

## Evaluation and Treatment of Children and Adolescents with Obesity (2023)

### About the Guideline

- The subcommittee tasked with developing this guideline included the following individuals and specialties: pediatric primary and tertiary care providers; behavioral health, nutrition, public health researchers; pediatric surgery specialists, medical epidemiologists, an implementation scientist, a parent representative, and a representative from the American Academy of Pediatrics (AAP).
- A literature search was conducted using PubMed and CENTRAL, and the evidence was graded using a leveled grading matrix.

### Key Clinical Considerations

Become familiar with the recommendations and best-practice statements provided in this guideline, especially if you work with a pediatric population.

### Overview

- Obesity is one of the most common pediatric chronic conditions, affecting 14.4 million children.
- Childhood obesity is defined using the “gold standard” of body mass index (BMI). Children with a BMI of greater than or equal to the 95th percentile for age and sex are considered obese. Those with a BMI greater than or equal to 120% of the 95th percentile for age and sex are considered severely obese.

### Risk Factors

- Policy factors
  - Marketing of unhealthy foods
  - Under-resourced communities
    - Socioeconomic status
    - Children in families that have immigrated
  - Food insecurity
- Neighborhood and community environmental influences or contributors to obesity
  - School environment
  - Lack of fresh food access
  - Presence of fast-food restaurants
  - Access to safe physical activity
  - Environmental health
- Family and home environmental factors
  - Parenting feeding styles, such as the following:
    - Authoritative (responsive and warm with high expectations)
    - Authoritarian (not responsive, but with high expectations)
    - Permissive or indulgent (responsive and warm, but lenient with few rules)
    - Negligent (not responsive with few rules)
  - Family home environment organization, including family routines and setting limits
  - Sugar-sweetened beverages
  - Portion sizes

- Snacking behavior
- Dining out and family meals
- Screen time, including TV, computer, video or videogames, mobile phones, and other digital devices
  - More than 2 hours per day of screen time is associated with a higher risk of overweight or obesity.
- Sedentary behavior
- Sleep duration
- Environmental smoke exposure
- Adverse childhood experiences, including the following:
  - History of physical, emotional, or sexual abuse
  - Exposure to domestic violence
  - Household dysfunction from parental divorce or substance abuse
  - Economic insecurity
  - Mental illness
  - Loss of a parent due to death or incarceration

### **Individual-Level Influences or Contributors to Obesity**

- Genetic factors
  - Monogenetic syndromes and polygenetic effects
    - Leptin deficiency (monogenetic)
    - Prader-Willi syndrome (syndromic forms of obesity)
  - Epigenetic factors
- Prenatal risk factors
  - Parental obesity
  - Maternal weight gain
  - Gestational diabetes
  - Maternal smoking
- Postnatal risk factors
  - Birth weight
  - Early breastfeeding cessation and formula feeding
  - Rapid weight gain during infancy and early childhood
  - Early use of antibiotics (use in children under 2 years of age)
    - Boys are more susceptible to weight gain than girls.
    - Antibiotics alter the gut microbiome, which is usually established during the first years of life, leading to a change in energy balance.
- Childhood risk factors
  - Endocrine disorders, such as Cushing syndrome
  - Children and youths with special health care needs impacting nutrition and physical activity, such as the following:
    - Developmental and physical disabilities
    - Autism spectrum disorder (ASD)
    - Myelomeningocele
  - Attention-deficit/hyperactivity disorder (ADHD)
  - Weight-promoting appetitive traits
  - Medication use, such as the following:
    - Medications used for the management of allergies and asthma

- Antidepressants
- Antiepileptics
- Antipsychotics
- Anxiolytics
- Migraine management
- Mood stabilizers and antimania medications
- Psychostimulants
- Depression

### **Evaluation of Patients with Overweight or Obesity**

- Evaluation should include obtaining a complete history, performing a review of systems and physical examination, and determining the family's readiness to alter behaviors. The following should be included in the evaluation:
  - Medical history
  - Review of systems
  - Family living arrangements and eating routines and schedules
  - Nutrition and physical activity history
  - Assessments for behavioral health and disordered eating concerns
  - Physical evaluation, including the following assessments and findings:
    - Vital signs
    - Anthropometric measurements
    - Head, eyes, ears, nose, and throat
    - Chest
    - Gastrointestinal
    - Genitourinary
    - Musculoskeletal
    - Skin
  - Cardiopulmonary examination
  - Liver size assessment
  - Genitourinary examination
  - Neurologic evaluation
  - Neuromuscular evaluation
- Laboratory evaluation and comorbidity diagnosis
  - Evaluation for lipid abnormalities, abnormal glucose metabolism, and liver dysfunction is recommended and should be performed at the same time, starting at age 10.
    - To evaluate for dyslipidemia in children and adolescents with overweight and obesity, a fasting lipid panel is recommended.
    - Routine testing for abnormal glucose metabolism or liver function is not recommended for children younger than 10 years of age.
    - To evaluate for familial hypercholesterolemia, a nonfasting lipid panel is recommended for all children 9 to 11 years of age.
    - Perform testing for type 2 diabetes mellitus (T2DM) if there is a suspicion of hyperglycemia and the presence of any of the following symptoms:
      - Polydipsia
      - Polyuria
      - Polyphagia
      - New onset of bedwetting

- Blurred vision
- Unexplained or unexpected weight loss
- Fatigue
- Testing for prediabetes or T2DM may include one of the following tests:
  - Oral glucose tolerance test
  - HgA1c
  - Fasting plasma glucose
- Performing a fasting insulin test is not recommended.
- For the diagnosis of nonalcoholic fatty liver disease, the preferred test is an alanine aminotransferase (ALT).
- For the diagnosis of hypertension (HTN) after an initial elevated BP (greater than or equal to the 90th percentile), the following method is recommended:
  - Repeat the BP twice with auscultation and averaged at the same visit to determine accurate BP measurement and category. Confirm elevated BP measurements, using auscultation, on three separate visits for elevated BP and stage 1 HTN, and on two separate visits for stage 2 HTN.
- Obstructive sleep apnea (OSA) is distinguished by prolonged partial airway obstruction and/or intermittent complete obstruction that disrupts normal ventilation during sleep.
  - To evaluate for OSA, the following are recommended:
    - Conduct a sleep history that includes daytime somnolence, symptoms of snoring, inattention, morning headaches, and nocturnal enuresis.
    - Perform a polysomnogram for children and adolescents with at least one symptom of disordered breathing.
- For suspicion of polycystic ovarian syndrome, the evaluation of menstrual irregularities and assessment for signs of hyperandrogenism are recommended for female adolescents.
- Monitoring for symptoms of depression and conducting an annual evaluation for depression using a formal self-reporting tool is recommended for adolescents 12 years and older.
- Orthopedic comorbidities may include slipped capital femoral epiphysis and Blount disease.
- Idiopathic intracranial hypertension is a neurologic condition with long-term effects. Symptoms may include visual changes, vision loss, persistent headaches, and pulsatile synchronous tinnitus. Evaluation by a neurologist and ophthalmologist is recommended.

### Treatment

- Treatment of obesity in children and adolescents involves intensive and long-term strategies that include reducing risks for disordered eating, motivational interviewing, health behavior and lifestyle changes, and include the following strategies:
  - Reduction of sugar-sweetened beverages
  - Utilization of the Choose MyPlate dietary guidelines
  - Sixty minutes of daily moderate to vigorous physical activity
  - Reduction in sedentary behavior
- Offering obesity weight loss pharmacotherapy is recommended as an adjunct to healthy lifestyle and behavior treatment for ages 8 through 11 years of age, according to medication risks, benefits, and indications.
- The safety and efficacy of the following medications are currently being reviewed:

- Metformin
- Orlistat
- Glucagon-like peptide-1 receptor agonist
- Melanocortin 4 receptor (MC4R) agonists
- Phentermine
- Topiramate
- Phentermine and topiramate (combination)
- Lisdexamfetamine
- Metabolic and bariatric surgery are currently being studied for the pediatric population. If deemed appropriate, referral to a comprehensive metabolic and bariatric surgery center for pediatric patients is recommended.

#### Reference

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