

# Promoting Healthy Weight

Maintaining a healthy weight during childhood and adolescence is critically important for children's and adolescents' overall health and well-being, as well as for good health in adulthood. A child's or adolescent's weight status is the result of multiple factors working together—heredity, metabolism, height, behavior, and environment.<sup>1</sup> Two of the most important behavioral determinants are nutrition and physical activity. How much and what a child or adolescent eats and the types and intensity of physical activity she participates in can affect weight and therefore overall health. A balanced, nutritious diet and regular physical activity are keys to preventing overweight and obesity.

Underweight is an issue for some children and adolescents, including some children and youth with special health care needs and some adolescents with eating disorders, but the overriding concern with weight status in the United States today is overweight and obesity. Therefore, this theme focuses on preventing, assessing, and treating overweight and obesity in children and adolescents. It can be used in concert with the *Promoting Healthy Nutrition and Promoting Physical Activity* themes.

## Definitions and Terminology

Body mass index (BMI) is defined as weight (kilograms) divided by the square of height (meters):  $\text{weight (kg)}/[\text{height (m)}]^2$ . Although BMI does not directly measure body fat, it is a useful screening tool because it correlates with body fat and health risks.<sup>2</sup> Additionally, measuring BMI is clinically feasible. In children and adolescents, BMI distribution, like weight and height distributions, changes with age. As a result, while BMI is appropriate to categorize body weight in adults, BMI percentiles specific for age and sex from reference populations define underweight, healthy weight, overweight, and obesity in children and adolescents.

Body mass index is recommended as one of several screening tools for assessing weight status. For individual children and adolescents, health care professionals need to review growth patterns, family histories, and medical conditions to assess risk and determine how to approach the child or adolescent, and family. Children and adolescents with BMI between the 85th and 94th percentiles are defined as having overweight (Table 1) and often have excess body fat and health risks, although for some, this BMI category reflects high lean body mass rather than high levels of body fat. Almost all children and adolescents with BMIs at or above the 95th percentile have obesity and have excess body fat with associated health risks. The use of 2 cut points, 85th percentile and 95th percentile BMI, captures varying risk levels and minimizes overdiagnosis and underdiagnosis.



**Table 1**

<b>Body Mass Index Percentile Categories for Children and Adolescents</b>	
<b>Body Mass Index Percentile</b>	<b>Definition</b>
<5th percentile	Underweight
≥5th–84th percentile	Healthy weight
≥85th–94th percentile	Overweight
≥95th percentile	Obese

Source: Centers for Disease Control and Prevention. Division of Nutrition, Physical Activity, and Obesity, National Center for Chronic Disease Prevention and Health Promotion. About Children & Teen BMI. [http://www.cdc.gov/healthyweight/assessing/bmi/childrens\\_bmi/about\\_childrens\\_bmi.html](http://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bmi.html). Updated May 15, 2015. Accessed September 18, 2016.

## Prevalence of Overweight and Obesity

According to measured heights and weights from nationally representative samples of children and adolescents assessed as part of the National Health and Nutrition Examination Survey (NHANES) (1976–1980 and 2011–2012), obesity prevalence rose from 5.0% to 8.4% in children aged 2 to 5 years, from 6.5% to 17.7% in children and adolescents aged 6 to 11 years, and from 5.0% to 20.5% in adolescents aged 12 to 19 years.<sup>3</sup> During 2008 to 2011, a downward trend in obesity prevalence was seen among children aged 2 to 4 years participating in federal nutrition programs in 19 states and territories, whereas other states showed no change or showed increases in prevalence.<sup>4</sup> The obesity epidemic disproportionately affects some racial-ethnic and economic groups.<sup>3,5</sup> In 2011 to 2012, the obesity prevalence was particularly high among African American females aged 2 to 19 (20.5%) and among Hispanic males aged 2 to 19 (24.1%).<sup>3</sup> Poverty has been associated with higher obesity prevalence among adolescents. However, the prevalence among specific population subgroups has differed.<sup>5</sup> Health care professionals are faced with

addressing this problem in an increasing number of children and adolescents.

A child or adolescent who has obesity often continues to have obesity into adulthood, with higher degrees of excess weight associated with increasing risk of persistence.<sup>6</sup> Obesity is associated with many chronic health conditions, including type 2 diabetes, hypertension, dyslipidemia, nonalcoholic fatty liver disease, obstructive sleep apnea, and cardiovascular disease.<sup>7,8</sup> These chronic conditions, previously identified only in adults, are now present in growing numbers of adolescents and even in children. These conditions lead to increased health care costs. In addition, children and adolescents who have obesity experience stigmatization and lower quality of life.

## Defining Overweight and Obesity in Special Populations

### Infants and Children Younger Than 24 Months

For infants and children younger than 24 months, the Centers for Disease Control and Prevention (CDC) and the American Academy of Pediatrics (AAP) recommend the use of the World Health Organization (WHO) Growth Charts (Appendix A), which more accurately reflect the recommended standard of breastfeeding than do the CDC Growth Charts (Appendix B). The WHO charts describe healthy growth in optimal conditions and are therefore growth standards. In contrast, the CDC charts are growth references, describing how populations of children grow in a particular place and time.

The WHO charts also provide BMI values for 0 to 2 years; BMI cannot be calculated with CDC charts until after 2 years. Normative values for healthy weight, underweight, overweight, and obesity differ between the CDC and WHO systems. According to the WHO, weight-for-length and BMI less than the 2nd percentile defines underweight and greater than the 98th percentile defines



overweight, with no specific cut point for obesity in this age group. Reflecting a clearer understanding of normative growth in breastfed infants, the CDC highlights that “clinicians should be aware that fewer US children will be identified as having underweight using the WHO charts, slower growth among breastfed infants during ages 3 to 18 months is normal, and gaining weight more rapidly than is indicated on the WHO charts might signal early signs of overweight.”<sup>9,10</sup>

### Late Adolescents

The adult cut point for overweight (BMI = 25 kg/m<sup>2</sup>) can be used to define overweight in late adolescence even when the 85th percentile is defined by a higher absolute BMI. For example, a female adolescent aged 17 years, 4 months, with a BMI of 25.2 is at the 84th percentile. Even though her BMI is slightly below the 85th percentile, the BMI is in the overweight category because it is above the adult cut point for overweight of 25 kg/m<sup>2</sup>. Similarly, the adult definition of obesity (BMI ≥30 kg/m<sup>2</sup>) can be used in late adolescence when this value is lower than the 95th percentile.

### Those With Severe Obesity

The overall obesity rate is increasing, as is the prevalence of severe obesity among children and adolescents. Those who have severe obesity are at high risk of multiple cardiovascular disease risk factors and poor health.<sup>11,12</sup> There is no consensus on a definition of severe obesity. The AAP Expert Committee on Treatment of Child and Adolescent Obesity<sup>13</sup> suggested use of the 99th percentile based on cut points defined by Freedman and colleagues<sup>12</sup> from NHANES data. However, the sample of children and adolescents with BMI at this level was small, and more valid cut points may soon supersede this information. However, for children and adolescents with BMI at or above this level, intervention is more urgent than for children and adolescents who have lesser degrees of obesity. Health care professionals should ensure

that best efforts are made to provide treatment to children and adolescents whose BMI for age and sex is above the 97th percentile, which is the highest curve available on the growth charts. (*For information about treating obesity, see the Treating Overweight and Obesity section of this theme.*)

### Children and Youth With Special Health Care Needs

Children and youth with special health care needs may find it difficult to make healthy food choices, control their weight, and be physically active. This can be caused by difficulty with chewing or swallowing foods, medications that contribute to weight gain and changes in appetite, physical limitations that reduce the child’s ability to be active, and a lack of accessible environments that enable exercise. As a result, children with mobility limitations and intellectual or learning disabilities are at increased risk of obesity.<sup>14-16</sup> Children and adolescents aged 10 through 17 years who have special health care needs have higher rates of obesity (20%) than do children of the same ages without these needs (15%).<sup>17</sup>

### Preventing Overweight and Obesity

Preventing overweight and obesity should begin early. This includes encouraging women to enter pregnancy at a healthy weight and to gain weight according to current guidelines.<sup>18</sup> Pregnant women also are encouraged to quit smoking during pregnancy, because exposure to tobacco in utero has been independently associated with an increased risk of obesity in multiple population-based epidemiological studies.<sup>19</sup> Following delivery, women should be supported to exclusively breast-feed for the first 6 months of life followed by continued breastfeeding with added complementary foods for at least one year. This method of feeding prevents short-term and long-term risks of obesity.<sup>20</sup>



Lifestyle behaviors to prevent obesity, rather than intervention to improve weight status, should be the aim of anticipatory guidance for children and adolescents with healthy BMI for age and sex ( $\geq 5$ th–84th percentile) and for some children and adolescents with BMI for age and sex in the overweight category ( $\geq 85$ th–94th percentile), depending on their growth pattern and risk factors. Health care professionals should be aware of the increased risk of obesity in children and adolescents with parents who have obesity and in those whose mothers had diabetes during the child's gestation.

Obesity prevention is complex. It is less about the health care professional targeting a specific health behavior and more about the process of influencing families to change behaviors when habits, culture, and environment promote less physical activity and more energy intake. Health care professionals can work effectively with families and can create systems that support ongoing commitment to achieving and maintaining a healthy weight. Although limited research is available for use in clinical practice, the approaches described below may be useful guides for providing anticipatory guidance and counseling for children and adolescents and their families.

- **Communicating effectively.** Health care professionals need to convey support and empathy. They should choose words carefully, recognizing that terms such as *fat* and *obese* may be perceived as derogatory. Instead, they should consider using neutral terms, such as *weight*, *having excess weight*, and *high BMI*. They should learn about values or circumstances that may be common in the population they serve, especially if that culture differs from the health care professional's own culture. A health care professional's knowledge of a family's values and circumstances may be helpful in tailoring anticipatory guidance. Some parents may need help in seeking and obtaining resources such as food

assistance, case management, support groups, and home visiting services.

- **Sensitivity to cultural traditions.** Culture influences perceptions of an attractive body image, ideas of a healthy weight, and the importance of physical activity, selection of foods, and parenting strategies. For example, parents may view excess weight as healthy and may be offended at suggestions their child or adolescent has excess weight, overweight, or obesity. Ensuring that a child or adolescent is not underweight may be very important to people from cultures in which poverty or insufficient food is common.<sup>21</sup>
- **Encouraging effective parenting.** Parents are critical to helping children and adolescents develop healthy habits, and health care professionals can encourage parents to provide age-appropriate guidance and be good role models. Health care professionals can suggest that parents establish and promote routines and structures (eg, related to family meals, physical activity, screen time, and sleep) for their child or adolescent in a nurturing and healthy environment. Inadequate sleep has been associated with increased BMI.<sup>22</sup>
- **Accommodating stages of change (readiness to change).** Before a person is ready to change a behavior, she needs to be aware of the problem, have a plan to address it, and then begin the new behavior.<sup>23</sup> Health care professionals can help children and adolescents and their families move along these stages rather than prescribing a new behavior to those who are not ready to change. For example, unsafe neighborhoods or lack of recreation areas may cause a parent to fear outside play and may be a barrier to increasing physical activity. Working with parents to devise a plan for finding alternative opportunities for safe play may help parents be more comfortable in encouraging their children to be physically active.





- **Using motivational interviewing.** Motivational interviewing (MI) uses nonjudgmental questions and reflective listening to uncover a child's, adolescent's, or parent's beliefs and values. Health care professionals can use MI to motivate rather than direct or tell families what to do. Motivational interviewing can help the child, the adolescent, or families formulate a plan that is consistent with their values and readiness to change. This approach may prevent defensiveness that can arise in response to a more directive style. Recent studies have demonstrated a reduction in BMI percentiles when MI was used by a physician, with and without the assistance of a registered dietitian.<sup>24,25</sup>
- **Using cognitive behavioral techniques.** Health care professionals can encourage goal setting, monitoring behaviors targeted for change, and use of positive reinforcement. Initial goals should be easily achievable, such as engaging in 15 minutes of moderate physical activity each day or cutting back on sugar-sweetened beverages by one per day over a period of time. Parents should reinforce behavior goals rather than weight change goals, and reinforcement should be verbal praise or an extra privilege, not food. Health care professionals and parents should expect imperfect adherence and should focus on successes, not failures.<sup>26</sup>

Although defining the contribution of specific behaviors to overweight and obesity prevention is difficult, evidence shows that certain eating and physical activity behaviors improve the balance between energy expenditure and food intake. Box 1 lists actions that health care professionals, families, communities, and school personnel, as well as legislators, policy makers, and insurance providers, can take to prevent overweight and obesity in children and adolescents.

### The Role of the Health Care Professional Office or Clinic Staff

Health care professional office or clinic staff and office systems can support efforts to address

obesity prevention consistently. The following practices can help ensure that all staff adopt methods to address obesity prevention<sup>2,30</sup>:

- Routinely document BMI for age and sex. This practice will improve early recognition of overweight and obesity, which may be more amenable to intervention than more severe obesity.<sup>2</sup>
- Establish procedures to deliver obesity prevention messages to children and adolescents (eg, 5-2-1-0).<sup>42</sup> When the child's or adolescent's individual risk of obesity is low, these messages can promote appropriate general health or wellness rather than weight management. Simple, memorable guidelines, presented early and repeated regularly with supporting educational materials, can be delivered efficiently in the office or clinic and are likely to be effective teaching tools.
- Establish procedures for intervening with children and adolescents who have overweight ( $\geq 85$ th–94th percentile BMI) or obesity ( $\geq 95$ th percentile BMI).<sup>43</sup> For instance, when a child or adolescent has overweight, a health care professional can review family history, the child's or adolescent's blood pressure and cholesterol, and BMI percentile over time and then assess health risk according to that information. Staff should flag charts of children and adolescents with overweight or obesity so all staff at all visits are aware of the problem and can monitor growth, risk factors, and social and emotional issues.
- Involve and train interdisciplinary teams (eg, physicians, nurses, physician assistants, dietitians, mental health professionals, and administrative staff) in their respective responsibilities in addressing obesity prevention.

Building on the prevention approach of promoting healthy weight, issues salient to each developmental period are addressed next. The emphasis during each period is on eating healthy foods, participating in physical activity, and supporting a nurturing environment in age-appropriate ways.



## Box 1

### Actions to Prevent Overweight and Obesity in Children and Adolescents<sup>27</sup>

#### For Health Care Professionals

- Encourage breastfeeding.<sup>9,28</sup>
- Discourage smoking during pregnancy, and provide resources for females capable of becoming pregnant to quit smoking.<sup>19</sup>
- Plot and assess BMI percentiles routinely for early recognition of overweight and obesity.<sup>2</sup>
- Address increasing BMI percentiles before they reach  $\geq 95$ th percentile.<sup>2</sup>
- Identify children and adolescents at risk of overweight and obesity,<sup>6,13</sup> who are those
  - Whose parents have overweight or obesity
  - With a sibling who has overweight or obesity
  - From families of lower socioeconomic status
  - With limited cognitive stimulation
  - Born to mothers who had gestational diabetes during pregnancy
  - With special health care needs
- Assess eating and physical activity behavior, amount of non-homework (recreational) screen time (eg, TV, computer, handheld device), and whether the child or adolescent has a TV or other devices with screens in the bedroom.<sup>29</sup>
- Assess barriers to healthy eating and physical activity.<sup>30</sup>
- Provide anticipatory guidance for nutrition and physical activity.<sup>30</sup>

#### For Families

- Choose healthy behaviors.
  - Ensure that “special times” do not frequently involve food or sedentary activities.
  - Use things other than food or screen time as rewards.
  - Promote physically active family time (eg, hikes, bike rides, playing outside, dancing, active indoor games).
  - Eat together as a family ( $\geq 3$  times per week).<sup>30,31</sup>
  - Limit eating out.<sup>30,32</sup>
  - Eat breakfast daily.<sup>30</sup>
- Emphasize healthy food and drink choices.
  - Focus on nutrient-dense choices—vegetables, fruits, whole grains, fat-free or low-fat milk and dairy products, seafood, lean meats and poultry, eggs, beans and peas, and nuts and seeds.
  - Limit foods and drinks high in calories and with few nutrients—those high in added sugars, saturated fats, and refined grains (eg, sugar-sweetened beverages, baked goods, dairy desserts, pizza).
  - Limit before-bed snacks.
  - Limit between-meal snacking.
- Be physically active.
  - Encourage adults to engage in the equivalent of at least 150 minutes a week of moderate-intensity<sup>a</sup> aerobic physical activity and also do muscle-strengthening activities  $\geq 2$  days a week.
  - Encourage children and adolescents, aged 6–17 years, to engage in  $\geq 60$  minutes of physical activity each day. Most of the 60 minutes should be spent engaging in moderate- or vigorous<sup>b</sup>-intensity aerobic physical activity that generates sweating.<sup>33</sup>

<sup>a</sup> Moderate-intensity activity is activity that makes children's and adolescents' hearts beat faster than normal and that makes them breathe harder than normal. They should be able to talk but not sing.

<sup>b</sup> Vigorous-intensity activity is activity that makes children's and adolescents' hearts beat much faster than normal and that makes them breathe much harder than normal. Children and adolescents should be able to speak only in short sentences.

*continued*

**Box 1** (continued)**Actions to Prevent Overweight and Obesity in Children and Adolescents<sup>27</sup>**

- Encourage young children to engage in at least 60 minutes and up to several hours of unstructured physical activity each day.<sup>34</sup> Young children should not be sedentary for >60 minutes at a time except when sleeping. For infants, physical activity should take the form of daily supervised “tummy time” when the child is awake.
- Avoid screen time in infants and children <18 months. Children 18 months through 4 years should limit screen time to no more than 1 hour per day.<sup>35</sup>
- Turn off the TV during mealtimes.
- Establish a family media use plan (a set of rules about media use and screen time that are written down and agreed on by all family members).<sup>36,37</sup> The family media use plan is an online tool that parents and children can fill out together. The tool prompts the family to enter daily health priorities, such as an hour for physical activity, 8 to 11 hours of sleep, time for homework and school activities, and unplugged time each day for independent time and time with family. The family can then consider the time left over and decide on rules around the quantity, quality, and location of media use.
- Ensure that children and adolescents get adequate sleep based on age.<sup>22</sup>

**For Schools**

- Integrate nutrition and physical activity education into school curriculum.<sup>38</sup>
- Promote physical activity throughout the day.<sup>38</sup>
- Provide recess in addition to physical education.<sup>39</sup>
- Encourage children and adolescents to walk or bike to school where it is safe to do so.
- Provide nutritious meals that meet National School Lunch and School Breakfast Programs standards, as mandated by the Healthy, Hunger-Free Kids Act.
- Enact policies that limit the availability of sugar-sweetened beverages in schools and competitive foods served on school campuses.<sup>40</sup>

**For Communities**

- Ensure that healthy food and beverage options are the routine, easy choice.<sup>41</sup>
- Provide safe playgrounds and safe neighborhoods for biking, walking, and other physical activities.<sup>30</sup>
- Promote physical activity outside the school day, such as after-school programs that encourage physical activity.
- Identify and deliver culturally relevant messages about healthy eating, physical activity, and weight.

**For Legislators, Policy Makers, and Insurance Providers**

- Support schools and communities in their activities to promote healthy weight and prevent overweight and obesity.
- Reimburse health care professionals (eg, physicians, nurse practitioners, physician assistants, dietitians) for providing anticipatory guidance about nutrition and physical activity.

Abbreviations: BMI, body mass index; TV, television.



## Screening for and Assessing Overweight and Obesity

### Universal Assessment of Obesity Risk

Screening for obesity risk, an ongoing process,<sup>11,13</sup> starts with BMI evaluation (or weight-for-length if the child is <2 years) and incorporates evaluation of medical conditions and risks, current behaviors, family attitudes, socioeconomic concerns, and psychosocial situation. According to this information, health care professionals can promote obesity prevention through anticipatory guidance and by reinforcing behaviors that will promote sustained healthy weight (eg, increasing intake of vegetables and fruits; increase physical activity; decreasing intake of food high in calories, fats, and added sugars; decreasing screen time and other sedentary behaviors) or treat overweight or obesity.

In general, children and adolescents with normal BMI for their age and sex (ie, between the 5th and 85th percentile) benefit from preventive anticipatory guidance, which guides them toward healthy behaviors or reinforces current healthy behaviors. This guidance should be framed as growing healthy bodies rather than achieving specific weights. Children and adolescents whose BMI is in the overweight category (ie, 85th–94th percentile) require additional attention. Some may have a healthy body weight, but others may have excess body fat and will benefit from weight control intervention. A wait-and-see approach may result in a missed opportunity to prevent progression of overweight. Children and adolescents whose BMI is in the obese category (ie, >95th percentile) benefit from weight control intervention.

The Expert Committee for the Prevention, Assessment, and Treatment of Child and Adolescent Overweight and Obesity (convened

by the Health Resources and Services Administration, CDC, and American Medical Association) recommends the following actions for screening and assessing all children for prevention and providing counseling for early intervention<sup>11,13</sup>:

- **Calculate BMI and plot on the appropriate growth curve at least once a year.** Identify current category of underweight (<5th percentile), healthy weight (5th–84th percentile), overweight (85th–94th percentile), or obese ( $\geq$ 95th percentile). Calculators, wheels, tables, and nomograms are some of the tools used to calculate BMI, which is plotted on the CDC or WHO Growth Charts.
- **Assess medical factors.** Includes family history in first- and second-degree relatives (ie, siblings, parents, aunts, uncles, and grandparents) of type 2 diabetes and cardiovascular disease risk factors, such as hypertension and dyslipidemia. In addition, the health care professional should perform a medical history and physical examination to identify any obesity-related conditions that may exist. In the case of severe obesity, the health care professional can evaluate for rare cases of underlying syndromes. Depending on BMI category, age, and family history, laboratory evaluation may be needed for several obesity-related conditions that often have no signs or symptoms, including dyslipidemia, diabetes, and nonalcoholic fatty liver disease.
- **Assess dietary, physical activity, and sedentary behaviors.** A brief assessment of foods and beverages typically consumed and the pattern of consumption can uncover modifiable behaviors associated with excess caloric intake. A dietitian can do a thorough evaluation when detail is needed or when initial obvious excesses have been addressed. An assessment of participation in age-appropriate moderate- and vigorous-intensity physical activity, both structured and unstructured, can determine approximate





amount of time spent being physically active, again with the goal of identifying opportunities for increased activity. Screen time (eg, watching television [TV] and using computers and digital devices) is associated with increased risk of obesity, and reduction of non-homework screen time is an effective strategy for weight control. Therefore, asking about hours of media or screen time will uncover a very important opportunity to modify behavior for improved energy balance.

- **Assess attitude and emotional state, including any socioeconomic stressors.** Families may not recognize excess weight or be aware of risks that obesity poses. Or, they may be unable to make behavior changes to improve eating and physical activity behaviors. This may often be caused by changes in economic, employment, or other psychosocial situations. Before providing anticipatory guidance about new behaviors, it is recommended that health care professionals assess attitude and capacity for change.

### Treating Overweight and Obesity

The primary goal of obesity treatment is to improve long-term physical and psychosocial health through establishing permanent healthy lifestyle behaviors and changes to the environment where the child or adolescent lives.<sup>11</sup> For some children and adolescents who have overweight or obesity, implementing these habits alone will lead to improved weight (weight loss or weight maintenance during linear growth), but other children and adolescents may need additional focused efforts to achieve negative energy balance. Others may need additional help with behavior modification strategies to develop and sustain healthy habits. Emotional health (good self-esteem and an appropriate attitude toward food and the body) also is an important outcome. To achieve these goals, it has been recommended that health care professionals present a staged approach with 4

treatment stages of increasing intensity.<sup>8</sup> Children and adolescents can begin at the least intense stage and advance from there, depending on response to treatment, age, degree of obesity, health risks, and motivation.

Table 2 presents the 4 stages of treatment and includes the intervention strategies (the behavior changes to recommend) and the process for providing the intervention (how to offer an intervention to a family, including information about location, staffing, and support).

- **Stage 1. Prevention Plus.** As a first step, children and adolescents who have overweight or obesity and their families can focus on basic healthy eating and physical activity habits that are the foundation of obesity prevention strategies. However, unlike children and adolescents who are already at a healthy weight, the outcome is improved BMI status rather than maintained healthy BMI, and the health care professional offers more frequent monitoring to motivate the child or adolescent, and family. *Stage 1* interventions could be included in the health supervision visit.
- **Stage 2. Structured Weight Management.** This stage of treatment is accomplished in follow-up to the health supervision visit and is distinguished from Prevention Plus less by differences in targeted behaviors and more by the support and structure provided to the child or adolescent, and family, to achieve those behaviors.
- **Stage 3. Comprehensive Multidisciplinary Intervention.** This stage of treatment involves more intensive targeting behavior changes, more frequent visits, and the involvement of specialists to maximize support for behavior changes. Generally, this type of intervention is beyond what a health care professional office can offer within the typical visit structure. However, an office or several offices could organize specialists to provide this type of approach.



**Table 2**

<b>Staged Approach for Treatment of Childhood and Adolescent Obesity<sup>2,32</sup></b>			
<b>Stage</b>	<b>What: Recommended Behaviors for Child or Adolescent, and Family</b>	<b>How: Settings and Staff for Intervention</b>	<b>When</b>
<b>Stage 1. Prevention Plus</b>	<ul style="list-style-type: none"> <li>• 5+ fruits and vegetables.</li> <li>• &lt;1 hour per day screen time.</li> <li>• ≥1 hour per day moderate or vigorous physical activity.</li> <li>• Reduce or eliminate sugar-sweetened beverages.</li> <li>• Maintain healthy eating behaviors (eg, 3 meals a day, family meals, limited eating out).</li> <li>• Family-based change.</li> </ul>	<ul style="list-style-type: none"> <li>• Office-based</li> <li>• Trained office support (eg, physician, nurse practitioner, nurse, physician assistant)</li> <li>• Scheduled follow-up visits</li> </ul>	<ul style="list-style-type: none"> <li>• Frequency of visits based on readiness to change or behavioral counseling.</li> <li>• Reevaluate in 3–6 months.</li> <li>• Advance to next level depending on response and interest.</li> </ul>
<b>Stage 2. Structured Weight Management</b>	<ul style="list-style-type: none"> <li>• Develop plan for child or adolescent, and family, to include more structure (timing and content) of daily meals and snacks.</li> <li>• Balanced macronutrient diet.</li> <li>• Reduced screen time to &lt;1 hour per day for non-academic activities.</li> <li>• Increased time spent in moderate and vigorous physical activity.</li> <li>• Monitoring taught to improve success (eg, logs of screen time, physical activity, dietary intake, dietary patterns).</li> </ul>	<ul style="list-style-type: none"> <li>• Office-based (registered dietitian, physician, nurse) trained in assessment techniques</li> <li>• Motivational interviewing or behavioral counseling</li> <li>• Teaching parenting skills and managing family conflict</li> <li>• Food planning</li> <li>• Physical activity counseling</li> <li>• Support from referrals</li> </ul>	<ul style="list-style-type: none"> <li>• Monthly visits tailored to child or adolescent, and family.</li> <li>• Advance if needed or if no improvement after 3–6 months (improvement = weight maintenance or BMI deflection downward).</li> </ul>

*continued*

**Table 2** (continued)

Stage	What: Recommended Behaviors for Child or Adolescent, and Family	How: Settings and Staff for Intervention	When
<b>Stage 3. Comprehensive Multidisciplinary Intervention</b>	<ul style="list-style-type: none"> <li>Structured behavioral program (eg, food monitoring, goal-setting contingency management)</li> <li>Improved home food environment</li> <li>Structured dietary and physical activity interventions designed to result in negative energy balance</li> <li>Strong parental or family involvement, especially for infants and children &lt;12 years</li> </ul>	<ul style="list-style-type: none"> <li>Multidisciplinary team that includes registered dietitian, counselor or mental health care professional, and physical activity specialist</li> <li>Dedicated pediatric weight-management program that includes nutrition, physical activity, and behavior change</li> </ul>	<ul style="list-style-type: none"> <li>Weekly for 8–12 weeks and then monthly</li> <li>If no improvement after 6 months (improvement = weight loss or BMI deflection downward),               <ul style="list-style-type: none"> <li>For children aged 2–5 years, remain in stage 3 with continued support.</li> <li>For children and adolescents aged 6–11 years if &gt;99th percentile and a comorbidity, consider stage 4.</li> <li>For children, adolescents, and young adults aged 12–18 years if &gt;99th percentile with a comorbidity or with &gt;6 months of no weight loss in stage 3, consider stage 4.</li> </ul> </li> </ul>
<b>Stage 4. Tertiary Care Intervention</b>	<ul style="list-style-type: none"> <li>Continued diet and physical activity behavioral counseling. Also, consider more aggressive approaches, such as medication, surgery, or meal replacement.</li> </ul>	<ul style="list-style-type: none"> <li>Pediatric weight-management center operating under established protocols</li> <li>Multidisciplinary team</li> </ul>	<ul style="list-style-type: none"> <li>According to protocol</li> </ul>

Abbreviation: BMI, body mass index.

Derived from Barton M; US Preventive Services Task Force. Screening for obesity in children and adolescents: US Preventive Services Task Force recommendation statement. *Pediatrics*. 2010;125(2):361-367; and adapted with permission from Spear BA, Barlow SE, Ervin C, et al. Recommendations for treatment of child and adolescent overweight and obesity. *Pediatrics*. 2007;120(suppl 4):S254-S288.

- **Stage 4. Tertiary Care Intervention.** This stage of treatment, which is well beyond the purview of a health supervision visit, may include intensive interventions. These interventions, which include medications, surgery, and meal replacements, may be considered for some children and adolescents with severe obesity.

The metric for improved weight is BMI percentile, generally to below the 85th percentile, although some children and adolescents will be healthy in the overweight category (85th–94th percentile). Although improvement in BMI percentile is the goal, serial weights can reflect energy balance in the short-term. Weight maintenance leads to reduction in absolute BMI because of ongoing

linear growth, and even slow weight gain can result in lower BMI percentile because BMI for a given percentile curve rises with age. In general, younger children and those with milder obesity should change weight more gradually than older children or adolescents or those with severe obesity.

Table 3 summarizes recommendations for weight change targets for children and adolescents in obesity treatment. For children 2 years and younger, caloric restrictions designed to reduce weight are not recommended. However, health care professionals should discuss the long-term risks of obesity with parents and encourage them to establish obesity prevention strategies for this younger age.



Table 3

Weight Change Targets for Children and Adolescents Based on Body Mass Index <sup>2,32,44</sup>				
Age, years	Body Mass Index 5th–84th Percentile	Body Mass Index 85th–94th Percentile <sup>a</sup>	Body Mass Index 95th–98th Percentile	Severe Obesity <sup>b</sup>
2–5	Maintain growth velocity.	Weight maintenance or BMI trending downward <sup>a</sup>	Weight maintenance or BMI trending downward	If BMI >21 gradual weight loss of not >1 lb per month until BMI <97th percentile
6–11	Maintain growth velocity.	Weight maintenance or BMI trending downward <sup>a</sup>	Gradual weight loss not more than 1 lb per month <sup>c</sup>	Weight loss maximum of an average of 2 lb per week <sup>c</sup>
12–18	Maintain growth velocity until linear growth complete.	Weight maintenance or BMI trending downward <sup>a</sup>	Weight loss of a maximum of an average of 2 lb per week <sup>c</sup>	Weight loss maximum of an average of 2 lb per week <sup>c</sup>

Abbreviations: BMI, body mass index; NHANES, National Health and Nutrition Examination Survey.

<sup>a</sup> These targets apply to children and adolescents who need to improve weight. Some children and adolescents who are in (or just above) the 85th–94th percentile category are unlikely to have excess body fat and should receive usual prevention counseling without a goal of lowering BMI percentile.

<sup>b</sup> There is no consensus on a definition of severe obesity. The expert committee suggested use of the 99th percentile based on cut points defined by Freedman et al<sup>12</sup> using NHANES data. However, these cut points may be imprecise. Children and adolescents with BMI at or above this level have increased health risks; therefore, intervention is more urgent.

<sup>c</sup> Excessive weight loss should be evaluated for high-risk behaviors.

Derived from Barton M; US Preventive Services Task Force. Screening for obesity in children and adolescents: US Preventive Services Task Force recommendation statement. *Pediatrics*. 2010;125(2):361-367; adapted with permission from Spear BA, Barlow SE, Ervin C, et al. Recommendations for treatment of child and adolescent overweight and obesity. *Pediatrics*. 2007;120(suppl 4):S254-S288; and Holt K, Wooldridge N, Story N, Sofka D. *Bright Futures: Nutrition*. 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2011.

## Promoting a Healthy Weight: Infancy—Birth Through 11 Months

Breastfeeding<sup>9,28</sup> and not overfeeding (if bottle-feeding) are recommended to ensure adequate growth that is not excessive. The introduction of solid foods, as complementary additions to energy and nutrient intakes, should be delayed until around age 6 months.<sup>9</sup> Introducing foods with a variety of tastes and textures lays the groundwork for children's acceptance of a variety of healthy foods, including vegetables.<sup>45,46</sup>

The feeding relationship between the parent or other caregiver and the infant reflects a dynamic process that is initiated during infancy and extends into adolescence. Many parents and other caregivers are aware of cues from the infant suggesting hunger but need education about when to stop feeding the infant. Signs of fullness include turning

away from a spoon, clamping the mouth shut, or playing with food. The interplay of signs of hunger and fullness lead to the infant's ability to self-regulate food intake in response to energy needs. Self-regulation is learned in a responsive, healthy feeding relationship that involves

- Responding early and appropriately to hunger and satiety cues
- Recognizing the infant's developmental abilities and feeding skills
- Balancing the infant's need for assistance with encouragement of self-feeding
- Allowing the infant to initiate and guide feeding interactions
- Providing the infant with multiple opportunities for back and "tummy time" and other age-appropriate physical activity
- Allowing the infant to explore his environment





### Promoting a Healthy Weight: Early Childhood—1 Through 4 Years

Promoting healthy weight using a responsive parenting approach during early childhood continues building on the self-feeding and self-regulation skills initiated during infancy.<sup>46</sup> Healthy food choices divided into 3 meals and 2 to 3 snacks daily should provide adequate macronutrients and micronutrients for growth. (*See the For Families section of Box 1 in this theme for information on healthy eating behaviors and healthy food choices.*) Toddlers and young children typically display erratic eating behaviors that reflect growth spurts and pauses and their need to demonstrate independence. Parents and other caregivers should be guided to respond to these behaviors in ways that reflect understanding, provide structure, and support exploration. Rather than imposing how a food is served (eg, whole foods or pieces), parents can ask the child which way he would like it. They can offer two vegetables and allow the child to choose one. If a child stops eating his favorite food, parents can accept the refusal calmly, recognizing that appetite is variable and he may simply not be hungry. Alternative suggestions might be offered but not forced. If the child doesn't want to try a new food, the parent can let the child know they will be serving the food again, and maybe next time he will like it.

Parents may need guidance about age-appropriate time limits as they begin to introduce their young child to TV and other types of media. Interactive play between adults and young children prevents long periods of sedentary behaviors.

Early childhood programs have been identified as promising environments for intervention and prevention of obesity with research specifically supporting child care as an ideal context.<sup>47</sup> Other programs that serve young children and their families include early intervention and home

visiting programs. Because of the significant number of hours a child can spend in child care and early childhood programs, the settings present ideal opportunities to prevent obesity by raising awareness about the issue, providing guidance to families and caregivers, and creating environments that support health for our youngest children.

### Promoting a Healthy Weight: Middle Childhood—5 Through 10 Years

In middle childhood, children begin to broaden their experiences, and they are expected to make some of their own food choices. Out-of-home influences become more important as school routine and peers' behavior may challenge or enrich the child's and family's habits. It is recommended that health care professionals provide parents and children with information about healthy foods for lunches and snacks. In some schools, children as young as age 5 years serve themselves during school breakfast and lunch, and they should be encouraged to make healthy food choices. Parents and children may not be aware of the large number of calories consumed from juice, soft drinks, and coffee and energy drinks.

Media messages strongly influence food choices. During middle childhood, children are exposed to more media messages than at younger ages. During this period, many children increase their use of computers and handheld devices, which can increase their exposure to media messages about food and in turn influence their food choices.

When children start school, they are less active during the day. Encouraging physical activity outside the school day is critical. This activity should be free play and something the child considers fun. Although many children may begin organized



sports during or before middle childhood, free play also should be encouraged.<sup>34</sup>

During middle childhood, children become more aware of their appearance and may express concern with their body image or weight. They may eat less to try to lose weight. Addressing the individual child's concerns may help prevent unhealthy eating behaviors.

### **Promoting a Healthy Weight: Adolescence—11 Through 21 Years**

Adolescents spend a good deal of time away from home, and many consume fast foods and other foods that are often high in calories, saturated fats, added sugars, refined grains, and sodium. It is common for adolescents to skip meals and to snack frequently. As adolescents take increasing responsibility for what they eat, parents can support their choices by providing healthy foods at home and opportunities for the adolescent to learn about selecting, purchasing, and preparing foods. This can help the adolescent choose healthy foods. Parents, health care professionals, and others in the community can advocate for healthy food options in school cafeterias, vending machines, snack bars, school stores, and other venues at which adolescents buy food and beverages.

Health care professionals need to be sensitive to adolescents' concerns about body image and weight. Evaluating the level of body satisfaction and practices the adolescent uses to maintain or reduce body weight (eg, dieting, binge eating, physical activity patterns) will help health care professionals recognize early symptoms of eating disorders that can develop with unhealthy weight control behaviors.<sup>48</sup>



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