Obesity

Obesity is an excess of body fat, generally 20% above ideal body weight. The prognosis for correction of obesity is poor: Fewer than 30% of patients succeed in losing 20 lb (9 kg), and only half of these maintain the loss over a prolonged period. Rates of obesity are climbing, and the percentage of children and adolescents who are obese has doubled in the last 30 years.

Causes
Obesity results from excessive calorie intake and inadequate expenditure of energy. Theories to explain this condition include hypothalamic dysfunction of hunger and satiety center, genetic predisposition, abnormal absorption of nutrients, and impaired action of gastrointestinal and growth hormones and of normal regulators such as insulin. An inverse relationship between socioeconomic status and prevalence of obesity has been documented, especially in women. Obesity in parents increases the probability of obesity in children from genetic or environmental factors such as activity levels and learned patterns of eating. Psychological factors, such as stress or emotional eating, may also contribute to obesity.

Pathophysiology
Unused or excess dietary fats leave the capillary circulation and enter fat cells (adipocytes). When the body needs fuel, it can draw on this stored energy. Fat, in the form of triglycerides, is the major component of the adipocyte.

Adipocytes increase in size in response to dietary intake. When the cells can no longer expand, they increase in number. With weight loss, the size of the fat cells decreases, but the number of cells doesn’t.

Assessment findings
The patient may report such associated signs and symptoms as snoring and sleep apnea, gastroesophageal reflux, and arthritis. He may also show signs of poor body image, poor self-esteem, and depression.

Special considerations
- Take an accurate diet history to identify the patient’s eating patterns and the importance of food to his lifestyle. Ask the patient to keep a careful record of what, where, and when he eats to help identify situations that normally provoke overeating.
- To increase caloric expenditure, promote increased physical activity, including an exercise program. Recommend varying activity levels according to the patient’s general condition and cardiovascular status.
- If the patient is taking an appetite-suppressing drug, watch carefully for signs of dependence or abuse and for adverse reactions, such as insomnia, excitability, dry mouth, and gastrointestinal disturbances.
- Teach the patient about obesity, as shown below.

Teaching about obesity
- Explain the principles of energy balance and their relationship to obesity and weight loss.
- Talk about the assessment of obesity with height/weight charts, body mass index, an skin-fold measurements.
- Explain complications, such as diabetes, coronary artery disease, and respiratory problems.
- Discuss the prescribed diet as well as dietary tips to reduce food consumption.
- Teach about prescribed medications, their names, indications, dosages, adverse effects, and special considerations.
- Teach the importance of good skin care to prevent breakdown in moist skin folds.
- To help prevent obesity in children, teach parents to avoid overfeeding their infants and to familiarize themselves with actual nutritional needs and optimum growth rates.
- Discourage parents from using food to reward or console their children, from emphasizing the importance of “clean plates,” and from allowing eating to prevent hunger rather than to satisfy it.
- Encourage physical activity and exercise, especially in children and young adults, to establish lifelong patterns.
- Review procedures and surgery to treat morbid obesity, as indicated.
- Explain how to keep a food diary.
- Discuss behavior modification techniques.

Source: Managing Chronic Disorders, Lippincott Williams & Wilkins, 2006.

Take5 brochure, © 2005, Lippincott Williams & Wilkins
Diagnosis
• Height/weight comparison to standard table indicates obesity.
• Body mass index calculations are 30 or greater. (See BMI measurements, below.)
• Measurement of the thickness of subcutaneous fat folds with calipers provides an approximation of total body fat. (See Taking anthropometric arm measurements, right.)

Complications
• Cardiovascular disease
• Diabetes mellitus
• Gallbladder disease
• Hypertension
• Menstrual irregularities
• Psychosocial difficulties
• Renal disease
• Respiratory difficulties
• Premature death

BMI measurements
Use these steps to calculate body mass index (BMI)
• Multiply weight in pounds by 705.
• Divide the result by height in inches.
• Then divide it by height in inches again.
• Compare results to these standards:
  —18.5 to 24.9—normal
  —25 to 29.9—overweight
  —30 to 39.9—obese
  —40 or greater—morbidly obese

Treatment
• Total fasting is an effective method of rapid weight reduction but requires close monitoring and supervision to minimize risks of ketonemia, electrolyte imbalance, hypotension, and loss of lean body mass.
• Prolonged fasting and very-low-calorie diets have been associated with sudden death, possibly resulting from cardiac arrhythmias caused by electrolyte abnormalities.
• Hypnosis and behavior modification techniques, which promote fundamental changes in eating habits and activity patterns, may work in some patients.
• Psychotherapy may be beneficial for some patients because weight reduction may lead to depression or even psychosis. Antidepressants are also helpful in weight loss.
• Amphetamines and amphetamine congeners have been used to enhance compliance with a prescribed diet by temporarily suppressing the appetite and creating a feeling of well-being. However, their value in long-term weight control is questionable, and they have significant potential for dependence.
• Surgery may be done as a last resort for the morbidly obese (body weight that’s 50% to 100% higher than ideal), body weight that’s 100 pounds higher than ideal, or a body mass index greater than 39, using bariatric procedures such as vertical-banded gastroplasty and gastric bypass surgery.

Taking anthropometric arm measurements
Follow these steps to determine triceps skinfold thickness, midarm circumference, and midarm muscle circumference.

Triceps skinfold thickness
• Find the midpoint circumference of the arm by placing the tape measure halfway between the axilla and the elbow. Grasp the patient’s skin with your thumb and forefinger, about 3/8” (1 cm) above the midpoint, as shown at right.
• Place calipers at the midpoint, and squeeze for 3 seconds.
• Record the measurement to the nearest millimeter.
• Take two more readings, and use the average.

Midarm circumference and midarm muscle circumference
• At the midpoint, measure the midarm circumference, as shown at right. Record the measurement in centimeters.
• Calculate the midarm muscle circumference by multiplying the triceps’ skinfold thickness—measured in millimeters—by 3.14.
• Subtract this number from the midarm circumference.

Recording the measurements
Record all three measurements as a percentage of the standard measurements (see table below), by dividing the actual measurement by the standard measurement then multiplying the result by 100%. Remember, a measurement less than

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Standard</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triceps skinfold thickness</td>
<td>Men: 12.5 mm</td>
<td>Women: 16.5 mm</td>
</tr>
<tr>
<td>Midarm circumference</td>
<td>Men: 29.3 cm</td>
<td>Women: 28.5 cm</td>
</tr>
<tr>
<td>Midarm muscle circumference</td>
<td>Men: 25.3 cm</td>
<td>Women: 23.3 cm</td>
</tr>
</tbody>
</table>