Obesity Guideline Team

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Obesity Prevention and Management

Patient population: Patients aged 2 years and older seen in primary care

Objectives: Prevention of obesity in patients and weight management in overweight and obese patients

Key points

Problem. One-third or more of American adults, adolescents, and children are obese. Obesity rates have tripled in one generation, resulting in increases in associated medical comorbidities and care costs. [C].

Weight classification. BMI (body mass index – weight compared to height, see Table 1) is the primary measure of overweight and obesity. A rising BMI helps identify patients at risk of developing obesity.

Primary prevention. Regular assessment of lifestyle factors (e.g., diet, exercise, sleep) identifies patients at risk for excess weight gain [II C]. Preventive lifestyle changes are important. (Tables 2-4.)

Screening. Annual assessment of BMI should be recorded and discussed with patients [I D]. Identify patients crossing weight or BMI percentiles, indicating increased risk for developing obesity [II B].

General approach. Obesity is a sensitive and stigmatized topic. Address it compassionately with a focus on the health benefits of adopting a healthy diet and increasing physical activity [I C].

Diagnostic work-up. (Table 5) For those identified as obese:

- **History:** weight/BMI trajectory over time, prior attempts to lose weight, medications predisposing to weight gain, psychosocial factors, family history of obesity and related conditions [I D].
- **Physical exam** focusing on: BP and heart rate, and signs of related comorbidities (acanthosis nigricans, hirsutism in women for example) [II B].
- **Psychosocial assessment:** identify motivated patients and also barriers to weight management [II C].

Limited lab panel: lipid panel, glucose (or HgB A1C in adults), AST & ALT [II B].

Treatment

**Goal.** For children, decrease rate of weight gain or 1-2 lb/week weight loss is reasonable. For adults, 10% weight loss in 6 months is recommended [I D] (Table 6.)

**Lifestyle counseling.** Engage patient and family. Provide education about self-management and provide support, identifying lifestyle changes, and collaboratively set goals [I A].

**Physical activity.** Incorporate regular physical activity at least 5 times per week – see Table 3 for type, level, and duration of activity. Decrease sedentary time [I A]. (Table 3.)

**Dietary interventions.** Appropriate portion sizes of whole grains, fruits & vegetables, and lean meats/dairy. [I D]. Decrease intake of high calorie foods and drinks, including alcohol [I A] (Table 4.)

**Sleep.** Inadequate sleep is associated with excess weight gain. Recommendations for sleep duration and how to achieve good quality sleep are in Table 7 [II C].

**Medications.** Identify and modify medications that may contribute to weight gain [I A]. Three FDA-approved medications can have modest weight loss effects in certain obese patients [II A]. (Table 8.)

**Bariatric surgery.** Consider for motivated obese individuals who are unsuccessful in meeting initial weight loss goals in 6 months [II B].

Managing comorbid conditions. Identify and manage associated comorbid conditions, e.g., CAD, [II A]. Consider the impact of obesity on radiologic studies, procedures, and pharmacologic doses [I A]

**Follow-up and monitoring.** (Table 9.) Base follow up frequency on risk factors and readiness of patient and family to make lifestyle changes. Consider monthly contact by member of care team [II D].

**Referrals.** For comorbidities, dietitian, multidisciplinary weight-loss clinic, bariatric surgery [I A].

**Pregnancy.** Excessive weight gain has maternal and fetal risks and predicts long term weight gain [C].

**Patient education and resources.** Website resources listed. – see Table 10 [I D].

**Clinical performance.** Meaningful Use measures BMI, blood pressure, and diet and activity counseling.

**Strength of recommendation:**
- I = generally should be performed; II = may be reasonable to perform; III = generally should not be performed.

**Levels of evidence for the most significant recommendations**
- A = randomized controlled trials; B=controlled trials, no randomization; C=observational trials; D=opinion of expert panel.
Table 1. Weight Classification

<table>
<thead>
<tr>
<th>Pediatric BMI Classification*</th>
<th>Adult BMI Classification a,b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>Underweight</td>
</tr>
<tr>
<td>&lt;5%ile</td>
<td>&lt;18.49</td>
</tr>
<tr>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>5-84%ile</td>
<td>18.50 – 24.90</td>
</tr>
<tr>
<td>Overweight (Pre-obesity)</td>
<td>Overweight (Pre-obesity)</td>
</tr>
<tr>
<td>85-94%ile</td>
<td>25.00 – 29.99</td>
</tr>
<tr>
<td>Obesity</td>
<td>Obesity Class I</td>
</tr>
<tr>
<td>≥95%ile</td>
<td>30.00-34.99</td>
</tr>
<tr>
<td></td>
<td>Obesity Class II</td>
</tr>
<tr>
<td></td>
<td>35.00 -39.99</td>
</tr>
<tr>
<td></td>
<td>Obesity Class III</td>
</tr>
<tr>
<td></td>
<td>&gt; 40.00</td>
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</tbody>
</table>

a Patients age ≥65 years tend to have increased body fat and decreased lean muscle mass. Depending on individual patient factors, for these patients a BMI < 22 may be below normal and a BMI of 25-30 may be acceptable.

b If waist circumference considered:
- Increased risk for metabolic complications: men - WC > 94 cms (Asian men > 90 cms); non-pregnant women - WC > 80 cms (Asian women > 80 cms)
- Substantially increased risk for metabolic complications: men - WC > 102 cms; non-pregnant women - WC > 88 cms


Table 2. General Summary of Recommendations for the Prevention of Obesity

**Lifestyle Assessment Related to Obesity Risk**
- Assess BMI at least annually, monitor for increasing BMI (or BMI percentile in children)
- Review dietary and physical activity habits in addition to sleep duration
- Review other obesity risk factors such as medical co-morbidities, familial obesity, medication use, and lack of nutrition knowledge and/or skills for food preparation.

**Counseling and Approaches**
- Provide healthy lifestyle promotion messages to all patients
- Discuss weight control interventions for overweight patients to prevent the progression to obesity
- Use patient-centered counseling techniques to evaluate what the patient is interested in learning and what they would like to focus on regarding change
- Encourage a self-management approach including setting goals for healthy lifestyle habits

**Physical Activity and Exercise**
- Encourage adults and children to engage in regular physical activity and decrease sedentary activity. (See Table 3 for specific physical activity recommendations)

**Diet and Eating**
- Promote consumption of a variety of nutritious foods. Recommend avoidance of high calorie foods and sugar sweetened beverages. (See table 4 for specific dietary recommendations)
- Address environmental and family factors associated with eating
  - Encourage and support breastfeeding during infancy
  - Encourage families to create a healthful eating environment that is responsive to hunger and fullness cues
  - Discuss ways to access affordable healthy foods
  - Promote family meals and limited eating out and fast food
  - Limit children’s screen time and exposure to food and beverage marketing

**Sleep**
- Promote age-appropriate sleep durations

**Let’s Go! 5-2-1-0 (Quick Summary for Children and Adolescents)**

- 5 or more servings daily of fruits and vegetables
- 2 hours or less of screen time daily (Keep TV/computer out of bedroom. No screen time under the age of 2.)
- 1 hour or more daily of physical activity
- 0 sugary drinks – more water & low fat milk

Note: General summary based on obesity prevention recommendations of several national guidelines and of Let’s Go! 5-2-1-0 from [http://www.letsgo.org/](http://www.letsgo.org/)
### Table 3. Physical Activity Recommendations with Definitions and Examples

<table>
<thead>
<tr>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Children &amp; Adolescents</strong></td>
</tr>
</tbody>
</table>
| **Adults** | Aerobic exercise – either or a combination of:  
At least 150 minutes of moderate-intensity exercise weekly, e.g., ≥ 30 minutes/day on ≥ 5 days/week  
At least 75 minutes of vigorous-intensity exercise weekly, e.g., ≥ 20 minutes/day on ≥ 3 days/week  
For additional health benefits, also consider:  
Strength/resistance exercises 2-3 days/week  
Neuromotor exercise (balance, agility, and coordination) 2-3 days/week  
Flexibility exercises ≥ 2 days/week |

<table>
<thead>
<tr>
<th>Level of Physical Activity</th>
<th>Definition</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **Muscle strengthening** | Weight lifting  
Push-ups and pull ups  
Tree or rock climbing | |
| **Bone strengthening** | Weights, resistance bands,  
Running  
Brisk walking | |
| **Moderate** | While performing the physical activity, your breathing and heart rate is noticeably faster but you can still carry on a conversation (i.e. you can talk, but not sing) | Walking briskly  
Light yard work (raking/bagging leaves or using a lawn mower) or snow shoveling  
Actively playing with children- basketball, playground  
Biking at a moderate pace |
| **Vigorous** | While performing the physical activity, your heart rate is increased substantially and you are breathing too hard and fast to have a conversation (i.e. not able to say more than a few words without pausing for a breath) | Jogging/running  
Swimming laps  
Rollerblading/inline skating at a brisk pace  
Cross-country skiing  
Most competitive sports (football, basketball, soccer)  
Jumping rope |
Table 4. Dietary Changes to Promote Weight Loss

<table>
<thead>
<tr>
<th>Diet and eating: avoid high calorie, low nutrient foods</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eat a variety of nutritious foods.</strong> Encourage and support breastfeeding during infancy. Emphasize:</td>
</tr>
<tr>
<td>Fruits and vegetables – at least 5 servings per day</td>
</tr>
<tr>
<td>Whole grains – look for 100% whole wheat or whole grain and at least 3 grams of dietary fiber per serving</td>
</tr>
<tr>
<td>Fat-free or low-fat milk and milk products. If lactose-intolerant, choose fat-free lactose-free milk or fat-free, plain soy milk.</td>
</tr>
<tr>
<td>Lean meats, skinless poultry, fish, beans, soy products, eggs, and nuts. Bake, broil, steam or grill. Avoid frying foods.</td>
</tr>
<tr>
<td>Low saturated fats. (look for 5% or less on the nutrition facts label)</td>
</tr>
<tr>
<td>Stay within your daily calorie needs or use the plate method to control caloric intake</td>
</tr>
<tr>
<td><strong>Eliminate or Reduce:</strong></td>
</tr>
<tr>
<td>Foods high in saturated fat include fatty meats (ex. bacon, sausage, deli meats, hot dogs), fried foods, full fat dairy products, donuts, cookies, ice cream.</td>
</tr>
<tr>
<td>High calorie beverages: sugar-sweetened beverages (regular soft drinks, fruit drinks, fruit punch, sweet tea, sweetened coffee drinks) and alcoholic beverages</td>
</tr>
<tr>
<td>High calorie and low nutrient foods: sweets and junk food such as chips.</td>
</tr>
<tr>
<td>Avoid fast food and limit eating out to rare occasions. When eating out, choose grilled or baked fish or chicken, steamed vegetables without butter, salads with low-fat dressing on the side. If eating fast food, select a grilled chicken sandwich or veggie burger and a side salad with low-fat dressing on the side. Avoid French fries and other fried foods.</td>
</tr>
<tr>
<td><strong>Address environmental and family factors associated with eating:</strong></td>
</tr>
<tr>
<td>Reduce portions. Use smaller plates and measure foods.</td>
</tr>
<tr>
<td>Schedule food consumption. Schedule regular meals and snacks throughout the day, starting with breakfast. Avoid excessive snacking.</td>
</tr>
<tr>
<td>Help adults increase children’s healthy eating. Promote family meals and limited eating out or fast food.</td>
</tr>
<tr>
<td>Limit young children’s screen time and exposure to food and beverage marketing.</td>
</tr>
<tr>
<td>Shop the outside perimeter of the typical grocery store to obtain the basic food groups. Limit the purchase of packaged, processed and convenience foods.</td>
</tr>
<tr>
<td>Read food labels and select low fat, high fiber, and low sodium foods: Look for no more than 5 grams of fat per serving. Do look for 5 grams of fiber or more per serving. Limit sodium to 300 mg per serving</td>
</tr>
</tbody>
</table>
Table 5. History, Physical Examination, Psychological Assessment, and Studies Related to Obesity

**History**
- Weight history including details of prior weight loss attempts
- Ethnicity and family history
- Dietary habits, eating pattern
- Physical activity, sleep, and stress
- Family history of obesity and genetic predisposition, dietary and activity habits.

Medical factors contributing to obesity, such as:
- medications that can cause weight gain: e.g., hormonal contraceptives, insulins, thiazolidinedions, sulfonylureas, corticosteroids, anticonvulsants, some antidepressants, atypical antipsychotics.
- endocrine abnormalities (rare)

Risk factors for cardiovascular complications (requires heightened efforts at risk factor modification):
- established coronary heart disease (CHD)
- atherosclerotic disease
- diabetes mellitus or impaired fasting glucose
- hypertension
- family history of premature CHD

Conditions associated with obesity, e.g., polycystic ovary syndrome, osteoarthritis, cholelithiasis, and stress incontinence.

**Physical Examination**
- Measurement of height, weight, calculate BMI
- Measurement of blood pressure and heart rate
- Assess the presence and severity of obesity-related conditions

**Psychological Assessment**
- Patient expectations and motivation for weight loss
- Screening for the presence or a history of an eating disorder, or other mood disorders such as depression.

**Consider Laboratory and Other Studies**
- Fasting blood glucose, or Hgb A1C in adults
- Serum lipid profile,
- Aspartate aminotransferase (AST) and alanine aminotransferase (ALT) to evaluate for nonalcoholic fatty liver disease in:
  - Children 10-18 years with either BMI ≥ 95%ile or ≥ 85%ile with additional risk factors
  - Adults with BMI ≥ 30
- Additional studies as indicated by comorbidities or history, e.g., cardiovascular assessment if clinically suspected or indicated, endocrine evaluation for thyroid disease or Cushing’s syndrome or if hypothalamic disease is suspected.

Table 6. Starting Goals for Weight Loss *

<table>
<thead>
<tr>
<th>Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children: decrease rate of weight gain while they continue to grow taller</td>
<td>BMI ≤ 30 kg/m² and no significant burden of obesity-related comorbid conditions: 10% weight reduction over 6 months</td>
</tr>
<tr>
<td>Adolescents at BMI ≥ 99%ile: ¼ to 1 pound a week weight loss is reasonable</td>
<td></td>
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</tbody>
</table>

Table 7. Strategies for Good Sleep Promotion

**Children**: preschoolers (3-5 years: 11-13 hours), school-aged (5-12 years: 10-11 hours)
- Maintain a daily sleep schedule and consistent bedtime routine
- Establish a relaxing bedtime routine
- Create a quiet, dark and relaxing bedroom environment
- Establish an environment that is used for sleeping only and not for other activities (e.g. watching TV, using the computer)

**Adolescents and Adults**: adolescents (12-18 years): 9-10 hours, adults: 7-8 hours
- Avoid caffeinated beverages after lunchtime
- Plan to be in bed with lights off at least 7 hours before the time to get up
- Avoid activities that may be arousing around bedtime (e.g. playing computer games, texting)
- Establish relaxing activities such as writing in a journal, listening to relaxing music, stretching
- Create a quiet, dark, and relaxing bedroom environment
<table>
<thead>
<tr>
<th><strong>Table 8. FDA Approved Medications to Treat Obesity</strong> *</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phentermine (several brands)</strong></td>
</tr>
<tr>
<td><strong>Duration of use</strong></td>
</tr>
<tr>
<td><strong>Effect</strong></td>
</tr>
<tr>
<td><strong>Mechanism</strong></td>
</tr>
<tr>
<td><strong>Side effects</strong></td>
</tr>
<tr>
<td><strong>Contraindications</strong></td>
</tr>
<tr>
<td><strong>Form</strong></td>
</tr>
<tr>
<td><strong>Dosing</strong></td>
</tr>
<tr>
<td><strong>Cost</strong></td>
</tr>
</tbody>
</table>

* Medications typically result in little weight loss, but may help prevent further weight gain

Cost = Average wholesale price based -10% for brand products and Maximum Allowable Cost (MAC) + $3 for generics for average 30-day supply, AmerisourceBergen item catalog, 1/2012, and Michigan Department of Community Health M.A.C. Manager, 1/2012. Pricing for OTC products is based on [http://www.drugstore.com/](http://www.drugstore.com/)
Table 9. Recommendations for Monitoring and Follow-Up

<table>
<thead>
<tr>
<th>Physical exam, laboratory and other studies</th>
<th>Plot height, weight, BMI (BMI percentile for children) and blood pressure annually</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assess lab levels as indicated</td>
</tr>
<tr>
<td></td>
<td>Provide care through planned care visits for follow up of obesity and overweight</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lifestyle assessment</th>
<th>Review physical activity, nutrition, and sleep habits and associated goals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Provide ongoing self-management support (can be provided by any member of the care team)</td>
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<tr>
<td></td>
<td>Follow up on self-management education to reinforce behavior changes</td>
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<tr>
<td></td>
<td>Provide family support and referral to a Registered Dietitian or Social Worker for extensive counseling (if indicated)</td>
</tr>
<tr>
<td></td>
<td>Offer referral to more intensive weight management interventions or programs for patients not making progress</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Self-management support</th>
<th>Deliver consistent, focused message about healthy lifestyles (5-2-1-0 for children and adolescents)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assess readiness to change and self-efficacy, and provide advice for behavior change consistent with patient/family’s readiness to change</td>
</tr>
<tr>
<td></td>
<td>Use collaborative approach to setting goals</td>
</tr>
<tr>
<td></td>
<td>Promote self-management skills</td>
</tr>
</tbody>
</table>

Table 10. Online Resources

- **ChooseMyplate.gov** - a USDA website designed to promote good nutrition and well-being for Americans
- **Letsmove.gov** - a website that promotes a healthy start for kids, healthy school food, increasing physical activity, increasing access to healthy, affordable food, and empowering parents and caregivers
- **Livestrong.com, Sparkpeople.com, Loseit.com, Myfitnesspal.com** - individualized programs to help set calorie needs, track food intake and exercise and provide motivation and support
- **Kaboom.org** - a non-profit organization that provides a tool to search and review playgrounds
- **Kidseatright.org** - a web based resource from the Academy of Nutrition and Dietetics
- **Weightwatchers.com** - an online weight loss program that allows participants to lose weight and track their progress at their own pace (there is a cost associated with this program)

Clinical Problem and Management Issues

**Clinical Problem**

**Prevalence.** During the past 20 years, obesity has dramatically increased in the United States. According to the CDC in 2012, more than one-third of U.S. adults are obese. The South has the highest obesity prevalence (29.4%), followed by the Midwest (28.7%), Northeast (24.9%) and the West (24.1%). Michigan currently ranks 10th in the US for obesity rates.

Overall obesity prevalence does not differ between men and women, though adults aged 60 and older are more likely to be obese than younger adults. Non-Hispanic blacks have the highest rates of obesity (44.1%) compared with Mexican Americans (39.3%), all Hispanics (37.9%) and non-Hispanic whites (32.6%).

Approximately 17% (or 12.5 million) of children and adolescents aged two through 19 years are obese, triple the rate from just one generation ago. Over 70% of overweight and obese children become obese adults. Obesity prevalence among U.S. children and adolescents differs significantly by race and ethnicity. Hispanic boys are significantly more likely to be obese than non-Hispanic white boys, and non-Hispanic black girls are significantly more likely to be obese than non-Hispanic white girls.

One of seven low-income, preschool-aged children is obese. Lower neighborhood socioeconomic status contributes to overweight and obesity due to factors including lack of access to shopping venues with healthy foods and lack of access to safe exercise areas. Higher income women are less likely to be obese than low-income women, as are those with college degrees compared to less educated women. Early childhood poverty leads to accelerated weight gain over the course of childhood into early adulthood. Obesity and education are not related for
Risk for other conditions. Obesity is a risk factor for most major causes of death, including cardiovascular disease, numerous cancers, and diabetes, and is linked with markedly diminished life expectancy. Osteoarthritis, gall bladder disease, sleep apnea, respiratory impairment, diminished mobility, and social stigmatization are also associated with obesity. Excess weight is a risk factor for cancers of the colon, rectum, prostate, gall bladder, biliary tract, breast, cervix, endometrium, and ovary.

Obese children and adolescents have an increased risk of type 2 diabetes mellitus, asthma, and nonalcoholic fatty liver disease. They are more likely to have cardiovascular risk factors, and have greater anesthesia risk. Obese children may also experience more mental health and psychological issues such as depression and low self-esteem compared with non-obese children.

Cost. The direct medical cost of overweight and obesity combined is approximately 5.0% to 10% of US healthcare spending. In 2008 alone the aggregate national cost of overweight and obesity combined was estimated at $147 billion.

Management Issues

For individuals identified as obese, the person—not the obesity—should be the focus of treatment. The sensitive care of obese patients requires respect and compassion. It is important for clinicians to develop a trusting relationship first by tackling health care goals identified by the patient before addressing weight loss.

The stigma of obesity is common in society and obese persons often face negative attitudes and discriminatory behavior. Healthcare professionals may carry negative stereotypical assumptions of obese persons being lazy, non-compliant or less competent. Obese patients often feel unwelcome in medical settings and may choose to ignore or delay seeking attention for their medical problems.

Establishing an alliance between the family and the primary care medical home may facilitate weight loss. In addition to the physician, clinic nurses, dietitians, or social workers within the medical home can reinforce the lifestyle changes the patient is trying to achieve. It is important that the entire family attempt to adopt these healthy practices, not just the patient.

Rationale for Recommendations

Consensus committees including the Unites States Preventive Services Task Force (USPSTF), the American Academy of Pediatrics (AAP), the Centers for Disease Control and Prevention (CDC), the National Heart Lung and Blood Institute (NHLBI), and the Institute of Medicine (IOM) have established guidelines for the prevention and management of obesity. Common themes in these guidelines include healthy eating, exercise, lifestyle changes, and consideration of medications and surgery when initial efforts are unsuccessful in motivated patients. This guideline summarizes the most recent evidence on obesity management.

Obesity Measurement and Classification

Body mass index (BMI). In children and adults, overweight and obesity are classified by BMI percentile or absolute value. BMI is an anthropometric measure that estimates body fat through a person's weight in kilograms divided by the square of the height in meters. BMI is a practical and widely accepted method of classifying obesity and is recommended as a general estimate of body fat. BMI can be calculated in patients 3 years and older. See Table 1 for BMI classifications based on pediatric or adult age.

Waist circumference. Waist circumferences may be helpful in classifying individuals with atypical muscle-to-fat ratios. BMI overestimates body fat in very muscular persons.

Centrally distributed obesity is now considered a better indicator for a range of health problems than total body mass. Above a BMI of 35, abdominal obesity has little predictive power of disease risk beyond that of BMI.

Primary Prevention of Obesity

The AAP, the IOM, the USPSTF, and the CDC have each developed recommendations for preventing obesity. Their recommendations have been integrated into an overall set of recommendations presented in Table 2, with recommendations for physical activity elaborated in Table 3 and recommendations regarding diet incorporated into Table 4.

Pediatric guidelines from the AAP and IOM focus on key factors that influence obesity risk in young children—physical activity, healthy eating, marketing and screen time, and sleep. The AAP's recommendations additionally recognize the importance of social and environmental change to reduce the obesity epidemic in children and adolescents, and also identify ways healthcare providers and health care systems can be part of broader efforts.

Adult guidelines from the USPSTF and CDC primarily focus on diet and physical activity counseling. A USPSTF review in 2012 found that the benefit of behavioral counseling in the primary care setting to promote a
healthful diet and physical activity is small, and that clinicians may selectively choose to counsel patients. The CDC provides more detailed guidelines on diet and physical activity to prevent obesity. Short sleep duration has additionally been associated with obesity in adults, and adults suffering from sleep deprivation should be counseled on their increased risk of excess weight gain.

Screening for Obesity

Children and adolescents should be screened annually for obesity. For adults a specific screening frequency is less clear, with the National Heart Lung and Blood institute recommending screening every two years. BMI should be calculated and recorded in the medical record to facilitate monitoring change over time. Waist circumference or waist-to-height ratios may also be useful for interpreting BMI in persons who are very muscular or who have lost muscle mass.

Diagnostic Workup

**History and physical examination.** Developing a weight loss strategy involves a risk assessment through a comprehensive history and a focused physical examination. Important obesity-specific issues to consider on history-taking and examination are listed in Table D.

- **Blood pressure.** Measuring blood pressure is important, requiring appropriate cuff sizes for obese patients. Blood pressure should be measured annually and tracked in the medical record for all patients 3 years and older. Following recommended practice for blood pressure measurement is important. (See UMHS clinical guideline for [Essential Hypertension](#), Appendix A “Standardized Blood Pressure Measurement.”)

- **Laboratory and other studies.** Exactly which studies are indicated in the evaluation and management of excess weight is somewhat controversial. Commonly recommended studies are listed in Table 5. If baseline studies are normal, repeating them in a two-year interval is reasonable.

**Treatment**

Management of overweight patients focuses primarily on lifestyle changes such as diet, physical activity, sleep and stress reduction. A combination of physical activity and dietary changes has been found to be most effective for weight loss. If these measures are unsuccessful after 6 months, then medications, surgery, and other referrals may be required.

Small concrete changes that focus on lifestyle change, behavior modification, healthy eating and physical activity are most likely to be successful in the long run. Progress should be measured on lifestyle change as much as weight parameters as it is known that modifying diet and activity can have positive health consequences even in the absence of weight loss.

**Lifestyle counseling.** Even within a limited time providers can promote a healthy lifestyle and influence patient behavior.

Lifestyle counseling includes self-management education and support, identifying lifestyle changes, and collaborative goal setting between the provider and patient. The provider works with the patient to identify the patient’s biggest concern regarding change. Examples of modifiable behaviors to target include physical activity and television viewing. The patient actually drives the encounter. Using open ended questions and listening skills, the provider helps the patient explore any issues and works collaboratively with the patient to establish a self-management goal.

**Additional for children and adolescents.** Management of obesity involves the entire family. Engagement of family members is important for adults and parental involvement is critical for children. Lifestyle changes are greatly facilitated by supporting changes in the environment. Individual counseling and web-based weight-loss programs are much less successful in promoting lifestyle changes for children than group-based or family-based treatments. Recent studies have shown that many parents perceive that their overweight child is of normal weight. If the family does not perceive that the child is obese or if they will not cooperate with lifestyle changes, then office-based interventions for pediatric obesity will not be successful.

**Additional for adults.** Lifestyle counseling means to help patients make informed decisions, identify and overcome barriers, provide health education and appropriate care recommendations, and self-management support. Important steps include:

- Initiating a discussion about nutrition and physical activity.
- Helping the patient set realistic goals.
- Encouraging open communication between the patient and health care provider.
- Following up on the patient’s progress.

The healthcare team can be utilized to provide extended support.

**Treatment goals.** The adverse health outcomes associated with obesity depend on several factors including the presence of other risks and comorbid conditions such as cigarette smoking, family history, hypertension, dyslipidemia, diabetes mellitus, etc. Thus, clinicians should determine treatment goals keeping these in mind rather than on the basis of weight alone.

General goals of weight management in obese persons are:

- Reduce body weight
- Sustain weight loss by minimizing risk of weight gain
- Prevent further weight gain.
Weight loss goals should be realistic, individualized and aimed at the long term. Starting points for developing individual goals are summarized in Table 6.

Additional for children and adolescents. In growing children, slowing the rate of weight gain while they continue to get taller will result in a decreased BMI over time. For adolescents with BMI 99th %ile or higher, ½ to 1 pound a week weight loss goals may be reasonable. A simple approach for children and families is the “5-2-1-0” plan promoted by the Let’s Move initiative (see Table 2).

Additional for adults. A reduction in body weight by approximately 10 percent over a span of 6 months is a reasonable initial goal for weight loss therapy. Such a goal is realistic and this level of modest loss can be maintained over time. Depending on the BMI, this corresponds to an average energy deficit of approximately 500 – 1000 kcal per day, resulting in a weight loss rate of 1 to 2 pounds per week. The corresponding calories per day for individuals of average height, weight, and activity level are 1800-2000 for men and 1300-1500 for women. (Individualized targets for reduced calorie intake can be calculated by dietitians or estimated using free online “weight loss calorie calculators.”) Subsequent weight loss strategy will depend upon the initial amount of weight loss.

A greater (20% or more) weight loss may be considered for persons with BMI >35 kg/m² or those with a significant burden of obesity-related comorbid conditions.

Physical activity. Recommended basic activity goals are presented in Table 3 along with categories of activity levels, their definitions, and examples.

Additional for children. Children should participate in physical activities that are age-appropriate, enjoyable, and that offer variety. Intensive family-based programs have been found to lead to sustained weight loss in children.

The average child spends 7.5 hours per day in front of a screen, including watching television, using the computer, or playing video games. The more time children spend in front of a screen, the higher their risk of obesity. Children and adolescents should limit their screen time to no more than one to two hours of quality programming daily.

Additional for adults. CDC recommends a gradual increase in physical activity toward a goal of 60 to 90 minutes of daily moderate-intensity physical activity to sustain weight loss. To then help maintain weight and prevent weight gain, adults should engage in approximately 60 minutes of moderate- to vigorous-intensity activity on most days of the week.

Older adults and those with chronic medical conditions limiting physical activity should be as physically active as their abilities allow. Those at risk of falling should also do exercises to improve balance.

Dietary intervention. General dietary recommendations to promote weight loss are summarized in Table 4. These recommendations apply to children and adults.

Additional for children. While the basic interventions are the same as for adults, the focus should be on family diet changes not just the overweight child.

Additional for adults. Decrease total calories by 500 to 1,000 per day to achieve a weight loss of 1 to 2 pounds per week.

Sleep. Short sleep duration is associated with risk for excessive weight gain and obesity. Clinicians should counsel patients and families on appropriate sleep requirements. Recommendations for age-appropriate sleep durations and strategies for good sleep for children and adults are presented in Table 7.

Medications. Medications are not recommended for children or adolescents. For adult patients medications typically result in little weight loss, but may help prevent further weight gain. Medication may be considered for adults with BMI > 30 kg/m² or with BMI > 27 kg/m² and significant medical complications, if diet and activity modifications do not result in weight loss of 5% at 3 months and 10% after 6 months.

Phentermine (short term only) and orlistat are FDA approved for weight loss in conjunction with lifestyle intervention when lifestyle intervention alone is unsuccessful. The use of these two approved drugs is described in Table 8. Two additional weight loss medications have recently received FDA approval: a combination of phentermine and topiramate (available as Qsymia) and lorcaserin (to be marketed as Belviq), the latter of which is not yet available. All four drugs are contraindicated in pregnancy – use all with caution in women of childbearing age.

Metformin led to a 1.5-cm greater decrease in waist circumference; however, its use for obesity is not approved by the FDA and is thus considered an off-label use.

Medications that have been approved for other indications that are employed in off-label use for obesity and can promote short-term modest weight loss include: bupropion, zonisamide and topiramate. However, the USPSTF found no evidence on the maintenance of improvement after discontinuation of medications.

In general, over-the-counter (OTC) medications are not recommended for weight loss. The exception is the OTC version of orlistat, which is marked as Alli.

Multidisciplinary weight loss clinics. The most effective strategies for weight management employ a multidisciplinary team working in concert to achieve individualized weight loss goals. Multidisciplinary teams typically include:
Physician: evaluates, assesses risk and counsels the patient, coordinates care of the team and who can refer to specialists as needed

Dietitian: delivers tailored nutritional information appropriate to the patient’s preferences and lifestyle

Exercise physiologist: assesses a patient’s capacity for exercise and prescribes a regimen that can be done at home, at a gym or in one-on-one session

Behavioral therapist: offers standard behavioral or cognitive behavioral therapy.

Endocrinologist: evaluates for secondary causes of obesity, evaluate and treat complications of obesity such as diabetes and prescribe pharmacotherapy when lifestyle intervention alone results in little success.

Bariatric surgery. When other approaches have not resulted in adequate weight control, bariatric surgery may be considered. While bariatric surgery results in significantly greater weight loss than conventional treatment for obese adults, surgery is associated with a greater risk of complications. Bariatric surgery has been found to reduce or resolve obesity-related medical comorbidities including diabetes and hypertension.

Bariatric surgery may be considered for patients with a BMI > 40, or > 35 with weight-related health complications (e.g., hypertension, heart disease, diabetes, polyarthritis, pulmonary hypertension, sleep apnea, or hyperlipidemia). Before bariatric surgery will be performed, most surgeons and insurers require documented compliance with a medically supervised weight loss program for a minimum of six months (including monthly documentation of weight, dietary, exercise and lifestyle modifications at each visit) without achieving significant weight loss. The supervised weight loss program usually should have occurred within the past 2 years, although some insurance companies will include the past 4 years. Absolute contraindications to bariatric surgery include pregnancy, lactation, active substance abuse, end-stage cardiovascular disease, severe or uncontrolled psychiatric disorders, and anorexia nervosa. Relative contraindications include unstable medical condition, end-stage renal disease, active binge eating disorder, or bulimia nervosa.

Managing comorbid conditions. Obese patients frequently have or develop comorbid conditions. The specifics of managing comorbid conditions are beyond the scope of this guideline. See the list of UMHS clinical guidelines for recommendations concerning some common comorbid conditions, including coronary artery disease, depression, diabetes, heart failure, hypertension, and lipid management.

Obesity can affect the diagnosis and treatment of the patient’s other conditions. The effects are noteworthy for:

- Pharmacologic dosing. Based on their pharmacokinetic profile, drugs differ in their volume of distribution depending on the amount of body fat.
- Radiologic studies and procedures. The amount of subcutaneous adipose tissue influences the quality of the results of various radiologic modalities. The results of ultrasonography and x-ray examinations are particularly vulnerable to the effects of subcutaneous fat.

Follow-up and Monitoring

The weight and BMI of all patients should routinely monitored at each visit, or at a minimum, annually. Factors associated with overweight and obesity that should be monitored are summarized in Table 9. Follow up visits should include behavioral counseling and addressing the patient’s goals. If goals have not been achieved, the clinician should re-assess the reasons for failure to meet goals. If significant obesity persists and the obesity-associated risk factors remain, consider referral to a higher level of weight management.

Referrals

Primary care providers should initially manage overweight and obesity. For patients who are motivated but not making progress meeting their diet and exercise goals, referrals can be helpful. Referrals may also be indicated to manage comorbidities. Common referrals are to the following:

- Intensive multidisciplinary obesity program for patients with severe obesity and making little/limited progress
- Registered dietitian for help with dietary modifications
- Endocrine specialist for adult patients with BMI > 30 whose excess weight may be due to an endocrine disorder.
- Physical Medicine and Rehabilitation for patients with arthritis, joint, or mobility concerns
- Social work and mental health for issues regarding personal resources and emotional concerns
- Surgeon for consideration of bariatric surgery (see requirements of patients, listed in the bariatric surgery section above).

Special Populations

Pregnancy

Excessive weight gain in pregnancy (e.g., > 35 pounds for normal weight women) is an additional predictor of long-term weight gain and obesity of women, and has maternal and fetal risks. In 2009 the IOM provided an updated guideline on recommended weight gain in pregnancy. Delivering an organized, consistent program of dietary and lifestyle counseling has been found to reduce weight gain in pregnancy.

Patient education and resources

Some useful online resources are listed in Table 10.
**Strategy for Literature Search**

The team began the search of literature by accepting the results of a literature search performed for fairly recent systematic reviews (see “annotated references” for full citation): Scottish Intercollegiate Guidelines Network (SIGN). Management of obesity. A national clinical guideline, 2010. The search addressed obesity in children and adults in literature through 2007.

To update that search a systematic search of literature on Medline was performed. The major search parameters were: topic of obesity, time frame from 1/1/08 – 2/14/12; type of publication was guidelines, controlled trials (including meta-analyses), and cohort studies; population was human ages 2 and above (children and adults); and language was English.

Within these parameters individual searches were performed for the following topics: differences by gender, race, age, low SES, urban/rural; prevention; screening; history (health risk, risk for comorbidities, medications, prior weight loss attempt);BMI measurement; blood pressure; physical exam, signs; laboratory testing; treatment barriers, change readiness; treatment goals; addressing barriers; education; family involvement; motivational interviewing; dietary interventions; physical activity; medications; monitoring/follow-up; special programs; bariatric surgery; other references not included in any of the preceding individual searches.

**Related National Guidelines**

The UMHS Clinical Guideline on Obesity is consistent with:
- American College of Sports Medicine, Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guidance for Prescribing Exercise (2011)
- Centers for Disease Control and Prevention: Healthy Eating for Healthy weight (2011)
- Physical activity for a healthy weight (2011)
- Institute of Medicine: Weight Gain During Pregnancy (2009)
- Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation (2012)
- Counseling to Promote Physical Activity and a Healthful Diet to Prevent Cardiovascular Disease in Adults (2012)
- Screening for and Management of Obesity in Adults (2012)

**Measures of Clinical Performance**

National programs that have clinical performance measures concerning obesity and weight management include the following.

Centers for Medicare & Medicaid Services:
- Clinical Quality Measures for financial incentives for Meaningful Use of certified Electronic Health Record technology (MU)
- Quality measures for Accountable Care Organizations (ACO)

These programs have clinical performance measures for obesity management addressed in this guideline. While specific measurement details vary (e.g., method of data collection, population inclusions and exclusions), the general measures are summarized below.

**Adult: BMI documented.** Percentage of patients aged 18 years and older with a body mass index (BMI) in the past 6 months or during the current visit documented in the medical record. (ACO, MU)

**Adult: Follow-up plan.** If the most recent BMI is outside parameters, a follow-up plan is documented. Parameters: Age 65 and older BMI greater than or equal to 30 OR < 22; Age 18-64 BMI greater than or equal to 25 OR < 18.5. (ACO, MU)

**Pediatric: BMI documented.** The percentage of patients 2-17 years of age who had an outpatient visit with a PCP or OB/GYN and who had evidence of BMI percentile documentation, counseling for nutrition and counseling for physical activity during the measurement year. (MU)

**Pediatric: BMI classified.** Percent children, 2 through 17 years of age, whose weight is classified based on BMI Percentile for age and gender. (MU)

**Pediatric: Nutrition counseling.** The percent of patients 3-17 years old as of December 31 of the measurement year who had a visit with a PCP or OB/GYN during the measurement year who had counseling for nutrition during the measurement year. (MU)

**Pediatric: Physical activity.** The percent of patients 3-17 years old as of December 31 of the measurement year who had a visit with a PCP or OB/GYN during the measurement year who had counseling for physical activity during the measurement year. (MU)
Disclosures

The University of Michigan Health System endorses the Guidelines of the Association of American Medical Colleges and the Standards of the Accreditation Council for Continuing Medical Education that the individuals who present educational activities disclose significant relationships with commercial companies whose products or services are discussed. Disclosure of a relationship is not intended to suggest bias in the information presented, but is made to provide readers with information that might be of potential importance to their evaluation of the information.

None of the members of the guideline team have a personal financial relationship with a commercial interest whose products or services are addressed in this guideline.

Review and Endorsement

Drafts of this guideline were reviewed in clinical conferences and by distribution for comment within departments and divisions of the University of Michigan Medical School to which the content is most relevant: Family Medicine; General Medicine; General Pediatrics; Metabolism, Endocrinology & Diabetes; Pediatric Medical Surgical Joint Practice Committee, and Mott Executive Committee. The Executive Committee for Clinical Affairs of the University of Michigan Hospitals and Health Centers endorsed the final version.

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