

Reviews

Guidelines for the initiation of obesity treatment

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Obesity is epidemic in America. About 80 million Americans are obese, 33.4% of adults and about 20% to 25% of children. Obesity produces morbidity and mortality: there are 300,000 obesity-related deaths annually in America. The definition of obesity has not been standard. Recently, the World Health Organization defined overweight as a body mass index (BMI = kg/m²) of 25 and obesity as a BMI of ≥ 30 . A BMI of ≥ 35 produces a high risk from obesity and of ≥ 40 produces a severe risk. The presence of complications of obesity (hypertension, diabetes, dyslipidemia, sleep apnea, etc.) increases the risk. Treatments of obesity depend on the severity of obesity, the presence of complications, and the absence of exclusions. Exclusions from obesity treatment include pregnancy, lactation, terminal illness, major mental illness, anorexia nervosa. Eating disorders and major medical disorders are strong cautions for obesity treatment. Obesity with a low or modest health risk (BMI: 25–30) is best treated with a diet lower in calories and fat than the current diet, exercise, and lifestyle modification. With obesity that produces a moderate to high health risk (BMI: 30–35), the above treatments plus a very low calorie diet or obesity drugs may be indicated. High and very high health risk due to obesity may be treated with the above regimen plus obesity surgery. In every category of obesity, the presence of complications of obesity increases the risk and justifies more aggressive forms of treatment. Treatment of obesity with drugs has gained acceptance in recent years. There are no absolute indications for drug treatment. Contraindications include pregnancy and lactation, unstable cardiac disease, uncontrolled hypertension, severe psychiatric disorder or anorexia, and other drug therapy, if incompatible. Cautions include the presence of any severe systemic illness and certain other problems such as closed angle glaucoma. Obesity surgery is reserved as a last resort. Contraindications to surgery and significant mental or physical diseases preclude obesity surgery. Whatever the form of treatment, individualized attention with careful follow-up is mandatory. Obesity is similar to other chronic diseases; if the treatment stops, the disease comes back. (J. Nutr. Biochem. 9:546–552, 1998) © Elsevier Science Inc. 1998

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Introduction

Obesity has reached epidemic proportions in America. More than one-third of adults and about one quarter of

children have medically significant obesity, a total approaching 80 million people.¹ The prevalence of obesity increased by about 30% in the decade from 1980 to 1990 based on statistics collected in the U.S. Government's National Health and Nutrition Examination Survey (NHANES).² Similar trends were noted across the world. Obesity is associated with numerous complications and co-morbidities, and it has been estimated that obesity is associated with 300,000 excess deaths annually, making it the second leading cause of preventable deaths.² By some estimates, the costs of obesity and weight control in America are more than \$100 billion each year.³

Despite the enormous costs of obesity to society, surprisingly little research has been done on the etiology, pathophysiology, and particularly the treatment of obesity. The concept of obesity as a chronic disease has not been accepted by a large portion of the American population, including many in the health professions. Obesity is still

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Table 1 Evidence-based guidelines: Criteria for rating publications

- Ratings are given in order of priority
1. Meta-analysis
 - a. Controlled, randomized
 - b. Controlled
 2. Prospective, large trials
 - a. Randomized, placebo controlled, blinded
 - b. Nonrandomized, controlled
 - c. Controlled: no follow-up or high attrition
 - d. Quasi-experimental design or descriptive
 3. Prospective, smaller trials
 - a. Quasi-experimental design
 - b. Case study
 - c. Descriptive
 4. Abstracts or studies of short duration, no follow-up
 5. Reviews
 - a. Comprehensive
 - b. Limited
 6. Committee reports, consensus statements, opinions

Criteria used in the *Guidance for Treatment of Adult Obesity* (ref. 7).

viewed as a psychological disease characterized by poor discipline or lack of willpower. Most medical school curricula contain little or no information on obesity and its treatment. This has resulted in several generations of physicians who have little knowledge of obesity and minimal interest in treating obese patients. The treatments that were available have been viewed as costly, time-consuming, and poorly effective.

The ignorance and lack of attention to obesity has led obese people to seek treatment from whatever sources were available, and frequently these sources have been less than credible. Obesity is the only major disease in America in which a large percentage of the treatment is delivered in shopping malls and other commercial areas. The desperation of obese people for effective treatment resulted in an enthusiastic embrace of obesity drugs when the first report of the effectiveness of long-term treatment with drugs was reported by Weintraub et al.⁴ in 1992. Drug treatment of obesity rapidly became a mania with the use of phentermine and fenfluramine (phen-fen) and the introduction in 1996 of dexfenfluramine, the first new obesity drug approved by the U.S. Food and Drug Administration (FDA) since 1973. These drugs were used inappropriately in some cases, which received sensationalized coverage in the media. The reports of potentially severe adverse events associated with obesity drugs, specifically primary pulmonary hypertension and cardiac valve lesions, led to the removal from the market of fenfluramine and dexfenfluramine in September 1997.

Until recently, there were few guidelines for either patients or physicians on the appropriate treatment of obesity, particularly for the use of obesity drugs. Several organizations developed limited guidelines^{5,6} for specific types of treatment, and comprehensive guidances for the overall handling of obese people were developed by the American Obesity Association (AOA) and Shape Up America! (SUA).⁷ The AOA-SUA Guidances for the Treatment of Adult Obesity were developed using an evidence-based system.⁷ Table 1 outlines the categories of evidence in decreasing order of scientific rigor that were used to develop the Guidances. More weight was given to data

Table 2 Goals for the use of guidelines for obesity treatment

1. To discourage inappropriate treatment of lean individuals
2. To encourage treatment of obese individuals
3. To assist in determining appropriate treatments depending on obesity risks
4. To encourage appropriate long-term follow-up
5. To assist in setting appropriate expectations and goals for patients

collected in large, randomized, double-blind, placebo-controlled studies. At the other end of the spectrum, little credence was given to opinions and consensus statements where data were lacking. Unfortunately, for many areas of the field of obesity, there are no data or insufficient data to draw firm conclusions, and the current Guidances will require periodic updating as more evidence is accumulated.⁷

This article summarizes the recommendations of these guidelines, including discussions of the definitions of obesity and associated health risks, who should be treated, which types of treatments are available, and who should receive which type of treatment. Goals for the use of guidelines for the treatment of obesity are listed in Table 2. It is important to avoid treatment of individuals who do not need weight reduction and to identify overweight and obese people who do not need intervention. Also, guidelines are important to select the most appropriate treatments and to encourage the long-term continuation of treatment to prevent weight gain, regain, and to attain the healthiest lifestyle the patient can accomplish. Finally, guidelines are important to help both the patient and the physician set appropriate goals for treatment and outcome.

Definitions of obesity

Obesity has been defined in a variety of ways. Most definitions have focused on the increased risk of mortality that occurs with increasing obesity. The most recognized definitions were based on the Metropolitan Life Insurance tables of "ideal" or "desirable" body weight.⁸ Most investigators in the field have moved away from these tables because the data from which they were generated were underrepresented in minorities and in the extremes of the socioeconomic scales. The U.S. Government and most scientists have adopted classifications based on body mass index (BMI), which is calculated by dividing the weight in kilograms (kg) by the square of the height in meters. The U.S. Government used population-based definitions of obesity from the 1980 NHANES study. A cutoff at the 85th percentile defined obesity as a BMI of 27.3 for men and 27.8 for women.⁹ The hazards of using population-derived definitions were illustrated with the old definition of normal serum cholesterol concentrations as 300 mg/dL. Research demonstrated that the level associated with optimal health was much lower, and today a definition of 200 mg/dL has been recommended.

An NIH consensus development conference defined overweight as a BMI of ≥ 25 ,¹⁰ and the Canadian Government adopted the definition of obesity as a BMI of 27 or above.¹¹ In June 1997, the World Health Organization (WHO) recognized obesity as a chronic disease that is

Table 3 Classification of obesity and BMI-related health risks

BMI category	Health risk	Adjusted risk
<25	Minimal	Low
25–30	Low–moderate	Moderate–high
30–35	High	Very high
35–40	Very high	Extremely high
≥40	Extremely high	Extremely high

developing into a global public health problem.¹² The WHO recommends a more restrictive classification of obesity in which overweight is defined as a BMI ≥ 25 and obesity as a BMI of ≥ 30 . This definition of obesity is based on health risks associated with increasing obesity. The WHO is encouraging the governments of the world to standardize their reporting of obesity based on the WHO definitions. This will allow more accurate comparisons across countries and population groups. A BMI classification of obesity with weight-related health risks is outlined in *Table 3*.

The definitions of obesity based on health risk take into account the observations that the presence of complications and co-morbidities of obesity may dramatically affect overall health risk for any given weight. Thus, the AOA-SUA Guidances for the Treatment of Adult Obesity adopted a format similar to the WHO document, in which the presence of certain complications in a given weight category moved a person into a higher health-risk category (*Table 3*). The complications and co-morbidities of obesity that may be considered in determining health risks that might influence the type of treatment selected are listed in *Table 4*. Obesity is associated with numerous complications, but some are not affected by weight reduction. The complications of obesity that improve with weight reduction are major factors in determining the aggressiveness with which the treatment of obesity is carried out.

Weight reduction: Who should be treated

The decision of who should be treated is based on a series of factors, including the BMI, level of health risk, and readiness of the patient for treatment. *Table 5* lists the steps that are considered in determining who should be treated.

Table 4 Assessment of patient's health risk: Factors that influence treatment¹

1. Hypertension
2. Type II diabetes mellitus
3. Dyslipidemia
4. Sleep apnea/hypoventilation syndrome
5. Cardiovascular disease
6. Other
 - a. Degenerative arthritis
 - b. Gastro-esophageal reflux disease
 - c. Gout
 - d. Idiopathic intracranial hypertension
 - e. Infertility
 - f. Urinary incontinence
 - g. Venous stasis disease of extremities

¹Adapted from *Guidance for Treatment of Adult Obesity* (ref. 7).

Table 5 Steps in determining treatment

1. Determine BMI
2. Assess complications and risk factors
3. Determine BMI-related health risk
4. Determine weight reduction exclusions
5. Assess patient readiness
6. Treatment decision
 - a. Pt. eligible, not ready for treatment
 - b. Pt. eligible, ready for treatment

Adapted from *Guidance for Treatment of Adult Obesity* (ref. 7).

The BMI is defined and the complications and co-morbidities associated with obesity are taken into account to determine the level of health risk. As will be discussed later, the degree of health risk determines how aggressive the type of treatment should be.

Treatment exclusions

Because obesity treatment, particularly with the more aggressive forms of treatment, may be associated with its own health risks, there are a number of factors that are used to exclude patients from treatment. *Table 6* lists factors that might influence the physician in determining who should be treated and who might be excluded, either temporarily or permanently, from treatment. Pregnancy and lactation are obvious exclusions, as are most unstable medical and psychiatric illnesses. The presence of gallbladder disease and perhaps osteoporosis may influence the decision to proceed with treatment. A number of medications can contraindicate specific types of treatment, particularly treatment with obesity drugs. The necessity for continued exclusion from treatment with obesity drugs is dependent on whether the drugs must be used on a temporary or permanent basis. Anorexia nervosa and terminal illness generally permanently preclude weight-reduction efforts. However, there are always exceptions to any exclusions, and these should be taken into account in individual cases.

Eligibility for treatment

Some patients may desire treatment, but based on guidelines they may not be eligible for treatment. All health professionals who treat obesity confront patients who request treatment but whose BMI falls into the minimal or no-risk

Table 6 Exclusion criteria for weight reduction programs

1. Temporary exclusions
 - a. Pregnancy or lactation
 - b. Unstable mental illness
 - c. Unstable medical illness
 - d. Treatment with certain medications
2. Possible exclusions
 - a. Cholelithiasis
 - b. Osteoporosis
 - c. BMI in minimal or no-risk category
 - d. History of major medical or mental illness
 - e. Treatment with certain medications
3. Permanent exclusions
 - a. Anorexia nervosa
 - b. Terminal illness

category. The social pressures to be thin, particularly in women, prompt these individuals to seek treatments that may carry risks and for which the risk-benefit ratio is unfavorable. Guidelines for obesity treatment, such as the AOA-SUA Guidances assist health professionals to identify such patients and to suggest courses of action that might be followed. Such patients can be educated as to what is a healthy weight and evaluated for any evidence of an eating disorder that might require other treatment. Physicians and other health professionals can perform a major service by working with such individuals to identify healthy lifestyles and eating and exercise habits. They can help such patients accept their body size and habitus and work on the patient's self-esteem. A reasonable goal for such patients would be to maintain their current weight or to decrease fat mass and improve muscle tone by increasing exercise if the patient is sedentary.

An exception to the general guideline that individuals at a healthy weight should not enter a weight-reduction program is the individual who has lost a great deal of weight from a previously obese level, and now is having difficulty maintaining that loss or is gaining weight. Such individuals cannot be considered to be normally lean, but should be considered "reduced obese." Such individuals may require a great deal of attention and support to maintain their current weight. In some cases, the use of drugs to maintain loss might even be indicated.

Readiness for obesity treatment

Occasional patients who visit a health professional may seem to be seeking treatment for obesity, but they may not have accepted the necessity for treatment. Brownell¹³ has labelled such patients as "not ready" for treatment. Some such individuals may have been coerced into visiting the health professional by their family, friends, employer, or others, but they do not desire treatment and would not have sought it on their own. Such patients may have a poor outcome and may not be compliant with the treatment regimen, which wastes both their time and money and the time of the health professional. Other patients may sincerely wish to lose weight, but they have not reached the state that they are willing to alter their lifestyle and to follow a program of diet change, increased activity, or even to be willing to take their obesity drugs on a regular basis. Patients presenting for obesity surgery may have expectations that the surgery alone will accomplish their weight loss and that they do not have to alter their lifestyle. Such patients require careful education and assessment by the health professional as it may be necessary to delay treatment until the patient has fully accepted the necessity for treatment.

Options for obesity treatment

The major options for treatment of adult obesity, adjusted for degree of health risk, are listed in *Table 7*. These range from maintenance of energy balance to preventing weight gain in normal weight or weight-reduced individuals to treatment of severe obesity with surgical procedures. As the degree of health risk based on BMI and the presence of

Table 7 Treatment options for obesity

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- | |
|--------------------------------------|
| 1. Mild energy-deficit regimen |
| a. Weight maintenance diet |
| b. Increased activity and exercise |
| 2. Aggressive energy-deficit regimen |
| a. Low calorie diets (LCD) |
| b. Very low calorie diets (VLCD) |
| c. Extensive exercise programs |
| 3. Obesity drugs |
| 4. Obesity surgery |
-

complications and co-morbidities of obesity increases, the aggressiveness of the regimens increases.

Regimens for weight maintenance or modest weight loss

Regimens appropriate for all patients are improvements in diet and activity. For individuals seeking to maintain their current weight, attention to eating a diet rich in vegetables, fruits, and grain products, but limited in total grams of fat, is recommended. Both calorie intake and fat intake are important. Excess calorie intake will produce weight gain in a person who has been in energy balance. Conversely, increases in dietary fat, despite constant calorie intake, has been shown in some studies to produce increased body fat.¹⁴ Dietary fiber has been advertised as a critical factor in producing weight loss, but controlled studies suggest that simple addition of dietary fiber supplements or prescription of high fiber diets has a poor success record.¹⁵

For individuals who wish to lose only modest amounts of weight, diets moderately lower in calories than are currently being consumed are recommended for gradual weight loss and maintenance.

Low to very low calorie diets

Consumption of low to very low calorie diets accelerates the rate of weight loss, but many studies suggest that patients may have difficulty with long-term weight maintenance with such regimens. Diets low or very low in calories cannot be sustained long-term; thus, at the end of a temporary marked restriction, subjects must be able to modestly restrict intake to maintain the lost weight. The psychological temptation to return to baseline intakes and the physiologic stimulation that results from being below the level at which body weight is defended make it very difficult for patients to maintain the loss.

While the routine use of very low calorie diets (VLCD) may be difficult to justify, there may be indications for their use in special situations. VLCD may be useful in individuals who need to lose weight rapidly to undergo surgery, transplantation, or for unstable illnesses such as congestive heart failure, poorly controlled diabetes, or sleep apnea. Many obesity-related conditions respond very quickly to severe calorie restriction, even before there is substantial weight loss.¹⁶

Finally, there is some evidence that rapid weight loss by VLCD may produce improvements in obesity-related complications and co-morbidities that are greater and persist longer than slower weight loss. Wing et al.¹⁷ noted that

obese Type II diabetics had a marked improvement in diabetic control, and the improvement, compared to control, was still present a year after the treatment, despite the fact that the lost weight had been regained. More research is necessary to confirm these findings, and it is possible that a role for VLCD in complicated obese patients may be found.

Activity and exercise

Increasing activity is critical for long-term weight maintenance and prevention of obesity, but exercise alone has only a modest record of success in producing weight loss. Exercise is planned activity, and many authorities recommend 30 to 45 min of exercise 4 to 6 times each week. However, increasing the activities of daily living may be even more critical. Zurlo et al.¹⁸ have shown that spontaneous physical activity or "fidgeting" consumes from 150 to 850 kcal per day. For the high-level fidgeter, this energy output is comparable to walking over 8 miles a day. Thus, some authorities recommend that patients be instructed to avoid inactivity, and the resulting activity will significantly increase energy expenditure and produce weight loss or contribute to weight maintenance.

Health professionals must be alert to the patient who has excessive physical activity, as this may signal psychopathology or an eating disorder. Excessive physical activity may lead to bone and joint problems, amenorrhea in women, and, if coupled with food restriction, vomiting, or purging, may signal anorexia nervosa.

Drugs for treatment of obesity

Based on current knowledge, drugs currently approved by the FDA and still on the market should be limited to patients who have medically significant obesity, and there are several sets of guidelines for their use.⁵⁻⁷ The North American Association for the Study of Obesity (NAASO) guidelines recommend that patients have a BMI of 27 or above before using drugs, unless there are compelling reasons documented by the physician for their use in lighter patients.⁶ The AOA-SUA Guidances adhere to the recommendations of the FDA, which are a BMI of 30 in patients without complications and a BMI of 27 if complications or co-morbidities of obesity are present.⁷ As with every medical treatment, the physician should evaluate each case individually.¹⁹ Some patients with a BMI of 30 or above may have only a modest total body fat and therefore not be a candidate for obesity drugs. Conversely, a patient who is very sedentary, has a large amount of visceral fat, has diabetes or other complication of obesity, and has a BMI less than 27 may, in the judgment of his or her physician, be a candidate for obesity drugs.

Other exclusion criteria for obesity drugs are unstable medical or psychiatric illnesses, pregnancy and lactation, drugs that interact negatively with obesity drugs, and a history of eating disorders or bipolar disorder. Glaucoma is a relative contra-indication for some obesity drugs.

Table 8 lists various drugs that have been used or may be used for the treatment of obesity, along with the Drug Enforcement Agency (DEA) schedule. The use of drugs for obesity is in a state of flux because of the reports of potentially serious side effects such as primary pulmonary

Table 8 Categories of obesity drugs and DEA schedules

1. Adrenergic agonists
 - a. II: Amphetamine, methamphetamine, phenmetrazine
 - b. III: Benzphetamine, Phendimetrazine
 - c. IV: Diethylpropion, Mazindol, Phentermine
 - d. OTC: Phenylpropanolamine, ephedrine-caffeine¹
2. Serotonin agonists
 - a. IV: *d,l*-fenfluramine²; *d*-fenfluramine²
 - b. Not scheduled: Fluoxetine,¹ Sertraline¹
3. Combined adrenergic and serotonergic agonist: Sibutramine
4. Drugs affecting absorption: Orlistat,¹ Acarbose¹

¹Not currently approved for the treatment of obesity.

²These drugs were removed from the market in September 1997.

hypertension and cardiac valve abnormalities with fenfluramine, dexfenfluramine, and the combination of phentermine and fenfluramine.^{20,21} Uncontrolled studies demonstrate that aortic and mitral valve insufficiency is seen on echocardiography in as many as 35% of cases of individuals who have taken fenfluramine and phentermine. However, no cases have been reported in some centers. The highest frequency appears to occur in the upper Midwest. There is no explanation for the geographic differences.

Fenfluramine and dexfenfluramine are serotonergic drugs that both stimulate secretion of serotonin by nerve terminals and block its uptake. These two drugs have been removed from the market because of reports that they produce cardiac valve abnormalities.²¹ A number of cases have been reported in patients on either of these drugs alone, but in the only controlled, blinded study of dexfenfluramine alone, there was no difference in echocardiographic frequency of valve lesions between drug and placebo. There are no cases of cardiac valve abnormalities with phentermine or other adrenergic agents used alone. It is not clear if combining an adrenergic agent with fenfluramine or dexfenfluramine produces more severe cardiac lesions or produces a higher frequency of lesions. Also, there is no evidence that phentermine or other adrenergic agents combined with serotonergic agents such as fluoxetine or sertraline produce cardiac lesions, but anecdotal data suggest that they do not (M. Anchors, oral communication). Phentermine has not been removed from the market by the FDA.

Until more research is done to delineate the level of the risk from specific drugs and categories of drugs, authorities in the field are urging great caution for any use of medications for obesity. This caution is also extended to drug replacements that are being touted by commercial organizations. "Natural" products such as herbal extracts may contain active ingredients that produce weight loss, but there are no data on the long-term efficacy and safety of such products. Many of these over-the-counter products contain ephedrine and caffeine. The Federal Trade Commission (FTC) has investigated a number of such products and reported that quality control is poor. The concentrations of active agents may vary from batch to batch, creating a potentially hazardous situation. Some of these products have been removed from the market by the FTC.

Following the removal of fenfluramine and dexfenfluramine from the market, the drugs most commonly used currently for the treatment of obesity include phentermine,

Table 9 Current strategies for use of obesity drugs

1. Single agents (phentermine, sibutramine, etc.)
2. Combinations
 - a. Ephedrine, caffeine, aspirin¹
 - b. Adrenergic agent and selective serotonin reuptake inhibitor (e.g.):
 - (1) Phentermine-fluoxetine¹
 - (2) Phentermine-sertraline¹
3. Herbal preparations^{1,2}
4. Conjugated linoleic acid^{1,2}

¹These regimens have not been approved by the FDA and are recommended only in research settings.

²These agents have not been adequately tested on humans.

alone or in combination with fluoxetine, sertraline, or another serotonergic antidepressant. The serotonergic antidepressants have not been approved by the FDA for use in obesity, and there are almost no data on the effectiveness and safety of these combinations. Sibutramine, a selective adrenergic and serotonergic reuptake inhibitor,^{22,23} was introduced in the market in February 1998. Sibutramine produces a modest increase in blood pressure in normotensive individuals and a more severe increase in a small number of patients. This rise in blood pressure mandates careful follow-up when this drug is used.²³

Orlistat, a lipase inhibitor,²⁴ is under review by the FDA. Orlistat causes malabsorption of about one-third of ingested fat.²⁴ The undigested fat passes into the colon, where it may be associated with abdominal discomfort, diarrhea, gas, oily stools, and fecal incontinence.²⁴ A slightly higher rate of breast cancer in the drug group versus placebo was noted in the clinical trials. This seems to be a statistical fluke, but the FDA is carefully considering whether to approve the drug for the market based on these findings.

Acarbose blocks digestion of complex carbohydrates. It is ineffective as a single agent for obesity, but anecdotal experience suggests that it may produce modest additional weight loss in an occasional patient when added along with other obesity agents.

Table 9 describes the potential obesity drug treatment strategies for the current situation in which there is so much confusion. Single agents still on the market may be used alone. Combinations such as phentermine with serotonergic agonists not approved for the treatment of obesity are being recommended and/or prescribed by some physicians, but discretion would dictate that these combinations be used only with great caution and preferably in the setting of a research project. Herbal preparations and conjugated linoleic acid have not been tested adequately and cannot be recommended outside a research setting.

Surgical treatments of obesity

The surgical procedures being done for obesity in the United States are listed in Table 10. Surgical treatment is reserved for patients who have an extremely high health risk from obesity and its complications. An NIH Consensus Development Conference on obesity surgery concluded that a BMI of 40 or above was sufficient grounds to recommend surgery in an uncomplicated patient. Patients with a BMI of

Table 10 Surgical treatments for obesity

1. Gastric bypass surgery
2. Vertical banded gastroplasty
3. Gastric wrap procedures
4. Biliopancreatic bypass
5. Liposuction

35 or above and complications or co-morbidities of obesity also were deemed eligible for surgery.

Pories et al.^{25,26} have published extensive follow-up studies on a large cohort of patients with gastric bypass followed for up to about 15 years. These studies demonstrate dramatic improvements in complications of obesity and are the first to demonstrate that treatment of obesity results in a reduced mortality rate.²⁶ Sugeran et al.²⁷ have shown that gastric bypass produces better weight loss that is maintained longer than vertical banded gastroplasty (VBG). VBG divides the stomach into a very small upper pouch and a large distal pouch, with a very limited opening between the two. The produces a partial gastric outlet obstruction syndrome, and the mechanism of weight loss is almost purely mechanical. Gastric bypass produces a number of hormonal and metabolic changes that account for the weight loss.

Gastric wrapping procedures have not been studied extensively, but theoretically they would suffer from the same limitations as vertical banded gastroplasty. Biliopancreatic bypass is a drastic procedure associated with malabsorption syndrome and at least some of the complications associated with jejuno-ileal bypass surgery that is no longer performed.²⁸ Liposuction is generally reserved for cosmetic purposes as it is difficult to remove a significant percentage of total body fat, and the procedure cannot be used to remove visceral fat.²⁸

Some authorities in the United States have concluded that gastric bypass is the preferred surgical procedure for obesity based on the better long-term outcomes.^{27,28} However, many surgeons prefer the VBG or gastric wrapping as they can be done by laparoscope and have fewer short-term surgical complications.

The exclusion criteria for obesity surgery are similar to those for obesity treatment in general. In addition to the weight criteria, psychological factors are important, and any unstable medical or psychiatric illness may exclude patients. Patients who have unrealistic expectations or who have a history of noncompliance with medical therapy may not be candidates for surgery and must be very carefully evaluated.

Criteria for success for weight loss programs

A clear understanding of the criteria for success for weight loss programs is important for both patients and health professionals. Success must be defined individually, as patients may have very different life situations.²⁹ Table 11 lists some of the criteria for success of the treatment of obesity. Virtually every obese patient who enters an obesity treatment program would prefer to lose weight, but individual life situations may preclude significant weight loss. In

Table 11 Criteria for success in the treatment of obesity

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1. Weight loss
 2. Weight maintenance
 3. Reduction of complications
 4. Adoption of healthy lifestyle
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such patients, maintenance of current weight may be viewed as success. Conversely, if complications and co-morbidities of obesity improve, even without weight loss, this may be considered a successful outcome. Finally, adoption of a more healthy lifestyle of diet and activity might be the maximum that can be achieved for some patients, but this too can be considered a success if the alternative is continued weight gain or worsening of complications of obesity.

In summary, patients must be considered individually and a mutually acceptable agreement reached between patient and health professional on the nature of the weight control program. Long-term treatment is required as obesity is a chronic disease. Patients may not be ready for treatment, or they may choose a regimen that cannot be continued. With changes in life situations, changes in obesity treatment, whether more or less stringent, may be necessary. The objective of all obesity treatment programs is to improve the quality of life for the patient.

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