

Nutrition

LEARNING OBJECTIVES

After completing the study of this concept, you will be able to:

- ▶ Apply basic guidelines for healthy eating.
- ▶ List and apply dietary recommendations for carbohydrates, fats, proteins, vitamins, minerals, and water.
- ▶ Interpret and use food labels to make healthy decisions.
- ▶ Describe and incorporate sound eating practices.
- ▶ Describe and apply nutrition guidelines for active people and those interested in performance (e.g., sports).
- ▶ Analyze your diet to determine nutrient quality.
- ▶ Compare nutritional quality of various foods.



The amount and kinds of food you eat affect your health and wellness.

The importance of good nutrition for optimal health is well established. Eating patterns have been related to four of the seven leading causes of death, and poor nutrition increases the risks for numerous diseases, including heart disease, obesity, stroke, diabetes, hypertension, osteoporosis, and many cancers (e.g., colon, prostate, mouth, throat, lung, and stomach). The American Cancer Society estimates that 35 percent of cancer risks are related to nutritional factors. In addition to helping avoid these health risks, proper nutrition can enhance the quality of life by improving appearance and increasing the ability to carry out work and leisure-time activity without fatigue.

Most people believe that nutrition is important but still find it difficult to maintain a healthy diet. One reason for this is that foods are usually developed, marketed, and advertised for convenience and taste rather than for health or nutritional quality. Another reason is that many individuals have misconceptions about what constitutes a healthy diet. Some of these misconceptions are propagated by commercial interests and so-called experts with less than impressive credentials. Other misconceptions are created by the confusing, and often contradictory, news reports about new nutrition research. In spite of the fact that nutrition is an advanced science, many questions remain unanswered. This concept reviews important national guidelines and recommendations for healthy eating. The significance of essential dietary nutrients is also described along with strategies for adopting and maintaining a healthy diet.

Guidelines for Healthy Eating

National dietary guidelines provide a sound plan for good nutrition. The U.S. Department of Agriculture (USDA) and the Department of Health and Human Services (DHHS) publishes a definitive report called the *Dietary Guidelines for Americans* to help consumers make healthier food choices. Federal law requires that these

guidelines be updated every 5 years to incorporate new research findings. The most recent USDA nutrition guidelines were published in 2010. Many other countries release similar sets of guidelines specific to their population (e.g., Health Canada's *Food Guide*).

The MyPlate model conveys a variety of key nutrition principles. The U.S. Dietary Guidelines are developed largely to help promote education about healthy eating. Many of the key elements of the guidelines are summarized in the MyPlate model (see Figure 1) which replaces the previous MyPyramid model as the primary symbol or icon of the program. The four colored areas represent the different food groups (fruits, grains, vegetables, and proteins) and a glass represents the dairy food group (including solid dairy products). The pyramid included the same categories, but the plate helps a person visualize the recommended allocations in a typical meal. Fruits and vegetables are emphasized in the MyPlate model (representing half of the plate) because they are high in nutrients and fiber and low in calories. The MyPlate model also emphasizes healthy food choices in each category. For example, they recommend low-fat dairy choices (e.g., shifting to skim milk) and making half of your grains “whole” (i.e., whole grains). Key principles highlighted in the MyPlate model are summarized to the left of Figure 1. Like the pyramid, the MyPlate image is widely promoted and displayed to help remind consumers about the key principles of good nutrition. There are a number of other resources available to help consumers apply these principles and guidelines at the MyPlate website (www.choosemyplate.gov).

National dietary guidelines provide suggestions for healthy eating. The current version of the national Dietary Guidelines for Americans emphasizes a “total diet” approach, which is defined as the “combination of foods and beverages that provide energy and nutrients, and constitute an individual’s complete dietary intake, on average,

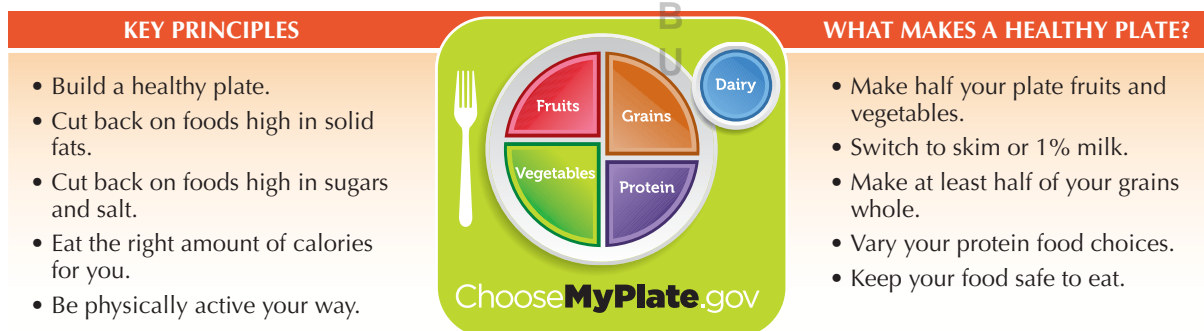


Figure 1 ▶ MyPlate presents a combination of nutrition guidelines and healthy food choices.

Source: Adapted from the USDA 2010, www.choosemyplate.gov

over time.” The information at the right of Figure 1 tells how to “build a plate” to meet the “total diet” goal. The report further describes other key components of a nutrient-dense total diet:

- *Eat the right amount of calories for you.* Effective weight control requires balancing energy intake with energy expenditure. The new guidelines encourage Americans to achieve their recommended nutrient intakes by consuming foods within a total diet that meets, but does not exceed, energy needs. This should be done using personal information such as age, gender, current body weight, and current physical activity levels. Studies indicate that Americans underestimate the number of calories they eat and only about 9 percent regularly keep track of the calories in the foods they eat.
- *Consume nutrient-dense foods.* Americans consume less than 20 percent of the recommended intakes for whole grains, less than 60 percent for vegetables, less than 50 percent for fruits, and less than 60 percent for milk and milk products. Consuming nutrient-dense foods improves the overall quality of the diet. Examples of nutrient-dense foods include vegetables, fruits, high-fiber whole grains, fat-free or lowfat milk and milk products, seafood, lean meat and poultry, eggs, soy products, nuts, seeds, and oils.
- *Reduce solid fats and added sugars (SoFAS).* Evidence indicates that solid fats and added sugars (SoFAS) contribute about 35 percent of total calories, leading to excessive intake of saturated fat and cholesterol and insufficient intake of dietary fiber and other nutrients. The guidelines recommend reducing consumption of SoFAS as an important diet strategy.
- *Reduce sodium intake.* Excessive sodium in the diet can increase blood pressure and lead to health problems.
- *Be physically active your way.* The USDA nutrition guidelines also emphasize the importance of daily physical activity (60 minutes each day) in energy balance. Most Americans overestimate the number of calories that they expend in activity.

Specific Dietary Reference Intakes (DRI) provide a target zone for healthy eating. About 45 to 50 nutrients in food are believed to be essential for the body’s growth, maintenance, and repair. These are classified into six categories: carbohydrates (and fiber), fats, proteins, vitamins, minerals, and water. The first three provide energy, which is measured in calories. Specific dietary recommendations for each of the six nutrients are presented later in this concept.

In the United States, guidelines specifying the nutrient requirements for good health are developed by the Food and Nutrition Board of the National Academy of Science’s Institute of Medicine. **Recommended Dietary**

Allowance (RDA) historically was used to set recommendations for nutrients, but the complexity of dietary interactions prompted the board to develop a more comprehensive and functional set of dietary intake recommendations. These broader guidelines, referred to as **Dietary Reference Intake (DRI)**, include RDA values when adequate scientific information is available and estimated **Adequate Intake (AI)** values when sufficient data aren’t available to establish a firm RDA. The DRI values also include **Tolerable Upper Intake Level (UL)**, which reflects the highest level of daily intake a person can consume without adverse effects on health (see Table 1). The guidelines make it clear that although too little of a nutrient can be harmful to health, so can too much. The distinctions are similar to the concept of the target zone used to prescribe exercise levels. The Recommended Dietary Allowance (RDA) or Adequate Intake (AI) values are analogous to the threshold levels (minimal amount needed to meet guidelines), while the Upper Limit values represent amounts that should not be exceeded.

A unique aspect of the DRI values is that they are categorized by function and classification in order to facilitate awareness of the different roles that nutrients play in the diet. Specific guidelines have been developed for B-complex vitamins; vitamins C and E; bone-building nutrients, such as calcium and vitamin D; micronutrients, such as iron and zinc; and the class of macronutrients that includes carbohydrates, fats, proteins, and fiber. Table 1 includes the DRI values (including the UL values) for most of these nutrients.

Nutrition recommendations are flexible, but also highly individualized. A unique aspect of the nutrition guidelines is that they highlight a variety of dietary patterns. The established DASH-style and Mediterranean-style dietary patterns were cited as examples of healthy diets because they have been well-supported in the scientific literature. The guidelines also referenced traditional Asian dietary patterns and vegetarian diets as

Recommended Dietary Allowance (RDA) Dietary guideline that specifies the amount of a nutrient needed for almost all of the healthy individuals in a specific age and gender group.

Dietary Reference Intake (DRI) Appropriate amounts of nutrients in the diet (AI, RDA, and UL).

Adequate Intake (AI) Dietary guideline established experimentally to estimate nutrient needs when sufficient data are not available to establish an RDA value.

Tolerable Upper Intake Level (UL) Maximum level of a daily nutrient that will not pose a risk of adverse health effects for most people.

Table 1 ▶ Dietary Reference Intake (DRI), Recommended Dietary Allowance (RDA), and Tolerable Upper Intake Level (UL) for Major Nutrients

	DRI/RDA			Function
	Males	Females	UL	
Energy and Macronutrients				
Carbohydrates (45–65%)	130 g	130 g	ND	Energy (only source of energy for the brain)
Fat (20–35%)	ND	ND	ND	Energy, vitamin carrier
Protein (10–35%)	.8 g/kg	.8 g/kg	ND	Growth and maturation, tissue formation
Fiber (g/day)	38 g/day*	25 g/day*	ND	Digestion, blood profiles
B-Complex Vitamins				
Thiamin (mg/day)	1.2	1.1	ND	Co-enzyme for carbohydrates and amino acid metabolism
Riboflavin (mg/day)	1.3	1.1	ND	Co-enzyme for metabolic reactions
Niacin (mg/day)	16	14	35	Co-enzyme for metabolic reactions
Vitamin B-6 (mg/day)	1.3	1.3	100	Co-enzyme for amino acid and glycogen reactions
Folate (µg/day)	400	400	1,000	Metabolism of amino acids
Vitamin B-12 (µg/day)	2.4	2.4	ND	Co-enzyme for nucleic acid metabolism
Pantothenic acid (mg/day)	5*	5*	ND	Co-enzyme for fat metabolism
Biotin (µg/day)	30*	30*	ND	Synthesis of fat, glycogen, and amino acids
Choline (mg/day)	550*	425*	3,500	Precursor to acetylcholine
Antioxidants and Related Nutrients				
Vitamin C (mg/day)	90	75	2,000	Co-factor for reactions, antioxidant
Vitamin E (mg/day)	15	15	1,000	Undetermined, mainly antioxidant
Selenium (µg/day)	55	55	400	Defense against oxidative stress
Bone-Building Nutrients				
Calcium (mg/day)	1,000*	1,000*	2,500	Muscle contraction, nerve transmission
Phosphorus (mg/day)	700	700	3,000	Maintenance of pH, storage of energy
Magnesium (mg/day)	400–420	310–320	350	Co-factor for enzyme reactions
Vitamin D (µg/day)	5*	5*	50	Maintenance of calcium and phosphorus levels
Fluoride (mg/day)	4*	3*	10	Stimulation of new bone formation
Micronutrients and Other Trace Elements				
Vitamin K (µg/day)	120*	90*	ND	Blood clotting and bone metabolism
Vitamin A (µg/day)	900	700	3,000	Vision, immune function
Iron (mg/day)	8	18	45	Component of hemoglobin
Zinc (mg/day)	11	8	40	Component of enzymes and proteins

Note: These values reflect the dietary needs generally for adults aged 19–50 years. Specific guidelines for other age groups are available from the Food and Nutrition Board of the National Academy of Sciences (www.iom.edu). Values labeled with an asterisk (*) are based on Adequate Intake (AI) values rather than the RDA values; ND = not determined.

examples of ways to achieve dietary goals. The new guidelines emphasize that a healthful total diet is not a rigid prescription but rather a flexible approach to eating that can be adjusted for a variety of individual tastes and preferences. The flexibility for individual eating patterns is also reflected in the wide ranges provided for various DRI categories. The recommended DRI values for carbohydrates range from 45 to 65 percent. The DRI values for protein range from 10 to 35 percent, while the DRI values for fat range from 20 to 35 percent. These ranges are much broader than recommendations from the USDA in previous versions of the dietary guidelines. According to the Institute of Medicine (IOM), this broader range was established to “help people make healthy and more realistic choices based on their own food preferences.” Figure 2 illustrates the recommended DRI distributions for carbohydrates, fats, and proteins.

The quantity of nutrients recommended varies with age and other considerations; for example, young children need more calcium than adults and pregnant women, and postmenopausal women need more calcium than other women. Accordingly, DRIs, including RDAs, have been established for several age/gender groups. In this book, the values are appropriate for most adult men and women. The USDA has a website that calculates personally determined DRI values. You can enter data such as your gender, age, height, weight, and activity level, and the calculator determines your DRI values. (Search “USDA DRI calculator” on the Internet.)



Dietary Recommendations for Carbohydrates

Complex carbohydrates should be the principal source of calories in the diet. Carbohydrates have gotten a bad rap in recent years due to the hype associated

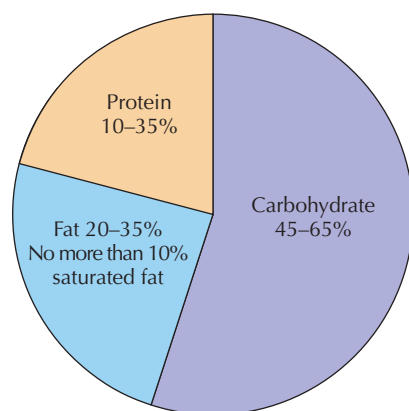


Figure 2 ► Dietary Reference Intake values.

with low-carbohydrate diets. Carbohydrates have been unfairly implicated as a cause of obesity. The suggestion that they cause insulin to be released and that insulin, in turn, causes the body to take up and store excess energy as fat is overly simplistic and doesn't take into account differences in types of carbohydrates. Simple sugars (such as sucrose, glucose, and fructose) found in candy and soda lead to quick increases in blood sugar and tend to promote fat deposition. Complex carbohydrates (e.g., bread, pasta, rice), on the other hand, are broken down more slowly and do not cause the same effect on blood sugar. They contribute valuable nutrients and fiber in the diet and should constitute the bulk of a person's diet. Lumping simple and complex carbohydrates together is not appropriate, since they are processed differently and have different nutrient values.

A number of low-carb diet books have used an index known as the glycemic index (GI) as the basis for determining if foods are appropriate in the diet. Foods with a high GI value produce rapid increases in blood sugar, while foods with a low GI value produce slower increases. While this seems to be a logical way to categorize carbohydrates, it is misleading, since it doesn't account for the amount of carbohydrates in different servings of a food. A more appropriate indicator of the effect of foods on blood sugar levels is called the glycemic load. Carrots, for example, are known to have a very high GI value, but the overall glycemic load is quite low. The carbohydrates from most fruits and vegetables exhibit similar properties.

Despite the intuitive and logical appeal of this classification system, neither the glycemic index nor glycemic load have been consistently associated with body weight. Evidence also indicates no difference on weight loss between high glycemic index and low glycemic index diets. There is some evidence linking glycemic load to a higher risk for diabetes but no associations with cancer risk.

Additional research is needed, but excess sugar consumption appears to be problematic only if caloric intake is larger than caloric expenditure. Carbohydrates are the body's preferred form of energy for physical activity, and the body is well equipped for processing extra carbohydrates. Athletes and other active individuals typically have no difficulty burning off extra energy from carbohydrates. Sugar consumption, among people with an adequate diet, is also not associated with major chronic diseases.

Reducing dietary sugar can help reduce risk of obesity and heart disease. Although sugar consumption has not been viewed as harmful, people who consume high amounts of sugar also tend to consume excess calories. The new dietary guidelines clearly recommend decreasing consumption of added sugars to reduce risk of excess calorie consumption and weight gain. The American Heart Association also endorsed this position in a

scientific statement entitled “Dietary Sugars Intake and Cardiovascular Health.”

The document notes that excessive consumption of sugars (sugars added to foods and drinks) contributes to overconsumption of discretionary calories. Among Americans, the current average daily sugars consumption is 355 calories per day (22.2 teaspoons) as opposed to 279 calories in 1970. Soft drinks and sugar-sweetened beverages are the primary sources of added sugars in the American diet. The AHA’s scientific statement recommends no more than 100 calories of added sugars for most women and not more than 150 calories for most men. A typical 12-ounce sweetened soft drink contains 150 calories, mostly sugar. Reducing consumption of sugar-sweetened beverages is a simple, but important, diet modification.

Increasing consumption of dietary fiber is important for overall good nutrition and health. Diets high in complex carbohydrates and **fiber** are associated with a low incidence of coronary heart disease, stroke, and some forms of cancer. Long-term studies indicate that high-fiber diets may also be associated with a lower risk for diabetes mellitus, diverticulosis, hypertension, and gallstone formation. It is not known whether these health benefits are directly attributable to high dietary fiber or other effects associated with the ingestion of vegetables, fruits, and cereals.

A position statement from the American Dietetics Association summarizes the health benefits and importance of fiber in a healthy diet. It indicates that high-fiber diets provide bulk, are more satiating, and are linked to lower body weights. It also points out that a fiber-rich diet often has a lower fat content, is larger in volume, and is richer in micronutrients, all of which have beneficial health effects. Evidence for health benefits has become strong enough that the FDA has stated that specific beneficial health claims can be made for specific dietary fibers. The National Cholesterol Education Program also recommends dietary fiber as part of overall strategies for treating high cholesterol in adults.

In the past, clear distinctions were made between soluble fiber and insoluble fiber because they appeared to provide separate effects. Soluble fiber (typically found in fruits and oat bran) was more frequently associated with improving blood lipid profiles, while insoluble fiber (typically found in grains) was mainly thought to help speed up digestion and reduce risks for colon and rectal cancer. Difficulties in measuring these compounds in typical mixed diets led a National Academy of Sciences panel to recommend eliminating distinctions between soluble and insoluble fibers and instead to use a broader definition of fiber.

Currently, few Americans consume the recommended amounts of dietary fiber. The average intake of dietary fiber is about 15 g/day, which is much lower than the recommended 25 to 35 g/day. Foods in the typical American

diet contain little, if any, dietary fiber, and servings of commonly consumed grains, fruits, and vegetables contain only 1 to 3 g of dietary fiber. Therefore, individuals have to look for ways to ensure that they get sufficient fiber in their diet. Manufacturers are allowed to declare a food as a “good source of fiber” if it contains 10 percent of the recommended amount (2.5 g/serving) and an “excellent source of fiber” if it contains 20 percent of the recommended amount (5 g/serving). Because fiber has known health benefits, the new dietary guidelines encourage consumers to select foods high in dietary fiber, such as whole-grain breads and cereals, legumes, vegetables, and fruit, whenever possible.

Fruits and vegetables are essential for good health.

Fruits and vegetables are a valuable source of dietary fiber, are packed with vitamins and minerals, and contain many additional phytochemicals, which may have beneficial effects on health. The International Agency of Research on Cancer (IARC), an affiliate of the World Health Organization, did a comprehensive review on the links between dietary intake of fruits and vegetables and cancer. It concluded that both human studies and animal experimental studies “indicate that a higher intake of fruits and vegetables is associated with a lower risk of various types of cancer.” The clearest evidence of a cancer-protective effect from eating more fruits is for stomach,

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Plan ahead for healthy, low-fat snacks when on the run.

lung, and esophageal cancers. A higher intake of vegetables is also associated with reduced risks for cancers of the esophagus and colon-rectum. This evidence—plus the evidence of the beneficial effects of fruits and vegetables on other major diseases, such as heart disease—indicates that individuals should strive to increase their intake of these foods. Reports from the 2010 Dietary Guidelines Advisory Committee indicate that beneficial effects on health appear to be linked to a minimum of five servings of fruits and vegetables per day. Additional benefits were noted at even higher consumption levels. These findings contributed to the increased emphasis being placed on a plant-based diet in the new dietary guidelines.

Follow the recommendations to assure healthy amounts of carbohydrates in the diet. The following list summarizes key strategies to achieve dietary guidelines for carbohydrate content in the diet:

- Consume a variety of fiber-rich fruits and vegetables.
- Select whole-grain foods when possible.
- Choose and prepare foods and beverages with little added sugars or caloric sweeteners.

connect
VIDEO 2

Dietary Recommendations for Fat

Fat is an essential nutrient and an important energy source. Humans need some fat in their diet because fats are carriers of vitamins A, D, E, and K. They are a source of essential linoleic acid, they make food taste better, and they provide a concentrated form of calories, which serve as a vital source of energy during moderate to vigorous exercise. Fats have more than twice the calories per gram as carbohydrates.

There are several types of dietary fat. **Saturated fats** come primarily from animal sources, such as red meat, dairy products, and eggs, but they are also found in some vegetable sources, such as coconut and palm oils. There are two basic types of **unsaturated fats**: polyunsaturated and monounsaturated. Polyunsaturated fats are derived principally from vegetable sources, such as safflower, cottonseed, soybean, sunflower, and corn oils (omega-6 fats), and cold-water fish sources, such as salmon and mackerel (omega-3 fats). Monounsaturated fats are derived primarily from vegetable sources, including olive, peanut, and canola oil.

Saturated fat is associated with an increased risk for disease, but polyunsaturated and monounsaturated fats can be beneficial. Excessive total fat in the diet (particularly saturated fat) is associated with atherosclerotic cardiovascular diseases and breast, prostate, and



Being an informed and educated consumer can help you make healthier food choices.

colon cancer, as well as obesity. Excess saturated fat in the diet contributes to increased cholesterol and increased low-density lipoprotein (LDL) cholesterol in the blood. For this reason, no more than 10 percent of your total calories should come from saturated fats.

Unsaturated fats are generally considered to be less likely to contribute to cardiovascular disease, cancer, and obesity than saturated fats. Polyunsaturated fats can

Fiber Indigestible bulk in foods that can be either soluble or insoluble in body fluids.

Saturated Fats Dietary fats that are usually solid at room temperature and come primarily from animal sources.

Unsaturated Fats Monounsaturated or polyunsaturated fats that are usually liquid at room temperature and come primarily from vegetable sources.

reduce total cholesterol and LDL cholesterol, but they also decrease levels of high-density lipoprotein (HDL) cholesterol. Omega-3 fatty acids (a special type of polyunsaturated fat found in cold-water fish) have received a lot of attention due to their potential benefits in reducing the risk of cardiovascular disease. A plant source of omega-3 fatty acids (alpha-linolenic acid) found in walnuts, flaxseed, and canola oil may have similar benefits.

Monounsaturated fats have been shown to decrease total cholesterol and LDL cholesterol without an accompanying decrease in the desirable HDL cholesterol. Past dietary guidelines recommended a diet low in saturated fat and cholesterol but moderate in total fat, making it clear that excess saturated fat is the main concern and that some fat is necessary in the diet. Fat should account for 20 to 35 percent of calories in the diet, with no more than 10 percent of total calories from saturated fat. The remaining fat should come from plant-based sources, especially monounsaturated fats.

Trans fats and hydrogenated vegetable oils should be minimized in the diet.

For decades, the public has been cautioned to avoid saturated fats and foods with excessive cholesterol. Many people switched from using butter to margarine because margarine is made from vegetable oils that are unsaturated and contain no cholesterol. The hydrogenation process used to convert oils into solids, however, is known to produce **trans fats**, which are just as harmful as saturated fats, if not more so. Trans fats are known to cause increases in LDL cholesterol and have been shown to contribute to the buildup of atherosclerotic plaque. Because of these effects, it is important to try to minimize consumption of trans fats in your diet.

The FDA requires trans fat content to be listed on the nutrition facts labels so that consumers can be more aware of foods high in this fat. The requirement to post trans fat content on food labels has prompted companies to look for ways to remove excess trans fats from products. Lay's uses cottonseed oil instead of sunflower oil to help eliminate trans fats from Fritos, Tostitos, and Cheetos. A number of margarines are also available with little or no trans fat (e.g., Smart Balance). These changes and the increased awareness about trans fat appear to have had a positive effect. The CDC reports that levels of trans fat have declined in the population by over 58 percent. These findings provide an effective example of how food policy (e.g., labeling) has prompted positive changes in food quality and food access. The Dietary Guidelines continue to recommend that consumers keep trans fat consumption as low as possible by limiting solid fats and foods that contain synthetic sources of trans fats. Foods that have trace amounts of trans fat (i.e., those containing less than .5 g of trans fat per serving) may still be listed as having no trans fat. Therefore, you should also look for foods that contain little or no hydrogenated vegetable oil.

Fat substitutes and neutraceuticals in food products may reduce fat consumption and lower cholesterol.

Olestra is a synthetic fat substitute that passes through the gastrointestinal system without being digested. Thus, foods prepared with Olestra have fewer calories. For example, a chocolate chip cookie prepared in a normal way would have 138 calories, but an Olestra cookie would have 63. Some consumer groups warn that the promotion of Olestra-containing products may make individuals more likely to snack on less energy-dense snack foods. They also express concern that Olestra inhibits absorption of many naturally occurring antioxidants that have been shown to have many beneficial effects on health. Early warnings were required on the product because of fear that it caused gastric problems. These warnings were removed by the FDA soon after Olestra was introduced.

Several other new products offer potential to modify the amount and effect of dietary fat in our diets. The first is a naturally occurring compound included in several margarines (Benecol and Take Control). The active ingredient in this compound (sitostanol ester) comes from pine trees and has been shown to reduce total and LDL cholesterol in the blood. Several clinical trials have confirmed that these margarines are both safe and effective in lowering cholesterol levels. The products must be used regularly to be effective and may be useful only in individuals who have high levels of cholesterol. Food products that contain these medically beneficial compounds are often referred to as *neutraceuticals*, or *functional foods*, because they are a combination of pharmaceuticals and food.

Follow the recommendations to assure healthy amounts of fat in the diet.

The 2010 Dietary Guidelines Advisory Committee emphasized that significant health benefits can be achieved by making several changes in consumption of dietary fats and cholesterol.

- Limit saturated fatty acid intake to less than 10 percent of total calories, with continued gradual reductions down to 7 percent. Substitute food sources of mono- or polyunsaturated fatty acids.
- Limit dietary cholesterol to less than 300 mg per day (200 mg per day for persons with or at high risk for cardiovascular disease or Type II diabetes).
- Avoid trans fatty acids from processed foods (except the small amounts that occur naturally from ruminant sources in animals).
- Limit cholesterol-raising fats (saturated fats exclusive of stearic acid and trans fatty acids) to less than 5 to 7 percent of energy.
- Consume two servings of seafood per week to provide healthy



amounts of omega-3 fatty acids from marine sources (e.g., docosahexaenoic acid [DHA] and eicosapentaenoic acid [EPA]).

Dietary Recommendations for Proteins

Protein is the basic building block for the body, but dietary protein constitutes a relatively small amount of daily caloric intake. Proteins are often referred to as the building blocks of the body because all body cells are made of protein. More than 100 proteins are formed from 20 different **amino acids**. Eleven of these amino acids can be synthesized from other nutrients, but 9 **essential amino acids** must be obtained directly from the diet. One way to identify amino acids is the *-ine* at the end of their name. For example, arginine and lysine are two of the amino acids. Only 3 of the 20 amino acids do not have the *-ine* suffix. They are aspartic acid, glutamic acid, and tryptophan.

Certain foods, called complete proteins, contain all of the essential amino acids, along with most of the others. Examples are meat, dairy products, and fish. Incomplete proteins contain some, but not all, of the essential amino acids. Examples include beans, nuts, and rice.

Protein should account for at least 10 percent of daily caloric consumption, which can be met easily with complete (animal) or incomplete (vegetable) sources of protein. A person consuming a typical 2,000-calorie diet should consume approximately 200 calories from protein. Protein provides 4 calories per gram, so minimum daily protein needs are as low as 50 grams per day. Figure 3 shows the relative protein content of various foods.

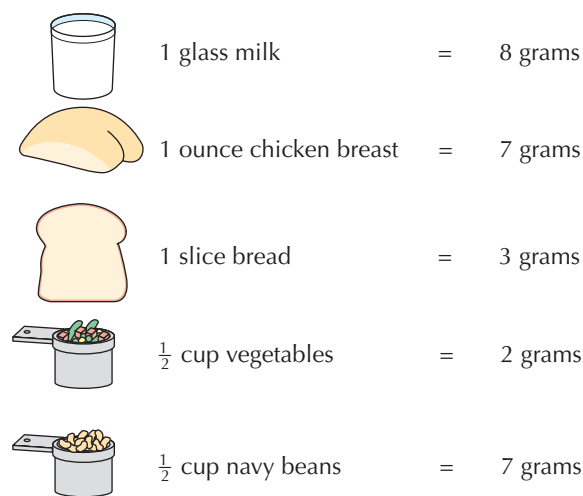


Figure 3 ► Protein content of various foods.
Source: Williams, M.

To provide more flexibility, dietary guidelines indicate that protein can account for as much as 35 percent of caloric intake. Experts, however, agree that there are no known benefits and some possible risks associated with consuming excess protein, particularly animal protein. High-protein diets are damaging to the kidneys, as the body must process a lot of extra nitrogen. Excessive protein intake can also lead to urinary calcium loss, which can weaken bones and lead to osteoporosis.

People who eat a variety of foods, including meat, dairy, eggs, and plants rich in protein, virtually always consume more protein than the body needs. Because of the negative consequences associated with excess intake, dietary supplements containing extra protein are not recommended for the general population.

Vegetarian diets provide sufficient protein and may offer health benefits. Vegetarian diets provide ample sources of protein as long as a variety of protein-rich food sources are included in the diet. According to the American Dietetics Association, well-planned vegetarian diets “are appropriate for all stages of the life cycle, including during pregnancy, and lactation,” and can “satisfy the nutrient needs of infants, children, and adolescents.” You can get enough protein as long as the variety and amounts of foods consumed are adequate. **Vegans** must supplement the diet with vitamin B-12 because the only source of this vitamin is food from animal sources. **Lacto-ovo vegetarians** do not have the same concerns because vitamin B-12 can be obtained in dairy products.

There is an increased recognition of the importance of whole grains, fruits, and vegetables in the diet, but vegetarian diets based primarily on plants are still uncommon. A Harris poll estimates that approximately 3 percent of Americans are vegetarian (.5 percent vegan). However, an additional 10 percent of the population indicates they

Trans Fats Fats that result when hydrogen is added to liquid oil to make it more solid. Hydrogenation transforms unsaturated fats so that they take on the characteristics of saturated fats, as is the case for margarine and shortening.

Amino Acids The 20 basic building blocks of the body that make up proteins.

Essential Amino Acids The nine basic amino acids that the human body cannot produce and that must be obtained from food sources.

Vegans Strict vegetarians, who exclude not only all forms of meat from the diet but also dairy products and eggs.

Lacto-Ovo Vegetarians Vegetarians who include dairy and eggs in the diet.

follow a vegetarian-inclined diet. Research has widely supported the health benefits associated with vegetarian diets and trends suggest that it is growing in popularity.

An increasing array of soy foods are available to provide alternative sources of protein. Soybeans and soy-based foods are a high-quality source of protein. They may also have beneficial effects on blood pressure and cholesterol levels, possibly contributing to reductions in risk for coronary heart disease. Soy-based foods contain compounds called isoflavones, a phytoestrogen that contributes to bone health, immune function, and maintenance of menopausal health in women. A variety of soy-based food products are commercially available as alternatives to traditional meat foods. Common options include tofu, tempeh, soy milk, or textured vegetable (soy) protein. Grocery stores carry a variety of other meatless products based on soy (e.g., veggie burgers). Soy foods that contain at least 6.25 grams per serving can be labeled with FDA-approved health claims.

Follow the recommendations to assure healthy amounts of protein in the diet. The following list summarizes some key dietary recommendations for protein:

- Of the three major nutrients that provide energy, protein should account for the smallest percentage of total calories consumed (10 to 35 percent).
- Protein in the diet should meet the RDA of 0.8 gram per kilogram (2.2 pounds) of a person's weight (about 54 grams for a 150-pound person).
- People on low-calorie diets need to consume a higher percentage of protein in the diet. In contrast, people consuming a lot of calories need a lower percentage.
- Vegetarians must eat a combination of foods to assure an adequate intake of essential amino acids. Vegans should supplement their diet with vitamin B-12.
- Excess protein can be harmful to the kidneys. Protein in the diet should not exceed twice the RDA (1.6 grams per kilogram of body weight).
- Dietary supplements of protein, such as tablets and powders, are not recommended.

Dietary Recommendations for Vitamins

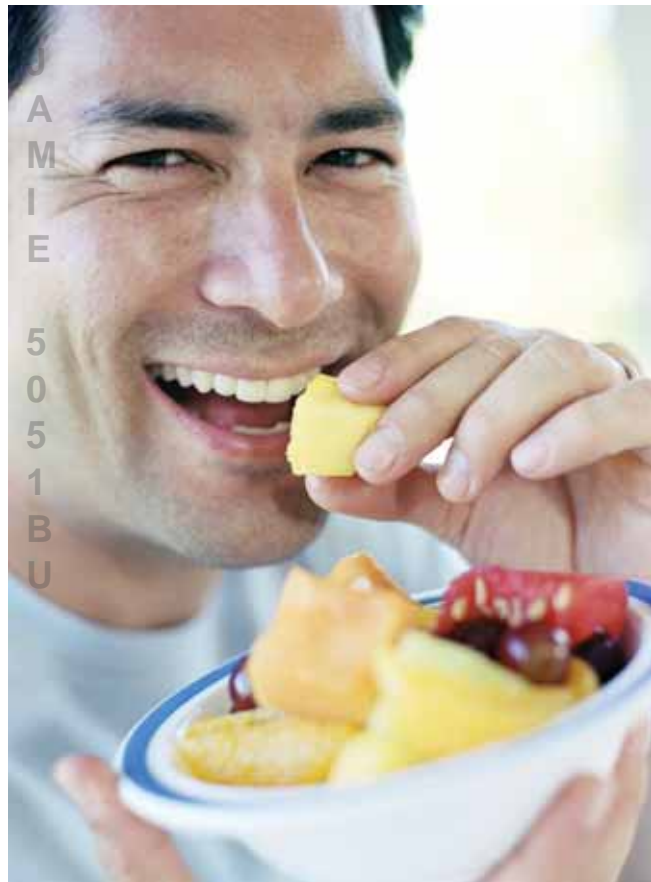
Adequate vitamin intake is necessary for good health and wellness, but excessive vitamin intake is not necessary and can be harmful. Vitamins serve a variety of functions within the body. For example, they serve as co-enzymes for metabolism of different nutrients, contribute to the regulation of energy stores, and assist in immune function. Some vitamins (e.g.,

B-complex vitamins and vitamin C) are water soluble and are excreted in urine. These vitamins must be consumed on a daily basis. Other vitamins, such as A, D, E, and K, are fat soluble. These vitamins are stored over time, so daily doses of these vitamins are not necessary. Excess consumption of fat-soluble vitamins can actually build to toxic levels and harm cell function and health. The specific DRI values (minimal amounts) for some of the more important vitamins are shown in Table 1, along with the Tolerable Upper Intake Levels (maximum amounts).

Some vitamins act as antioxidants, but health benefits may depend on other compounds in foods.

Carotenoid-rich foods, such as carrots and sweet potatoes, contain high amounts of vitamin A and high amounts of beta-carotene. Diets high in vitamin C (e.g., citrus fruits) and vitamin E (e.g., green leafy vegetables) are also associated with reduced risk of cancer. Vitamin E has also been associated with reduced risk of heart disease.

Vitamins A, C, and E (as well as beta-carotene) act as **antioxidants** within the body. Antioxidants are substances that are thought to inactivate free radicals (molecules



Fruits and vegetables contain vitamins as well as health-promoting phytochemicals.

that can cause cell damage and health problems). For this reason, health benefits have been attributed to antioxidant properties. However, several large-scale studies have shown no benefit (and possible risks) from taking beta-carotene supplements. Another study of over 20,000 people failed to find health benefits associated with consumption of a daily mixture of vitamin E, vitamin C, and beta-carotene. These results were difficult for scientists to interpret, but it is now known that there may be other beneficial substances in foods that contribute health benefits.

As mentioned earlier, the designation of “*functional foods*” has been coined to refer to foods or dietary components that may provide a health benefit beyond basic nutrition. Fruits and vegetables, for example, are loaded with a variety of powerful phytochemicals that have been shown to have potential health benefits (see Table 2). The relative importance to health of each compound is difficult to determine because the compounds may act synergistically with each other (and with antioxidant vitamins) to promote positive outcomes.

Other examples of functional foods include the beneficial types of fiber and beta glucan in whole grains, the isoflavones in soy products, the omega-3 fatty acids in cold-water fish, and the probiotic yeasts and bacteria in yogurts and other cultured dairy products. Most vitamins and minerals are also classified as functional foods, since they have functions beyond their primary role in basic nutrition. The examples listed here and in Table 2 should not be viewed as “magic bullets,” since research is still accumulating on these compounds. In general, diets containing a lot of fruits and vegetables and whole grains (as recommended in MyPlate) will provide adequate intake of vitamins and other healthy food components.

Fortification of foods has been used to ensure adequate vitamin intake in the population. National policy requires many foods to be fortified. For example, milk is fortified with vitamin D, low-fat milk with vitamins A and D, and margarine with vitamin A. These foods were selected because they are common food sources for growing children. Many common grain products are fortified with folic acid because low folic acid levels increase the risk for birth defects in babies. Fortification is considered essential, since more than half of all women do not consume adequate amounts of folic acid during the first months of gestation (before most women even realize they are pregnant). Research clearly demonstrates the value of fortification. One study showed that neural tube defects are 19 percent less likely today than in 1996 (prior to fortification). Though other factors may have contributed to this decline, the study supports the benefits of fortification for improving nutritional intakes.

Table 2 ► Examples of Functional Foods and Potential Benefits

Carotenoids	Potential Benefits
<i>Beta-carotene</i> : found in carrots, pumpkin, sweet potato, cantaloupe	May bolster cellular antioxidant defenses
<i>Lutein, zeaxanthin</i> : found in kale, collards, spinach, corn, eggs, citrus	May contribute to healthy vision
<i>Lycopene</i> : Found in tomatoes, watermelon, red/pink grapefruit	May contribute to prostate health
Flavonoids	Potential Benefits
<i>Anthocyanins</i> : found in berries, cherries, red grapes	May bolster antioxidant defenses; maintain brain function and heart health
<i>Flavanones</i> : found in citrus foods	
<i>Flavonols</i> : found in onions, apples, tea, broccoli	
Isothiocyanates	Potential Benefits
<i>Proanthocyanidins</i> : found in cranberries, cocoa, apples, strawberries, grapes, peanuts	May contribute to maintenance of urinary tract health and heart health
<i>Sulforaphane</i> : found in cauliflower, broccoli, brussels sprouts, cabbage, kale, horseradish	May enhance detoxification of undesirable compounds; bolsters cellular antioxidant defenses
Phenolic Acids	Potential Benefits
<i>Caffeic/ferulic acids</i> : found in apples, pears, citrus fruits, some vegetables, coffee	May bolster cellular antioxidant defenses; may contribute to maintenance of healthy vision
Sulfides/Thioles	Potential Benefits
<i>Sulfides</i> : found in garlic, onions, leeks, scallions	May enhance detoxification of undesirable compounds; may contribute to maintenance of heart health and healthy immune function
<i>Dithiolthiones</i> : found in cruciferous vegetables	

Taking a daily multiple vitamin supplement may be a good idea. Sometimes supplements are needed to meet specific nutrient requirements for specific groups. For example, older people may need a vitamin D supplement if they get little exposure to sunlight, and iron supplements

Antioxidants Vitamins that are thought to inactivate “activated oxygen molecules,” sometimes called free radicals. Free radicals may cause cell damage that leads to diseases of various kinds. Antioxidants may inactivate the free radicals before they do their damage.

are often recommended for pregnant women. Vitamin supplements at or below the RDA are considered safe; however, excess doses of vitamins can cause health problems. For example, excessively high amounts of vitamin C are dangerous for the 10 percent of the population who inherit a gene related to health problems. Excessively high amounts of vitamin D are toxic, and mothers who take too much vitamin A risk birth defects in unborn children.

In the past some medical groups recommended a daily multivitamin to insure adequate daily intake. However, national dietary guidelines specifically note that “For the general, healthy population, there is no evidence to support a recommendation for the use of multivitamin/mineral supplements in the primary prevention of chronic disease.” In spite of this recommendation, some people may choose to take a multivitamin/mineral supplement. (Guidelines are presented in Table 3.)

Follow the recommendations to assure healthy amounts of vitamins in the diet. Vitamins in the amounts equal to the RDAs should be included in the diet each day. The following guidelines will help you implement this recommendation:

- Eat a diet containing the recommended servings for carbohydrates, proteins, and fats.
- Consume extra servings of green and yellow vegetables, citrus and other fruits, and other nonanimal food sources high in fiber, vitamins, and minerals.

Table 3 ► Vitamin and Mineral Supplements

- Limit the use of supplements unless warranted because of a health problem or a specific lack of nutrients in the diet.
- If you decide supplementation is necessary, select a multivitamin/mineral supplement that contains micronutrients in amounts close to the recommended levels (e.g., “one-a-day”-type supplements).
- If your diet is deficient in a particular mineral (e.g., calcium or iron), it may be necessary to incorporate dietary sources or an additional mineral supplement as well, since most multivitamins do not contain the recommended daily amount of minerals.
- Choose supplements that provide between 50 and 100 percent of the AI or RDA, and avoid those that provide many times the recommended amount. The use of supplements that hype “megadoses” of vitamins and minerals can increase the risk for some unwanted nutrient interactions and possible toxic effects.
- Buy supplements from a reputable company and look for supplements that carry the U.S. Pharmacopoeia (USP) notation (www.usp.org).

Source: Manore.

- People with special needs should seek medical advice before selecting supplements and should inform medical personnel as to the amounts and content of all supplements (vitamin and other).

Dietary Recommendations for Minerals

Adequate mineral intake is necessary for good health and wellness, but excessive mineral intake is not necessary and can be harmful. Like vitamins, minerals have no calories and provide no energy for the body. They are important in regulating various bodily functions. Two particularly important minerals are calcium and iron. Calcium is important to bone, muscle, nerve, and blood development and function and has been associated with reduced risk for heart disease. Iron is necessary for the blood to carry adequate oxygen. Other important minerals are phosphorus, which builds teeth and bones; sodium, which regulates water in the body; zinc, which aids in the healing process; and potassium, which is necessary for proper muscle function.

RDAs are established to determine the amounts of each mineral necessary for healthy daily functioning. A sound diet provides all of the RDA for minerals. Evidence indicating that some segments of the population may be mineral-deficient has led to the establishment of health goals identifying a need to increase mineral intake for some people.

A National Institutes of Health (NIH) consensus statement indicates that a large percentage of Americans fail to get enough calcium in their diet and emphasizes the need for increased calcium—particularly for pregnant women, postmenopausal women, and people over 65, who need 1,500 mg/day, which is higher than previous RDA amounts. The NIH has indicated that a total intake of 2,000 mg/day of calcium is safe and that adequate vitamin D in the diet is necessary for optimal calcium absorption to take place. Though getting these amounts in a calcium-rich diet is best, calcium supplementation for those not eating properly seems wise. Many multivitamins do not contain enough calcium for some classes of people, so some may want to consider additional calcium. Check with your physician or a dietitian before you consider a supplement because individual needs vary.

Another concern is iron deficiency among very young children and women of childbearing age. Low iron levels may be a special problem for women taking birth control pills because the combination of low iron levels and birth control pills has been associated with depression and generalized fatigue. Eating the appropriate number of servings recommended in MyPlate provides all the minerals necessary for meeting the RDA for minerals.

Nutrition goals for the nation emphasize the importance of adequate servings of foods rich in calcium, such as green, leafy vegetables and milk products; adequate servings of foods rich in iron, such as beans, peas, spinach, and meat; and reduced salt in the diet.

Follow the recommendations to assure healthy amounts of minerals in the diet. The following list includes basic recommendations for mineral content in the diet:

- Minerals in amounts equal to the RDAs should be consumed in the diet each day.
- In general, a calcium dietary supplement is not recommended for the general population; however, supplements (up to 1,000 mg/day) may be appropriate for adults who do not eat well. For postmenopausal women, a calcium supplement is recommended (up to 1,500 mg/day for those who do not eat well). A supplement may also be appropriate for people who restrict calories, but RDA values should not be exceeded unless the person consults with a registered dietitian or a physician.

The following guidelines will help you implement these recommendations:

- A diet containing the food servings recommended for carbohydrates, proteins, and fats will more than meet the RDA standards.
- Extra servings of green and yellow vegetables, citrus and other fruits, and other nonanimal sources of foods high in fiber, vitamins, and minerals are recommended as a substitute for high-fat foods.

Reducing salt in the diet can reduce health risks.

Salt is common in many processed food products and most Americans consume way too much. Since the 1970s, salt consumption has gone up 55 percent for men and 60 percent for women. Salt intake increases the risk for hypertension, which is a major risk factor for heart disease and stroke. Many people have assumed that salt consumption is not a problem if you are not hypertensive, but this is not the case. Recent studies have shown that sodium intake increases risks of stroke independent of the presence of hypertension. Therefore, reducing salt consumption is important for everyone.

Reducing salt consumption was emphasized as a key priority in the latest Dietary Guidelines. The amount of salt recommended in the diet was reduced from 2.5 grams, slightly less than one teaspoon per day, to 1.5 grams (about half a teaspoon) for both adults and children. This is because of the strong link between salt intake and high blood pressure. The guidelines note it will take time for most people to reduce salt intake, so it may be done gradually. Increased potassium in the diet

is recommended because it helps reduce the effects of sodium on blood pressure.

A prominent report by the Institute of Medicine and the National Academy of Sciences indicates that reducing salt intake could prevent 100,000 deaths and save \$18 billion in medical expenses. A principal recommendation in the report is to encourage manufacturers to reduce salt content in processed foods. Sodium content is also high in fast foods. A study of 17 fast-food chains showed that 85 percent of meals served had more than a full day's allotment of salt. While changes in food supply are important, taking responsibility for lowering salt in the diet is the best way for an individual to make change.

Dietary Recommendations for Water and Other Fluids

Water is a critical component of a healthy diet.

Though water is not in the MyPlate food groups because it contains no calories, provides no energy, and provides no key nutrients, it is crucial to health and survival. Water is a major component of most of the foods you eat, and more than half of all body tissues are composed of it. Regular water intake maintains water balance and is critical to many bodily functions. Though a variety of fluid-replacement beverages are available for use during and following exercise, replacing water is the primary need.

Beverages other than water are a part of many diets, but some beverages can have an adverse effect on good health.

Coffee, tea, soft drinks, and alcoholic beverages are often substituted for water. Too much caffeine consumption has been shown to cause symptoms such as irregular heartbeat in some people. Tea has not been shown to have similar effects, though this may be because tea drinkers typically consume less volume than coffee drinkers, and tea has less caffeine per cup than coffee. Many soft drinks also have caffeine, though drip coffee typically contains two to three times the caffeine of a typical cola drink.

Excessive consumption of alcoholic beverages can have negative health implications because the alcohol often replaces nutrients. Excessive alcohol consumption is associated with increased risk for heart disease, high blood pressure, stroke, and osteoporosis. Long-term excessive alcoholic beverage consumption leads to cirrhosis of the liver and to increased risk for hepatitis and cancer. Alcohol consumption during pregnancy can result in low birth weight, fetal alcoholism, and other damage to the fetus. While there are clear risks associated with excessive alcohol consumption, the dietary guidelines indicate that alcohol used in moderation can enhance enjoyment of meals and reduce risks for coronary heart disease.

Follow the recommendations to assure healthy amounts of water and other fluids in the diet. The following list includes basic recommendations for water and other fluids in the diet:

- In addition to foods containing water, the average adult needs about eight glasses (8 ounces each) of water every day. Active people and those who exercise in hot environments require additional water.
- Coffee, tea, and soft drinks should not be substituted for sources of key nutrients, such as low-fat milk, fruit juices, or foods rich in calcium.
- Limit daily servings of beverages containing caffeine to no more than three.
- Limit sugared soft drinks.
- If you are an adult and you choose to drink alcohol, do so in moderation. The dietary guidelines for Americans indicate that moderation means no more than one drink per day for women and no more than two drinks per day for men (one drink equals 12 ounces of regular beer, 5 ounces of wine [small glass], or one average-size cocktail [1.5 ounces of 80-proof alcohol]).

Making Well-Informed Food Choices

Well-informed consumers eat better. Most people underestimate the number of calories they consume daily and the caloric content of specific foods. Not surprisingly, people who are better informed about the content of their food are more likely to make wise food choices. Ways to get better food choice information include accurate food labels on packages and information about food content on menus or signs in restaurants.

The content of food labels changes from time to time depending on federal guidelines and policies. The most recent change is the requirement to post trans fat content on labels (see Figure 4). This action was prompted by the clear scientific evidence that trans fats are more likely to cause atherosclerosis and heart disease than are other types of fat. Trans fats are discussed in a later section.

Reading food labels helps you be more aware of what you are eating and make healthier choices in your daily eating. In particular, paying attention to the amounts of saturated fat, trans fat, and cholesterol posted on food labels helps you make heart-healthy food choices. When comparing similar food products, combine the grams (g) of saturated fat and trans fat and look for the lowest combined amount. The listing of % Daily Value (% DV) can also be useful. Foods low in saturated fat and cholesterol generally have % DV values less than 5 percent, while foods high in saturated fat and cholesterol have values greater than 20 percent.



Start here

Limit these nutrients

Get enough of these nutrients

Footnote

Nutrition Facts	
Serving Size 1 cup (228g)	
Servings Per Container 2	
Amount Per Serving	
Calories 250	Calories from Fat 110
% Daily Value*	
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 1.5g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.

	Calories: 2,000	2,500
Total Fat	Less than 65g	80g
Sat Fat	Less than 20g	25g
Cholesterol	Less than 300mg	300mg
Sodium	Less than 2,400mg	2400mg
Total Carbohydrate	300g	375g
Dietary Fiber	25g	30g

Figure 4 ► Sample food label for macaroni and cheese.
Source: U.S. Food and Drug Administration.

Supplemental food labels may not provide accurate information. Some manufacturers have used supplemental labels on foods to advertise healthy aspects of their products. An example is the “Smart Choice” designation created by a consortium of food manufacturers. The labels were placed prominently on the front of selected food packages to promote them as a healthy choice for good nutrition. While perhaps well-intentioned, the claims and designations were not approved by the FDA and could have swayed consumers to select the product. National nutrition groups criticized the name (Smart Choice) as well as the location and content of the labels. This action prompted the FDA to require manufacturers to cease using the potentially confusing labels. Care should be taken when considering claims on food packages.

Guides to food contents in restaurants can help consumers eat better. It is increasingly common for restaurants to post the calorie counts for the foods on their menu. Some restaurants also provide more detailed information about specific nutrients (e.g., protein, carbohydrate, salt, fiber). These changes have come about due, in part, to policy changes and USDA requirements; however, they also reflect an increased consumer demand for health and nutrition information. While some restaurants still emphasize gluttony and excess in advertisements and menus, there are many others that are positioning themselves to accommodate greater demand for healthier food

TECHNOLOGY UPDATE

Vending Machines to Provide Nutrition Information

Food labels are required on all food products, but consumers do not have access to this information when selecting foods from most vending machines. According to an industry organization, over 100 million Americans use a vending machine each day. Legislation in Congress may soon require vending companies to provide nutrition information so that consumers have the opportunity to make healthier food choices at these machines. Companies that make vending machines have developed machines to make it easy for consumers to view this information, so the technology is already available. Some vending groups are concerned that people may be less inclined to buy snacks from vending machines if they look at the nutritional content. However, this is the whole point of the proposed policy.

Do you think these high-tech vending machines will influence decisions about food purchases?

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choices. Posting the nutritional quality of foods allows restaurants to at least document that they have provided consumers with the information needed to make healthier choices.

Sound Eating Practices

Consistent eating patterns (with a daily breakfast) are important for good nutrition. Eating regular meals every day, including a good breakfast, is wise. Many studies have shown breakfast to be an important meal, in which one-fourth of the day's calories should be consumed. Skipping breakfast impairs performance because blood sugar levels drop in the long period between dinner the night before and lunch the following day. Eating every 4 to 6 hours is wise.

Moderation is a good general rule of nutrition. You do not have to permanently eliminate foods that you really enjoy, but some of your favorite foods may not be among the best choices. Enjoying special foods on occasion is part of moderation. The key is to limit food choices high in empty calories.

Portion sizes have increased in recent years. Cafeteria-style restaurants (and others) sometimes offer all you can eat meals, which encourage larger portions. Reducing portion size is very important when eating out and at home (see Concept 15 for more information).

HELP Health is available to Everyone for a Lifetime, and it's Personal

Food safety is an important public health concern. Almost every year there are tragic reports of food-related illnesses and deaths caused by infections from such bacteria as Salmonella or Listeria. In 2010, an outbreak of Salmonella in eggs sickened over 1,500 people. A more recent outbreak of Salmonella from contaminated ground turkey killed 1 person and sickened 111 others. The most tragic and publicized food safety issue was an outbreak of Listeria traced to contaminated cantaloupes that killed 29 people and sickened over 130 others from 28 states. The CDC has indicated that the incidence of infection has actually come down 23 percent over the past 15 to 20 years, but news of food contamination always creates headlines.

Do outbreaks of food-related diseases concern you? Do they influence your decisions about buying certain types of foods?

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Minimize your reliance on fast foods. Recent estimates suggest that 63 percent of Americans eat fast food one to three times a week and an additional 3 percent eat fast food three to five times a week. Unfortunately, many fast foods are poor nutritional choices. Hamburgers are usually high in fat, as are french fries (because they are usually cooked in saturated fat). Even chicken and fish are often high in fat and calories because they may be cooked in fat and covered with high-fat/high-calorie sauces. (Fast foods are also discussed in more detail in Concept 15.)

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VIDEO 5

Healthy snacks can be an important part of good nutrition. For people who want to lose weight or maintain their current weight, small snacks of appropriate foods can help fool the appetite. For people wanting to gain weight, snacks provide additional calories. The calories consumed in snacks will probably necessitate limiting the calories from meals. The key is proper selection of the foods for snacking.

As with your total diet, the best snacks are nutritionally dense. Too many snacks are high in calories, fats, simple sugar, and salt. Even foods sold as "healthy snacks," such as granola bars, are often high in fat and simple sugar. Some common snacks, such as chips, pretzels, and even popcorn, may be high in salt and may be cooked in fat. Healthier snacks include ice milk (instead of ice cream), fresh fruits, vegetable sticks, popcorn not cooked in fat and with little or no salt, crackers, and nuts with little or no salt.



A CLOSER LOOK

MyPlate “SuperTracker” for Diet and Activity Monitoring

Self-monitoring is an important behavioral skill for adopting and maintaining healthy lifestyles. There are many cell phone apps and resources for monitoring your diet, but the web-based resources available through MyPlate provide a free, comprehensive set of tools (called SuperTracker). An easy-to-use food database (Food-A-Pedia) allows you to enter the name of a specific food and get quick feedback concerning the food’s content. A customized tool called the Food Tracker evaluates the nutrient quality of your diet and an accompanying Physical Activity Tracker evaluates activity levels compared to the U.S. Physical Activity Guidelines. An integrative tool (My Weight Manager) combines data on energy intake and expenditure to facilitate weight management. Companion tools let you set goals, use virtual coaches, and monitor progress over time. The comprehensive set of self-monitoring tools can assist consumers in adopting and maintaining a healthy and active lifestyle.

How would your diet stack up to the 2010 Dietary Guidelines? Would you benefit from tools designed to evaluate and track the quality of your diet over time?

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Minimize your consumption of overly processed foods and foods high in hydrogenated fat or saturated fat. Many foods available in grocery stores have been highly processed to enhance shelf life and

convenience. In many cases, the processing of foods removes valuable nutrients and includes other additives that may compromise overall nutrition. Processing of grains, for example, typically removes the bran and germ layers, which contain fiber and valuable minerals. In regard to additives, there has been considerable attention on the possible negative effects of high fructose corn syrup, as well as the pervasive use of hydrogenated vegetable oils containing trans fatty acids. Table 4 compares food quality in each of the main food categories. To improve your diet, you should aim to choose foods in the “more desirable” category instead of those in the “less desirable” category.

Consider eating organic foods to reduce exposure to carcinogens. Consumers are often confused about what “organic” means. Organic food differs from conventionally produced food primarily in the way it is grown, handled, and processed. Organic food is produced without conventional pesticides and using natural fertilizers. Organic meat, poultry, eggs, and dairy products come from animals that are given no antibiotics or growth hormones. Organic foods are typically produced by farmers who emphasize the use of renewable resources and the conservation of soil and water. The benefits of organic farming production have led to initiatives to encourage farmers to adopt organic practices.

The U.S. Department of Agriculture (USDA) has recently established a new set of standards for foods labeled as “organic.” The current labeling requires that a government-approved certifier inspect the farm where the food is grown or produced to ensure that the farmer is following all the rules necessary to meet USDA organic

Table 4 ▶ Comparing the Quality of Similar Food Products

Food Product	Less Desirable Option	More Desirable Option	Benefit of More Desirable Option in Nutrition Quality
Bread	White bread	Whole wheat bread	More fiber
Rice	White rice	Brown rice	More fiber
Juice	Sweetened juice	100% juice	More fiber and less fructose corn syrup
Fruit	Canned	Fresh	More vitamins, more fiber, less sugar
Vegetables	Canned	Fresh	More vitamins, less salt
Potatoes	French fries	Baked potato	Less saturated fat
Milk	2% milk	Skim milk	Less saturated fat
Meat	Ground beef (high fat)	Ground sirloin (low fat)	Less saturated fat
Oils	Vegetable oil	Canola oil	More monounsaturated fat
Snack food	Fried chips	Baked chips	Less fat/calorie content, less trans fat



In the News

Knowledge Doesn't Translate to Behavior

Nutrition remains a top priority for most Americans. A Harris poll found that awareness of key nutritional facts is high. At least three-quarters of all U.S. adults place importance on freshness (89 percent), fiber (81 percent), and whole grains (81 percent) when choosing foods. Consumers also carefully consider the fat content (80 percent), portion size (79 percent), calorie content (77 percent), and saturated fat (76 percent) when making food and beverage purchases. Over half of U.S. adults (57 percent) report monitoring or restricting consumption of some foods to improve their diet. Sugar and salt are the top two restricted items, with 34 percent and 32 percent restricting salt and sugar, respectively.

While awareness is high, it does not appear to translate into dietary change for most segments of the population. Fewer

than half of Americans who rated sugar or salt as “important when managing their diet/weight” actually restrict their sugar (42 percent) or salt (47 percent) intake. Adherence to diet recommendations varies across the generations. Respondents over age 66 were the most likely to pay close attention to nutritional facts and translate their health consciousness into behavior. This was attributed to the greater need to follow a diet with specific restrictions. Overall, the results suggest that adherence to diet recommendations may be more driven by necessity than by knowledge.

Does your knowledge and awareness of nutrition directly impact your food choices?

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standards. Companies that handle, process, or sell organic food must also be certified. The USDA does not imply that organically produced food is safer or more nutritious than conventionally produced food, but many health experts recommend organic foods to reduce exposure to pesticides and other chemicals and to help support more sustainable and environmentally friendly agricultural practices. Foods purchased at local farmer's markets may claim to be organic but may or may not meet FDA standards.

Nutrition and Physical Performance

Some basic dietary guidelines exist for active people.

In general, the nutrition rules described in this concept apply to all people, whether active or sedentary, but some additional nutrition facts are important for exercisers and athletes. Because active people often expend calories in amounts considerably above normal, they need extra calories in their diet. To avoid excess fat and protein, complex carbohydrates should constitute as much as 70 percent of total caloric intake. A higher amount of protein is generally recommended for active individuals (1.2 grams per kg of body weight) because some protein is used as an energy source during exercise. Extra protein is obtained in the additional calories consumed. While the IOM range of 10 to 35 percent allows a “broader range” of choice, intake above 15 percent is not typically necessary.

Carbohydrate loading before exercise and carbohydrate replacement during exercise can enhance sustained aerobic performances.

Athletes and vigorously active people must maintain a high level of readily available fuel, especially in the muscles. Consumption of complex carbohydrates is the best way to assure this.

Prior to an activity requiring an extended duration of physical performance (more than 1 hour in length, such as a marathon), **carbohydrate loading** can be useful. Carbohydrate loading is accomplished by resting 1 or 2 days before the event and eating a higher than normal amount of complex carbohydrates. This helps build up maximum levels of stored carbohydrate (**glycogen**) in the muscles and liver so it can be used during exercise. The key in carbohydrate loading is not to eat a lot but, rather, to eat a higher percentage of carbohydrates than normal.

Ingesting carbohydrate beverages during sustained exercise can also aid performance by preventing or forestalling muscle glycogen depletion. Fluid-replacement drinks containing 6 to 8 percent carbohydrates and no more than 6 to 8 percent sugar are very helpful in preventing dehydration and replacing energy stores. A number

Carbohydrate Loading The extra consumption of complex carbohydrates in the days prior to sustained performance.

Glycogen A source of energy stored in the muscles and liver necessary for sustained physical activity.

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Good nutrition is essential for active people.

of companies also make concentrated carbohydrate gels that deliver carbohydrates (generally 80 percent complex, 20 percent simple) in a form the body can absorb quickly for energy. Examples are PowerGel and Gu. Energy bars, such as Powerbars and Clif bars, are also commonly eaten during or after exercise to enhance energy stores. The various carbohydrate supplements have been shown to be effective for exercise sessions lasting over an hour and are good for replacing glycogen stores after exercise. Consuming carbohydrates 15 to 30 minutes following exercise can aid in rapid replenishment of muscle glycogen, which may enhance future performance or training sessions.

These supplements have little benefit for shorter bouts of exercise. Because they contain considerable calories,

they are not recommended for individuals primarily interested in weight control.

The timing may be more important than the makeup of a pre-event meal. If you are racing or doing high-level exercise early in the morning, eat a small meal prior to starting. Eat about 3 hours before competition or heavy exercise to allow time for digestion. Generally, athletes can select foods on the basis of experience, but easily digested carbohydrates are best. Generally, fat intake should be minimal because fat digests more slowly; proteins and high-cellulose foods should be kept to a moderate amount prior to prolonged events to avoid urinary and bowel excretion. Drinking 2 or 3 cups of liquid will ensure adequate hydration.

Consuming simple carbohydrates (sugar, candy) within an hour or two of an event is not recommended because it may cause an insulin response, resulting in weakness and fatigue, or it may cause stomach distress, cramps, or nausea.

Changes in the frequency and composition of meals are important to gain muscle mass. To increase muscle mass, the body requires a greater caloric intake. The challenge is to provide enough extra calories for the muscle without excess amounts going to fat. An increase of 500 to 1,000 calories a day will help most people gain muscle mass over time. Smaller, more frequent meals are best for weight gain, since they tend to keep the metabolic rate high. The majority of extra calories should come from complex carbohydrates. Breads, pasta, rice, and fruits such as bananas are good sources. Granola, nuts, juices (grape and cranberry), and milk also make good high-calorie, healthy snacks.

Diet supplements are not particularly effective unless used as part of a behaviorally based program. High-fat diets can result in weight gain but may not be best for good health, especially if they are high in saturated fat. If weight gain does not occur over a period of weeks and months with extra calorie consumption, individuals may need to seek medical assistance.



Strategies for Action

An analysis of your current diet is a good first step in making future decisions about what you eat. Many experts recommend keeping a log of what you eat over an extended period so you can determine the overall quality of your diet. In Lab 14A, you will have an opportunity to track your diet over several days. In addition to computing the amount of carbohydrates, fats, and

proteins, you will also be able to monitor your consumption of fruits and vegetables. A number of online tools and personal software programs can make dietary calculations for you and provide a more comprehensive report of nutrient intake. Whether you use a Web-based tool or a paper and pencil log doesn't really matter—the key is to monitor and evaluate the quality of your diet.

Making small changes in diet patterns can have a big impact. Nutrition experts emphasize the importance of making small changes in your diet over time rather than trying to make comprehensive changes at one time. Try cutting back on sweets or soda. Simply adding a bit more fruit and vegetables to your diet can lead to major changes in overall

diet quality. In Lab 14B, you will be given the opportunity to compare a “nutritious diet” to a “favorite diet.” Analyzing two daily meal plans will help you get a more accurate picture as to whether foods you think are nutritious actually meet current healthy lifestyle goals.

connect
ACTIVITY

Web Resources

American Dietetic Association www.eatright.org
 Berkeley Nutrition Services www.nutritionquest.com
 Center for Nutrition Policy and Promotion www.usda.gov/cnpp
 Center for Science in the Public Interest www.cspinet.org
 FDA Food Website www.fda.gov/Food/default.htm
 Food and Drug Administration (FDA) www.fda.gov
 Food Safety Database www.foodsafety.gov
 Institute of Medicine www.iom.edu
 Institute of Medicine—Food and Nutrition www.iom.edu/Global/Topics/Food-Nutrition.aspx
 International Food Information Council Foundation www.ific.org
 MyPlate www.choosemyplate.gov
 MyPlate Food-A-Pedia www.choosemyplate.gov/SuperTracker/foodapedia.aspx
 MyPlate SuperTracker www.choosemyplate.gov/SuperTracker/foodtracker.aspx
 National Nutrition Summit Database www.nlm.nih.gov/pubs/cbm/nutritionsummit.html
 Nutrition.gov www.nutrition.gov
 Office of Dietary Supplements <http://ods.od.nih.gov>
 Rudd Center for Food Policy and Obesity (Yale University) www.yaleruddcenter.org
 U.S. Department of Agriculture (USDA) www.usda.gov
 USDA Food and Nutrition Information Center www.nal.usda.gov/fnic
 USDA MyFoodapedia (calorie calculator) <http://fnic.nal.usda.gov/dietary-guidance/interactive-tools/calculators-and-counters>

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Suggested Readings

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Healthy People 2020

The objectives listed below are societal goals designed to help all Americans improve their health between now and the year 2020. They were selected because they relate to the content of this concept.

- Increase the contribution of fruits in the diet.
- Increase the variety and contribution of vegetables in the diet.
- Increase the contribution of whole grains in the diet.
- Reduce consumption of saturated fat in the diet.
- Reduce consumption of sodium.
- Increase consumption of calcium.
- Reduce iron deficiency.

A national goal is to increase fruit and vegetables in the diet. This is information children learn in elementary school, yet many Americans fail to meet the guideline that “half of the plate should be fruits and vegetables.” What can be done to change the pattern of eating so that more people eat adequate fruits and vegetables?



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Lab 14A Nutrition Analysis

Name

Section

Date

Purpose: To learn to keep a dietary log, to determine the nutritional quality of your diet, to determine your average daily caloric intake, and to determine necessary changes in eating habits

Procedures

1. Record your dietary intake for 2 days using the Daily Diet Record sheets (see pages 345–346). Record intake for 1 weekday and 1 weekend day. You may wish to make copies of the record sheet for future use.
2. Include the actual foods eaten and the amount (size of portion in teaspoons, tablespoons, cups, ounces, or other standard units of measurement). Be sure to include all drinks (coffee, tea, soft drinks, etc.). Include *all* foods eaten, including sauces, gravies, dressings, toppings, spreads, and so on. Determine your caloric consumption for each of the 2 days. Use the calorie guides at the myplate.gov website to assist in evaluating your diet.
3. List the number of servings from each food group by each food choice.
4. Estimate the proportion of complex carbohydrate, simple carbohydrate, protein, and fat in each meal and in snacks, as well as for the total day.
5. Answer the questions in Chart 1 on page 344, using information for a typical day based on the Daily Diet Record sheets. Score 1 point for each “yes” answer. Then use Chart 2 to rate your dietary habits (circle rating).
6. Complete the Conclusions and Implications sections

Results

Record the number of calories consumed for each of the 2 days.

Weekday calories Weekend calories

Conclusions and Implications: In several sentences, discuss your diet as recorded in this lab. Explain any changes in your eating habits that may be necessary. Comment on whether the days you surveyed are typical of your normal diet.

Chart 1 Dietary Habits Questionnaire

Yes	No	Answer questions based on a typical day (use your Daily Diet Records to help).
<input type="radio"/>	<input type="radio"/>	1. Do you eat at least three healthy meals each day?
<input type="radio"/>	<input type="radio"/>	2. Do you eat a healthy breakfast?
<input type="radio"/>	<input type="radio"/>	3. Do you eat lunch regularly?
<input type="radio"/>	<input type="radio"/>	4. Does your diet contain 45 to 65 percent carbohydrates with a high concentration of fiber?*
<input type="radio"/>	<input type="radio"/>	5. Are less than one-fourth of the carbohydrates you eat simple carbohydrates?
<input type="radio"/>	<input type="radio"/>	6. Does your diet contain 10 to 35 percent protein?*
<input type="radio"/>	<input type="radio"/>	7. Does your diet contain 20 to 35 percent fat?*
<input type="radio"/>	<input type="radio"/>	8. Do you limit the amount of saturated fat in your diet (no more than 10 percent)?
<input type="radio"/>	<input type="radio"/>	9. Do you limit salt intake to acceptable amounts?
<input type="radio"/>	<input type="radio"/>	10. Do you get adequate amounts of vitamins in your diet without a supplement?
<input type="radio"/>	<input type="radio"/>	11. Do you typically eat 6 to 11 servings from the bread, cereal, rice, and pasta group of foods?
<input type="radio"/>	<input type="radio"/>	12. Do you typically eat 3 to 5 servings of vegetables?
<input type="radio"/>	<input type="radio"/>	13. Do you typically eat 2 to 4 servings of fruits?
<input type="radio"/>	<input type="radio"/>	14. Do you typically eat 2 to 3 servings from the milk, yogurt, and cheese group of foods?
<input type="radio"/>	<input type="radio"/>	15. Do you typically eat 2 to 3 servings from the meat, poultry, fish, beans, eggs, and nuts group of foods?
<input type="radio"/>	<input type="radio"/>	16. Do you drink adequate amounts of water?
<input type="radio"/>	<input type="radio"/>	17. Do you get adequate minerals in your diet without a supplement?
<input type="radio"/>	<input type="radio"/>	18. Do you limit your caffeine and alcohol consumption to acceptable levels?
<input type="radio"/>	<input type="radio"/>	19. Is your average caloric consumption reasonable for your body size and for the amount of calories you normally expend?
<input type="text"/>		Total number of "yes" answers

*Based on USDA standards.

Chart 2 Dietary Habits Rating Scale

Score	Rating
18–19	Very good
15–17	Good
13–14	Marginal
12 or less	Poor

Daily Diet Record

Day 1

Breakfast Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Meal Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
							<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Meal Total	 						
Lunch Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Meal Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
							<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Meal Total	 						
Dinner Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Meal Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
							<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Meal Total	 						
Snack Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Snack Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
							<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Meal Total	 						
Daily Totals		Calories	Servings	Servings	Servings	Servings	Estimated Daily Total Calories %
 							<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total

Daily Diet Record

Day 2

Breakfast Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Meal Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
Meal Total	 						<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Lunch Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Meal Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
Meal Total	 						<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Dinner Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Meal Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
Meal Total	 						<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Snack Food	Amount (cups, tsp., etc.)	Calories	Food Servings				Estimated Snack Calories %
			Bread/Cereal	Fruit/Veg.	Milk/Meat	Fat/Sweet	
Meal Total	 						<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
Daily Totals	 						<input type="checkbox"/> % Protein <input type="checkbox"/> % Fat <input type="checkbox"/> % Complex carbohydrate <input type="checkbox"/> % Simple carbohydrate <hr/> 100% Total
		Calories	Servings	Servings	Servings	Servings	

Lab 14B Selecting Nutritious Foods

Name

Section

Date

Purpose: To learn to select a nutritious diet, to determine the nutritive value of favorite foods, and to compare nutritious and favorite foods in terms of nutrient content

Procedures

1. Select a favorite breakfast, lunch, and dinner from the foods list in Appendix C. Include between-meal snacks with the nearest meal. If you cannot find foods you would normally choose, select those most similar to choices you might make.
2. Select a breakfast, lunch, and dinner from foods you feel would make the most nutritious meals. Include between-meal snacks with the nearest meal.
3. Record your “favorite foods” and “nutritious foods” on page 348. Record the calories for proteins, carbohydrates, and fats for each of the foods you choose.
4. Total each column for the “favorite” and the “nutritious” meals.
5. Determine the percentages of your total calories that are protein, carbohydrate, and fat by dividing each column total by the total number of calories consumed.
6. Comment on what you learned in the Conclusions and Implications section.

Results: Record your results below. Calculate percentage of calories from each source by dividing total calories into calories from each food source (protein, carbohydrates, or fat).

Food Selection Results

Source	Favorite Foods		Nutritious Foods	
	Calories	% of Total Calories	Calories	% of Total Calories
Protein	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Carbohydrates	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fat	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Total 100%	<input type="text"/>	100%	<input type="text"/>	100%

Conclusions and Implications: In several sentences, discuss the differences you found between your nutritious diet and your favorite diet. Discuss the quality of your nutritious diet as well as other things you learned from doing this lab.

“Favorite” versus “Nutritious” Food Choices for Three Daily Meals

Breakfast Favorite		Food Choices				Breakfast Nutritious		Food Choices			
Food	Cal.	Pro. Cal.	Car. Cal.	Fat Cal.	Food	Cal.	Pro. Cal.	Car. Cal.	Fat Cal.		
Totals					Totals						

Lunch Favorite		Food Choices				Lunch Nutritious		Food Choices			
Food	Cal.	Pro. Cal.	Car. Cal.	Fat Cal.	Food	Cal.	Pro. Cal.	Car. Cal.	Fat Cal.		
Totals					Totals						

Dinner Favorite		Food Choices				Dinner Nutritious		Food Choices			
Food	Cal.	Pro. Cal.	Car. Cal.	Fat Cal.	Food	Cal.	Pro. Cal.	Car. Cal.	Fat Cal.		
Totals					Totals						
Daily Totals (Calories)					Daily Totals (Calories)						
Daily % of Total Calories					Daily % of Total Calories						

Managing Diet and Activity for Healthy Body Fatness

LEARNING OBJECTIVES

After completing the study of this concept, you will be able to:

- ▶ Explain the principles for weight control and the concept of energy balance.
- ▶ Identify the features of an obesogenic environment that influence our behavior.
- ▶ Outline guidelines for weight loss treatments.
- ▶ Describe and apply, when appropriate, guidelines for losing body fat.
- ▶ Utilize healthy shopping and eating strategies and guidelines.
- ▶ Evaluate fast-food options.

Various management strategies for eating and performing physical activity are useful in achieving and maintaining optimal body composition.



The fact that more than 67 percent of adult Americans are classified as overweight is clear evidence that weight control is a vexing problem for the majority of the population. Most recognize the importance of the problem and want to correct it. In fact, a recent national survey by the International Food Information Council (IFIC) reported that nearly two-thirds of Americans were either very concerned or somewhat concerned about their weight.

Too often, the focus is on appearance rather than health and on weight loss rather than fat loss. In attempts to lose weight, the dietary (energy intake) side of the energy balance equation is typically emphasized. However, the energy expenditure side of the equation is just as important, if not more so. Despite the documented benefits, few people trying to lose weight are physically active. A state-based survey determined that approximately one-half of individuals trying to lose weight do not engage in any physical activity, and only 15 percent report exercising regularly. The challenges many people experience with weight control may be an indirect reflection of the challenges people face in trying to be more active. Although being physically active cannot ensure you will become as thin as you desire, you may attain a body size that is appropriate for your genetics and body type.

The focus in this concept is on lifestyle patterns (both diet and physical activity) that will assist with losing body fat rather than weight. Guidelines for maintaining healthy body fat levels over time are also presented.

Factors Influencing Weight and Fat Control

Long-term weight control requires a balance between energy intake and energy expenditure.

The relationships governing energy balance are very simple—the number of calories expended must match the number consumed. There may be subtle differences on a daily basis, but if intake exceeds expenditure over a period of time, a person will store the extra calories as body fat. The average person gains 1 pound of weight (i.e., fat) for every year over the age of 25. This may sound like a lot but it represents a calorie difference of only 10 kcal per day (approximately the calories found in a cracker or potato chip). This subtle difference shows the precise regulation of intake and expenditure that is normally in effect when a person maintains his or her body weight. The built-in regulation system is based on our appetite, which guides us when we might be running low on energy.

Figure 1 shows the hypothetical balance between energy intake and expenditure. Energy intake comes from the three major nutrients in our diet (carbohydrates, fats, and proteins) as well as from alcohol. Energy

expenditure can be divided into three major components as well. Basal metabolism accounts for the bulk of daily energy expenditure (60 percent to 75 percent) and this refers to the calories expended to maintain basic body functions while the body is at rest. A second category, called thermogenesis, captures the energy expended processing the food we eat (approximately 10 percent of total daily energy expenditure). The third and most variable component of energy expenditure rate is physical activity (typically accounting for 10 to 30 percent of total energy expenditure in most people). To maintain a healthy weight, a person's overall energy expenditure must offset energy intake. While it is difficult to monitor these directly, the body has built-in regulatory systems that help in weight regulation. Detailed coverage of these pathways is beyond the scope of the book, but the most important part of the system is your appetite because it helps prompt and influence eating.



Physical activity contributes to energy balance in a number of ways.

By maintaining an active lifestyle, you can burn off extra calories, keep your body's metabolism high, and prevent the decline in basal metabolic rate that typically occurs with aging (due to reduced muscle mass). All types of physical activity from the physical activity pyramid can be beneficial to weight control. Moderate physical activity (see Concept 6) is especially effective because people of all ages and abilities can perform it. It can be maintained for long periods of time and results in significant calorie expenditure. Long-term studies show that 60 or more minutes of moderate activity such as walking is very effective for long-term weight loss and maintenance.

Vigorous physical activity (see Concepts 7 and 8) can also be effective in maintaining or losing weight. For some people, especially older adults, vigorous activity may be more difficult to adhere to over a long time. However, for

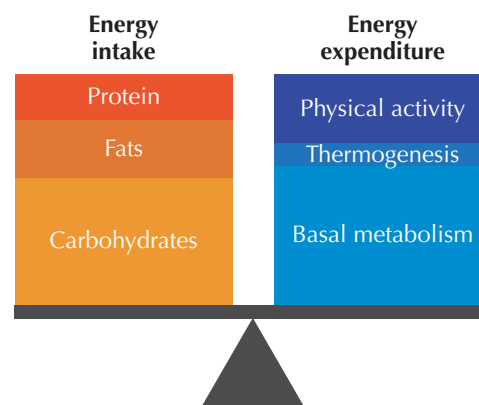


Figure 1 ▶ Components of energy intake must balance components of energy expenditure for weight maintenance.

those who stick with it, vigorous activity expends more calories in a shorter time, and for this reason, it can be a very good way to expend calories. Research shows that bouts of vigorous physical activity can lead to increases in basal metabolic rate that persist throughout the day. Therefore, vigorous activity can contribute to additional energy expenditure after the workout is done. There is now considerable evidence showing that muscle fitness exercise also contributes to maintaining a healthy body weight (see Concept 9). Muscle fitness exercise expends calories and increases muscle mass, leading to an increase in calories expended at rest. Flexibility exercises (see Concept 10) also expend calories, but are of lower intensity than other types of activities on the pyramid. They can still contribute to energy expenditure, however.

The accumulation of light physical activity can help burn extra calories. Most of the emphasis in this book has been on moderate and vigorous forms of physical activity. As described in Concept 6, “light” physical activity falls between rest and moderate physical activity on the energy expenditure continuum (1.5 to 3 METS). Research indicates that light activities may help reduce risks associated with excessive time spent being sedentary (e.g., sitting). The accumulation of light activity can also contribute to weight control by burning more calories. Researchers coined the term NEAT (non-exercise activity thermogenesis) to refer to the accumulation of activity from low-intensity movements throughout the day. Light activity may account for

as little as 15 percent of total daily energy expenditure in sedentary people and up to 50 percent in people with more active jobs and lifestyles. The weight maintenance benefits of light or NEAT activity are greatest when the activities replace sedentary activities such as sitting (e.g., TV watching and computer use). To further take advantage of NEAT, many people have started using active workstations that allow them to walk slowly on a treadmill or lightly pedal a bike while working at a computer.

Awareness and dietary restraint are needed to avoid excess caloric intake. In our modern society, it is very easy for people to meet their daily energy needs. In fact, considerable willpower is needed to keep energy intake at a manageable level. Having an extra cookie or brownie for a snack may sound like a good idea until you realize you would need to possibly walk between one and two miles to burn it off. Foods high in empty calories are easily available and are frequent selections of college students, who may be responsible for their food selection or preparation for the first time in their lives. Sugar, especially from soft drinks, and beer add calories. Learning to make healthy choices and showing some restraint with food intake are important skills for long-term weight control.

Many find it difficult to establish these patterns and develop unhealthy relationships with food, either restraining too much or using food as a source of comfort when feeling sad, anxious, or bored. The latter has been termed “emotional eating” since the consumption of food is directly tied to our emotions. The assumption has been that the food is consumed in response to emotional situations, but new research shows that consumption of some foods may actually have reciprocal effects on our emotions. One study showed that consumption of a high-fat snack helped people fend off negative emotions more effectively than a control snack. The biological connection between food and our brain may have had some evolutionary advantage in the past, but it can be problematic in our present society where food is abundant. While an occasional binge may not be a problem, emotional eating can escalate into a more compulsive habit that is hard to control. To avoid emotional eating, find other non-food-related methods to combat stress or help relax.

HELP Health is available to Everyone for a Lifetime, and it's Personal

A survey by the International Food Information Council reports that only 9 percent of people in the United States know the approximate number of calories they should eat in a day. About 9 percent report actually tracking their calories on a daily basis. Calorie requirements are unique to each person and are influenced by your gender, age, body size, and physical activity level. Typical ranges for a small sedentary woman may be 1,400 to 1,600 or 2,000 to 2,200 for a sedentary man. Our body has a natural ability to regulate intake (appetite) but people tend to disregard it or not pay attention to the cues. Some experts are concerned about the lack of awareness about calorie requirements. For example, if you knew your calorie requirement was 1,600 calories a day you may think twice about eating a burger and fries that contain 1,200 calories at one meal.

What steps can you take to make sure that you do not exceed recommended daily calorie requirements for your age, gender, and activity level?

connect
ACTIVITY

connect
VIDEO 2

Confronting an Obesogenic Environment

An obesogenic environment makes it hard to maintain a healthy weight. Although traditional approaches to weight control have emphasized individual behaviors, public health leaders focus considerable

energy on combating “*obesogenic environments*” that promote excessive eating and inactivity. For example, the 2010 Dietary Guidelines acknowledge that Americans have to make dietary choices “*within the context of an environment that promotes over-consumption of calories and discourages physical activity.*” A variety of social-ecological models have been proposed to summarize and study these environments. A simplified model is depicted in Figure 2 to show the various sectors and settings that shape our environment and ultimately our behavior. The essence of the model is that we are continually confronted with environments that make it easy to consume large quantities of energy-dense food and limit our physical activity. On the energy-intake side, we have easy access to large quantities of low-cost, highly-palatable, high-calorie foods almost everywhere we go. The convenience and large portion sizes lead to increases in daily

energy intake. On the energy expenditure side, we live in a world dominated by sedentary (computer-based) jobs and lifestyles dominated by automobiles and inactive recreation. These factors lead to reductions in daily energy expenditure. Small increases in energy intake combined with small decreases in energy expenditure lead to the storage of fat. While most people are aware of these general influences, they still find it hard to find ways to overcome them.

New public/private partnerships offer promise for promoting healthier environments. As shown in Figure 2, aspects of our environment are influenced by larger societal and economic forces. For example, it is unrealistic to expect changes in menu choices in a local fast-food restaurant since they receive their food from the corporate supply chain, which in turn receives ingredients

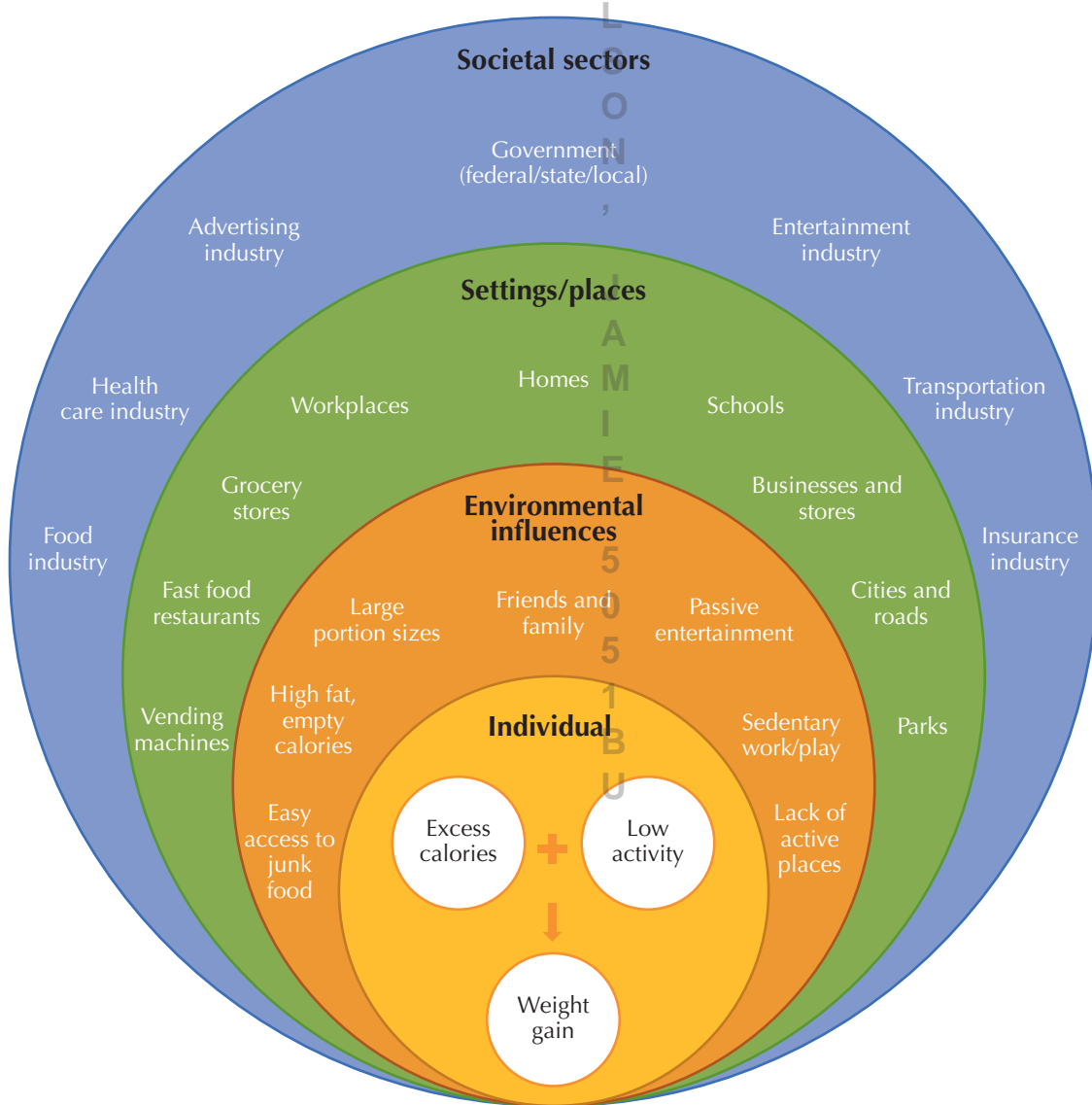


Figure 2 ► Social and environmental components of the obesogenic environment.

from other larger food conglomerates. To reverse the epidemic of obesity, a coordinated systemwide approach is needed. Changes in policy and the business supply chain offer the most promise since they can impact other aspects of the local environment. A number of large-scale public/private partnerships have shown potential for coordinated action. A few particularly prominent examples are highlighted below:

- **Healthy Weight Commitment Foundation** (www.healthyweightcommit.org). This large foundation is a consortium of grocery stores, food and beverage manufacturers, restaurants, sporting goods stores, insurance companies, and other health-related organizations that have joined forces to create healthier (less obesogenic) environments. This collaboration is unique because it is led by executives and CEOs of the various organizations. The group is committed to creating systematic changes in key segments of society in order to help reverse the obesity epidemic. The companies in the consortium may be in direct competition for consumer spending, yet here they are partnering together to help address a significant public health problem. For example, the food manufacturing companies in the group have pledged to work together to help reduce excess calorie consumption in their food products. They will do this by introducing lower-calorie options, changing recipes to lower the calorie content of current products, or by reducing portion sizes of existing single-serve products. The group has also launched several innovative social media tools and challenges to directly facilitate changes in society. One tool called Together Counts is designed to provide families with tools and resources to make (and track) healthy changes in their families. Another tool called Energy Balance 101 provides educational resources to teach principles of energy balance in schools.
- **Alliance for a Healthier Generation** (www.healthiergeneration.org). This nonprofit organization, formed as a partnership by the American Heart Association and the William J. Clinton Foundation, was established to specifically help to reverse the prevalence of childhood obesity. In 2006, the Alliance brokered agreements with beverage providers to limit portion sizes and reduce the number of beverage calories available to children during the school day. The agreement led to an 88 percent reduction in total beverage calories shipped to schools. A new agreement with leading food manufacturers, group purchasing organizations, and technology companies will enable America's schools to serve healthier meals at more affordable prices. Through the agreement, more than 30 million students across the country will have access to healthier school meals, including at least 14 million students who currently participate in the free and reduced lunch program. The Alliance also

established a new medically based partnership (Alliance Healthcare Initiative) that unites national medical associations, leading insurers, and employers to offer health benefits for the prevention, assessment, and treatment of childhood obesity. The agreement enables health-care providers to play a more active role in obesity treatment by making primary-care visits and visits to registered dietitians (RDs) a part of their health insurance benefits. The initiative will recruit additional health insurance companies and employers to participate so that more overweight American children have access to this care.

New public policies offer promise for promoting weight control. Public policy has a strong influence on behavior, because it has the potential to influence all segments of the population. Examples of recent public policy changes that have potential for helping reduce overweight are described below.

- **Posting food values in restaurants.** New legislation requires chain restaurants with 20 or more outlets to post calorie and other nutrition values for the foods they serve. The FDA has finalized guidelines for this legislation and new efforts will extend the labeling rules to vending machines. Posting food values has been shown to be effective in reducing calorie consumption in people eating at fast-food restaurants.
- **Restricting food commercials that target children.** The food industry adopted self-regulation on foods targeted for children, especially high-sugar, low-nutrient foods. Studies show that these self-regulations have made only small changes in advertising. Nutrition groups have proposed regulation requiring the food industry to advertise nutritious foods more often and to reduce advertising of non-nutritious foods during children's TV shows.
- **Ensuring healthy foods are available in school vending machines.** The USDA mandated that schools set formal policies for food service and vending machines. The requirements stipulate the latter must offer a balance of "healthy" and "unhealthy" food choices. Changes have also been made to limit soft drink consumption at schools.
- **Requiring more physical activity and physical education in schools.** Schools provide an infrastructure to help ensure that children get some regular physical activity each day. A national health goal is to increase the number of children who get daily physical education. Some states have imposed specific guidelines requiring schools to document that they are providing a certain amount of physical activity. Proposed federal legislation (Healthy Kids Outdoors Act) aims to increase children's access to outdoor recreational activities.

- **Promoting physical activity with incentives for participation.** Many companies provide employees with free access to employee-sponsored fitness centers or subsidies to use community fitness centers. Many also offer financial incentives for participation and flexible schedules for workouts during the day. Proposed changes in the Affordable Health Care Act would provide incentives for companies that adopt these types of measures.
- **Implementing policies and programs to promote active commuting.** Walk to school programs and Walking School Buses have become increasingly popular methods for promoting physical activity in youth. Different approaches are used for worksites but with the same goal of active commuting in mind. Buses and trains are often configured with bike racks. Many communities have also started investing in bike-share programs that allow individuals to check out a bike and drop it off at a different location. The systems are in widespread use in bicycle-friendly European countries and are slowly gaining momentum and visibility in the U.S.
- **Implementing empty calorie tax (also called fat tax).** Some public health experts have proposed a tax on foods low in nutritional density, such as sweetened soft drinks, candy, and fast food. Advocates of this type of tax propose that the proceeds go to campaigns to improve nutrition and increase activity levels.

Public support is strong for many of these policies. However, some people argue that policy changes such as a “fat tax” infringe on personal liberties. Nevertheless, changes in public policy have resulted in major reductions in smoking and smoking-related deaths over the past 20 years, and experts feel that similar policy changes can decrease obesity in America and reduce associated medical costs.



Guidelines for Losing Body Fat

Following appropriate weight loss guidelines is important for the best long-term results. There is considerable misinformation about diet and weight loss strategies, leading many people to use unsafe or ineffective weight loss supplements or to follow inappropriate exercise programs. Fat, weight, and body proportions are all factors that can be changed, but people often set goals that are impossible to achieve. Starting with small goals and aiming for reasonable rates of weight loss (1 to 2 pounds a week) are recommended. Setting unrealistic goals may result in eating disorders, failure to meet goals, or failure to maintain weight loss over time. Table 1 provides a summary of weight loss guidelines from the American College of Sports Medicine (ACSM).



A CLOSER LOOK

Mindless Eating

In his book, *Mindless Eating*, Dr. Brian Wansink presents a somewhat different approach to eating. Based on his research, Dr. Wansink contends that subtle and almost imperceptible cues and prompts in our day contribute to a tendency to overeat (“*We overeat because of family and friends, packages and plates, names and numbers, labels and lights, colors and candles, shapes and smells, distractions and distances, cupboard and containers*”). His research on labels and containers led to the development of the 100-calorie snack packages. He also advocates for eating with smaller plates and drinking from taller glasses since it tricks our mind into thinking that we ate or drank more than we did. By better understanding cues that lead us to eat, we can set habits and environments that help us to eat less. According to Dr. Wansink, “The best diet is the one that you don’t know that you are on.”

Would this mental approach to weight control help you better regulate your weight?



Behavioral goals are more effective than outcome goals. Researchers have shown that setting only **outcome goals**, or goals that set a specific amount of weight or fat loss (or gain), can be discouraging. If a **behavioral goal** of eating a reasonable number of calories per day and expending a reasonable number of calories in exercise is met, outcome goals will be achieved. Most experts believe that behavioral goals work better than weight or fat loss goals, especially in the short term (see Concept 2 for tips about goal-setting principles and SMART goals).

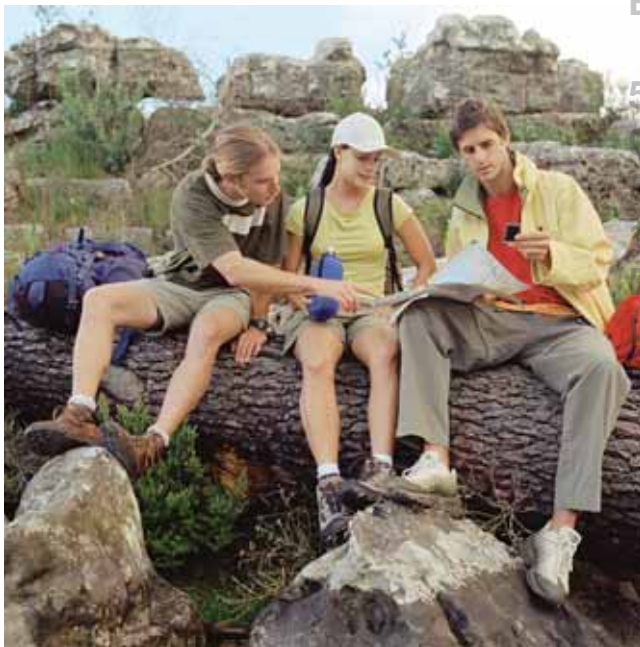
A combination of physical activity and a healthy, low-calorie diet is the best approach for long-term weight control. The most effective diet for fat loss is a low-calorie diet that you can stick with over time. Reduced-calorie diets result in meaningful weight loss, regardless of the composition of the diet (e.g., carbohydrates, fats, proteins). Diets high in grains, fruits, and vegetables are generally recommended because they are typically low in calories and easy to maintain over time. Research also clearly indicates that regular exercise is crucial to long-term fat loss. Weight loss programs that do not include physical activity are likely to fail.

A major advantage of emphasizing both physical activity and dietary changes is that physical activity can help maintain basal metabolic rate and prevent the decline that occurs with calorie sparing. Studies have shown that programs that include both diet and physical activity promote greater loss of body fat than programs based solely

Table 1 ► Guidelines for Weight Loss Treatment

Questions about Weight Loss	Recommendations
Who should consider weight loss?	Individuals with a BMI of >25 or in the marginal or overfat zone <i>should consider</i> reducing their body weight—especially if it is accompanied by abdominal obesity. Individuals with a BMI of >30 <i>are encouraged to seek</i> weight loss treatment.
What types of goals should be established?	Overweight and obese individuals should target reducing their body weight by a minimum of 5 to 10 percent and should aim to maintain this long-term weight loss.
What about maintenance?	Individuals should strive for long-term weight maintenance and the prevention of weight regain over the long term, especially when weight loss is not desired or when attainment of ideal body weight is not achievable.
What should be targeted in a weight loss program?	Weight loss programs should target both eating and exercise behaviors, as sustained changes in both behaviors have been associated with significant long-term weight loss.
How should diet be changed?	Overweight and obese individuals should reduce their current intake by 500–1,000 kcal/day to achieve weight loss (<30% of calories from fat). Individualized levels of caloric intake should be established to prevent weight regain after initial loss.
How should activity be changed?	Overweight and obese individuals should progressively increase to a minimum of 150 minutes of moderate-intensity physical activity per week for health benefits. However, for long-term weight loss, the program should progress to higher amounts of activity (e.g., 200–300 minutes per week or >2,000 kcal/week).
What about resistance exercise?	Resistance exercise should supplement the endurance exercise program for individuals undertaking modest reductions in energy intake to lose weight.
What about using drugs for weight loss?	Pharmacotherapy (medicine/drugs) for weight loss should be used only by individuals with a BMI >30 or those with excessive body fatness. Weight loss medications should be used only in combination with a strong behavioral intervention that focuses on modifying eating and exercise behaviors.

Source: American College of Sports Medicine.



An active, healthy lifestyle is critical for long-term weight control.

on dietary changes. The total weight loss from the programs may be about the same, but a larger fraction of the weight comes from fat when physical activity is included. In contrast, programs based solely on diet result in greater loss of lean muscle tissue. A healthy diet and regular physical activity are the keys for long-term weight control. Small changes, such as eating a few hundred calories less per day or walking for 30 minutes every day, can make a big difference over time. The important point is to strive for permanent changes that can be maintained in a normal daily lifestyle.

Outcome Goal Statement of intent to achieve a specific test score or a specific standard associated with good health or wellness—for example, “I will lower my body fat level by 3 percent.”

Behavioral Goal Statement of intent to perform a specific behavior (changing a lifestyle) for a specific period of time—for example, “I will reduce the calories in my diet by 200 a day for the next 4 weeks.”

TECHNOLOGY UPDATE

Lifestyle Monitoring for Weight Control

The BodyMedia FIT system provides individuals with a comprehensive lifestyle monitoring tool to assist with weight control efforts. The advanced, multisensor, monitor (worn on the upper arm) tracks physical activity and energy expenditure while you go about your normal activities. Data can be displayed on a wrist display, linked to free smartphone apps, or uploaded to an online self-monitoring tool (Activity Manager). The online application makes it possible for users to record foods they eat in order to provide estimates of calorie intake, thereby aiding in energy balance (i.e., calories in minus calories out). The monitor and associated applications have been shown to facilitate weight loss in several controlled studies.

Motivation to lose weight may be enough for most people but a new partnership with a Web-based social media company (Earndit.com) allows users to earn financial rewards for their self-monitoring efforts. After registering through Earndit, you can associate your Bodymedia Fit monitor with your account. Earndit will then award points based upon the amount of activity you perform in a day. Similar to other social media tools (such as Groupon), the points are redeemable through associated vendors.

Would the extra motivation to monitor your activity help you maintain your weight loss goals?



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Small changes in eating patterns can be effective in fat loss. Experts suggest that we make over 200 food decisions in a given day. Making good food choices is generally easier at home than when eating at restaurants, work, or special occasions. Table 2 provides guidelines for making good selections when purchasing and preparing food at home as well as when you are away from home. Following are some specific steps you can take to improve your eating habits.

- *Make small changes at first.* Small restrictions in caloric intake sustained over time are more effective than drastic short-term changers.

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VIDEO 4

- *Eat breakfast every day.* Studies show that breakfast skipping is associated with an increased risk of obesity.
- *Consider eating smaller and more frequent meals in a day.* A common strategy in guided weight loss programs is to consume healthy, high protein snacks to help curb hunger and excess consumption at meals.
- *Eat less fat.* Research shows that reduction of fat in the diet results not only in fewer calories consumed (fats have more than twice the calories per gram as carbohydrates or proteins) but in greater body fat loss as well.
- *Restrict consumption of empty calories.* Foods that provide little nutrition often account for an excessive proportion of daily caloric intake. Examples of these foods are candy (often high in simple sugar) and potato chips (often fried in saturated fat).
- *Increase complex carbohydrates.* Foods high in fiber, such as fresh fruits and vegetables, contain few calories for their volume. They are nutritious and filling, and they are especially good foods for a fat loss program.
- *Learn the difference between craving and hunger.* Hunger is a physiological signal that helps promote an organism's drive to eat when energy supply gets low. A craving is simply a desire to eat something, often a food that is sweet or high in calories. When you feel the urge to eat, ask yourself, "Is this real hunger or a craving?"
- *Adopt a "mindful" approach to eating.* Most people consume food for enjoyment, but having a mindful approach to eating helps you learn to view food as sustenance or energy for healthy living. (See the Web Resources for more information on mindful eating.)
- *Use smaller plates and taller, thinner glasses for meals.* Research has shown that the size of serving dishes is related to the amount of food consumed. By using smaller plates and bowls and taller, thinner glasses you can help trick your mind into eating less.
- *Avoid negative self-talk.* One type of **negative self-talk** occurs when a person self-criticizes for not meeting a goal. For example, if you are determined not to eat more than one serving of food at a party but fail to meet this goal, you might say, "It's no use stopping now; I've already blown it." View this as a minor setback rather than a failure. A more appropriate response is **positive self-talk**, such as, "I'm not going to eat anything else tonight; I can do it."

Empty Calories Calories in foods considered to have little or no nutritional value.

Negative Self-Talk Self-defeating discussions with yourself focusing on your failures rather than your successes.

Positive Self-Talk Telling yourself positive, encouraging things that help you succeed in accomplishing your goals.

Table 2 ► Guidelines for Healthy Shopping and Eating in a Variety of Settings

Guidelines for Shopping	<ul style="list-style-type: none"> • Shop from a list to avoid purchasing foods that contain empty calories and other foods that will tempt you to overeat. • Shop with a friend to avoid buying unneeded foods. For this technique to work, the other person must be sensitive to your goals. In some cases, a friend can have a bad, rather than a good, influence. • Shop on a full stomach to avoid the temptations of snacking on and buying junk food. • Check labels to avoid foods that are excessively high in fat or saturated fat.
Guidelines for How You Eat	<ul style="list-style-type: none"> • When you eat, do nothing else but eat. If you watch television, read, or do some other activity while you eat, you may be unaware of what you have eaten. • Eat slowly. Taste your food. Pause between bites. Chew slowly. Do not take the next bite until you have swallowed what you have in your mouth. Periodically take a longer pause. Be the last one finished eating. • Do not eat food you do not want. Some people do not want to waste food, so they clean their plate even when they feel full. • Follow an eating schedule. Eating at regular meal times can help you avoid snacking. Spacing meals equally throughout the day can help reduce appetite. • Leave the table after eating to avoid taking extra, unwanted bites and servings. • Eat meals of equal size. Some people try to restrict calories at one or two meals to save up for a big meal. • Eating several <i>small</i> meals helps you avoid hunger (fools the appetite), and this may help prevent overeating. • Avoid second servings. Limit your intake to one moderate serving. If second servings are taken, make them one-half the size of first servings. • Limit servings of salad dressings and condiments (e.g., catsup). These are often high in fat and sugar and can amount to greater caloric consumption than expected.
Guidelines for Controlling the Home Environment	<ul style="list-style-type: none"> • Store food out of sight. Avoid containers that allow you to see food. Limit the accessibility of foods that tempt you and foods with empty calories. Foods that are out of sight are out of mouth. • Do your eating in designated areas only, such as the kitchen and dining room, so you do not snack elsewhere. It is especially easy to eat too much while watching television. • If you snack, eat foods high in complex carbohydrates and low in fats, such as fresh fruits and carrot sticks. • Freeze leftovers so that it takes preparation to eat them, helping you avoid temptation.
Guidelines for Controlling the Work Environment	<ul style="list-style-type: none"> • Bring food from home rather than eating from vending machines or catering trucks. • Do not eat while working and take your lunch as a break. Do something active during breaks, such as taking a walk. • Avoid food provided by co-workers, such as snacks in work rooms, birthday cakes, or candy. • Have drinking water or low-calorie drinks available to substitute for snacks.
Guidelines for Eating on Special Occasions	<ul style="list-style-type: none"> • Practice ways to refuse food. Knowing exactly what to say will help you avoid being talked into eating something you do not want. • Eat before you go out, so you are not as hungry at parties and events. • Do not stand near food sources, and distract yourself if tempted to eat when you are not really hungry. • Limit servings of nonbasic parts of the meal, such as alcohol, soft drinks, appetizers, and desserts.
Guidelines for Eating at Restaurants	<ul style="list-style-type: none"> • Make healthy selections from the menu. Choose chicken without skin, fish, or lean cuts of meat. Grilled or broiled options are better than fried. Choose healthier options for dessert, as many decadent desserts can have more calories than the whole dinner. • Ask for the condiments (e.g., butter, mayonnaise, salad dressings) on the side, allowing you to determine how much to put on. • Do not feel compelled to eat everything on your plate. Many restaurants serve exceptionally large portions to try to please the customers. • Ask for a to-go box to divide big portions before eating. • Order à la carte rather than full meals to avoid multiple courses and servings. • Avoid supersizing your meals if eating at fast-food restaurants, as this can add unwanted calories. Opt for the child-sized meal if possible.

The support of family and friends can be of great importance in balancing caloric intake and caloric expenditure. Family and friends can help you adopt and maintain healthy eating practices and follow shopping guidelines (see Table 2). Sometimes, friends and family can “try too hard” to help. This can have the opposite effect

if it is perceived as an attempt to control your behavior. Encouragement and support, rather than control of behavior, are the keys.

Group support can also be beneficial to many individuals attempting to change their behavior. Commercial



In the News

Diet Soft Drinks

Diet soft drinks are a popular, and seemingly healthy, choice for people concerned about excess calories. However, recent studies have reported that consumption of diet soft drinks may increase risk for Type 2 diabetes and cardiovascular disease. The most prominent findings have been from a 10-year longitudinal project called the Northern Manhattan Study. This study had a large sample of over 2,500 adults report on how much and what kind of soft drinks they drank. They followed participants for an average of 9 or more years and monitored risks for vascular events such as ischemic and hemorrhagic stroke. People who drank diet soft drinks every day had a 61 percent higher risk of vascular events than those who reported no soda

drinking, even after controlling for a variety of demographic (e.g., age, gender, BMI) and lifestyle (smoking, alcohol, physical activity, calorie consumption) variables. The authors point out that diet soft drink drinkers should not be alarmed because the findings do not prove cause and effect. At present, there are no clear mechanisms that explain the findings, so additional work is clearly needed. The results, however, may lead some calorie-conscious consumers to rethink their beverage choices.

Do these results influence your thinking about the benefits and risks of diet soft drinks?



groups such as Overeaters Anonymous and Weight Watchers help those who need the support of peers in attaining and maintaining desirable fat levels for a lifetime. A number of new group-based lifestyle and fitness programs are available to provide social support for change (e.g., Kosama).

Facts about Fad Diets and Clinical Approaches to Weight Loss

Fad diets and extreme diets are not likely to be effective. Consumers are barraged with products and advertisements that claim easy weight loss solutions. Various fad diets capitalize on the consumer's concern about weight and a general lack of knowledge about diet and exercise. Fad diets often take some small fact about nutrition and claim they have uncovered some magic solution to weight loss that wasn't previously known. Consumers often believe the claims because they have a history of failing with past efforts to control their weight.

A common strategy in some fad diets is to restrict carbohydrates. Because water is required to store carbohydrates, reductions in carbohydrate intake leads to reductions in water storage—and weight. The person who restricts carbohydrates may see a reduction in “weight” (not fat!) and assume the diet worked when it didn't. Regardless of the approach, fad diets provide little hope since they typically can't



Fruits and vegetables are good snack choices to help reduce total calorie consumption and improve health.

be maintained over time. Constant losing and gaining, known as “yo-yo” dieting, is counterproductive and may lead to negative changes in the person’s metabolism and unwanted shifts in sites of fat deposition.

Avoid diets that require severe caloric restriction and exercise programs that require exceptionally large caloric expenditure. These plans can be effective in fat loss over a short period but are seldom maintained for a lifetime. Studies show that extreme programs for weight control, designed to “take it off fast,” result in long-term success rates of less than 5 percent. One reason extremely low calorie diets are ineffective is that they may promote “calorie sparing.” When caloric intake is 800 to 1,000 or less, the body protects itself by reducing basal and resting metabolism levels (sparing calories). This results in less fat loss, even though the caloric intake is very low. When in doubt, avoid programs that promise fast and easy solutions, extreme diets that favor specific foods or eating patterns, and any product that makes unreasonable claims about easy ways to stimulate your metabolism or “melt away fat.”

Artificial sweeteners and fat substitutes may help but do not provide a complete weight loss solution. Artificial sweeteners are frequently used in soft drinks and food to reduce the calorie content. Because they have few or no calories, these supplements were originally expected to help people with weight control. However, since they were introduced, the general public has not eaten fewer calories and more people are now overweight than before. People consuming these products end up consuming just as many calories per day as people consuming products with real sugar or sweeteners.

As described in Concept 14, a variety of artificial fat substitutes are now used to reduce fat content in foods. Potato chips and other fried foods cooked in these products as well as baked goods using these products have less fat and fewer calories. If you eat no more food than usual and substitute foods made with these products, you will consume fewer calories and less fat. Experts worry that consumers will not eat the same amount of foods with these fake fats but will feel they can eat more because the fake fats contain fewer calories and less fat.

A variety of appetite suppressants are available but all of them have limitations. Because long-term weight control is difficult, many individuals seek simple solutions from various nonprescription weight loss products. A common additive in dietary supplements has been the stimulant ephedra (or the herbal equivalent, Ma Huang). Many negative reactions and multiple deaths have been attributed to the use of ephedra, and this led the FDA to ban the sale and use of any products containing this

compound. A concern among public health officials is that many products still do not accurately label the contents of their supplements. Manufacturers of supplements have recently started selling “ephedra-free” supplements that use other stimulants, but these have been shown to present similar health risks. Consumers should be wary of dietary supplements, due to the unregulated nature of the industry.

Four prescription drugs have been approved by the FDA to help patients curb appetite and lose weight. Sibutramine (Meridia) acts by inhibiting the reuptake of the neurotransmitters serotonin and noradrenaline, which regulate hunger. Orlistat (used in prescription Xenical and over-the-counter Alli) enhances weight loss by inhibiting the body’s absorption of fat. Studies have confirmed that it can help patients lose more weight, but a limitation is that it also blocks the absorption of fat-soluble vitamins. Belviq, like Sibutramine, acts to inhibit the reuptake of neurotransmitters that regulate hunger. Qsymia (Qnexa), the most recently approved, suppresses appetite and increases feelings of fullness. All of the prescription medications are considered to be adjuncts to lifestyle modification and are designed for use with only obese patients or overweight adults with other comorbidities.

Products and procedures claiming to remove fat cells are not safe or effective. A procedure known as “lipodissolve” claims that it is possible to remove fat cells from the body with chemicals. A small amount of a chemical found in lecithin—a food ingredient derived from soybeans—is injected into fatty areas of the body, such as the buttocks or thighs. The fat absorbs the substance (phosphatidylcholine deoxycholate, or PCDC), resulting in an inflammation, followed by a hardening of the fat cells in the area. The fat cells are then allegedly eliminated from the body. The FDA has not approved the procedure, and the safety and effectiveness of the procedure has not been demonstrated by scientific evidence. However, there are reports of the procedure being marketed as a “quick fix” that “burns fat away with an injection.” Companies promoting the injections have marketed them as a dietary supplement because the active ingredient (lecithin) has been approved for human consumption by mouth. However, because the PCDC is injected (rather than consumed by mouth), the FDA views the product as a drug and has ordered the manufacturer to stop marketing and distributing the product due to safety concerns. In addition to unproven effectiveness, the procedure can cause permanent scarring, skin deformation, and deep, painful knots under the skin where the lipodissolve treatments are given. This highlights why consumers should be wary of unproven procedures they see on the Internet.



Strategies for Action

Knowing about guidelines for controlling body fat is not as important as following them. The guidelines in this concept work only if you use them. In Lab 15A, you will identify guidelines that may help you in the future.

Record keeping is important in meeting fat control goals and making moderation a part of your normal lifestyle. It is easy to fool yourself when determining the amount of food you have eaten or the amount of exercise you

have done. Once fat control goals have been set, whether for weight loss, maintenance, or gain, keeping a diet log and an exercise log can help you monitor your behavior and maintain the lifestyle necessary to meet your goals. A log can also help you monitor changes in weight and body fat levels. But remember, avoid too much emphasis on short-term weight changes. Lab 15B will help you learn about the actual content of fast foods, so you can learn to make better choices when eating out.

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Web Resources

Academy of Nutrition and Dietetics www.eatright.org
 Berkeley Nutrition Sciences www.nutritionquest.com
 Center for Mindful Eating www.tcme.org
 Mindless Eating <http://mindlesseating.org>
 Nutrition Action Health Letter www.cspinet.org/nahealth
 Nutriwatch (consumer website) www.nutriwatch.org
 Office of Dietary Supplements <http://ods.od.nih.gov>
 STOP Obesity Alliance www.stopobesityalliance.org
 USDA Food and Nutrition Information Center www.nal.usda.gov/fnic

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Healthy People 2020

The objectives listed below are societal goals designed to help all Americans improve their health between now and the year 2020. They were selected because they relate to the content of this concept.

- Increase policies that give retail food outlets incentives for foods that meet dietary guidelines.
- Increase work sites that offer nutrition and weight management classes and counseling.
- Increase participation in employee wellness programs.
- Increase BMI measurement by primary care physicians.
- Increase physician counseling on nutrition and weight management.
- Reduce percentage of adults who do no leisure-time activity.

- Reduce consumption of calories from solid fats and added sugars.
- Decrease the consumption of sugar-sweetened beverages.
- Reduce consumption of saturated fat in the diet.
- Increase proportion of adults with healthy weight.
- Reduce childhood overweight and obesity.

A national goal is to reduce the consumption of sugar-sweetened beverages. A 12 oz. soft drink contains 10 teaspoons of sugar and has no other nutritional values. Substituting consumption of soft drinks with water, milk, or 100 percent fruit juice would improve overall nutrition quality and reduce calorie consumption. Do you agree with proposals that would tax soft drink consumption in order to reduce consumption and shift consumer choices to healthier beverages?

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Lab 15A Selecting Strategies for Managing Eating

Name

Section

Date

Purpose: To learn to select strategies for managing eating to control body fatness

Procedures

1. Read the strategies listed in Chart 1.
2. Check the box beside 5 to 10 of the strategies that you think will be most useful for you.
3. Answer the questions in the Conclusions and Implications section.

Chart 1 Strategies for Managing Eating to Control Body Fatness

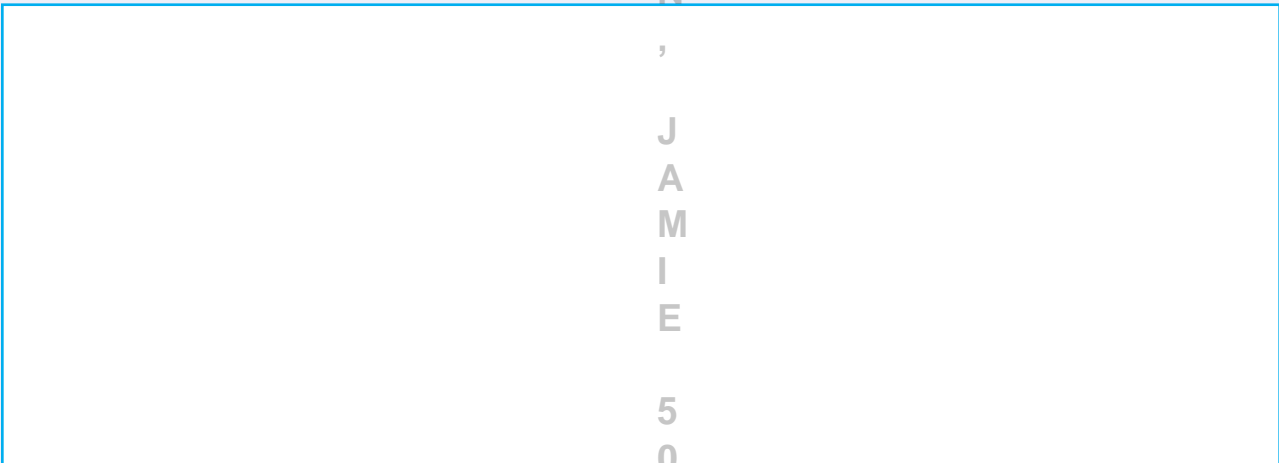
✓	Check 5 to 10 strategies that you might use in the future.	✓	Check 5 to 10 strategies that you might use in the future.
	Shopping Strategies		Eating on Special Occasions
	Shop from a list.		Practice ways to refuse food.
	Shop with a friend.		Avoid tempting situations.
	Shop on a full stomach.		Eat before you go out.
	Check food labels.		Don't stand near food sources.
	Consider foods that take some time to prepare.		If you feel the urge to eat, find someone to talk to.
	Methods of Eating		Strategies for Eating Out
	When you eat, do nothing but eat. Don't watch television or read.		Limit deep-fat fried foods.
	Eat slowly.		Ask for information about food content.
	Do not eat food you do not want.		Limit use of condiments.
	Follow an eating schedule.		Choose low-fat foods (e.g., skim milk, low-fat yogurt).
	Do your eating in designated areas, such as kitchen or dining room only.		Choose chicken, fish, or lean meat.
	Leave the table after eating.		Order à la carte.
	Avoid second servings.		Ask early for a to-go box and divide portions.
	Limit servings of condiments.		If you eat desserts, avoid those with sauces or toppings.
	Limit servings of nonbasics, such as dessert, breads, and soft drinks.		Eating at Home
	Eat several meals of equal size rather than one big meal and two small ones.		Keep busy at times when you are at risk of overeating.
	Eating in the Work Environment		Store food out of sight.
	Bring your own food to work.		Avoid serving food to others between meals.
	Avoid snack machines.		If you snack, choose snacks with complex carbohydrates, such as carrot sticks or apple slices.
	If you eat out, plan your meal ahead of time.		Freeze leftovers to avoid the temptation of eating them between meals.
	Do not eat while working.		
	Avoid sharing foods from co-workers, such as birthday cakes.		
	Have activity breaks during the day.		
	Have water available to substitute for soft drinks.		
	Have low-calorie snacks to substitute for office snacks.		

Conclusions and Implications

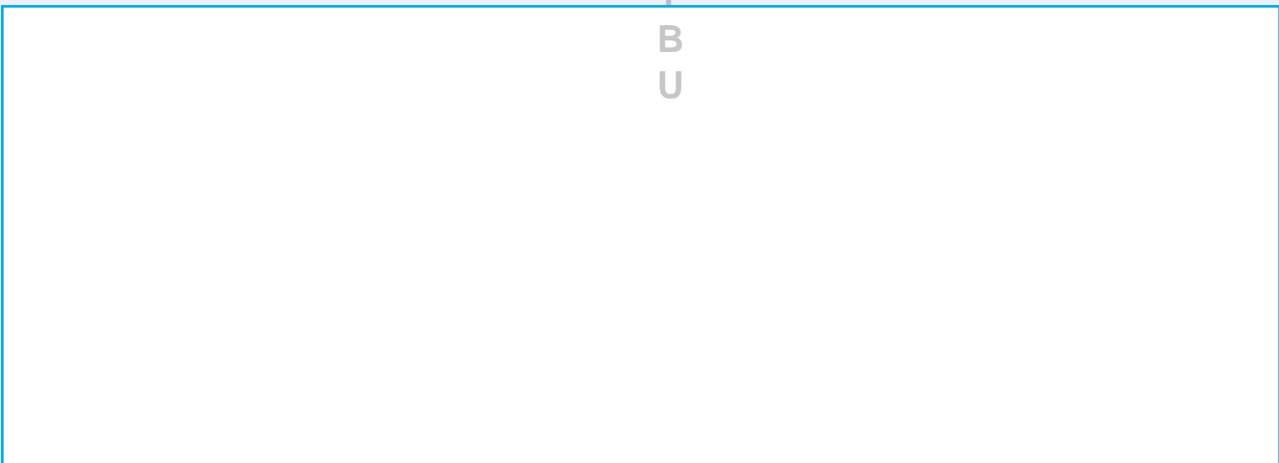
1. In several sentences, discuss your need to use strategies for effective eating. Do you need to use them? Why or why not?



2. In several sentences, discuss the effectiveness of the strategies contained in Chart 1. Do you think they can be effective for people who have a problem controlling their body fatness?



3. In several sentences, discuss the value of using behavioral goals versus outcome goals when planning for fat loss.



Lab 15B Evaluating Fast-Food Options

Name

Section

Date

Purpose: To learn about the energy and fat content of fast food and how to make better choices when eating at fast-food restaurants

Procedures

1. Select a fast-food restaurant and a typical meal that you might order. Then use an online food calculator to determine total calories, fat calories, saturated fat intake, and cholesterol for each food item.
2. Record the values in Chart 2.
3. Sum the totals for the meal in Chart 2.
4. Record recommended daily values by selecting an amount from Chart 1. The estimate should be based on your estimated needs for the day.
5. Compute the percentage of the daily recommended amounts that you consume in the meal by dividing recommended amounts (step 4) into meal totals (step 3). Record percent of recommended daily amounts in Chart 2.
6. Answer the questions in the Conclusions and Implications section.

Chart 1 Recommended Daily Amounts of Fat, Saturated Fat, Cholesterol, and Sodium

	2,000 kcal	3,000 kcal
Total fat	65 g	97.5 g
Saturated fat	20 g	30 g
Cholesterol	300 mg	450 mg
Sodium	2,400 mg	3,600 mg

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Results


Chart 2 Listing of Foods Selected for the Meal

Food Item	Total Calories	Total Fat (g)	Saturated Fat (g)	Cholesterol (mg)
1.		5		
2.		0		
3.		5		
4.		1		
5.				
6.		B		
Total for meal (sum up each column)		U		
Recommended daily amount (record your values from Chart 1)				
% of recommended daily amount (record your % of recommended)				

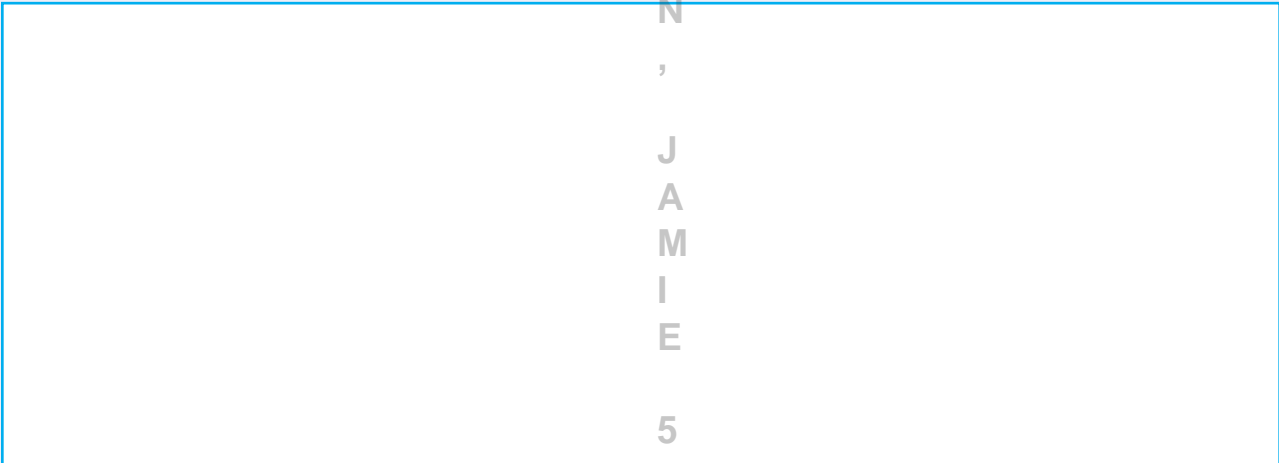
Consult an online fast food calculator to estimate calorie content of menu choices (see www.fastfoodnutrition.org).

Conclusions and Implications:

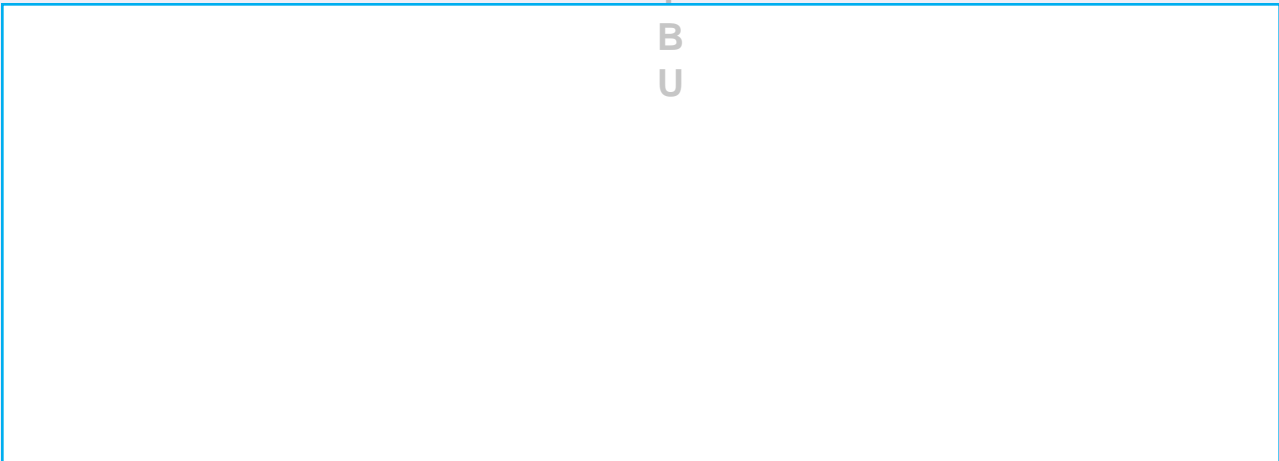
1. Describe how often you eat at fast-food restaurants and indicate whether you would like to reduce how much fast food you consume.



2. Were you surprised at the amount of fat, saturated fat, and cholesterol in the meal you selected?



3. What could you do differently at fast-food restaurants to reduce your intake of fat, saturated fat, and cholesterol?



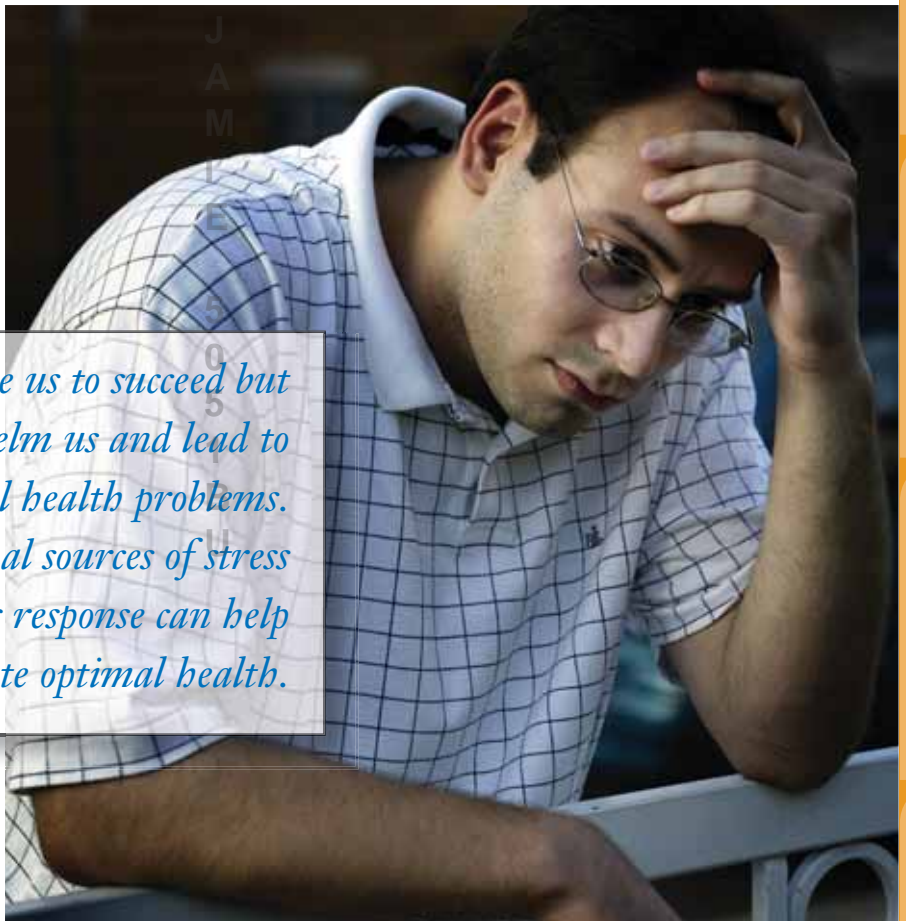
Stress and Health

LEARNING OBJECTIVES

After completing the study of this concept, you will be able to:

- ▶ Identify major sources and types of stress.
- ▶ Explain the major bodily responses to stress.
- ▶ Describe the stages of the General Adaptation Syndrome.
- ▶ Identify common physical, emotional, and behavioral consequences of stress.
- ▶ Understand individual differences in both physiological reactivity and appraisals of stressful events.
- ▶ Describe personal characteristics that influence consequences of stress.
- ▶ Identify personal sources of stress and your approaches for dealing with stressful life events.

Stress can motivate us to succeed but it can also overwhelm us and lead to physical and emotional health problems. Understanding personal sources of stress and your unique stress response can help facilitate optimal health.



Stress affects everyone to some degree. In fact, approximately 75 percent of adults say they have experienced moderate to high levels of **stress** in the past month, and nearly half report that their level of stress has increased in the past year. **Stressors** come in many forms, and even positive life events can increase our stress levels.

At moderate levels, stress can motivate us to reach our goals and keep life interesting. However, when stressors are severe or chronic, our bodies may not be able to adapt successfully. Stress can compromise immune functioning, leading to a host of diseases of **adaptation**. In fact, stress has been linked to between 50 and 70 percent of all illnesses. Further, stress is associated with negative health behaviors, such as alcohol and other drug use, and to psychological problems, such as depression and anxiety. Although all humans have the same physiological system for responding to stress, stress reactivity varies across individuals. In addition, the way we think about or perceive stressful situations has a significant impact on how our bodies respond. Thus, there are large differences in individual responses to stress.

This concept reviews the causes and consequences of stress. First, the sources of stress (stressors), such as daily hassles and major life events, are described. Then the physiological responses to stress and the impact of these effects on physical and mental health are reviewed. Finally, individual differences in physiological and cognitive responses to stress and the implications of these individual differences for health and wellness are discussed.



Sources of Stress

The first step in managing stress is to recognize the causes and to be aware of the symptoms. Identify the factors in your life that make you feel “stressed-out.” Everything from minor irritations, such as traffic jams, to major life changes, such as births, deaths, or job loss, can be a stressor. A stress overload of too many demands on your time can make you feel that you are no longer in control. Recognizing the causes and effects of stress is important for learning how to manage it.

Stress has a variety of sources. There are many kinds of stressors. Environmental stressors include heat, noise, overcrowding, pollution, and second-hand smoke. Physiological stressors are such things as drugs, caffeine, tobacco, injury, infection or disease, and physical effort.

Emotional stressors are the most frequent and important stressors. Some people refer to these as *psychosocial stressors*. A national study of daily experiences indicated that more than 60 percent of all stressful experiences fall into a few areas (see Table 1).

Table 1 ▶ Ten Common Stressors in the Lives of College Students and Middle-Aged Adults

College Students	Middle-Aged Adults
1. Troubling thoughts about the future	1. Concerns about weight
2. Not getting enough sleep	2. Health of a family member
3. Wasting time	3. Rising prices of common goods
4. Inconsiderate smokers	4. Home maintenance (interior)
5. Physical appearance	5. Too many things to do
6. Too many things to do	6. Misplacing or losing things
7. Misplacing or losing things	7. Yard work or outside home maintenance
8. Not enough time to do the things you need to do	8. Property, investments, or taxes
9. Concerns about meeting high standards	9. Crime
10. Being lonely	10. Physical appearance

Source: Kanner, et al.

Stressors vary in severity. Major stressors create major emotional turmoil or require tremendous amounts of adjustment. This category includes personal crises (e.g., major health problems or death in the family, divorce/separation, financial problems, legal problems) and job/school-related pressures or major age-related transitions (e.g., college, marriage, career, retirement). Daily hassles are generally viewed as shorter-term or less severe. This category includes events such as traffic problems, peer/work relations, time pressures, and family squabbles. In school, pressures such as grades, term papers, and oral presentations would likely fall into this category. Major stressors can alter daily patterns of stress and impair our ability to handle the minor stressors of life, while daily hassles can accumulate and create more significant problems. It is important to be aware of both types of stressors.



Negative, ambiguous, and uncontrollable events are usually the most stressful. Although stress can come from both positive and negative events, negative ones generally cause more distress because negative stressors usually have harsher consequences and little benefit. Positive stressors, on the other hand, usually have enough benefit to make them worthwhile. For example, the stress of starting a new job may be tremendous, but it is not as bad as the negative stress from losing a job.

Ambiguous stressors are harder to accept than more clearly defined problems. In most cases, if the cause of a stressor or problem can be identified, measures can be taken to improve the situation. For example, if you are stressed about a project at work or school, you can use specific strategies to complete the task on time. Stress brought on by a relationship with friends or co-workers, on the other hand, may be harder to understand. In some cases, it is not possible to determine the primary source or cause of the problem. These situations are more problematic because fewer clear-cut solutions exist. Another factor that makes events stressful is a lack of control. Because little can be done to change the situation, these events leave us feeling powerless.

Stress in Contemporary Society

Americans report high levels of stress. The American Psychological Association commissions an annual survey (“Stress in America”) to monitor attitudes and perceptions of stress in the general public. The results from the most recent survey (2011) reveal a decline in overall ratings of stress, continuing a slow decline compared to peaks in 2007. However, more adults report that their stress is increasing instead of decreasing. In fact, over 44 percent reported that their stress increased over the past 5 years while only 27 percent reported a decrease. Money, work, and the economy were the three most commonly reported sources of stress, as they have been for the past 5 years. The most commonly reported physical symptoms of stress included irritability/anger, feeling nervous or anxious, and fatigue.

Although sources and consequences of stress are similar for men and women, and for younger and older Americans, the report highlights some important gender differences. Overall, women seem to be more aware of the potential negative impact of stress on health than men. With respect to age, older adults tend to report lower levels of stress and more successful efforts to manage their stress. (See A Closer Look on page 375 for more details.)

College presents unique challenges and stressors.

For college students, schoolwork can be a full-time job, and those who have to work outside of school must handle the stresses of both jobs. Although the college years are often thought of as a break from the stresses of the real world, college life has its own stressors. Obvious sources of stress include taking exams, speaking in public, and becoming comfortable with talking to professors. Students are often living independently of family for the first time while negotiating new relationships—with



Daily hassles can contribute to stress.

roommates, dating partners, and so on. Young people entering college are also faced with a less structured environment and with the need to control their own schedules. Though this environment has a number of advantages, students are faced with a greater need to manage their stress effectively.

In addition to the traditional challenges of college, the new generation of students faces stressors that were not typical for college students in the past. According to the American Council on Education, only 40 percent of today’s college students enroll full-time immediately after high school. More students now work, and many go back to school after spending time in the working world. More of today’s college students are the first in their family to attend college. Perhaps as a result of some of these factors and the pressures that they create, rates of mental health problems among college students have

Stress The nonspecific response (generalized adaptation) of the body to any demand made on it in order to maintain physiological equilibrium. This positive or negative response results from emotions that are accompanied by biochemical and physiological changes directed at adaptation.

Stressors Things that place a greater than routine demand on the body or evoke a stress reaction.

Adaptation The body’s efforts to restore normalcy.

increased dramatically in recent years (see Figure 1). In a 2011 survey of campus counseling center directors, 91 percent of respondents indicated that they believed that more students today have severe psychological problems. This impression is substantiated by the increasing percentage of students on psychiatric medications (9 percent in 1994 to 23 percent in 2011). Student surveys paint a similar picture. For example, a recent study found that 42 percent of students reported feeling “so depressed it was difficult to function” at some point during the past year.

connect
VIDEO 3

Some sources of stress are shared by entire communities, cultures, or societies. Although the stresses individuals experience are often unique to their particular circumstances, there are times when entire communities, cultures, or even countries have shared experiences of severe stress. The economic downturn in the United States has been a shared source of stress for everyone in this country. A poll developed by Gallup and Healthways to track the well-being of the U.S. population has documented the effects of shared stressors on well-being. The poll includes daily surveys of 1,000 Americans beginning in January 2008. As the economic downturn worsened in the latter half of 2008, dramatic decreases in well-being were observed, with low levels persisting through the early months of 2009. Although the economic crisis is far from over, Americans have shown themselves to be quite resilient. By June 2009, levels of well-being had returned to levels first assessed in January 2008, and levels have stayed relatively stable since that time.

Experiences of discrimination are a significant source of stress. In a 2009 meta-analysis of 134 previous studies, researchers found that higher levels of perceived discrimination were associated with both negative

HELP Health is available to Everyone for a Lifetime, and it's Personal

Once a year colleges all over the country participate in a National Stress Out Day where other college students and professionals provide pre-finals stress relief, educate about anxiety disorders, and help promote mental health awareness among college students. Between classes, finals, jobs, and family responsibilities, college students today have a lot on their plate.

Which types of stressors do you think have the most impact on college students?

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ACTIVITY

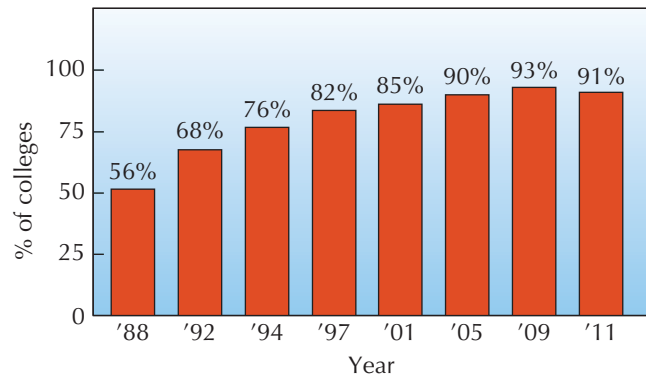


Figure 1 ▶ Colleges reporting increased psychological problems.

Source: R. Gallagher.

physical and psychological health outcomes. Perceived discrimination was also associated with more negative physiological and psychological stress responses, more negative health behaviors (e.g., smoking), and fewer positive health behaviors (e.g., exercise). With respect to physiological response, a recent study of Caucasian and African-American women found that higher levels of perceived discrimination were associated with higher levels of visceral fat, a known risk factor for cardiovascular disease. Regarding health risk behaviors, a recent study of college students found that students who reported more discrimination experiences had more negative moods, were more likely to drink as a way to cope with negative emotions, and were more likely to be heavy drinkers. These findings were consistent across a range of discrimination experiences (e.g., race/ethnicity, gender, weight, sexual orientation).

5 Reactions to Stress

All people have a general reaction to stress. In the early 1900s, Walter Cannon identified the fight-or-flight response to threat. According to his model, the body reacts to a threat by preparing either to fight or flee the situation. The body prepares for either option through the activation of the **sympathetic nervous system (SNS)**. When the SNS is activated, epinephrine (adrenaline) and norepinephrine are released to focus attention on the task at hand. Heart rate and blood pressure increase to deliver oxygen to the muscles and essential organs, the eyes take in more light to increase visual acuity, and more sugar is released into the bloodstream to increase energy level. At the same time, nonessential functions like digestion and urine production are slowed. Figure 2 depicts some of the many physiological changes that occur during this process. Once the immediate threat has passed,

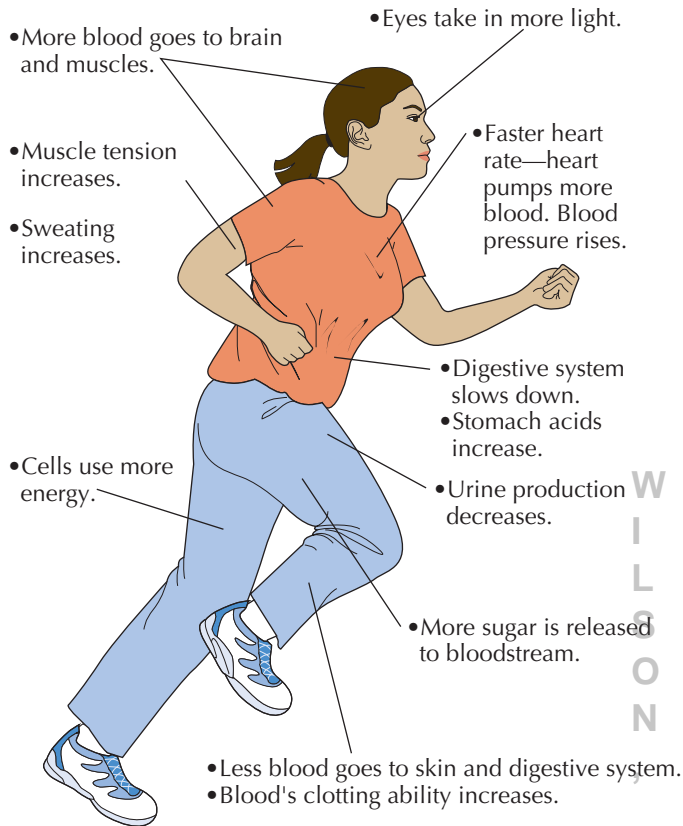


Figure 2 ▶ Physical symptoms of stress.

the **parasympathetic nervous system (PNS)** takes over in an attempt to restore the body to homeostasis and conserve resources. The PNS largely reverses the changes initiated by the SNS (e.g., slows heart rate and returns blood from the muscles and essential organs to the periphery).

Sometimes the fight-or-flight, or SNS, response is essential to survival, but when invoked inappropriately or excessively it may be more harmful than the effects of the original stressor. Hans Selye, another prominent scientist, was the first to recognize the potential negative consequences of this response. Selye suggested that this system could be invoked by mental as well as physical threats and that the short-term benefits might lead to long-term negative consequences. Based on these ideas, Selye described the general adaptation syndrome, which explains how the autonomic nervous system reacts to stressful situations and the conditions under which the system may break down (Table 2). The term *general* highlights the similarities in response to stressful situations across individuals. Selye's work led him to be referred to as the "father of stress."

Although chronic activation of the SNS is still believed to be important in the development of physical disease,

Table 2 ▶ The Three Stages in the General Adaptation Syndrome

Stage 1: Alarm Reaction

Any physical or mental trauma triggers an immediate set of reactions that combat the stress. Because the immune system is initially depressed, normal levels of resistance are lowered, making us more susceptible to infection and disease. If the stress is not severe or long-lasting, we bounce back and recover rapidly.

Stage 2: Resistance

Eventually, sometimes rather quickly, we adapt to stress, and we tend to become more resistant to illness and disease. The immune system works overtime during this period, keeping up with the demands placed on it.

Stage 3: Exhaustion

Because the body is not able to maintain homeostasis and the long-term resistance needed to combat stress, we invariably experience a drop in resistance level. No one experiences the same resistance and tolerance to stress, but everyone's immunity at some point collapses following prolonged stress reactions.

Source: H. Selye.

other systems in the body are also involved. For example, the hypothalamic-pituitary-adrenal (HPA) axis is activated during stress, leading to the release of corticotropin-releasing hormone (CRH) and secondary activation of the pituitary gland. The pituitary releases a chemical called adrenocorticotropic hormone (ACTH), which ultimately causes the release of an active stress hormone called cortisol. With chronic exposure to stress, the HPA system can become dysregulated, and both over- and underactivation of the system are associated with risk for negative health outcomes.

Excessive stress reduces the effectiveness of the immune system. In addition to preparing the body for fight or flight, the stress-related activation of the SNS and the HPA axis slows down the functioning of the immune response. In the face of an immediate threat, mobilizing resources that will help in the moment is more important to the body than preventing or fighting infection. As

Sympathetic Nervous System (SNS) The component of the autonomic nervous system that responds to stressful situations by initiating the fight-or-flight response.

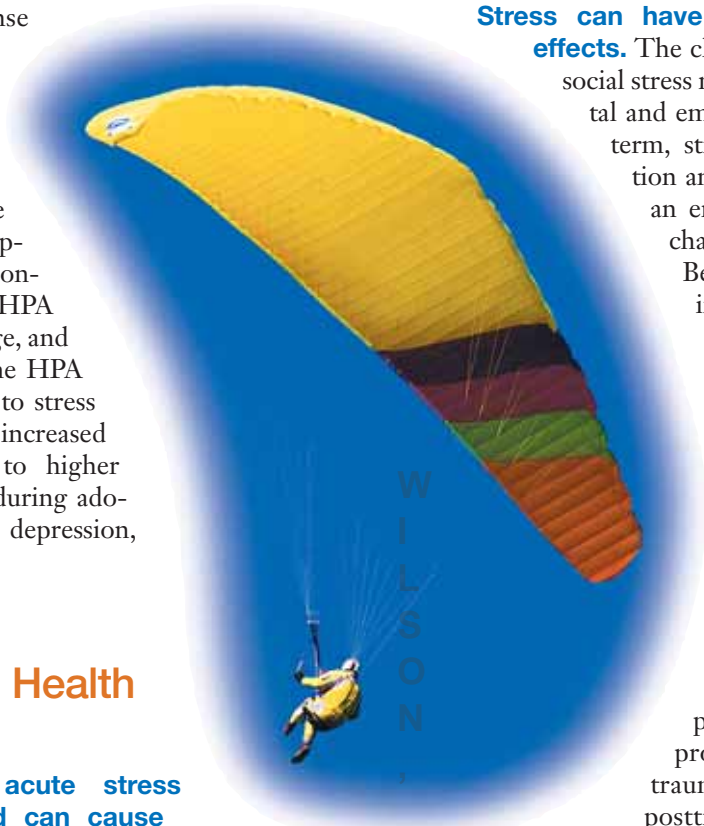
Parasympathetic Nervous System (PNS) The component of the autonomic nervous system that helps bring the body to a resting state following stressful experiences.

a result, if the stress response is chronically activated, high levels of adrenaline and cortisol continue to tell the body to mobilize resources at the expense of immune functioning. There are also normative developmental changes in the functioning of the HPA axis. Overall, HPA axis activity increases with age, and a recent study found that the HPA axis becomes more reactive to stress during adolescence. This increased reactivity may contribute to higher rates of negative outcomes during adolescence, including anxiety, depression, and substance use.

Stress Effects on Health and Wellness

Chronic or repetitive acute stress can lead to fatigue and can cause or exacerbate a variety of health problems. Some stress persists only as long as the stressor is present. For example, job-related stress caused by a challenging project generally subsides once that project is complete. In contrast, exposure to chronic stress or repeated exposure to acute stress may lead to a state of fatigue. Fatigue may result from lack of sleep, emotional strain, pain, disease, or a combination of these factors. Both **physiological fatigue** and **psychological fatigue** can result in a state of exhaustion, with resultant physical and mental health consequences. Chronic stress has been linked to health maladies that plague individuals on a daily basis, such as headaches, indigestion, insomnia, and the common cold. In fact, one study concluded that out-of-control stress is the leading preventable source of increased health-care cost in the workforce, roughly equivalent to the costs of the health problems related to smoking.

The effects of stress on health are not limited to minor physical complaints. Compelling evidence links psychological stress to a host of serious health problems, including cardiovascular disease, cancer, and HIV/AIDS. Stress may also increase the risk for upper respiratory tract infections, asthma, herpes, viral infections, autoimmune diseases, and slow wound healing. Reduced immune function due to negative emotions and stress appears to be a principal reason for these health problems. Stress may also increase the risk of early death. It is theorized that stress accelerates the aging process by causing a more rapid deterioration of chromosomes (changes in DNA proteins).



One person's stress is another's pleasure.

Stress can have mental and emotional effects.

The challenges caused by psychosocial stress may lead to a variety of mental and emotional effects. In the short term, stress can impair concentration and attention span. Anxiety is an emotional response to stress characterized by apprehension. Because the response usually involves expending a lot of nervous energy, anxiety can lead to fatigue and muscular tension.

Anxiety may persist long after a stressful experience. Both early childhood trauma and recent traumatic experiences have been shown to alter functioning of the HPA axis, contributing to later risk for physical and mental health problems. In some cases, traumatic experiences lead to posttraumatic stress disorder (PTSD). Symptoms of PTSD include flashbacks of the traumatic event, avoidance of situations that remind the person of the event, emotional numbing, and increased level of arousal.

People who are excessively stressed are also more likely to be depressed than people who have optimal amounts of stress in their lives. Although drugs commonly prescribed to reduce depression can be effective in many cases, drugs do not get to the source of the life stressors that cause depression, and many have negative side effects.

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Stress can alter both positive and negative health behaviors.

In addition to direct effects on health, stress can contribute to negative health outcomes indirectly, through increased engagement in negative behaviors, such as smoking, alcohol use, and overeating. Stress may also decrease engagement in health-protective behaviors like exercise. During periods of increased stress, people may also get insufficient sleep and have sleep difficulties associated with the causes of stress. For example, an individual experiencing severe stress related to finances may pick up additional shifts at work, leaving less time for sleep. The person may also have difficulty sleeping due to worry associated with the financial situation. Unfortunately, reduced or disrupted sleep may exacerbate the problem. Studies have consistently found a link between sleep difficulties and stress-related physical and mental



In the News

Telehealth

Rates of mental health problems in the military are increasing dramatically as a consequence of combat stress associated with deployments in Iraq and Afghanistan. A 2010 study found that, even using the most stringent criteria, rates of depression ranged from 5 to 9 percent and rates of PTSD ranged from 6 to 11 percent. Given the large number of veterans currently in need of services and the perceived stigma associated with mental health problems, the Veterans Administration (VA) has embraced telehealth

as an approach to providing mental health services to veterans in need. This includes use of videoconferencing, anonymous Internet-based treatment delivery, use of smartphone applications, and development of a new website dedicated to delivering wellness resources to veterans and their families (www.afterdeployment.org).

If you were in need of mental health services, would you favor these telehealth applications or would you rather visit with a real person?



health problems, including cardiovascular disease and depression, and a recent study found a strong link between stress and sleep disturbances among college students.

Eustress is an optimal amount of stress. We all need sufficient stress to motivate us to engage in activities that make our lives meaningful. Otherwise, we would be in a state of **hypostress**, which leads to apathy, boredom, and less than optimal health and wellness. An example of hypostress is a person working on an assembly line. Because the same task is repeated without variation, the level of stimulation is quite low and might lead to a state of boredom and job dissatisfaction. In fact, a certain level of stress, called **eustress**, is experienced positively. In contrast, **distress** is a level of stress that compromises performance and well-being. Each of us

possesses a system that allows us to mobilize resources when necessary and seeks to find a homeostatic level of arousal (see Figure 3). Although we all have an optimal level of arousal, it varies considerably. What one person finds stressful another may find exhilarating. For example, riding a roller coaster is thrilling for some people, but stressful and unpleasant for others.

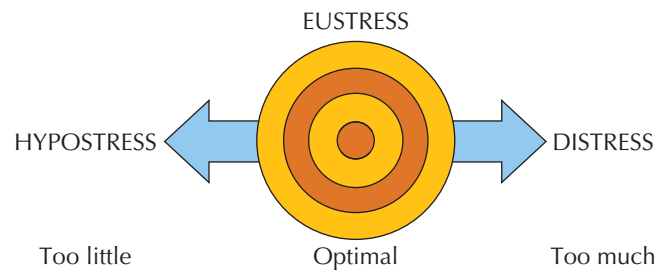


Figure 3 ► Stress target zone.

TECHNOLOGY UPDATE

Effect of Smartphones on Stress

A recent Gallup poll found that 78 percent of young adults (age 18 to 29) own smartphones. Although smartphones may facilitate organization and time-management, recent studies suggest that excessive use of smartphones may negatively impact well-being. According to one study, the more hours people spent on their smartphones, the higher their levels of stress. Interestingly, it was time spent on social networking rather than school- or work-related activities that produced the most stress. Many respondents said they spend too much time on their phones (58 percent) and on social networking (about 50 percent).

Are you adding stress to your life through your use of a mobile phone? How might you better manage your use of this technology?



Physiological Fatigue A deterioration in the capacity of the neuromuscular system as a result of physical overwork and strain; also referred to as true fatigue.

Psychological Fatigue A feeling of fatigue, usually caused by such things as lack of exercise, boredom, or mental stress, that results in a lack of energy and depression; also referred to as subjective or false fatigue.

Hypostress Insufficient levels of stress leading to boredom or apathy.

Eustress Positive stress, or stress that is mentally or physically stimulating.

Distress Negative stress, or stress that contributes to health problems.

Individual Differences in the Stress Response

Individuals respond differently to stress. Individuals exposed to high levels of stress are most at risk for negative health consequences. However, not everyone exposed to severe or chronic stress will experience negative outcomes. The events that occurred on September 11, 2001, provide a vivid example of the very different reactions that people have to the same or similar stressors. Everyone who witnessed these events, in person or on television, was profoundly impacted. At the same time, individual reactions varied dramatically. Most felt overwhelming sadness, many felt extreme anger, others felt hopeless or desperate, and yet others felt lost or confused. Undoubtedly, there were some who were simply too shocked to process their emotional experience at all. With time, most Americans began to experience a wave of additional emotions, such as hope and patriotism. Figure 4 depicts the role that stress appraisals play in mediating relations between stress and its emotional, physical, and behavioral consequences.

Reactions to stress depend on one’s appraisal of both the event and the subsequent physiological response. Stressors by themselves generally do not cause problems unless they are perceived as stressful. As shown in Figure 4, two specific factors are thought to influence individual susceptibility to negative stress-related outcomes: stress appraisal and stress reactivity.

Stress appraisal refers to an individual’s perceptions of a stressor and the person’s resources for managing stressful situations. Appraisal usually involves consideration of the consequences of the situation (primary appraisal) and an evaluation of the resources available to cope with the situation (secondary appraisal). If one sees a stressor as a challenge that can be tackled, one is likely to respond in a more positive manner than if the stressor is viewed as an obstacle that cannot be overcome. Individual differences in appraisal are due to inherited predispositions as well as our unique histories of experiencing and attempting to cope with stress.

Individual appraisal of the body’s response to a stressful event is also important. Stress reactivity refers to the extent to which the sympathetic nervous system, or fight-or-flight system, is activated by a stressor. The degree of activation influences how one will react emotionally and behaviorally, but some react more than others. For example, public speaking is a situation that leads to significant autonomic arousal for most people. Those who handle these situations well probably recognize that these sensations are normal and may even interpret them as excitement about the situations. In contrast, those who experience severe and sometimes debilitating anxiety are probably interpreting the same sensations as indicators of fear, panic, and loss of control. The combination of individual differences in stress reactivity and appraisals may lead to characteristic ways of responding to stress that either confer risk or protect against risk for physical and mental health problems. In fact, several different patterns of behavior (or personality styles) have been clearly identified.

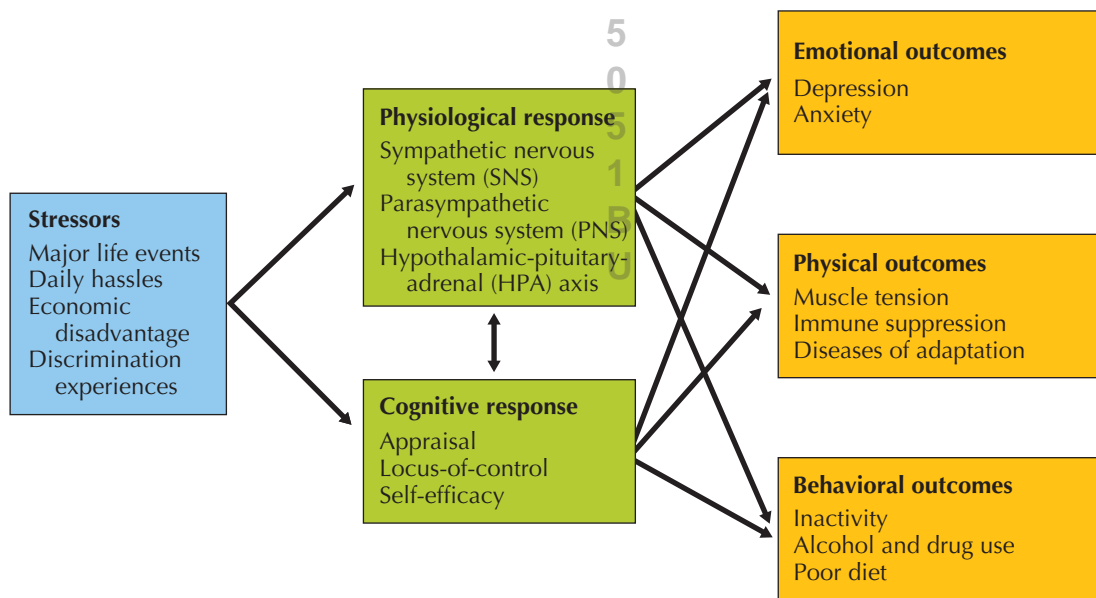


Figure 4 ▶ Reactions to stress.



A CLOSER LOOK

Gender Differences in Stress

The recent “Stress in America” report from the American Psychological Association provides insights about patterns and trends in stress. Although sources and consequences of stress are similar for men and women, there are many key differences in how each gender reports and perceives stress. Women tend to report higher levels of stress than men, but they also appear to be following better stress management practices than men. The report suggests that men may be less concerned about managing stress and feel they are doing enough in this area. Women, in contrast, tend to place more emphasis on the need to manage stress, but feel they are not doing a good enough job of it.

Are you surprised that there are gender differences in ratings of stress?

connect
ACTIVITY

Type A and Type D personalities may increase risk for negative health outcomes.

The best-known “personality” style associated with risk for negative health outcomes is the **Type A behavior pattern**. Several decades ago psychologists Friedman and Rosenman identified a subgroup of goal-oriented, or “driven,” patients, whom they believed were at increased risk based on their pattern of behavior. These individuals demonstrated a sense of time urgency, were highly competitive, and tended to experience and express anger and hostility under conditions of stress. In contrast, individuals with the **Type B** behavior pattern were relatively easygoing and less reactive to stress. Although early research on Type A behavior demonstrated increased risk for heart disease, it now appears that certain aspects of the Type A behavior pattern pose greater risk than others. In particular, hostility and anger appear to be consistently associated with risk for cardiovascular disease. Although most studies have not found time urgency or competitiveness predictive of risk for cardiovascular disease, a recent study found that people who scored high on a measure of impatience were nearly twice as likely to have high blood pressure relative to individuals lower on this trait. At the same time, certain aspects of the Type A behavior pattern (other than hostility) may lead to higher levels of achievement and an increased sense of personal accomplishment. Although the Type A behavior pattern has often been referred to as Type A personality, it was not the intention of those who developed the concept to identify a “personality type.”

In contrast, the more recently identified **Type D**, or “distressed,” **behavior pattern** is associated with two well-defined personality characteristics based on personality theory. Individuals with Type D personality are characterized

by high levels of “negative affectivity,” or negative emotion, and “social inhibition,” or the tendency not to express negative emotions in social interactions. The combination of these characteristics appears to constitute risk for cardiovascular disease and other negative health outcomes. Converging evidence from recent research on both Type A and Type D behaviors has led some to conclude that negative affectivity, in general, is a more important risk for negative health outcomes than any emotion in particular. In other words, anger and hostility (Type A), as well as anxiety and depressed mood (Type D), pose a health risk. Several other well-established personality traits, including neuroticism and novelty seeking, have also been linked to morbidity and mortality.

connect
VIDEO 4

Several personality traits are associated with resilience in the face of stress.

Resilience is not simply due to an absence of risk factors, but also to the presence of protective factors that lead to adaptive functioning. The experience of positive emotion is one well-established protective factor. Individuals who experience more positive emotion are more likely to adopt healthy lifestyles, and their physical responses to stress are more adaptive than those who experience less positive emotion. For example, patterns of cortisol response, heart rate, and blood pressure under stress are all more favorable among individuals who experience higher levels of positive emotion. Positive emotion may also be an effective coping mechanism for managing acute stress. Positive moods have been shown to undo some of the cardiovascular effects associated with negative emotions. Individuals who have more positive moods are also more socially integrated and report higher levels of social support, both characteristics associated with health benefits. **Optimism** is a trait associated with more positive emotional experiences and a more positive outlook on the future. Extensive research demonstrates that optimistic individuals have better physical and mental health outcomes than pessimistic individuals.

Type A Behavior Pattern Characterized by impatience, ambition, and aggression; Type A personalities may be more susceptible to the effects of stress but may also be more able to cope with stress.

Type D Behavior Pattern Characterized by high levels of negative emotion and the tendency to withhold expression of these emotions.

Resilience Positive outcomes in the face of stress or disadvantage.

Optimism The tendency to have a positive outlook on life or a belief that things will work out favorably.

An individual's **locus of control** can also have a significant impact on how he or she responds to a stressful situation. Research has consistently found that having an internal locus of control is associated with better health outcomes. People with an internal locus of control are more likely to take steps to address the problems that created the stress, rather than avoiding them. Those with an external locus of control tend to use passive methods for managing stress. In addition, an external locus of control is related to higher perceived levels of stress, lower job satisfaction, and poorer school achievement.

Although an internal locus of control generally promotes health, this is not always the case. This truth is apparent in depressed individuals with a pessimistic explanatory style. They believe that their failures are due to internal factors, squarely placing the control of these events within themselves. Even though they believe stressors are under their control, they don't believe in their ability to initiate change. Thus, for an internal locus of control to be beneficial to well-being, it must be combined with the belief that one is capable of making changes to prevent future problems. The belief in one's ability to reach a desired goal is often referred to as **self-efficacy**. Finally, studies have consistently shown health benefits of **conscientiousness**, the tendency to be organized, thoughtful, and goal directed. Highly conscientious individuals are at decreased risk for a range of negative outcomes, including asthma, stroke, depression, and panic attacks. It appears that conscientiousness contributes to better health outcomes both through

reduced engagement in health risk behaviors like alcohol use and through more adaptive responses to stressful experiences. For example, individuals higher in conscientiousness are more likely to exercise on days that they experience high levels of stress.

As noted earlier, individuals who possess characteristics that protect them from the negative health consequences of stress are said to be resilient. **Hardiness** is one constellation of characteristics associated with resilience. Hardy individuals are strongly committed to their goals, view difficult situations as challenges rather than stressors, and find ways to assume control over their problems.

connect
VIDEO 5

W

Locus of Control The extent to which we believe the outcomes of events are under our control (internal locus) or outside our personal control (external locus).

Self-Efficacy The belief in one's ability to take action that will lead to the attainment of a goal.

Conscientiousness Associated with high levels of organization, thoughtfulness, and goal-directed activity.

Hardiness A collection of personality traits thought to make a person more resistant to stress.

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to stress. Although overall personality structure has proven somewhat resistant to change, it is certainly possible to change your appraisal of stressful events and thereby diminish the resulting emotional, physical, and behavioral outcomes. In Lab 16B you can assess your hardiness and locus of control, characteristics associated with appraising and coping effectively with stress.

U



Strategies for Action

Self-assessments of stressors in your life can be useful in managing stress. As discussed in the text, to effectively manage stress, you first must identify the sources of stress in your life. In Lab 16A you will have the opportunity to evaluate your stress levels using the Life Experience Survey.

Learning to appraise stressful events in a more positive way can help you respond to stress more effectively. Personality characteristics have been associated with reactions

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Web Resources

American Institute of Stress www.stress.org

APA Stress in America Press Room www.apa.org/news/press/index.aspx

Gallup-Healthways Well-Being Index www.well-beingindex.com

National Center for Post Traumatic Stress Disorder www.ptsd.va.gov

National Mental Health Information Center
www.mentalhealth.samhsa.gov

Uline: The online behavioral support system for young adults www.ulifeline.org

U.S. Health and Human Services www.womenshealth.gov/publications/our-publications/fact-sheet/stress-your-health.cfm

Suggested Readings

American College Counseling Association. 2011. *National Survey of Counseling Center Directors*. Alexandria, VA: The International Association of Counseling Services, Inc.

American Psychological Association. 2012. *Stress in America*. Washington, DC: American Psychological Association.

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Lund, H. G., et al. 2010. Sleep patterns and predictors of disturbed sleep in a large population of college students. *Journal of Adolescence Health* 46:124–132.

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Pascoe, E. A., and L. S. Richman. 2009. Perceived discrimination and health: A meta-analytic review. *Psychological Bulletin* 135 (4):531–554.

Sloan, D. M., Marx, B. P., and T. M. Keane. 2011. Reducing the burden of mental illness in military veterans: Commentary on Kazdin and Blase. *Perspectives on Psychological Science* 6(5):503–506.

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Healthy People

2020

The objectives listed below are societal goals designed to help all Americans improve their health between now and the year 2020. They were selected because they relate to the content of this concept.

- Promote quality of life, healthy development, and healthy behaviors across all stages of life.
- Increase screening for and treatment of mental health problems.
- Reduce suicide and suicide attempts.
- Increase availability of work-site stress-reduction programs.

- Reduce rates of depression and disordered eating.
- Increase levels of social support among adults.
- Increase the proportion of primary care facilities that provide mental health treatment.

A national goal is to improve mental health through prevention and by ensuring access to appropriate, quality mental health services. What are some of the activities your school offers to address mental health issues (e.g., depression, anxiety)? Are adequate facilities available on your campus for students in need of mental health services?

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Lab 16A Evaluating Your Stress Level

Name

Section

Date

Purpose: To evaluate your stress during the past year and determine its implications

Procedures

1. Complete the Life Experience Survey (page 380) based on your experiences during the past year. This survey lists a number of life events that may be distressful or eustressful. Read all of the items. If you did not experience an event, leave the box blank. In the box after each event that you did experience, write a number ranging from -3 to +3 using the scale described in the directions. Extra blanks are provided to write in positive or negative events not listed. Some items apply only to males or females. Items 48 to 56 are only for current college students.
2. Add all of the negative numbers and record your score (distress) in the Results section. Add the positive numbers and record your score (eustress) in the Results section. Use all of the events in the past year.
3. Find your scores on Chart 1 and record your ratings in the Results section.
4. Interpret the results by discussing the Conclusions and Implications in the space provided.

Results

Sum of negative scores (distress)

Rating on negative scores

Sum of positive scores (eustress)

Rating on positive scores

Chart 1 Scale for Life Experiences and Stress

	Sum of Negative Scores (Distress)	Sum of Positive Scores (Eustress)
May need counseling	14+	
Above average	9-13	11+
Average	6-8	9-10
Below average	<6	<9

Scoring the Life Experience Survey

1. Add all of the negative scores to arrive at your own distress score (negative stress).
2. Add all of the positive scores to arrive at a eustress score (positive stress).

Conclusions and Implications: In several sentences, discuss your current stress rating and its implications.

Life Experience Survey

Directions: If you did not experience an event, leave the box next to the event empty. If you experienced an event, enter a number in the box based on how the event impacted your life. Use the following scale:

- Extremely negative impact** = -3
- Moderately negative impact** = -2
- Somewhat negative impact** = -1
- Neither positive nor negative impact** = 0
- Somewhat positive impact** = +1
- Moderately positive impact** = +2
- Extremely positive impact** = +3

1. Marriage
2. Detention in jail or comparable institution
3. Death of spouse
4. Major change in sleeping habits (much more or less sleep)
5. Death of close family member:
 - a. Mother
 - b. Father
 - c. Brother
 - d. Sister
 - e. Child
 - f. Grandmother
 - g. Grandfather
 - h. Other (specify) _____
6. Major change in eating habits (much more or much less food intake)
7. Foreclosure on mortgage or loan
8. Death of a close friend
9. Outstanding personal achievement
10. Minor law violation (traffic ticket, disturbing the peace, etc.)
11. *Male:* Wife's/girlfriend's pregnancy
Female: Pregnancy
12. Changed work situation (different working conditions, working hours, etc.)
13. New job
14. Serious illness or injury of close family member:
 - a. Father
 - b. Mother
 - c. Sister
 - d. Brother
 - e. Grandfather
 - f. Grandmother
 - g. Spouse
 - h. Child
 - i. Other (specify) _____
15. Sexual difficulties
16. Trouble with employer (in danger of losing job, being suspended, demoted, etc.)
17. Trouble with in-laws
18. Major change in financial status (a lot better off or a lot worse off)
19. Major change in closeness of family members (decreased or increased closeness)

20. Gaining a new family member (through birth, adoption, family member moving in, etc.)
 21. Change of residence
 22. Marital separation from mate (due to conflict)
 23. Major change in church activities (increased or decreased attendance)
 24. Marital reconciliation with mate
 25. Major change in number of arguments with spouse (a lot more or a lot fewer arguments)
 26. *Married male:* Change in wife's work outside the home (beginning work, ceasing work, changing to a new job)
Married female: Change in husband's work (loss of job, beginning new job, retirement, etc.)
 27. Major change in usual type and/or amount of recreation
 28. Borrowing more than \$10,000 (buying a home, business, etc.)
 29. Borrowing less than \$10,000 (buying car or TV, getting school loan, etc.)
 30. Being fired from job
 31. *Male:* Wife/girlfriend having abortion
Female: Having abortion
 32. Major personal illness or injury
 33. Major change in social activities, such as parties, movies, visiting (increased or decreased participation)
 34. Major change in living conditions of family (building new home, remodeling, deterioration of home or neighborhood, etc.)
 35. Divorce
 36. Serious injury or illness of close friend
 37. Retirement from work
 38. Son or daughter leaving home (due to marriage, college, etc.)
 39. Ending of formal schooling
 40. Separation from spouse (due to work, travel, etc.)
 41. Engagement
 42. Breaking up with boyfriend/girlfriend
 43. Leaving home for the first time
 44. Reconciliation with boyfriend/girlfriend
- Other recent experiences that have had an impact on your life: list and rate.*
45. _____
 46. _____
 47. _____

For Students Only

48. Beginning new school experience at a higher academic level (college, graduate school, professional school, etc.)
49. Changing to a new school at same academic level (undergraduate, graduate, etc.)
50. Academic probation
51. Being dismissed from dormitory or other residence
52. Failing an important exam
53. Changing a major
54. Failing a course
55. Dropping a course
56. Joining a fraternity/sorority

Source: Sarason, Johnson, and Siegel.

Lab 16B Evaluating Your Hardiness and Locus of Control

Name

Section

Date

Purpose: To evaluate your level of hardiness and locus of control and to help you identify the ways in which you appraise and respond to stressful situations

Procedures

1. Complete the Hardiness Questionnaire and the Locus of Control Questionnaire. Make an X over the circle that best describes what is true for you personally.
2. Compute the scale scores and record the values in the Results section.
3. Evaluate your scores using the Rating chart (Chart 1), and record your ratings in the Results section.
4. Interpret the results by answering the questions in the Conclusions and Implications section.

Hardiness Questionnaire

	Not True	Rarely True	Sometimes True	Often True	Score
1. I look forward to school and work on most days.	1	2	3	4	<input type="text"/>
2. Having too many choices in life makes me nervous.	4	3	2	1	<input type="text"/>
3. I know where my life is going and look forward to the future.	1	2	3	4	<input type="text"/>
4. I prefer not to get too involved in relationships.	4	3	2	1	<input type="text"/>
Commitment Score, Sum 1-4					<input type="text"/>
5. My efforts at school and work will pay off in the long run.	1	2	3	4	<input type="text"/>
6. I just have to trust my life to fate to be successful.	4	3	2	1	<input type="text"/>
7. I believe that I can make a difference in the world.	1	2	3	4	<input type="text"/>
8. Being successful in life takes more luck and good breaks than effort.	4	3	2	1	<input type="text"/>
Control Score, Sum 5-8					<input type="text"/>
9. I would be willing to work for less money if I could do something really challenging and interesting.	1	2	3	4	<input type="text"/>
10. I often get frustrated when my daily plans and schedule get altered.	4	3	2	1	<input type="text"/>
11. Experiencing new situations in life is important to me.	1	2	3	4	<input type="text"/>
12. I don't mind being bored.	4	3	2	1	<input type="text"/>
Challenge Score, Sum 9-12					<input type="text"/>

Locus of Control Questionnaire

13. Hard work usually pays off.	1	2	3	4	<input type="text"/>
14. Buying a lottery ticket is not worth the money.	1	2	3	4	<input type="text"/>
15. Even when I fail I keep trying.	1	2	3	4	<input type="text"/>
16. I am usually successful in what I do.	1	2	3	4	<input type="text"/>
17. I am in control of my own life.	1	2	3	4	<input type="text"/>
18. I make plans to be sure I am successful.	1	2	3	4	<input type="text"/>
19. I know where I stand with my friends.	1	2	3	4	<input type="text"/>
Locus of Control, Sum 13-19					<input type="text"/>

Results

Hardiness

Commitment score

Commitment rating

Control score

Control rating

Challenge score

Challenge rating

Hardiness score

Hardiness rating

Locus of Control

Locus of Control score

Locus of Control rating

Chart 1 Rating Chart

Rating	Individual Hardiness Scale Scores	Total Hardiness Score	Locus of Control Score
High	14–16	40–48	24–28
Moderate	10–13	30–39	12–23
Low	<10	<30	<12

Conclusions and Implications

1. In several sentences, discuss your commitment, control, and challenge ratings, as well as your overall hardiness rating. Are they what you expected? Do you think they are true indications of your hardiness? Explain.

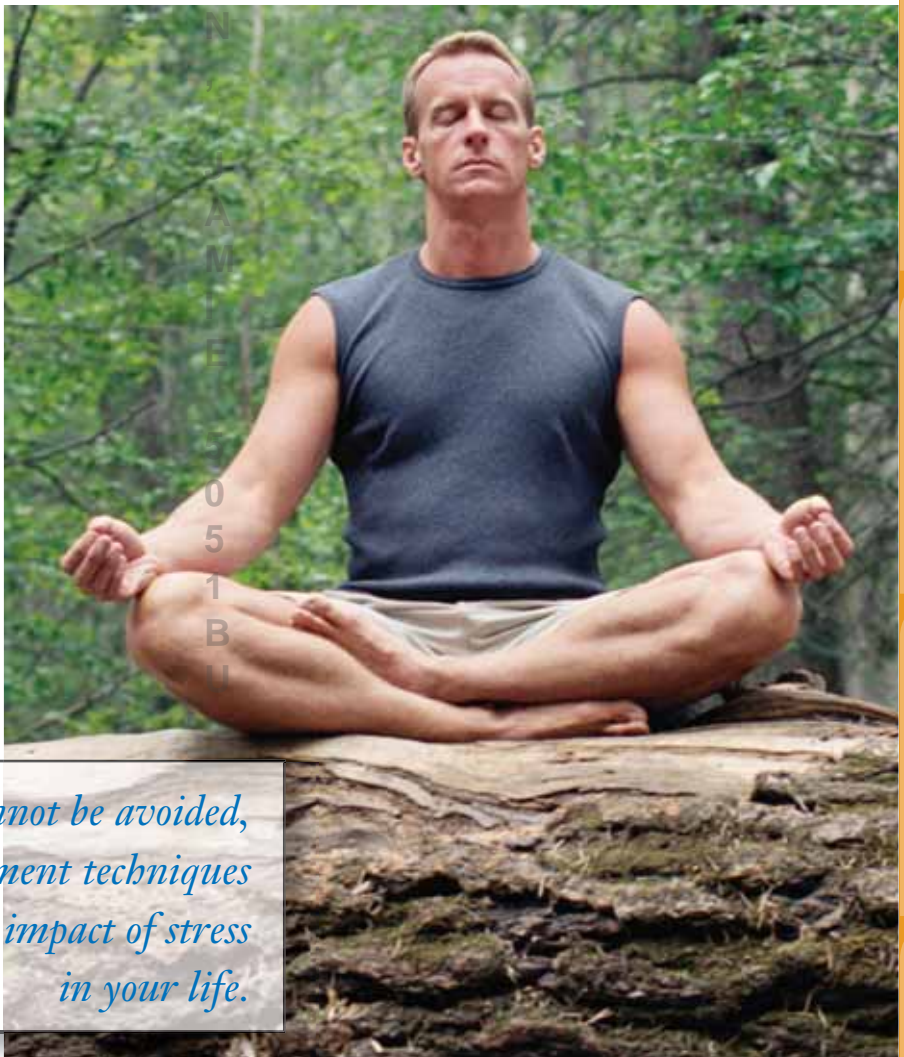
2. In several sentences, discuss your locus of control rating. Is it what you expected (a high rating indicates an internal locus of control)? Do you think your rating is a realistic indicator of your locus of control? Explain.

Stress Management, Relaxation, and Time Management

LEARNING OBJECTIVES

After completing the study of this concept, you will be able to:

- ▶ Describe the stress-buffering effects of physical activity that contribute to positive psychological health.
- ▶ Identify behaviors that contribute to better sleep hygiene.
- ▶ Describe the benefits of recreation, leisure, and play to overall quality of life.
- ▶ Identify a variety of strategies for effective time management.
- ▶ Understand the unique benefits of cognitive-, emotion-, and problem-focused coping strategies.
- ▶ Describe the mental health benefits of mindfulness, spirituality, and emotional expression.
- ▶ Determine several relaxation techniques that can be used to effectively manage stress.
- ▶ Describe different types of social support and ways in which it facilitates effective stress management.



Although stress cannot be avoided, proper stress-management techniques can help reduce the impact of stress in your life.

As outlined in Concept 16, we all experience stress on a daily basis and must find ways to manage stress effectively. We can do many things to prevent excessive levels of stress, including exercising regularly, getting sufficient sleep, and allowing time for recreation. Effective time management is essential for balancing work and other activities. Despite our best efforts, stressful situations will occur, and we must find a way to deal with them. Later in this concept, three effective methods for managing stress are described.

Physical Activity and Stress Management

Regular activity and a healthy diet can help you adapt to stressful situations. An individual's capacity to adapt is not a static function but fluctuates as situations change. The better your overall health, the better you can withstand the rigors of tension without becoming susceptible to illness or other disorders. Physical activity is especially important because it conditions your body to function effectively under challenging physiological conditions.

Physical activity can provide relief from stress and aid muscle tension release. Physical activity has been found to be effective at relieving stress, particularly white-collar job stress. Studies show that regular exercise decreases the likelihood of developing stress disorders and reduces the intensity of the stress response. It also shortens the period of recovery from an emotional trauma. Its effect tends to be short-term, so exercise regularly for it to have a continuing effect. Whatever your choice of exercise, it is likely to be more effective as an antidote to stress if it is something you find enjoyable.

Regular physical activity reduces reactivity to stress. Physical activity is associated with a physiological response that is similar, in many ways, to the body's response to psychosocial stressors. Individuals who are physically fit have a reduced physiological response to exercise. Therefore, it makes sense that someone who is physically fit would also have a reduced response to psychosocial stressors. Research supports this hypothesis indicating that regular exercise reduces physiological reactivity to non-exercise stressors. For example, a recent study found that children's responses to stress are dampened by engagement in exercise. Compared to children who watched television before a stressor, those who exercised showed lower systolic and diastolic blood pressure and reduced heart rate reactivity. A recent study suggests that exercising after a stressor may also be an effective coping mechanism.



Physical activity has many other positive effects on mental health. Exercise can reduce anxiety, aid in recovery from depression, and assist in efforts to eliminate negative health behaviors, such as smoking. It also appears to buffer the effects of stress on cellular aging. Key findings related to mental health are summarized below.

- *Physical activity can reduce anxiety.* Evidence shows that physical activity leads to reductions in anxiety in non-clinical samples. One study found that exercise may also be effective in reducing anxiety among individuals with panic disorder. An aerobic exercise program led to reductions in panic symptoms relative to a control group. Although exercise was not as effective as medication, it may be a useful addition to other treatment methods for anxiety disorders.
- *Physical activity can reduce depression.* A randomized clinical trial compared antidepressant medication and aerobic exercise with a combined antidepressant and exercise condition in the treatment of major depressive disorder. The aerobic exercise group fared as well as the other two at the end of treatment. In addition, the patients who only exercised were less likely to have a remission to depression at a 6-month follow-up.
- *Physical activity can aid in health behavior change.* One study tested vigorous physical activity as an adjunct to a cognitive-behavioral smoking cessation program for women. Women who received the exercise intervention were able to sustain continuous abstinence from smoking for a longer period relative to those who did not receive the exercise intervention. Women in the exercise program also gained less weight during smoking cessation.
- *Physical activity buffers the negative impact of stress on cellular aging.* Stress can reduce the length of telomeres (protective ends of DNA strands), leading to more rapid cell aging. Recent studies suggest that regular physical activity can prevent stress-induced damage to DNA. One recent study found that sedentary individuals showed stress induced decreases in telomere length, whereas those who engaged in at least 75 minutes of weekly exercise demonstrated no relation between stress and telomere length.

Stress, Sleep, and Recreation

In order to adapt effectively to stressful situations, one must get adequate sleep. Although the number of hours needed varies, the average adult needs between 7 and 8 hours of sleep per night. Teenagers and young adults (those in their early 20s) may need slightly more sleep. Unfortunately, many do not get this extra amount of sleep. As noted in a later section, full-time college students get an average of 8.4 hours of sleep on weekday nights. However,

more than one-fourth of college students average 7 or fewer hours of sleep on weekdays. Thus, a substantial number of students fail to get adequate sleep. With insufficient sleep, many people resort to caffeine to stay awake, leading to an endless cycle of deficient sleep and caffeine usage and compromised health and wellness. Table 1 presents guidelines for good sleep.

All work and no play can lead to poor mental and physical health. Between 1860 and 1990, the number of hours typically spent working in industrialized countries decreased relatively dramatically. While that trend has continued in most countries, work hours in the United States have increased considerably over the past two decades. A major reason for this increase is that more people now hold second jobs than in the past. Also, some jobs of modern society have increasing rather than decreasing time demands. For example, many medical doctors and other professionals work more hours than the 35 to 44 hours that most people work. Nearly three times as many married women with children work full-time now, as compared with 1960.

Table 1 ► Guidelines for Good Sleep

- Be aware of the effects of medications. Some medicines, such as weight loss pills and decongestants, contain caffeine or other ingredients that interfere with sleep.
- Avoid tobacco use. Nicotine is a stimulant and can interfere with sleep.
- Avoid excess alcohol use. Alcohol may make it easier to get to sleep but may be a reason you wake up at night and are unable to get back to sleep.
- You may exercise late in the day, but do not do vigorous activity right before bedtime.
- Sleep in a room that is cooler than normal.
- Avoid hard-to-digest foods late in the day, as well as fatty and spicy foods.
- Avoid large meals late in the day or right before bedtime. A light snack before bedtime should not be a problem for most people.
- Avoid too much liquid before bedtime.
- Avoid naps during the day.
- Go to bed and get up at the same time each day.
- Do not study, read, or engage in other activities in your bed. You want your brain to associate your bed with sleep, not with activity.
- If you are having difficulty falling asleep, do not stay in bed. Get up and find something to do until you begin to feel tired, and then go back to bed.

Experts have referred to young adults as the “overworked Americans” because they work several jobs and maintain dual roles (full-time employment coupled with normal family chores), or they work extended hours in demanding professional jobs. A Gallup poll showed that the great majority of adults have “enough time” for work, chores, and sleep but not enough time for friends, self, spouse, and children. When time is at a premium, the factors most likely to be negatively affected are personal health, relationships with children, and marriage or romantic relationships.

Recreation and leisure are important contributors to wellness (quality of life). **Leisure** is generally considered to be the opposite of work and includes “doing things we just want to do,” as well as “doing nothing.” In contrast, **recreation** involves the organized use of free time and typically includes social interaction. Leisure and recreation can contribute to stress reduction and wellness, though leisure activities are not done specifically to achieve these benefits.

The value of recreation and leisure in the busy lives of people in Western culture is evidenced by the emphasis public health officials place on the availability and accessibility of recreational facilities in communities.

There are many meaningful types of recreation. If fitness is the goal, choose recreational activities involving moderate to vigorous physical activity. Involvement in nonphysical activities also constitutes recreation. For example, reading is an activity that can contribute significantly to other wellness dimensions, such as emotional/mental and spiritual. Passive involvement (spectating) is a third type of participation.

Play is critical to development and a sense of play in adult recreation contributes to wellness. **Play** is distinct from recreation in that it is typically intrinsically motivated and has an imaginative component.

Leisure Time that is free from the demands of work. Leisure is more than free time; it is also an attitude. Leisure activities need not be means to ends (purposeful) but are ends in themselves.

Recreation *Recreation* means creating something anew. In this book, it refers to something that you do for amusement or for fun to help you divert your attention and to refresh yourself (re-create yourself).

Play Activity done of one’s own free will. The play experience is fun and intrinsically rewarding, and it is a self-absorbing means of self-expression. It is characterized by a sense of freedom or escape from life’s normal rules.

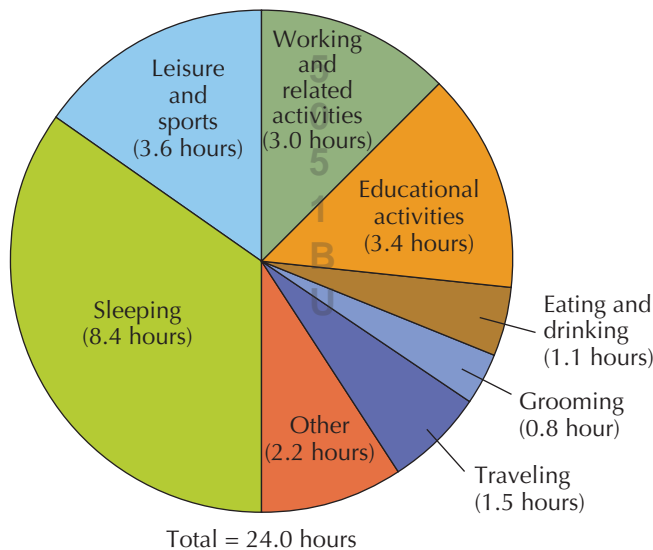
Play has been shown to be important to healthy brain development in humans, and there is considerable evidence for physical, social, and cognitive benefits of play. In children, “free play,” or unstructured time for play, seems to be particularly important. This type of play has been linked to a number of positive outcomes, including increased attention in the classroom, better self-regulation, and improved social skills and problem solving. Although much less attention has been given to the value of play in adults, a recent literature review identified benefits of play in adults, including mood enhancement, skill development, and enhanced relationships. Clearly, benefits associated with play have the potential both to prevent stress and to facilitate effective coping with stress.

Time Management

Effective time management helps you adapt to the stresses of modern living. Lack of time is cited by both the general public and experts as a source of stress and a reason for failing to implement healthy lifestyle changes. For college students, managing time is critical to academic success as well as overall well-being. Managing time effectively has become even more of a challenge for college students in recent years, as more and more students are working part- or full-time jobs to support their education (see Figure 1). The following strategies may help you learn to manage your time more effectively.



- **Prioritize.** Many people feel that there are not enough hours in the day to do everything that needs to be done. The truth is, they are probably right. If you think about all the things that have to get done, it can seem unmanageable. That is why it is important to prioritize. Many time-management experts advocate the ABC approach as a way to prioritize tasks effectively. Create three lists of things you need to do, with list A including the most urgent tasks and list C containing the least urgent. To help you remember the ABC approach, remember that A tasks must *Absolutely* get done, B tasks had *Better* get done, and C tasks *Could* get done. See Table 2 for a brief description of the ABC approach.
- **Know how you spend your time.** Where does your time go? The answer to this question is the first step toward better time management. Most of us are not fully aware of how we spend our time. If you carry a notebook and write down what you are doing and how long it takes, you can find out exactly where the time goes. You probably need to do this for at least a week. After you complete this exercise, you will know where you need to spend more time. Just as important, monitoring your time will help you identify where you could spend less time. Some common areas where people spend too much time are socializing (in person, by phone, or via email), watching television, playing video games, surfing the Internet, and doing busy-work. Lab 17A will give you a chance to evaluate your current use of time.



Note: Data include individuals, ages 15 to 49, who were enrolled full time at a university or college. Data include averages for non-holiday weekdays.

Figure 1 ▶ Time use on an average weekday for full-time university and college students

Source: Bureau of Labor Statistics, American Time Use Survey.

Table 2 ▶ The ABC System for Time Management

Level of Importance	Description
A	<i>A tasks</i> are those that <i>must</i> be done, and soon. When accomplished, A tasks may yield extraordinary results. Left undone, they may generate serious, unpleasant, or disastrous consequences. Immediacy is what an A priority task is all about.
B	<i>B tasks</i> are those that <i>should</i> be done soon. While not as pressing as A tasks, they're still important. They can be postponed, but not for too long. Within a brief time, though, they can easily rise to A status.
C	<i>C tasks</i> are those that <i>could</i> be done. These tasks could be put off without creating dire consequences. Some can linger in this category almost indefinitely. Others—especially those tied to distant completion dates—will eventually rise to A or B levels as the deadline approaches.

Source: Mancini, M.

- *Write it down.* When things are not too busy, it may be possible to remember what you need to do and when you need to do it without writing it down. During busy times, though, trying to remember everything can lead to big problems. One of the most important steps in effective time management is to write things down. This includes keeping a daily planner to remember your schedule, calendars (weekly and/or monthly) to remember important events and deadlines, and a to-do list (or several, using the ABC approach) to help you remember your goals and priorities. Computers and other digital organizers allow you to keep all of this information in one place.
- *Set goals and deadlines.* In addition to knowing how you spend your time, it is important to know what things need to get done. This includes everything from small tasks that need to get done today to important long-term goals. When setting goals, make sure they are attainable and that the time frame for completing them is reasonable. Some tasks may be more easily accomplished if they are broken down into a series of smaller tasks, each with its own deadline. Setting deadlines for the completion of goals increases the likelihood that you will follow through.
- *Include recreational activities in your schedule in addition to your responsibilities.* Although it may seem that scheduling fun takes away from the enjoyment, you may not find this to be the case. By scheduling your free time,

you can fully enjoy it rather than worrying about other things you “should” be doing.

- *Make the most of the time you have.* To get the most out of your time, know when you do your best work and under what conditions. If you are sharpest in the morning, schedule the most important work to be done during this time. If you study most effectively when you are alone in a quiet place, schedule your studying at a time when you can create that environment. It is also important not to let time that could be productive go to waste. Keep materials with you that will allow you to take advantage of small periods of time (e.g., between classes).
- *Self-assessment of time management can help you improve your ability to manage your time effectively.* Monitoring your progress in time management is helpful in two ways. First, it allows you to see the progress you have made. Success is rewarding in and of itself, but you might also consider rewarding yourself with something tangible when you start out. For example, you might treat yourself to a nice dinner if you finish an important project on time. Monitoring also helps you identify areas in need of further improvement, so that you can adapt your plan to improve your chances of success.
- *Avoid procrastination.* Virtually all of us procrastinate at one time or another, but for many, procrastination can significantly decrease performance and increase stress. A number of causes of procrastination have been identified, including both internal and external influences. Understanding the causes of procrastination can help



A CLOSER LOOK

Leisure Time

Although Americans find roughly 5 hours each day to engage in leisure activities, the vast majority of time is spent in sedentary activities. For example, the average American spends an average of 2.7 hours each day watching television and only 18 minutes participating in sports, exercise, and recreation. On the positive side, Americans report active efforts to engage in relaxation (average of 17 minutes) and social communication (average of 38 minutes). Search “American Time Use Survey” on the Internet to take a closer look at how time use patterns vary for different segments of the population.

What strategies can you use to decrease sedentary time and increase active recreation?

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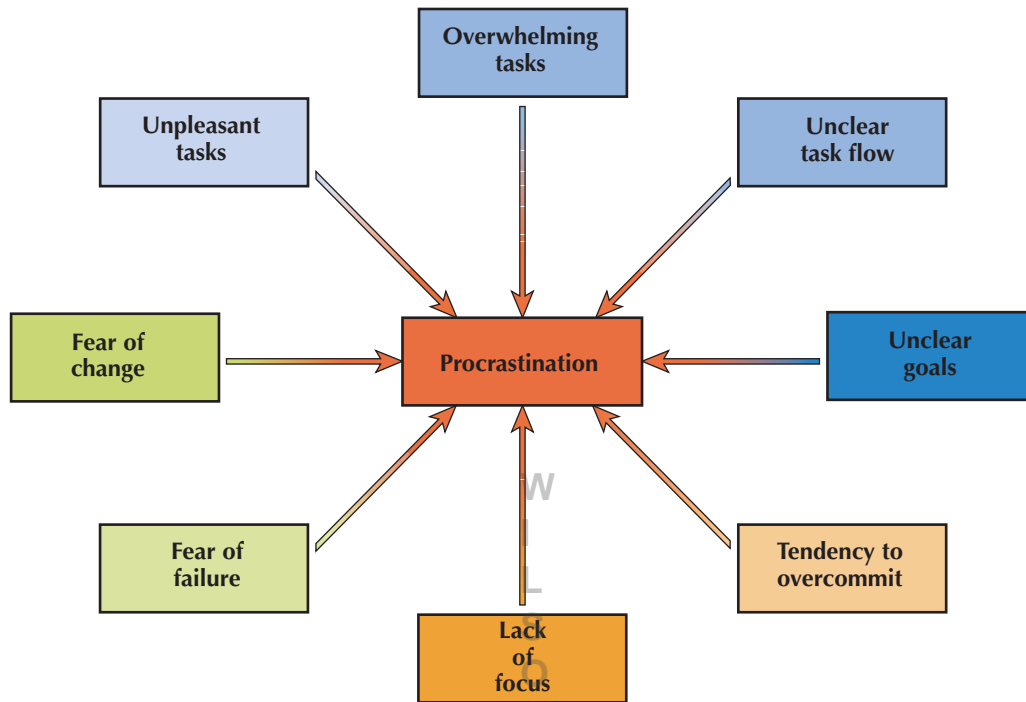


Figure 2 ▶ Causes of procrastination.

Source: Mancini, M.

you find ways to prevent it in the future (see Figure 2). Strategies such as the ABC approach should also help you limit procrastination by getting you to work on the things that are most important first. One of the simplest solutions to procrastination is simply to “get started.” The first step toward completing a project is often the most difficult. Once people take the first step, they often find that the task becomes easier, so get started on projects as soon as possible, even if you spend only a short time working.

Stress Management

Stress-management skills can be learned. There is considerable evidence that stress-management training yields both physical and mental health benefits. Positive effects have been noted in a variety of populations.

For example, a recent study found that stress-management training for patients with heart disease resulted in improved cardiovascular function, decreased depression, and lower levels of general distress. Similar results were found following a stress-management intervention provided to women following treatment for breast cancer. Interestingly, and perhaps of more relevance to college students, stress-management training has also been shown to improve academic performance.

One of the most common settings for stress-management training is the workplace. Relaxation training is the most commonly used approach, although

cognitive behavioral programs produce the largest benefits. An advantage of cognitive behavioral interventions is that they typically address each of the three types of coping that have been shown to be adaptive. These different coping styles are described in detail in the following section.



Taking time to relax can help you manage stress.

Table 3 ▶ Strategies for Stress Management

Category	Description
Appraisal-Focused Strategies <ul style="list-style-type: none"> • Cognitive restructuring • Seeking knowledge or practicing skills 	Strategies That Alter Perceptions of the Problem or Your Ability to Cope Effectively with the Problem <ul style="list-style-type: none"> • Changing negative or automatic thoughts leading to unnecessary distress • Finding ways to increase your confidence in your ability to cope
Emotion-Focused Strategies <ul style="list-style-type: none"> • Relaxing • Exercising • Expressing your feelings • Spirituality 	Strategies That Minimize the Emotional and Physical Effects of the Situation <ul style="list-style-type: none"> • Using relaxation techniques to reduce the symptoms of stress • Using physical activity to reduce the symptoms of stress • Talking with someone about what you are feeling or writing about your emotional experiences • Looking for spiritual guidance to provide comfort
Problem-Focused Strategies <ul style="list-style-type: none"> • Systematic problem solving • Being assertive • Seeking active social support 	Strategies That Directly Seek to Solve or Minimize the Stressful Situation <ul style="list-style-type: none"> • Making a plan of action to solve the problem and following through to make the situation better • Standing up for your own rights and values while respecting the opinions of others • Getting help or advice from others who can provide specific assistance for your situation
Avoidant Coping Strategies <ul style="list-style-type: none"> • Ignoring • Escaping • Suppressing • Ruminating 	Strategies That Attempt to Distract the Individual from the Problem <ul style="list-style-type: none"> • Refusing to think about the situation or pretending no problem exists • Looking for ways to feel better or to stop thinking about the problem, including eating or using nicotine, alcohol, or other drugs • Actively trying to suppress emotional experiences or emotional expression • Focusing on your negative emotions and what they mean without taking efforts to address the problem

Stress-management training focuses on teaching active coping strategies. Active coping strategies are those that attempt to directly affect the source of the stress or to effectively manage the individuals' reactions

HELP Health is available to Everyone for a Lifetime, and it's Personal

Many college campuses have resources available to help students address the various causes of stress. Those resources include academic offices to help with time management and scholastic difficulties as well as counseling centers for anxiety, depression, relationships, and other problems. Additionally, offices such as housing, the medical clinic, health promotion, and financial aid can be a resource for a variety of other stressors that often come up.

Do you take advantage of the resources that your college provides to aid in your stress management? Why or why not? What stress management tactics do you use and how important are they in your lifestyle?

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to stress. In contrast, passive coping strategies attempt to direct attention away from the stressor. Active coping strategies can be classified into three basic categories: **appraisal-focused coping**, **emotion-focused coping**, and **problem-focused coping**. These coping strategies target the emotional and physiological, behavioral, and cognitive aspects of stress, respectively (see Table 3).

Appraisal-focused coping strategies are based on changing the way one perceives the stressor or changing one's perceptions of resources for effectively managing stress. Emotion-focused coping strategies attempt to regulate the emotions resulting from stressful events. In contrast, problem-focused strategies are aimed at changing the source of the stress. While each of these strategies is effective in various circumstances, **avoidant coping** strategies, such as ignoring or escaping the problem or suppressing negative emotions, are likely to be ineffective for almost everyone.

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VIDEO 3

Coping A person's constantly changing cognitive and psychological efforts to manage stressful situations.

Appraisal-Focused Coping Adapting to stress by changing your perceptions of stress and your resources for coping.

Emotion-Focused Coping Adapting to stress by regulating the emotions that cause or result from stress.

Problem-Focused Coping Adapting to stress by changing the source or cause of stress.

Avoidant Coping Seeking immediate, temporary relief from stress through distraction or self-indulgence (e.g., use of alcohol, tobacco, or other drugs).

Concept 16 described the characteristics associated with positive health outcomes, including optimism, an internal locus of control, self-efficacy, and conscientiousness. Not surprisingly, individuals with these characteristics tend to engage more effectively in adaptive coping strategies.

Coping with most stress requires a variety of thoughts and actions. Stress forces the body to work under less than optimal conditions, yet this is the time when we need to function at our best. Effective coping may require some efforts to regulate the emotional aspects of the stress and other efforts to solve the problem. For example, if you receive a bad grade on an exam, how you view the situation and interpret its meaning will have a major impact on how you feel. You will have to eventually accept your current grade and manage the emotions that accompany this reality. Then, you will need to take active steps to improve your performance on the next exam. It does no good to worry about past events so it is more important to look ahead for ways to address the problem. Coping with this situation may, therefore, require the use of all three coping strategies.

Emotion regulation is a primary goal of both appraisal- and emotion-focused coping. Emotion regulation refers to efforts to manage initial emotional reactions to stress or the resulting emotions and how they

are expressed. Thus, both appraisal- and emotion-focused coping are considered emotion regulation strategies. The difference between the two approaches is in the timing: appraisal-focused coping attempts to change the initial emotional experience, whereas emotion-focused coping attempts to manage the emotional experiences that follow appraisal. Efforts to positively reappraise stressful experiences can reduce initial emotional reactions to a stressor but additional efforts may be needed to manage these emotions. Such efforts can be both adaptive and maladaptive. Adaptive approaches include relaxation and meditation, appropriate emotional expression, and efforts to seek social support. Often the latter two approaches go hand-in-hand, as members of one's social support network provide an outlet for expression of emotional distress.

Effective Coping Strategies

Appraisal-focused coping strategies can be effective for certain situations. The way you think about stressful situations (see Table 4) can dramatically impact your emotional experiences. Research has demonstrated that cognitive reappraisal leads to down-regulation of the autonomic and endocrine systems, leading to physical and mental health benefits. Fortunately, even those of us who do not typically engage in reappraisal can learn to use this approach. Research on

Table 4 ▶ Types of Distorted Thinking

Type	Description
1. All-or-none thinking	You look at things in absolute, black-and-white categories.
2. Overgeneralization	You view a negative event as a never-ending pattern of defeat.
3. Mental filter	You dwell on the negatives and ignore the positives.
4. Discounting the positives	You insist that your accomplishments and positive qualities don't count.
5. Jumping to conclusions	(a) Mind reading—you assume that others are reacting negatively to you when there is no definite evidence of this. (b) Fortune telling—you arbitrarily predict that things will turn out badly.
6. Magnification or minimization	You blow things out of proportion or shrink their importance inappropriately.
7. Emotional reasoning	You reason from how you feel: "I feel like an idiot, so I must be one." "I don't feel like doing this, so I'll put it off."
8. Should statements	You criticize yourself or other people with "shoulds" or "shouldn'ts." "Musts," "oughts," and "have tos" are similar offenders.
9. Labeling	You identify with your shortcomings. Instead of saying, "I made a mistake," you tell yourself, "I am a jerk," "a fool," or "a loser."
10. Personalization and blame	You blame yourself for something that you weren't entirely responsible for, or you blame other people and overlook ways that your own attitudes and behaviors might have contributed to the problem.

Source: Burns, D. D.

cognitive therapy approaches for treating anxiety and mood disorders has shown that people can readily learn this skill, and learning to change the way you think can reduce emotional distress. Fortunately, the effectiveness of cognitive reappraisal is not limited to people experiencing anxiety or mood disorders. In a study of workplace stress and health, a cognitive-behavioral intervention that targeted appraisal of stress was more effective than a behavioral coping skills intervention that combined emotion- and problem-focused coping strategies. Thus, the way you think about stressful situations can be as important as how you respond to them.

At one time or another, virtually all people have distorted thinking, which can create unnecessary stress. Distorted thinking is also referred to as negative or automatic thinking. To alleviate stress, it can be useful to recognize some common types of distorted thinking (see Table 4). If you can learn to recognize distorted thinking, you can change the way you think and often reduce your stress levels.

If you have ever used any of the 10 types of distorted thinking described in Table 4, you may find it useful to consider different methods of “untwisting” your thinking and change negative thinking to positive thinking (see Table 5). To try this, think of a recent situation that caused stress. Describe the situation on paper, and see if you used distorted thinking in the situation (see Table 4). If so, write down which types of distorted thinking you used. Finally, determine if any of the guidelines in Table 5 would have been useful. If so, write down the strategy you could have used. When a similar situation arises, you will be prepared to deal with the stressful situation. Repeat this technique, using several situations that have recently caused stress.



Emotion-focused coping strategies are helpful for issues or problems that are not within your control. Relaxation techniques and/or coping strategies can help reduce the negative impact of both physical and

Table 5 ► Ten Ways to Untwist Your Thinking

Way	Description
1. Identify the distortion.	Write down your negative thoughts, so you can see which of the 10 types of distorted thinking you are involved in. This will make it easier to think about the problem in a more positive and realistic way.
2. Examine the evidence.	Instead of assuming that your negative thought is true, or if you feel you never do anything right, you can list several things that you have done successfully.
3. Use the double standard method.	Instead of putting yourself down in a harsh, condemning way, talk to yourself in the same compassionate way you would talk to a friend with a similar problem.
4. Use the experimental technique.	Do an experiment to test the validity of your negative thought. For example, if, during an episode of panic you become terrified that you are about to die of a heart attack, you can jog or run up and down several flights of stairs. This will prove that your heart is healthy and strong.
5. Think in shades of gray.	Although this method might sound drab, the effects can be illuminating. Instead of thinking about your problems in all-or-none extremes, evaluate things on a range from 0 to 100. When things do not work out as well as you had hoped, think about the experience as a partial success, rather than a complete failure. See what you can learn from the situation.
6. Use the survey method.	Ask people questions to find out if your thoughts and attitudes are realistic. For example, if you believe that public speaking anxiety is abnormal and shameful, ask several friends if they have ever felt nervous before giving a talk.
7. Define terms.	When you label yourself “inferior,” “a fool,” or “a loser,” ask, “What is the definition of ‘a fool’?” You will feel better when you see that there is no such thing as a fool or a loser.
8. Use the semantic method.	Simply substitute language that is less colorful or emotionally loaded. This method is helpful for “should” statements. Instead of telling yourself, “I <i>shouldn’t</i> have made that mistake,” you can say, “It would be better if I hadn’t made that mistake.”
9. Use reattribution.	Instead of automatically assuming you are “bad” and blaming yourself entirely for a problem, think about the many factors that may have contributed to it. Focus on solving the problem instead of using up all your energy blaming yourself and feeling guilty.
10. Do a cost-benefit analysis.	List the advantages and disadvantages of a feeling (such as getting angry when your plane is late), a negative thought (such as “No matter how hard I try, I always screw up”), or a behavior pattern (such as overeating and lying around in bed when you are depressed). You can also use the cost-benefit analysis to modify a self-defeating belief, such as “I must always be perfect.”

Source: Burns, D. D.

emotional consequences of stress. These approaches can slow your heart and respiration rate, relax tense muscles, clear your mind, and help you relax mentally and emotionally. Perhaps most important, these techniques can improve your outlook and help you cope better with the stressful situation. In Lab 17C, you will try several relaxation techniques. However, performing the exercises only once will not prepare you to use relaxation techniques effectively. You must practice learning to relax.



Conscious relaxation techniques reduce stress and tension by directly altering the physical symptoms. When you are stressed, heart rate, blood pressure, and muscle tension all increase to help your body deal with the challenge. Conscious relaxation techniques reduce these normal effects and bring the body back to a more relaxed state. These approaches can also help you manage the negative emotions that result from stressors and your appraisal of those stressors. Most techniques use the “three Rs” of relaxation to help the body and mind relax: (1) reduce mental activity, (2) recognize tension, and (3) reduce respiration. Some relaxation techniques include:

- *Deep breathing and mental imagery.* One of the quickest ways to experience relaxation is through deep breathing. There are many versions of deep breathing exercises. For example, first inhale deeply through your nose for about 4 seconds, making sure that your abdomen rises when you are inhaling. Next, let the air out slowly through your mouth (for about 8 seconds, or twice as long as the inhalation). Repeating these steps for several minutes can help control the body’s reaction to stress. See Lab 17C, Figure 3, for detailed instructions on diaphragmatic breathing. Many relaxation approaches combine deep breathing with mental imagery to maximize the relaxation response. This approach involves imagining a pleasant image or scene that you associate with relaxation, such as a peaceful lake or stream. The goal is to imagine the scene as completely as possible using all of your senses. The main advantage of these approaches is that they can be used in any setting, and they take very little time to induce a relaxation response.
- *Jacobson’s progressive relaxation method.* You must be able to recognize how a tense muscle feels before you can voluntarily release the tension. In this technique, contract the muscles strongly and then relax. Relax each of the large muscles first and later the small ones. Gradually reduce the contractions in intensity until no movement is visible. The emphasis is always placed on detecting the feeling of tension as the first step in “letting go,” or “going negative.” Jacobson, a pioneer

in muscle relaxation research, emphasized the importance of relaxing eye and speech muscles, because he believed these muscles trigger the reactions of the total organism more than other muscles.

- *Biofeedback.* Biofeedback training uses machines that monitor certain physiological processes of the body and that provide visual or auditory evidence of what is happening to normally unconscious bodily functions. The evidence, or feedback, is then used to help you decrease these functions. When combined with autogenic training, subjects have learned to relax and reduce the electrical activity in their muscles, lower blood pressure, decrease heart rate, change their brainwaves, and decrease headaches, asthma attacks, and stomach acid secretion.
- *Stretching and rhythmical exercises.* After working long hours at a desk, release tension by getting up frequently to stretch, taking a brisk walk, or by performing “office exercises.” Exercising to music or a rhythmic beat can be relaxing and even hypnotic. One popular activity that uses stretching and rhythmic exercise (as well as breathing techniques) is yoga. Many find it to be beneficial in reducing stress, and research has found both physical and mental health benefits associated with yoga.



TECHNOLOGY UPDATE

Instant Biofeedback

Although biofeedback has been used by physicians for decades, it has typically involved patient visits to the doctor to use expensive biofeedback equipment. Fortunately, new technology has increased the portability of biofeedback. There are now several commercially available biofeedback devices that are relatively compact and affordable, and some can simply be connected to your own computer. Examples include StressEraser and MyCalmBeat. More recently, biofeedback programs have been developed as applications for mobile devices. For example, Stress Check is a free application that uses the camera on your smartphone to measure heart rate variability, providing you with feedback about your stress level. You can try using it before and after one of the relaxation techniques described in Lab 17C to find out if you are effectively managing your stress response.

Would you consider using this type of biofeedback application for stress management if it was available on your smartphone?



Spirituality and mindfulness can help you cope with stress and daily problems. Besides managing the body's physical response to stress, one must deal with the impact of stress on thoughts and emotions. Although relaxation strategies can impact these dimensions, additional approaches may be necessary to adequately manage these aspects of the stress response.

- *Spirituality.* Studies have shown that spirituality can decrease blood pressure, be a source of internal comfort, and have other calming effects associated with reduced distress. It can also provide confidence to function more effectively, thereby reducing the stresses associated with ineffectiveness at work or in other situations. The health benefits of spirituality do not appear to be restricted to prayer, however. Using a more global measure of spirituality, one study of college students found that spirituality moderated the relationship between stress and health outcomes. For those low in spirituality, stress was associated with higher levels of negative emotion and physical symptoms of illness. Among those higher in spirituality, the link between stress and health outcomes was much weaker.
- *Mindfulness meditation.* While most relaxation techniques seek to distract attention away from distressing emotions, mindfulness meditation encourages the individual to experience fully his or her emotions in a nonjudgmental way. The individual brings full attention to the internal and external experiences that are occurring “in the moment.” Although research on mindfulness is just emerging, results look promising. For example, in a study of medical students, a mindfulness-based stress-reduction program led to significant decreases in mood disturbances. In another study, mindfulness meditation reduced the impact of daily stressors, psychological distress, and medical symptoms. Mindfulness may have particular value for individuals with chronic medical conditions. Benefits have been demonstrated with medical conditions such as fibromyalgia, cancer, and coronary artery disease. The nonjudgmental aspect of awareness in mindfulness is critical to the success of this approach. Increased attention to negative emotion that involves an evaluative component (e.g., this emotion is terrible) is often referred to as rumination. There is considerable evidence that rumination leads to negative psychological adjustment, including increased risk for depression.

Appropriately expressing emotion can help you reduce distress. The ability to control emotional outbursts is an adaptive skill that develops with age. As a society, we socialize our children to develop these skills, as they are critical to adaptive functioning in adulthood. At the same time, complete suppression of emotion has long

been recognized as potentially harmful to our health. For example, Freud believed that inhibition of emotion contributed to psychological problems. Although it has taken roughly 100 years since Freud's early writing, recent studies have demonstrated that suppression of emotion leads to negative outcomes. In the laboratory, emotional suppression leads to increased physiological stress. Among college students, emotional suppression is related to increased anxiety, sensitivity, depression, and poor social adjustment. Thus, if we want to minimize the potential negative impact of our emotions, we need to find appropriate ways to express them.

We often turn to others to provide an outlet for us to “vent” or “get it off our chest.” Although this is a perfectly good way to express emotion, we can also benefit from writing about our stressful experiences. Expressive writing has shown benefits for a wide range of outcomes, from faster wound healing to better adaptation following traumatic events. Writing also seems to help mitigate the effects of stress related to discrimination. For example, a recent study of gay male college students found that writing about stresses related to sexual orientation led to better adjustment 3 months later. Interestingly, the writing experience seemed to provide the most benefit to students who had lower levels of social support. Thus, writing about stressful experiences may provide an important outlet when social support is not readily available. In addition, there is some evidence that sharing one's expressive writing with others has further benefits. In fact, a recent study of college students found that, although both private and shared writing improved psychological outcomes, only shared emotional writing showed benefits on physical symptoms.

Problem-focused coping is most effective in dealing with controllable stressors. While appraisal- and emotion-focused coping may be the most effective means for coping with situations beyond one's control, a problem under personal control may best be addressed by taking action to solve the problem.

Problem solving and assertiveness can help you cope. Each stressful situation has unique circumstances and meaning to the individual. Thus, it is impossible to offer specific information about the best stress management strategy without knowing the source of the stress and how it is affecting a specific person. However, it is possible to offer a framework for consistently responding to difficult situations. A technique called “systematic problem solving” has been shown to improve the likelihood of problem resolution.

The first step is brainstorming, generating every possible solution to the problem. During this stage, do not limit the solutions you generate in any way. Even silly and impractical solutions should be included. After generating

a comprehensive list, narrow your focus by eliminating any solutions that do not seem reasonable. Reduce the number of solutions to a reasonable number (four or five), and then carefully evaluate each option. Consider the potential costs and benefits of each approach to aid in making a decision. Once you decide on an approach, carefully plan the implementation of the strategy, anticipating anything that might go wrong and being prepared to alter your plan as necessary.

In some cases, directly addressing the source of stress involves responding assertively. For example, if the source of stress is an employer placing unreasonable demands on your time, the best solution to the problem may involve talking to your boss about the situation. This type of confrontation is difficult for many people concerned about being overly aggressive. However, you can stand up for yourself without infringing on the rights of others.

Many people confuse assertiveness with aggression, leading to passive responses in difficult situations. An aggressive response intimidates others and fulfills one's own needs at the expense of others. In contrast, an assertive response protects your own rights and values while respecting the opinions of others.

Once you are comfortable with the idea of responding assertively, practice or role-play assertive responses with a trusted friend before trying them in the real world. Your friend may provide valuable feedback about your approach, and the practice may increase your self-efficacy for responding and your expectancies for a positive outcome.



Social Support and Stress Management

Social support is important for effective stress management. Social support can play a role in coping with stress, and it has been linked to better physical and mental health outcomes among individuals with chronic stress-related illnesses. For example, in a large group of patients with coronary artery disease, participation in a social support group was associated with lower systolic blood pressure, better social functioning, and better mental health. The improvements in social functioning and mental health were due, at least in part, to improved health behaviors. Social support may also be critical to managing stress in academic settings. A recent study found that a lack of social support from family, teachers, and peers was associated with a lack of academic motivation and subsequent academic failure.

Social support may be particularly important for women. Women may be particularly likely to seek and provide social support when stressed. A paradigm called



Social support is important for stress management.

the “tend or befriend” model suggests that women have a unique stress response. Women respond to stress by tending to others (nurturing) and affiliating with a social group (befriending). This response is helpful in protecting offspring and reducing the risk for the negative health consequences of stress.

Social support has various sources. Everyone needs someone to turn to for support when feeling overwhelmed. Support can come from friends, family members, clergy, a teacher, a coach, or a professional counselor. Different sources provide different forms of support. Even pets have been shown to be a good source of social support, with consequent health and quality of life benefits. The goal is to identify and nurture relationships that can provide this type of support. In turn, it is important to look for ways to support and assist others.

There are many types of social support. Social support has three main components: informational, material, and emotional. Informational (technical) support includes tips, strategies, and advice that can help a person get through a specific stressful situation. For example, a parent, friend, or co-worker may offer insight into how he or she once resolved similar problems. Material support is direct assistance to get a person through a stressful situation—for example, providing a loan to help pay off a short-term debt. Emotional support is encouragement or sympathy that a person provides to help another cope with a particular challenge.

Regardless of the type of support, it is important that it fosters autonomy. Social support that helps you to become more self-reliant because of increased feelings

Social Support The behavior of others that assists a person in addressing a specific need.



In the News

Social Networking for Social Support

Some have expressed concern that social networking sites (SNS) like Facebook may lead to a deterioration in “real world” social support; however, recent studies suggest that these websites are associated with higher rather than lower levels of social support. A recent study by Pew Internet (www.pewinternet.org) found no differences between SNS and non-SNS users with respect to the number of people in their social networks. However, SNS users were significantly less likely to be socially isolated and reported a larger number of close social ties. The latter

difference remained when controlling for demographic variables including gender, age, and education. These results suggest that the use of SNS strengthens rather than weakens social support. A recent study of college students published in *Developmental Psychology* also found support for the social benefits of social network sites though not all outcomes were positive (e.g., possible increases in narcissistic displays).

Do you think your use of social networking sites has improved or worsened the quality of your social network?

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of competence is best for developing autonomy. Social support that is controlling or leads to dependence may increase rather than decrease stress over time.

Obtaining good social support requires close relationships. Although we live in a social environment, it is often difficult to ask people for help. Sometimes the nature and severity of our problems may not be apparent to others. Other times, friends may not want to offer suggestions or insight because they do not want to appear too pushy. To obtain good support, one must develop quality personal relationships. Although having a large social support network is helpful, quality seems to be at least as important as quantity. Many individuals report feeling lonely despite having large social networks, and loneliness is associated with negative health behaviors, including smoking and lack of exercise.

Sometimes professional help is necessary to deal with problems related to stress. Although members of your social support network may be able to help you manage many of the stressors you experience, sometimes stress creates problems that require professional help. If you think you might be suffering from posttraumatic stress disorder or depression, there are well-established treatments that can help you function more effectively. Sometimes, professionals can also be helpful in efforts to change negative health behaviors such as alcohol and drug use, or problematic patterns of eating. Thankfully, stigmas associated with these problems have decreased in the past 25 years, leading many more people to seek professional services. In addition, new approaches to treatment are now being developed, including online therapy and mail-based interventions. These approaches have the potential to reach even more people in need of professional help.



Strategies for Action

Some practical steps can help you identify and manage your stress. This concept described strategies and skills for preventing, managing, and coping with stress. For strategies to be effective, they must be used regularly. Several practical steps you can take are described in the following list.

- *Self-assess your stress levels.* Making self-assessments such as those in Labs 16A and 16B can help you identify the sources and the magnitude of stress in your life.
- *Adopt effective coping strategies.* Consistent with the information presented in this concept, learning about and using a variety of appraisal-focused, emotion-focused,

and problem-focused strategies will help you manage stress in your daily life.

- *Manage time effectively.* Lab 17A can help you understand your current time use patterns and help you develop a schedule that will allow you to focus on your priorities.
- *Evaluate strategy effectiveness.* Lab 17B will help you assess the effectiveness of various coping strategies. It also provides a basis for altering strategies to manage your stress levels more effectively. Lab 17C will help you to relax tense muscles, an emotion-focused coping strategy. Lab 17D will help you evaluate your current social support system.

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Web Resources

ABC's of Internet Therapy www.metanoia.org/imhs
 American Institute of Stress www.stress.org
 American Psychological Association www.apa.org
 American Time Use Survey from the Bureau of Labor Statistics www.bls.gov/tus/
 International Stress Management Association www.isma.org.uk
 Mental Health Resources www.mentalhealth.about.com
 National Mental Health Information Center www.mentalhealth.samhsa.gov
 Time Management for College Students www.time-management-for-students.com

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Healthy People

2020

The objectives listed below are societal goals designed to help all Americans improve their health between now and the year 2020. They were selected because they relate to the content of this concept.

- Promote quality of life, healthy development, and healthy behaviors across all stages of life.
- Increase screening and treatment of mental health problems.
- Increase levels of social support among adults.
- Increase screening for and reduce rates of depression.

- Increase availability of work-site stress-reduction programs.
- Increase the proportion of primary care facilities that provide mental health treatment.

A national goal is to improve mental health through prevention and by ensuring access to appropriate, quality mental health services. A specific goal is to improve screening and treatment of depression. The increased acceptance of depression as a medical problem has helped many people to seek help. Would you know the signs of depression well enough to recommend that a friend or family member seek help from a doctor?

Lab 17A Time Management

Name

Section

Date

Purpose: To learn to manage time to meet personal priorities

Procedures

1. Follow the four steps outlined below.
2. Complete the Conclusions and Implications section.

Results

Step 1: Establishing Priorities

1. Check the circles that reflect your priorities in the list below. Add priorities as necessary.
2. Rate each of the priorities you checked. Use a 1 for highest priority, 2 for moderate priority, and 3 for low priority.

Check Priorities	Rating	Check Priorities	Rating	Check Priorities	Rating
<input type="checkbox"/> More time with family	<input type="text"/>	<input type="checkbox"/> More time with boy/girlfriend	<input type="text"/>	<input type="checkbox"/> More time with spouse	<input type="text"/>
<input type="checkbox"/> More time for leisure	<input type="text"/>	<input type="checkbox"/> More time to relax	<input type="text"/>	<input type="checkbox"/> More time to study	<input type="text"/>
<input type="checkbox"/> More time for work success	<input type="text"/>	<input type="checkbox"/> More time for physical activity	<input type="text"/>	<input type="checkbox"/> More time to improve myself	<input type="text"/>
<input type="checkbox"/> More time for other recreation	<input type="text"/>	<input type="checkbox"/> Other _____	<input type="text"/>	<input type="checkbox"/> Other _____	<input type="text"/>

Step 2: Monitor Current Time Use

1. On the following daily calendar, keep track of daily time expenditure.
2. Write in exactly what you did for each time block.

7–9 A.M.	9–11 A.M.	11 A.M.–1 P.M.	1–3 P.M.
3–5 P.M.	5–7 P.M.	7–9 P.M.	9–11 P.M.

Step 3: Analyze Your Current Time Use by Using the ABC Method (See Table 2 on page 387)

A Tasks That Must <i>Absolutely</i> Get Done	B Tasks That <i>Better</i> Get Done	C Tasks That <i>Could</i> Be Done

Step 4: Make a Schedule: Write in Your Planned Activities for the Day

Time	Activities	Time	Activities
6:00 A.M.		3:00 P.M.	
7:00 A.M.		4:00 P.M.	
8:00 A.M.		5:00 P.M.	
9:00 A.M.		6:00 P.M.	
10:00 A.M.		7:00 P.M.	
11:00 A.M.		8:00 P.M.	
12:00 P.M.		9:00 P.M.	
1:00 P.M.		10:00 P.M.	
2:00 P.M.		11:00 P.M.	

Conclusions and Implications: In several sentences, discuss how you might modify your schedule to find more time for important priorities.

Lab 17B Evaluating Coping Strategies

Name

Section

Date

Purpose: To learn how to use appropriate coping strategies that work best for you

Procedures

1. Think of five recent stressful experiences that caused you some concern, anxiety, or distress. Describe these situations in Chart 1. Then use Chart 2 to make a rating for changeability, severity, and duration. Assign one number for each category for each situation.
2. In Chart 3, place a check for each coping strategy that you used in coping with each of the five situations you described.
3. Answer the questions in the Conclusions and Implications section.

Results

Chart 1 Stressful Situations

Think of five different stressful situations. Appraise each situation and assign a score (changeability, severity, duration) using the scale in Chart 2.

Briefly describe the situation.	Changeability	Severity	Duration
1.			
2.			
3.			
4.			
5.			

Chart 2 Appraisal of the Stressful Situations

Use this chart to rate the five situations you described in Chart 1. Assign a number for changeability, severity, and duration for each situation in Chart 1.

	1	2	3	4	5
Was the situation changeable?	Completely within my control	Mostly within my control	Both in and out of my control	Mostly out of my control	Completely outside of my control
What was the severity of the stress?	Very minor	Fairly minor	Moderate	Fairly major	Very major
What was the duration of the stress?	Short-term (weeks)	Moderately short	Moderate (months)	Moderately long	Long (months to year)

Chart 3 Coping Strategies

Directions: Think about your response to the five stressful situations you recently experienced and check the strategies that you used in each situation. List use of other strategies as appropriate.

	Situation	Situation	Situation	Situation	Situation
Coping Strategy	1	2	3	4	5
1. I apologized or corrected the problem as best I could.					
2. I ignored the problem and hoped that it would go away.					
3. I told myself to forget about it and grew as a person from the experience.					
4. I tried to make myself feel better by eating, drinking, or smoking.					
5. I prayed or sought spiritual meaning from the situation.					
6. I expressed anger to try to change the situation.					
7. I took active steps to make things work out better.					
8. I used music, images, or deep breathing to help me relax.					
9. I tried to keep my feelings to myself and kept moving forward.					
10. I pursued leisure or recreational activity to help me feel better.					
11. I talked to someone who could provide advice or help me with the problem.					
12. I talked to someone about what I was feeling or experiencing.					
13. Other _____					
14. Other _____					
15. Other _____					

Conclusions and Implications: In several sentences, discuss the coping strategies you used. What were the ones you used the most? Are these the ones you typically use? Were they effective? Would you consider other strategies in the future?

Lab 17C Relaxation Exercises

Name

Section

Date

Purpose: To gain experience with specific relaxation exercises and to evaluate their effectiveness

Procedures

1. Choose two of the relaxation exercises included in Chart 1 of this lab (see page 402) and read through the written instructions until you have a basic understanding of the exercises. Think through the specific aspects of the exercise until you have the process figured out.
2. Find a quiet place to try one of the exercises and follow the procedures as best you can. It is not possible to provide detailed instructions, but the information should be sufficient to give you a basic understanding of the exercises.
3. On another day try a different exercise.
4. Answer the questions in the Results section. Then complete the Conclusions and Implications section.

Results

1. Which of the two exercises did you try? (List them below.)

2. Have you done either of the exercises before? Yes No

3. Was one relaxation exercise more effective or better suited to you than the others? Which one?

Conclusions and Implications

In several sentences, discuss whether or not you feel that relaxation exercises will be a part of your wellness program. In what ways might you benefit from relaxation training? If you do not think you have a problem with relaxation, explain why.

Chart 1 Descriptions of Relaxation Exercises

A. Progressive Relaxation

Progressive relaxation uses active (conscious) mechanisms to achieve a state of relaxation. The technique involves alternating phases of muscle contraction (tension) and muscle relaxation (tension release). Muscle groups are activated one body segment at a time, incorporating all regions of the body by the end of the routine. Begin by lying on your back in a quiet place with eyes closed. Alternately contract and relax each of the muscles below—following the procedures described below. Begin with the dominant side of the body first; repeat on the nondominant side.

1. Hand and forearm—Make a fist.
2. Biceps—Flex elbows.
3. Triceps—Straighten arm.
4. Forehead—Raise your eyebrows and wrinkle forehead.
5. Cheeks and nose—Wrinkle nose and squint.
6. Jaws—Clench teeth.
7. Lips and tongue—Press lips together and tongue to roof of mouth, teeth apart.
8. Neck and throat—Tuck chin and push head backward against floor (if lying) or chair (if sitting).
9. Shoulder and upper back—Hunch shoulders to ears.
10. Abdomen—Suck abdomen inward.
11. Lower back—Arch back.
12. Thighs and buttocks—Squeeze buttocks together, push heels into floor (if lying) or chair rung (if sitting).
13. Calves—Pull instep and toes toward shins.
14. Toes—curl toes.

Muscle contraction

phase: Inhale as you contract the designated muscle for 3–5 seconds. Use only a moderate level of tension.

Muscle relaxation phase:

Exhale, relaxing the muscle and releasing tension for 6–10 seconds. Think of relaxation words such as warm, calm, peaceful, and serene.

Relax every muscle in your body at the end of the exercise.



Figure 3 ▶ Diaphragmatic breathing.

B. Diaphragmatic Breathing

This exercise will help improve awareness of using deep abdominal breathing over shallower chest-type breathing. To begin, lie on your back with knees bent and feet on the floor. Place your right hand over your abdomen and left hand over your chest. Your hands will be used to monitor breathing technique. Slowly inhale through the nose by allowing the abdomen to rise under your right hand. Concentrate on expanding the abdomen for 4 seconds. Continue inhaling another 2 seconds allowing the chest to rise under your left hand. Exhale through your mouth in reverse order (for about 8 seconds, or twice as long as inhalation). Relax the chest first, feeling it sink beneath the left hand and then the abdomen, allowing it to sink beneath the right hand. Repeat 4–5 times. Discontinue if you become light-headed.

C. Show Gun

This is a form of Qigong, a Chinese meditation technique. The basic principles of tai chi are to maintain balance, use the entire body to achieve movement, unite movement with awareness (mind) and breathing (chi), and to keep the body upright. Tai chi involves holding the body in specific positions, or “forms.” To execute the basic form, stand straight, feet shoulder-width apart and parallel with one another. Your knees should be bent and turned outward slightly with knees over the foot. Your hands are on belly button with palms facing body (men place hands right on left and women left on right), fingers are straight, spread slightly and relaxed.

1. Bring arms in front of body at a 30-degree angle to the plane of the back, palms face downward. Reach up to shoulder height with arms moving up and to the sides. (Breathe in, allowing belly to move out as you raise arms upward.)
2. When hands reach shoulder height, turn palms up and move hands to head, allowing wrists to drop down. Imagine energy (chi) flowing from palms to top of head. (Continue breathing in.)
3. Imagine energy flowing down through a central line of the body. Follow the energy with hands, point fingers toward one another, palms down, move arms downward in front of the midline of face and chest. (Breathe out as arms lower.)
4. Two inches below belly button stop, cross palms, and move hands together.
5. Lower hands toward sides. (Complete breathing out.)
6. Repeat.

Lab 17D Evaluating Levels of Social Support

Name

Section

Date

Purpose: To evaluate your level of social support and to identify ways that you can find additional support

Procedures

1. Answer each question in Chart 1 by placing a check in the box below Not True, Somewhat True, or Very True. Place the number value of each answer in the score box to the right.
2. Sum the scores (in the smaller boxes) for each question to get subscale scores for the three social support areas.
3. Record your three subscores in the Results section on the next page. Total your subscores to get a total social support score.
4. Determine your ratings for each of the three social support subscores and for your total social support score using Chart 2 on the next page.
5. Answer the questions in the Conclusions and Implications section.

Chart 1 Social Support Questionnaire

These questions assess various aspects of social support. Base your answer on your actual degree of support, not on the type of support that you would like to have. Place a check in the space that best represents what is true for you.

Social Support Questions	Not True 1	Somewhat True 2	Very True 3	Score
1. I have close personal ties with my relatives.				<input type="text"/>
2. I have close relationships with a number of friends.				<input type="text"/>
3. I have a deep and meaningful relationship with a spouse or close friend.				<input type="text"/>
Access to social support score:				<input type="text"/>
4. I have parents and relatives who take the time to listen and understand me.				<input type="text"/>
5. I have friends or co-workers whom I can confide in and trust when problems come up.				<input type="text"/>
6. I have a nonjudgmental spouse or close friend who supports me when I need help.				<input type="text"/>
Degree of social support score:				<input type="text"/>
7. I feel comfortable asking others for advice or assistance.				<input type="text"/>
8. I have confidence in my social skills and enjoy opportunities for new social contacts.				<input type="text"/>
9. I am willing to open up and discuss my personal life with others.				<input type="text"/>
Getting social support score:				<input type="text"/>

Results

Scores and Ratings

(Use Chart 2 to obtain ratings.)

Access to social support score

Rating

Degree of social support score

Rating

Getting social support score

Rating

Total social support score (sum of three scores)

Rating

Chart 2 Rating Scale for Social Support

Rating	Item Scores	Total Score
High	8–9	24–27
Moderate	6–7	18–23
Low	Below 6	Below 18

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Conclusions and Implications

1. In several sentences, discuss your overall social support. Do you think your scores and ratings are a true representation of your social support?

2. In several sentences, describe any changes you think you should make to improve your social support system. If you do not think change is necessary, explain why.