Obesity Treatments and Controversies

The amount of weight lost should not be the primary gauge for successful obesity treatment. According to the National Institutes of Health (NIH), the main focus of any obesity intervention should be on health improvement instead of body weight reduction. People who are overweight or obese have increased risk for more than 30 other diseases such as heart disease, cancer, breathing problems, and diabetes.¹

Selection of appropriate obesity management should be based on the relationship between BMI and the presence of comorbidities or risk factors. Comorbidities are other diseases that get worse as obesity or BMI increases and improve as obesity or BMI decreases. For anyone in the overweight category (BMI 25–29.9 kg/m²), prevention of additional weight gain through lifestyle therapy is suggested. As Table 1 shows, weight reduction is not necessarily recommended for individuals in that BMI category unless they also have two or more comorbidities. Lifestyle treatment is recommended for everyone with a BMI ≥ 30 kg/m², with pharmacotherapy as an option for some. For adults with a BMI ≥ 40 kg/m² without comorbidities or a BMI of 35–39.9 kg/m², bariatric surgery could be considered after other attempts at weight control have been ineffective.¹

Although the NIH guidelines seem straightforward, there is a great deal of controversy about how and when to apply any of the treatments. Some of this controversy is because not all treatments will work for everyone. When a diet, exercise, or drug plan does not produce expected results, either the individual is blamed for noncompliance, or the treatment is deemed ineffective. Because results vary, there are controversies regarding the usefulness of each type of intervention. Using the NIH guidelines as a model, we will discuss the following selected issues and controversies surrounding diet, physical activity, behavior, pharmacotherapy, and bariatric surgery.

• Is there a best diet for weight loss?
• Is a supervised diet program necessary?
• How does physical activity affect weight loss?
• Is television to blame for the obesity epidemic?
• How do we define weight loss success?
• Should drugs be used long term for weight management?
• Is gastric surgery a realistic and available option?

Is there a best diet for weight loss?

Our current food environment presents large portions, energy-dense foods, and ready accessibility of thousands of food choices. When confronted with an abundance of tasty, easily available foods, our biological food intake regulation is predominantly geared toward eager consumption instead of restraint. It should not be surprising that few people are suc-

In Brief

The ideal model of obesity treatment is a comprehensive intervention including dietary, activity-related, behavioral, pharmacological, and/or surgical components that is geared toward individual needs, similar to the ideal treatment for diabetes. The main focus of any obesity intervention should be on health improvement instead of just body weight reduction. To resolve the controversies surrounding obesity, we must invest much more in research into the prevention of obesity and to ascertain those lifestyle or medical approaches that will make it easier for anyone to maintain a healthful energy balance.
Table 1. National Institutes of Health Guide to Selecting Appropriate Weight Loss Treatment for Overweight and Obesity

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Overweight 25–29.9 kg/m²</th>
<th>Obesity 1 30–34.9 kg/m²</th>
<th>Obesity 2 35–39.9 kg/m²</th>
<th>Obesity 3 ≥ 40 kg/m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifestyle therapy (diet, physical activity, and behavior therapy)</td>
<td>With two or more comorbidities</td>
<td>No comorbidity required</td>
<td>No comorbidity required</td>
<td>No comorbidity required</td>
</tr>
<tr>
<td>Pharmacotherapy</td>
<td>With comorbidities</td>
<td>No comorbidity required</td>
<td>No comorbidity required</td>
<td>No comorbidity required</td>
</tr>
<tr>
<td>Bariatric surgery</td>
<td></td>
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Adapted from Ref. 1.

Successful in losing weight and maintaining weight loss.

To discover how to resolve our biological and environmental barriers to long-term weight management, we turn to nonprofessional weight management experts: people who have actually lost weight and kept it off. The National Weight Control Registry (NWCR) is a database of nearly 3,000 people who have been recognized as successful at long-term weight maintenance. To join the registry, individuals must have lost at least 30 lb. and have kept it off for at least a year. The registry was established in 1993 as a way to follow weight-loss maintainers and to determine the variables of weight maintenance or weight regain.

A study of the participants in 1997 reported that, at that time, registrants had lost an average of 66 lb. and had maintained at least a 30-lb. weight loss for an average of 5.5 years. The key behaviors of these successful weight maintainers were reduced energy intake, reduced dietary fat intake, and increased physical activity.

To reduce energy intake, weight maintainers became aware of calorie values of food, reduced their dietary fat intake, and limited the quantity of food they consumed. In an earlier study, another group of women who were successful at weight maintenance devised personalized weight loss and maintenance plans and exercised regularly. Weight loss methods were varied because some used ideas from their earlier weight loss experiences or ideas from books. These women were conscious of quantity but did not deprive themselves of favorite high-calorie foods because they did not view their dietary changes as temporary and were therefore not just waiting for the diet to end in order to indulge again.

Currently, there is considerable interest in manipulating macronutrients—fat, protein, and carbohydrate—in diet plans to make weight management easier or more effective. High-carbohydrate, high-fiber, low-fat plans, such as the Ornish and Pritikin diets, usually include whole grains, fruits, and vegetables that are associated with good overall health. These diets place severe limitations on dietary fat. Dietary fat is not inherently bad, but because fat has twice the calories of protein or carbohydrate, limiting fat allows more food volume for fewer calories.

High-fat, high-protein, low-carbohydrate diets, such as the Atkins diet, may be more satiating, which could result in less food intake. A 6-month study showed that a high-protein diet resulted in significant weight loss with no adverse effects on blood lipids, although that study was conducted without a placebo control group. Such diets require supplementation with vitamins, minerals, and fiber because the diet is so limited.

A review of 94 studies of low-carbohydrate diets concluded that there is not enough evidence to recommend for or against the use of such diets. The reviewed study diets supplied various amounts of carbohydrate, with some as low as 20 g/day. Participant weight loss was principally associated with decreased caloric intake and increased duration of the diet, but not with reduced carbohydrate content. We do not have long-term studies with respect to efficacy, safety, and weight maintenance. A special caution, the National Academy of Sciences’ Institute of Medicine has recommended a minimum daily intake of 100 g of carbohydrate for optimal brain function.

We do not have reliable data to show that any diet plan is safer or will work better than the others over the long term. High-carbohydrate, high-protein, vegetarian—any diet will work if energy intake is reduced. Although complex relationships between genetic, physiological, behavioral, and environmental factors are involved in regulation of body weight and body composition, weight management ultimately relies on the concept of energy balance. Energy balance is matching the energy intake from food and beverages with the energy output for an individual’s basal energy expenditure and physical activity. Simply put, “energy in balances energy out.”

Is a supervised diet program necessary?

On average, comprehensive medical or commercial diet programs lasting for about 6 months result in mean weight losses of 15–25 lb. or about 9% of initial body weight and are associated with a drop-out rate of 15–20%. Less-intensive treatments that provide patients with diet and exercise information but minimal contact produce weight losses of only 3–10 lb. over 6 months.

Long-term behavioral treatment facilitates weight loss maintenance, but it does not increase the amount of weight lost over time. Most weight is lost during the first 6 months of treatment. Even when continued therapy is available, attendance at maintenance sessions declines over time, and once treatment is ended, individuals regain weight. Studies indicate that weight regain in the first year after treatment is about 30–35%. Behavioral therapy delays weight regain, but 3–5 years later, at least 50% of participants have returned to their initial weight or more.

How does physical activity affect weight loss?

Although exercise is almost universally prescribed for people who are trying to lose weight, research studies...
suggest that exercise alone does little to cause short-term weight loss. A review of several hundred weight loss studies conducted between 1969 and 1994 showed that combining exercise with diet resulted in only a marginal benefit in terms of weight loss over diet alone.9 Contrary to popular opinion, moderate exercise does not seem to have a large effect on body composition during weight loss. The effect of exercise on fat mass reduction was not significantly different in a study of 91 obese women who followed either a reduced-calorie diet (1,200–1,300 kcal/day); performed moderate exercise 45 minutes, 5 days a week; or combined both interventions. This and other studies did not show that resistance or strength training enhanced weight loss.9,10 In contrast, extreme exercise, such as was required in a study of Singaporean military recruits, resulted in a 35-lb. weight loss over 5 months.11

The ineffectiveness of moderate exercise alone to reduce body fat is not surprising when we consider that 1 lb. of body fat contains the equivalent of about 3,600 kcal, and the basis of body fat reduction is a shift to negative energy balance, i.e., to take in less energy than is expended. This does not mean that moderate exercise is a waste of time. For example, a 15-minute brisk walk uses only about 100 kcal (depending on body weight). As shown below, walking for 15 minutes seven days a week will result in only a 0.2-lb. weight loss per week but a 10 lb. loss per year if the walking is performed every day and if energy intake remains constant:

- A 15-minute brisk walk uses 100 kcal of energy.
- Walking for 15 minutes seven days a week results in a 0.2-lb. loss per week.
- Walking for 15 minutes 365 days a year results in a 10.4-lb. loss per year.

Over the long term, moderate exercise has a significant effect in preventing weight regain. A 2001 report noted that 90% of the NWCR participants exercised regularly. NWCR women averaged 2,545 kcal/week and NWCR men averaged 3,293 kcal/week in physical activity.2 That is equivalent to walking about 30–45 minutes each day. And, even though resistance exercise was not related to weight loss, it can increase strength and fat-free mass10 and that increased strength may allow an obese or overweight person to become more physically active.

Exercise does have a positive impact on diabetes management, however. The Diabetes Prevention Program, a major multi-center clinical trial, found that 150 minutes or more of exercise per week decreased the risk of developing type 2 diabetes in a patient population with glucose intolerance.12

For prevention of weight gain or regain, any time is a good time to exercise.

- Physical activity improves the chances of avoiding weight gain.
- Regular exercise is important for maintenance of weight loss.
- Physical activity contributes to the overall health of people at any weight.

Is television to blame for the obesity epidemic?

In the United States, television viewing accounts for half of the average adult’s leisure time. A prospective study of more than 50,000 women showed that the amount of time spent watching TV was positively associated with the development of obesity and type 2 diabetes. The researchers emphasized that replacing prolonged sitting and especially TV watching with even light activity, such as walking around the home, reduced risk.13

Children are even more susceptible to the negative health effects of watching television.14 As they spend hours in front of the TV, they are being taught about what to eat by commercials. A study presented by Marlene Most, MD, at the American Heart Association’s 2002 annual meeting showed that, in contrast to the 1970s when sugary breakfast cereals were the main advertising staple, there is now a surge in commercials highlighting fast-food restaurants with new, larger “kid-sized” portions of food and soft drinks. Ads associate snacking with fun, happiness, adventure, and popularity—things that no food can deliver. Most, an associate professor of research at Pennington Biomedical Research Center in Baton Rouge, La., asserts that children at an impressionable age are receiving nutrition messages that will influence their health outlook for years to come.15

Most Americans already eat portions much in excess of their daily energy needs, and the increase in soft-drink consumption is especially dramatic. Soft drinks are now the major

Figure 1. Beverage portion sizes. Calories per serving without ice. Colas have about 12.5 Kcalories per ounce. Reprinted with permission from Judith S. Stern.
source of added sugars in the diet of youths in the United States. Figure 1 illustrates the range in portion sizes and calories of single servings of soda. When people are given larger portions, they eat more.\textsuperscript{16,17} Nearly 25\% of adolescents drink 26 oz. of soda each day. That is equal to about 325 calories, which is \textasciitilde12–15\% of their daily caloric needs. A 2-year study examined the link between soft-drink consumption and obesity in 780 children (mean age 12 years). The odds of becoming obese increased by 1.6 times for each extra serving of sugar-containing soft drink consumed daily. By comparison, an increase in diet soda intake halved the risk of developing obesity.\textsuperscript{18}

**What is weight loss success?**

Traditionally, weight loss goals were based on reaching a theoretical ideal weight based on the Metropolitan Life Insurance Company’s height-weight charts. Since 1995, a 10\% reduction in body weight has been suggested as a successful outcome.\textsuperscript{19} Weight losses of as little as 5–10\% of initial weight can improve weight-related complications, including hypertension, type 2 diabetes, and dyslipidemia, even if the person is still overweight.\textsuperscript{19} However, dieters may not be satisfied with such modest goals.

In a study published in 2000, individuals who lost 10\% of their body weight during just 4 months of treatment were disappointed with their weight loss.\textsuperscript{20} Foster et al.\textsuperscript{21} asked nearly 400 women who were beginning a weight loss program to describe their goal weight loss in terms of what they wished to achieve, what they would be happy with, and weight loss they would view as an unsuccessful attempt. The women chose an average of about a 38\% reduction in body weight—more than three times the recommended goal. A 25\% reduction was described as “acceptable,” but not one they would be happy with, and a 16\% loss was considered “disappointing.” This study suggests that most people trying to lose weight have unrealistic goals. Even after a medically significant weight loss, they may feel unsuccessful. In general, it is not realistic to expect more than a 10–15\% reduction of initial weight.\textsuperscript{21}

**Should drugs be used for long-term weight management?**

Over the years, attitudes about the use of weight loss drugs have changed in response to a revision in our thinking about obesity. Obesity is now seen as a chronic disease with a genetic basis that is associated with serious comorbidities and premature death. It is not just a cosmetic problem.

A 2000 review of placebo-controlled trials of long-term (36–52 weeks) drug treatment of obesity examined the three most prescribed drugs: phentermine, sibutramine, and orlistat.\textsuperscript{22} Orlistat blocks absorption of dietary fat by inhibiting the activity of pancreatic lipase, an enzyme involved in absorption of fat. Sibutramine and phentermine work by suppressing appetite through actions on neurotransmitters. Table 2 shows that these drugs do have a modest effect on weight loss and maintenance. While the total effect on weight may be small, the degree of weight loss is associated with important health benefits.

Response to drug therapy varies strikingly among individuals for reasons that we do not currently understand. Trials show that only 40–60\% of patients have a significant clinical response to a given drug.\textsuperscript{22} This should not be surprising because no one drug works for all patients. This is particularly true in the treatment of diabetes.

Past reports of adverse events associated with the phentermine-fenfluramine combination have created wariness about using the few pharmacological options now available. In a 1997 article, Frank\textsuperscript{23} noted that diet medications are often prematurely judged to be ineffective because the medications are given in an insufficient dose or for too short a time period. Attention to management of side effects and providing adequate instructions and support for patients will also produce better results.\textsuperscript{23}

Patients also have to take responsibility for managing their obesity because diet drugs will not force anyone to stop eating. Most people eat in response to personal and environmental cues rather than simply eating because they are hungry and stopping because they are no longer hungry. An uncommitted patient can “out eat” the weight loss effects of any drug. Medical professionals and the public are beginning to understand that weight gain after stopping drug or any other treatment is not treatment failure but instead indicates that obesity is a chronic disease much like hypertension. Patients and health care providers alike should acknowledge that diet drugs are not a quick fix for a disease that requires long-term, continuous treatment.

There are risks in taking any medication. Research is needed to address the long-term safety of obesity drugs so that we can accurately assess the drug side effects in comparison to the health risks of obesity and overweight. The Food and Drug Administration should encourage the development of additional drugs that can be used for long periods of time, such as those for hypertension and dyslipidemia.

**Is gastric surgery a realistic and available option?**

For most very obese people, there are few noninvasive options available that result in long-term weight loss. For this group of individuals who are at greatest risk for developing comorbidities, there are currently no nonsurgical approaches that are uniformly as effective in the long term as gastric reduction or bypass surgery. Gastric, or bariatric, surgery helps to reduce energy intake by physically limiting food intake and absorption. This surgery is becoming extremely popular; it is estimated that nearly 100,000 surgeries will be done in 2003 compared to 47,000 surgeries in 2001.\textsuperscript{24} Demand for bariatric surgery is so great that many hospitals have waiting lists of hundreds of patients. There are several reasons for the surge in demand for bariatric surgery:

- The increase in the number of people who are extremely obese and

<table>
<thead>
<tr>
<th>Drug</th>
<th>Weight loss above effect of placebo (%)</th>
<th>Weight loss above effect of placebo (lb.)</th>
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<tbody>
<tr>
<td>Phentermine</td>
<td>8.1</td>
<td>17.4</td>
</tr>
<tr>
<td>Sibutramine</td>
<td>5.0</td>
<td>9.5</td>
</tr>
<tr>
<td>Orlistat</td>
<td>3.5</td>
<td>1.5</td>
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Adapted from Ref. 22.

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for whom other treatments are not effective—an estimated 6 million people in the United States.\textsuperscript{25} New laparoscopic methods make surgery easier and safer and reduce recovery time. NIH-established eligibility criteria for surgical treatment of obesity can be used as a basis for insurance coverage.

According to the American Society of Bariatric Surgery, health insurers are beginning to realize that they may save money in the long run by covering bariatric surgery. Still, 20–25% of patients must pay the $5,000 or more cost of such surgery out of pocket because they do not have such coverage in their policies.\textsuperscript{26} Coverage can also be limited when insurers require patients to meet more stringent BMI guidelines than those set forth by the NIH or when they stipulate that surgery will be done only when there is documented failure of other forms of treatment.

This raises questions about who gets treated, which operation is best, who should be doing the surgeries, and what the long-term health results are. In a major step to providing scientific evidence to answer these questions, the National Institute of Diabetes and Digestive and Kidney Diseases is establishing a consortium of four to six centers that treat large numbers of bariatric surgery patients to gather data that will help determine the best practices.\textsuperscript{27}

Conclusions

There are no guarantees for any method, including surgery, to produce and maintain weight loss. As a consequence of small positive changes in energy balance, obesity develops over time and, once developed, is difficult to treat. Right now, the most effective method of controlling obesity and its associated comorbidities is prevention:

• prevention of overweight in normal weight people;
• prevention of overweight progressing to obesity; and
• prevention of obese individuals gaining more weight.

The ideal model of obesity treatment would be comprehensive intervention—dietary, activity-related, behavioral, pharmacological, and/or surgical—geared toward individual needs, similar to the ideal treatment for diabetes, HIV, or cancer. To resolve the controversies surrounding obesity, we must invest much more in research into the prevention of obesity and to ascertain those lifestyle or medical approaches that will make it easier for anyone to maintain a healthful energy balance.

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