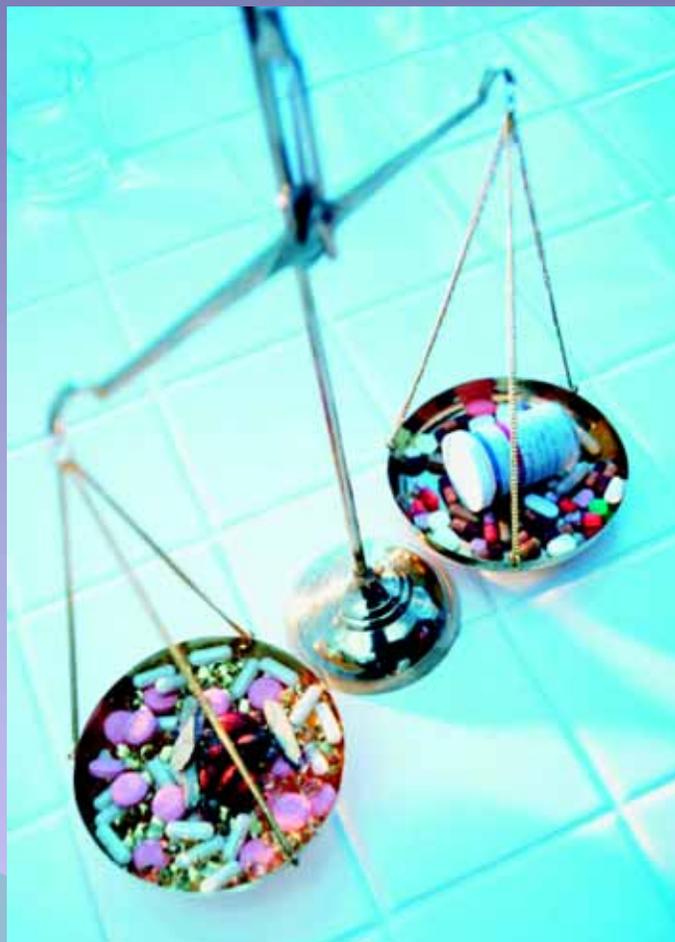




## DRUG AND SURGICAL TREATMENT OF OBESITY

Body Mass Index (BMI) is a way to define overweight and obesity. The index is a mathematical formula in which a person's body weight in kilograms is divided by the square of his or her height in meters [ $\text{kg}/\text{m}^2$ ]. The BMI is more highly correlated with body fat than any other mathematical ratio of height and weight; however, athletes and individuals with a high percentage of muscle may have a BMI in the overweight range because of the higher density of muscle compared to fat.

- A BMI of 18 to 25 is considered normal weight. Individuals with a BMI of 25 to 29.9 are considered **overweight**, and those with a BMI of 30 or more are considered **obese**.
- Overweight is defined as **increased weight in relation to height**.
- Obesity is defined as **an excessively high amount of body fat or adipose tissue in relation to lean body mass**.



In carefully selected patients, appropriate drug or surgical treatment can augment low-calorie diet, physical activity and behavior therapy in weight loss. Weight loss drugs have been approved by the Food and Drug Administration for both short- and long-term use.

## 1 Obesity treatment: Medication

*Medication is indicated when the BMI is higher than 30 kg/m<sup>2</sup> or when the BMI is higher than 27 kg/m<sup>2</sup> if cardiovascular risk factors are present and safer methods have proven unsuccessful. The risk factors and diseases considered serious and that would justify pharmacotherapy at a BMI of 27 to 29.9 are hypertension, dyslipidemia, coronary heart disease, type 2 diabetes and sleep apnea. Medication is recommended only when combined with a diet and lifestyle instruction. A person must be under continual medical supervision by a physician during drug therapy. The medication and dosage is tailored individually to the patient. Under medication, a weight loss of about 7 percent to 10 percent can be expected.*

### a. Phentermine

Phentermine has been approved for continuous use of up to three months. Brand names are Adipex-P, Obenix, Oby-Trim.

Phentermine is the most commonly prescribed medication for weight loss. Phentermine works by increasing the release of norepinephrine, a neurotransmitter in the brain that decreases appetite. Phentermine has stimulant properties, and it may cause high blood pressure or irregular heart beats.



### b. Sibutramine

The brand name is Meridia. Sibutramine induces weight loss primarily through its effects on food intake and to a lesser degree through its effect on metabolic rate. A weight loss program including medication should also include a reduced-calorie diet, behavior change advice and increased physical activity. Normally when individuals lose weight, their metabolic rate goes down and energy expenditures decrease. Sibutramine blunts this decline. Sibutramine affects serotonin and norepinephrine metabolism in the brain by stimulating satiety at the appetite centers in the brain. Studies indicate that maximum weight loss can be achieved by six months and is maintained for twelve months. More than half lose 5 percent of their body weight and about 25 percent lose 10 percent of their body weight. Weight regain occurs after sibutramine is discontinued. Sibutramine use may increase heart rate and blood pressure. Regular blood pressure checkups are encouraged. Sibutramine is not recommended for someone with uncontrolled hypertension, tachycardia or serious heart, liver or kidney disease.

### c. Orlistat, brand name Xenical

Orlistat prevents the digestion of dietary fat. It inactivates an enzyme that is involved with fat digestion called lipase, and about 30 percent less fat is absorbed. The unabsorbed dietary fat is then eliminated in the stool. Because dietary fat is not absorbed, there may be a change in bowel habits. There may be oily or fatty stools, an increased frequency of bowel movements and inability to control bowel movements. Orlistat intake, together with a 30 percent fat diet, can result in modest weight loss of about 5 percent to 10 percent of body weight in 6 months. Because less fat is absorbed, there is improvement in blood lipids. There can be a decrease in blood cholesterol levels and a decrease in blood pressure. Since less fat is absorbed, a person may become deficient in fat-soluble vitamins A, D, E and K during the treatment and a multivitamin supplement is recommended.



## 2 Obesity treatment: Surgery

*Surgical therapy can be considered for a limited number of individuals who have BMI equal to or higher than 40 kg/m<sup>2</sup> OR have a BMI equal to or higher than 35 kg/m<sup>2</sup> with significant co-morbidities such as hypertension, diabetes or sleep apnea AND in whom dietary attempts at weight loss maintenance have been ineffective. Weight loss surgery should be reserved for those who have failed other options, such as dietary treatment and medication.*

Two types of surgery are available:

### a. Malabsorptive:

#### *i. Roux-en-Y gastric bypass.*

This is one of the most common weight loss surgeries performed because it results in a 60 percent to 70 percent loss of excess body weight that is sustainable. In this surgery, a large section of the stomach is bypassed. A limb of the small bowel is attached to the stomach while the other limb of the Y diverts bile and pancreatic juices into the more distal small intestine bypassing the top 20 percent of the small bowel. This delays absorption of food and increases the levels of hormones from the distal small intestine that decrease appetite. Because only a small part of the stomach is left available, food intake is reduced to only few ounces at a time. This reduces meal size and, along with the bypassing of the first 20 percent of the small intestine, results in weight loss. With gastric bypass surgery, a lifelong commitment to a healthy lifestyle and adequate diet is recommended. Supplemental intake of vitamins and minerals is suggested to avoid B12, iron and calcium deficiencies.

#### *ii. Biliopancreatic bypass with a duodenal switch.*

The operation bypasses two-thirds to three-fourths of the stomach along with an intestinal segment, which significantly reduces the absorption of fat. In addition, bile and pancreatic juices move along a biliopancreatic limb, reducing the digestion of food. Food and digestive juices are carried in different branches of intestine and join far downstream. Because of this, the amount of fat and calories absorbed is reduced. Lifetime intake of vitamin and mineral supplement is necessary with this operation. Fatty foods can cause diarrhea.

The advantages of this procedure are larger stomach capacity, increases in hormones from the lower intestine that decrease appetite and the best weight loss of all the surgical techniques (about 70 percent to 90 percent of excess weight is lost) that is

maintained long-term. Some of the disadvantages are greater operative risks, infection and malabsorption of some minerals, vitamins and protein. Patients must take supplements of fat-soluble vitamins (A, D, E and K), calcium and iron.

### b. Restrictive:

#### *i. Adjustable gastric banding.*

The size of the stomach is reduced to a small stomach pouch by a restrictive silicone band that is placed around the upper part of the stomach. This smaller gastric pouch limits the amount of food that the stomach holds at any time. A small amount of food creates a greater sense of fullness, and, because of slow emptying of the pouch, the feeling of fullness lasts longer. This then results in reduced food intake. An adjustable inflatable ring controls the flow of food from this small pouch to the rest of the digestive tract. The advantages of this approach are maintenance of the normal anatomy and shorter recovery. The band can be adjusted when needed by injecting a port under the skin of the abdomen. There is no malabsorption because the food goes through the entire digestive system. Some disadvantages are displacement of the band with the need for reoperation and reduced weight loss compared to the malabsorptive procedures. Loss of 50 percent to 60 percent of excess weight can be expected.



**Heli Roy, PhD, RD,  
Associate Professor**

**Frank Greenway, MD  
Professor**

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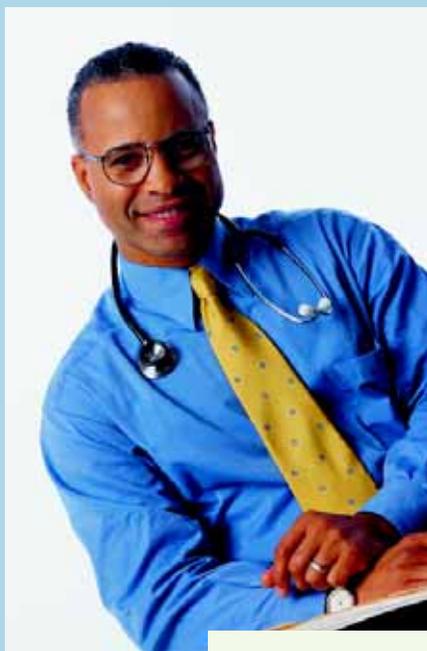
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Paul D. Coreil, Vice Chancellor and Director

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