

A Review of the Benefits of Improving Body Weight

The topic of today for all health professionals is overweight and obesity, including effective approaches to managing weight. Is it sensible eating, a popular diet plan, a focus on behavior modification or one of the myriad of other approaches available? Set aside this debate for a moment. Health practitioners seek to provide sound advice to clients based on efficacy and scientific evidence.

Perhaps the first question to ask is to what degree weight change is beneficial to health status. Does weight loss significantly impact morbidity, mortality and disease risk? If so, how much is enough? And what about children? A review of these issues, as well as a brief summary of two other areas to watch in weight management, is presented here.

The Scope of the Problem

The scope of the problem underscores the concern around solving the overweight dilemma. As reported in the October 9, 2002, issue of the *Journal of the American Medical Association*, age-adjusted obesity rates hit 30.5% in 1999-2000, compared to 22.9% in the third National Health and Nutrition Examination Survey (NHANES III, 1988-1994). During this same time period, overweight rates increased from 55.9% to 64.5%. In a study of 4,722 children in the 1999-2000 NHANES, 15.5% of 12- through 19-year-olds were overweight, as were 15.3% of 6- through 11-year-olds and 10.4% of 2- through 5-year-olds. This compares with 10.5%, 11.3% and 7.2% overweight, respectively, in 1988-1994.

Body Mass Index (BMI) is used as a reference tool for determining overweight and obesity. BMI divides a person's weight in kilograms by height in meters squared (kg/m^2). A healthy weight range is represented by a BMI from 18.5 to 24.9. Individuals with a BMI of 25 to 29.9 are considered overweight, and those with a BMI of 30 or more, obese. Extreme obesity is diagnosed at a BMI of 40 or more. For children, age- and gender-specific charts have been developed. These can be valuable tools for pediatricians and other health professionals to use in identifying children who are overweight or at risk of becoming overweight. Children with a BMI at or above the 95th percentile for their gender and age are considered overweight. Children between the 85th and 95th percentile are considered at risk for overweight.

The National Institutes of Health (NIH) report, *The Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*, is a landmark reference that pro-

vides considerable detail on the serious consequences of overweight (based on reviews of randomized, controlled trials). These include:

- **Hypertension:** The incidence of high blood pressure in adults with BMI ≥ 30 is 38.4% for men and 32.2% for women compared with 18.2% in men and 16.5% in women with BMI < 25 .
- **Dyslipidemia:** Overweight and obesity are associated with increased total cholesterol and triglyceride levels. Data suggest that LDL-cholesterol levels are increased by 10 to 20 mg/dL in relation to a 10 unit BMI difference, between 20 and 30 kg/m^2 . A 10 mg/dL rise in LDL-cholesterol corresponds to an approximate 10% increase in coronary heart disease risk over 5 to 10 years. Studies also report that HDL-cholesterol levels are lower at higher BMI levels.
- **Diabetes Mellitus:** The relative risk of type 2 diabetes increases by roughly 25% for each unit of BMI above 22 kg/m^2 .
- **Coronary Heart Disease (CHD):** In the Nurses' Health Study, relative risks for CHD were twice as high at BMIs between 25 and 28.9, and more than three times as high at BMIs ≥ 29 , compared to BMIs of less than 21 kg/m^2 .
- **Other:** The risk of gallstones, osteoarthritis, sleep apnea and gynecological abnormalities increases with overweight or obesity. Higher rates of various cancers, including colon, postmenopausal breast and endometrial cancers, are also associated with obesity.

The Impact of Modest Weight Loss in Adults

This NIH report also reviewed studies to determine the impact of weight loss on the incidence of these morbidities. This meta-analysis concluded the following:

- In a review of 45 articles, strong, consistent evidence supports a decrease in blood pressure levels in both overweight hypertensive and nonhypertensive individuals due to weight loss produced by lifestyle modifications.
- Positive changes were seen on plasma lipids with weight loss, as indicated in a review of 22 articles. Lower triglyceride and increased HDL-cholesterol levels were found with weight loss. Reductions in total and LDL-cholesterol were generally observed. These results occurred when weight loss was achieved through lifestyle modification; weight loss achieved through weight loss medications showed inconsistent effects on serum lipids.

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- There is strong evidence from nine lifestyle interventions that weight loss results in a lowered blood glucose level in overweight and obese individuals without diabetes and improved blood glucose and Hemoglobin A1c (HbA1c) levels in some patients with type 2 diabetes.

In response to these, and additional data reviewed, the Expert Panel convened by the NIH recommends modest weight loss for people with a BMI of ≥ 30 and for people with a BMI of 25 to 29.9 who want to lose weight or have two or more risk factors for weight-related conditions. The initial goal is to lose approximately 10% from baseline, at a rate of one to two pounds a week for up to six months. This level of weight loss has been found to have significant positive impact on risk for chronic disease as described above. After the initial weight loss has been achieved, a weight maintenance program should be a priority.

Since the NIH report was published (1998), other studies, reviews and professional position statements have supported modest weight loss as having a positive impact on health.

- In the Diabetes Prevention Program, a study considering both lifestyle and pharmaceutical methods to prevent diabetes, subjects randomly assigned to the lifestyle intervention group reduced their risk of developing type 2 diabetes by 58%. Through diet and exercise changes, the group achieved, on average, a 7% (15-pound) weight loss in the first year and generally sustained a 5% total loss for the study's duration. Participants randomly assigned to pharmaceutical treatment with metformin reduced their risk of developing type 2 diabetes by 31%.
- Videll, reviewing the benefits of weight loss in a December 2002, supplement to the *International Journal of Obesity*, reports that a 5% to 10% weight reduction is associated with improved fasting blood glucose levels, blood pressure and plasma lipid levels.
- The American Dietetic Association's (ADA) position statement on weight management for adults indicates that weight loss of 5% results in some health benefits, while weight loss of 10% may improve health risks associated with excess body weight. ADA notes that successful weight management to improve health requires a lifelong commitment to sustainable healthful eating and daily physical activity.
- The American College of Sports Medicine (ACSM), in its position paper, states that ideal body weight does not have to be achieved to obtain health benefits and concludes that a modest weight loss of 5% to 10% of initial body weight by

overweight adults provides significant and immediate improvements in health. ACSM recommends combining reductions in energy intake with increases in energy expenditure for weight loss interventions.

A key message from all of the studies, reviews and professional groups is that such weight losses must be sustained over the long-term to maximize health benefits.

Benefits of Managing Weight in Children

The statistics on the number of children who carry excess weight at increasingly younger ages are startling. Much concern – and notably little data – surrounds the potential risk of chronic diseases that overweight children will have as they enter and live through adulthood, since overweight children are clearly at risk for becoming overweight adults.

Of these chronic diseases, the area of most immediate concern is the increasing prevalence of type 2 diabetes in children. While there are currently no nationwide, epidemiologic data available, clinic-based reports and regional studies estimate the incidence of type 2 diabetes to be between 2 and 50 per 1,000 children (the range is due to prevalence differences among ethnic groups). Ages of the children ranged from 10 to 19 years (*Journal of the American Medical Association*, September, 26, 2001). These rates are an estimated 10-fold increase over the past 20 years, and may actually underestimate the problem due to misclassification and undiagnosed or unreported cases. As with adults, type 2 diabetes in children is more strongly associated with obesity than any other risk factor. In fact, according to a report by the American Diabetes Association in the March 2000, issue of *Pediatrics*, up to 85% of children with type 2 diabetes are overweight or obese at the time of diagnosis.

Despite the increases in overweight and type 2 diabetes in children, little solid evidence exists to support a specific weight management philosophy. A review article in a 1997 issue of the *International Journal of Obesity* indicates that a reduction in sedentary behavior appears to have the greatest impact on weight loss and maintenance in obese children. This review also reports that, at five-year follow-up, the targeting of parents and children together for weight loss showed a statistically significant benefit when compared to working with children alone. Depending on the age of the child, some evidence suggests separate sessions for parents and children may be more beneficial than joint intervention sessions.

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Data from the mid 1980s suggest that even mildly calorie-restricted diets can result in decreased linear growth in children.

Inadequate intakes of certain nutrients, including iron, zinc, calcium and vitamins A and E, were found with energy-restricted diets. In light of these data, organizations including the American Academy of Pediatrics, the American Dietetic Association, the American Heart Association and the Department of Health and Human Services agree upon these main points related to weight management in children:

- 1) The primary goal is weight maintenance and prevention of weight gain to allow height to catch up to weight.
- 2) Family involvement is essential.
- 3) Increasing activity is essential. One strategy is to limit sedentary activities such as television, video games and excessive computer usage.
- 4) Eating habits should be based on the *Dietary Guidelines for Americans*, and provide enough energy for growth. Emphasis should be placed on choosing nutrient-rich foods from the five food groups.

However, since the numbers of overweight children have risen so dramatically, so quickly, this conservative approach may not be enough to prevent a future epidemic of obese adults. While slowing weight gain is the primary goal in overweight children, there is little research that examines the psychological and emotional issues of weight loss in childhood, or the potential for a lifetime of disordered eating if weight loss techniques are used inappropriately. More research is critical to address these issues.

Two Areas to Watch in Weight Loss

Ongoing research continues to support information we've always known: healthy eating, sensible portions and increased physical activity are key to weight loss and maintenance. However, two areas of biomedical interest have gained attention, specifically, the relationship between calcium intake and weight loss and other medical treatments for weight loss.

A New Look at Calcium

In the late 1980s, a hypertension study with African-American men included a dietary intervention of adding two cups of yogurt to daily eating habits, resulting in increased calcium intake of 400 to 1,000 mg. While not the main focus of the study, participants lost approximately 11 pounds of body fat in a year with no other diet or exercise changes. Thus, interest in a possible impact of calcium on weight regulation got its start.

In 2002, reports showed strengthened support for the inverse relationship between calcium and weight gain. Zemel, et al examined data from NHANES III. When they controlled for caloric intake, physical activity, gender and age, people with the highest consumption of calcium and dairy foods had the lowest body fat. Heaney, et al re-examined nine intervention studies originally conducted to look at calcium intake and bone mass. They concluded that for each additional 300 mg of calcium consumed per day, there was a reduction in body weight of six pounds. Similarly, in a five-year longitudinal study of 53 preschool-aged children, an inverse relationship between calcium consumption and body fat, as well as a positive relationship between calcium intake and lean body mass, was found.

The question of whether this effect is due to calcium itself or the whole food – dairy products – is a logical one. While early findings suggest that both natural and supplemental sources of calcium have an impact, dairy foods seem to impart additional benefit. More research, especially interventions, is needed to verify whether this is so and, if it is, to determine the reason why.

Other Medical Treatments for Weight Loss

- *Pharmacotherapy*: The NHLBI guidelines concluded that FDA-approved weight loss drugs, when prescribed as part of a comprehensive weight loss program that includes diet therapy, physical activity and behavior therapy, may be used for carefully-selected individuals with a BMI of ≥ 30 with no existing obesity-related risk factors or diseases or for those with a BMI of ≥ 27 with obesity-related risk factors or diseases. Use of such medications should be closely monitored for safety and efficacy in helping individuals to lose and/or sustain weight loss without serious adverse effects.
- *Bariatric Surgery*: With the high rates of obese individuals who have repeatedly tried and failed at multiple approaches to lose weight, bariatric surgery is increasingly used today. Weight-loss success rates for such surgery are high. Over the past 25 years, it has been the most effective approach for achieving long-term weight loss in obese people. More than 90% of individuals achieve a weight loss of 20-25%, and 50-80% maintain weight loss for over five years. However, consideration of bariatric surgery is only recommended for individuals with BMI of ≥ 40 or ≥ 35 with co-morbidities. As with any surgery, there are risks and possible complications, including infection and death. There are also short- and long-term side effects, including risk

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of rupture, a requirement for routine multi-vitamin/multi-mineral supplements and other ongoing nutrition concerns. Thus, it is essential that individuals considering this treatment option have access to an integrated program providing guidance on nutrition, diet and physical activity, as well as behavioral and social support, before and after surgery. Weight loss surgery should be reserved for individuals suffering from complications of extreme obesity, for whom other medical therapies have failed.

Summary

The prevalence of overweight and obesity in the United States is a serious issue, and it is clear that no single group or approach can solve the problem. Stakeholders, including government agencies, food manufacturers, health professionals, educators and consumers, must work together to support a multi-dimensional solution. Government agencies can provide science-based diet and health guidance for national policies and programs and track the nation's progress; food manufacturers can supply a range of products to meet different needs and preferences; health professionals can monitor their patients' weight and health and recommend appropriate interventions; educators can encourage healthful practices such as balanced eating and active living and, as consumers, we all have a responsibility to make food and activity choices that are in step with our personal health goals.

While seeking a broad-based solution, health professionals can encourage their patients and clients to take some proactive steps to manage their weight. First and foremost, we should advise those who are within a healthy weight range, as well as those who are overweight, to prevent additional weight gain. One approach to establish a plateau is the 100-calorie rule, which helps curtail insidious weight gain. The goal is to eat 100 fewer calories each day *or* burn 100 additional calories through increased physical activity *or* do a combination of the two. Once an individual has stabilized his or her weight, the next step is a decision about whether or not it is appropriate to recommend weight loss for those who are overweight. Since the 1970's, evidence has supported a modest weight loss for health improvement. While weight loss is influenced by a number of factors including heredity, age and body type, lifestyle changes sustained over time can lead to positive results. Losses of one-half to one pound of body weight per week can usually be achieved by reductions of 300 to 500 calories per day. Ideally, such reductions reflect changes to both sides of the weight equation: food (eating 150 to 250 fewer calories per day) and physical activity (expending 150 to 250 more calories per day). A key objective is to help individuals understand how their

behaviors related to food choices and active living influence their body weight. Research into appropriate weight management approaches for children should also be a top priority for professionals.

Further Reading:

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