

# Screening for Obesity in Children and Adolescents: US Preventive Services Task Force Recommendation Statement

**AUTHORS:** US Preventive Services Task Force

**KEY WORDS**

children and adolescents, clinical practice, obesity, screening

**ABBREVIATIONS**

USPSTF—US Preventive Services Task Force

FDA—Food and Drug Administration

The USPSTF makes recommendations about preventive care services for patients without recognized signs or symptoms of the target condition. It bases its recommendations on a systematic review of the evidence of the benefits and harms and an assessment of the net benefit of the service.

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

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## abstract

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**DESCRIPTION:** Update of the 2005 US Preventive Services Task Force (USPSTF) statement about screening for overweight in children and adolescents.

**METHODS:** The USPSTF examined the evidence for the effectiveness of interventions that are primary care feasible or referable. It also examined the evidence for the magnitude of potential harms of treatment in children and adolescents.

**RECOMMENDATION.** The USPSTF recommends that clinicians screen children aged 6 years and older for obesity and offer them or refer them to intensive counseling and behavioral interventions to promote improvements in weight status (grade B recommendation). *Pediatrics* 2010;125:361–367

## SUMMARY OF RECOMMENDATION AND EVIDENCE

The US Preventive Services Task Force (USPSTF) recommends that clinicians screen children aged 6 years and older for obesity and offer them or refer them to comprehensive, intensive behavioral interventions to promote improvement in weight status. This is a grade B recommendation.

See Fig 1 for a summary of the recommendation and suggestions for clinical practice, Table 1 for a description of the USPSTF grades, and Table 2 for a description of the USPSTF classification of levels of certainty about net benefit.

## RATIONALE

### Importance

Since the 1970s, childhood and adolescent obesity has increased three- to sixfold. Approximately 12% to 18% of 2- to 19-year-old children and adolescents are obese (defined as having an age- and gender-specific BMI at  $\geq 95$ th percentile). BMI values are used to determine a percentile score on the basis of population-based references such as those developed by the Centers for Disease Control and Prevention (CDC). The 2000 CDC growth charts that are used to calculate BMI were developed with data from 5 na-

tional health examination surveys that occurred from 1963 to 1994 and supplemental data from surveys that occurred from 1960 to 1995.<sup>1</sup>

### Detection

Previously, the USPSTF found adequate evidence that BMI was an acceptable measure for identifying children and adolescents with excess weight.

### Benefits of Detection and Early Intervention/Treatment

The USPSTF found adequate evidence that multicomponent, moderate- to high-intensity behavioral interventions for obese children and adolescents



## SCREENING FOR OBESITY IN CHILDREN AND ADOLESCENTS: CLINICAL SUMMARY OF USPSTF RECOMMENDATION

<b>Population</b>	<b>Children and adolescents 6 to 18 y of age</b>
<b>Recommendation</b>	<b>Screen children aged 6 y and older for obesity. Offer or refer for intensive counseling and behavioral interventions.  Grade: B</b>

Screening tests	BMI is calculated from the weight in kilograms divided by the square of the height in meters.  Height and weight, from which BMI is calculated, are routinely measured during health maintenance visits. BMI percentile can be plotted on a chart or obtained from online calculators.  Overweight = age- and gender-specific BMI at $\geq 85$ th to 94th percentile Obesity = age- and gender-specific BMI at $\geq 95$ th percentile
Timing of screening	No evidence was found on appropriate screening intervals.
Interventions	Refer patients to comprehensive moderate- to high-intensity programs that include dietary, physical activity, and behavioral counseling components.
Balance of harms and benefits	Moderate- to high-intensity programs were found to yield modest weight changes. Limited evidence suggests that these improvements can be sustained over the year after treatment. Harms of screening were judged to be minimal.
Relevant recommendations from the USPSTF	Recommendations on other pediatric and behavioral counseling topics can be found at <a href="http://www.preventiveservices.ahrq.gov">www.preventiveservices.ahrq.gov</a> .

For a summary of the evidence systematically reviewed in making these recommendations, the full recommendation statement, and supporting documents please go to [www.preventiveservices.ahrq.gov](http://www.preventiveservices.ahrq.gov).

**FIGURE 1**

Summary of the USPSTF recommendation.

**TABLE 1** What the USPSTF Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer/provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer/provide this service.
C	The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is moderate or high certainty that the net benefit is small.	Offer/provide this service only if there are other considerations in support of the offering/providing the service to an individual patient.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read "Clinical Considerations" in the USPSTF recommendation statement. If offered, patients should understand the uncertainty about the balance of benefits and harms.

**TABLE 2** USPSTF Levels of Certainty Regarding Net Benefit

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as the number, size, or quality of individual studies; inconsistency of findings across individual studies; limited generalizability of findings to routine primary care practice; or lack of coherence in the chain of evidence. As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.
Low	The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of the limited number or size of studies; important flaws in study design or methods; inconsistency of findings across individual studies; gaps in the chain of evidence; findings not generalizable to routine primary care practice; or a lack of information on important health outcomes. More information may allow an estimation of effects on health outcomes.

Definition: The USPSTF defines certainty as the "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level on the basis of the nature of the overall evidence available to assess the net benefit of a preventive service.

aged 6 years and older can effectively yield short-term (up to 12 months) improvements in weight status. Inade-

quate evidence was found regarding the effectiveness of low-intensity interventions.

## Harms of Detection and Early Intervention/Treatment

There is adequate evidence that the harms of behavioral interventions are no greater than small.

## USPSTF Assessment

The USPSTF concludes that there is moderate certainty that the net benefit is moderate for screening for obesity in children aged 6 years and older and for offering or referring children to moderate- to high-intensity interventions to improve weight status.

## CLINICAL CONSIDERATIONS

### Patient Population Under Consideration

This recommendation applies to children and adolescents aged 6 to 18 years. The USPSTF is using the following terms to define categories of increased BMI: overweight is defined as an age- and gender-specific BMI between the 85th and 95th percentiles, and obesity is defined as an age- and gender-specific BMI at  $\geq 95$ th percentile. The USPSTF did not find sufficient evidence for screening children younger than 6 years.

### Screening Tests

In 2005, the USPSTF found adequate evidence that BMI was an acceptable measure for identifying children and adolescents with excess weight. BMI is calculated from the measured weight and height of an individual.

### Treatment

The USPSTF found that effective comprehensive weight-management programs incorporated counseling and other interventions that targeted diet and physical activity. Interventions also included behavioral management techniques to assist in behavior change. Interventions that focused on younger children incorporated parental involvement as a component.

Moderate- to high-intensity programs involved >25 hours of contact with the child and/or the family over a 6-month period and showed results including improved weight status, defined as an absolute and/or relative decrease in the BMI 12 months after the beginning of the intervention. Most participants were obese, and it is not known whether these results can be applied to children who are overweight but not obese. In addition, evidence was limited on the long-term sustainability of BMI changes achieved through behavioral interventions and on the trajectory of weight gain in children and adolescents. Interventions generally took place in referral settings, and the results can only be generalized to children who follow through on treatment. Low-intensity interventions, defined as  $\leq 25$  contact hours over a 6-month period, did not result in significant improvement in weight status.

Interventions that combined pharmacologic agents (sibutramine or orlistat) with behavioral interventions resulted in modest short-term improvement in weight status in children aged 12 years and older. There were no long-term data on the maintenance of improvement after discontinuation of medications. The magnitude of the harms of these drugs in children could not be estimated with certainty. Adverse effects included elevated heart rate, elevated blood pressure, and adverse gastrointestinal effects. Sibutramine, a centrally acting appetite suppressant, has been approved by the US Food and Drug Administration (FDA) for use in adolescents aged 16 years and older. Orlistat, a lipase inhibitor, has been approved by the FDA for use in adolescents aged 12 years and older. Neither sibutramine nor orlistat has been approved for use in pediatric populations younger than 12 years.

### Screening Intervals

No evidence was found regarding appropriate intervals for screening. Height and weight, from which BMI is calculated, are routinely measured during health maintenance visits.

### OTHER CONSIDERATIONS

#### Implementation

BMI percentile can be plotted on a chart or calculated by using readily available online calculators. Although moderate- to high-intensity interventions will rarely be practical in the primary care setting, children can be referred from primary care to these programs.

#### Research Needs and Gaps

Areas for further research include investigations to determine the specific effective components of behavioral interventions. Longer-term follow-up of participants in behavioral or multi-component trials is needed to confirm maintenance of treatment effect and to assess longer-term risks and harms. Investigation is needed of more efficient, primary care-feasible interventions that use allied health professionals. More studies are needed that address weight management in minority children and adolescents, behavioral interventions in younger children (aged  $\leq 5$  years), and behavioral interventions in children who are overweight but not obese.

### DISCUSSION

#### Burden of Disease

During the past 3 decades, childhood and adolescent obesity (defined as age- and gender-specific BMI at  $\geq 95$ th percentile) has increased three- to six-fold, with the rate of increase dependent on age, gender, and ethnicity.<sup>2</sup> Recent prevalence figures (2003–2006) have indicated that  $\sim 12\%$  to  $18\%$  of 2- to 19-year-old children and adolescents are obese.<sup>3,4</sup> The prevalence of

obesity varies with age and is more likely to be higher in older children, in males, and in racial and ethnic minorities. Evidence suggests that childhood and adolescent obesity can have a sizeable health impact.<sup>5,6</sup> Obese children and adolescents have an increased risk of type 2 diabetes mellitus, asthma, and nonalcoholic fatty liver disease; are more likely to have cardiovascular risk factors; and have greater anesthesia risk.<sup>5–7</sup> They may also experience more mental health and psychological issues such as depression<sup>8</sup> and low self-esteem<sup>9–10</sup> compared with nonobese children.

#### Scope of Review

The USPSTF examined the evidence for interventions intended to improve weight status in overweight and obese adolescents, evaluating both the effectiveness and harms of these interventions. Multicomponent behavioral interventions and interventions that combined behavioral and pharmacologic treatments were considered. Surgical treatments, which are reserved for morbidly obese patients who are identified without the need for screening, were considered to be outside the scope of this review, as was obesity prevention.

#### Accuracy of Screening Tests

In 2005, the USPSTF found that BMI (calculated as weight in kilograms divided by height in meters squared) percentile for age and gender is the preferred measure for detecting overweight in children and adolescents, because it is feasible and reliable and because it tracks with adult obesity measures.<sup>11</sup> The definitions used by the USPSTF have changed since the 2005 report. Overweight is now defined as having a BMI between the 85th and 94th percentiles for the individual's age and gender, and obesity is defined as having a BMI at  $\geq 95$ th percentile for age and gender.<sup>12,13</sup> BMI-for-age percentile is

not a direct measure of adiposity, but it correlates fairly well with percentile rankings of directly measured percent body fat (with correlations generally between 0.78 and 0.88)<sup>14</sup> in children. Because BMI changes with age, percentile scores based on age- and gender-specific norms are used to monitor growth.

## Effectiveness of Treatment

### *Behavioral Interventions*

Thirteen behavioral intervention trials conducted with 1258 overweight or obese (primarily obese) children and adolescents aged 4 to 18 years were included in the USPSTF review. No studies targeted those younger than 4 years.<sup>15</sup>

Hours of contact were used as a proxy for treatment intensity and categorized as very low (<10 hours), low (10–25 hours), moderate (26–75 hours), or high (>75 hours). Weight outcomes were defined as short-term (6–12 months since the beginning of the intervention) or maintenance (between 1 and 4 years after the beginning of the intervention and at least 12 months after the end of the intervention).<sup>15</sup>

The comprehensiveness of interventions was also assessed. Interventions were deemed comprehensive if they included all of the following elements: (1) counseling for weight loss or healthy diet; (2) counseling for physical activity or a physical activity program; and (3) instruction in and support for the use of behavioral management techniques to help make and sustain changes in diet and physical activity. Behavioral management techniques included self-monitoring, stimulus control, eating management, contingency management, and cognitive-behavioral techniques.<sup>15</sup>

Moderate- to high-intensity interventions were conducted in specialty health care facilities such as pediatric obesity referral clinics or similar

settings. Such interventions would not be feasible for implementation in a primary care setting; however, they would be feasible for referral. The amount of absolute or relative weight change associated with 3 fair-quality comprehensive moderate- to high-intensity behavioral interventions was modest (1.9–3.3 kg/m<sup>2</sup> difference in mean BMI 6–12 months after starting treatment, compared with controls). For an 8-year-old boy or girl, the largest BMI difference (3.3 kg/m<sup>2</sup>) would be equivalent to ~13 lb (based on 50th percentile for height for ages 8 and 9, assuming ~2 in of growth). For girls aged 16 years this BMI difference would be equivalent to ~19 lb, whereas for boys aged 16 years the difference would be between 22 and 23 lb. Limited evidence suggests that these improvements can be maintained over 12 months after treatment. Lower-intensity interventions that are possibly feasible for primary care did not demonstrate a significant, consistent benefit with regard to BMI. Limited evidence suggests that reductions in insulin-resistance measures are possible with moderate- to high-intensity comprehensive interventions.<sup>15</sup> However, decreases in cardiovascular risk factors (eg, blood pressure, lipid levels, blood glucose levels, or insulin resistance) were not consistent.

### *Combined Pharmacologic and Behavioral Interventions*

Seven trials combined pharmacologic treatments (sibutramine or orlistat) with behavioral interventions in 1294 obese adolescents aged 12 to 18 years. In 691 obese adolescents aged 12 to 18 years, between-group BMI differences were 1.6 to 2.7 kg/m<sup>2</sup> greater among those treated with 6 to 12 months of sibutramine plus behavioral intervention, compared with those who received placebo plus behavioral inter-

vention. In 539 obese adolescents aged 12 to 18 years, 12 months of orlistat plus behavioral intervention compared with behavioral intervention alone resulted in a small but statistically significant between-group BMI difference (0.85 kg/m<sup>2</sup>). Two very small studies showed no significant differences between groups.<sup>15</sup> There are no long-term data on the maintenance of improvement after discontinuation of sibutramine or orlistat. As noted, sibutramine has not been approved by the FDA for use in pediatric populations, whereas orlistat is currently approved for prescription use in children aged 12 years and older.

### Potential Harms of Treatment

An examination of the literature on the harms of weight-management programs found no evidence of adverse effects on growth, eating-disorder pathology, or mental health. Other harms, such as risk of exercise-induced injuries, were considered minimal. Serious adverse events were reported for 2.7% of the patients who were taking sibutramine and <1% of the patients who were taking the placebo. Adverse events occurred in 3% of the patients who received orlistat compared with 2% of the patients who received placebo. Adolescent sibutramine users were more likely to develop small increases in heart rate or blood pressure. They also commonly experienced mild-to-moderate adverse gastrointestinal effects, with 20% to 30% reporting oily spotting, oily evacuation, abdominal pain, fecal urgency, or flatus with discharge and 9% reporting fecal incontinence. Neither medication seems to adversely affect short-term (6–12 months) growth and maturation. Orlistat does not adversely impact fat-soluble vitamin levels.<sup>15,16</sup>



## Estimate of Magnitude of Net Benefit

The USPSTF found adequate evidence that multicomponent, moderate- to high-intensity behavioral interventions for obese children and adolescents aged 6 years and older can effectively yield short-term (up to 12 months) improvements in weight status. Inadequate evidence was found regarding the effectiveness of low-intensity interventions. There is adequate evidence that the harms of behavioral interventions are no greater than small. Harms of screening were judged to be minimal. Therefore, the net benefit of screening was judged to be at least moderate.

## Update of the Previous USPSTF Recommendation

This recommendation replaces the 2005 recommendation on screening and interventions for overweight in children and adolescents.<sup>17</sup> At that time, the USPSTF found that overweight children can be identified by using BMI measurement but that the evidence for effective interventions for weight management in childhood was inadequate. The major change in the current recommendation is that the USPSTF has determined that comprehensive moderate- to high-intensity programs that include dietary, physical activity, and behavioral counseling components can

result in improvement in weight status among obese children aged 6 and older who complete the programs.

## RECOMMENDATIONS OF OTHERS

In 2007, an American Medical Association (AMA) expert committee of 15 individuals representing 15 professional medical organizations revised 1998 recommendations on how clinicians should approach the prevention, assessment, and treatment of childhood obesity.<sup>11,18</sup> In the updated recommendations, the AMA advised that a clinician's assessment should include a BMI calculation as well as medical and behavioral risks for obesity.<sup>11</sup> For overweight and obese patients, the expert committee proposed using a stepwise approach that divides treatment into several stages including counseling, providing a structured weight-management plan, and using a comprehensive multidisciplinary intervention/tertiary care intervention delivered by multidisciplinary teams with expertise in childhood obesity. The American Academy of Pediatrics endorsed the 2007 AMA expert committee recommendations and has also recommended the annual plotting of BMI for all patients aged 2 years and older.<sup>11,19</sup>

## MEMBERS OF THE USPSTF

The members of the USPSTF at the time that this recommendation was finalized were Ned Calonge, MD, MPH, Chair,

USPSTF (Colorado Department of Public Health and Environment, Denver, CO); Diana B. Petitti, MD, MPH, Vice-chair, USPSTF (Arizona State University, Phoenix, AZ); Thomas G. DeWitt, MD (Children's Hospital Medical Center, Cincinnati, OH); Allen Dietrich, MD (Dartmouth Medical School, Lebanon, NH); Kimberly D. Gregory, MD, MPH (Cedars-Sinai Medical Center, Los Angeles, CA); David Grossman, MD, MPH (Group Health Cooperative, Seattle, WA); George Isham, MD, MS (HealthPartners, Inc, Minneapolis, MN); Michael L. LeFevre, MD, MSPH (University of Missouri School of Medicine, Columbia, MO); Rosanne Leipzig, MD, PhD (Mount Sinai School of Medicine, New York, NY); Lucy N. Marion, PhD, RN (Medical College of Georgia, Augusta, GA); Bernadette Melnyk, PhD, RN (Arizona State University College of Nursing and Healthcare Innovation, Phoenix, AZ); Virginia A. Moyer, MD, MPH (Baylor College of Medicine, Houston, TX); Judith K. Ockene, PhD, MEd (University of Massachusetts Medical School, Worcester, MA); George F. Sawaya, MD (University of California, San Francisco, CA); J. Sanford Schwartz, MD (University of Pennsylvania School of Medicine and the Wharton School, Philadelphia, PA); and Timothy Wilt, MD, MPH (Minneapolis Veterans Affairs Medical Center for Chronic Disease Outcomes Research, Minneapolis, MN). For a list of current USPSTF members, go to [www.ahrq.gov/clinic/uspstfab.htm](http://www.ahrq.gov/clinic/uspstfab.htm).

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**Are Virtual Visits Here to Stay?** *The nation's largest health insurer (UnitedHealth Group) has created a division that will be offering a service that connects patients to doctors using video chat through their home computers. According to an article in The New York Times (Miller CC, December 21, 2009), the program will be introduced state by state starting in Texas with the goal of providing a less expensive method of routine care. Critics of this approach believe that quality will suffer without the intimacy of an in-person visit and the opportunity to do a physical exam. If same-day access to a primary care physician is difficult in some parts of this country, not to mention long emergency room waits, then the virtual visit may be a viable alternative—although whether accurate high quality diagnoses and doctor-patient interactions can be made through this technique remains to be seen. Valid and reliable outcome studies have yet to be published.*

Noted by JFL, MD