Managing the Pediatric Diabetes Patient

0915-1030
10 April 2020
Learning Objectives

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
Managing the Pediatric Obesity Patient
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
Dr. Candace Percival has no relevant financial or non-financial relationships to disclose relating to the content of this activity; or presenter(s) must disclose the type of affiliation/financial interest (e.g., employee, speaker, consultant, principal investigator, grant recipient) with company name(s) included.

The opinions expressed on this document are solely those of the author(s) and do not represent an endorsement by or the views of the United States Air Force, the Department of Defense, or the United States Government.

This continuing education activity is managed and accredited by the Defense Health Agency J7 Continuing Education Program Office (DHA J7 CEPO). DHA J7 CEPO, as well as all accrediting organizations do not support or endorse any product or service mentioned in this activity.

DHA J7 CEPO, as well as, activity planners and reviewers have no relevant financial or non-financial interest to disclose.

Commercial support was not received for this activity.
Disclosures

“The views of (KVH Tech, Elite Pharmaceuticals, Vivus, Pfizer, Sanofi Aventis, GlaxoSmithKline, Arena Pharmaceuticals, Orexigen Therapeutics, Wyeth-Ayerst Laboratories) are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the Department of the Air Force. No Federal endorsement of (manufacturer) is intended.”
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

Pediatric Obesity: Where do we fit in?

Increasing Rates of Obesity

1986

1994

2002

2009

https://www.cdc.gov/obesity/data/prevalence-maps.html
Childhood Obesity

Genetic Link – cell “antenna”

https://www.google.com/search?q=images+of+childhood+obesity+i+nclip+art&tbm=isch&ved=2ahUKEwiN6LPvtMfnAhXLEVMKHZBrDeQQ2-cCegQ1ABAA&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.......0/30.byO_U1R2r0w&ei=74VBXs20C8uiAzAKQ17WgDg&bih=844&biw=1156&client=firefox-b-1-d#imgrc=g1QCl36q9PcKnM
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...0.180.1010.11j1......0....1..gws-wiz-im...
Childhood Obesity

https://www.google.com/search?q=fast+food+restaurant+clipart&tbm=isch&source=univ&sa=X&ved=2ahUKEwiwx4S6usfnAhWnmuaKHWKJg8QwM5BAgKEA&biw=1156&bih=844#imgrc=ZJc3MVr1gheKRM
Childhood Obesity

https://www.google.com/search?q=Clip+art+child+refusing+to+eat+healthy+foods&tbm=isch&ved=2ahUKEwi-icW_ustnAhUKWIMKHXVVDzkQ2-cCegQlABAA&oq=Clip+art+child+refusing+to+eat+healthy+foods&gs_l=img.3...126810.143254..144246...2.0..3.111.6610.61j11......0....1..gw-s-wiz-img....10..35i39j0i8i30i35i362i39i0i67i0i10.4hDx_IARN1U&ei=1YtBXv7WGYy0zQLVqr_IAw&bih=844&biw=1156#imgrc=b64czdAt0yhxzM/
Childhood Obesity

Growth in Childhood Obesity, 1971 to Present

Percent of children aged 2-19 who are obese

Source: CDC, National Center for Health Statistics, National Health and Nutrition Examination Surveys.
Note: Obesity is defined as BMI ≥ 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
Ashley Cockrell Skinner, PhD1; Joseph A. Skelton, MD, MS2,3
Rates of Childhood Obesity

INCREASING NUMBER OF OVERWEIGHT CHILDREN AROUND THE WORLD

Percentage overweight

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

\[\text{Rates of Childhood Obesity}\]

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

\[\text{Boys}\]

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>College graduate</th>
<th>Some college</th>
<th>High school graduate</th>
<th>Less than high school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>11.8</td>
<td>15.9</td>
<td>17.9</td>
<td>21.1</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>10.5</td>
<td>14.2</td>
<td>16.2</td>
<td>18.0</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>16.3</td>
<td>18.2</td>
<td>18.8</td>
<td>17.2</td>
</tr>
<tr>
<td>Mexican American</td>
<td>17.2</td>
<td>22.0</td>
<td>25.7</td>
<td>25.5</td>
</tr>
</tbody>
</table>

\[\text{Girls}\]

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>College graduate</th>
<th>Some college</th>
<th>High school graduate</th>
<th>Less than high school</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>8.3</td>
<td>14.8</td>
<td>19.8</td>
<td>20.4</td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>7.0</td>
<td>12.8</td>
<td>19.0</td>
<td>22.0</td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>17.0</td>
<td>22.7</td>
<td>27.0</td>
<td>26.0</td>
</tr>
<tr>
<td>Mexican American</td>
<td>16.0</td>
<td>16.1</td>
<td>20.9</td>
<td>19.4</td>
</tr>
</tbody>
</table>

\[\text{Significant trend.}\]

\[\text{NOTE: Persons of other race and ethnicity included in total.}\]

Too Fat to Fight

Percentage of active U.S. armed forces members diagnosed as overweight or obese, by calendar year

Total U.S. armed forces members diagnosed as overweight or obese, by calendar year

1.6%

5.3%

1998 2010

86,186

25,766

1998 2010

https://sites.psu.edu/mszczesniakeportfolio/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”)

Cycle of Childhood Obesity

The Vicious Cycle Of Childhood Obesity

- Healthy Child
- Obese Adult
- Severe Obese Child
- Moderately Obese Child
- Mildly Obese Child

Factors:
- Asthma, Diabetes & Musculoskeletal Disease
- Coronary Artery Disease
- Pulmonary Disease
- High blood pressure
- Other conditions

Actions:
- Exercise
- Low fat foods
- High fiber foods
- No action
- Study

Consequences:
- High medical bills
- Mortality
- Extra 10-50 lbs
- Extra 5-10 lbs
- Perceived pain
- Perceived social rejection
Why is this so important?

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=2ahUKEwjI7LZw8fnAhWFVLVMKHgkAUcQ2-cCegQIABAA&oq=Clip+art+Obese+child+walking+with+parents&gs_i=img.12...45750.52038..54540...0...0.111.585.6j1......0....1..gws-wiz-img........35i39.QQsUbnVw7SA&ei=e5VBXonIYXbxALYyIS4BA&bih=844&biw=1156#imgrc=RftHAqcq3uZ6NM/

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 ≥ 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-fvzw8fnAnUHz1MKHRY7CQcQ2-cCegQIABAA&oq=Clip+art+person+with+fingers+plugging+ears&gs_l=img.3...264106.283398.284615...6.0...139.5539.67j3......0....1..gws-wizimg.......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 ≥ 95% for age/gender
C. BMI percentile ≥ 85% for age/gender
D. BMI percentile ≥ 90% for age/gender
E. BMI > 30
What is Pediatric Obesity?

Defined based on BMI

- Metric
  - BMI = kg ÷ m²

- English
  - BMI = lbs ÷ in² × 703

BMI and BMI Percentile should be calculated at EVERY VISIT!

https://www.cdc.gov/nccdphp/dnpao/growthcharts/training/bmiage/page5_1.html
<table>
<thead>
<tr>
<th>BMI Category</th>
<th>Former Terminology</th>
<th>Recommended Terminology</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5&lt;sup&gt;th&lt;/sup&gt; percentile</td>
<td>Underweight</td>
<td>Underweight</td>
</tr>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; – 84&lt;sup&gt;th&lt;/sup&gt; percentile</td>
<td>Healthy weight</td>
<td>Healthy weight</td>
</tr>
<tr>
<td>85&lt;sup&gt;th&lt;/sup&gt; – 94&lt;sup&gt;th&lt;/sup&gt; percentile</td>
<td>At risk for overweight</td>
<td>Overweight</td>
</tr>
<tr>
<td>≥95&lt;sup&gt;th&lt;/sup&gt; percentile</td>
<td>Overweight or Obesity</td>
<td>Obesity</td>
</tr>
<tr>
<td>≥120% x 95&lt;sup&gt;th&lt;/sup&gt; percentile (BMI &gt; 35)</td>
<td>Morbid Obesity</td>
<td>Class 2 Obesity</td>
</tr>
<tr>
<td>≥140% x 95&lt;sup&gt;th&lt;/sup&gt; percentile (BMI &gt; 40)</td>
<td>Morbid Obesity</td>
<td>Class 3 Obesity</td>
</tr>
</tbody>
</table>

Pediatrics 2007;120;S164

JAMA 2014; 168(6)
BMI vs BMI Percentile

Centers for Disease Control and Prevention (CDC) Growth Charts for male and female children (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
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.

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

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

Differentiating Causes of Obesity

Exogenous Cause

Endogenous Cause

<table>
<thead>
<tr>
<th>Exogenous Cause</th>
<th>Endogenous Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>#DIV/0!</td>
<td>#DIV/0!</td>
</tr>
<tr>
<td>6.00</td>
<td>8.00</td>
</tr>
<tr>
<td>20.00</td>
<td>21.00</td>
</tr>
<tr>
<td>115.00</td>
<td>119.00</td>
</tr>
<tr>
<td>15.12</td>
<td>15.12</td>
</tr>
<tr>
<td>31.00</td>
<td>31.00</td>
</tr>
<tr>
<td>128.00</td>
<td>129.00</td>
</tr>
<tr>
<td>18.92</td>
<td>19.21</td>
</tr>
<tr>
<td>8.00</td>
<td>10.00</td>
</tr>
<tr>
<td>52.00</td>
<td>75.00</td>
</tr>
<tr>
<td>145.00</td>
<td>159.00</td>
</tr>
<tr>
<td>24.73</td>
<td>24.73</td>
</tr>
<tr>
<td>10.00</td>
<td>12.00</td>
</tr>
<tr>
<td>75.00</td>
<td>86.00</td>
</tr>
<tr>
<td>165.00</td>
<td>142.00</td>
</tr>
<tr>
<td>27.55</td>
<td>27.55</td>
</tr>
<tr>
<td>12.00</td>
<td>14.00</td>
</tr>
<tr>
<td>86.00</td>
<td>91.00</td>
</tr>
<tr>
<td>172.00</td>
<td>145.00</td>
</tr>
<tr>
<td>29.07</td>
<td>29.07</td>
</tr>
<tr>
<td>14.00</td>
<td>16.00</td>
</tr>
<tr>
<td>91.00</td>
<td>96.00</td>
</tr>
<tr>
<td>173.00</td>
<td>159.00</td>
</tr>
<tr>
<td>30.41</td>
<td>30.41</td>
</tr>
<tr>
<td>16.00</td>
<td>18.00</td>
</tr>
<tr>
<td>92.00</td>
<td>101.00</td>
</tr>
<tr>
<td>174.00</td>
<td>174.00</td>
</tr>
<tr>
<td>30.73</td>
<td>30.73</td>
</tr>
<tr>
<td>#DIV/0!</td>
<td>#DIV/0!</td>
</tr>
<tr>
<td>6.00</td>
<td>8.00</td>
</tr>
<tr>
<td>20.00</td>
<td>21.00</td>
</tr>
<tr>
<td>115.00</td>
<td>119.00</td>
</tr>
<tr>
<td>15.12</td>
<td>15.12</td>
</tr>
<tr>
<td>31.00</td>
<td>31.00</td>
</tr>
<tr>
<td>128.00</td>
<td>129.00</td>
</tr>
<tr>
<td>18.92</td>
<td>19.21</td>
</tr>
<tr>
<td>8.00</td>
<td>10.00</td>
</tr>
<tr>
<td>52.00</td>
<td>75.00</td>
</tr>
<tr>
<td>145.00</td>
<td>159.00</td>
</tr>
<tr>
<td>24.73</td>
<td>24.73</td>
</tr>
<tr>
<td>10.00</td>
<td>12.00</td>
</tr>
<tr>
<td>75.00</td>
<td>86.00</td>
</tr>
<tr>
<td>165.00</td>
<td>142.00</td>
</tr>
<tr>
<td>27.55</td>
<td>27.55</td>
</tr>
<tr>
<td>12.00</td>
<td>14.00</td>
</tr>
<tr>
<td>86.00</td>
<td>91.00</td>
</tr>
<tr>
<td>172.00</td>
<td>145.00</td>
</tr>
<tr>
<td>29.07</td>
<td>29.07</td>
</tr>
<tr>
<td>14.00</td>
<td>16.00</td>
</tr>
<tr>
<td>91.00</td>
<td>96.00</td>
</tr>
<tr>
<td>173.00</td>
<td>159.00</td>
</tr>
<tr>
<td>30.41</td>
<td>30.41</td>
</tr>
<tr>
<td>16.00</td>
<td>18.00</td>
</tr>
<tr>
<td>92.00</td>
<td>101.00</td>
</tr>
<tr>
<td>174.00</td>
<td>174.00</td>
</tr>
<tr>
<td>30.73</td>
<td>30.73</td>
</tr>
</tbody>
</table>
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
Labs to Consider

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

<table>
<thead>
<tr>
<th>BMI</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;85th–94th percentile, with no risk factors</td>
<td>Fasting lipid levels</td>
</tr>
<tr>
<td>&gt;85th–94th percentile, with risk factors (e.g., family history of obesity-related diseases, elevated blood pressure, elevated lipid levels, or tobacco use)</td>
<td>Fasting lipid levels, AST and ALT levels, and fasting glucose levels</td>
</tr>
<tr>
<td>≥95th percentile</td>
<td>Fasting lipid levels, AST and ALT levels, and fasting glucose levels</td>
</tr>
</tbody>
</table>

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)

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

1. Identification
   - Calculate and plot BMI at every well child visit
   - BMI 5th-84th percentile
     - Child history & exam
     - Child growth
     - Parental obesity
     - Family history
   - BMI 85th-94th percentile
     - Child history & exam
     - Child growth
     - Parental obesity
     - Family history
     - Laboratory, as needed
   - BMI ≥ 95th percentile
     - Child history & exam
     - Child growth
     - Parental obesity
     - Family history
     - Laboratory

2. Assessment
   - Medical Risk
     - Sedentary time
     - Eating
   - Behavior Risk
     - Physical activity
   - Attitudes
     - Family and patient concern and motivation

3. Prevention
   - Target behavior
     - Identify problem behaviors
     - If no problem behaviors, praise current practice
     - Patient/family counseling
     - Review any risks (e.g., DM)
     - Use patient-directed techniques to encourage behavior change (see algorithm table)
   - Intervention for Treatment
     - (No evidence of health risk)
     - (Evidence of health risk)
   - Stage 1 Prevention Plus
     - Primary care office
   - Stage 2 Structured Weight Management
     - Primary care office with support
   - Stage 3 Comprehensive Multidisciplinary Intervention
     - Pediatric weight management center
   - Stage 4 Tertiary Care Intervention (select patients)
     - Tertiary care center

Pediatrics 2007;120;S164
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

<table>
<thead>
<tr>
<th>&lt;2 years Use the WHO Growth Chart</th>
<th>2-18 years Use the CDC Growth Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight for Length</td>
<td>BMI Percentile</td>
</tr>
</tbody>
</table>

- 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 ≥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

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)
- BMI Percentile: ≥ 95%, ≥ 99%

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

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
## 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

<table>
<thead>
<tr>
<th>&lt;2 years Use the WHO Growth Chart</th>
<th>2-18 years Use the CDC Growth Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight for Length</td>
<td>BMI Percentile</td>
</tr>
</tbody>
</table>

- 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”  
  o Rare for child with BMI ≥95%
  o 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
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

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

Healthy Weight

<table>
<thead>
<tr>
<th>Age</th>
<th>Measure</th>
<th>2-18 yo</th>
<th>&lt;95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2 yo</td>
<td>&lt;95%</td>
<td>5-84%</td>
<td></td>
</tr>
</tbody>
</table>

Overweight

<table>
<thead>
<tr>
<th>Age</th>
<th>Measure</th>
<th>2-18 yo</th>
<th>≥95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;2 yo</td>
<td>≥95%</td>
<td>85%</td>
<td></td>
</tr>
</tbody>
</table>

Obesity (2-18 yo)

<table>
<thead>
<tr>
<th>BMI Percentile</th>
<th>≥95%</th>
<th>≥99%</th>
</tr>
</thead>
</table>
Healthy Habits Curriculum

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.
  \textit{Pre-contemplation}

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

- I keep meaning to do something to improve my eating habits, but have not gotten around to it.
  \textit{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.
  \textit{Action}

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

https://pdfs.semanticscholar.org/presentation/
ON the LABEL

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 5g per serving.
- A food with low amounts of sugar.

SHOPPING LIST

Milk and Milk Products (low-fat or fat-free)
- Milk
- Yogurt
- Cheddar cheese
- Cottage cheese
- Cream cheese
- American cheese
- Ricotta cheese
- String cheese

Fruit (Fresh or packed in 100% juice)
- Apples
- Bananas
- Grapes
- Pineapples
- Mangoes
- Strawberries

Grains
- Oatmeal
- Brown rice
- Italian long grain rice
- English muffins (enriched)
- Popcorn (no added fat or salt)

Vegetables
- Carrots
- Leek
- Beans
- Orions
- Broccoli
- Peppers
- Celery
- Potatoes
- Cucumber
- Tomatoes
- Corn

Protein
- Beef (lean)
- Pork lean chops or loin
- Chicken (white, parts)
- Fish
- Vegeburger
- Eggs
- Tofu

Whole wheat products

Other

What size is a portion?

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Vegetables</th>
<th>Cheese (low-fat or fat-free)</th>
<th>Pasta (cooked)</th>
</tr>
</thead>
</table>
| 1 medium fruit is about the size of a baseball. | ½ cup, about the size of a small computer mouse. | 1½ ounces, about the size of six dice. | ½ cup, about the size of a small computer mouse.

or lean meat: 2–3 ounces, the size of a deck of cards.
# 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. Grill, grill, or bake foods instead of frying.
5. Limit drinking sodas no twice a week, treating them as a dessert and not as a meal beverage.

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>TOTAL</th>
</tr>
</thead>
</table>

**Next Visit ____________________**

**The Power of Three Checklist**

**Homework Assignment**

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/
Change Talk App

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

Behavioral Therapy

- 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

16 y/o female
4 sessions

15 y/o male
4 sessions

11 y/o male
5 sessions

10 y/o female
6 sessions

[Graphs showing BMI distribution over age for different age groups]

Dealing With Nonadherence

- 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
Pharmacotherapy

- 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/
Surgical Options

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

Roux-en-Y

Gastric Sleeve

Key Takeaways

- 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.
Questions
Managing the Pediatric Diabetes Patient
John M. Oberlin, MD
Lieutenant Colonel, USAF, Medical Corps
Chief, Pediatric Endocrinology
San Antonio Military Medical Center
JBSA-Ft Sam Houston, TX
Dr. John Oberlin has no relevant financial or non-financial relationships to disclose relating to the content of this activity; or presenter(s) must disclose the type of affiliation/financial interest (e.g., employee, speaker, consultant, principal investigator, grant recipient) with company name(s) included.

The opinions expressed on this document are solely those of the author(s) and do not represent an endorsement by or the views of the United States Air Force, the Department of Defense, or the United States Government.

This continuing education activity is managed and accredited by the Defense Health Agency J7 Continuing Education Program Office (DHA J7 CEPO). DHA J7 CEPO, as well as all accrediting organizations do not support or endorse any product or service mentioned in this activity.

DHA J7 CEPO, as well as, activity planners and reviewers have no relevant financial or non-financial interest to disclose.

Commercial support was not received for this activity.
The views of (KVH Tech, Elite Pharmaceuticals, Vivus, Pfizer, Sanofi Aventis, GlaxoSmithKline, Arena Pharmaceuticals, Orexigen Therapeutics, Wyeth-Ayerst Laboratories) are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the Department of the Air Force. No Federal endorsement of (manufacturer) is intended.
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
<table>
<thead>
<tr>
<th>LAB TEST</th>
<th>PREDIABETES</th>
<th>DIABETES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1c</td>
<td>5.7-6.4%</td>
<td>≥6.5%</td>
</tr>
<tr>
<td>FPG (Fasting Plasma Glucose)</td>
<td>&gt;100-125</td>
<td>≥126 mg/dL (7.0 mmol/L)</td>
</tr>
<tr>
<td>OGTT (2-h post 75g glucola oral glucose tolerance test)</td>
<td>&gt;140-199</td>
<td>≥200 mg/dL (11.1 mmol/L)</td>
</tr>
<tr>
<td>Random Glucose</td>
<td></td>
<td>≥200 mg/dL (11.1 mmol/L)</td>
</tr>
</tbody>
</table>

ADA. (2020).
“Classic” Signs/Symptoms

Type 1
- Slender
- Polyuria
- Polydipsia
- Weight loss

Type 2
- Overweight
- Polydipsia
- Polyuria
- Acanthosis nigricans

Diagnostics
- Hyperglycemia, Ketonemia
- Glycosuria, Ketonuria
- Antibodies

Other Diagnostics
- Hypertension
- Hyperlipidemia

ADA. (2020).
**T1DM versus T2DM**

**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

ADA. (2020).
T1DM versus T2DM

https://accesspharmacy.mhmedical.com/content.aspx?bookid=689&Sectionid=45310509
When to Refer

LOW Risk
- HbA1c < 6.0%
- FPG < 100 md/dL
- Random/OGTT < 140 mg/dL
- BMI ≥ 85th 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

When to Refer

MODERATE Risk
- HbA1c 6.0-6.4%
- FPG 100-125 md/dL
- Random/OGTT 140-199 mg/dL
- BMI ≥ 95th 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

When to Refer

HIGH Risk
- HbA1c ≥ 6.5%
- FPG ≥ 126 md/dL
- Random/OGTT ≥ 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 ≥ 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)

What Causes Type 1 Diabetes Mellitus?

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

The Gradual Onset of Type 1 Diabetes

Damage to Islet Cells → Diabetes (with elevated blood sugar)

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
Insulin Types

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

www.diabetes.org/schooltraining
Basal and Bolus Insulin

BOLUS INSULIN is timed and amount is given based on food intake.

BASAL INSULIN provides steady dose throughout day and night.

Blood glucose still rises with food intake, but doesn't peak as high.

www.diabetes.org/schooltraining
Federal Laws: Equal Access

- **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
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
# Written Plans for Diabetes Management

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

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

- 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

www.diabetes.org/schooltraining
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

www.diabetes.org/schooltraining
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

www.diabetes.org/schooltraining
### 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

www.diabetes.org/schooltraining
Management of Pediatric DKA/“Sick Days”

Considerations for Transfer

- Consult Pediatric Endocrinologist if:
  - Blood glucose >250 mg/dL
  - Urine Ketones = “moderate”-“large”

- Hospitalize if:
  - Unable to tolerate oral hydration
  - pH <7.3
  - HCO3 ≤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

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
Diabetes is Managed, But it Does Not Go Away.

GOAL:

Maintain target blood glucose

Constant Juggling 24/7!

www.diabetes.org/schooltraining
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

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

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

*Pediatric Diabetes 2014: 15(Suppl. 20): 270–278*
## Summary of Management Goals

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>&lt;7.5%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>LDL &lt;100 mg/dL; HDL &gt;40 mg/dL</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>&lt;150 mg/dL</td>
</tr>
<tr>
<td>ACR</td>
<td>&lt;30 mg/g</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>&lt;90&lt;sup&gt;th&lt;/sup&gt; %tile by age, sex, &amp; height ( &lt;130/80 for adolescents)</td>
</tr>
<tr>
<td>BMI</td>
<td>&lt;95&lt;sup&gt;th&lt;/sup&gt; %tile (non-obese)</td>
</tr>
<tr>
<td>Diet</td>
<td>Fat &lt;30% (Saturated Fat &lt;10%), Fiber 25-35 g/day, fresh fruit/vegetables 5+ servings/day</td>
</tr>
<tr>
<td>Activity</td>
<td>&gt;1-hour/day moderate/aerobic; &lt;2-hour/day sedentary</td>
</tr>
<tr>
<td>Smoking</td>
<td>None</td>
</tr>
</tbody>
</table>
Special Considerations for Pediatric Patients in the Military Health System

- 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
- www.ispad.org
- www.BarbaraDavisCenter.org
  - www.ucdenver.edu/academics/colleges/medicalschool/centers/BarbaraDavis/Pages/barbaradaviscenter.aspx
- diabetes.cemmlibrary.org
- www.ChildrensDiabetesFoundation.org
- www.ChildrenWithDiabetes.com
- www.aboutkidshealth.ca/En/ResourceCentres/Diabetes
- www.choosemyplate.org
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
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)


References


How to Obtain CE Credits

To receive CE credits you must complete the course posttest and evaluation before collecting your certificate. The posttest and evaluation will be available from 10 - 24 April 2020 at 2359 ET. Please complete the following steps to obtain CE credit:

1. Go to URL https://www.dhaj7-cepo.com/
2. In the search bar on the top left, copy and paste the activity name: Diabetes Champion Course #16. This will take you to the activity home page.
3. Click on the REGISTER/TAKE COURSE tab.
   a. If you have previously used the CEPO LMS, click login.
   b. If you have not previously used the CEPO LMS click register to create a new account.
4. Verify, correct, or add your profile information.
5. Enter the Access code.
6. Follow the onscreen prompts to complete the post-activity assessments:
   a. Read the Accreditation Statement
   b. Complete the Evaluation
   c. Take the Posttest
7. After completing the posttest at 80% or above, your certificate will be available for print or download.
8. You can return to the site at any time in the future to print your certificate and transcripts at https://www.dhaj7-cepo.com/
9. If you require further support, please contact us at dha.ncr.j7.mbx.cepo-lms-support@mail.mil
Questions
# CPT & ICD-9 Coding for Obesity-Related Preventive Care

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

Pediatrics 2007;120;S229
# CPT Coding for Obesity-Related Preventive Care

<table>
<thead>
<tr>
<th>Code</th>
<th>Designation/Situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>96150</td>
<td>Health &amp; behavior assessment (e.g., health-focused clinical interview, behavioral observations, psychophysiological monitoring, health-oriented questionnaires)</td>
</tr>
<tr>
<td>96151</td>
<td>Reassessment</td>
</tr>
<tr>
<td>96152</td>
<td>Health &amp; behavior intervention</td>
</tr>
<tr>
<td>96153</td>
<td>Health &amp; behavior intervention with ≥2 patients</td>
</tr>
<tr>
<td>96154</td>
<td>Health &amp; behavior intervention with family, with patient present</td>
</tr>
<tr>
<td>96155</td>
<td>Health &amp; behavior intervention with family, without patient present</td>
</tr>
<tr>
<td>99241-99245</td>
<td>Consultation, office, or other outpatient visit</td>
</tr>
</tbody>
</table>
# Diagnosis Codes for Obesity-Related Visits

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

Pediatrics 2007;120;5229
## Diagnosis Codes for Obesity-Related Visits

<table>
<thead>
<tr>
<th>Code</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>V62.9</td>
<td>Unspecified psychosocial circumstances</td>
</tr>
<tr>
<td>V69.0</td>
<td>Lack of physical exercise</td>
</tr>
<tr>
<td>V69.1</td>
<td>Inappropriate diet and eating habits</td>
</tr>
<tr>
<td>V69.8</td>
<td>Other problems related to lifestyle; self-damaging behavior</td>
</tr>
<tr>
<td>V69.9</td>
<td>Problem related to lifestyle, unspecified</td>
</tr>
</tbody>
</table>

**Diagnoses for subsequent visits**

<table>
<thead>
<tr>
<th>Code</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>V65.3</td>
<td>Dietary surveillance and counseling</td>
</tr>
<tr>
<td>V65.41</td>
<td>Exercise counseling</td>
</tr>
<tr>
<td>V65.49</td>
<td>Other specified counseling</td>
</tr>
</tbody>
</table>

*Pediatrics 2007;120;S229*