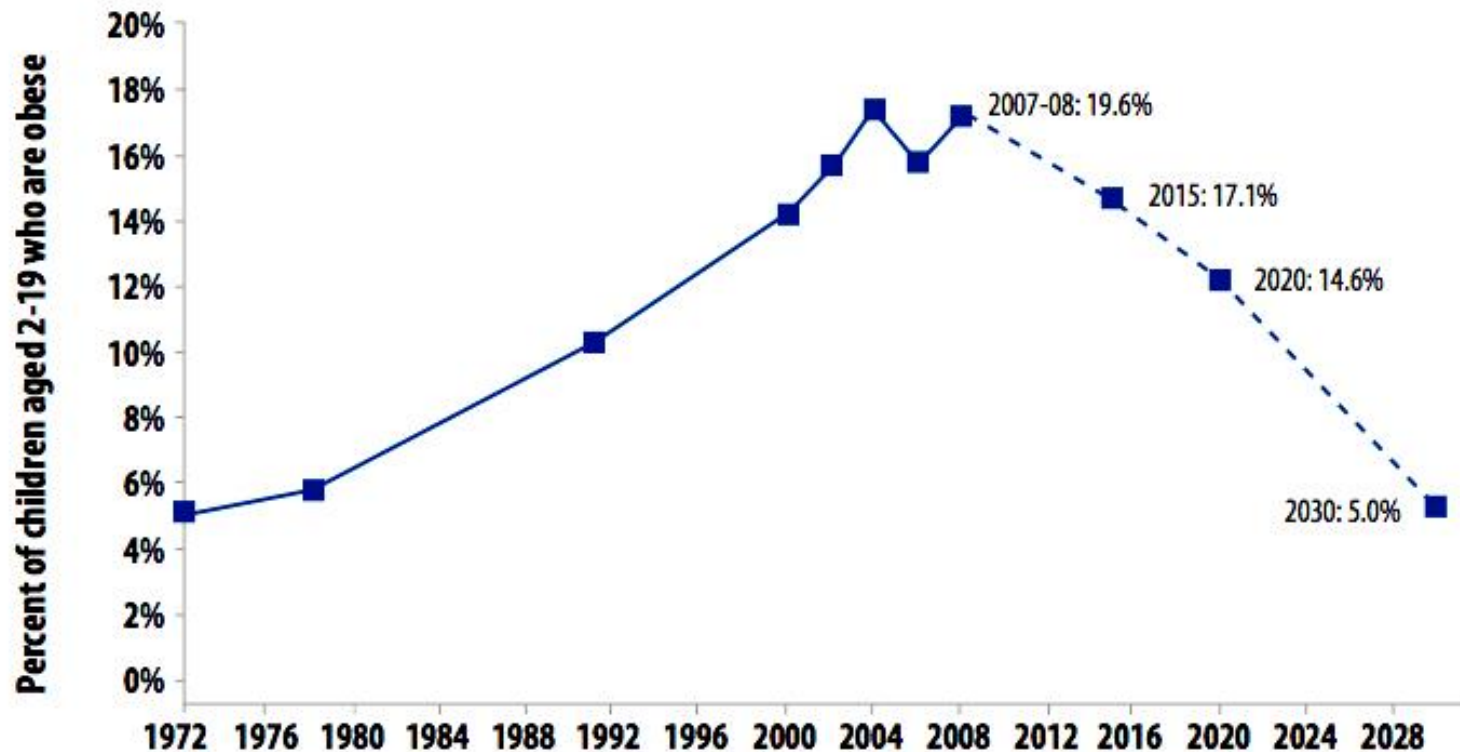
[https://www.google.com/search?q=Clip+art+Obese+child+walking+with+parents&tbm=isch&ved=2ahUKEwjJi7LZw8fnAhWFLVMKHVgkAUcQ2-cCegQIABAA&oq=Clip+art+Obese+child+walking+with+parents&gs\\_l=img.12...45750.52038..54540...0.0..0.111.585.6j1.....0....1..gws-wiz-img.....35i39.QQsUbnVw7SA&ei=e5VBXonilYXbzALYlS4BA&bih=844&biw=1156#imgrc=RftHAqcq3uZ6NM/](https://www.google.com/search?q=Clip+art+Obese+child+walking+with+parents&tbm=isch&ved=2ahUKEwjJi7LZw8fnAhWFLVMKHVgkAUcQ2-cCegQIABAA&oq=Clip+art+Obese+child+walking+with+parents&gs_l=img.12...45750.52038..54540...0.0..0.111.585.6j1.....0....1..gws-wiz-img.....35i39.QQsUbnVw7SA&ei=e5VBXonilYXbzALYlS4BA&bih=844&biw=1156#imgrc=RftHAqcq3uZ6NM/)

N Engl J Med Vol. 352(11) March 2005.



# Childhood Obesity

## Bending the Curve: Childhood Obesity, 1972 to 2030



Source: CDC, National Center for Health Statistics, National Health and Nutrition Examination Surveys.  
Note: Obesity is defined as BMI  $\geq$  gender- and weight-specific 95th percentile from the 2000 CDC Growth Charts.

# Barriers to Discussing and Treating Obesity

- Only 30% providers feel good-to-excellent at providing obesity counseling
- Only 10% feel obesity counseling is effective
- Time consuming
- Poor reimbursement
- Patients/parents not motivated to change
- Parents - not concerned
- Families often eat fast food
- Families don't exercise
- Families watch too much TV



[https://www.google.com/search?q=Clip+art+person+with+fingers+plugging+ears&tbm=isch&ved=2ahUKEwiP-fvzw8fnAhUH1MKHRV7CQcQ2-cCegQIABAA&oq=Clip+art+person+with+fingers+plugging+ears&gs\\_l=img...264106.283398..284615...6.0..2.139.5539.67j3.....0....1..gws-wiz-img.....35i39j0i8i30j0i8i10i30j0i5i10i30.2k7A0a12FEE&ei=s5VBXs\\_TEYeezwKV9qU4&bih=844&biw=1156](https://www.google.com/search?q=Clip+art+person+with+fingers+plugging+ears&tbm=isch&ved=2ahUKEwiP-fvzw8fnAhUH1MKHRV7CQcQ2-cCegQIABAA&oq=Clip+art+person+with+fingers+plugging+ears&gs_l=img...264106.283398..284615...6.0..2.139.5539.67j3.....0....1..gws-wiz-img.....35i39j0i8i30j0i8i10i30j0i5i10i30.2k7A0a12FEE&ei=s5VBXs_TEYeezwKV9qU4&bih=844&biw=1156)

- What is the definition of obesity in pediatric patients >2 years of age?
  - A. BMI > 25
  - B. BMI percentile  $\geq$  95% for age/gender
  - C. BMI percentile  $\geq$  85% for age/gender
  - D. BMI percentile  $\geq$  90% for age/gender
  - E. BMI > 30

# What is Pediatric Obesity?

## Defined based on BMI

- Metric
  - $BMI = kg \div m^2$
- English
  - $BMI = lbs \div in^2 \times 703$
- BMI and BMI Percentile should be calculated at **EVERY VISIT!**

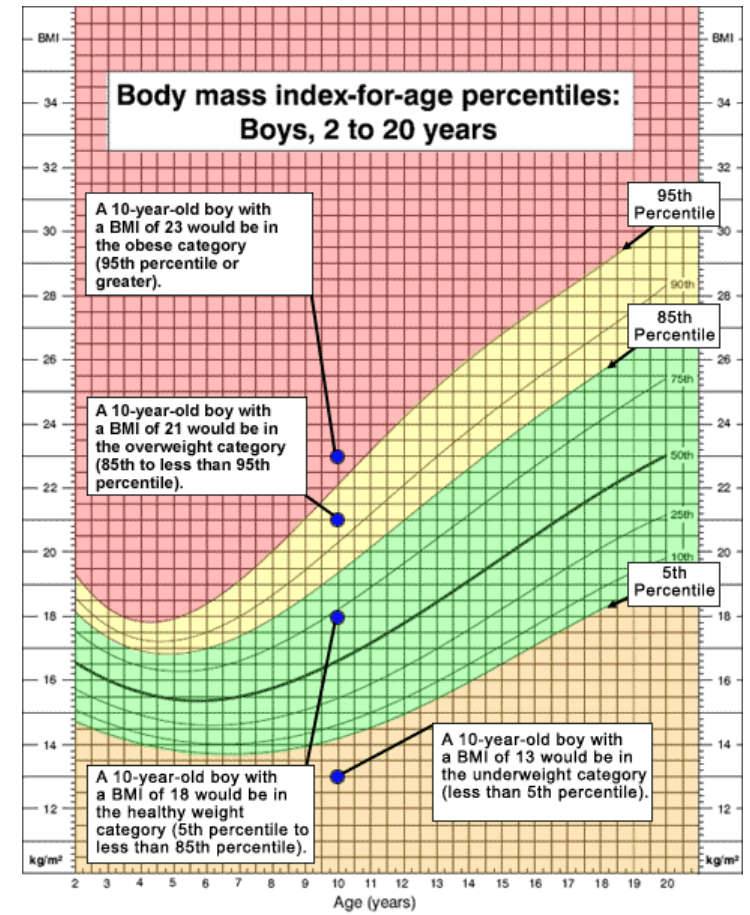
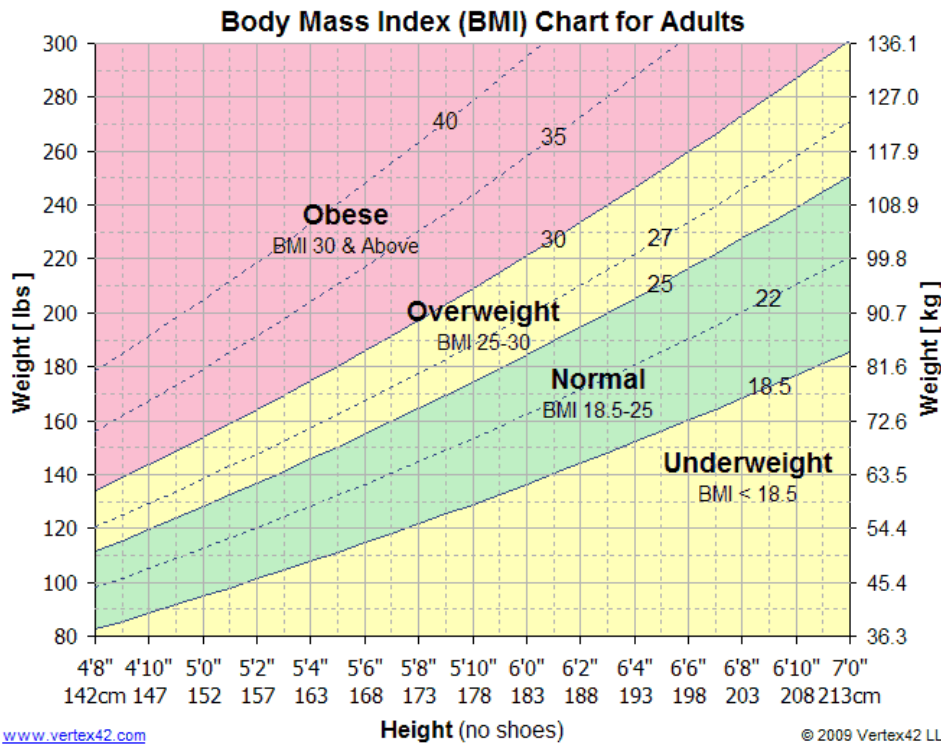


[https://www.cdc.gov/nccdphp/dnpao/growthcharts/training/bmiage/page5\\_1.html](https://www.cdc.gov/nccdphp/dnpao/growthcharts/training/bmiage/page5_1.html)

# BMI Terminology

BMI Category	Former Terminology	Recommended Terminology
<5 <sup>th</sup> percentile	<i>Underweight</i>	<b>Underweight</b>
5 <sup>th</sup> – 84 <sup>th</sup> percentile	<i>Healthy weight</i>	<b>Healthy weight</b>
85 <sup>th</sup> – 94 <sup>th</sup> percentile	<i>At risk for overweight</i>	<b>Overweight</b>
≥95 <sup>th</sup> percentile	<i>Overweight or Obesity</i>	<b>Obesity</b>
≥120% x 95 <sup>th</sup> percentile (BMI > 35)	<i>Morbid Obesity</i>	<b>Class 2 Obesity</b>
≥140% x 95 <sup>th</sup> percentile (BMI > 40)	<i>Morbid Obesity</i>	<b>Class 3 Obesity</b>

# BMI vs BMI Percentile



Centers for Disease Control and Prevention (CDC) Growth Charts for male and female children ([www.cdc.gov/growthcharts/](http://www.cdc.gov/growthcharts/))

# BMI Percentile in AHLTA

- BMI/BMI percentiles are automatically calculated in AHLTA
- Enter height/weight on vitals screen
- BMI will be calculated

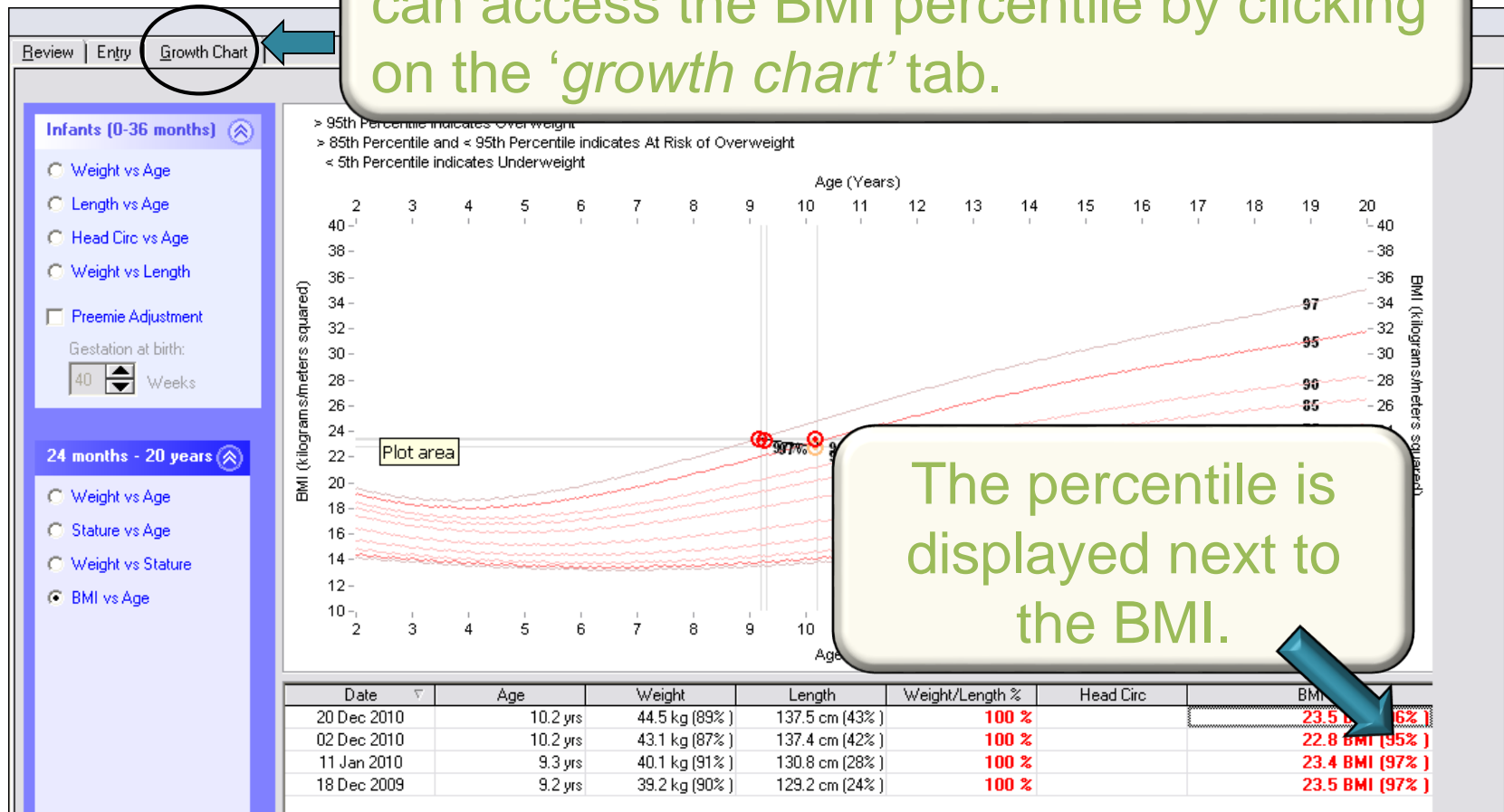
The screenshot shows the AHLTA interface for entering vital signs. The 'Entry' tab is selected. The date and time are set to 20 Dec 2010 13:35. There are checkboxes for 'Visual Acuity' and 'Oxygen'. The 'Standard Vital Signs' section includes fields for BP, HR, RR, and Temperature. The 'Height/Weight' section has input fields for Height (Ht) and Weight (Wt) in both imperial and metric units. The BMI is calculated and displayed as 23.5. The BSA is also calculated and displayed as 44.5. The 'Habits' section includes radio buttons for Tobacco and Alcohol.

Field	Value
Date	20 Dec 2010 13:35
BP	
HR	
RR	
Temperature	
Ht (in)	54.1
Ht (cm)	137.5
Wt (lbs)	97.9
Wt (kg)	44.5
BMI	23.5
BSA	44.5



# BMI Percentile is what matters!!!

After height and weight are entered you can access the BMI percentile by clicking on the 'growth chart' tab.



The percentile is displayed next to the BMI.

<https://www.cdc.gov/nccdphp/dnpa/growthcharts/training/modules/module1/text/module1print.pdf>



- All of these comorbidities, with the exception of \_\_\_\_\_, are associated with obesity?
  - A. Polycystic Ovarian Syndrome
  - B. Thrombocytopenia
  - C. Depression
  - D. Blount Disease
  - E. Vitamin D Insufficiency

# Look for Co-Morbidities

- T2DM
- Insulin Resistance
- PCOS
- Metabolic syndrome
- Hypertension
- Dyslipidemia
- Gallbladder disease
- GERD
- NAFLD
- Pseudotumor Cerebri
- Vitamin D insufficiency
- Joint pain
- SCFE
- Blount Disease
- Sleep Apnea
- Social stigma
- Eating Disorder
- Depression
- Early Death

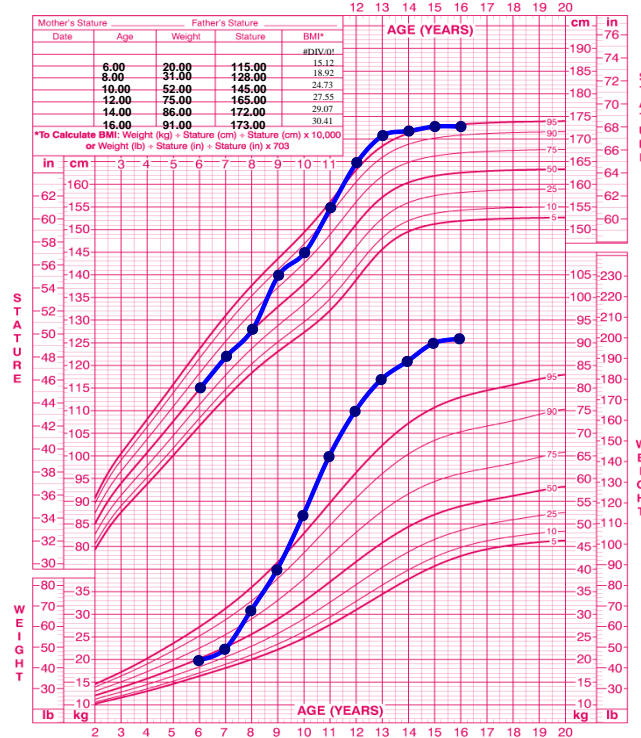
Pulgarón, E. R. (2013). Childhood Obesity: A Review of Increased Risk for Physical and Psychological Co-morbidities. *Clinical Therapeutics*, 35(1), A18–A32. <http://doi.org/10.1016/j.clinthera.2012.12.014>

# *Physical Exam Findings*

- Acanthosis Nigricans
- Skin tags
- Striae
- Adipose distribution
- Buffalo Hump
- Moon facies
- Proximal Muscle weakness
- Blurred optic discs
- Hirsutism
- Dysmorphism
- Genital exam/Tanner Stage
- Hepatomegaly
- Thyroid exam
- Gait

## Exogenous Cause

2 to 20 years: Girls  
Stature-for-age and Weight-for-age percentiles



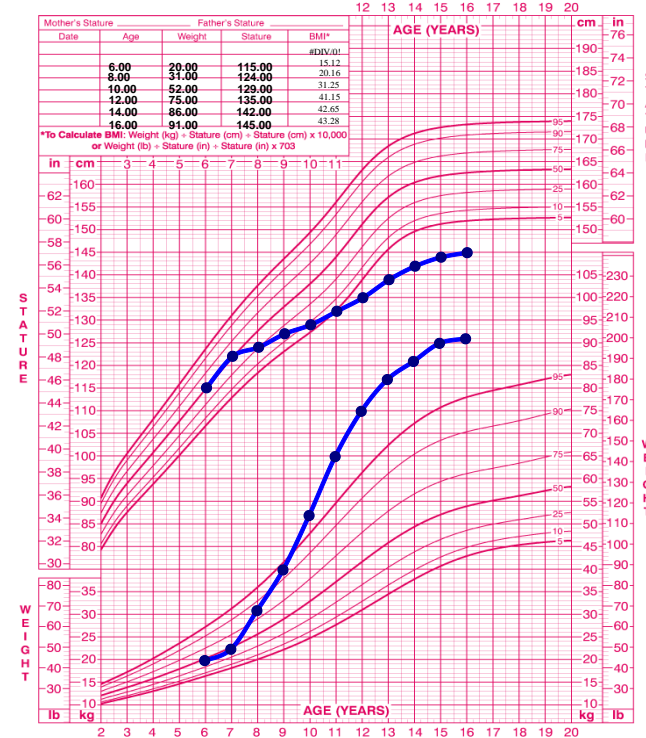
Published May 30, 2000 (modified 11/21/00).  
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).  
<http://www.cdc.gov/orowthcharts>



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## Endogenous Cause

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Published May 30, 2000 (modified 11/21/00).  
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).  
<http://www.cdc.gov/orowthcharts>



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- The American Academy of Pediatrics (AAP) recommends the following lab tests for a pediatric patient with obesity?
  - A. Fasting Insulin, glucose, and lipid profile
  - B. Fasting glucose, lipid profile, and A1c
  - C. Fasting glucose, lipid profile, and liver function tests (AST, ALT)
  - D. Fasting glucose, insulin, lipid profile, TSH, fT4, Vitamin D
  - E. No labs recommended

**TABLE 8** Laboratory Assessments to be Considered in Primary Care Settings

BMI	Tests
>85th–94th percentile, with no risk factors	Fasting lipid levels
>85th–94th percentile, with risk factors (eg, family history of obesity-related diseases, elevated blood pressure, elevated lipid levels, or tobacco use)	Fasting lipid levels, AST and ALT levels, and fasting glucose levels
≥95th percentile	Fasting lipid levels, AST and ALT levels, and fasting glucose levels

AST indicates aspartate aminotransferase; ALT, alanine aminotransferase.

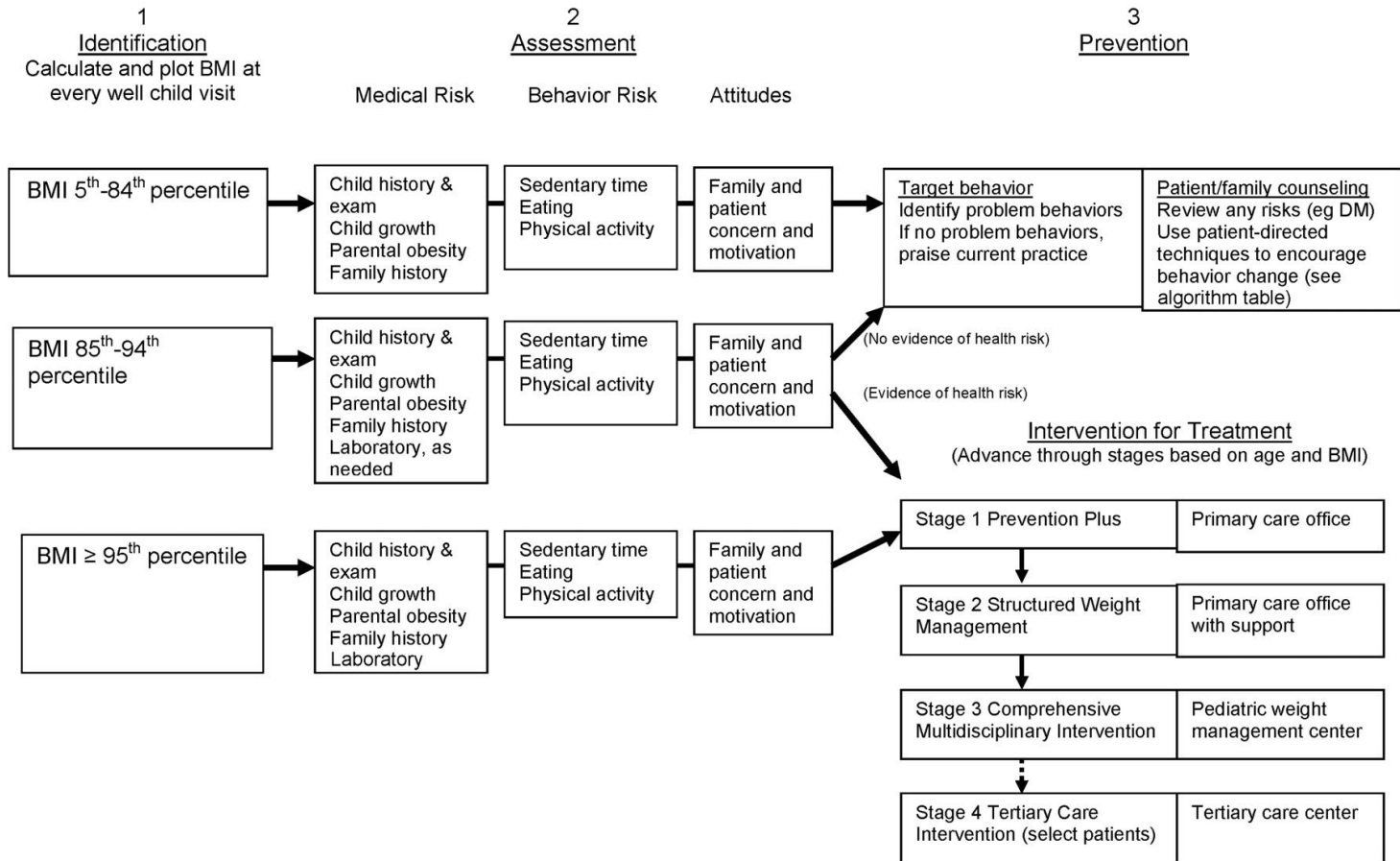
- Others to consider: Fasting insulin, FSH/LH, testosterone, TSH/fT4, 24h UFC, A1c, 25 OH Vit D, CO2, 17-OHP, DHEA-S, OGTT, genetics (MC4R, PWS)

Styne DM, et al. (2017). Pediatric Obesity—Assessment, Treatment, and Prevention: An Endocrine Society Clinical Practice Guideline, *J Clin Endocrinol Metab.* 102 (3), 709–757.

# Indications for Referral

- Cardiologist
  - Abnormal EKG
  - Exertion symptoms
- Gastroenterologist
  - Abnormal LFTs
  - Hepatomegaly
- Nephrologist
  - Hypertension
- Genetics
  - Dysmorphic appearance
  - Very early accelerated weight gain
- Sleep Medicine
  - Snoring
- Endocrinologist
  - Hyperlipidemia
  - PCOS
    - Hirsutism,  
Oligomenorrhea
  - Precocious Puberty
  - Goiter
  - **Diabetes Mellitus**
    - ***ALWAYS URGENT IN PEDIATRICS***

# Identification → Risk Assessment





# BAMC Pediatric Obesity CPG

## BAMC Pediatric Obesity CPG

1. Obtain weight-for-length in all clinical encounters (ages 0-23 months)
  - a. Naked weight should be obtained and Length should be obtained in the supine position
2. Obtain body mass index (BMI) in all clinical encounters (ages 2-18y)
  - a. Wall-mounted stadiometer should be used for standing height when possible

### Determine Weight Classification and Activity

- Identify if child is at-risk or already overweight/obese, including weight/BMI trajectory over time

#### <2 years Use the WHO Growth Chart

Weight for Length

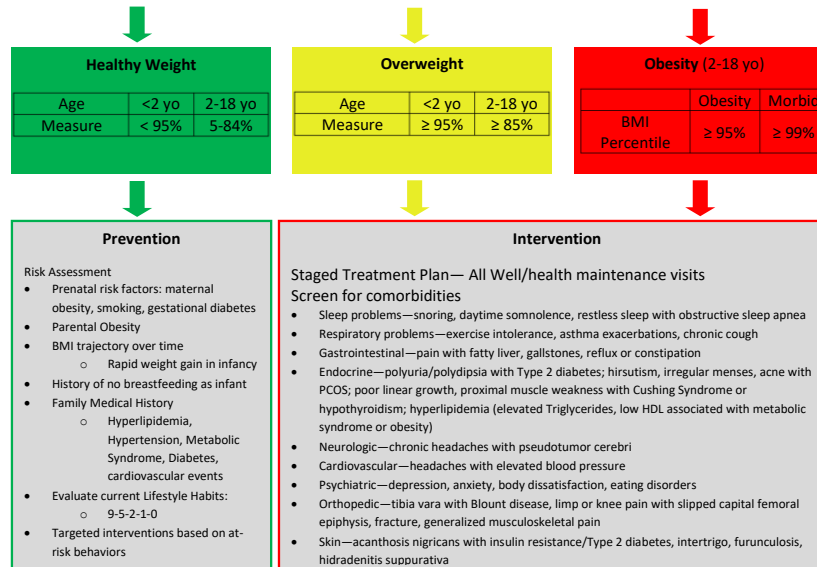
<http://www.cdc.gov/growthcharts/>

#### 2- 18 years Use the CDC Growth Chart

BMI Percentile

<http://www.cdc.gov/growthcharts/>

- Assess child's overall health
- Do not rely on visual impression of weight
- Review BMI trajectory over time
- May conclude child is overweight, but not "overfat"
  - Rare for child with BMI  $\geq 95\%$
  - Child may be "healthy weight", but have still have health risks
- Share conclusions/diagnosis with patient/parent
- Paste BMI Percentile Growth Curve or Weight-for-Length Growth Curve into clinic encounter



# BAMC Pediatric Obesity CPG

## BAMC Pediatric Obesity CPG

1. Obtain weight-for-length in all clinical encounters (ages 0-23 months)
  - a. Naked weight should be obtained and Length should be obtained in the supine position
2. Obtain body mass index (BMI) in all clinical encounters (ages 2-18y)
  - a. Wall-mounted stadiometer should be used for standing height when possible

### Determine Weight Classification and Activity

- Identify if child is at-risk or already overweight/obese, including weight/BMI trajectory over time

**<2 years Use the WHO Growth Chart**

Weight for Length

<http://www.cdc.gov/growthcharts/>

**2- 18 years Use the CDC Growth Chart**

BMI Percentile

<http://www.cdc.gov/growthcharts/>

- Assess child's overall health
- Do not rely on visual impression of weight
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# BAMC Pediatric Obesity CPG

## Healthy Weight

Age	<2 yo	2-18 yo
Measure	< 95%	5-84%

## Overweight

Age	<2 yo	2-18 yo
Measure	≥ 95%	≥ 85%

## Obesity (2-18 yo)

	Obesity	Morbid
BMI Percentile	≥ 95%	≥ 99%



## Prevention

### Risk Assessment

- Prenatal risk factors: maternal obesity, smoking, gestational diabetes
- Parental Obesity
- BMI trajectory over time
  - Rapid weight gain in infancy
- History of no breastfeeding as infant
- Family Medical History
  - Hyperlipidemia, Hypertension, Metabolic Syndrome, Diabetes, cardiovascular events
- Evaluate current Lifestyle Habits:
  - 9-5-2-1-0
- Targeted interventions based on at-risk behaviors



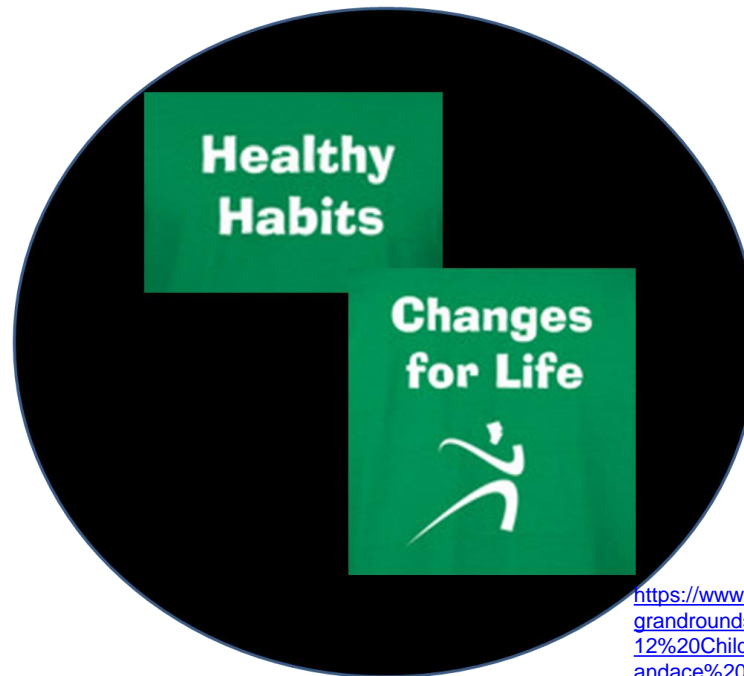
## Intervention

### Staged Treatment Plan— All Well/health maintenance visits Screen for comorbidities

- Sleep problems—snoring, daytime somnolence, restless sleep with obstructive sleep apnea
- Respiratory problems—exercise intolerance, asthma exacerbations, chronic cough
- Gastrointestinal—pain with fatty liver, gallstones, reflux or constipation
- Endocrine—polyuria/polydipsia with Type 2 diabetes; hirsutism, irregular menses, acne with PCOS; poor linear growth, proximal muscle weakness with Cushing Syndrome or hypothyroidism; hyperlipidemia (elevated Triglycerides, low HDL associated with metabolic syndrome or obesity)
- Neurologic—chronic headaches with pseudotumor cerebri
- Cardiovascular—headaches with elevated blood pressure
- Psychiatric—depression, anxiety, body dissatisfaction, eating disorders
- Orthopedic—tibia vara with Blount disease, limp or knee pain with slipped capital femoral epiphysis, fracture, generalized musculoskeletal pain
- Skin—acanthosis nigricans with insulin resistance/Type 2 diabetes, intertrigo, furunculosis, hidradenitis suppurativa



## Healthy Habits Curriculum



[https://www.pediatrics.uthscsa.edu/grandrounds/handouts/2014-12-12%20Childhood%20Obesity%20\(Candace%20Percival,%20MD\).pdf](https://www.pediatrics.uthscsa.edu/grandrounds/handouts/2014-12-12%20Childhood%20Obesity%20(Candace%20Percival,%20MD).pdf)

# Where do we start?



# Let's Go!

<http://www.safehealthychildren.org/95210-lets-go-2/>

# Readiness to Change

- I have not given any thought at all to healthy eating.

*Pre-contemplation*

- I think about healthy eating from time to time, and then put the matter out of my head.

*Contemplation*

- I keep meaning to do something to improve my eating habits, but have not gotten around to it.

*Preparation*

- From time to time I shop/cook healthy food, but occasionally I go back to eating what my family likes or what is available.

*Action*

- I have been consciously planning/preparing healthy meals and snacks for my family for 6 months or more.

*Maintenance*



<https://pdfs.semanticscholar.org/presentation/>



# What size is a portion?



Quickly identify "better for you" foods by reading the nutrition label.

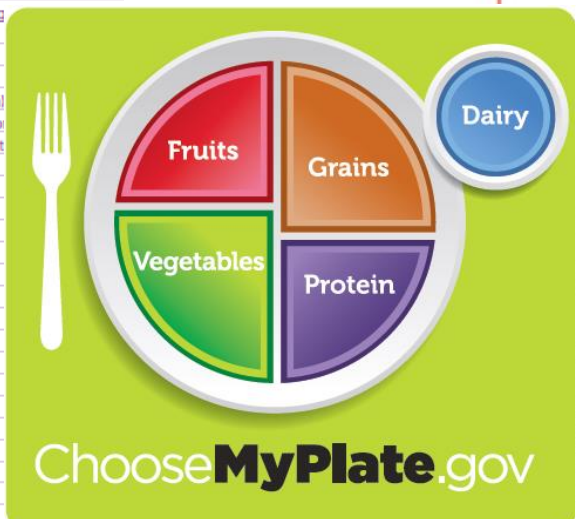
- A food low in fat has 3g or less per serving.
- A food low in saturated fats has less than 1g per serving.
- A food low in cholesterol has less than 20mg per serving.
- A food low in sodium has 140mg or less per serving.
- A food considered a good source of fiber has 3g per serving.
- A food with low amounts of sugar

Nutrition Facts	
Serving Size 1 cup (252g)	
Servings Per Container about 2	
Amount Per Serving	
<b>Calories</b> 270	Calories from Fat 25
% Daily Value*	
<b>Total Fat</b> 1g	2%
Saturated Fat 0g	
Trans Fat 0g	
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 130mg	6%
<b>Total Carbohydrate</b> 43g	14%
Dietary Fiber 6g	24%
Sugars 0g	
<b>Protein</b> 9g	
Vitamin A 10% • Vitamin C 0%	
Calcium 2% • Iron 10%	
* Percent Daily Values are based on a diet of 2,000 calories.	

Nutrition Facts	
Serving Size 1/2 cup (114g)	
Servings Per Container 4	
Amount Per Serving	
<b>Calories</b> 90	Calories from Fat 30
% Daily Value*	
<b>Total Fat</b> 3g	5%
Saturated Fat 0g	0%
<b>Cholesterol</b> 0mg	0%
<b>Sodium</b> 300mg	13%
<b>Total Carbohydrate</b> 13g	4%
Dietary Fiber 3g	12%
Sugars 3g	
<b>Protein</b> 3g	
Vitamin A 80% • Vitamin C 60%	
Calcium 4% • Iron 4%	
* Percent Daily Values are based on a diet of 2,000 calories. Your daily values may be higher or lower depending on your calorie needs:	
	Calories: 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2,400mg 2,400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g
Calories per gram:	
Fat 9 • Carbohydrate 4 • Protein 4	

## SHOPPING LIST

- |  |   |
|--|---|
| <b>Milk and Milk Products</b><br><i>(Low-fat or fat-free)</i><br><input type="checkbox"/> Milk<br><input type="checkbox"/> Yogurt<br><input type="checkbox"/> Cheddar cheese<br><input type="checkbox"/> Cottage cheese<br><input type="checkbox"/> Cream cheese<br><input type="checkbox"/> American cheese<br><input type="checkbox"/> Ricotta cheese<br><input type="checkbox"/> String cheese                  | <b>Fruit</b><br><i>(Fresh or packed in 100% juice)</i><br><input type="checkbox"/> Apples<br><input type="checkbox"/> Bananas<br><input type="checkbox"/> Grapes<br><input type="checkbox"/> Mangoes<br><input type="checkbox"/> Melons<br><input type="checkbox"/> Oranges<br><input type="checkbox"/> Papayas<br><input type="checkbox"/> Pears<br><input type="checkbox"/> Pineapples<br><input type="checkbox"/> Strawberries<br><input type="checkbox"/> Oranges |
| <b>Grains</b><br><input type="checkbox"/> Oatmeal<br><input type="checkbox"/> Brown rice<br><input type="checkbox"/> English muffins (enriched)<br><input type="checkbox"/> Popcorn (no added fat or salt)<br><input type="checkbox"/> Whole grain bread<br><input type="checkbox"/> Whole grain pasta<br><input type="checkbox"/> Whole wheat pita<br><input type="checkbox"/> Whole grain cereals (ready-to-eat) | <b>Protein</b><br><input type="checkbox"/> Beef (lean)<br><input type="checkbox"/> Pork (lean chops or loin)<br><input type="checkbox"/> Chicken (whole, parts or skinless)<br><input type="checkbox"/> Turkey (lean whole, part or skinless)<br><input type="checkbox"/> Fish<br><input type="checkbox"/> Veggie burgers<br><input type="checkbox"/> Eggs<br><input type="checkbox"/> Tofu   |
| <b>Vegetables</b><br><i>(Choose more often without sauces)</i><br><input type="checkbox"/> Carrots<br><input type="checkbox"/> Beans<br><input type="checkbox"/> Broccoli<br><input type="checkbox"/> Celery<br><input type="checkbox"/> Cucumber<br><input type="checkbox"/> Corn   | <b>Other</b><br><input type="checkbox"/> Lettuce<br><input type="checkbox"/> Onions<br><input type="checkbox"/> Peppers<br><input type="checkbox"/> Potatoes<br><input type="checkbox"/> Tomatoes   |



**Fruit:** 1 medium fruit is about the size of a baseball.



**Vegetables:** 1/2 cup, about the size of a small computer mouse.



**Cheese (low-fat or fat-free):** 1 1/2 ounces, about the size of six dice.



**Pasta (cooked):** 1/2 cup, about the size of a small computer mouse.



**or lean meat:** 2-3 ounces, the size of a deck of cards.



### THIS IS A DECEPTIVE TACTIC

used by the industry to make smokers appear sexy and glamorous. Notice her white teeth and smooth skin. If tobacco companies showed a real smoker, she would have yellow teeth and wrinkled skin. This is to make you attracted to the model and the act that she's performing. If the tobacco industry portrayed her the way a smoker might really look, would you be attracted to the ad?

**OF COURSE NOT!**

Notice that she's lying upside down on pillows talking on her cell phone. Does this seem familiar? The tobacco industry knew it would! They knew you could identify with the scenario because it might remind you of something you do each night with your friends. So then they slick in a cigarette with the hopes that you'll think that smoking while chatting with your friends is just as normal.

**IT'S NOT!**

© 2011 Camel Cigarettes. Notice the extremely thin model with shapely legs and an alluring face.

CAMEL CIGARETTES WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, May Complicate Pregnancy. Quitting Now Greatly Reduces Serious Risks to Your Health.



# Agenda Setting/Goal Setting

## Session 1 (Handouts)

### SETTING GOALS

Use the "sample goals" below to give you some ideas. Select two or three goals the first month and add one or two more the following month after reviewing journals again. Don't try to achieve more than five goals in the first few months.

Goal #1: \_\_\_\_\_

When will you get started? \_\_\_\_\_

*(month and day)*

Goal #2: \_\_\_\_\_

When will you get started? \_\_\_\_\_

*(month and day)*

Goal #3: \_\_\_\_\_

When will you get started? \_\_\_\_\_

*(month and day)*

Goal #4: \_\_\_\_\_

When will you get started? \_\_\_\_\_

*(month and day)*

Goal #5: \_\_\_\_\_

When will you get started? \_\_\_\_\_

*(month and day)*

\* Make sure to write these goals in your Family Food and Fitness Journal.

#### Sample goals:

- 1 Increase daily intake of fruits and vegetables from an average of \_\_\_ to \_\_\_.
- 2 Prepare bag school lunches that include healthy foods.
- 3 Cook a meal with fish twice a week.
- 4 Broil, grill, or bake foods instead of frying.
- 5 Limit drinking sodas to twice a week, treating them as a dessert and not as a meal beverage.

Next Visit \_\_\_\_\_

### The Power of Three Checklist

### Homework Assignment

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	TOTAL	

**Be sure to bring your Healthy Habits Notebook and your dependent ID with you each session. Do your monthly homework. Wear comfortable clothes and shoes to exercise in! See you next visit!**

# Motivational Interviewing

- Egalitarian, empathetic, “way of being”
- Key components:
  - Reflective Listening
  - Shared Decision making
  - Agenda setting
  - Resolves Ambivalence
- Behavior change driven by personal motivation
- Directing
- Following
- GUIDING



<https://www.pinterest.com/pin/524106475355983939/>

Dehlendorf EG, et al. (2014). Shared decision making and motivational interviewing: achieving patient-centered care across the spectrum of health care problems. *The Annals of Family Medicine*, 12(3), 270-275.



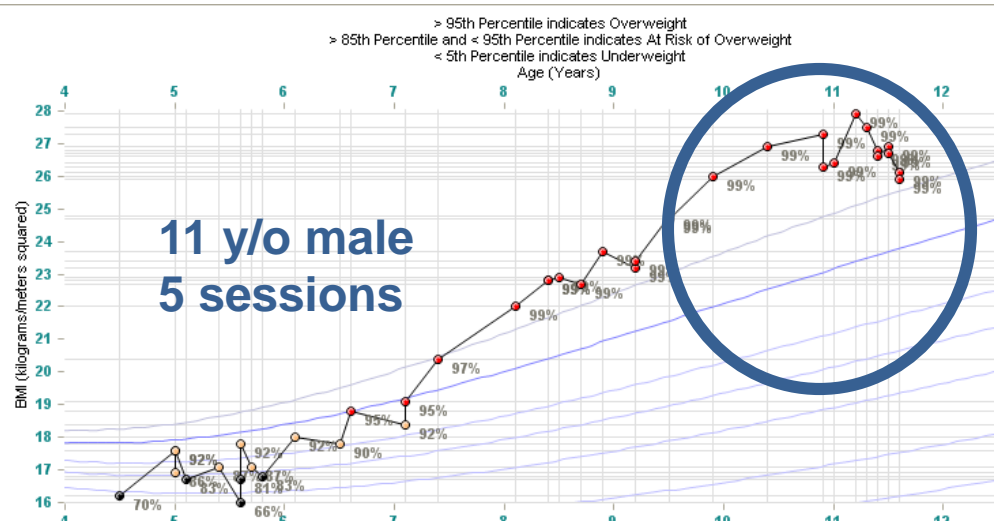
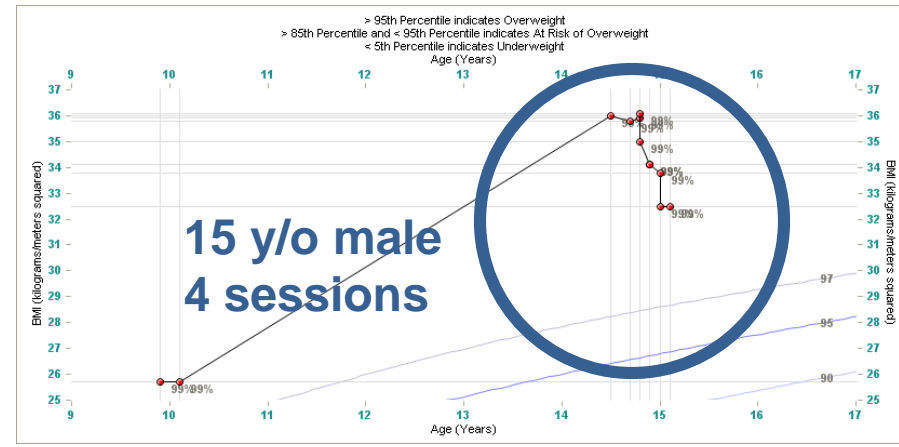
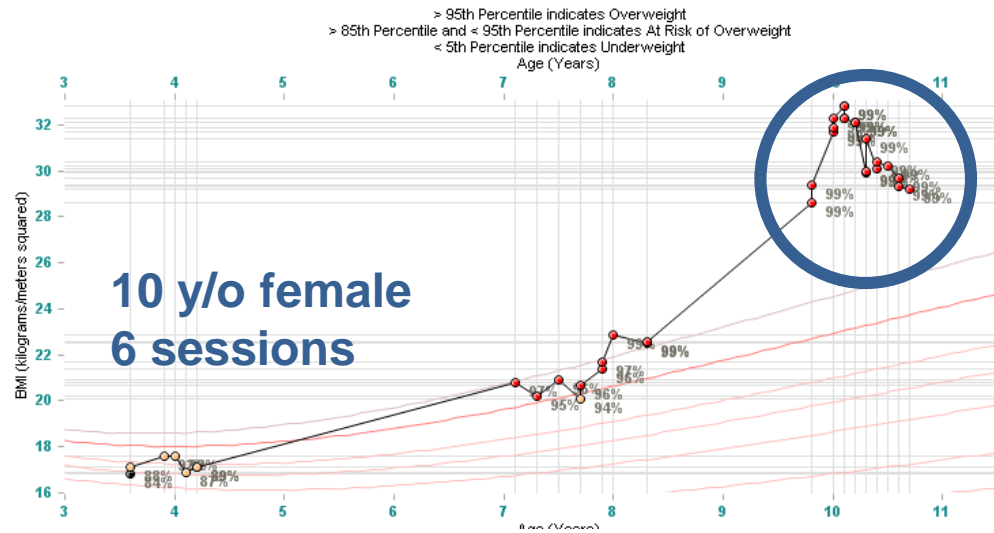
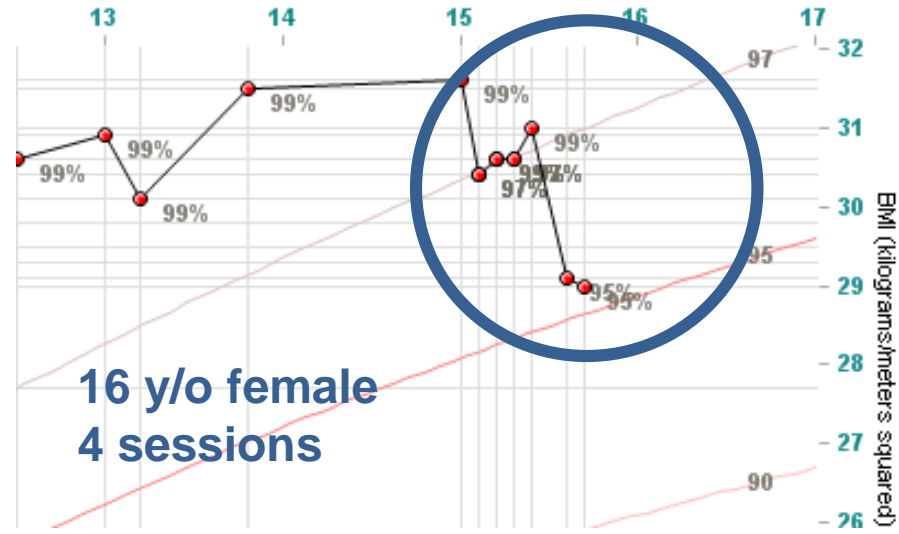
Change Talk App/Online Course—free through AAP.org

<https://www.mobihealthnews.com/31802/kognito-taps-american-academy-of-pediatrics-for-childhood-obesity-education-app>

- Based on the principles of classical conditioning
- “Mindless” eating occurs based on cues strongly linked to food intake
- Behavioral treatment:
  - Help identify cues that trigger inappropriate eating
  - Learn new responses to cues
  - Reward the adoption of positive behaviors

Wansinik B and Sobal J.. (2007). Mindless Eating: The 200 Daily Food Decisions We Overlook. *Environment and Behavior*. 39(1): 106-123.

indicates Overweight  
 tile indicates At Risk of Overweight  
 icates Underweight  
 (years)



Wansinik B and Sobal J.. (2007). Mindless Eating: The 200 Daily Food Decisions We Overlook. *Environment and Behavior*. 39(1): 106-123.

# *Dealing With Nonadherence*

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- Assume lack of planning/skills vice motivation
- Recognize barriers to help determine backup plan
- Instill hope and offer encouragement
- Help patient assume responsibility for actions
- Avoid criticism, **preserve the patient's self esteem**
- **Vent to your colleagues--no one has yet cured obesity!**

# *What if it Doesn't Work?*

---

- Medications
- Surgical Options



- What medication is approved for weight loss in the pediatric population?
  - A. Topiramate
  - B. Phentermine
  - C. Phentermine/Topiramate
  - D. Sibutramine
  - E. Orlistat

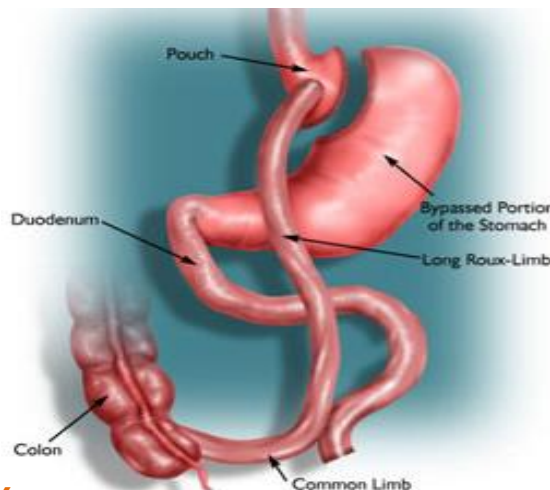
- Few medications FDA approved in <18 age group
  - Orlistat
  - Metformin—for diabetes only
- Adults: phentermine, phendimetrazine, phentermine-topiramate, benzphetamine, diethylpropion, orlistat, lorcaserin, naltrexone/bupropion, many more
  - *Many used off-label*
  - Sibutramine and Fenfluramine/Phentermine taken off the market in the US



<http://massagetherapybocaraton.wordpress.com/>

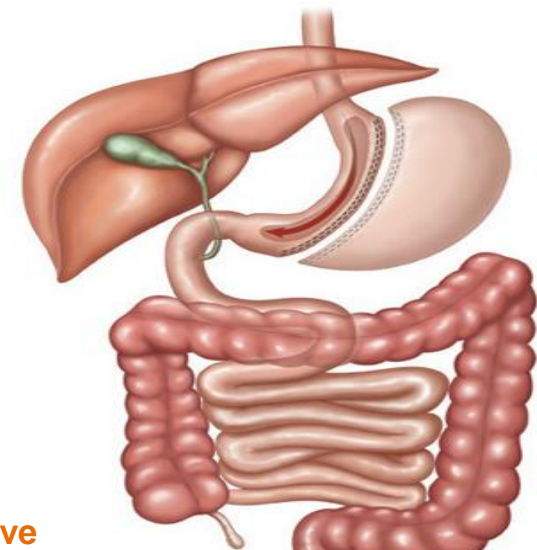
Styne DM, et al. (2017). Pediatric Obesity—Assessment, Treatment, and Prevention: An Endocrine Society Clinical Practice Guideline, *J Clin Endocrinol Metab.* 102 (3), 709–757.

- BMI > 50 (> 40 with significant co-morbidities)
- Capable of adhering to post-op management



**Roux-en-Y**

<http://www.prweb.com/releases/weight-loss/surgeon/prweb10302711.htm>



**Gastric Sleeve**

<https://www.sagebariatric.com/about-surgery-home/about-bariatric-surgery/>

- When monitoring children, a weight and height should always be obtained to calculate a BMI and plot a BMI percentile
- A focused history and physical exam is useful in evaluating for co morbidities and causes of secondary obesity
- Motivational interviewing techniques may help develop rapport and gain buy-in for patients and their families in efforts to improve lifestyle
- Primary care providers serve an important role in the prevention, diagnosis, and management of obesity in children. Further care in multi-disciplinary clinics may be an effective adjunct in the patient's care



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# Questions

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# Managing the Pediatric Diabetes Patient



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**John M. Oberlin, MD**  
**Lieutenant Colonel, USAF, Medical Corps**  
**Chief, Pediatric Endocrinology**  
**San Antonio Military Medical Center**  
**JBSA-Ft Sam Houston, TX**



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# Key Takeaways

- Recognize the differences between T1DM & T2DM
- Be a diabetes resource for your patient
- Be familiar with laws pertaining to pediatric diabetes care
- Respond appropriately to diabetic emergencies
- Coordinate care between your patient & specialty team
- Be prepared to advocate for your patient
  - Visit [www.diabetes.org/safeatschool](http://www.diabetes.org/safeatschool)

# ADA Criteria

LAB TEST	PREDIABETES	DIABETES
A1c	5.7-6.4%	≥6.5%
FPG (Fasting Plasma Glucose)	>100-125	≥126 mg/dL (7.0 mmol/L)
OGTT (2-h post 75g glucola oral glucose tolerance test)	>140-199	≥200 mg/dL (11.1 mmol/L)
Random Glucose		≥200 mg/dL (11.1 mmol/L)

ADA. (2020).

# “Classic” Signs/Symptoms

## Type 1

- ~~Slender~~
- Polyuria
- Polydipsia
- Weight loss

## Diagnostics

- Hyperglycemia, Ketonemia
- Glycosuria, Ketonuria
- Antibodies

## Type 2

- Overweight
- Polydipsia
- Polyuria
- Acanthosis nigricans

## Other Diagnostics

- Hypertension
- Hyperlipidemia

# ***T1DM versus T2DM***

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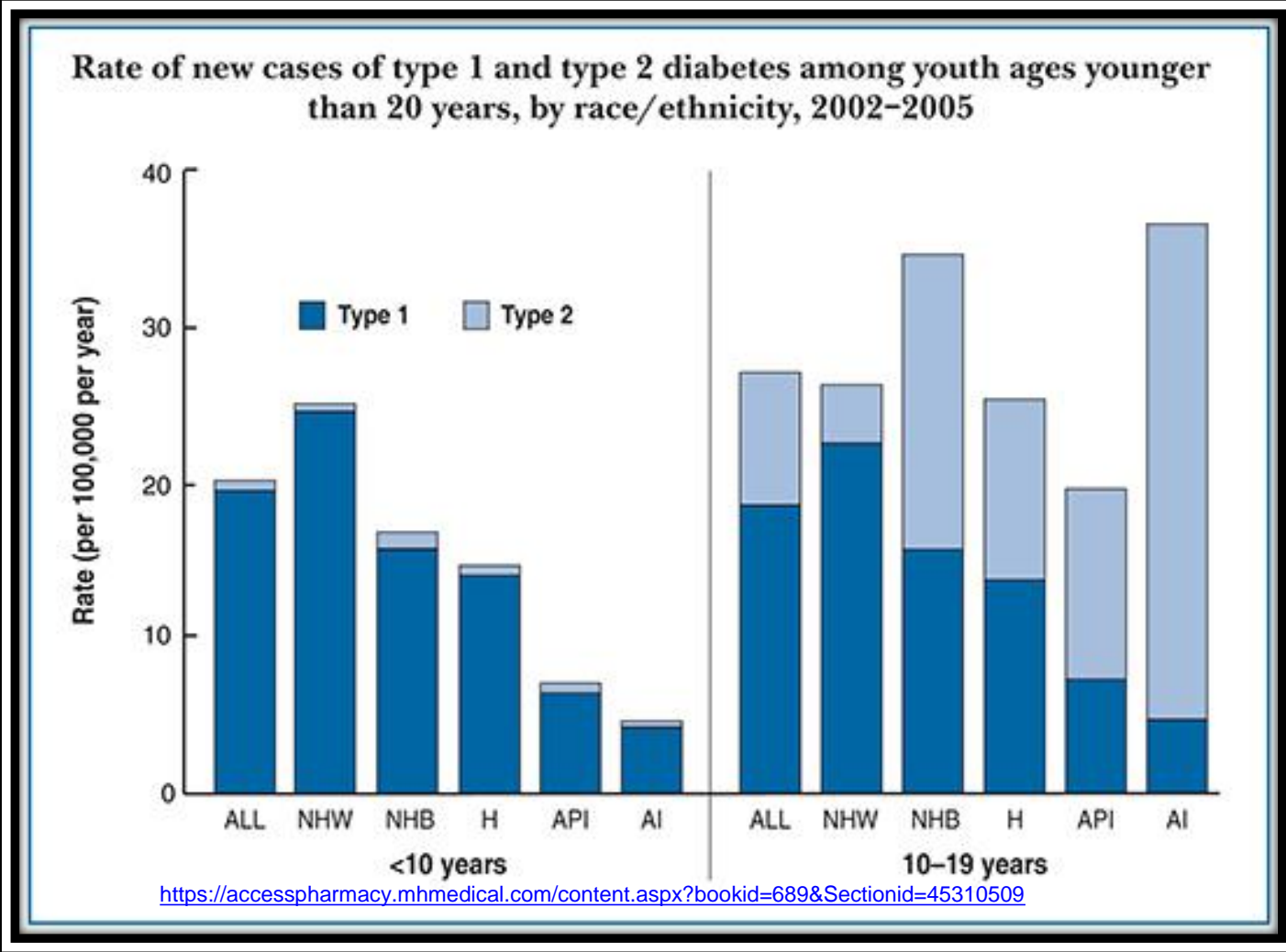
## **TYPE 1 DIABETES MELLITUS**

- Most common under age 40
- Requires lifelong insulin
  - Insulin Deficient
- Islet cell antibodies are present

## **TYPE 2 DIABETES MELLITUS**

- Most common after age 40
- Often managed without insulin
  - Insulin Resistant
- Islet cell antibodies are NOT present

# T1DM versus T2DM





## **LOW Risk**

- HbA1c < 6.0%
- FPG < 100 mg/dL
- Random/OGTT < 140 mg/dL
- BMI ≥ 85<sup>th</sup> percentile
- Asymptomatic
  - No Polyuria/Polydipsia
  - No Recent Weight Loss
  - +/- Acanthosis

## **Suggested Management**

- Routine Care
- Consider focus on healthy eating and active living
  - 9-5-2-1-0
  - <https://letsgo.org>
- Refer to weight management program
  - “Health Habits”
  - <https://ihcw.aap.org>
- Metformin not recommended

<https://mainehealth.org/-/media/mainehealth/pdfs/pediatric-guidelines-and-protocols/endo-diabetes.pdf?la=en>

## **MODERATE Risk**

- HbA1c 6.0-6.4%
- FPG 100-125 md/dL
- Random/OGTT 140-199 mg/dL
- BMI  $\geq$  95<sup>th</sup> percentile
- Asymptomatic
  - No Polyuria/Polydipsia
  - No Recent Weight Loss
  - +/- Acanthosis

## **Suggested Work-up**

- Focus on healthy eating and active living
  - Educate family regarding polyuria/polydipsia
  - Refer to weight management program
- Consider Co-Management or Consultation with pediatric specialist
  - Repeat HbA1c/FPG/OGTT screening in 3 months
  - Metformin can be considered

## **HIGH Risk**

- HbA1c  $\geq$  6.5%
- FPG  $\geq$  126 mg/dL
- Random/OGTT  $\geq$  200 mg/dL
- Red Flags
  - Polyuria/Polydipsia
  - Recent Weight Loss
  - Vomiting/Dehydration
  - Abnormal Breathing

## **EMERGENT Consultation**

- URGENT discussion with PEDIATRIC ENDOCRINOLOGY
- STAT laboratory screening for potential DKA
  - BMP
  - VBG
  - UA
- IMMEDIATE assessment to identify/prevent cerebral edema

# *Pediatric Diabetes Pearls*

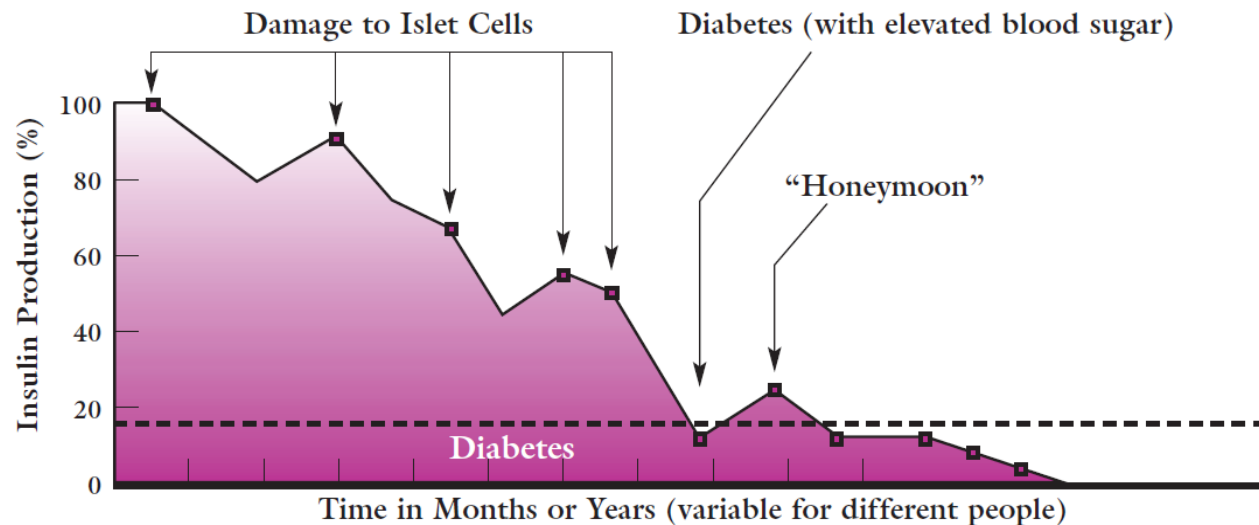
- DO NOT assume Type 2 diabetes if HbA1c is  $\geq 6.5\%$  in an overweight/obese patient
- Distinguishing Type 1 from Type 2 diabetes in pediatrics can be difficult
- Additional laboratory investigation may include Insulin, C-peptide, & Pancreatic Autoantibodies in order to differentiate T1DM from T2DM
  - Not useful for screening
- Pediatric patients with new-onset T1DM are usually admitted to the hospital for 48-72 hours to start basal/bolus insulin therapy and initiate diabetes self-management education (DSME)

<https://mainehealth.org/-/media/mainehealth/pdfs/pediatric-guidelines-and-protocols/endo-diabetes.pdf?la=en>

# What Causes Type 1 Diabetes Mellitus?

- *Genetics (inheritance)*
- *Autoimmunity (self-allergy)*
- *Environment*

The Gradual Onset of Type 1 Diabetes



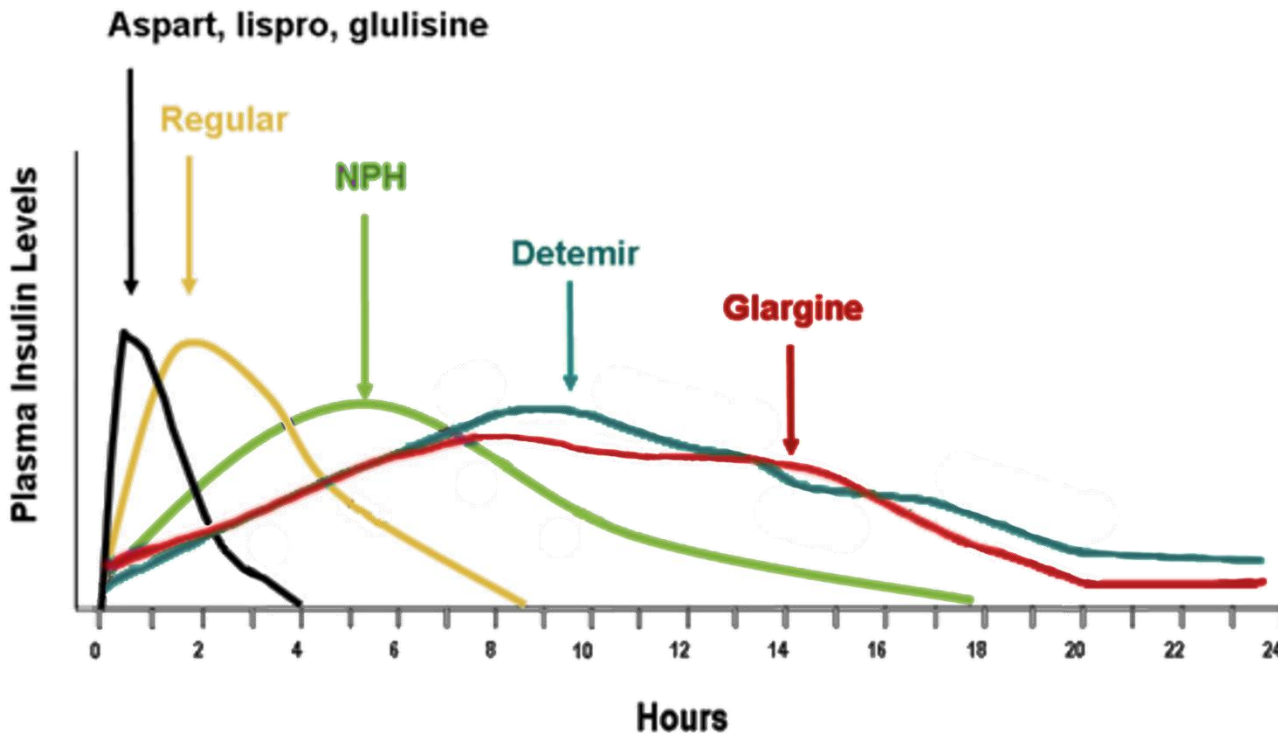
It is now believed that diabetes develops gradually, over many months or many years. It does not just come on suddenly in the week or two before the elevated blood sugars. Many insults (represented by the arrows in this Figure) likely result in further damage until the diagnosis of diabetes is made. The insults may include viral infections, stress, chemicals in the diet or other agents. These agents may work by “activating” white blood cells in the islets to make toxic chemicals that cause injury to the insulin-producing cells (beta cells). However, a “genetic-predisposition” (inherited factors) must be present for the process to start.

# Special considerations for Pediatric Patients

- Monitoring
  - Glucose
    - Blood Glucose Meter (BGM) – “Glucometer”
    - Continuous Glucose Monitoring (CGM) systems
  - Ketones – Urine or Blood
- Insulin Regimens
  - Basal-Bolus versus Conventional
  - Syringes versus Pens
  - Continuous Subcutaneous Insulin Infusion (CSII)
    - aka “Insulin Pump”
    - Hybrid Closed-Loop Insulin Delivery System (Medtronic MiniMed 670G)
- Oral Medications
  - Metformin
- School
  - Diabetes Medical Management Plan (DMMP)
- Sports & Exercise
- “Sick” Days
- Screening



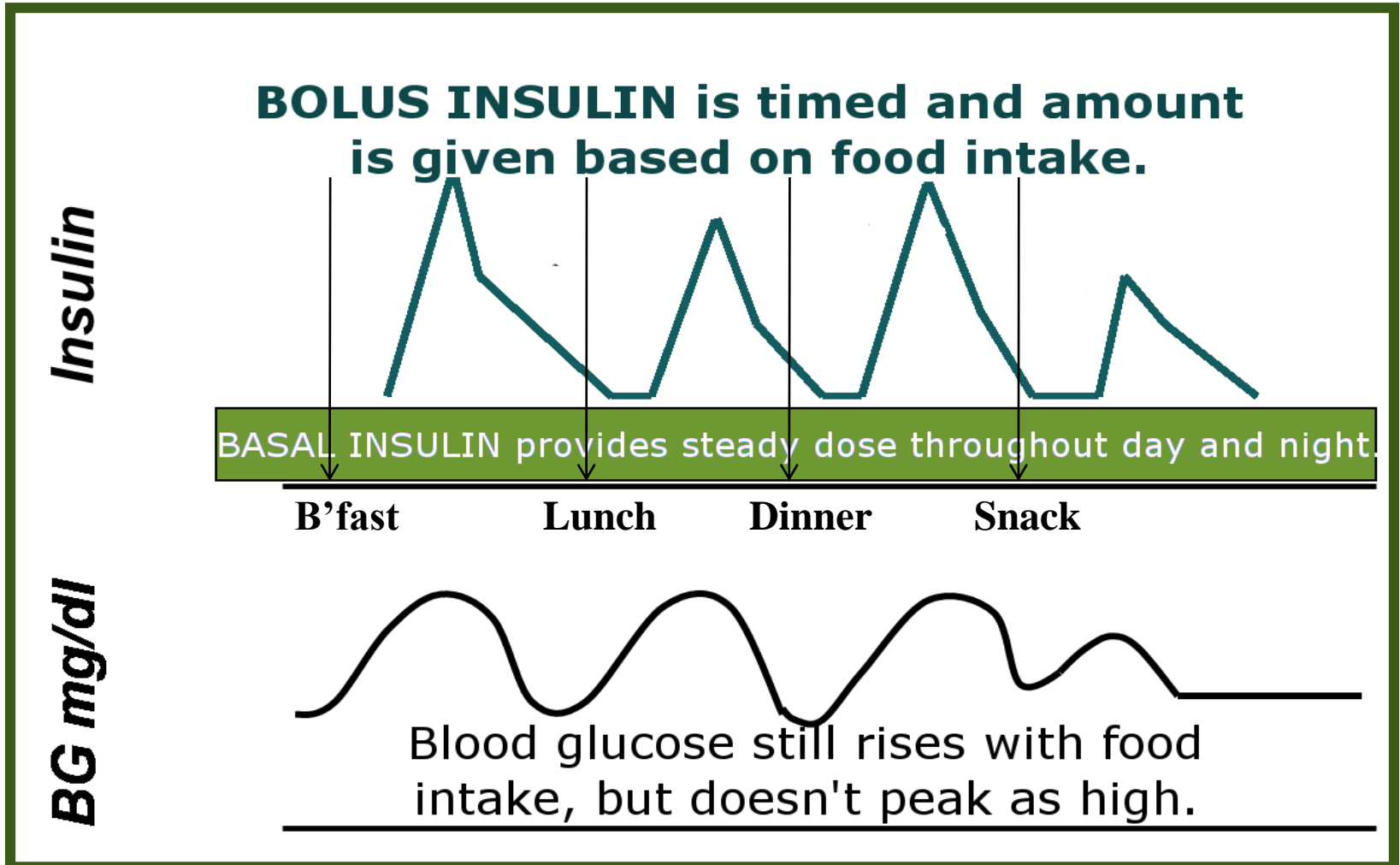
- Rapid-acting - Humalog ®, Novolog ®, Apidra
- Short-acting - Regular
- Intermediate - NPH
- Long-acting - Glargine (Lantus), Detemir (Levemir)



[www.diabetes.org/schooltraining](http://www.diabetes.org/schooltraining)



# Basal and Bolus Insulin



## ■ **Section 504**

- Section 504 of the Rehabilitation Act of 1973

## ■ **ADA**

- Americans with Disabilities Act

## ■ **IDEA**

- Individuals with Disabilities Education Act

[www.diabetes.org/schooltraining](http://www.diabetes.org/schooltraining)

# *State Laws & Regulations*

---

- State and local laws and regulations vary regarding who may perform various aspects of diabetes care
- Become familiar with state and local laws that impact school diabetes care
- Regardless of state and local law, the requirements of federal laws must be met

[www.diabetes.org/schooltraining](http://www.diabetes.org/schooltraining)

# Written Plans for Diabetes Management

Plan	What it covers	Who writes it
<b>DMMP</b>	<i>"Doctor's Orders"</i> – details all aspects of routine and emergency diabetes care.	Personal health care team
<b>504 Plan</b> <b>IEP</b>	<i>Education plans</i> - details both health care and educated related aids, services, accommodations, and special education services the student needs.	504 team IEP team
<b>IHP</b>	<i>School nursing care plan</i> - specifies how diabetes care as prescribed in the DMMP will be delivered in the school	School nurse
<b>Quick Reference Emergency</b>	<i>Tool for school staff</i> - how to recognize and treat hypoglycemia or hyperglycemia	School nurse

[www.diabetes.org/schooltraining](http://www.diabetes.org/schooltraining)

- Everyone benefits from physical activity
  - Students with diabetes should fully participate
- In general, activity lowers blood glucose levels
  - If there is insufficient insulin, physical activity can raise blood glucose
- May need to make adjustments to insulin/medications and food intake, per DMMP
- A quick-acting source of glucose, glucose meter, and water should always be available
- PE teachers and coaches must be familiar with symptoms of both high and low blood glucose

# *Activity & Blood Glucose Monitoring*

- Check before, during, and after physical activity per DMMP:
  - Especially when trying a new activity or sport
  - If blood glucose starts to fall, student should stop and have a snack or quick-acting source of sugar
  - Students with pumps may disconnect or adjust the basal rate downward temporarily, prior to physical activity

- Students with hyperglycemia or hypoglycemia often do not concentrate well.
- Students should have adequate time for taking medication, checking blood glucose, and eating.
- During academic testing, provide accommodations as per 504 plan or IEP
  - *Check blood glucose before and during testing, per plan*
  - *Access to food/drink and restroom*
  - *If a serious high or low blood glucose episode occurs, students should be excused with an opportunity for retake*



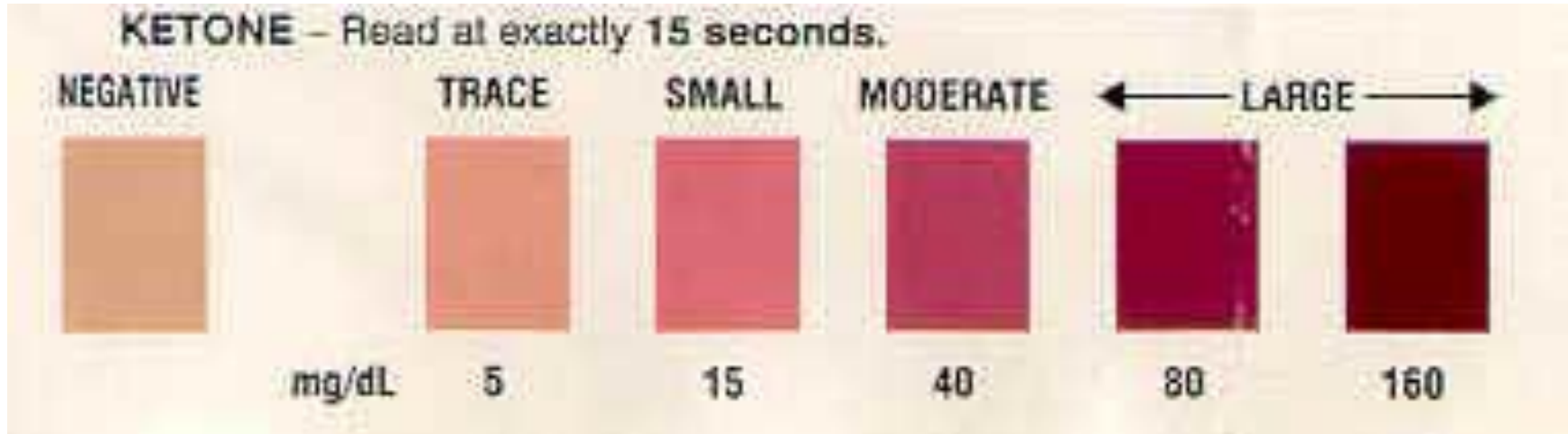
## **Clinical Features**

- Polyuria, Polydipsia, Polyphagia
- Weight Loss
- Vomiting
- Dehydration
- Tachypnea
- “Fruity” breath
- Altered consciousness
- Hyperglycemia
- Ketonuria

## **Laboratory Evaluation**

- Glucose (bedside) – hourly
- Comprehensive metabolic profile
  - Electrolytes
  - BUN
  - Creatinine
- Blood Gas/pH
- Ketones (urine and/or blood)

# Urine Ketone Test Results: Color Code



- no ketones
- trace
- small
- moderate
- large ketones present

## Considerations for Transfer

- Consult Pediatric Endocrinologist if:
  - Blood glucose >250 mg/dL
- AND
- Urine Ketones = “moderate”-“large”
- Hospitalize if:
  - Unable to tolerate oral hydration
  - pH <7.3
  - $\text{HCO}_3 \leq 15$  mEq/L

## Interventions

- Fluid replacement
  - Oral rehydration solution (if tolerated)
  - Isotonic IVF (NS or LR) bolus of 10 mL/kg
- Specific Insulin Therapy
  - Regular
    - 0.05-0.1 U/kg every 4 hours
  - Aspart/Lispro
    - 0.05-0.1 U/kg every 2 hours

Pediatric Ann. 2005 Nov;34(11):870-7

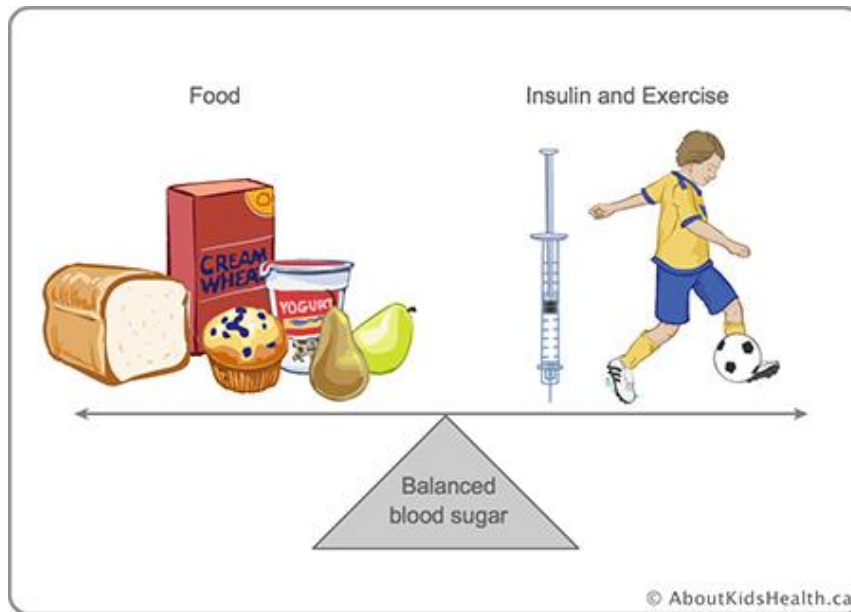
# *How Quickly Does DKA Progress?*

- An isolated high blood glucose reading, in the absence of other symptoms is not cause for alarm
- DKA usually develops over hours, or even days
- DKA can progress much more quickly for students who use insulin pumps, or those who have an illness or infection
- Most at risk when symptoms of DKA are mistaken for flu and high blood glucose is unchecked and untreated

[www.diabetes.org/schooltraining](http://www.diabetes.org/schooltraining)

# *Diabetes is Managed, But it Does Not Go Away.*

## **GOAL:**



Maintain target  
blood glucose

## **Constant Juggling 24/7!**

# *A1c and Glucose Goals*

- HbA1c
  - An A1c goal of <7.5% is recommended across all pediatric age-groups
  - A lower goal of <7.0% is reasonable if it can be achieved without excessive hypoglycemia
- Blood glucose
  - Before Meals: 90-130 mg/dL
  - Bedtime/Overnight: 90-150 mg/dL

*Diabetes Care. 2020*

# Screening for Microvascular & Macrovascular Complications

Screening	When	Method
Retinopathy	Annually from age 10 years, or after 2-5 years duration (biannually)	Fundal photography or mydriatic ophthalmoscopy
Nephropathy	Annually from age 10 years, or after 2-5 years duration (annually)	Albumin-to-Creatinine Ratio (ACR), urine
Dyslipidemia	After age 2 years (soon after diagnosis once glucose control achieved)	Fasting Lipid Profile (Every 3-5 years if “normal”; Annually if LDL >100)
Hypertension	Every 3-6 months (at least annually)	SBP or DBP relative to 90 <sup>th</sup> %tile for age, sex, & height
Neuropathy	5 year after diagnosis (annually)	History & Physical Examination (monofilament)

*Pediatric Diabetes 2014; 15(Suppl. 20): 257–269*



# Screening for Other Diabetes-Associated Complications/Conditions

Screening	When	Method
Thyroid	Soon after diagnosis	TSH & Thyroid (anti-TPO) antibodies (every 1-2 years, or if symptomatic)
Celiac Disease	Soon after diagnosis	tTG IgA & Total IgA (every 1-2 years, or if symptomatic)
Lipodystrophy	Every 3-6 months (at least annually)	Physical Examination
Bone Health	Late adolescence	Vitamin D screening Bone densitometry
Addison's Disease	With symptoms, or if high-risk for polyendocrinopathy	Cortisol (Morning and/or after ACTH-stimulation) ACTH level Adrenal antibodies
Lifestyle	Initial & Follow-up Visits	Diet History Smoking Cessation Counseling

*Pediatric Diabetes 2014; 15(Suppl. 20): 270–278*

# Summary of Management Goals

Parameter	Target
HbA1c	<7.5%
Cholesterol	LDL <100 mg/dL; HDL >40 mg/dL
Triglycerides	<150 mg/dL
ACR	<30 mg/g
Blood Pressure	<90 <sup>th</sup> %tile by age, sex, & height (<130/80 for adolescents)
BMI	<95 <sup>th</sup> %tile (non-obese)
Diet	Fat <30% (Saturated Fat <10%), Fiber 25-35 g/day, fresh fruit/vegetables 5+ servings/day
Activity	>1-hour/day moderate/aerobic; <2-hour/day sedentary
Smoking	None

*Pediatric Diabetes 2014; 15(Suppl. 20): 257–269*

# *Special Considerations for Pediatric Patients in the Military Health System*

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- Exceptional Family Member Program (EFMP)
  - Identify medical/educational service requirements of AD family members
  - Mandatory Enrollment
    - Long-term (>6 mo) chronic health condition
    - AFI 40-701
  - PCM role:
    - Referral to EFMP Special Nurse Coordinator
    - DD 2792, EFM Medical Summary
    - Medical recommendations
- Coordinating care w/ Civilian Network Providers

# *Suggested Resources*

- [www.diabetes.org](http://www.diabetes.org)
- [www.ispad.org](http://www.ispad.org)
- [www.BarbaraDavisCenter.org](http://www.BarbaraDavisCenter.org)
  - [www.ucdenver.edu/academics/colleges/medicalschool/centers/BarbaraDavis/Pages/barbaradaviscenter.aspx](http://www.ucdenver.edu/academics/colleges/medicalschool/centers/BarbaraDavis/Pages/barbaradaviscenter.aspx)
  - Understanding Diabetes by H. Peter Chase, MD. 11th Edition, 2006
  - First Book for Understanding Diabetes: Companion to the 11th Edition of "Understanding Diabetes" by H. Peter Chase, MD. 11th Edition, 2006
- [diabetes.cemmlibrary.org](http://diabetes.cemmlibrary.org)
- [www.ChildrensDiabetesFoundation.org](http://www.ChildrensDiabetesFoundation.org)
- [www.ChildrenWithDiabetes.com](http://www.ChildrenWithDiabetes.com)
- [www.aboutkidshealth.ca/En/ResourceCentres/Diabetes](http://www.aboutkidshealth.ca/En/ResourceCentres/Diabetes)
- [www.choosemyplate.org](http://www.choosemyplate.org)



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## Welcome to the Barbara Davis Center for Diabetes (BDC)

### Mission:

Our mission is to provide state-of-the-art care to children and adults with type 1 diabetes and to teach our patients how to prevent or delay complications. Our research is devoted to finding prevention, cure, and most effective treatment of diabetes and associated disorders.

### [Marian Rewers, MD, PhD](#)

Executive Director



The Barbara Davis Center for Diabetes (BDC)

specializes in type 1 diabetes research and care for children and adults. It is one of the largest diabetes institutes in the world. The Center is part of the University of Colorado School of Medicine and has its dedicated building on the [Anschutz Medical Campus](#) ([map](#)) in Aurora, Colorado. The Center was funded by Marvin Davis, in 1978, and is generously supported by the [Children's Diabetes Foundation \(CDF\)](#).

Clinicians, clinical researchers, and basic biomedical scientists work at the BDC to find the most effective treatment, prevention, and cure for type 1 diabetes. The Center provides state-of-the-art diabetes care to

## BDC in the news

- ▶ [Afrezza, Inhalable Insulin Now Available](#)
- ▶ [Stem Cell Research Could Help T1D Patients](#)
- ▶ [Uromodulin Shows Promise for Prediction of Kidney Disease](#)
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## Online Books & Slides

### Online Books

#### [Understanding Diabetes](#)

by H. Peter Chase, MD & David M Maahs, MD, PhD

An instruction manual for families on the management of diabetes.

The newest, 12th edition, online!

#### [First Book for Understanding Diabetes](#)

by H. Peter Chase, MD & David M Maahs, MD, PhD

Companion to the 12th Edition of "Understanding Diabetes"

#### [Understanding Insulin Pumps & Continuous Glucose Monitors](#)

by H. Peter Chase, MD, & Laurel Messer, RN, MPH, CDE

Insulin pumps & continuous glucose monitors (CGMs) for people with type 1 diabetes.

#### [Type 1 Diabetes: Cellular, Molecular & Clinical Immunology](#)

edited by George S. Eisenbarth, MD and Peter Gottlieb, MD

Updated online chapters and teaching slideset

# Key Takeaways

- Recognize the differences between T1DM & T2DM
- Be a diabetes resource for your patient
- Be familiar with laws pertaining to pediatric diabetes care
- Respond appropriately to diabetic emergencies
- Coordinate care between your patient & specialty team
- Be prepared to advocate for your patient
  - Visit [www.diabetes.org/safeatschool](http://www.diabetes.org/safeatschool)



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# Questions



# ***CPT & ICD-9 Coding for Obesity-Related Preventive Care***

<b>Code</b>	<b>Designation/Situation</b>
<i>Preventive medicine visit</i>	
99384-99385	New patient, preventive medicine visit; patient 12-18 years of age
99394-99395	Established patient, preventive medicine visit: patient 12-18 years of age
WN016-WN019 or WR016-WR019	Health check under Medicaid
<i>Evaluation and management (E&amp;M)</i>	
99201-99205	New patient, office or other outpatient visit
99212-99215	Established patient, office or other outpatient visit
99241-99245	Consultation, office, or other outpatient visit

Pediatrics 2007;120;S229



# CPT Coding for Obesity-Related Preventive Care

Code	Designation/Situation
<i>Health &amp; behavior assessment or intervention</i>	
96150	Health & behavior assessment (e.g., health-focused clinical interview, behavioral observations, psychophysiological monitoring, health-oriented questionnaires)
96151	Reassessment
96152	Health & behavior intervention
96153	Health & behavior intervention with $\geq 2$ patients
96154	Health & behavior intervention with family, with patient present
96155	Health & behavior intervention with family, without patient present
99241-99245	Consultation, office, or other outpatient visit

Pediatrics 2007;120;S229





# *Diagnosis Codes for Obesity-Related Visits*

Code	Diagnosis
278.0	Obesity, unspecified
401.9	Essential hypertension, unspecified
611.1	Hypertrophy of breast
701.2	Acquired acanthosis nigricans
783.1	Abnormal weight gain
V18.0	Family history of diabetes mellitus
V18.1	Family history of endocrine or metabolic diseases
V61.20	Counseling for parent-child problem, unspecified
V62.89	Other psychological or physical stress, NEC

Pediatrics 2007;120;S229



# Diagnosis Codes for Obesity-Related Visits

Code	Diagnosis
V62.9	Unspecified psychosocial circumstances
V69.0	Lack of physical exercise
V69.1	Inappropriate diet and eating habits
V69.8	Other problems related to lifestyle; self-damaging behavior
V69.9	Problem related to lifestyle, unspecified
<i>Diagnoses for subsequent visits</i>	
V65.3	Dietary surveillance and counseling
V65.41	Exercise counseling
V65.49	Other specified counseling

Pediatrics 2007;120;S229