

# Interventions for High Body Mass Index in Children and Adolescents

## US Preventive Services Task Force Recommendation Statement

US Preventive Services Task Force

**IMPORTANCE** Approximately 19.7% of children and adolescents aged 2 to 19 years in the US have a body mass index (BMI) at or above the 95th percentile for age and sex, based on Centers for Disease Control and Prevention growth charts from 2000. The prevalence of high BMI increases with age and is higher among Hispanic/Latino, Native American/Alaska Native, and non-Hispanic Black children and adolescents and children from lower-income families.

**OBJECTIVE** The US Preventive Services Task Force (USPSTF) commissioned a systematic review to evaluate the evidence on interventions (behavioral counseling and pharmacotherapy) for weight loss or weight management in children and adolescents that can be provided in or referred from a primary care setting.

**POPULATION** Children and adolescents 6 years or older.

**EVIDENCE ASSESSMENT** The USPSTF concludes with moderate certainty that providing or referring children and adolescents 6 years or older with a high BMI to comprehensive, intensive behavioral interventions has a moderate net benefit.

**RECOMMENDATION** The USPSTF recommends that clinicians provide or refer children and adolescents 6 years or older with a high BMI ( $\geq 95$ th percentile for age and sex) to comprehensive, intensive behavioral interventions. (B recommendation)

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**Group Information:** A complete list of the US Preventive Services Task Force (USPSTF) members appears at the end of this article.

**Corresponding Author:** Wanda K. Nicholson, MD, MPH, MBA, George Washington University, Milken Institute of Public Health, 950 New Hampshire Ave NW #2, Washington, DC 20052 (chair@uspstf.net).

### Summary of Recommendation

Population	Recommendation	Grade
Children and adolescents 6 years or older	The USPSTF recommends that clinicians provide or refer children and adolescents 6 years or older with a high body mass index (BMI) ( $\geq 95$ th percentile for age and sex) to comprehensive, intensive behavioral interventions.	B

See the Practice Considerations section for more information about behavioral interventions. USPSTF indicates US Preventive Services Task Force.

See the Summary of Recommendation figure.

#### Pathway to Benefit

To achieve benefit, it is important that children and adolescents 6 years or older with a high BMI receive intensive (26 or more contact hours) behavioral interventions.

### Preamble

The US Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of specific preventive care services for patients without obvious related signs or symptoms to improve the health of people nationwide.

*It bases its recommendations on the evidence of both the benefits and harms of the service and an assessment of the balance. The USPSTF does not consider the costs of providing a service in this assessment.*

*The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision-making to the specific patient or*

Table 1. Summary of USPSTF Rationale

Rationale	Assessment
Benefits of behavioral and pharmacotherapy interventions	<ul style="list-style-type: none"> <li>The USPSTF found adequate evidence that comprehensive, intensive (<math>\geq 26</math> contact hours) behavioral interventions in children and adolescents 6 years or older with a high BMI can lead to improvements in weight status and quality of life. The magnitude of this benefit is moderate.</li> <li>The USPSTF found inadequate evidence on the benefits of pharmacotherapy due to small number of studies and limited evidence on long-term treatment harms.</li> </ul>
Harms of behavioral and pharmacotherapy interventions	<ul style="list-style-type: none"> <li>The USPSTF found adequate evidence to bound the harms of comprehensive, intensive behavioral interventions in children and adolescents as no greater than small, based on the absence of reported harms in the evidence and the noninvasive nature of the interventions.</li> <li>The USPSTF found adequate evidence to bound the harms of pharmacotherapy as no greater than moderate due to the number of studies that reported gastrointestinal symptoms such as fecal incontinence, flatus, and gallstones.</li> </ul>
USPSTF assessment	The USPSTF concludes with moderate certainty that providing or referring children and adolescents 6 years or older with a high BMI to comprehensive, intensive behavioral interventions has a moderate net benefit.

Abbreviations: BMI, body mass index; USPSTF, US Preventive Services Task Force.

situation. Similarly, the USPSTF notes that policy and coverage decisions involve considerations in addition to the evidence of clinical benefits and harms.

The USPSTF is committed to mitigating the health inequities that prevent many people from fully benefiting from preventive services. Systemic or structural racism results in policies and practices, including health care delivery, that can lead to inequities in health. The USPSTF recognizes that race, ethnicity, and gender are all social rather than biological constructs. However, they are also often important predictors of health risk. The USPSTF is committed to helping reverse the negative impacts of systemic and structural racism, gender-based discrimination, bias, and other sources of health inequities, and their effects on health, throughout its work.

## Importance

Approximately 19.7% of children and adolescents aged 2 to 19 years in the US have a body mass index (BMI) at or above the 95th percentile for age and sex, based on Centers for Disease Control and Prevention (CDC) growth charts from 2000.<sup>1,2</sup> BMI percentile is plotted on growth charts, such as those developed by the CDC, which are based on US-specific, population-based norms for children 2 years or older.<sup>1,3</sup> The prevalence of high BMI increases with age and is higher among Hispanic/Latino, Native American/Alaska Native, and non-Hispanic Black children and adolescents and children from lower-income families.<sup>1,2</sup>

## USPSTF Assessment of Magnitude of Net Benefit

The USPSTF concludes with moderate certainty that providing or referring children and adolescents 6 years or older with a high BMI to comprehensive, intensive behavioral interventions has a **moderate net benefit**. The USPSTF concludes with moderate certainty that intensive behavioral interventions have a **moderate net benefit** for children and adolescents 6 years or older. Therefore, clinicians should provide those with high BMI with such interventions or refer them to appropriate health care professionals.

See **Table 1** for more information on the USPSTF recommendation rationale and assessment and the eFigure in the Supplement for information on the recommendation grade. See the **Figure** for a summary of the recommendation for clinicians. For more details on

the methods the USPSTF uses to determine the net benefit, see the USPSTF Procedure Manual.<sup>4</sup>

## Practice Considerations

### Patient Population Under Consideration

This recommendation applies to children and adolescents 6 years or older.

### Definitions

BMI (weight in kilograms divided by the square of height in meters) is the currently accepted clinical standard measure of excess fat in the US,<sup>1,5</sup> and childhood and adolescent weight status is usually obtained by calculating BMI. Traditionally, children and adolescents are categorized as having "overweight" when their BMI is between the 85th and 95th percentile and as having "obesity" when their BMI is at or above the 95th percentile on CDC growth charts. In this recommendation, the USPSTF will use the general term "high BMI" when referring to youth considered to be above "normal" body weight status ( $\geq 95$ th percentile for age and sex) according to CDC standards. Specific BMI cutoffs (" $\geq 95$ th percentile for age and sex" rather than "obese" and "85th to 95th percentile for age and sex" rather than "overweight") will also be used when feasible. BMI is an imperfect measure of adiposity and is not an equivalent measure of adiposity across all racial and ethnic populations. However, most children with a BMI-for-age at or above the 95th percentile have high adiposity, while few children with a BMI-for-age below the 85th percentile have high adiposity.<sup>1,6</sup>

### Behavioral Counseling Interventions and Implementation Considerations

Comprehensive, intensive behavioral interventions with at least 26 contact hours or more that include supervised physical activity sessions for up to 1 year result in weight loss in children and adolescents.<sup>1</sup> Effective, high-intensity ( $\geq 26$  contact hours) behavioral interventions result in greater weight loss than less intense interventions and result in some improvements in cardiometabolic risk factors.<sup>1</sup> These behavioral interventions consist of multiple components, and although components vary across interventions, many of the studied interventions include sessions targeting both the parent and child (separately, together, or both); offer group sessions in addition to individual or single-family sessions; provide

Figure. Clinician Summary: Interventions for High Body Mass Index in Children and Adolescents

What does the USPSTF recommend?	<b>Children and adolescents 6 years or older:</b> Clinicians should provide or refer children and adolescents 6 years or older with a high body mass index (BMI) (≥95th percentile for age and sex) to comprehensive, intensive behavioral interventions. <b>Grade: B</b>
To whom does this recommendation apply?	This recommendation applies to all children and adolescents 6 years or older.
What's new?	This recommendation is consistent with the 2017 USPSTF recommendation statement on screening for obesity in children and adolescents.
How to implement this recommendation?	<ul style="list-style-type: none"> <li>To achieve benefit, it is important that children and adolescents 6 years or older with a high BMI receive intensive (≥26 contact hours) behavioral interventions.</li> <li>Comprehensive, intensive behavioral interventions of 26 or more contact hours resulted in weight loss. Effective interventions consisted of multiple components, including sessions targeting both the parent and child (separately, together, or both); offering group sessions in addition to individual or single-family sessions; providing information about healthy eating, safe exercising, and reading food labels; and incorporating behavior change techniques such as problem solving, monitoring diet and physical activity behaviors, and goal setting.</li> <li>These types of interventions are often delivered by multidisciplinary teams, including pediatricians, exercise physiologists or physical therapists, dietitians or diet assistants, psychologists or social workers, or other behavioral specialists.</li> </ul>
What additional information should clinicians know about this recommendation?	The USPSTF recognizes the challenges that the families of children and adolescents encounter in accessing effective, intensive behavioral interventions for high BMI. Identifying high BMI and how to address it are important steps in helping children and adolescents and their families obtain the support they need.
Why is this recommendation and topic important?	Approximately 19.7% of children and adolescents aged 2 to 19 years in the US have a BMI at or above the 95th percentile for age and sex, based on Centers for Disease Control and Prevention growth charts from 2000. The prevalence of high BMI increases with age and is higher among Hispanic/Latino, Native American/Alaska Native, and non-Hispanic Black children and adolescents and children from lower-income families.
What are other relevant USPSTF recommendations?	The USPSTF has issued recommendation statements on screening for high blood pressure in children and adolescents, screening for lipid disorders in children and adolescents, and screening for prediabetes and type 2 diabetes in children and adolescents. Current versions of these and other related USPSTF recommendations are available at <a href="https://www.uspreventiveservicestaskforce.org/uspstf/">https://www.uspreventiveservicestaskforce.org/uspstf/</a> .
What are additional tools and resources?	<ul style="list-style-type: none"> <li>The Community Preventive Services Task Force recommends several interventions in youth addressing physical activity, access to affordable healthy food and beverages, making healthy food and beverage choices, reducing sedentary screen time, and using digital health interventions for weight management (<a href="https://www.thecommunityguide.org/pages/task-force-findings-obesity.html">https://www.thecommunityguide.org/pages/task-force-findings-obesity.html</a>).</li> <li>The US Department of Health and Human Services published the "Physical Activity Guidelines for Americans," which provide recommendations for how physical activity can help promote health and reduce the risk of chronic disease for Americans 3 years or older (<a href="https://health.gov/our-work/nutrition-physical-activity/physical-activity-guidelines">https://health.gov/our-work/nutrition-physical-activity/physical-activity-guidelines</a>).</li> <li>The Centers for Disease Control and Prevention has resources available for families and clinicians addressing high BMI (<a href="https://www.cdc.gov/obesity/">https://www.cdc.gov/obesity/</a>).</li> </ul>
Where to read the full recommendation statement?	Visit the USPSTF website ( <a href="https://www.uspreventiveservicestaskforce.org/uspstf/">https://www.uspreventiveservicestaskforce.org/uspstf/</a> ) or the JAMA website ( <a href="https://jamanetwork.com/collections/44068/united-states-preventive-services-task-force">https://jamanetwork.com/collections/44068/united-states-preventive-services-task-force</a> ) to read the full recommendation statement. This includes more details on the rationale of the recommendation, including benefits and harms; supporting evidence; and recommendations of others.

The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision-making to the specific patient or situation.

information about healthy eating, safe exercising, and reading food labels; and incorporate behavior change techniques such as problem solving, monitoring diet and physical activity behaviors, and goal setting.<sup>1</sup> These types of interventions are often delivered by multidisciplinary teams, including pediatricians, exercise physiologists or physical therapists, dietitians or diet assistants, psychologists or social workers, or other behavioral specialists.<sup>1</sup>

The USPSTF recognizes the challenges that the families of children and adolescents encounter in accessing effective, intensive behavioral interventions for high BMI. Identifying high BMI and how to address it are important steps in helping children and adolescents and their families obtain the support they need. The USPSTF also understands that stigma associated with high BMI

can be harmful to children and adolescents. However, the USPSTF did not find evidence that behavioral interventions resulted in additional stigma. Also, none of the trials found a decrease in self-esteem or body satisfaction, or an increase in disordered eating, associated with behavioral interventions.<sup>1</sup>

### Pharmacotherapy Considerations

While several medications demonstrated greater weight loss than placebo, the totality of the evidence was found to be inadequate. An important limitation of the pharmacotherapy studies was that there was only a single trial for each effective medication (ie, phentermine/topiramate, semaglutide, and liraglutide) that lasted longer than 2 months.<sup>1</sup> The limited evidence on weight

maintenance after pharmacotherapy discontinuation suggests that weight rebound starts soon after discontinuation, implying that long-term use will be needed to maintain weight loss. However, there is no evidence on the harms of long-term medication use.<sup>1</sup> In addition, pharmacotherapy is associated with moderate harms due to gastrointestinal symptoms (eg, nausea, vomiting, diarrhea, fecal incontinence, flatus, and gallstones).<sup>1</sup> Therefore, the USPSTF encourages clinicians to promote behavioral interventions as the primary effective intervention for weight loss in children and adolescents.

### Additional Tools and Resources

The Community Preventive Services Task Force recommends several youth interventions promoting physical activity and healthy eating, access to affordable healthy food and beverages, healthy food and beverage choices, and fostering physical activity among children, reducing sedentary screen time, and using digital health interventions for weight management (<https://www.thecommunityguide.org/pages/task-force-findings-obesity.html>).

The US Department of Health and Human Services published the "Physical Activity Guidelines for Americans," which provides recommendations for how physical activity can help promote health and reduce the risk of chronic disease for Americans 3 years or older (<https://health.gov/our-work/nutrition-physical-activity/physical-activity-guidelines>).

The CDC has resources available for families and clinicians addressing high BMI at <https://www.cdc.gov/obesity/>.

### Other Related USPSTF Recommendations

The USPSTF has issued recommendations on screening for high blood pressure in children and adolescents,<sup>7</sup> screening for lipid disorders in children and adolescents,<sup>8</sup> and screening for prediabetes and type 2 diabetes in children and adolescents.<sup>9</sup> Current versions of these and other related USPSTF recommendations are available at <https://www.uspreventiveservicestaskforce.org/uspstf/>.

## Update of Previous USPSTF Recommendation

This recommendation updates the 2017 USPSTF recommendation statement on screening for obesity in children and adolescents 6 years or older (B recommendation).<sup>8</sup>

## Supporting Evidence

### Scope of Review

The USPSTF commissioned a systematic evidence review<sup>1,10</sup> to update its 2017 recommendation on screening for obesity in children and adolescents.<sup>11</sup> Because assessing BMI is now part of routine clinical practice, it was not a focus of this review. The USPSTF reviewed evidence on interventions (behavioral counseling and pharmacotherapy) for weight loss or weight management that can be provided in or referred from a primary care setting. Interventions that did not include a weight loss or weight management component were not eligible for inclusion in this review. Surgical weight loss interventions are generally not first-line preventive interventions and are outside the scope of the review.

### Effectiveness of Behavioral Counseling and Pharmacotherapy Interventions

Fifty randomized clinical trials (RCTs) (N = 8798) examined behavioral interventions. Twenty-eight trials were conducted in the US; the remaining 22 were conducted in Europe, Canada, Australia, New Zealand, Israel, and Turkey. Twenty-seven trials were conducted in primary care settings, and the remaining 23 were conducted in other health care settings (eg, various specialty outpatient clinics or research facilities).<sup>1,10</sup> Most trials (41/50) included study participants who had a BMI at or above the 85th percentile or at or above the 95th percentile for their age or sex according to CDC growth charts, country-specific norms, or International Obesity Task Force norms. The mean BMI percentile was 93 (range, 84.9-99.2).<sup>1,10</sup> Trials included children and adolescents aged 2 to 19 years. Eighteen trials were limited to elementary school-aged children (aged 6 to 8 years, up to age 12 years); 13 trials included preschool-aged or elementary school-aged children to adolescents; 12 trials evaluated adolescents only; and 7 trials targeted preschool- to kindergarten-aged children.<sup>1,10</sup>

Most trials did not report on race or ethnicity or included predominantly White study participants. Trials conducted in the US had a more diverse study population; trials were mostly composed of White (52.4%), Black (20.5%), and Hispanic/Latino (25%) study participants.<sup>1,10</sup> There was limited inclusion of Asian or Native American/Alaska Native participants. Most trials described the level of patient participation in interventions. In the included trials, 31% to 93% of participants completed all sessions. The average percentage of sessions completed generally ranged from 60% to 80%.<sup>1,10</sup>

Trials rarely reported health outcomes (eg, depression or social adjustment). However, pooled analyses demonstrated a statistically significant increase in global quality of life after 6 to 12 months (mean difference in change, 1.9 [95% CI, 0.2 to 3.5]; 11 RCTs; n = 1922). Among studies with more contact hours ( $\geq 26$  contact hours), the mean difference in change in quality-of-life measures was 3.8 points (95% CI, 3.6 to 4.1) (most scales ranged from 0-100).<sup>1,10</sup> No studies reported longer-term benefits on health outcomes. Studies suggest that 4.4- to 5.4-point differences in the Pediatric Quality of Life Inventory (PedsQL) represent a minimal clinically important difference, and some of the included trials of higher-contact interventions did report improvement in this range on the PedsQL among children participating in the interventions.<sup>1,10,12,13</sup>

Behavioral interventions were associated with reductions in BMI and other weight-related outcomes after 6 to 12 months (mean difference in change between groups, -0.7 [95% CI, -1.0 to -0.3]; 28 RCTs [n = 4494];  $I^2 = 86.8\%$ ). Larger effects were seen in interventions with more contact hours ( $\geq 26$ ) and physical activity sessions (1.4-point reduction in BMI [95% CI, -2.2 to -0.6]; 11 RCTs [n = 1087];  $I^2 = 87.8\%$ ; and 2.6-kg loss in weight [95% CI, -3.8 to -1.3 kg]; 10 RCTs [n = 907];  $I^2 = 58.2\%$ ).

Other weight and adiposity outcomes showed similar patterns.<sup>1,10</sup>

Cardiometabolic risk factors (eg, lipid levels, blood pressure, and fasting plasma glucose level) were reported by 16 trials (n = 1700).<sup>1,10</sup> Pooled analyses of trials providing 26 or more contact hours and physical activity sessions showed improvements in blood pressure (eg, mean difference in systolic blood pressure, -3.6 mm Hg [95% CI, -5.7 to -1.5 mm Hg]; 8 RCTs [n = 773];

$I^2 = 47.3\%$ ; mean difference in diastolic blood pressure,  $-3.0$  mm Hg [95% CI,  $-5.7$  to  $-1.5$  mm Hg]; 8 RCTs [ $n = 774$ ];  $I^2 = 49.3\%$ ) and fasting plasma glucose level (mean difference,  $-1.9$  mg/dL [95% CI,  $-2.7$  to  $-1.2$  mg/dL]; 4 RCTs [ $n = 367$ ];  $I^2 = 0\%$ ) after 6 to 12 months.<sup>1,10</sup> Pooled results of all 16 studies (including those with  $<26$  contact hours) were not associated with improvements in systolic blood pressure.

Although the USPSTF found no evidence to determine the individual benefits of specific intervention components, effective interventions commonly included supervised physical activity sessions; provided information about healthy eating, safe exercising, and reading food labels; and incorporated behavior change techniques such as problem solving, monitoring diet and physical activity behaviors, and goal setting.

Evidence on effective interventions in children younger than 6 years is limited.<sup>1,10</sup>

Eight trials assessed pharmacotherapy interventions: liraglutide (3 RCTs [ $n = 296$ ]), semaglutide (1 RCT [ $n = 201$ ]), orlistat (2 RCTs [ $n = 579$ ]), and phentermine/topiramate (2 RCTs [ $n = 269$ ]). Five trials included behavioral counseling components along with the medication or placebo. Seven of the 8 trials were either conducted entirely in the US or had study sites in the US; the remaining trial was conducted in Germany.<sup>1,10</sup> The majority of study participants were 12 years or older or 14 years or older; 1 study included children aged 7 to 11 years.<sup>1,10</sup> The evidence base for each medication was limited, consisting of only 1 trial per medication with 12 months or longer of treatment.<sup>1,10</sup>

Only 1 medication, semaglutide, was associated with a greater improvement in weight-related quality of life than placebo (mean difference, 5.3 [95% CI, 0.2 to 8.3]) (scales ranged from 0-100), which is consistent with published minimal clinically important differences for the PedsQL (range, 4.4-6.3 points).<sup>1,10,12,13</sup> Three other pharmacotherapy trials found no between-group differences in change in quality of life or depression incidence compared with placebo after 6 to 13 months.<sup>1,10</sup>

Pharmacotherapy was associated with larger mean BMI reductions compared with placebo in most trials. Liraglutide was associated with a 1.6-point greater reduction in BMI than placebo (mean difference,  $-1.6$  [95% CI,  $-2.5$  to  $-0.7$ ] after 13 months), semaglutide with a 6.0-point greater reduction in BMI (mean difference,  $-6.0$  [95% CI,  $-7.3$  to  $-4.6$ ] after 16 months), orlistat with a 0.9-point greater reduction (mean difference,  $-0.9$  [95% CI not reported];  $P = .001$ ; after 12 months), and phentermine/topiramate with 3.7- to 5.4-point greater reductions (15/92-mg dose mean difference,  $-5.4$  [95% CI,  $-6.4$  to  $-4.3$ ]; 7.4/46-mg dose mean difference,  $-3.7$  [95% CI,  $-5.0$  to  $-2.5$ ] after 13 months).<sup>1,10</sup> Group differences were not maintained in the liraglutide study after 6 months without treatment. While there was an initial reduction in BMI, longer-term maintenance after medication withdrawal was either not reported for any of the other medications or showed immediate weight increase after discontinuation. All medications showed increases in the likelihood of losing both 5% and 10% of baseline weight or BMI.<sup>1,10</sup>

Cardiometabolic outcomes were reported for orlistat (2 RCTs) and 1 study each of phentermine/topiramate, liraglutide, and semaglutide. The only medication that showed a clear reduction in blood pressure was phentermine/topiramate and only at the higher dose level (mean difference,  $-4.0$  [95% CI,  $-7.7$  to  $-0.5$ ]).<sup>1,10</sup>

Semaglutide improved low-density lipoprotein cholesterol levels (mean difference in percent change,  $-7.1$  [95% CI,  $-11.9$  to  $-1.8$ ]), and phentermine/topiramate improved high-density lipoprotein cholesterol levels (eg, mean difference in percent change, 8.8 [95% CI, 2.2 to 15.4] for 15/92-mg/d dose); other medications did not demonstrate statistically significant improvements. None of the pharmacotherapy trials found improvements in glucose-related parameters.<sup>1,10</sup>

### Potential Harms of Behavioral Counseling and Pharmacotherapy Interventions

Eighteen trials ( $n = 2539$ ) examined the harms of behavioral interventions. Outcomes were reported 6 to 12 months after baseline assessments. None of the trials found an increased risk of any adverse event or serious adverse events, including disordered eating, or decreases in self-esteem or body satisfaction.<sup>1,10</sup>

Eight trials ( $n = 1345$ ) examined the adverse effects of pharmacotherapy. More than 60% of youth taking liraglutide, semaglutide, or orlistat experienced gastrointestinal adverse effects (eg, nausea, vomiting, diarrhea, gallstones, flatulence with discharge, and fecal incontinence). For example, in the largest trial of liraglutide, gastrointestinal adverse effects occurred in 65% of study participants in the intervention group vs 36% in the placebo group (relative risk, 3.20 [95% CI, 1.91 to 5.36]).<sup>1,10</sup> Musculoskeletal and psychiatric adverse effects were most reported with phentermine/topiramate (at doses of 15/92 mg/d) (8.8% with intervention vs 1.8% with placebo for both categories of adverse effects).<sup>1,10</sup> Serious adverse effects were rare in all of the pharmacotherapy trials. No evidence was available on adverse effects beyond 1 month after medication discontinuation or longer than 17 months for any medication.<sup>1,10</sup>

### Response to Public Comment

A draft version of this recommendation statement was posted for public comment on the USPSTF website from December 12, 2023, to January 16, 2024. In response to comments, the USPSTF clarified the type of studies eligible for inclusion in the Scope of Review section. The USPSTF incorporated language in the Practice Considerations section regarding the harms associated with having a high BMI and the use of BMI for assessment/screening. The USPSTF also listed additional resources to help clinicians in the Additional Tools and Resources section.

## Research Needs and Gaps

See [Table 2](#) for research needs and gaps related to interventions for high BMI in children and adolescents.

## Recommendations of Others

The American Academy of Pediatrics recommends plotting BMI on a growth chart at all pediatric visits for all patients 2 years or older. It also recommends comprehensive treatment of high BMI with improved nutrition, physical activity, behavioral therapy, and consideration of pharmacotherapy according to US Food and Drug Administration indications for children 12 years or older and consideration of bariatric surgery for adolescents.<sup>14,15</sup> The Canadian Task Force on

**Table 2. Research Needs and Gaps in Interventions for High BMI in Children and Adolescents**

To fulfill its mission to improve health by making evidence-based recommendations for preventive services, the USPSTF routinely highlights the most critical evidence gaps for making actionable preventive services recommendations. We often need additional evidence to create the strongest recommendations for everyone and especially for persons with the greatest burden of disease. In this table, we summarize key bodies of evidence needed for the USPSTF to make recommendations for interventions for high BMI in children and adolescents. For each of the evidence gaps listed below, research must be inclusive of populations with a high prevalence of high BMI, including Hispanic/Latino, Native American/Alaska Native, and non-Hispanic Black children and adolescents. For additional information on research needed to address these evidence gaps, see the Research Gaps Taxonomy table on the USPSTF website (<https://www.uspreventiveservicestaskforce.org/home/getfilebytoken/d8dVJQhw6JgJWbTE97s6>).

**Interventions for high BMI in children and adolescents**

Research is needed on long-term health outcomes (at least 2 years) and the benefits of behavioral and pharmacotherapy interventions. Studies should include outcomes such as improvement in weight/BMI, cardiometabolic outcomes, psychosocial outcomes (eg, global quality of life, weight-related quality of life, psychosocial functioning outcomes, and improved depressive symptoms), and dietary patterns. Trials should include populations with a higher prevalence of high BMI (eg, Hispanic/Latino, Native American/Alaska Native, and non-Hispanic Black children and adolescents).

Research is needed on long-term (at least 2 years) psychosocial harms (eg, quality of life) of pharmacotherapy.

Research is needed on the benefits and harms of healthy lifestyle, or weight-neutral, interventions in children and adolescents with a high BMI.

Research is needed on the best timing for interventions for weight management. Research is needed to understand whether there are certain ages in childhood and adolescence when interventions might provide a higher likelihood of treatment benefit.

Research is needed on the maintenance of weight loss after behavioral interventions and assessment of long-term (>5 y) benefits and harms.

Research is needed on the best practices for weight-related discussions with children and adolescents and their families.

Abbreviations: BMI, body mass index; USPSTF, US Preventive Services Task Force.

Preventive Health recommends growth monitoring for all children and adolescents 17 years or younger at primary care visits. It also recommends that primary care clinicians offer or refer children and adolescents with high BMI to structured behavioral interventions aimed at healthy weight management.<sup>16</sup> The American Psychological Association recommends family-based multicomponent behavioral interventions with a minimum of 26 contact hours, initiated at an early age for children and adolescents with overweight or obesity.<sup>17</sup> The American College of Obstetricians and Gynecologists recommends screening for adolescent overweight and obesity and that adolescents with overweight or obesity be screened for depression and bullying and appropriately referred. It also recommends that clinicians initiate behavioral counseling or other multidisciplinary management as necessary. It does not recommend metformin for adolescent weight loss alone and recommends that

bariatric surgery should only be considered after careful candidate selection by a multidisciplinary team.<sup>18</sup> Additionally, it recommends that clinicians caution against the use of weight loss supplements. The Society for Adolescent Health and Medicine recommends calculating BMI percentile for all adolescents, reinforcing healthy behaviors, and counseling regarding body image, inappropriate dieting, and weight stigmatization, when indicated. For patients with a high BMI, it also recommends behavioral counseling or, if needed, referral to more intensive treatment options such as weight loss surgery.<sup>19</sup> The National Association of Pediatric Nurse Practitioners recommends measuring BMI in children 2 years or older and assessing family eating patterns, physical activity, sedentary time, and daily screen time in all children. It further recommends that weight loss programs be multicomponent and accessible within clinical, school, or community settings.<sup>20,21</sup>

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#### The US Preventive Services Task Force (USPSTF)

**Members:** Wanda K. Nicholson, MD, MPH, MBA; Michael Silverstein, MD, MPH; John B. Wong, MD; David Chelmow, MD; Tumaini Rucker Coker, MD, MBA; Esa M. Davis, MD, MPH; Katrina E. Donahue, MD, MPH; Carlos Roberto Jaén, MD, PhD, MS; Marie Krousel-Wood, MD, MSPH; Sei Lee, MD, MAS; Li Li, MD, PhD, MPH; Goutham Rao, MD; John M. Ruiz, PhD; James Stevermer, MD, MSPH; Joel Tsevat, MD, MPH; Sandra Millon Underwood, PhD, RN; Sarah Wiehe, MD, MPH.

#### Affiliations of The US Preventive Services Task Force (USPSTF) Members:

George Washington University, Washington, DC (Nicholson); Brown University, Providence, Rhode Island (Silverstein); Tufts University School of Medicine, Boston, Massachusetts (Wong); Virginia Commonwealth University, Richmond (Chelmow); University of Washington, Seattle (Coker); University of Maryland School of Medicine, Baltimore (Davis); University of North Carolina at Chapel Hill (Donahue); The University of Texas Health Science Center, San Antonio (Jaén, Tsevat); Tulane

University, New Orleans, Louisiana (Krousel-Wood); University of California, San Francisco (Lee); University of Virginia, Charlottesville (Li); Case Western Reserve University, Cleveland, Ohio (Rao); University of Arizona, Tucson (Ruiz); University of Missouri, Columbia (Stevermer); University of Wisconsin, Milwaukee (Underwood); Indiana University, Bloomington (Wiehe).

**Author Contributions:** Dr Nicholson had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. The USPSTF members contributed equally to the recommendation statement.

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