Identification, Evaluation, and Treatment of Overweight and Obesity in Adults

Clinical Practice Guideline
MedStar Health
Ambulatory Best Practice Committee
May 2012

About 97 million adults in the United States are overweight or obese. Obesity and overweight substantially increase the risk of morbidity from hypertension; dyslipidemia; type 2 diabetes; coronary heart disease; stroke; gallbladder disease; osteoarthritis; sleep apnea and respiratory problems; and endometrial, breast, prostate, and colon cancers. Higher body weights are also associated with increases in all-cause mortality. The aim of this guideline is to provide useful advice on how to achieve weight reduction and maintenance of a lower body weight. It is also important to note that prevention of further weight gain can be a goal for some patients. Obesity is a chronic disease, and both the patient and the practitioner need to understand that successful treatment requires a life-long effort.

Assessment of Weight and Body Fat

Two measures important for assessing overweight and total body fat content are; determining body mass index (BMI) and measuring waist circumference.

1. **Body Mass Index:** The BMI, which describes relative weight for height, is significantly correlated with total body fat content. The BMI should be used to assess overweight and obesity and to monitor changes in body weight. Measurements of body weight alone can be used to determine efficacy of weight loss therapy.

   BMI is calculated as weight (kg)/height squared (m²). To estimate BMI using pounds and inches, use: [weight (pounds)/height (inches)²] x 703. Weight classifications by BMI, selected for use in this report, are shown in the table below.

   **Table IV-1: Classification of Overweight and Obesity by BMI**

<table>
<thead>
<tr>
<th>Obesity Class</th>
<th>BMI (kg/m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
</tr>
<tr>
<td>Normal</td>
<td>18.5-24.9</td>
</tr>
<tr>
<td>Overweight I</td>
<td>25.0-29.9</td>
</tr>
<tr>
<td>Obesity II</td>
<td>30.0-34.9</td>
</tr>
<tr>
<td>Extreme Obesity</td>
<td>40</td>
</tr>
</tbody>
</table>

   Pregnant women who, on the basis of their pre-pregnant weight, would be classified as obese may encounter certain obstetrical risks. However, the inappropriateness of weight reduction during pregnancy is well recognized (Thomas, 1995). Hence, this guideline specifically excludes pregnant women.


2. **Waist Circumference:** The presence of excess fat in the abdomen out of proportion to total body fat is an independent predictor of risk factors and morbidity. Waist circumference is positively correlated with abdominal fat content. It provides a clinically acceptable measurement for assessing a patient's abdominal fat content before and during weight loss treatment.

   **High Risk**

   - Men: >102 cm (>40 in.)
   - Women: >88 cm (>35 in.)

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Assessment of Risk Status
The patient's risk status should be assessed by determining the degree of overweight or obesity based on BMI, the presence of abdominal obesity based on waist circumference, and the presence of concomitant CHD risk factors or comorbidities.

The table, below, defines relative risk categories according to BMI and waist circumference. It is important to note that these categories denote relative risk, not absolute risk. They relate to the need to institute weight loss therapy, and do not directly define the required intensity of risk factor modification. The latter is determined by estimation of absolute risk based on the presence of associated disease or risk factors.

Table IV-2: Classification of Overweight and Obesity by BMI, Waist Circumference and Associated Disease Risk*

<table>
<thead>
<tr>
<th>Disease Risk* Relative to Normal Weight and Waist Circumference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Underweight</td>
</tr>
<tr>
<td>Normal+</td>
</tr>
<tr>
<td>Overweight</td>
</tr>
<tr>
<td>Obesity</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Extreme Obesity</td>
</tr>
</tbody>
</table>

* Disease risk for type 2 diabetes, hypertension, and CHD.
+ Increased waist circumference can also be a marker for increased risk even in persons of normal weight.

Identification of Patients at Very High Absolute Risk
The following disease conditions or target organ damage in hypertensive patients denotes the presence of very high absolute risk that triggers the need for intense risk factor modification as well as disease management. For example, the presence of very high absolute risk indicates the need for aggressive cholesterol-lowering therapy.

a. Established coronary heart disease (CHD)
   - History of myocardial infarction
   - History of angina pectoris (stable or unstable)
   - History of coronary artery surgery
   - History of coronary artery procedures (angioplasty)

b. Presence of other atherosclerotic diseases
   - Peripheral arterial disease
   - Abdominal aortic aneurysm
   - Symptomatic carotid artery disease

c. Type 2 diabetes

d. Sleep apnea

Identification of other obesity-associated diseases
Obese patients are at increased risk for several conditions that require detection and appropriate management, but that generally do not lead to widespread or life-threatening consequences. These include:

- Gynecological abnormalities
- Osteoarthritis
- Gallstones and their complications
- Stress incontinence
Identification of Cardiovascular Risk Factors That Impart a High Absolute Risk

Patients can be classified as being at high absolute risk for obesity-related disorders if they have three or more of the multiple risk factors listed below. The presence of high absolute risk increases the intensity of cholesterol lowering therapy and blood pressure management.

- Cigarette smoking
- High serum low-density lipoprotein cholesterol
- Low high-density lipoprotein cholesterol
- Family history of premature CHD
- Hypertension
- Impaired fasting glucose
- Age: Male 45 years, Female 55 years (or postmenopausal)

Other Risk Factors

Physical inactivity

A lack of physical activity imparts an increased risk for both CVD and type 2 diabetes. Physical inactivity enhances the severity of other risk factors, but it also has been shown to be an “independent” risk factor for all-cause mortality or CVD mortality.

High triglycerides

In obese patients, elevated serum triglycerides are a marker for increased cardiovascular risk.

<table>
<thead>
<tr>
<th>Category</th>
<th>Serum Triglyceride Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal triglycerides</td>
<td>Less than 200 mg/dL</td>
</tr>
<tr>
<td>Borderline-high triglycerides</td>
<td>200 to 400 mg/dL</td>
</tr>
<tr>
<td>High triglycerides</td>
<td>400 to 1,000 mg/dL</td>
</tr>
<tr>
<td>Very high triglycerides</td>
<td>Greater than 1,000 mg/dL</td>
</tr>
</tbody>
</table>

Patients with very high triglycerides are at increased risk for acute pancreatitis and must undergo immediate triglyceride lowering therapy.

Assessment of Patient Motivation

Practitioners need to assess the patient’s motivation to enter weight loss therapy, assess the readiness of the patient to implement the plan, and then take appropriate steps to motivate the patient for treatment.

Goals of Weight Loss and Management

The general goals of weight loss and management are:
1. To reduce body weight.
2. To maintain a lower body weight over the long term.
3. To prevent further weight gain.

- Target Levels for Weight Loss

The initial target goal of weight loss therapy for overweight patients is to decrease body weight by about 10 percent. If this target can be achieved, consideration can be given to the next step of further weight loss.

- Rate of Weight Loss

A reasonable time line for weight loss is to achieve a 10 percent reduction in body weight over 6 months of therapy. For overweight patients with BMIs in the typical range of 27 to 35, a decrease of 300 to 500 kcal/day will result in weight losses of about 1/2 to 1 lb/week and a 10 percent weight loss in 6 months. For more severely obese patients with BMIs 35, deficits of up to 500 to 1,000 kcal/day will lead to weight losses of about 1 to 2 lb/week and a 10 percent weight loss in 6 months. After 6 months, the rate of weight loss usually declines and weight plateaus because of less energy expenditure at the lower weight. At this point, efforts to maintain weight loss should be put in place. If more weight loss is needed, another
attempt at weight reduction can be made. This will require further adjustment of the diet and physical activity prescriptions.

- **Prevention of Further Weight Gain**

Some patients may not be able to achieve significant weight reduction. In such patients, an important goal is to prevent further weight gain that would exacerbate disease risk. Thus, prevention of further weight gain may justify entering a patient into weight loss therapy. Prevention of further weight gain can be considered a partial therapeutic success for many patients. Moreover, if further weight gain can be prevented, this achievement may be an important first step toward beginning the weight loss process. Primary care practitioners ought to recognize the importance of this goal for those patients who are not able to immediately lose weight. The need to prevent weight gain may warrant maintaining patients in a weight management program for an extended period.

**Strategies for Weight Loss and Weight Maintenance**

1. **Dietary Therapy**

In the majority of overweight and obese patients, adjustment of the diet to reduce caloric intake will be required. Dietary therapy consists, in large part, of instructing patients on how to modify their diets to achieve a decrease in caloric intake. A key element of the current recommendation is the use of a moderate reduction in caloric intake to achieve a slow but progressive weight loss. Ideally, caloric intake should be reduced only to the level required to maintain weight at the desired level. If this level of caloric intake is achieved, excess weight will gradually disappear. In practice, somewhat greater caloric deficits are used in the period of active weight loss, but diets with very low calories are to be avoided. Finally, the composition of the diet should be modified to minimize other cardiovascular risk factors.

**Low-calorie diet (LCD) (800 to 1,500 kcal/day).** The LCD recommended contains a nutrient composition that will decrease other risk factors, notably, high serum cholesterol and hypertension.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Recommended Intake</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories</td>
<td>Approximately 500 to 1,000 kcal/day reduction from usual intake</td>
</tr>
<tr>
<td>Total Fat</td>
<td>30 percent or less of total calories</td>
</tr>
<tr>
<td>Saturated Fatty Acids</td>
<td>8 to 10 percent of total calories</td>
</tr>
<tr>
<td>Monounsaturated Fatty Acids</td>
<td>Up to 15 percent of total calories</td>
</tr>
<tr>
<td>Polyunsaturated Fatty Acids</td>
<td>Up to 10 percent of total calories</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>300 mg/day</td>
</tr>
<tr>
<td>Protein</td>
<td>Approximately 15 percent of total calories</td>
</tr>
<tr>
<td>Carbohydrate</td>
<td>55 percent or more of total calories</td>
</tr>
<tr>
<td>Sodium Chloride</td>
<td>No more than 100 mmol per day (approximately 2.4 g of sodium or approximately 6 g of sodium chloride)</td>
</tr>
<tr>
<td>Calcium</td>
<td>1,000 to 1,500 mg</td>
</tr>
<tr>
<td>Fiber</td>
<td>20 to 30 g</td>
</tr>
</tbody>
</table>

2. **Physical Activity**

An increase in physical activity is an important component of weight loss therapy since it leads to increased expenditure of energy. Increased physical activity may also inhibit food intake in overweight patients. Physical activity can also be helpful in maintaining a desirable weight. In addition, sustained physical activity has the benefit of reducing overall CHD risk beyond that produced by weight reduction alone.
Strategies to Increase Physical Activity

Extremely obese persons may need to start with simple exercises that can gradually be intensified. The practitioner must decide whether exercise testing for cardiopulmonary disease is needed before embarking on a new physical activity regimen. This decision should be based on a patient's age, symptoms, and concomitant risk factors.

- Initial activities may be walking or swimming at a slow pace.
- With time, depending on progress, the amount of weight lost, and functional capacity, the patient may engage in more strenuous activities. Some of these include fitness walking, cycling, rowing, cross-country skiing, aerobic dancing, and rope jumping.
- Jogging provides a high-intensity aerobic exercise, but can lead to orthopedic injury. If jogging is desired, the patient's ability to do this must first be assessed. The availability of a safe environment for the jogger is also a necessity.
- Competitive sports, such as tennis and volleyball, can provide an enjoyable form of physical activity for many, but again, care must be taken to avoid injury, especially in older people.

3. Behavior Therapy

The goal of behavior therapy is to alter the eating and activity habits of an obese patient. Behavioral strategies to reinforce changes in diet and physical activity can produce a weight loss in obese adults in the range of 10 percent of baseline weight over 4 months to 1 year. Unless a patient acquires a new set of eating and physical activity habits, long-term weight reduction is unlikely to succeed. The acquisition of new habits is particularly important for long-term weight maintenance at a lower weight. Most patients return to baseline weights in the absence of continued intervention.

- **Self-monitoring of both eating habits and physical activity**—Objectifying one’s own behavior through observation and recording is a key step in behavior therapy. Patients should be taught to record the amount and types of food they eat, the caloric values, and nutrient composition. Keeping a record of the frequency, intensity, and type of physical activity likewise will add insight to personal behavior.

- **Stress management**—Stress can trigger dysfunctional eating patterns, and stress management can defuse situations leading to overeating. Coping strategies, meditation, and relaxation techniques all have been successfully employed to reduce stress.

- **Stimulus control**—Identifying stimuli that may encourage incidental eating enables individuals to limit their exposure to high-risk situations. Examples of stimulus control strategies include learning to shop carefully for healthy foods, keeping high-calorie foods out of the house, limiting the times and places of eating, and consciously avoiding situations in which overeating occurs.

- **Problem solving**—Self-corrections of problem areas related to eating and physical activity. Approaches to problem solving include identifying weight-related problems, generating or brainstorming possible solutions and choosing one, planning and implementing the healthier alternative, and evaluating the outcome of possible changes in behavior.

- **Contingency management**—Behavior can be changed by use of rewards for specific actions, such as increasing time spent walking or reducing consumption of specific foods Rewards can come from either the professional team or from the patients themselves. For example, self-rewards can be monetary or social and should be encouraged.

- **Cognitive restructuring**—Unrealistic goals and inaccurate beliefs about weight loss and body image need to be modified to help change self-defeating thoughts and feelings that undermine weight loss efforts. Rational responses designed to replace negative thoughts are encouraged.

- **Social support**—A strong system of social support can facilitate weight reduction. Family members, friends, or colleagues can assist an individual in maintaining motivation and providing positive reinforcement.

Treatment of Obese Individuals with Binge Eating Disorder

If a patient suffers from binge eating disorder (BED), consideration can be given to referring the patient to a health professional who specializes in BED treatment. Behavioral approaches to BED associated with obesity have been derived from cognitive behavior therapy (CBT) used to treat bulimia nervosa.
Combined Therapy
To achieve the greatest likelihood of success from weight loss therapy, the combination of dietary therapy with an LCD, increased physical activity, and behavior therapy will be required. Inclusion of behavior therapy and increased physical activity in a weight loss regimen will provide the best opportunity for weight loss, and hopefully for long-term weight control. In order to achieve weight loss, such a regimen should be maintained for at least 6 months before considering pharmacotherapy.

Pharmacotherapy
It is important to remember that the major role of medications should be to help patients stay on a diet and physical activity plan while losing weight. Medication cannot be expected to continue to be effective in weight loss or weight maintenance once it has been stopped.

Therefore, an initial trial period of several weeks with a given drug or combination of drugs may help determine their efficacy in a given patient. If a patient does not respond to a drug with reasonable weight loss, the physician should reassess the patient to determine adherence to the medication regimen and adjunctive therapies, or consider the need for dosage adjustment. If the patient continues to be unresponsive to the medication, or serious adverse effects occur, the physician should consider its discontinuation. Medications are to be used in conjunction with lifestyle modification (i.e. dietary interventions, behavioral therapy, and increased physical activity).

Pharmacotherapy is recommended for individuals with a BMI >30 kg/m² or a waist circumference >35 inches (women) or 40 inches (men) and for patients with a BMI >27 kg/m² with the presence of an additional comorbid condition or more than one risk factor for 'weight-related' disease such as hypercholesterolemia, diabetes, hypertension.

Many herbal prepartions have been used for weight loss, however, the NIH states that herbal preparations are not recommended as part of weight loss program. Only caffeine and ephedra have well performed studies, but this is only the short term. Overall the risks outweigh the benefits.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Action</th>
<th>Dose</th>
<th>Adverse Effects</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Sibutramine       | Mixed noradrenergic and serotonergic (C-IV) | 10mg daily x 4 weeks then titrate to 15mg daily with or without food | Increase in BP, pulse (less than other weight loss drugs), dry mouth, headache, insomnia, nausea | Approved for long term use
|                   |                               |                                                |                                                     | Contraindications: uncontrolled HTN, severe renal or liver impairment, CAD, CHF, arrhythmias, CVA
|                   |                               |                                                |                                                     | *Drug interactions*: during or within 2 weeks of MAOIs or centrally active anorexiants; CYP3A4 inducers and inhibitors; SSRIs; sumatriptan; dihydroergotamine; dextromethorphan; meperidine; fentanyl; lithium; tramadol; tryptophan |
| Orlistat (Xenical®, Alli®) | Lipase inhibitor-reduces nutrient absorption (OTC) | 120mg 3 times/day with or within 1 hour after fat containing meals, plus a daily multivitamin (spaced at least two hours from the medication) | HA, flatus with discharge, fecal urgency, abdominal pain, steatorrhea, oily spotting, and increased defecation. These may decrease in frequency with time. Decreases absorption of fat-soluble vitamins | Approved for long term use
|                   |                               |                                                |                                                     | *Contraindications*: chronic malabsorption syndrome, cholestasis
|                   |                               |                                                |                                                     | *Drug interactions*: cyclosporine, decrease absorption of amiodarone and vitamin K (may affect warfarin). |
Sympathomimetic agents
- Benzphetamine, diethylpropion, methamphetamine, phendimetrazine, phentermine

Noradrenergic
See individual product information

Tachyarrhythmia, palpitations, hypertension, insomnia, dry mouth, urticaria, and nausea
Indicated for short-term use (few weeks) because tolerance develops, they become ineffective, and the risk of dependence and abuse increases. 

Contraindications: HTN, CAD, pulmonary HTN, hyperthyroidism, glaucoma, agitated states, pregnancy

Drug interactions: During or within 14 days following MAOIs in addition see individual product information.

Other investigational agents:

Antidiabetic agents (metformin, exanatide, pramlintide) may provide a modest weight reduction around 1.5 – 2.5kg.

SSRIs: During the first 6-12 months they may enhance weight loss but show loss of efficacy with long term use (weight regain). Fluoxetine and fluvoxamine are indicated for treatment of binge eating disorder.

Bupropion SR has been modestly effective in promoting weight loss.

Anti-seizure medications (topiramate and zonisamide) have show weight loss around an average of 6kg but with high rates of neurologic and psychiatric effects.

Rimonabant not FDA approved, but has shown to induce clinically significant weight loss, but with a significant increase in psychiatric effects

Amphetamines – Not recommended for weight loss- small effect and usually not long lasting

Surgery for Weight Loss
Surgery is one option for weight reduction for some patients with severe and resistant obesity. The aim of surgery is to modify the gastrointestinal tract to reduce net food intake. Most authorities agree that weight loss surgery should be reserved for patients with severe obesity, in whom efforts at other therapy have failed, and who are suffering from the complications of obesity.

Patient Education
A Practical Guide for weight loss and other useful materials can be found on the NHLBI’s Aim for a Healthy Weight Web site (http://rover.nhlbi.nih.gov/health/public/heart/obesity/lose_wt). A new feature on the Institute's Web site is the ultimate "cyber" tool for devising low calorie meals, an interactive menu planner. The menu planner allows the user to plan a single meal or a whole day's meals. Other sites for information are listed below.

Shape Up America! web site

American Obesity Association (AOA)
Newsletter, discounts on services and products, including prescription drugs. Annual membership dues are $25 for individuals, $40 for families, $50 for health care professionals. American Obesity Association
1250 24th St. NW, Suite 300
Washington, DC 20037
800-98-OBESE http://www.obesity.org

Weight Control Information Network (WIN)
Fact sheets, article reprints, reports, videos, information on local dietitians. Produced by the National Institute of Digestive Diseases and Kidney Disorders (NIDDK), NIH. 1 WIN Way
Bethesda, MD 20893-3665 http://www.niddk.nih.gov (see nutrition & obesity) 800-WIN-8098

References

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A Quick Reference Tool to ACT

**Assessment (A) and Classification (C)**

**Patient encounter**
- Assess the patient's weight status
- Provide advice, counseling, or treatment

**Body Mass Index (BMI)**
- BMI categories:
  - Overweight: 25-29.9 kg/m²
  - Obesity: ≥ 30 kg/m²
- Calculate BMI as follows:
  \[ \text{BMI} = \frac{\text{weight (kg)}}{\text{height squared (m²)}} \]
  
  If pounds and inches are used:
  \[ \text{BMI} = \frac{\text{weight (pounds)}}{\text{height squared (inches²)}} \]

**BMI Table**
<table>
<thead>
<tr>
<th>Height</th>
<th>25</th>
<th>27</th>
<th>30</th>
<th>35</th>
</tr>
</thead>
<tbody>
<tr>
<td>55''</td>
<td>119</td>
<td>120</td>
<td>143</td>
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<tr>
<td>50''</td>
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<td>60''</td>
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<td>61''</td>
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<td>63''</td>
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<td>64''</td>
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<td>65''</td>
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<tr>
<td>73''</td>
<td>189</td>
<td>204</td>
<td>227</td>
<td>265</td>
</tr>
</tbody>
</table>

*For a complete BMI Table see Appendix A.*

**Waist Circumference**
- Abdominal fat increases risk
- High risk
  - F: >35 in (>88 cm)
  - M: >40 in (>102 cm)
- Measure Waist Circumference as follows:
  - Locate the upper hip bone and the top of the right iliac crest (below figure). Place a measuring tape in a horizontal plane around the abdomen at the level of the iliac crest. Before reading the tape measure, ensure that the tape is snug, but does not compress the skin, and is parallel to the floor. The measurement is made at the end of expiration.

**Assess risk factors**
- Established Coronary Heart Disease
- Other Atherosclerotic Disease
- Type 2 Diabetes
- Sleep Apnea
- Other Obesity Associated Diseases
- Risk Factors
  - Smoking
  - Hypertension
  - High LDL-C
  - Low HDL-C
  - Impaired fasting glucose
  - Family history of premature CHD
  - ≥45 yrs (M) and ≥55 yrs (F)

**BMI ≥ 25 OR waist > 35 in (88 cm) (F) > 40 in (102 cm) (M)**
- Yes

**BMI ≥ 30 OR (BMI 25 to 29.9 waist > 35 in (F) > 40 AND ≥ 2 risk factors)**
- No

**Evaluate/Reinforce**
- Advise to maintain weight
- Address other risk factors
- Periodic weight, BMI, and waist circumference check (every 2 years)

**Does patient want to lose weight?**
- Yes

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Identification, Evaluation, and Treatment of Overweight and Obesity in Adults

Treatment (T)/Follow-up

1. **Clinician and patient devise goals and treatment strategy for weight loss and risk factor control**
   - Set Goals
     - Advise patient to lose 10% of initial weight
     - 1-2 lbs/wk
     - 6 months of therapy

2. **Progress being made/goal achieved?**
   - Yes
     - Maintenance counseling
     - Yes
     - Periodic weight, BMI, and waist circumference check
   - No
     - Assess reasons for failure to lose weight

3. **Option 1**
   - BMI 25-29.9 and ≥ 2 risk factors or BMI ≥ 30
     - Lifestyle Therapy
       - Diet: 500-1000 kcal/day reduction 30% or less total kcal from fat = 15% total kcal from protein ≥ 55% of total kcal from CHO.
       - Physical Activity: Initially, 30-45 mins. of moderate activity, 3-5 times a week. Eventually 30 mins of moderate activity on most days.
       - Behavior Therapy

4. **Option 2**
   - BMI ≥ 27 and ≥ 2 risk factors or BMI ≥ 30
     - Pharmacotherapy
       - Adjunct to lifestyle therapy, Consider if patient has not lost 1 lb/wk after 6 months of lifestyle therapy.
       - Orlistat - 120 mg or 120 mg po tid before meals
       - Sibutramine - 5, 10, 15 mg: 10 mg po qd to start may be increased to 15 mg or decreased to 5 mg.

5. **Option 2**
   - BMI ≥ 35 and ≥ 2 risk factors or BMI ≥ 40
     - Weight Loss Surgery
       - Consider if other weight loss attempts have failed.
       - Vertical banded gastroplasty or gastric bypass
       - Lifelong medical monitoring

Source: Full text of the Practical Guide to the Identification, Evaluation and Treatment of Overweight and Obesity in Adults is available from the National Heart, Lung and Blood Institute Health Information Center at (301) 592-8573 or can be downloaded from the NHLBI’s Aim for a Healthy Weight Web page at www.nhlbi.nih.gov and click on “Aim for a Healthy Weight.” Also, available from NAASO at www.naaso.org