Screen for Obesity and Co-Morbidity

**Growth**
- Birth to 2 years: use CDC weight-for-length charts
- 2-18 years: use CDC BMI %ile charts
- Breast fed infants: use WHO breast feeding charts
- Excessive weight gain prior to 6 months of age is associated with later obesity
- Overweight = 85-94%ile, Obese ≥95%ile

**Blood Pressure**
- Systolic and Diastolic
- Begin routine screening at 3 years of age
- Pre-hypertension: BP 90-94%, Stage I: 95-99% + 5mm, Stage II: >99% + 5mm
- Obtain 3 measurements on separate days for diagnosis of HTN (except if stage II)

**History**
- Screen all patients, regardless of BMI status, for healthy behaviors using 5-2-1-0:
  - 5 fruits and vegetables daily, less than 2 hours of screen time daily, 1 hour or more of daily physical activity, 0 sweetened beverages
- Family history of obesity, gestational diabetes, type 2 diabetes, early cardiovascular event in parents or grandparents (prior to 55 years in males and 65 years in females) = increased risk

**Lab screening**
- If BMI >95%ile + 10 years or older: non-fasting lipids, HbA1C, ALT
- If family history of early cardiovascular event, obtain lipids beginning at 2 years of age to rule out genetic dyslipidemia

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**Childhood Obesity Guideline**

Obesity is preventable.

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**Promote Healthy Fit Children and Reduce Obesity**

Give consistent messages for all children regardless of BMI

**Nutrition**
- Infant and Toddlers (0-2 yrs)
  - Breast feeding offers protection against obesity (exclusivity and duration strengthen association)
  - To prevent overfeeding: increase parental awareness of hunger and satiety cues and teach comforting with attention rather than food
  - Introduction of solids prior to 4 months is associated with increased obesity risk
  - Diet quality decreases with the transition to table foods: encourage fruits and vegetables and discuss avoiding sweetened beverages
- Older Children (3-18 yrs)
  - Encourage plate method: ½ plate fruit and vegetables, ¼ lean protein, ¼ whole grain carbohydrate
  - Vegetables may be fresh, frozen or canned
  - Family meals are associated with higher dietary quality
  - Portion sizes are often excessive when eating out
  - Skipping breakfast is associated with a higher risk of obesity and decreased academic performance
  - Food insecurity is associated with higher obesity risk

**Screen Time**
- Infant and Toddlers (0-2 yrs)
  - Television and videos are not recommended <2 years of age
- Older Children (3-18 yrs)
  - Television in bedrooms is associated with sleep disruption and increased viewing
  - Limit screen time to less than 2 hours daily
  - Empower parents to unplug their children

**Physical Activity**
- Infant and Toddlers (0-2 yrs)
  - Physical activity is promoted by providing frequent opportunity for movement
  - Infant and toddlers should not be inactive for more than 60 minutes unless sleeping
  - Toddlers need several hours of unstructured movement every day
- Older Children (3-18 yrs)
  - Physical activity is associated with improved mood, focus and academic achievement
  - Outside time is associated with increased activity, improved Vitamin D status, and improved focus
  - Family role modeling and peer support are associated with increased levels of activity

**Beverages**
- Infant and Toddlers (0-2 yrs)
  - Serve nonfat milk beginning at 1 year of age unless weight-for-length <5%
  - No sweetened beverages; intake increases risk of obesity
  - Fruit is more nutritious than juice and does not have the potential risk for obesity and caries
- Older Children (3-18 yrs)
  - Nonfat milk and water are preferred for nutrient value and hydration
  - No sweetened beverages: intake increases risk of obesity (soda, fruit drinks, and sport drinks)

**Sleep**
- Infant and Toddlers (0-2 yrs)
  - Sleep duration is inversely associated with obesity
- Older Children (3-18 yrs)
  - Sleep duration is inversely associated with obesity

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1. **Engage patient/parent**
   - Have you heard of 5-2-1-0?
   - 5-2-1-0 are recommended daily behaviors which improve fitness, health, and weight (see definition of 5-2-1-0 below).

2. **Advise**
   - How is your family doing with 5-2-1-0? Do you have any ideas for improvement? If no: Are there one or two goals on this Action Plan that your family is ready to work on?

3. **Elicit**
   - On a scale of 1-10, how confident are you that you will be able to make this change?

4. **Assist**
   - May I (or someone from my office) follow up with you in 2 weeks to discuss your progress or difficulties with these goals?
**Childhood Obesity Guideline**

*Obesity is preventable.*

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### Treatment for Overweight and Obese Children

For the Age-Specific Weight Loss Targets table, see [www.healthteamworks.org](http://www.healthteamworks.org)

#### Basic Lifestyle Intervention
- Use motivational interviewing techniques and action plan to set at least 1 nutrition and/or physical activity goal for the entire family. (This may be done by medical staff, registered dietitian or healthcare provider.)
- Track family goals and refer to community resources: [www.healthteamworks.org](http://www.healthteamworks.org)
- Follow up in two weeks, then monthly via office visit, phone or email to assess progress and barriers to change
- After success with one behavior, begin work on another behavior
- Re-evaluate behaviors, BMI %ile and co-morbidities at 3-6 months

#### Structured Lifestyle
- If no success with basic lifestyle intervention, refer motivated families to a family-based program which incorporates nutrition, physical activity and behavioral components and involves >25 hours of contact over a 6 month period

#### Physician/RD Specialty Consult
- Consult/refer if co-morbidities persist or if no improvement after 6 months of structured lifestyle

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### Obesity Co-Morbidities

<table>
<thead>
<tr>
<th>Disease</th>
<th>Evaluation</th>
<th>Diagnostic Criteria</th>
<th>Rule Outs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulin Resistance</td>
<td>Fasting glucose</td>
<td>Fasting glucose 100-125 mg/dl or HbA1C 5.7-6.4%</td>
<td></td>
</tr>
<tr>
<td>Type 2 Diabetes</td>
<td>HbA1C</td>
<td>HbA1C ≥ 6.5%</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>Blood Pressure x3, UA, Creatinine, CBC, electrolytes, renal US</td>
<td>Age/gender/height tables</td>
<td></td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>Non-fasting Lipid Panel</td>
<td>LDL &gt;100 mg/dl, Non HDL-C &gt;120, Trig &gt;150, HDL &lt;40</td>
<td>If LDL &gt;130, TG &gt;250 or non HDL-C &gt;145 obtain R/O thyroid, liver, renal disease, or diabetes</td>
</tr>
<tr>
<td>Non Alcoholic Steatohepatitis (NASH)</td>
<td>ALT if ALT &gt;60 order liver profile</td>
<td>ALT &gt; AST, normal bilirubin &amp; albumin, Exclude other liver diseases if ALT &gt;100 or ALT &gt;60 after 3 months</td>
<td>Hepatitis screen, ANA, Anti LKM antibody, Anti smooth muscle ab, Alpha 1 antitrypsin phenotype, ceruloplasmin, alcohol, drugs, toxins, liver ultrasound</td>
</tr>
<tr>
<td>Polycystic Ovary Syndrome (PCOS)</td>
<td>Testosterone: free and total DHEAS Prolactin Thyroid profile FSH</td>
<td>Requires 2 of: Oligo- or amenorrhea &lt;9 periods/year Hyperandrogenism clinical or biochemical Polycystic ovaries on US</td>
<td>Hyperprolactinemia Congenital adrenal hyperplasia Cushing's syndrome Ovarian/Adrenal tumors (if testosterone &gt;150 ng/dl or DHEAS &gt;700 mcg/dl)</td>
</tr>
<tr>
<td>Depression</td>
<td>PHQ-9 (11-18 years) PSC (6-16 years)</td>
<td>Score ≥11 or Q12 or 13 yes Score ≥30 or Q36 or 37 yes</td>
<td></td>
</tr>
<tr>
<td>Sleep Apnea</td>
<td>Pediatric sleep questionnaire</td>
<td>Sleep study</td>
<td></td>
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<tr>
<td>Genetic Syndrome</td>
<td>Developmental delay, short stature or dysmorphic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endocrine causes</td>
<td>Decreased height velocity</td>
<td>Hypothyroidism, Cushing's</td>
<td>TSH, Free T4, Cortisol AM</td>
</tr>
<tr>
<td>Slipped Capital Femoral Epiphysis (SCFE)</td>
<td>Hip X-ray</td>
<td></td>
<td></td>
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<tr>
<td>Pseudotumor Cerebri</td>
<td>Papillidema/headache</td>
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</tbody>
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### Resources

**Food Access:** To access county social services websites/phones: [http://www.cdhs.state.co.us/servicebycounty.htm](http://www.cdhs.state.co.us/servicebycounty.htm). For online application and screening tools: [https://peak.state.co.us/selfservice](https://peak.state.co.us/selfservice), WIC, Share Colorado, Operation Frontline, School Meal Program

**Physical Activity:** City/County Recreational Centers, YMCA, Boys & Girls Clubs, School Programs, Safe Routes to School, [http://www.nwf.org/Get-Outside](http://www.nwf.org/Get-Outside)

**Nutrition:** Colorado Dietetic Association ([www.eatrightcolorado.org](http://www.eatrightcolorado.org) or 303-757-2060)  

*For additional resources, visit [www.healthteamworks.org](http://www.healthteamworks.org)*

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This guideline is designed to assist the primary care provider in the prevention and treatment of childhood obesity. It is not intended to replace a clinician’s judgment or establish a protocol for all patients. For national recommendations, references, and additional copies of the guideline go to [www.healthteamworks.org](http://www.healthteamworks.org) or call (720) 297-1681. This guideline was supported through funds from The Colorado Health Foundation.