

Treatment of Adolescent Obesity in 2020

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Treating the approximately 9 million US adolescents with obesity¹ is challenging because of the complex nature of this chronic disease. Adolescence is a critical period for managing obesity, owing to the dynamic physiological and psychological changes inherent to this period of growth and development. To identify and diagnose obesity, body mass index (BMI) for age and sex percentile should be assessed and tracked (Table)² and assessments for obesity causes, contributors, and complications should include a comprehensive weight, medical, surgical, social, and family history; medication review; physical examination; and laboratory tests.^{3,4}

Consistent with other adolescent chronic diseases, choice of treatment should be guided by the patient's age and pubertal status, severity of obesity, psychosocial factors, and comorbidities.² Rather than proceeding by chronological stages or phases, treatment should occur as an integrated continuum of care that begins with the least invasive, yet appropriately intensive, treatment (Table). All options should be discussed with the family, and it is critical to use patient-first language and terms preferred by adolescents, such as *BMI*, and to avoid terms such as *fat* or even diagnostic terms such as *obese*.⁵

Behavioral Interventions

Comprehensive, intensive lifestyle modification is the cornerstone of obesity treatment for adolescents,^{2,3} yet the magnitude of BMI reduction for this therapy alone is moderate, though potential harms are noted as small to none.² Given that greater weight loss and improvements in cardiometabolic factors are observed at a higher intensity of intervention, behavioral interventions should be delivered for at least 26 contact hours over 2 to 12 months by an interdisciplinary team including a pediatrician, registered dietitian, exercise physiologist, and/or psychologist.² Moreover, targeting the home environment may facilitate change, and involvement of the family in the intervention is recommended.^{2,4} Prescribed modification of diet addressing both quantity and quality of food should include decreasing portions; consuming less ultra-processed foods, sugar-sweetened beverages, and other added sugars; eating more fruits, vegetables, and fiber; and eating regular meals with the family.^{2,4} Recommended physical activity should include 60 minutes of physical activity per day, 20 minutes of which should be moderate to vigorous and should include activities enjoyed by the adolescent to improve adherence and sustainability.^{2,3} Inactivity should be reduced by limiting nonacademic screen time and other sedentary activities to less than 2 hours per day.^{2,4} Adherence to comprehensive, intensive lifestyle interventions ranged from 68% to 95% as reported by the United States Preventive Services Task Force in 2017.² Behavioral change strategies emphasize developing skills in self-monitoring, goal setting, problem solving, contingent reward systems, and stimulus control (eg, limiting screen time and access to unhealthy foods).^{2,3}

Pharmacotherapy

The US Food and Drug Administration has approved 2 medications for adolescent obesity: orlistat, a lipase inhibitor, for long-term use (for ages ≥ 12 years) and phentermine, a norepinephrine reuptake inhibitor, for short-term use (for ages ≥ 17 years) (Table).⁶ In the largest of the randomized clinical trials examining orlistat, the placebo-subtracted BMI reduction at 52 weeks was 0.86 with orlistat.⁷ A total of 64% of participants in the control group and 65% in the orlistat group completed the trial.⁷ The most common adverse events in the orlistat group were gastrointestinal-related, with most reports being of mild to moderate intensity.⁷ These adverse events included steatorrhea, fecal urgency, flatus with oily spotting, abdominal pain, and possible contribution to a vitamin D deficiency.⁷ No randomized clinical trials of phentermine have been conducted in individuals younger than 17 years. However, common adverse effects observed in adults include tachycardia, hypertension, anxiety, insomnia, and headache.⁶ With limited options for antiobesity pharmacotherapy in younger individuals and millions of patients falling into the treatment gap between suboptimal response to behavioral interventions and bariatric surgery, antiobesity medications approved by the US Food and Drug Administration for adults are being used off-label for adolescents.⁶ These medications include metformin, GLP-1 analogues, phentermine, topiramate, naltrexone/bupropion, and lorcaserin.⁶ Research on safety and efficacy of existing and new antiobesity pharmacotherapeutic agents and on long-term outcomes in adolescents are needed.

Bariatric Surgery

Bariatric surgery is an effective treatment for adolescents with severe obesity.⁸ Though lacking a control group, the Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS) study reported 3-year mean BMI reductions of 29% with Roux-en-Y gastric bypass and 27% with vertical sleeve gastrectomy among individuals aged 19 years or younger.⁸ The 5-year outcomes in the Roux-en-Y gastric bypass group demonstrated that the BMI reduction was largely sustained.⁸ Risks of bariatric surgery include specific micronutrient deficiencies and the need for additional abdominal surgical procedures.⁸ Long-term safety and effectiveness data in patients undergoing bariatric surgery during adolescence are lacking.

Future Directions

Obesity demands the scientific rigor and quality of clinical care, including lifelong treatment, afforded to other chronic diseases. Considering the scope of the obesity epidemic and the limited number of obesity medicine specialists, future management of obesity will likely be provided in large part by primary care physicians, as is common with other chronic diseases (eg, type 2 diabetes). Thus, there is a need for obesity medicine training throughout the continuum of medical education for primary care physicians

Table. Treatment Approach for Managing Adolescent Obesity

Recommendation	How	When
Classify and document weight status using BMI	Overweight: BMI in the 85th to 95th percentile for sex and age Obesity: BMI \geq 95th percentile for age and sex Severe obesity: BMI \geq 120% of the 95th percentile for age and sex or BMI $>$ 35	Throughout care and follow-up
Conduct a thorough history, physical examination, and laboratory assessment	Conduct a comprehensive weight history; medical, surgical, social, and family history; medication review; physical examination; and laboratory tests ^{3,4}	At the initial diagnosis of overweight or obesity; monitoring and reassessment as needed thereafter
Discuss diagnosis with patient and caregivers	Ask patient if she or he is open to discussing weight Communicate in a respectful, empathetic, and compassionate manner using patient-first language and appropriate terms ⁵	Throughout care and follow-up
Recommend behavioral interventions	Present throughout treatment continuum Suggest dietary modifications and, when possible, refer patient to a registered dietitian Recommend 60 min of physical activity and less than 2 h of nonacademic sedentary activities Encourage behavioral change strategies, such as self-monitoring and goal setting Refer patient to a psychologist if psychological problems or adverse family dynamics are noted	At the initial diagnosis of overweight or obesity; monitoring and discussion as needed thereafter
Prescribe an FDA-approved pharmacological intervention	Orlistat, a pancreatic lipase inhibitor, is FDA-approved for long-term use in individuals aged \geq 12 years Phentermine, a norepinephrine reuptake inhibitor, is FDA-approved for short-term use in individuals aged \geq 17 years	Combined with lifestyle interventions, medications are appropriate for individuals with BMI \geq 120% of 95th percentile for age and sex or BMI \geq 95th percentile with at least 1 significant obesity-related comorbidity
Recommend a surgical intervention	Refer medically eligible and interested patients to a surgeon with experience performing bariatric surgical procedures on adolescents with a dedicated and experienced multidisciplinary team that provides support before and after the surgical procedure with consistent, long-term follow-up	Individuals with BMI \geq 140% of 95th percentile for age and sex or BMI \geq 120% of 95th percentile with at least 1 significant obesity-related comorbidity

Abbreviations: BMI, body mass index; FDA, US Food and Drug Administration.

and specialists; it is imperative that such educational programs are developed. Additional research funding support is needed to accelerate the development of novel mechanism-based and personalized therapeutic interventions and to assess the efficacy,

safety, and long-term outcomes of existing antiobesity medications in large, long-term randomized clinical trials. Adolescents with obesity, if left untreated, will likely face the unrelenting and detrimental consequences of the disease throughout their life.

ARTICLE INFORMATION

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