12.4: Dietary, Behavioral, and Physical Activity Recommendations for Weight Management

Skills to Develop

- Explain the complementary actions of dietary changes and increased physical activity level on health.
- Formulate an exercise plan that fits your lifestyle and that follows the 2008 Physical Activity Guidelines for Americans.

Theories of Obesity

Scientists have been looking for a cause of obesity for many decades now. Clearly, the evidence shows this a multifaceted disease that is not explained by one cause, for example, one gene. Clearly, it is an energy imbalance - too many calories in for the calories expended. Yet, for some, there are other explanations that help contribute. These include genetic variation, metabolic, and environmental influences and each interacts with the other. For example, since sequencing the human genome was completed, scientists have learned that the environment plays a powerful role in determining which genes are expressed.

*Genetic Influences:* A number of examples suggest gene can play a role in one's weight. There is an 80% propensity for offspring to gain weight if both parents are overweight, 60% chance if one parent is obese and a 10% chance if neither parent is obese. Identical twins raised apart have similar weight gain patterns and gain fat in similar sites. Also, body shape is a heritable trait. The ectomorph tends to be lean, the mesomorph muscular and the endomorph large. Finally, rare genetic disorders give us insight into genes that control weight. There are several rare genetic defects that cause excessive weight gain. Examples are Prader-Willi syndrome (absence of chromosome 15) and Laurence-Moon syndrome. Individuals with Prader-Willi have an insatiable appetite.
Metabolic Influences: A number of metabolic theories have been proposed. A few are detailed here:

- **Set-point theory:** This theory states that a person is programmed to be a certain weight and have a certain body fat content. If a person weighs less than this set point, then their body will make adjustments in food intake or BMR to compensate and get the person back to their set point weight. If a person weighs more, again, their body will compensate to bring them back to the set point. People become obese because they have a high set point.

- **Enzyme theory:** Lipoprotein lipase (LPL) is an enzyme that breaks down LDL or VLDL at the cell surface to release the particles triglyceride into the cell. The activity of LPL increases when a fat cell is starving or seeking fat. Obese people have more LPL, but they also have more fat cells.

- **Fat cell theory:** This theory is based on the number of fat cells in your body. Fat cells want to store fat and body fat is related to the number of fat cells you have and the amount of fat they are storing. According to this theory, childhood overeating increases the number of fat cells. Obese children tend to have the same number of adipocytes as lean adults. Obese adults have more fat cells. We do not grow much more fat cells as an adult; these are laid down when we are children. When someone who is obese loses weight, they shrink the fat cells size and do not reduce the number of fat cells. These cells then are very hungry and hoard fat causing the person to gain back the weight they lost.

- **Brown fat thermogenesis:** Our body has white and brown fat. Brown fat makes heat from fat. It does not store fat like white fat. Newborns and true hibernators, like bears, have a lot of brown fat while adult humans have less. This theory states that obese people have less brown fat.

Environmental Influences: A wide variety of influences in our social and built environment encourage a lifestyle associated with fat accumulations. We call these environmental influences and examples include lack of activity such as walking 10,000 steps a day; lack of aerobic exercise; an excessive amount of time spent sitting at our computers, playing video games and/or watching television; excessive portion sizes; an infrastructure conducive to driving not walking or bike riding; and easy access to food high in calories.

Combating Excessive Fat

Throughout the years, many different weight loss programs have come and gone each promising quick weight loss. All weight loss diets involve reducing one’s caloric intake but the most successful programs also 1) meet the dieter’s nutrient needs except energy, 2) meet the individual’s tastes and habits, 3) favors development and maintenance of changed eating patterns, and 4) is consistent with the improvement of overall health. The programs with the greatest probability of long-term success modify the dieter’s eating behavior, encourage moderate portion control, include moderate exercise most days of the week.

Weight loss should be slow to promote loss of fat, not muscle. A loss of two pounds or less a week is recommended. A pound of fat is approximately 3500 kcal so to lose 1 lbs of fat a week one should cut 500 calories from their diet without falling below 1,200 calories per day. This is the minimum amount of calories to assure adequate nutrient intake. At least 100 grams of carbohydrate is recommended per day, and this should be complex and include dietary fiber. Fat should provide between 10 and 30% of the total calories and protein near the RDA, 50 to 60 grams per day. It is essential to eat a variety of different foods to avoid boredom and assure one is getting all their micronutrients. The following are weight loss programs that do not meet some or all of these recommendations: very low energy diets (<1,000 calories per day), carbohydrate restrictive diets like the Atkins diet, diets that rely on special formulas or products, and diets that use appetite suppressant drugs. For some people, bariatric surgery has helped them reduce their body fat. These surgeries bypass part of the digestive tract. Other surgical procedures include stomach stapling or placing a band on the stomach to shrink its size.
Most dieters are not successful at keeping the weight they lost off and most gain the weight back plus more weight than they lost. This syndrome is called the yo-yo syndrome or weight cycling. It is a vicious cycle of weight loss, weight gain, weight loss, weight gain in which the dieter ends up weighing more and has more body fat. Scientists theorize that the body becomes more efficient at storing calories once the dieter stops their weight loss diet.

We have just considered the gravity of the obesity problem in America and worldwide. How is America combating its weight problem on a national level and have the approaches been successful?


The National Weight Control Registry (NWCR) tracks over ten thousand people who have been successful in losing at least 30 pounds and maintaining this weight loss for at least one year. Their research findings are that 98 percent of participants in the registry modified their food intake and 94 percent increased their physical activity (mainly walking.) The National Weight Control Registry. “Research Findings.” Accessed October 8, 2011. http://www.nwcr.ws/Research/default.htm. Although there are a great variety of approaches taken by NWCR members to achieve successful weight loss, most report that their approach involved adhering to a low-calorie, low-fat diet and doing high levels of activity (about one hour of exercise per day). Moreover, most members eat breakfast every day, watch fewer than ten hours of television per week, and weigh themselves at least once per week. About half of them lost weight on their own and the other half used some type of weight-loss program. In most scientific studies successful weight loss is accomplished only by changing the diet and by increasing physical activity. Doing one without the other limits the amount of weight lost and the length of time that weight loss is sustained. On an individual level, it is quite possible to achieve successful weight loss, as over ten thousand Americans can attest. Moreover, losing as little as 10 percent of your body weight can significantly improve health and reduce disease risk. National Heart, Lung, and Blood Institute. “Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report.” Obes Res 6 supplement (1998): 51S–210S. http://www.ncbi.nlm.nih.gov/books/NBK2003/. You do not have to be overweight or obese to reap benefits from eating a healthier diet and increasing physical activity as both provide numerous benefits beyond weight loss and maintenance.

Evidence-Based Dietary Recommendations

• **Increase intake of whole grains, vegetables, and fruits.** Scientific evidence demonstrates that adults who have a higher intake of whole grains, mainly those high in dietary fiber, have lower body weights compared to adults who eat a smaller amount of whole grains. Moreover, diets incorporating more whole grains reduce chronic disease risk. A higher intake of fruits and vegetables is scientifically shown to protect against weight gain in adults and there is some evidence that this is also true for children and adolescents.

• **Reduce intake of sugar-sweetened beverages.** There is good evidence that reducing consumption of sugar-sweetened beverages, especially in children and adolescents, decreases body weight and reduces chronic disease risk.

• **Monitor intake of 100 percent fruit juice for children and adolescents, especially those who are overweight or obese.** There is some evidence that increased intake of 100 percent juice exacerbates weight problems in children and adolescents who are already overweight or obese.

• **Monitor calorie intake from alcoholic beverages for adults.** Drinking in moderation is not linked to weight gain; however, excessive intake of alcohol over time is associated with weight gain.

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**Evidence-Based Behavioral Recommendations**

In addition to the dietary recommendations, the *2010 Dietary Guidelines for Americans* offers specific evidence-based recommendations that address behavioral changes aimed to keep calorie intake in balance with physical activity. The recommendations include:

• **Focus on the total number of calories consumed.** Reducing calorie intake improves health and aids in weight management.

• **Monitoring food and caloric intake.** Being more aware of the calories in foods and beverages by reading the Nutrition Facts panel is helpful for consumers to monitor intake. Vigilant monitoring of food and caloric intake assists in weight management.

• **When eating out, choose smaller portions or lower-calorie options.** As mentioned in an earlier section of this chapter, eating out more often, especially at fast food restaurants, contributes to weight gain. The *Dietary Guidelines* advise people that when they are eating out to order smaller portions, share meals when possible, or take home part of the meal.

• **Prepare, serve, and consume smaller portions of foods and beverages, especially those high in calories.** Having less on your plate helps you eat less.

• **Eat a nutrient-dense breakfast.** The old adage that “breakfast is the most important meal of the day” holds true when you consider that not eating breakfast is associated with higher body weights, especially among children and adolescents. Moreover, eating a nutrient-dense breakfast has in some scientific studies been shown to stimulate weight loss.

• **Limit screen time.** In children, adolescents, and adults, the sedentary activities of watching television and spending time on the computer are linked to increased overweight and obesity. The *Dietary Guidelines* recommend children and adolescents spend no more than one to two hours daily watching television, playing electronic games, or using the computer (other than for homework).

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**Evidence-Based Physical Activity Recommendations**

The other part of the energy balance equation is physical activity. The *2010 Dietary Guidelines* are complemented by the *2008 Physical Activity Guidelines for Americans* issued by the Department of Health and Human Services in an effort to provide evidence-based guidelines for appropriate physical activity levels. The *2008 Physical Activity Guidelines* offer recommendations for fitness and health-related physical activity, including aerobic, muscle-strengthening, and bone-strengthening exercises.
provide guidance to Americans aged six and older about how to improve health and reduce chronic disease risk through physical activity. Increased physical activity has been found in scientific studies to lower the risk of heart disease, stroke, high blood pressure, Type 2 diabetes, colon, breast, and lung cancer, falls and fractures, depression, and dying early. Increased physical activity not only reduces disease risk, but also improves overall health by increasing cardiovascular and muscular fitness, increasing bone density and strength, improving cognitive function, and assisting in weight loss and weight maintenance. The key guidelines for adults are the following (those for pregnant women, children, and older people will be given elsewhere): US Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. 2008. Accessed October 8, 2011. http://www.health.gov/paguidelines/guidelines/chapter2.aspx.

- Even small amounts of activity are beneficial to your health.
- More substantial health benefits are obtained by doing at least two hours and thirty minutes per week of moderate-intensity, or one hour and fifteen minutes per week of vigorous-intensity aerobic physical activity, or an equivalent combination thereof. Aerobic activity has better benefits if performed for at least ten minutes at a time, spread throughout the week.
- More extensive health benefits occur when moderate aerobic physical activity is increased to five hours per week of moderate-intensity, or to two hours and thirty minutes of vigorous-intensity aerobic physical activity, or a combination thereof. Additional health benefits are gained by going beyond these recommended amounts of physical activity.
- Muscle-strengthening activities at moderate or high intensity involving all major muscle groups two or more days per week provide additional health benefits to aerobic exercise.


Table \( \PageIndex{1} \): Moderate and Vigorous Physical Activities

<table>
<thead>
<tr>
<th>Moderate Activities</th>
<th>Vigorous Activities</th>
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<tbody>
<tr>
<td>Ballroom/line dancing</td>
<td>Aerobic dance</td>
</tr>
<tr>
<td>Biking on level ground</td>
<td>Biking (more than 10 miles per hour)</td>
</tr>
<tr>
<td>Canoeing</td>
<td>Heavy gardening (digging, hoeing)</td>
</tr>
<tr>
<td>Gardening</td>
<td>Hiking uphill</td>
</tr>
<tr>
<td>Baseball, softball, volleyball</td>
<td>Fast dancing</td>
</tr>
<tr>
<td>Tennis (doubles)</td>
<td>Jumping rope</td>
</tr>
<tr>
<td>Walking briskly</td>
<td>Martial arts (karate)</td>
</tr>
<tr>
<td>Water aerobics</td>
<td>Race walking</td>
</tr>
<tr>
<td>Using hand cyclers</td>
<td>Jogging or running</td>
</tr>
<tr>
<td>Using hand cyclers</td>
<td>Sports with running (basketball, hockey, soccer)</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Moderate Activities</th>
<th>Vigorous Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Swimming laps</td>
</tr>
<tr>
<td></td>
<td>Tennis (singles)</td>
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<tr>
<td></td>
<td>Ice hockey</td>
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http://www.health.gov/paguidelines/

Interactive \(\PageIndex{1}\) 

To get started on ramping up your physical activity or following a new exercise program use the toolkit, “Be Active Your Way” available from HHS: http://www.health.gov/paguidelines/adultguide/activeguide.aspx.

Campaigns for a Healthy-Weight America

On a national level, strategies addressing overweight and obesity in the past have not been all that successful as obesity levels continue to climb. However, in the recent past (2007–2011) several newly created initiatives and organizations are actively reinforcing strategies aimed to meet the challenge of improving the health of all Americans.

In 2010 the national campaign to reduce obesity was reinforced when First Lady Michelle Obama launched the “Let’s Move” initiative, which has the goal of “solving the challenge of childhood obesity within a generation so that children born today will reach adulthood at a healthy weight.” The White House, Office of the First Lady. “First Lady Michelle Obama Launches Let’s Move: America’s Move to Raise a Healthier Generation of Kids.” February 9, 2010. 
http://www.whitehouse.gov/the-press-office/first-lady-michelle-obama-launches -lets-move-americas-move-raise-a-healthier-genera. Another campaign, “Campaign to End Obesity,” was recently established to try to enable more Americans to eat healthily and be active by bringing together leaders from academia and industry, as well as public health policy-makers in order to create policies that will reverse the obesity trend and its associated diseases. It remains to be seen whether these new initiatives will finally help improve American health.
The “Small-Change” Approach

Currently, most people are not obese in this country. The gradual rise in overweight is happening because, on average, people consume slightly more calories daily than they expend, resulting in a gradual weight gain of one to two pounds a year. In 2003 the idea was first published that promoting small lifestyle changes to reduce weight gain occurring over time in all age groups may better reduce obesity rates in the American population. Hill, J. O. “Can a Small-Changes Approach Help Address the Obesity Epidemic? A Report of the Joint Task Force of the American Society for Nutrition, Institute of Food Technologists, and International Food Information Council.” *Am J Clin Nutr* 89, no. 2 (2009): 477–84. [http://www.ajcn.org/content/89/2/477.long](http://www.ajcn.org/content/89/2/477.long). Scientific studies have demonstrated that asking people to increase the number of steps they take each day while providing them with pedometers that count the steps they take each day successfully prevented weight gain. A “small-changes” study published in the October 2007 issue of *Pediatrics* evaluated whether families that made two small lifestyle changes, which were to walk an additional two thousand steps per day and to eliminate 100 kilocalories per day from their typical diet by replacing dietary sugar with a noncaloric sweetener, would prevent weight gain in overweight children. Rodearmel, S. J. et al. “Small Changes in Dietary Sugar and Physical Activity As an Approach to Preventing Excessive Weight Gain: The America on the Move Family Study.” *Pediatrics* 120, no. 4 (2007): e869–79. [http://pediatrics.aappublications.org/content/120/4/e869.long](http://pediatrics.aappublications.org/content/120/4/e869.long). The results of this study were that a higher percentage of children who made the small changes maintained or reduced their BMI in comparison to children of families given a pedometer but not asked to also make physical activity or dietary changes. Rodearmel, S. J. et al. “Small Changes in Dietary Sugar and Physical Activity As an Approach to Preventing Excessive Weight Gain: The America on the Move Family Study.” *Pediatrics* 120, no. 4 (2007): e869–79.
Several more studies funded by the National Institutes of Health and USDA are ongoing and are evaluating the effectiveness of the “small-changes” approach in reducing weight gain.

In 2009, a report of the Joint Task Force of the American Society for Nutrition, Institute of Food Technologists, and International Food Information Council proposed that the “small-changes” approach when supported by the community, industry, and governmental levels will be more effective than current strategies in gradually reducing the obesity rate in America.


**Key Takeaways**

- Successful weight loss is defined as when individuals intentionally lose at least 10 percent of their body weight and keep it off for at least one year.
- Although there is a great variety of approaches to achieve successful weight loss most report that it involves adhering to a low-calorie, low-fat diet and doing high levels of activity (about one hour of exercise per day).
- The 2015 Dietary Guidelines for Americans recommendations are based on scientific evidence.
- The other part of the energy balance equation is physical activity. The 2015 Dietary Guidelines were complemented by the 2008 Physical Activity Guidelines for Americans issued by the HHS in an effort to provide evidence-based guidelines for appropriate physical activity levels.
- On a national level, strategies addressing overweight and obesity in the past have not been all that successful as obesity levels continue to climb. However, in the recent past (2007–2011) several newly created initiatives and organizations are actively reinforcing strategies that aim to meet the challenge of improving the health of all Americans.

**Discussion Starters**

1. Discuss ways to address the childhood obesity problem in your own community.
2. Calculate your EER by using the formula in this chapter and determine whether your average daily intake of calories falls below, meets, or exceeds your EER.