

TENTH EDITION

# *Concepts of* **Fitness & Wellness**

*A Comprehensive  
Lifestyle Approach*

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# Health, Wellness, Fitness, and Healthy Lifestyles: An Introduction

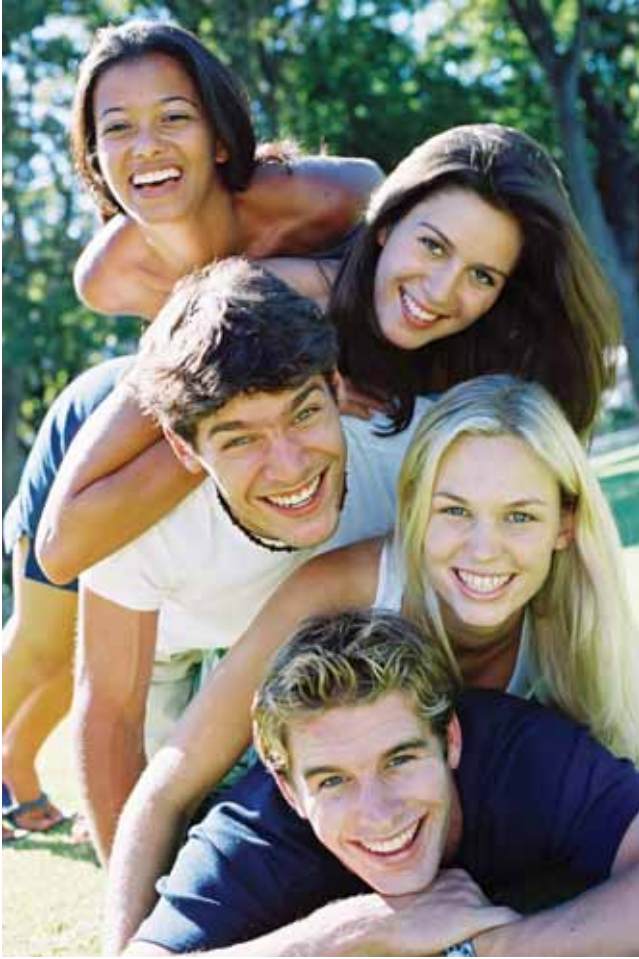
## LEARNING OBJECTIVES

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

- ▶ Describe the HELP philosophy and discuss its implications in making personal decisions about health, wellness, and fitness.
- ▶ Define the dimensions of health and wellness, and explain how they interact to influence health and wellness.
- ▶ Distinguish health-related and skill-related dimensions of physical fitness.
- ▶ Identify the determinants of health, wellness, and fitness, and explain how they each contribute to health, wellness, and fitness.
- ▶ Identify related national health goals and show how meeting personal goals can contribute to reaching national goals.
- ▶ Use health behavior change strategies to carry out self-assessments of personal lifestyles and wellness perceptions.

*Good health, wellness, fitness, and healthy lifestyles are important for all people.*





Health and wellness is available to everyone for a lifetime.

Ninety-nine percent of American adults say that “being in good health” is of primary importance. Good health—for them and those they care about—is more important than money and other material things. Having good health, wellness, and fitness can make us feel good, look good, and enjoy life fully. This book is designed to help you achieve good health by providing information to help you make good decisions. You will also learn essential **self-management skills**. With practice, use of these skills promotes healthy lifestyles that lead to good health, wellness, and fitness throughout life. An overview of basic self-management skills is provided in Concept 2.

## The HELP Philosophy

**The HELP philosophy provides a basis for making healthy lifestyle change possible.** The four-letter acronym HELP summarizes the overall philosophy used in this book. Each letter in HELP characterizes an important part of the philosophy: *Health* is available to *Everyone* for a *Lifetime*—and it’s *Personal*. The concepts in the book

provide principles and guidelines that help you adopt positive lifestyles. The labs provide experiences for learning behavioral skills needed to maintain these lifestyles.

**A personal philosophy that emphasizes health can lead to behaviors that promote it.** The *H* in HELP stands for *health*. One theory that has been extensively tested indicates that people who believe in the benefits of healthy lifestyles are more likely to engage in healthy behaviors. The theory also suggests that people who state intentions to put their beliefs into action are likely to adopt behaviors that lead to health, wellness, and fitness.

**Everyone can benefit from healthy lifestyles.** The *E* in HELP stands for *everyone*. Anyone can change a behavior or lifestyle. Nevertheless, many adults feel ineffective in making lifestyle changes. Physical activity is not just for athletes—it is for all people. Eating well is not just for other people—you can do it, too. All people can learn stress-management techniques and practice healthy lifestyles.

**Healthy behaviors are most effective when practiced for a lifetime.** The *L* in HELP stands for *lifetime*. Young people sometimes feel immortal because the harmful effects of unhealthy lifestyles are often not immediate. As we grow older, we begin to realize that unhealthy lifestyles have cumulative negative effects. Starting early in life to emphasize healthy behaviors results in long-term health, wellness, and fitness benefits. One study showed that the longer healthy lifestyles are practiced, the greater the beneficial effects. This study also demonstrated that long-term healthy lifestyles can even overcome hereditary predisposition to illness and disease.

**Healthy lifestyles should be based on personal needs.** The *P* in HELP stands for *personal*. No two people are exactly alike. Just as no single pill cures all illnesses, no single lifestyle prescription exists for good health, wellness, and fitness. Each person must assess personal needs and make lifestyle changes based on those needs.

**You can adopt the HELP philosophy.** As you progress through this book, consider ways that you can implement the HELP philosophy. In each concept, HELP boxes are provided to stimulate your thinking about key health issues.

## National Health Goals

**Healthy People 2020 (HP2020) is a comprehensive set of health promotion and disease prevention objectives with the primary intent of improving the nation’s health.** The objectives, developed by experts from hundreds of national health organizations and published in 2010, provide benchmarks to determine progress over the period from 2010 to 2020. The objectives

also serve as goals to motivate and guide people in making sound health decisions as well as to provide a focus for public health programs.

The national health goals for the year 2010 were established in 2000. Studies show that significant progress was made in that 10-year period: For example, 23 percent of all goals were met and progress was made on 48 percent. The hope is that similar progress can be made in the 10 years leading to 2020.

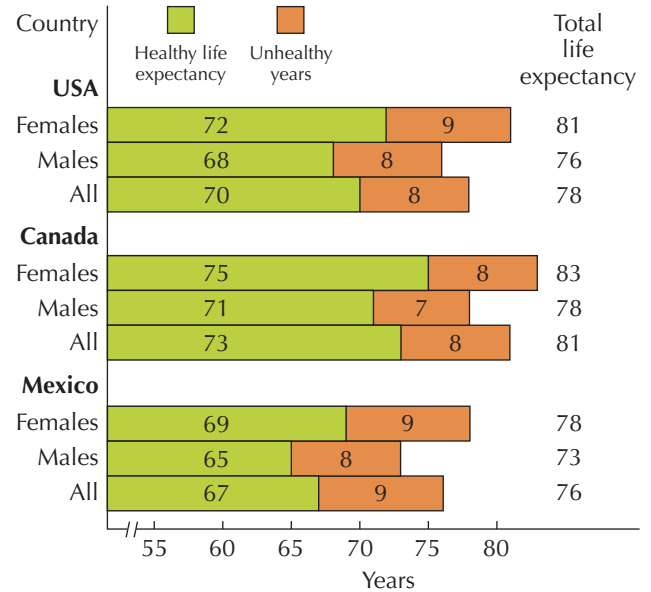
In addition to helping change the health of society at large, HP2020 goals also have implications for personal health behavior change. Societal changes can occur only when individuals adjust personal behaviors and work together to make changes that benefit other people. Not all objectives will have personal implications for each individual, but societal awareness of the objectives may lead to future changes in the health of our country.

Specific HP2020 goals are provided at the end of each concept to show the links between the content of this text and the national health goals. Four of the “overarching goals” of HP2020 are described in more detail in the sections that follow. The section at the end of each concept, “Strategies for Action,” offers assessment and planning tips for improving health, wellness, and fitness and for working toward meeting HP2020 goals.

**A primary goal of HP2020 is to help all people have high-quality, longer lives free of preventable disease, injury, and premature death.** Over the past century, the average life expectancy in the United States has increased by 60 percent. Although different reports yield slightly different results, studies have generally shown that Americans now live longer than ever before. Results included in Figure 1 are from the most recent **World Health Organization (WHO)** life expectancy report. These data provide statistics for healthy life expectancy in North American countries. Globally, according to the most current *World Factbook*, Canada ranks 12th, the United States ranks 50th, and Mexico ranks 72nd in life expectancy.

Living a long life is important, but so is having a high-quality life. This means feeling good, looking good, and being happy. It also means being fit enough to enjoy your leisure and to be able to do what you want to do without limitation. An index called HALE (Healthy Life Expectancy) is often used to determine the number of years of life a person has a good quality of life as opposed to having illness or impaired function. Figure 1 uses information from HALE to show the number of years of high-quality life (green) and years of life with low quality (orange). Adopting healthy lifestyles when we are young can increase the length of life and can also increase quality of life.

**Achieving health equity, eliminating disparities, and improving the health of all groups is another primary goal of HP2020.** Health varies greatly with



**Figure 1** ► Healthy life expectancy for North America.

Sources: World Health Organization and National Center for Health Statistics.

ethnicity, income, gender, and age. For example, African Americans, Hispanics, and Native Americans have a shorter life expectancy than White non-Hispanics, and men have a shorter life expectancy than women. Health disparities also exist in quality of life. One method of assessing disparities in quality of life is to compare the number of **healthy days** diverse groups experience each month. Minorities, including African Americans, Hispanics, and Native Americans, experience about 24 healthy days each month compared to 25 for White

**Self-management Skills** Skills that you learn to help you adopt healthy lifestyles and adhere to them.

**Health** Optimal well-being that contributes to one’s quality of life. It is more than freedom from disease and illness, though freedom from disease is important to good health. Optimal health includes high-level mental, social, emotional, spiritual, and physical wellness within the limits of one’s heredity and personal abilities.

**World Health Organization (WHO)** WHO is the United Nations’ agency for health and has 193 member countries. Its principal goal is the attainment of the highest possible level of health for all people. WHO has been instrumental in making health policy and in implementing health programs worldwide since its inception in 1948.

**Healthy Days** A self-rating of the number of days (per week or month) a person considers himself or herself to be in good or better than good health.

non-Hispanics. People with very low income typically have 22 healthy days per month, compared with 26 days for those with high income. Men have a higher number of healthy days than women.

The reason for such differences in the number of healthy days varies. The relatively higher number of unhealthy days for women is, at least in part, because they live longer and their unhealthy years later in life factor into their average number of healthy days. Disparities in healthy days by level of income may be due to environmental, social, or cultural factors as well as less access to preventive care. Both physical and mental health problems are the most frequent reasons for unhealthy days. Physical illness, pain, depression, anxiety, sleeplessness, and limitations in ability to function or perform enjoyable activities are the problems people most frequently reported.

**Another primary goal of HP2020 is to create social and physical environments that promote good health for all.** The environment, both social and physical, has much to do with both quality of life and length of life. Environmental factors are discussed in greater detail on page 13 and in several of the later concepts in this book.

**The final primary goal of HP2020 is to promote quality of life, healthy development, and healthy behaviors across all stages of life.** Healthy days decrease as we age. Young adults experience more healthy days each month than older adults. Over the past two decades, there has been a steady decline in healthy days for the average person, no doubt because of the increase in the number of older adults in our society. The number of healthy days takes its biggest drop after age 75. It is interesting that in recent national surveys older adults (ages 50 to 75) report being happier and more secure than younger people age 20 to 40.

A recent national report (*Blueprint for a Healthier America*) underscores the need to focus future efforts on



Physical activity is for everyone. An active lifestyle promotes health and wellness.

prevention and preparedness, including changing both the social and physical environment to increase emphasis on physical activity, nutrition, and prevention of tobacco use. The report indicates that an investment of \$10 per person per year in proven community-based programs that focus on healthy lifestyles could save the country \$16 per person over a five-year period.

## Health and Wellness

**Health is more than freedom from illness and disease.** Over 60 years ago, the World Health Organization defined health as more than freedom from illness, disease, and debilitating conditions. Prior to that time, you were considered to be “healthy” if you were not sick. HP2020 refers to quality of life in two of its four overarching goals, highlighting the importance of the wellness component of health.

Figure 2 illustrates the modern concept of health. This general state of being is characterized by freedom from disease and debilitating conditions (outer circle), as well as wellness (center circle).

connect  
VIDEO 1



Healthy lifestyles are the principal contributor to health and wellness.

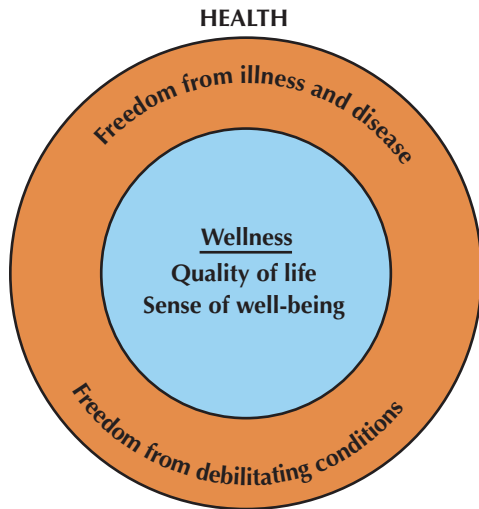


Figure 2 ► A model of optimal health, including wellness.

**Wellness is the positive component of optimal health.** Disease, **illness**, and debilitating conditions are negative components that detract from optimal health. Death can be considered the ultimate opposite of optimal health. **Wellness**, in contrast, is the positive component of optimal health. It is characterized by a sense of well-being reflected in optimal functioning, health-related **quality of life**, meaningful work, and a contribution to society. HP2020 objectives use the term *health-related quality of life* to describe a general sense of happiness and satisfaction with life.



## A CLOSER LOOK

### Social Determinants of Health

*Healthy People 2020* and related documents from the World Health Organization (WHO) emphasize the importance of understanding the determinants of health. The WHO reports outline the importance of *social determinants* in reducing health disparities throughout the world. They note that people's circumstances are shaped by distribution of money, power, and resources at local, national, and global levels, which can result in "unfair but avoidable" differences in health status in different places. For example, the lack of pure water, medical facilities, and medicine result in higher rates of disease (particularly infectious disease) and lower quality of life in third world countries than in more technologically advanced countries.

**How do social determinants influence health status within the United States?**

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ACTIVITY

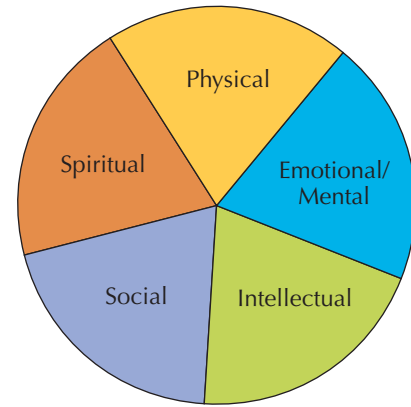


Figure 3 ► The dimensions of health and wellness.

**Health and wellness are personal.** Every individual is unique—and health and wellness are influenced by each person's unique characteristics. Making comparisons to other people on specific characteristics may produce feelings of inadequacy that detract from one's profile of total health and wellness. Each of us has personal limitations and strengths. Focusing on strengths and learning to accommodate weaknesses are essential keys to optimal health and wellness.

**Health and wellness are multidimensional.** The dimensions of health and wellness include emotional-mental, intellectual, social, spiritual, and physical. Table 1 describes the various dimensions, and Figure 3 illustrates the importance of each one for optimal health and wellness. Some people include environmental and vocational dimensions in addition to the five shown in Figure 3.

**Illness** The ill feeling and/or symptoms associated with a disease or circumstances that upset homeostasis.

**Wellness** The integration of many different components (social, emotional/mental, spiritual, and physical) that expand one's potential to live (quality of life) and work effectively and to make a significant contribution to society. Wellness reflects how one feels (a sense of well-being) about life, as well as one's ability to function effectively. Wellness, as opposed to illness (a negative), is sometimes described as the positive component of good health.

**Quality of Life** A term used to describe wellness. An individual with quality of life can enjoyably do the activities of life with little or no limitation and can function independently. Individual quality of life requires a pleasant and supportive community.

**Table 1 ▶ Definitions of Health and Wellness Dimensions**

**Emotional/mental health**—Freedom from emotional/mental illnesses, such as clinical depression, and possession of emotional wellness. The goals for the nation’s health refer to mental rather than emotional health and wellness. In this book, mental health and wellness are considered to be the same as emotional health and wellness.

**Emotional/mental wellness**—The ability to cope with daily circumstances and to deal with personal feelings in a positive, optimistic, and constructive manner. A person with emotional wellness is generally characterized as happy instead of depressed.

**Intellectual health**—Freedom from illnesses that invade the brain and other systems that allow learning. A person with intellectual health also possesses intellectual wellness.

**Intellectual wellness**—The ability to learn and to use information to enhance the quality of daily living and optimal functioning. A person with intellectual wellness is generally characterized as informed instead of ignorant.

**Physical health**—Freedom from illnesses that affect the physiological systems of the body, such as the heart and the nervous system. A person with physical health possesses an adequate level of physical fitness and physical wellness.

**Physical wellness**—The ability to function effectively in meeting the demands of the day’s work and to use free time effectively. Physical wellness includes good physical fitness and the possession of useful motor skills. A person with physical wellness is generally characterized as fit instead of unfit.

**Social health**—Freedom from illnesses or conditions that severely limit functioning in society, including antisocial pathologies.

**Social wellness**—The ability to interact with others successfully and to establish meaningful relationships that enhance the quality of life for all people involved in the interaction (including self). A person with social wellness is generally characterized as involved instead of lonely.

**Spiritual health**—The one component of health that is totally composed of the wellness dimension; it is synonymous with spiritual wellness.

**Spiritual wellness**—The ability to establish a values system and act on the system of beliefs, as well as to establish and carry out meaningful and constructive lifetime goals. Spiritual wellness is often based on a belief in a force greater than the individual that helps her or him contribute to an improved quality of life for all people. A person with spiritual wellness is generally characterized as fulfilled instead of unfulfilled.

In this book, health and wellness are considered to be personal factors, so environmental and vocational wellness are not included in Tables 1 and 2. However, the environment (including your work environment) is very

**Table 2 ▶ The Dimensions of Wellness**

Wellness Dimension	Negative	Positive
Emotional/mental	Depressed	Happy
Intellectual	Ignorant	Informed
Physical	Unfit	Fit
Social	Lonely	Involved
Spiritual	Unfulfilled	Fulfilled
Total outlook	Negative	Positive

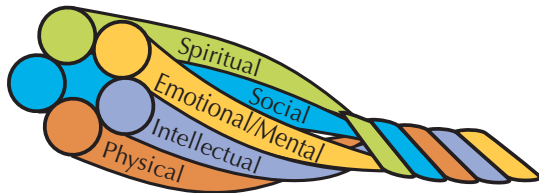
important to overall personal wellness, and for this reason, environmental factors are prominent in the model of wellness described on page 13 and are featured throughout this book. The final concept in the book links environmental and vocational factors to the personal wellness dimensions described in Table 1.

**Wellness reflects how one feels about life, as well as one’s ability to function effectively.** A positive total outlook on life is essential to each of the wellness dimensions. As illustrated in Table 2, a “well” person is satisfied in work, is spiritually fulfilled, enjoys leisure time, is physically fit, is socially involved, and has a positive emotional/mental outlook. He or she is happy and fulfilled.

The way one perceives each dimension of wellness affects one’s total outlook. Researchers use the term *self-perceptions* to describe these feelings. Many researchers believe that self-perceptions about wellness are more important than actual circumstances or a person’s actual state of being. For example, a person who has an important job may find less meaning and job satisfaction than another person with a much less important job. Apparently, one of the important factors for a person who has achieved high-level wellness and a positive outlook on life is the ability to reward himself or herself. Some people, however, seem unable to give themselves credit for their successes. The development of a system that allows a person to perceive the self positively is essential, along with the adoption of positive **lifestyles** that encourage improved self-perceptions. The questionnaire in Lab 1A will help you assess your self-perceptions of the various wellness dimensions. For optimal wellness, it is important to find positive feelings about each dimension.

**Health and wellness are integrated states of being.**

The segmented pictures of health and wellness shown in Figure 3 and Tables 1 and 2 are used only to illustrate the multidimensional nature of health and wellness. In reality, health and wellness are integrated states of being that



**Figure 4** ► The integration of wellness dimensions.

can best be depicted as threads woven together to produce a larger, integrated fabric. Each dimension relates to each of the others and overlaps all the others. The overlap is so frequent and so great that the specific contribution of each thread is almost indistinguishable when looking at the total (Figure 4). The total is clearly greater than the sum of the parts.

connect  
VIDEO 2

**It is possible to possess health and wellness while being ill or possessing a debilitating condition.**

Many illnesses are curable and may have only a temporary effect on health. Others, such as Type I diabetes, are not curable but can be managed with proper eating, physical activity, and sound medical treatment. Those with manageable conditions may, however, be at risk for other health problems. For example, unmanaged diabetes is associated with a high risk for heart disease and other health problems.

Debilitating conditions, such as the loss of a limb or loss of function in a body part, can contribute to a lower level of functioning or an increased risk for illness and thus to poor health. On the other hand, such conditions need not limit wellness. A person with a debilitating condition who has a positive outlook on life may have better overall health than a person with a poor outlook on life but no debilitating condition.

Just as wellness is possible among those with illness and disability, evidence is accumulating that people with a positive outlook are better able to resist the progress of disease and illness than are those with a negative outlook. Thinking positive thoughts has been associated with enhanced results from various medical treatments and surgical procedures.

**Wellness is a term used by the uninformed as well as experts.**

Unfortunately, some individuals and groups have tried to identify wellness with products and services that promise benefits that cannot be documented. Because well-being is a subjective feeling, unscrupulous people can easily make claims of improved wellness for their product or service without facts to back them up.

*Holistic health* is a term that is similarly abused. Consider that optimal health includes many areas; thus, the term *holistic* (total) is appropriate. In fact, the word *health*

originates from a root word meaning “wholeness.” Unfortunately, questionable health practices are sometimes promoted under the guise of holistic health. Care should be used when considering services and products that make claims of wellness and/or holistic health to be sure that they are legitimate.

## Physical Fitness

**Physical fitness is a multidimensional state of being.**

**Physical fitness** is the body’s ability to function efficiently and effectively. It consists of at least five health-related and six skill-related components, each of which contributes to total quality of life. Physical fitness is associated with a person’s ability to work effectively, enjoy leisure time, be healthy, resist **hypokinetic diseases or conditions**, and meet emergency situations. It is related to, but different from, health and wellness.

connect  
VIDEO 3

Although the development of physical fitness is the result of many things, optimal physical fitness is not possible without regular physical activity.

**The health-related components of physical fitness are directly associated with good health.**

The five components of health-related physical fitness are body composition, cardiovascular fitness, flexibility, muscular

**Lifestyles** Patterns of behavior or ways an individual typically lives.

**Physical Fitness** The body’s ability to function efficiently and effectively. It consists of health-related physical fitness and skill-related physical fitness, which have at least 11 components, each of which contributes to total quality of life. Physical fitness also includes metabolic fitness and bone integrity. Physical fitness is associated with a person’s ability to work effectively, enjoy leisure time, be healthy, resist hypokinetic diseases, and meet emergency situations. It is related to, but different from, health, wellness, and the psychological, sociological, emotional/mental, and spiritual components. Although the development of physical fitness is the result of many things, optimal physical fitness is not possible without regular exercise.

**Hypokinetic Diseases or Conditions** *Hypo-* means “under” or “too little,” and *-kinetic* means “movement” or “activity.” Thus, *hypokinetic* means “too little activity.” A hypokinetic disease or condition is one associated with lack of physical activity or too little regular exercise. Examples include heart disease, low back pain, Type II diabetes, and obesity.





Figure 5 ► Components of health-related physical fitness.

endurance, and strength (see Figure 5). Each health-related fitness characteristic has a direct relationship to good health and reduced risk for hypokinetic disease. It is for this reason that the five health-related physical fitness components are emphasized in this book.

Possessing a moderate amount of each component of health-related fitness is essential to disease prevention and health promotion, but it is not essential to have exceptionally high levels of fitness to achieve health benefits. High levels of health-related fitness relate more to performance than to health benefits. For example, moderate amounts of strength are necessary to prevent back and posture problems, whereas high levels of strength contribute most to improved performance in activities such as football and jobs involving heavy lifting.

**The skill-related components of physical fitness are associated more with performance than with good health.** The components of skill-related physical fitness are agility, balance, coordination, power, reaction time, and speed (see Figure 6). They are called skill-related because people who possess them find it easy to achieve high levels of performance in motor skills, such as those required in sports and in specific types of jobs. Power is sometimes referred to as a combined component of fitness, since it requires both strength (a health-related component) and speed (a skill-related component). Because most experts consider power to be associated more with performance than with good health, it is classified as a skill-related component of fitness in this book. Skill-related fitness is sometimes called sports fitness or motor fitness.



connect  
VIDEO 4

It is important to recognize that skill-related fitness is multidimensional and highly specific. For example, coordination could be hand-eye coordination, such as batting a ball; foot-eye coordination, such as kicking a ball; or many other possibilities. The six parts of skill-related fitness identified here are those commonly associated with successful sports and work performance. Each could be measured in ways other than those presented in this book. Measurements are provided to help you understand the nature of total physical fitness and to help you make important decisions about lifetime physical activity.

**Metabolic fitness is a nonperformance component of total fitness.** Physical activity can provide health benefits that are independent of changes in traditional health-related fitness measures. Physical activity promotes good **metabolic fitness**, a state associated with reduced risk for many chronic diseases. People with a cluster of low metabolic fitness characteristics are said to have metabolic syndrome (also known as Syndrome X). Metabolic syndrome is discussed in more detail in Concept 4.

**Bone integrity is often considered to be a nonperformance measure of fitness.** Traditional definitions do not include **bone integrity** as a part of physical fitness, but some experts feel they should. Like metabolic fitness, bone integrity cannot be assessed with performance measures the way most health-related fitness parts can. Regardless of whether bone integrity is considered a part of fitness or a component of health, strong, healthy bones are important to optimal health and are associated with regular physical activity and sound diet.

**The many components of physical fitness are specific but are also interrelated.** Physical fitness is a combination of several aspects, rather than a single characteristic. A fit person possesses at least adequate levels of each of the health-related, skill-related, and metabolic fitness components. Some relationships exist among various fitness characteristics, but each component of physical fitness is separate and different from the others. For example, people who possess exceptional strength may not have good cardiovascular fitness, and those who have good coordination do not necessarily possess good flexibility.

**Good physical fitness is important, but it is not the same as physical health and wellness.** Good physical fitness contributes directly to the physical component of good health and wellness and indirectly to the other four components. Good fitness has been shown to be associated with reduced risk for chronic diseases, such as heart disease, and has been shown to reduce the consequences of many debilitating conditions. In addition, good fitness contributes to wellness by helping us look our best, feel good, and enjoy life. Other physical factors can also influence health and wellness. For example, having good physical skills enhances quality of life by allowing us to participate in enjoyable activities, such as tennis, golf, and bowling. Although fitness can assist us in performing these activities, regular practice is also necessary. Another example is the ability to fight off viral and bacterial infections. Although fitness can promote a strong immune system, other physical factors can influence our susceptibility to these and other conditions.

**Metabolic Fitness** A positive state of the physiological systems commonly associated with reduced risk for chronic diseases such as diabetes and heart disease. Metabolic fitness is evidenced by healthy blood fat (lipid) profiles, healthy blood pressure, healthy blood sugar and insulin levels, and other nonperformance measures.

**Bone Integrity** Soundness of the bones is associated with high density and absence of symptoms of deterioration.



Figure 6 ► Components of skill-related physical fitness.

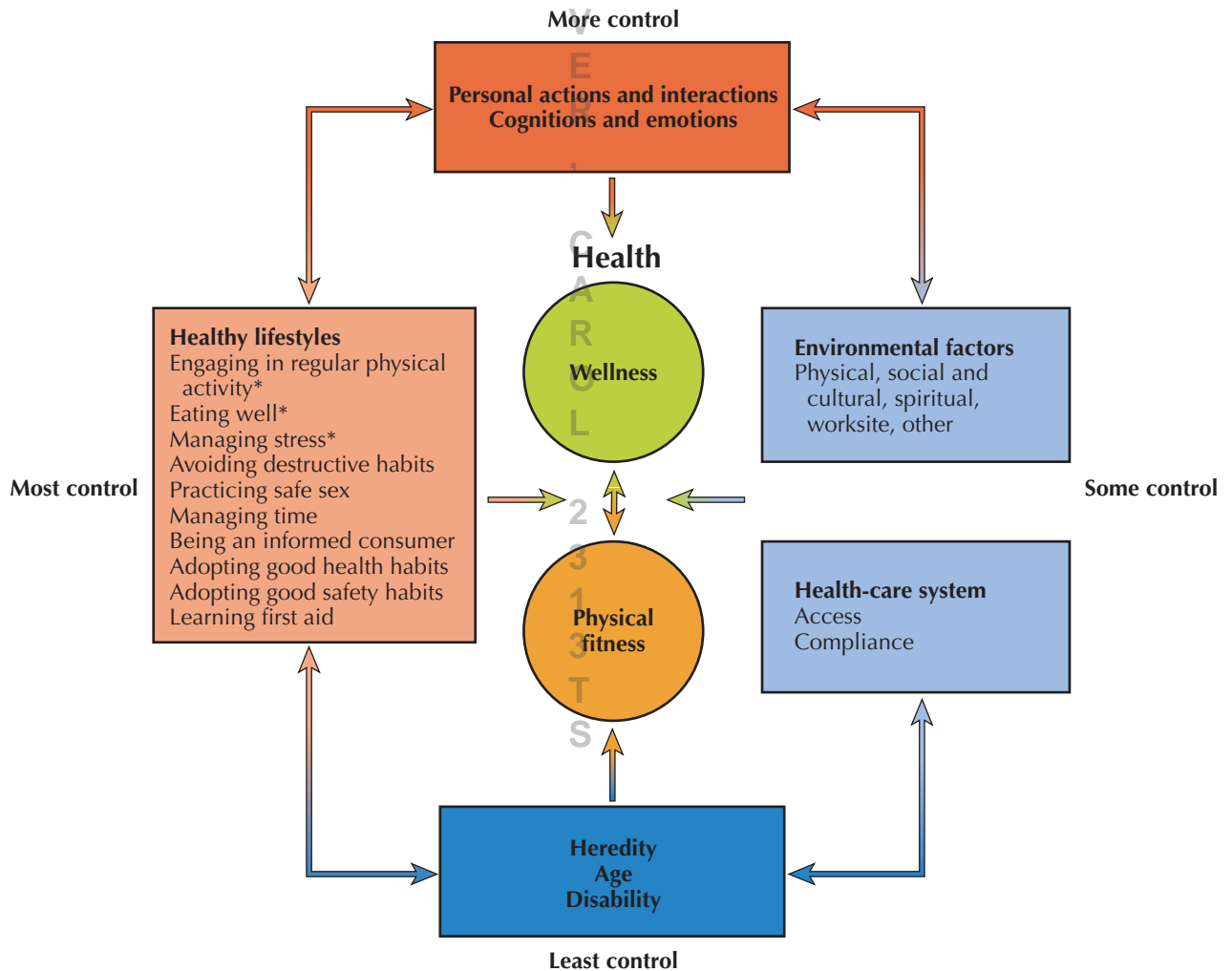
## Determinants of Lifelong Health, Wellness, and Fitness

Many factors are important in developing lifetime health, wellness, and fitness, and some are more in your control than others. Figure 7 provides a model for describing many of the factors that contribute to health, wellness, and fitness. Central to the model are health, wellness, and fitness because these are the states of being (shaded in green and gold) that each of us wants to achieve. Around the periphery are the factors that influence these states of being. Those shaded in dark blue are the factors over which you have the least control (heredity, age, and disability). Those shaded in light blue (health care and environmental factors) are factors over which you have some control but less than the factors shaded in red (personal actions/interactions, cognitions, and emotions).

Those shaded in light red are the factors over which you have greatest control (healthy lifestyles).



**Heredity (human biology) is a factor over which we have little control.** Experts estimate that human biology, or heredity, accounts for 16 percent of all health problems, including early death. Heredity influences each part of health-related physical fitness, including our tendencies to build muscle and to deposit body fat. Each of us reaps different benefits from the same healthy lifestyles, based on our hereditary tendencies. Even more important is that predispositions to diseases are inherited. For example, some early deaths are a result of untreatable hereditary conditions (e.g., congenital heart defects). Obviously, some inherited conditions are manageable (e.g., diabetes) with proper medical supervision and appropriate lifestyles.



\*These lifestyles are viewed as "priority lifestyles."

Figure 7 ► Determinants of health, fitness, and wellness.

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

According to the National Institutes of Health, although genes do not necessarily cause diseases, they do influence our risk of developing diseases, such as cancer, heart disease, and addiction. The interaction between our genes and our environments and experiences is a complex one that is still being studied.

*Would knowing you were genetically predisposed to a particular disease change the lifestyle decisions you make?*

connect  
ACTIVITY

Heredity is a factor over which we have little control and is, therefore, illustrated in dark blue in Figure 7. Each of us can limit the effects of heredity by being aware of our personal family history and by making efforts to best manage those factors over which we do have control.

In the concepts that follow, you will learn more about heredity and how it affects health, wellness, and fitness.

**Health, wellness, and fitness are influenced by the aging of our population.** In 2030 when post–World War II baby boomers are over the age of 65, adults 65 or older will make up 20 percent of the population. The number of people over 85 will triple by 2050. There are currently more than 100,000 people over the age of 100. The definition of *old* is changing, with most people believing that a person is not old until age 71 or older. Nearly a quarter of the population believes that being old begins at 81.

Whatever the standard for being old, age is a factor over which we have no control. The major health and wellness concerns of older adults include losing health, losing the ability to care for oneself, losing mental abilities, running out of money, being a burden to family, and being alone. Chronic pain is also a major problem among older adults. Nearly 30 percent of adults over 65 experience chronic pain, as opposed to 3 percent of those under 30. Nearly 60 percent of older adults experience frequent pain, as opposed to 17 percent of those under 30. Older adults have 36 percent more unhealthy days than young adults.

Age is shaded in dark blue in Figure 7 because it is a factor that you cannot control. However, healthy lifestyles can reduce the effects of aging on health, wellness, and fitness. As detailed later in this book, healthy lifestyles can extend life and have a positive effect on quality of life.

**Disabilities can affect, but they do not necessarily limit, health, wellness, and fitness.** Disabilities typically result from factors beyond your control (shaded in dark blue in Figure 7). Many types of disabilities affect

## TECHNOLOGY UPDATE

### Podcasts

Podcasts are compressed digital files containing audio or video that can be downloaded from the Internet to a portable media player or personal computer. The word *Pod* refers to a personal media player, the receiver of the information delivered by a *podcaster*. Originally used to transmit music and news, podcasts of health information are now common.

*Do you think you would rely on this type of resource for health-related information? Why or why not?*

connect  
ACTIVITY

health, fitness, and wellness. An objective disability (e.g., loss of a limb, impaired intellectual functioning) can make it difficult to function in certain circumstances but need not limit health, wellness, and fitness. All people have a limitation of one kind or another. Societal efforts to help all people function within their limitations can help everyone, including people with disabilities, have a positive outlook on life and experience a high quality of life. With assistance from an instructor, it is possible for all people to adapt the information in this book for use in promoting health, wellness, and fitness.

**The health-care system affects our ability to overcome illness and improve our quality of life.**

Approximately 10 percent of unnecessary deaths occur as a result of disparities in the health-care system. The quality of life for those who are sick and those who tend to be sick is influenced greatly by the type of medical care they receive. Health care is not equally available to all. A study by the Institute of Medicine, entitled “Insuring America’s Health,” indicates that 18,000 people die unnecessarily in the United States each year because they lack health insurance. Those without health insurance are less likely to get high-quality medical care than those with insurance. Many of those without insurance have chronic conditions that go undetected and as a result become untreatable. The passage of the Affordable Health Care Act addresses this issue by enabling all Americans to have health insurance.

Many people fail to seek medical help even though care is accessible. Others seek medical help but fail to comply with medical advice. For example, they do not take prescribed medicine or do not follow up with treatments. Men are less likely to seek medical advice than women. For this reason, treatable conditions sometimes become untreatable. Once men seek medical care, evidence reveals, they get better care than women. Also,

more of the medical research has been done on men. This is of concern because treatments for men and women often vary for similar conditions.

Wellness as evidenced by quality of life is also influenced by the health-care system. Traditional medicine, sometimes referred to as the **medical model**, has focused primarily on the treatment of illness with medicine, rather than illness prevention and wellness promotion. Efforts to educate health-care personnel about techniques for promoting wellness have been initiated in recent years. Still, it is often up to the patient to find information about health promotion. For example, a patient with risk factors for heart disease might be advised to eat better or to exercise more, but little specific information may be offered. In Figure 7, the health-care system is in light blue to illustrate the fact that it is a factor over which you may have limited control.

**The environment is a major factor affecting our health, wellness, and fitness.** Environmental factors account for nearly one-fourth of all early deaths and affect quality of life in many ways. We do have more control over environmental factors than heredity, but they are not totally under our control. For this reason, the environmental factors box is depicted in Figure 7 with a lighter shade of blue than the heredity, age, and disability box.

You can exert personal control by selecting healthy environments rather than by exposing yourself to unhealthy or unsafe environments. This includes your choice of living and work location, as well as the social, spiritual, and intellectual environments. On the other hand, circumstances may make it impossible for you to make the choices you would prefer. Important environmental factors are discussed throughout the text, particularly in Concept 6 and the final concept in the book. Some suggestions for how you can work to alter the environment in a positive way are also discussed in the last concept.

**Personal actions, interactions, cognitions, and emotions all have an effect on health, wellness, and fitness.** Some people think that good health, wellness, and fitness are totally out of personal control. Others think that they are totally in control. Neither statement is entirely true. While heredity, age, and disability are factors you cannot control, and health care and the environment are factors over which you have limited control, there are things that you can do relating to these factors. You can use your cognitive abilities to learn about your family history and use that information to limit the negative influences of heredity. You can learn how to adapt to disabilities and personal limitations, as well as to the aging process. You can research the health-care system and the environment to minimize the problems associated with them.

Your personal interactions also influence your health, wellness, and fitness. You are not alone in this world. Your

various environments, and how you interact with them, influence you greatly. You have a choice about the environments in which you place yourself and the people with whom you interact in these environments.

Humans have the ability to think (cognitions) and to use critical thinking to make choices and to determine the actions they take and the interactions they engage in. Emotions also affect personal actions and interactions. A major goal of this book is to help you learn self-management skills designed to help you use your cognitive abilities to solve problems and make good decisions about good health, wellness, and fitness, as well as to help you to be in control of your emotions when taking action and making decisions that affect your health.

None of us makes perfect decisions all of the time. Sometimes we take actions and make choices based on inadequate information, faulty thinking, pressure from others, or negative influences from our emotions. While the focus of this book is on healthy lifestyles, all of the factors that influence health, wellness, and fitness will be discussed in greater detail in the concepts that follow. The goal is to help you consider all factors and to make informed decisions that will lead to healthful behaviors. Some strategies for action for each of the factors are presented in the final concept of this book.

**Lifestyle change, more than any other factor, is the best way to prevent illness and early death in our society.** Statistics show that more than half of early deaths are the result of chronic diseases caused by unhealthy lifestyles. Many of these chronic diseases are targeted in the HP2020 report, and many of the new health objectives focus on them. As shown in Figure 7, these lifestyles affect health, wellness, and physical fitness. The double-headed arrow between health/wellness and physical fitness illustrates the interaction between these factors. Physical fitness is important to health and wellness development and vice versa.

**The major causes of early death have shifted from infectious diseases to chronic lifestyle-related conditions.** Scientific advances and improvements in medicine and health care have dramatically reduced the incidence of infectious diseases over the past 100 years (see Table 3). Diphtheria and polio, both major causes of death in the 20th century, have been virtually eliminated in Western culture. Smallpox was globally eradicated in 1977.

**Medical Model** The focus of the health-care system on treating illness with medicine, with little emphasis on prevention or wellness promotion.



## In the News

### Health, Wellness, and Fitness: The Good News

The Gallup-Healthways Well-Being Index<sup>®</sup> provides an indicator of how U.S. residents rate their health and well-being over time. More than 1,000 adults are surveyed every day and results are summarized each month. In addition to the overall Well-Being Index, separate indices monitor life adjustment, emotional health, physical health, healthy behaviors, work environment, and health

access. The indices track trends at the national level as well as by state, major cities, and congressional districts. Visit the Well-Being Index at [www.well-beingindex.com](http://www.well-beingindex.com) to see how Americans feel about their health and well-being.

*What do you think is needed to promote health and well-being at the local, state, and national level?*



**Table 3 ▶ Major Causes of Death in the United States**

Current Rank	Cause	1900 Rank	Cause
1	Heart disease	1	Pneumonia*
2	Cancer	2	Tuberculosis*
3	Lower respiratory disease	3	Diarrhea/enteritis*
4	Stroke	4	Heart disease
5	Injuries/accidents	5	Stroke
6	Alzheimer's disease	6	Liver disease
7	Diabetes	7	Injuries
8	Influenza/pneumonia*	8	Cancer
9	Kidney disease	9	Senility
10	Suicide	10	Diphtheria*

\*Infectious diseases: The only diseases among the top ten that are primarily infectious in nature today are influenza/pneumonia.

Infectious diseases have been replaced with chronic lifestyle-related conditions as the major causes of death. Four of the top seven current causes of death (heart disease, cancer, stroke, and diabetes) fall into this category. While heart disease remains the leading killer among all adults, National Cancer Institute statistics indicate that cancer is the leading cause of death for adults under the age of 85. Death rates have recently decreased for 8 of the top 10 causes of death. The incidence of kidney disease was unchanged, and suicide increased 1 percent.

HIV/AIDS, formerly in the top 10 causes of death, is now 15th. The drop is primarily because of the development of treatments to increase the life expectancy of those infected. Many among the top 10 are referred to as

chronic lifestyle-related conditions because alteration of lifestyles can result in reduced risk for these conditions.

**Healthy lifestyles are critical to wellness.** Just as unhealthy lifestyles are the principal causes of modern-day illnesses, such as heart disease, cancer, and diabetes, healthy lifestyles can result in the improved feeling of wellness that is critical to optimal health. In recognizing the importance of “years of healthy life,” the Public Health Service also recognizes what it calls “measures of well-being.” This well-being, or wellness, is associated with social, emotional/mental, spiritual, and physical functioning. Being physically active and eating well are two healthy lifestyles that can improve well-being and add years of quality living. Many of the healthy lifestyles associated with good physical fitness and optimal wellness will be discussed in detail later in this book. The Healthy Lifestyle Questionnaire at the end of this concept gives you the opportunity to assess your current lifestyles.

**Regular physical activity, sound nutrition, and stress management are priority healthy lifestyles.**

Three of the lifestyles listed in Figure 7 are considered to be priority healthy lifestyles: engaging in regular **physical activity** or **exercise**, eating well, and managing

**Physical Activity** Generally considered to be a broad term used to describe all forms of large muscle movements, including sports, dance, games, work, lifestyle activities, and exercise for fitness. In this book, *exercise* and *physical activity* will often be used interchangeably to make reading less repetitive and more interesting.

**Exercise** Physical activity done for the purpose of getting physically fit.

stress. There are several reasons for placing priority on these lifestyles. First, they affect the lives of all people. Second, they are lifestyles in which large numbers of people can make improvement. Finally, modest changes in these behaviors can make dramatic improvements in individual and public health. For example, statistics suggest that modest changes in physical activity patterns and nutrition can prevent more than 400,000 deaths annually. Stress also has a major impact on drug, alcohol, and smoking behavior, so managing stress can help individuals minimize or avoid those behaviors.

The other healthy lifestyles listed in Figure 7 are also very important for good health. The reason that they are not emphasized as priority lifestyles is that they do not affect everyone as much as the first three do. Many healthy lifestyles will be discussed in this book, but the focus is on the priority healthy lifestyles because virtually all people can achieve positive wellness benefits if they adopt them.

**The “actual causes” of most deaths are due to unhealthy lifestyles.** As illustrated in Table 3, chronic diseases (e.g., heart diseases, cancer) are the direct causes of most deaths in our society. Public health experts have used epidemiological statistics to show that unhealthy lifestyles such as tobacco use, inactivity, and poor eating actually cause the chronic diseases and for this reason are referred to as the “actual causes of death.” Tobacco is the leading actual cause of death, but inactivity and poor diet account for the next largest percentage of deaths (see Table 4). The percentage

**Table 4 ► Actual Causes of Death in the United States**

Rank	Actual Cause	Percentage of Deaths
1	Tobacco use	18.1
2	Inactivity/poor diet	16.6
3	Alcohol consumption	3.5
4	Microbial agents (flu, pneumonia)	3.1
5	Toxic agents	2.3
6	Motor vehicles	1.8
7	Firearms	1.2
8	Sexual behavior	0.8
9	Illicit drug use	0.7
10	Other	<.05

Source: Mokdad et al.

of deaths attributed to inactivity and poor diet has recently been questioned, but their overall influence on health is indisputable. The information presented throughout this book is designed to help you change behaviors to reduce your risk for early death from the actual causes listed in Table 4.



## Strategies for Action

**Self-assessments of lifestyles will help you determine areas in which you may need changes to promote optimal health, wellness, and fitness.** The Healthy Lifestyle Questionnaire in the lab resource materials will help you assess your current lifestyle behaviors to determine if they are contributing positively to your health, wellness, and fitness. Because this questionnaire contains some very personal information, answering all the questions honestly will help you get an accurate assessment. As you continue your study, refer back to this questionnaire to see if your lifestyles have changed.

**Initial self-assessments of wellness and fitness will provide information for self-comparison.** It is important to assess your wellness and fitness at an early stage. These early

assessments will only be estimates. As you continue your study, you will have the opportunity to do more comprehensive self-assessments that will allow you to see how accurate your early estimates were.

In Lab 1A, you will estimate your wellness using a Wellness Self-Perceptions questionnaire, which assesses five wellness dimensions. Remember, wellness is a state of being that is influenced by healthy lifestyles. Because other factors, such as heredity, environment, and health care, affect wellness, it is possible to have good wellness scores even if you do not do well on the lifestyle questionnaire. However, over a lifetime, unhealthy lifestyles will catch up with you and have an influence on your wellness and fitness. As each individual makes progress toward improving wellness, we move closer to meeting the HP2020 goal of living long, high-quality lives.





## Web Resources

American Medical Association (AMA) [www.ama-assn.org](http://www.ama-assn.org)  
 Centers for Disease Control and Prevention (CDC) [www.cdc.gov](http://www.cdc.gov)  
 Health Canada <http://www.hc-sc.gc.ca>  
 Healthier United States [www.healthfinder.gov](http://www.healthfinder.gov)  
*Healthy People 2020* [www.healthypeople.gov/HP2020](http://www.healthypeople.gov/HP2020)  
 Institute of Medicine [www.iom.edu](http://www.iom.edu)  
 Kaiser Permanente, HealthAlliance Hospital, CDC, and the Institute for Healthcare Improvement. 2011. <http://xnet.kp.org/newscenter/pointofview/2010/032410healthylife.html>  
 National Center for Chronic Disease Prevention and Health Promotion Publications <http://www.cdc.gov/chronicdisease/index.htm>  
 President's Council on Fitness, Sports, and Nutrition [www.fitness.gov](http://www.fitness.gov)  
 Robert Wood Johnson Foundation [www.rwjf.org](http://www.rwjf.org)  
 Trust for America's Health <http://healthyamericans.org/>  
 U. S. Government Healthcare [www.HealthCare.gov](http://www.HealthCare.gov)  
 Well-Being Index—Gallup Poll [www.gallup.com/poll/wellbeing.aspx](http://www.gallup.com/poll/wellbeing.aspx)  
 World Health Organization [www.who.int](http://www.who.int)

## Web Podcasts (Selected Websites)

Arizona State University on iTunes U—Introduction to Exercise and Wellness <http://itunes.asu.edu>  
 CDC [www2a.cdc.gov/podcasts](http://www2a.cdc.gov/podcasts)  
 Johns Hopkins Medicine Podcasts [www.hopkinsmedicine.org/news/audio/podcasts/Podcasts.html](http://www.hopkinsmedicine.org/news/audio/podcasts/Podcasts.html)  
 Journal of the American Medical Association Podcasts <http://jama.ama-assn.org/misc/audiocommentary.dtl>

University of Maryland—Medical Podcasts (Medically Speaking) [www.umm.edu/podcasts/?source-google&gclid=CNS2g7\\_8oo0CFRfOggodmDi\\_5g](http://www.umm.edu/podcasts/?source-google&gclid=CNS2g7_8oo0CFRfOggodmDi_5g)  
 U.S. Food and Drug Administration [www.fda.gov/AboutFDA/ContactFDA/StayInformed/RSSFeeds/ucm144574.htm](http://www.fda.gov/AboutFDA/ContactFDA/StayInformed/RSSFeeds/ucm144574.htm)  
 U.S. Government Podcasts—Health Podcasts from the U.S. Government [www.usa.gov/Topics/Reference-Shelf/Libraries/Podcasts/Health.shtml](http://www.usa.gov/Topics/Reference-Shelf/Libraries/Podcasts/Health.shtml)

## Suggested Readings

Central Intelligence Agency. 2011. *The World Factbook*. Washington, DC: CIA. Available at <https://www.cia.gov/library/publications/the-world-factbook/>  
 Owen, N., et al. 2010. Too much sitting: The population health science of sedentary behavior. *Exercise and Sport Sciences Reviews*. 38(3):105–1113.  
 Sebastiani, P., et al. 2010. Genetic signatures of exceptional longevity in humans. *Science*. Published online July 1, 2010, [www.sciencemag.org](http://www.sciencemag.org)  
 Trust for America's Health. 2008. *Blueprint for a Healthier America*. Washington, DC: Trust for America's Health. Available at <http://healthyamericans.org/report/55/blueprint-for-healthier-america>  
 United Nations Report on Non-Communicable Diseases. 2011. Available at [www.un.org/en/ga/president/65/issues/](http://www.un.org/en/ga/president/65/issues/)  
 World Health Organization. 2011. *World Report on Disability*. Geneva: WHO. Available at [www.who.int/publications/en](http://www.who.int/publications/en)  
 World Health Statistics 2012. Available at [www.who.int/gho/publications/world\\_health\\_statistics/2012/en/index.html](http://www.who.int/gho/publications/world_health_statistics/2012/en/index.html)

## Healthy People

# 2020

The *Healthy People 2020* goals provide health targets for the nation to achieve by the year 2020. The following goals relate specifically to the content of this concept:

- Create a society in which all people live long, healthy lives.
- Promote quality of life, healthy development, and healthy behaviors (including being active, eating well, and avoiding destructive habits) across all stages of life.
- Attain high-quality, longer lives free of preventable disease, injury, and premature death.
- Achieve health equity, eliminate disparities, and improve the health of all groups.
- Create social and physical environments that promote good health for all.
- Increase public awareness and understanding of the determinants of health, disease, and disability.

*The national health goals emphasize “high-quality” living and “quality of life.” How do these national goals relate to health, wellness, and fitness as defined in this concept?*

## Lab Resource Materials: The Healthy Lifestyle Questionnaire

The purpose of this questionnaire is to help you analyze your lifestyle behaviors and to help you make decisions concerning good health and wellness for the future. Information on this Healthy Lifestyle Questionnaire is of a personal nature. For this reason, this questionnaire is not designed to be submitted to your instructor. **It is for your information only.** Answer each question as honestly as possible, and use the scoring information to help assess your lifestyle.

**Directions:** Place an X over the “yes” circle to answer yes. If you answer “no,” make no mark. Score the questionnaire using the procedures that follow.

<p><input checked="" type="radio"/> 1. I accumulate 30 minutes of moderate physical activity most days of the week (brisk walking, stair climbing, yard work, or home chores).</p> <p><input checked="" type="radio"/> 2. I do vigorous activity that elevates my heart rate for 20 minutes at least 3 days a week.</p> <p><input checked="" type="radio"/> 3. I do exercises for flexibility at least 3 days a week.</p> <p><input checked="" type="radio"/> 4. I do exercises for muscle fitness at least 2 days a week.</p> <p><input checked="" type="radio"/> 5. I eat three regular meals each day.</p> <p><input checked="" type="radio"/> 6. I select appropriate servings from the major food groups each day.</p> <p><input checked="" type="radio"/> 7. I restrict the amount of fat in my diet.</p> <p><input checked="" type="radio"/> 8. I consume only as many calories as I expend each day.</p> <p><input checked="" type="radio"/> 9. I am able to identify situations in daily life that cause stress.</p> <p><input checked="" type="radio"/> 10. I take time out during the day to relax and recover from daily stress.</p> <p><input checked="" type="radio"/> 11. I find time for family, friends, and things I especially enjoy doing.</p> <p><input checked="" type="radio"/> 12. I regularly perform exercises designed to relieve tension.</p> <p><input checked="" type="radio"/> 13. I do not smoke or use other tobacco products.</p> <p><input checked="" type="radio"/> 14. I do not abuse alcohol.</p> <p><input checked="" type="radio"/> 15. I do not abuse drugs (prescription or illegal).</p> <p><input checked="" type="radio"/> 16. I take over-the-counter drugs sparingly and use them only according to directions.</p>	S T O V E R , C A R O L L  2 3 1 3 T S	<p><input checked="" type="radio"/> 17. I abstain from sex or limit sexual activity to a safe partner.</p> <p><input checked="" type="radio"/> 18. I practice safe procedures for avoiding sexually transmitted infections (STIs).</p> <p><input checked="" type="radio"/> 19. I use seat belts and adhere to the speed limit when I drive.</p> <p><input checked="" type="radio"/> 20. I have a smoke detector in my house and check it regularly to see that it is working.</p> <p><input checked="" type="radio"/> 21. I have had training to perform CPR if called on in an emergency.</p> <p><input checked="" type="radio"/> 22. I can perform the Heimlich maneuver effectively if called on in an emergency.</p> <p><input checked="" type="radio"/> 23. I brush my teeth at least twice a day and floss at least once a day.</p> <p><input checked="" type="radio"/> 24. I get an adequate amount of sleep each night.</p> <p><input checked="" type="radio"/> 25. I do regular self-exams, have regular medical checkups, and seek medical advice when symptoms are present.</p> <p><input checked="" type="radio"/> 26. When I receive advice and/or medication from a physician, I follow the advice and take the medication as prescribed.</p> <p><input checked="" type="radio"/> 27. I read product labels and investigate their effectiveness before I buy them.</p> <p><input checked="" type="radio"/> 28. I avoid using products that have not been shown by research to be effective.</p> <p><input checked="" type="radio"/> 29. I recycle paper, glass, and aluminum.</p> <p><input checked="" type="radio"/> 30. I practice environmental protection, such as carpooling and energy conservation.</p>
<div style="border: 1px solid black; width: 40px; height: 20px; display: inline-block; margin-right: 5px;"></div> <b>Overall Score—Total “Yes” Answers</b>		

**Scoring:** Give yourself 1 point for each “yes” answer. Add your scores for each of the lifestyle behaviors. To calculate your overall score, sum the totals for all lifestyles.

<b>Physical Activity</b>	<b>Nutrition</b>	<b>Managing Stress</b>	<b>Avoiding Destructive Habits</b>	<b>Practicing Safe Sex</b>	<b>Adopting Safety Habits</b>
1. <input type="checkbox"/>	5. <input type="checkbox"/>	9. <input type="checkbox"/>	13. <input type="checkbox"/>	17. <input type="checkbox"/>	19. <input type="checkbox"/>
2. <input type="checkbox"/>	6. <input type="checkbox"/>	10. <input type="checkbox"/>	14. <input type="checkbox"/>	18. <input type="checkbox"/>	20. <input type="checkbox"/>
3. <input type="checkbox"/>	7. <input type="checkbox"/>	11. <input type="checkbox"/>	15. <input type="checkbox"/>		
4. <input type="checkbox"/>	8. <input type="checkbox"/>	12. <input type="checkbox"/>	16. <input type="checkbox"/>		
<input type="checkbox"/> Total +	<input type="checkbox"/> Total +	<input type="checkbox"/> Total +	<input type="checkbox"/> Total +	<input type="checkbox"/> Total +	<input type="checkbox"/>
<b>Knowing First Aid</b>	<b>Personal Health Habits</b>	<b>Using Medical Advice</b>	<b>Being an Informed Consumer</b>	<b>Protecting the Environment</b>	<b>Sum All Totals for Overall Score</b>
21. <input type="checkbox"/>	23. <input type="checkbox"/>	25. <input type="checkbox"/>	27. <input type="checkbox"/>	29. <input type="checkbox"/>	
22. <input type="checkbox"/>	24. <input type="checkbox"/>	26. <input type="checkbox"/>	28. <input type="checkbox"/>	30. <input type="checkbox"/>	
<input type="checkbox"/> Total +	<input type="checkbox"/> Total +	<input type="checkbox"/> Total +	<input type="checkbox"/> Total +	<input type="checkbox"/> Total =	<input type="checkbox"/>

**Interpreting Scores:** Scores of 3 or 4 on the four-item scales indicate generally positive lifestyles. For the two-item scales, a score of 2 indicates the presence of positive lifestyles. An overall score of 26 or more is a good indicator of healthy lifestyle behaviors. It is important to consider the following special note when interpreting scores.

**Special Note:** Your scores on the Healthy Lifestyle Questionnaire should be interpreted with caution. There are several reasons for this. First, all lifestyle behaviors do not pose the same risks. For example, using tobacco or abusing drugs has immediate negative effects on health and wellness, whereas others, such as knowing first aid, may have only occasional use. Second, you may score well on one item in a scale but not on another. If one item indicates an unhealthy lifestyle in an area that poses a serious health risk, your lifestyle may appear to be healthier than it really is. For example, you could get a score of 3 on the destructive habits scale and be a regular smoker. For this reason, the overall score can be particularly deceiving.

**Strategies for Change:** In the space to the right, make some notes concerning the healthy lifestyle areas in which you could make some changes. You can refer to these notes later to see if you have made progress.

Healthy Lifestyle Ratings			
Rating	Two-Item Scores	Four-Item Scores	Overall Scores
Positive lifestyles	2	3 or 4	26 to 30*
Consider changes	Less than 2	Less than 3	Less than 26

\*See Special Note.

# Lab 1A Wellness Self-Perceptions

Name

Section

Date

**Purpose:** To assess self-perceptions of wellness

## Procedures

- Place an X over the appropriate circle for each question (4 = strongly agree, 3 = agree, 2 = disagree, 1 = strongly disagree).
- Write the number found in that circle in the box to the right.
- Sum the three boxes for each wellness dimension to get your wellness dimension totals.
- Sum all wellness dimension totals to get your comprehensive wellness total.
- Use the rating chart to rate each wellness area.
- Complete the Results section and the Conclusions and Implications section.

Question	Strongly Agree	Agree	Disagree	Strongly Disagree	Score
1. I am happy most of the time.	4	3	2	1	<input type="text"/>
2. I have good self-esteem.	4	3	2	1	<input type="text"/>
3. I do not generally feel stressed.	4	3	2	1	<input type="text"/>
<b>Emotional Wellness Total =</b>					<input type="text"/>
4. I am well informed about current events.	4	3	2	1	<input type="text"/>
5. I am comfortable expressing my views and opinions.	4	3	2	1	<input type="text"/>
6. I am interested in my career development.	4	3	2	1	<input type="text"/>
<b>Intellectual Wellness Total =</b>					<input type="text"/>
7. I am physically fit.	4	3	2	1	<input type="text"/>
8. I am able to perform the physical tasks of my work.	4	3	2	1	<input type="text"/>
9. I am physically able to perform leisure activities.	4	3	2	1	<input type="text"/>
<b>Physical Wellness Total =</b>					<input type="text"/>
10. I have many friends and am involved socially.	4	3	2	1	<input type="text"/>
11. I have close ties with my family.	4	3	2	1	<input type="text"/>
12. I am confident in social situations.	4	3	2	1	<input type="text"/>
<b>Social Wellness Total =</b>					<input type="text"/>
13. I am fulfilled spiritually.	4	3	2	1	<input type="text"/>
14. I feel connected to the world around me.	4	3	2	1	<input type="text"/>
15. I have a sense of purpose in my life.	4	3	2	1	<input type="text"/>
<b>Spiritual Wellness Total =</b>					<input type="text"/>
<b>Comprehensive Wellness</b>					<input type="text"/>
(Sum of five wellness scores)					<input type="text"/>

In the Results below, record your scores from the previous page; then determine your ratings for each score using the Wellness Rating Chart. Record your ratings in the Results section.

Results		
Wellness Dimension	Score	Rating
Emotional/mental		
Intellectual		
Physical		
Social		
Spiritual		
Comprehensive		

Wellness Rating Chart		
Rating	Wellness Dimension Scores	Comprehensive Wellness Scores
High-level wellness	10–12	50–60
Good wellness	8–9	40–49
Marginal wellness	6–7	30–39
Low-level wellness	Below 6	Below 30

**Conclusions and Implications:** In the space provided below, describe your current state of wellness. Do you think the ratings indicate your true state of wellness? Which areas need the most improvement?

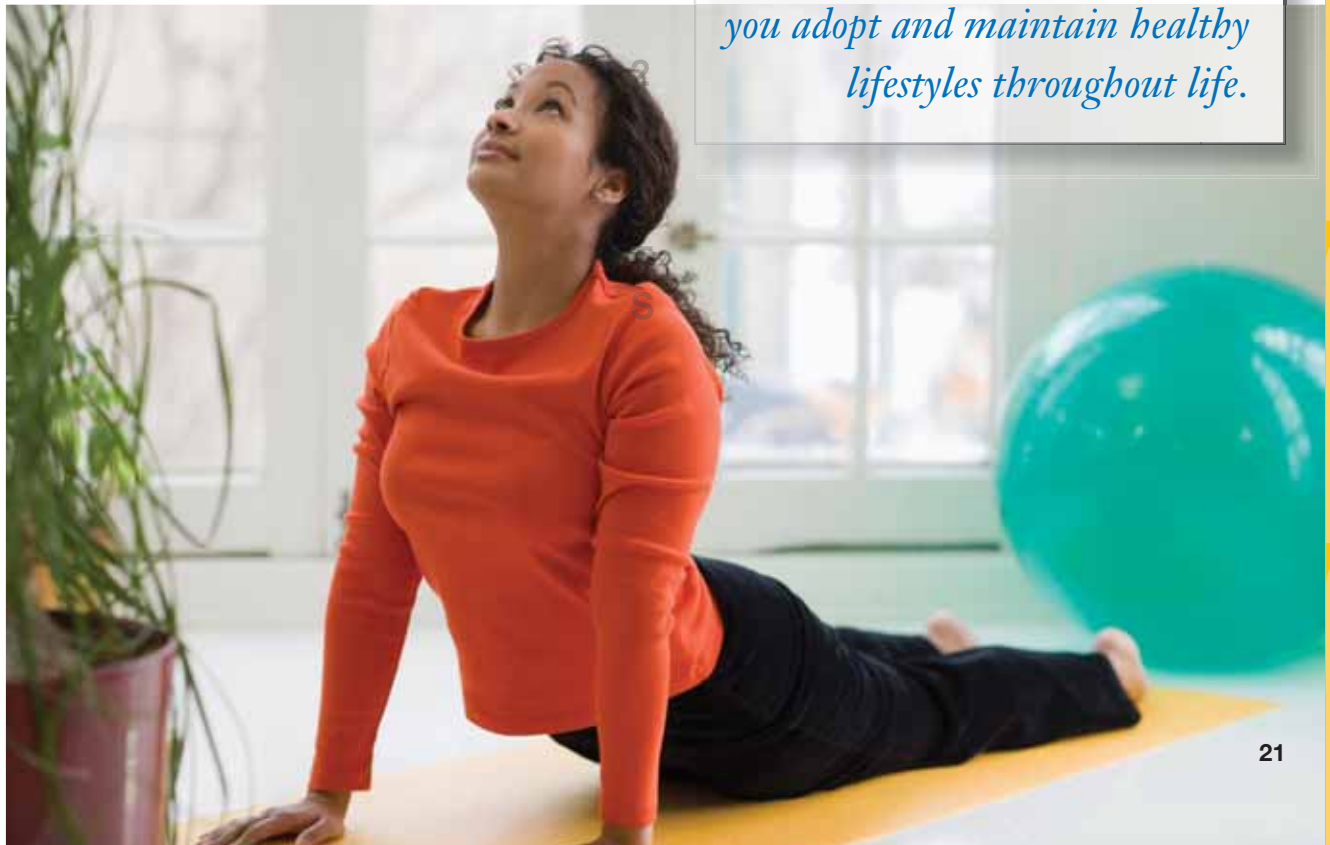
# Self-Management and Self-Planning Skills for Health Behavior Change

## LEARNING OBJECTIVES

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

- ▶ Identify and define the five stages of change and explain how the stages relate to making lifestyle changes.
- ▶ Describe the four key factors that influence health behaviors, describe components in each category, and explain how the factors relate to stages of change.
- ▶ Identify and describe the self-management skills that predispose and enable you to change and reinforce changes once you have made them.
- ▶ Identify and describe the six steps in self-planning and explain how they can be used to make personal plans for behavior change.
- ▶ Conduct self-assessments of your current stages for health behaviors and your self-management skills for making health behavior change.
- ▶ Identify related national health goals and show how meeting personal goals can contribute to reaching national goals.

*Learning and regularly using self-management skills can help you adopt and maintain healthy lifestyles throughout life.*



Reducing illness and debilitating conditions and promoting wellness and fitness are important public health goals. As noted in Concept 1, adopting healthy lifestyles is a key factor in health, wellness, and fitness promotion, but evidence suggests that many people are not able to make changes, even when they want to do so. Experts have determined that people who practice healthy lifestyles possess certain characteristics. These characteristics, including personal responsibility, can be modified to improve the health behaviors of all people. Researchers have also identified several special skills, referred to as self-management skills, that can be useful in altering factors related to adherence and ultimately in making lifestyle changes. Like any skill, self-management skills must be practiced if they are to be useful. The factors relating to adherence and the self-management skills described in this concept can be applied to a wide variety of healthy lifestyles. The early sections of this book focus on using self-management skills to become and stay active throughout life. Later sections focus on using these skills to adopt other healthy lifestyles that promote good health and wellness. In the final section, you get an opportunity to use the skills to make informed choices and plan for healthy living.

## Making Lifestyle Changes

**Many adults want to make lifestyle changes but find changes hard to make.** Results of several national public opinion polls show that adults often have difficulty making desired lifestyle changes. Examples include those who believe that physical activity is important but do not get enough exercise to promote good health, those who have tried numerous times to lose weight but have failed, those who know good nutrition is good for health but do not eat well, and those who feel stress on a regular basis but have not found a way to become less stressed. Changes in other lifestyles are frequently desired but often not accomplished. More information about public opinion polls related to health is presented in the “In the News” feature.

**Practicing one healthy lifestyle does not mean you will practice another, though adopting one healthy behavior often leads to the adoption of another.** College students are more likely to participate in regular physical activity than are older adults. However, they are also much more likely to eat poorly and abuse alcohol. Many young women adopt low-fat diets to avoid weight gain and smoke because they mistakenly believe that smoking will contribute to long-term weight maintenance. These examples illustrate the fact that practicing one healthy lifestyle does not ensure **adherence** to another. However, there is evidence that making one lifestyle change often makes it easier to make other changes. For example, smokers who

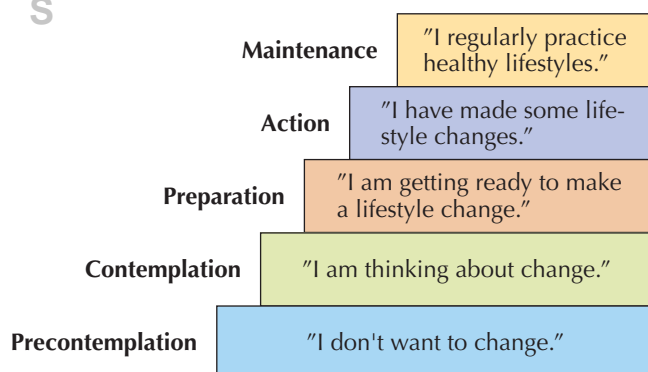
have started regular physical activity programs often see improvements in fitness and general well-being and decide to stop smoking.

**People do not make lifestyle changes overnight. People progress forward and backward through several stages of change.** When asked about a specific healthy lifestyle, people commonly respond with yes or no answers. If asked, “Do you exercise regularly?” the answer is yes or no. When asked, “Do you eat well?” the answer is yes or no. We know that there are many different stages of lifestyle behavior.

James Prochaska (a well-known health psychologist) and his colleagues developed the Transtheoretical Model to explain the importance of **stages of change** for understanding behavior. They suggest that lifestyle changes occur in at least five different stages, as illustrated in Figure 1. The stages were originally developed to help clarify negative lifestyles, such as smoking. Smokers who are not considering stopping are at the stage of precontemplation. Those who are thinking about stopping are classified in the contemplation stage. Those who have bought a nicotine patch or a book about smoking cessation are in the preparation stage. They have moved beyond contemplation and are preparing to take action. The action stage occurs when the smoker makes a change in behavior, even a small one, such as cutting back on the number of cigarettes smoked. The fifth stage, maintenance, is reached when a person finally stops smoking for a relatively long time (e.g., 6 months).

The stages of change model (as illustrated in Figure 1) has been applied to positive lifestyles as well as negative ones. Those who are totally sedentary are considered to be in the precontemplation stage. Contemplators are thinking about becoming active. A person at the preparation stage may have bought a pair of walking shoes and appropriate clothing for activity. Those who have started activity, even if infrequent, are at the stage of action. Those who have been exercising regularly for at least 6 months are at the stage of maintenance.

Whether the lifestyle is positive or negative, people move from one stage to another in an upward or a downward



**Figure 1** ► Stages of lifestyle change.



## In the News

### Public Opinion Polls about Health, Wellness, and Fitness

Many organizations, both profit and nonprofit, regularly poll Americans concerning their health, wellness, and fitness, as well as their attitudes about these subjects. Among the most well known polls are those by CBS/New York Times, USA Today/CNN/Gallup, NBC/Washington Post, and Trust for America's Health/Robert Wood Johnson Foundation. Some results of surveys by the various polls include the following:

- 76 percent of Americans favor increasing funding for prevention programs.
- 77 percent believe that prevention programs will save money over the long run.
- 72 percent want more investment in prevention—even if it does not save money—because it will prevent disease and save lives.

- 57 percent want to invest in prevention—even if money is not saved—if it improves quality of life (wellness).
- 50 percent believe that more money should be spent on medical and health research.

These results are from different sources and from different types of polls but they collectively show an interest in health, prevention, and wellness. While Americans overwhelmingly support these ideas, there is relatively little money invested in prevention and health promotion research. Funding is often in jeopardy for existing work-site wellness programs and school health/physical education programs.

*Why is it hard for organizations to invest more fully in prevention?*



direction. Individuals in the action stage may move on to maintenance or revert to contemplation. Smokers who succeed in quitting permanently report having stopped and started dozens of times before reaching lifetime maintenance. Similarly, those attempting to adopt positive lifestyles, such as eating well, often move back and forth from one stage to another, depending on their life circumstances.

**Once maintenance is attained, relapse is less likely to occur.** Although complete relapse is possible, it is generally less likely after the maintenance stage is reached. At the maintenance stage, the behavior has been integrated into a personal lifestyle, and it becomes easier to sustain. For example, a person who has been active for years does not have to undergo the same thought processes as a beginning exerciser—the behavior becomes automatic and habitual. Similarly, a nonsmoker is not tempted to smoke in the same way as a person who is trying to quit.

## Factors That Promote Lifestyle Change

**Various factors have been found to influence the adoption and maintenance of healthy lifestyles.** A variety of theories have been proposed to understand health behavior (e.g., Social Cognitive Theory, Self-Determination Theory, Theory of Planned Behavior, Theory of Reasoned Action). Each theory offers some unique attributes or concepts, but they share many of the same components. The previously mentioned Transtheoretical Model integrates elements from multiple theories and can be viewed as a “meta-theory.” The distinction between a “theory” and a “model” is



*Access to healthy foods is an important predisposing factor for good nutrition.*

important in this case. The Transtheoretical Model does not provide a new explanation of behavior (a theory) but rather a guide or map that makes using and applying the theories easier (a model). The unique advantage of the Transtheoretical Model is that it demonstrates that behavior is influenced in different ways depending on the stage of change a person has reached.

Another meta-theory that has been used to explain the challenges of changing health behaviors is the

**Adherence** Adopting and sticking with healthy behaviors, such as regular physical activity or sound nutrition, as part of your lifestyle.

**Stage of Change** The level of motivational readiness to adopt a specific health behavior.



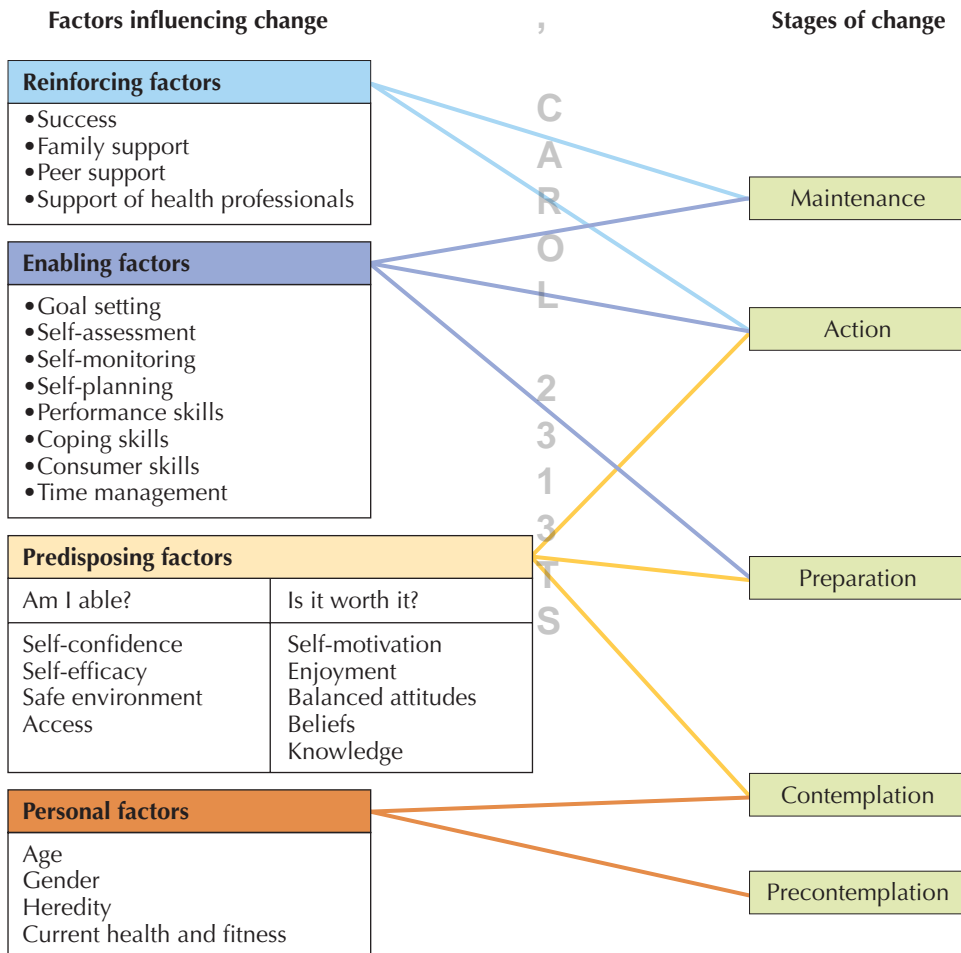
Social-Ecological Model. This model also integrates multiple theories, but a key point in this model is that a person’s behavior is strongly influenced by the nature of the environment in which she or he lives. If you are in a supportive social environment and have access to healthy foods and activity resources, adopting healthier lifestyles is easier.

You do not need a thorough understanding of the theories and models, but you should be aware of the basic principles. Concepts from both the Transtheoretical and Social-Ecological models have been combined to provide a simpler way to understand the various factors that influence behavior. For ease of understanding, the various factors are classified as **personal**, **predisposing**, **enabling**, and **reinforcing factors** (see Figure 2). Predisposing factors help precontemplators get going—moving them toward contemplation or even preparation. Enabling factors help those in contemplation or preparation take a step toward action. Reinforcing factors help those in action or maintenance.

**Personal factors affect health behaviors but are often out of your personal control.** Age, gender, heredity, social status, and current health and fitness levels are all personal factors that affect your health behaviors. For example, there are significant differences in health behaviors among people of various ages. According to one survey, young adults between the ages of 18 and 34 are more likely to smoke (30 percent) than those 65 and older (13 percent). On the other hand, young adults are much more likely than older adults to be physically active.

Gender differences are illustrated by the fact that women use health services more often than men. Women are more likely than men to have identified a primary care doctor and are more likely to participate in regular health screenings. As you will discover in more detail later in this book, heredity plays a role in health behaviors. For example, some people have a hereditary predisposition to gain weight, and this may affect their eating behaviors.

Age, gender, and heredity are factors you cannot control. Other personal factors that relate to health behaviors include social status and current health and



**Figure 2** ► Factors that influence health behaviors at various stages of change.



## A CLOSER LOOK

### Blue Zones

For his book *Blue Zones*, Dan Buettner researched communities across the world that had higher life expectancies and quality of life than other communities. He identified their common characteristics to try to determine the underlying factors that influence good health. He referred to these communities as “Blue Zones” and came up with nine specific attributes that contributed to the improved health. It is not surprising that physical activity (labeled as “Move Naturally”) was at the top of the list. (To see the complete list of principles, visit

[www.bluezones.com](http://www.bluezones.com).) Some public health groups and agencies have sought to promote broad application of these principles as the basis for coordinated community health programming. The book, in this case, can be viewed as a guide or recipe for healthy communities. However, it may also be likened to a fad diet that might promise an easy path to health and wellness.

*Is it possible for communities to follow these recommendations as part of building a healthy community? Why or why not?*

connect  
ACTIVITY

fitness status. Evidence indicates that people of lower socioeconomic status and those with poor health and fitness are less likely to contemplate or participate in activity and other healthy behaviors. No matter what personal characteristics you have, you can change your health behaviors. If you have several personal factors that do not favor healthy lifestyles, it is important to do something to change your behaviors. Making an effort to modify the factors that predispose, enable, and reinforce healthy lifestyles is essential. As shown in Figure 2, the factors influence behavior at different stages of change.

**Predisposing factors are important in getting you started with the process of change.** Several predisposing factors can help you move from contemplation to preparation and then to taking action with regard to healthy behavior. A person who possesses many of the predisposing factors is said to have self-motivation (also called intrinsic motivation). If you are self-motivated, you will answer positively to two basic questions: “Am I able?” and “Is it worth it?”

“Am I able to do regular activity?” “Am I able to change my diet or to stop smoking?” Figure 2 includes a list of four factors that help you say, “Yes, I am able.” Two of these factors are **self-confidence** and **self-efficacy**. Both have to do with having positive perceptions about your own ability. People with positive self-perceptions are more self-motivated and feel they are capable of making behavior changes for health improvement. Other factors that help you feel you are able to do a healthy behavior include easy access and a safe environment. For example, people who have easy access to exercise equipment at home or the workplace or who have a place to exercise within 10 minutes of home are more likely to be active than those who do not. Similarly, access to healthy food options is

critical for adopting a healthy diet. A supportive physical and social environment can also make it easier to adopt healthy habits.

“Is it worth it?” People who say yes to this question are willing to make an effort to change their behaviors. Predisposing factors that make it worth it to change behaviors include enjoying the activity, balancing positive and negative attitudes, believing in the benefits of a behavior, and having knowledge of the health benefits of a behavior (see Figure 2). If you enjoy something and feel good about it (have positive attitudes and beliefs), you will be self-motivated to do it. It will be

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VIDEO 1

**Personal Factors** Factors, such as age or gender, related to healthy lifestyle adherence but not typically under personal control.

**Predisposing Factors** Factors that make you more likely to adopt a healthy lifestyle, such as participation in regular physical activity, as part of your normal routine.

**Enabling Factors** Factors that help you carry out your healthy lifestyle plan.

**Reinforcing Factors** Factors that provide encouragement to maintain healthy lifestyles, such as physical activity, for a lifetime.

**Self-Confidence** The belief that you can be successful at something (for example, the belief that you can be successful in sports and physical activities and can improve your physical fitness).

**Self-Efficacy** Confidence that you can perform a specific task (a type of specific self-confidence).

**Table 1 ▶ Self-Management Skills for Changing Predisposing Factors**

Self-Management Skill	How Is It Useful?
<p><b>Overcoming Barriers</b></p> <p>Develop skills that make it possible to overcome problems or challenges in adopting or maintaining healthy behaviors. By conquering challenges, you learn skills that help you overcome other barriers to healthy lifestyles.</p>	<p><b>Lifestyle Example</b></p> <p>A person is tempted by snack foods and candy provided by co-workers. Learning to resist these foods takes discipline, but overcoming barriers builds confidence that helps the person stay focused on long-term goals.</p>
<p><b>Building Self-Confidence and Motivation</b></p> <p>Take small steps that allow success. With each small step, confidence and motivation increase and you develop the feeling “I can do that.”</p>	<p><b>Lifestyle Example</b></p> <p>A person says, “I would like to be more active, but I have never been good at physical activities.” Starting with a 10-minute walk, the person sees that “I can do it.” Over time, the person becomes confident and motivated to do more physical activity.</p>
<p><b>Balancing Attitudes</b></p> <p>Learn to balance positive and negative attitudes. Developing positive attitudes and reducing negative attitudes helps you adhere to a healthy lifestyle.</p>	<p><b>Lifestyle Example</b></p> <p>A person does not do activity because he or she lacks support from friends, has no equipment, and does not like to get sweaty. These are negatives. Shifting the balance to positive things, such as fun, good health, and good appearance, can help promote activity.</p>
<p><b>Building Knowledge and Changing Beliefs</b></p> <p>Build your beliefs on sound information. Knowledge does not always change beliefs, but awareness of the facts can play a role in achieving good health.</p>	<p><b>Lifestyle Example</b></p> <p>A person says, “I don’t think what I eat has much to do with my health and wellness.” Acquiring knowledge is fundamental to being an educated person. Studying the facts about nutrition can provide the basis for changes in beliefs and lifestyles.</p>

worth it. The lifestyle examples provided in Table 1 will help you understand how to apply these predisposing factors to your own lifestyle.

**Enabling factors move you from the beginning stages of change to action and maintenance.**

A variety of skills help you follow through with decisions to make changes in behaviors. Figure 2 lists eight self-management skills that contribute to behavior change. The labs in each concept provide opportunities to learn and apply these self-management skills to your lifestyle. Table 2 explains the importance of each skill and how each one can contribute to behavior change.



**Reinforcing factors help you adhere to lifestyle changes.**

Once you have reached the action or maintenance stage, it is important to stay at this high level. Reinforcing factors help you stick with a behavior change (see Figure 2).

One of the most important reinforcing factors is success. If you change a behavior and experience success, this makes you want to keep doing the behavior. If attempts to change a behavior result in failure, you may conclude that the behavior does not work and give up on it. Planning for success is essential for adhering to healthy lifestyle changes. Using the self-management

skills described in this concept and throughout this book can help you plan effectively and achieve success.

Social support from family, peers, and health professionals can also be reinforcing. There are, however, different kinds of support and some are more helpful than others. Support for well-informed personal choices is referred to as support of autonomy. One example is

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

Friends may have a bigger impact on us than we realize. A recent study followed people over 32 years to examine the impact of social connections on health and health outcomes. According to the study, people are more likely to become obese if a friend becomes obese. Similar relationships were found for adult siblings and spouses, though the connection between friends appears stronger. This relationship was not found for neighbors. The authors suggested that there is a clustering of health behaviors in social groups that explain the shared outcomes.

*Do your friends hurt or help you maintain a healthy lifestyle?*



**Table 2 ▶ Self-Management Skills for Changing Enabling Factors**

Self-Management Skill	How Is It Useful?
<b>Goal-Setting Skills</b>	<b>Lifestyle Example</b>
Establish what you want to achieve in the future. Goals should be realistic and achievable. Learning to set goals for behavior change is especially important for beginners.	A person wants to lose body fat. Setting a goal of losing 50 pounds makes success unlikely. Setting a process goal of restricting 200 calories a day or expending 200 more a day for several weeks makes success more likely.
<b>Self-Assessment Skills</b>	<b>Lifestyle Example</b>
Assess your own fitness, health, and wellness and learn to interpret your own self-assessment results. It takes practice to become good at doing self-assessments.	A person wants to know his or her health strengths and weaknesses. The best procedure is to select good tests and self-administer them. Practicing the assessments in this book will help you become good at self-assessment.
<b>Self-Monitoring Skills</b>	<b>Lifestyle Example</b>
Monitor your behavior by keeping records. Many people think they adhere to healthy lifestyles, but they do not. They have a distorted view of what they actually do. Self-monitoring gives you a true picture of your own behavior and progress.	In spite of restricting calories, a person can't understand why he or she is not losing weight. Keeping records may show that the person is not counting all the calories. Learning to keep records of progress contributes to adherence.
<b>Self-Planning Skills</b>	<b>Lifestyle Example</b>
Plan for yourself rather than having others do all the planning for you.	A person wants to be more active, to eat better, and to manage stress. Self-planning skills will help him or her plan a personal activity, nutrition, or stress-management program.
<b>Performance Skills</b>	<b>Lifestyle Example</b>
Learn the skills necessary for performing specific tasks, such as sports or relaxation. These skills can help you feel confident and enjoy activities.	A person avoids physical activity because he or she does not have the physical skills equal to those of peers. Learning sports or other motor skills allows this person to choose to be active.
<b>Coping Skills</b>	<b>Lifestyle Example</b>
Develop a new way of thinking about things. Using this skill, you can see situations in more than one way and learn to think more positively.	A person is stressed and frequently anxious. Learning stress-management skills, such as relaxation, can help a person cope. Like all skills, stress-management skills must be practiced to be effective.
<b>Consumer Skills</b>	<b>Lifestyle Example</b>
Gain knowledge about products and services. You may also need to rethink untrue beliefs that lead to poor consumer decisions.	A person avoids seeking medical help when sick. Instead, the person takes an unproven remedy. Learning consumer skills provides knowledge for making sound medical decisions.
<b>Time-Management Skills</b>	<b>Lifestyle Example</b>
Keep records similar to self-monitoring, focusing on total time use rather than specific behaviors. Skillful monitoring of time can help you plan and adhere to healthy lifestyles.	A person wants more quality time with family and friends. Monitoring time can help him or her reallocate time to spend it in ways that are more consistent with personal priorities.

encouragement from family, friends, or a doctor for starting and sticking to a nutritious diet. The supporting person might ask, “How can I help you meet your goals?” One goal of this book is to help you take control of your own behaviors concerning your personal health, fitness, and wellness.

Not all feedback is perceived as reinforcing and supportive. Although the people providing the feedback may feel they are being helpful and supportive, some feedback

may be perceived as applying pressure or as an attempt to control behavior. Scolding a person for not sticking to a diet, for example, or offering the suggestion that “you are not going to get anywhere if you don’t stick to your diet,” will often be perceived as applying pressure. If you want to help friends and family make behavior changes, avoid applying pressure and attempt to provide positive forms of support. Research also suggests it is desirable to promote autonomy and freedom of choice so that change is

**Table 3 ▶ Self-Management Skills for Changing Reinforcing Factors**

Self-Management Skill	How Is It Useful?
<b>Social Support</b> Obtain the support of others for healthy lifestyles. You learn how to get support from family and friends for your autonomous decisions. Support of a doctor can help.	<b>Lifestyle Example</b> A person has gradually developed a plan to be active. Friends and loved ones encourage activity and help the person develop a schedule that will allow and encourage regular activity.
<b>Relapse Prevention</b> Stick with a healthy behavior once you have adopted it. It can be easy to relapse to an unhealthy lifestyle. Skills such as avoiding high-risk situations and learning how to say no help you avoid relapse.	<b>Lifestyle Example</b> A person stops smoking. To stay at maintenance, the person can learn to avoid situations where there is pressure to smoke. He or she can learn methods of saying no to those who offer tobacco.

self-directed. Table 3 provides lifestyle examples of the key reinforcing factors of social support and relapse prevention.

connect  
VIDEO 3

## Self-Management Skills

**Learning self-management skills can help you alter factors that lead to healthy lifestyle change.**

Personal, predisposing, enabling, and reinforcing factors influence the way you live. These factors are of little practical significance, however, unless they can be altered to promote healthy lifestyles. Learning self-management skills (sometimes called self-regulation skills) can help you change the predisposing, enabling, and reinforcing factors described in Tables 1 (page 26), 2 (page 27), and 3. In fact, some of the enabling factors are self-management skills. Learning these skills takes practice, but with effort anyone can learn them. This book offers many opportunities to learn and practice self-management skills.

**It takes time to change unhealthy lifestyles.** People in Western cultures are used to seeing things happen quickly. We flip a switch, and the lights come on. We want food quickly, and thousands of fast-food restaurants provide it. The expectation that we should have what we want when we want it has led us to expect instantaneous changes in health, wellness, and fitness. Unfortunately, there is no quick way to health. There is no pill that can reverse the effects of a lifetime of sedentary living, poor eating, or tobacco use. Changing your lifestyle is the key. But lifestyles that have been practiced for years are not easy to change. As you progress through this book, you will have the opportunity to learn how to implement self-management skills. Learning these skills is the surest way to make permanent lifestyle changes.

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VIDEO 4



*Adopting healthy lifestyle habits requires extra discipline and effort.*

## Self-Planning for Healthy Lifestyles

**Self-planning is a particularly important self-management skill.** In the final concept in this book, after you have studied a variety of concepts and self-management skills, you will have the opportunity

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VIDEO 5

to develop a personal plan for several healthy lifestyles. Several self-management skills, including self-assessment, self-monitoring, and goal-setting, are used in the six-step self-planning process (see Table 4).

**Step 1: Clarifying Reasons**

**Clarifying your reasons for behavior change is the first step in program planning.** People at precontemplation stage are not considering a change in behavior; they see no need. It’s when they reach the contemplation stage that they consider changes in behavior. One of the most common and most powerful reasons for contemplating a change in a lifestyle is the recommendation of a doctor, often after a visit associated with an illness. Other common reasons are to improve personal appearance, lose weight, increase energy levels, improve the ability to perform daily tasks, and improve quality of life (wellness). Identifying your reasons for wanting to change helps you determine which behaviors to change first and

helps you establish specific goals. Reflect on your reasons for wanting to make lifestyle changes before moving on to step 2.

**Step 2: Identifying Needs**

**Self-assessments are useful in establishing personal needs, planning your program, and evaluating your progress.** You have already done some self-assessments of wellness, current activity levels, and current lifestyles. In the labs for this concept and others that follow, you will make additional assessments. The results of these assessments help you build personal profiles for a variety of health behaviors that can be used as the basis for program planning. With practice, self-assessments become more accurate. For this reason, it is important to repeat self-assessments and to pay careful attention to the procedures for performing them. If questions arise, get a professional opinion rather than making an error.

**Table 4 ► Self-Planning Skills**

Self-Planning	Description	Self-Management Skill
1. Clarifying reasons	Knowing the general reasons for changing a behavior helps you determine the type of behavior change that is most important for you at a specific point in time. If losing weight is the reason for wanting to change behavior, altering eating and activity patterns will be emphasized.	Results of the Self-Management Skills Questionnaire (Lab 2B) will help you determine which self-management skills you use regularly and the ones you might need to develop.
2. Identifying needs	If you know your strengths and weaknesses, you can plan to build on your strengths and overcome weaknesses.	Self-assessment: In the concepts that follow, you will learn how to assess different health, wellness, and fitness characteristics. Learning these self-assessments will help you identify needs.
3. Setting personal goals	Goals are more specific than reasons (see step 1). Establishing specific things that you want to accomplish can provide a basis for feedback that your program is working.	Goal setting: Guidelines in this concept will help you set goals. In subsequent concepts, you will establish goals for different lifestyles.
4. Selecting program components	A personal plan should include the specific program components that will meet your needs and goals based on steps 1–3. Examples include meal plans for nutrition and specific activities for your physical activity plan.	Many self-management skills, including time management, consumer, and performance skills, are useful in developing plans for a variety of healthy behaviors.
5. Writing your plan	Once program components, such as meal plans for nutrition and specific activities for physical activity, have been determined, you should put your plan in writing. This establishes your intentions and increases your chances of adherence.	Self-planning: This includes writing down the time of day, day of the week, and other details you will include in your plan.
6. Evaluating progress	Once you have used your plan, you will know what works and what does not. Periodic self-assessments can help you modify the plan to make it better.	Self-monitoring: This skill is used in keeping records (logs) and determining if goals are met. Self-assessment: This skill is used to help you determine if goals are met.

### Periodic self-assessments can help determine if you are meeting health, wellness, and fitness standards and making progress toward personal health goals.

When performed properly, self-assessments help you determine if you have met your goals and if you are meeting health standards (e.g., meeting health fitness standards, eating appropriate amounts of nutrients). Self-assessments also offer a measure of independence and can help you avoid unnecessary and expensive tests. They serve as a screening procedure to determine if you need professional assistance. However, because self-assessments may not be as accurate as tests by health and medical professionals, it is wise to have periodic tests by an expert to see if your self-assessments are accurate.

### Self-assessments also have the advantage of consistent error rather than variable error.

The best type of assessments are done by highly qualified experts using precise instruments. Following directions and practicing assessment techniques will reduce error significantly. Still, errors will occur. One advantage of a self-assessment is that the person doing the assessment is always the same—you. Even if you make an error in a self-assessment, it is likely to be consistent over time, especially if you use the same equipment each time you make the assessment. For example, scales have limitations for monitoring changes in weight (and fat). But if you measure your own weight using a home scale and your measurement always shows your weight to be 2 pounds higher than it really is, you have made a consistent error. You can determine if you are improving because you know the error exists. Variable errors are likely when different instruments are used, when different people make the assessments, and when procedures vary from test to test. Differences in scores are harder to explain with variable forms of error because they are not consistent.

## Step 3: Setting Personal Goals

**There are differences between short-term and long-term goals.** **Short-term goals** are goals that you can accomplish in days or weeks. **Long-term goals** take longer to accomplish—sometimes months or even years.

**There are differences between general goals and SMART goals.** **General goals** are broad statements of your reasons for wanting to accomplish something. Examples include changing a behavior such as eating better or being more active, or changing a physical characteristic such as losing weight or getting fit. **SMART goals** are less general and have several important characteristics. SMART goals are specific (*S*). A specific goal provides details, such as limiting calories to a specific number each day. SMART goals are measurable (*M*).

They allow you to perform assessments before you establish your goals and again later to see if you have met your goals. SMART goals are attainable (*A*). They are neither too hard, nor too easy. If the goal is too hard, failure is likely, which is discouraging. If the goal is too easy, it is not challenging. SMART goals are also relevant (*R*). They are your personal goals and should have meaning to you personally. Personally relevant goals provide motivation. Finally, SMART goals are timely (*T*). Timely goals are especially meaningful when you begin a program for making personal changes. Choosing goals that are timely helps you focus on the most salient changes that you want to make.

### There are differences between behavioral and outcome goals.

A **behavioral goal** is associated with something you do. An example of a specific short-term behavioral goal is *to perform 30 minutes of brisk walking 6 days a week for the next 2 weeks*. It is a behavioral goal because it refers to a behavior (something you do). An **outcome goal** is associated with a physical characteristic (e.g., lowering your body weight, lowering your blood pressure, building strength). Typically, it takes weeks or months to reach outcome goals. This is because outcome goals depend on many things other than your behavior. For example, your heredity affects your body fat and muscle development.

### Different factors influence your success in meeting goals.

Consider these factors when setting your goals:

- *Outcome goals are not recommended as short-term goals because they take time to achieve.* Typically, it takes weeks or months to reach outcome goals so they make better long-term goals than short-term goals.
- *Outcome goals depend on many things other than your lifestyle behavior.* For example, your heredity affects your ability to achieve an outcome goal such as achieving a certain body weight and or achieving a fitness standard. The same lifestyle change program may produce different results for different people. For this reason, goals must vary from person to person, especially outcome goals. For example, two people may establish an outcome goal of losing 5 pounds over a 6-week period. Because we inherit predispositions to body composition, one person may meet the goal, while another may not, even if both strictly adhere to the same diet. A similar example can be used for fitness and physical activity. People not only inherit a predisposition to fitness but also inherit a predisposition to benefit from training. In other words, if 10 people do the same physical activities, there will be 10 different results. One person may improve performance by 60 percent, while another might improve only 10 percent. This



A goal to consume more fruits and vegetables is an example of a behavioral goal.



Reducing blood pressure is an example of an outcome goal.

makes it hard for beginners to set realistic outcome goals. Too often, people set a goal based on a comparative standard rather than on a standard that is possible for the individual to achieve in a short time.

**Guidelines for beginners differ from guidelines for people who are more experienced when setting goals.** Beginners should consider these guidelines:

- *Start with general long-term goals in mind.* It is good to have your goals in mind when you begin a program. But beginners may want to use general rather than specific long-term goals. You may choose either behavioral or outcome goals, but keep them general. For example, choose a goal of losing weight or getting fit. Getting too specific can be discouraging for reasons discussed above.
- *Focus on SMART short-term behavioral objectives.* As noted previously, an example of a specific short-term behavioral goal is *to perform 30 minutes of brisk walking 6 days a week for the next 2 weeks.* It is a behavioral goal because it refers to a behavior (something you do). It is a SMART goal because it is specific, measurable, attainable, realistic, and timely. When using behavioral goals the principal factor associated with success

is your willingness to give effort. No matter who you are, you can accomplish a behavioral goal if you give regular effort. This type of goal will help you keep your motivation level high and prevent you from being discouraged.

- *Avoid frequent outcome self-assessments, focus on self-monitoring of behavior.* A self-assessment before setting goals helps you to set SMART goals. Self-assessments can also help you see if you have met your goals. For beginners, however, frequent self-assessment—especially of

Make your personal goals **SMART**.

- S** = Specific
- M** = Measurable
- A** = Attainable
- R** = Relevant
- T** = Timely

**Short-Term Goals** Statements of intent to change a behavior or achieve an outcome in a period of days or weeks.

**Long-Term Goals** Statements of intent to change behavior or achieve a specific outcome in a period of months or years.

**General Goals** Broad statements of your reasons for wanting to accomplish something. Examples include changing a behavior such as eating better or being more active, or changing a physical characteristic such as losing weight or getting fit.

**SMART Goals** Goals that are Specific (*S*), Measurable (*M*), Attainable (*A*), Relevant (*R*) and Timely (*T*).

**Behavioral Goal** A statement of intent to perform a specific behavior (changing a lifestyle) for a specific period of time. An example is “I will walk for 15 minutes each morning before work.”

**Outcome Goal** A statement of intent to achieve a specific test score (attainment of a specific standard) associated with good health, wellness, or fitness. An example is “I will lower my body fat by 3 percent.”

STORY CARDS



outcomes—is discouraged. For example, if the long-term goal is to lose weight, weighing frequently can be discouraging and even deceiving. Self-monitoring of behavior is encouraged however. For the walking goal discussed above, keeping an activity log of your daily participation will help you comply.

- *Use a series of short-term goals to make progress toward long-term goals.* Once short-term behavioral goals are reached, establish new ones. After meeting a series of short-term goals, consider goal-setting guidelines for more experienced people.

Experienced people should consider these guidelines:

- *Start with SMART long-term goals.* Experience helps people realize that it takes time to meet long-term goals, especially outcome goals. Both SMART behavioral and outcome goals can be considered.
- *Use a series of short-term SMART goals (both behavioral and outcome) as a means of accomplishing long-term goals.* Even experienced people are more likely to achieve success if they realize that setting and meeting a series of SMART short-term goals is important. For example, a person who has high blood pressure (160 systolic) may set a long-term outcome goal of lowering systolic blood pressure to 120 over a period of 6 months. Several behavioral goals can be established for the 6-month period, including taking blood pressure medication (daily), performing 30 minutes of moderate physical activity each day, and limiting salt in the diet to less than 100 percent of the recommended dietary allowance. If the long-term outcome goal is realistic, adhering to SMART short-term behavioral goals will result in achieving the outcome goal.
- *Use self-assessments and self-monitoring to determine if you are making progress.* Self-assessments can be more frequent for the experienced. Still, avoid expecting too much, especially for outcome goals. Self-monitoring of behavioral goals is good, even for the experienced. If you commit to the behavior and stick to your plan, the outcomes will follow.

**Maintenance goals are also appropriate once goals have been achieved or when improvements aren't necessary.** For example, the person who lowers systolic blood pressure from 160 to 120 need not continue to lower the new healthy blood pressure. Once a healthy outcome goal has been achieved, a new outcome goal of maintaining a systolic blood pressure of 120 is appropriate. Behavioral goals will also have to be modified. For the person who has reduced blood pressure to a healthy level, medication levels might be reduced for maintenance.

Maintenance goals are appropriate in other areas as well. For example, dietary restriction and extra exercise for weight maintenance will likely be different from those for losing weight. When a person reaches a healthy level of fitness, maintenance may be the goal rather than continued improvement. You cannot improve forever; at some point, attempting to do so may be counterproductive to health.

The self-management skills of social support and relapse prevention described in Table 3 are useful in maintenance. Several applications (apps) are now available to help you get social support and prevent relapse (see *Technology Update*).

**Making improvement can motivate you to reach long-term goals.** As noted earlier, setting short-term goals that are both attainable and realistic will help you reach your long-term goals. Meeting short-term goals encourages and motivates you to continue with your healthy lifestyle plan. Don't expect to set perfect goals all the time. No matter how much self-assessing and self-monitoring you do, you may sometimes set goals too low or too high. If the goal is set too low, it is easily achieved, and a new, higher goal can be established. If the goal is set too high, you may fail to reach it, even though you have made considerable progress toward the goal.

Rather than becoming discouraged when a goal is not met, consider the improvement you have made. Improvement, no matter how small, means that you are moving toward your goal. Also, you can measure your improvement and use it to help set future goals. Of course, periodic self-assessments and good record keeping (self-monitoring) are necessary to keep track of improvements accurately.

**Putting your goals in writing helps formalize them.** If you don't write them down, your goals will be easy to forget. Writing them helps establish a commitment to yourself and clearly establishes your goals. You can revise them if necessary. Written goals are not cast in concrete.

## Step 4: Selecting Program Components

**You can choose from many different program components to meet your goals.** Concept 1 described 10 types of lifestyle change, ranging from priority lifestyles (physical activity, nutrition, and stress management) to avoiding destructive habits and adopting positive safety and personal health habits. The components depend on the goals of your program. For example, if the goal is to become more fit and physically

## TECHNOLOGY UPDATE

### Health Apps for Smartphones

Rapid changes in cell phone technology have created a huge market for customized applications (apps) that are designed to run on these platforms. There are apps for almost everything, including hundreds of apps designed to help people manage and organize their lifestyles and provide supportive prompts and reminders. Others help people track health data or diet and activity behaviors.

*How useful are these types of health-related apps for promoting and maintaining healthy lifestyles? Are they simply fun technology or do they support health behavior change?*

connect  
ACTIVITY

active, the program components will be the activities you choose. You will want to identify activities that match your abilities and that you enjoy. You will want to select activities that build the type of fitness you want to improve.

Other examples of program components are preparing menus for healthy eating, participating in stress-management activities, planning to attend meetings to help avoid destructive habits, and attending a series of classes to learn CPR and first aid. Preparing a list of program components that will help you meet your specific goals will prepare you for step 5, writing your plan.

### Step 5: Writing Your Plan

**Preparing a written plan can improve your adherence to the plan.** A written plan is a pledge, or a promise, to be active. Research shows that intentions to be active are more likely to be acted on when put in writing. In the concepts that follow, you will be given the opportunity to prepare written plans for all of the activities in the physical activity pyramid, as well as for other healthy lifestyles. A good written plan includes daily plans with scheduled times and other program details. For example, the daily written plan for stress management could include the time of day when specific program activities are conducted (e.g., 15-minute quiet time at noon, yoga class from 5:30 to 6:30). An activity plan would include a schedule of the activities for each day of the week, including starting and finishing time and specific details concerning the activities to be performed. A dietary plan would include specific menus for each meal and between-meal snacks.



*Self-planning can help you implement a variety of changes to enhance health, wellness, and fitness.*

In the labs that accompany the final concept of this book, you will write plans for several different lifestyles. By then you will have learned a variety of self-management skills that will assist you.

connect  
VIDEO 6

### Step 6: Evaluating Progress

**Self-assessment and self-monitoring can help you evaluate progress.** Once you have written a plan, you will want to determine your effectiveness in sticking with your plan. Keeping written records is one type of self-monitoring.

Self-monitoring is a good way to assess success in meeting behavioral goals. Keeping a dietary log or using a pedometer to keep track of steps are examples of self-monitoring. Self-assessments are a good way to see if you have met outcome goals.

Throughout this book, you will learn to self-assess a variety of outcomes (e.g., fitness, body fatness) and self-monitor behaviors (e.g., diet, physical activities, stress-management activities). In step 2 in program planning, you used self-assessments to determine your needs and to help you plan your goals (step 3). Once you have tried your program, you can use the same self-assessments and self-monitoring strategies to evaluate the effectiveness of your program. You can see if you have met the goals you established for yourself.



## Strategies for Action

**To be effective, self-management and self-planning skills require a commitment to make changes in lifestyle.** As indicated in Figure 1 on page 22, change occurs stage by stage, and an individual is likely to be at different stages for different health behaviors. For example, a person may be at the maintenance stage for physical activity but at the contemplation stage for adopting sound nutrition practices. In this book, many self-management skills are described for use in progressing from one stage to another. Different skills are important, depending on your current stage and the lifestyle behavior you are attempting to change.

**The lab worksheets that accompany each concept will help you learn the self-assessment, self-management, and self-planning skills necessary for behavior change.** Self-assessments of current health, wellness, and fitness status, as well as self-monitoring of your current lifestyle, can help you determine your reasons for making change and help you establish SMART goals for change. Like all skills, practice is necessary to improve self-management skills. Table 5 refers you to labs in the text designed to enhance specific self-management skills.

**Assessing self-management skills that influence healthy lifestyles provides a basis for changing your health, wellness, or fitness.** Self-assessments of your current health, wellness, and fitness status, as well as self-monitoring of your current lifestyles, can help you determine your reasons and establish reasonable goals for healthy lifestyle change. The Healthy Lifestyle Questionnaire and the Wellness Self-Perceptions Questionnaire you took in Concept 1 got you started. In this concept you can use the Stage of Change Questionnaire (Lab 2A) to help you decide which lifestyles you might need to modify. You can use the Self-Management Skills Questionnaire (Lab 2B) to determine which self-management skills you may need to improve to help you make effective changes in your lifestyles. In later concepts, you will have the opportunity to make self-assessments for a variety of lifestyles.

**Table 5 ▶ Opportunities for Learning Self-Management Skills**

Self-Management Skill	Lab Number
Overcoming barriers	6B, 15A, 17A, 24B
Building self-confidence and motivation	2A, 2B
Balancing attitudes	1A, 2A, 2B, 3C, 8A, 19B
Building knowledge and beliefs	1A, 4A, 7A, 12B, 14A, 15A, 15B, 18A, 18B, 19A, 19B, 20A, 21A, 22A, 22B, 23A, 23B
Goal setting	6A, 8B, 9B, 10C, 10D, 11C, 14B, 24B, 24C
Self-assessment	1A, 2A, 3A, 3C, 4A, 5A, 5B, 6B, 7B, 8A, 9A, 10A, 10B, 10D, 11A, 11B, 12A, 12B, 13A, 13B, 13C, 14A, 15B, 16A, 16B, 22A, 22B, 23B, 24A, 24B, 24C
Self-monitoring	2A, 5A, 6A, 7A, 8A, 8B, 9B, 10C, 11C, 17A, 17D, 19A, 22B, 24B, 24C
Self-planning	6A, 8B, 9B, 10C, 10D, 11C, 14B, 24B, 24C
Performance skills	3B, 12A, 17C
Adopting coping skills	16A, 16B, 17A, 17B, 17C, 17D
Learning consumer skills	14B, 15A, 18A, 20A, 23A, 23B, 24B, 24C
Managing time	17A
Finding social support	17D
Preventing relapse	15A, 19B, 24B, 24C

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ACTIVITY

## Web Resources

ACSM's Fit Society Page [www.acsm.org/access-public-information/newsletters/fit-society-page](http://www.acsm.org/access-public-information/newsletters/fit-society-page)

ACSM's *Health and Fitness Journal* [www.acsm.org/access-public-information/acsm-journals/acsm's-health-fitness-journal](http://www.acsm.org/access-public-information/acsm-journals/acsm's-health-fitness-journal)

American Heart Association Health and Fitness Center [www.heart.org/HEARTORG/](http://www.heart.org/HEARTORG/)

American Red Cross [www.redcross.org](http://www.redcross.org)

Centers for Disease Control and Prevention (overcoming barriers) [www.cdc.gov/physicalactivity/everyone/getactive/barriers.html](http://www.cdc.gov/physicalactivity/everyone/getactive/barriers.html)

*Healthy People 2020* [www.healthypeople.gov/HP2020](http://www.healthypeople.gov/HP2020)

National Heart Lung and Blood Institute—Health Behavior Change [www.nhlbi.nih.gov/health/public/heart/obesity/lose\\_wt/index.htm](http://www.nhlbi.nih.gov/health/public/heart/obesity/lose_wt/index.htm)

Robert Wood Johnson Foundation [www.rwjf.org](http://www.rwjf.org)

SMART goals [www.projectsart.co.uk/smart-goals.html](http://www.projectsart.co.uk/smart-goals.html)

Trust for America's Health—BluePrint for Healthier

America <http://healthyamericans.org/report/55/blueprint-for-healthier-america>

Well-Being Index—Gallup Poll [www.gallup.com/poll/wellbeing.aspx](http://www.gallup.com/poll/wellbeing.aspx)

## Suggested Readings

Benson, G. A., et al. 2011. Telephone-based support for weight loss surgery. *ACSM's Health and Fitness Journal* 15(1):13–19.

Buettner, D. 2008. *The Blue Zones: Lessons for Living Longer from People Who've Lived the Longest*. Washington: DC: The National Geographic Society.

Glantz, K., B. K. Rimer, and K. Viswanath (Eds.). 2008. *Health Behavior and Health Education*. 4th ed. San Francisco: John Wiley and Sons.

Manson, P., and C. C. Butler. 2010. *Health Behavior Change: A Guide for Practitioners*. New York: Churchill Livingstone/Elsevier.

Marcus, B. E., and L. Forsyth. 2009. *Motivating People to Be Physically Active*. 2nd ed. Champaign, IL: Human Kinetics.

Martin, L. R., et al. 2010. *Health Behavior Change and Treatment Adherence: Evidence-Based Guidelines for Improving Health Care*. New York: Oxford University Press.

Pate, R. R., et al. 2011. Overcoming barriers to physical activity. *ACSM's Health and Fitness Journal* 15(1):7–12.

Pekmezi, D., et al. 2010. Using the transtheoretical model to promote physical activity. *ACSM's Health and Fitness Journal* 14(4):8–13.

Simons-Morton, B., McLeroy, K. R., and M. L. Wendel. 2012. *Behavior Theory in Health Promotion Practice and Research*. Burlington, MA: Jones and Bartlett Learning.

Sullivan, G. S., and J. P. Strode. 2010. Motivation through goal setting: A self-determined perspective. *Strategies* 23(6):19–23.

Taylor, S. E. 2008. *Health Psychology*. 7th ed. New York: McGraw-Hill Higher Education.

White, S. M., E. L. Mailey, and E. McAuley. 2010. Leading a physically active lifestyle: Effective individual behavior change strategy. *ACSM's Health and Fitness Journal* 14(1):8–15.

Whiteley, J. A., and L. A. Milliken. 2011. Making weight loss a family affair. *ACSM's Health and Fitness Journal* 15(2):8–12.

## 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 (including being active, eating well, and avoiding destructive habits) across all stages of life.
- Create a society in which all people live long, healthy lives.

- Attain high-quality, longer lives free of preventable disease, injury, and premature death.
- Increase public awareness and understanding of the determinants of health, disease, and disability.
- Increase health literacy of the population.

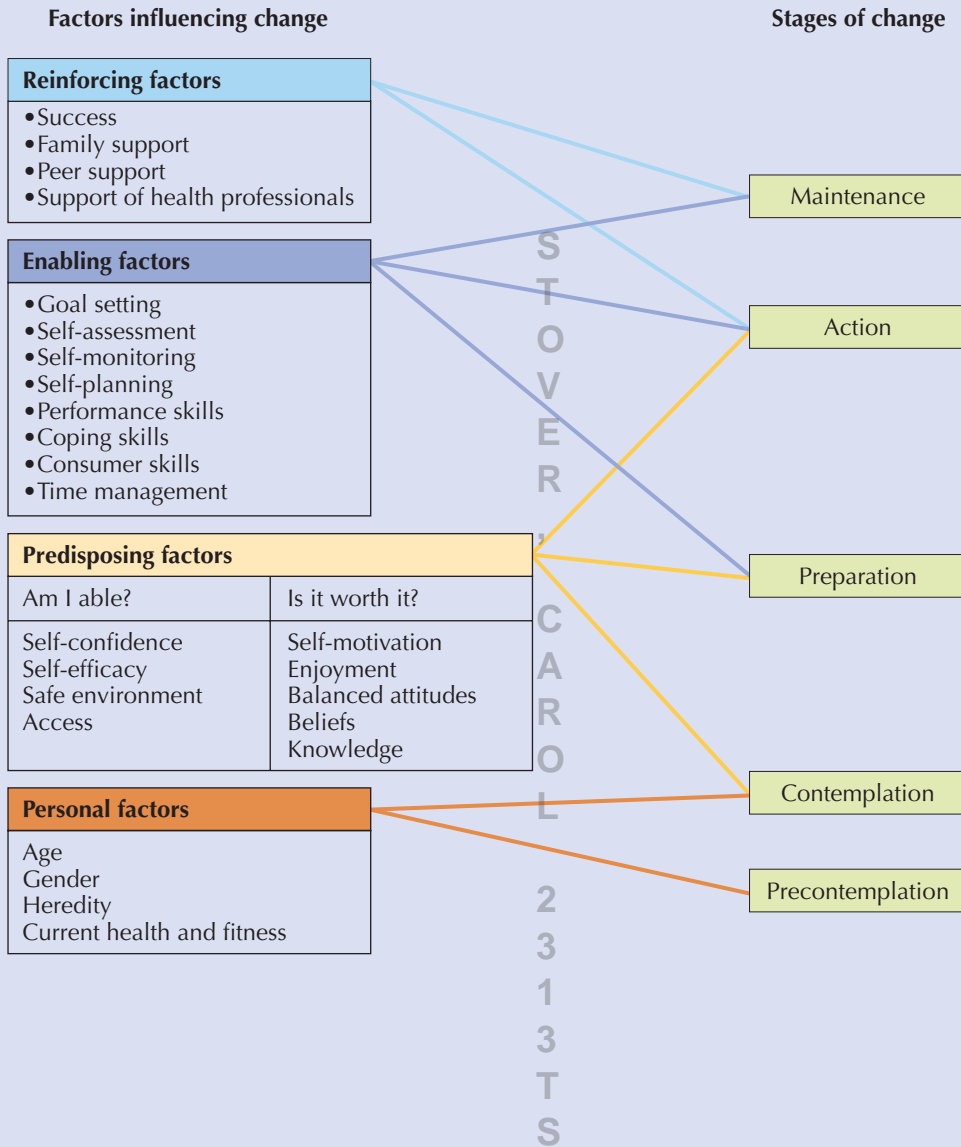
**A national goal is to promote health behaviors across all stages of life. Explain how using self-management skills can help individuals change health behaviors and how individual change can contribute to achieving national goals.**



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# Lab Resource Materials

Use the diagram below in answering the questions in Lab 2A. It is a reproduction of Figure 2 and includes factors that influence change in healthy behaviors.



# Lab 2A The Stage of Change Questionnaire

Name

Section

Date

**Purpose:** To help assess your current level in the stage of change hierarchy for a variety of health behaviors

### Procedures

1. Determine your "readiness for change" different health behaviors using the Stage of Change Questionnaire.
2. Evaluate predisposing, enabling, and reinforcing factors for several selected behaviors.
3. Answer the questions in the Conclusions and Implications section.

**Results:** Complete the Stage of Change Questionnaire on the next page. List two behaviors (below) that you are interested in improving. Beside the behaviors, write your current stage for that behavior.

**Behavior 1:** \_\_\_\_\_

**Current Stage?** \_\_\_\_\_

**Behavior 2:** \_\_\_\_\_

**Current Stage?** \_\_\_\_\_

**Conclusions and Implications:** For each behavior, discuss the enabling, predisposing, and reinforcing factors that you think are particularly important for you as you work to change this behavior (refer to the stages of change model and Tables 1, 2, and 3 in the text).

Behavior 1:

Behavior 2:

STAGES OF CHANGE

**Stage of Change Questionnaire (make one choice for each question)****1. Physical Activity**

- Precontemplation—I am not active, and I do not plan to start.
- Contemplation—I am not active, but I am thinking about starting.
- Preparation—I am getting ready to become active.
- Action—I do some activity but need to do more.
- Maintenance—I have been active regularly for several months.

**2. Eating Well (Nutrition)**

- Precontemplation—I do not eat well and don't plan to change.
- Contemplation—I do not eat well but am thinking about change.
- Preparation—I am planning to change my diet.
- Action—I sometimes eat well but need to do more.
- Maintenance—I have eaten well regularly for several months.

**3. Managing Stress**

- Precontemplation—I do not manage stress well and plan no changes.
- Contemplation—I am thinking about making changes to manage stress.
- Preparation—I am planning to change to manage stress better.
- Action—I sometimes take steps to manage stress better but need to do more.
- Maintenance—I have used good stress-management techniques for several months.

**4. Adopting Good Safety Habits (e.g., seat belt use, safe storage of medicine)**

- Precontemplation—I have at least one unsafe habit but plan no changes.
- Contemplation—I am thinking about making changes regarding a safety habit.
- Preparation—I am planning to make a change regarding a safety habit.
- Action—I have taken action concerning a habit but need to do more.
- Maintenance—I have no safety habits that need to change (I practice good safety).

**5. Adopting Good Personal Health Habits (e.g., brushing and flossing, adequate sleep)**

- Precontemplation—I have at least one health habit that needs change but plan no changes.
- Contemplation—I am thinking about making changes related to a health habit.
- Preparation—I am planning to make a change regarding a health habit.
- Action—I have taken action concerning a habit but need to do more.
- Maintenance—I have no health habits that need to change.

**6. Learning First Aid (e.g., CPR/First Aid)**

- Precontemplation—I do not know CPR/first aid and do not plan to learn.
- Contemplation—I am thinking about learning CPR/first aid.
- Preparation—I have made plans to learn CPR/first aid.
- Action—I once knew CPR/first aid but need an update.
- Maintenance—I am up-to-date on my CPR/first aid and will keep updated.

Questions 7 and 8 are highly personal. Answer for your own use, but do not record answers on this sheet.

**7. Avoiding Destructive Habits (e.g., tobacco, drugs, alcohol)**

- Precontemplation—I have at least one destructive habit but plan no change.
- Contemplation—I am thinking about making changes related to a destructive habit.
- Preparation—I am planning to make a change regarding a destructive habit.
- Action—I have taken action concerning a habit but need to do more.
- Maintenance—I have no destructive habits or have stopped the habit for months.

**8. Practicing Safe Sex**

- Precontemplation—I have practiced unsafe sex and plan no change.
- Contemplation—I am thinking about making changes to an unsafe habit.
- Preparation—I am planning to make a change regarding an unsafe habit.
- Action—I have taken action concerning a habit but need to do more.
- Maintenance—I do not practice unsafe sex or have stopped the habit for months.

## Lab 2B The Self-Management Skills Questionnaire

Name

Section

Date

**Purpose:** To help you assess your self-management skills that are important for three priority lifestyles (physical activity, healthy nutrition, stress management)

### Procedures

1. Each question in the questionnaire on pages 41 and 42 reflects one of the self-management strategies described in this text. Each of the 12 questions requires an answer about three different healthy behaviors. Answer each question using a 3 for very true, 2 for somewhat true, or 1 for not true. Record the number of your answer in the appropriate box for each of the three healthy lifestyles.
2. After you have answered all 12 questions for each of the three lifestyles, total the three columns to get a total score for physical activity, nutrition, and stress management.
3. Determine your rating for each lifestyle using the Self-Management Skills Rating Chart. Record your rating in the Results section.
4. Answer the questions in the Conclusions and Implications section.

**Results:** Record your rating for each of three healthy lifestyles in the chart below.

Self-Management Skills Rating Chart	
Rating	Score
Good	30–36
Marginal	24–29
Needs improvement	<24

Self-Management Skills Results	
Self-Management Skills Results	Rating
Physical activity	
Nutrition	
Stress management	

**Conclusions and Implications:** In several sentences, discuss your ratings regarding self-management skills related to physical activity. You may have a good total score but still have several self-management skills on which you need improvement. Comment on your overall scores and those individual self-management skills on which you had scores of 1 (not true).



In several sentences, discuss your ratings regarding self-management skills related to nutrition. You may have a good total score but still have several self-management skills on which you need improvement. Comment on your overall scores and those individual self-management skills on which you had scores of 1 (not true).

STOVER,

In several sentences, discuss your ratings regarding self-management skills related to stress management. You may have a good total score but still have several self-management skills on which you need improvement. Comment on your overall scores and those individual self-management skills on which you had scores of 1 (not true).

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The Self-Management Skills Questionnaire	Very true	Somewhat true	Not true	Activity Score	Nutrition Score	Stress Score
1. I regularly self-assess: (self-assessment)						
personal physical fitness and physical activity levels	3	2	1	<input type="text"/>		
the contents of my diet	3	2	1		<input type="text"/>	
personal stress levels	3	2	1			<input type="text"/>
2. I self-monitor and keep records concerning: (self-monitoring)						
physical activity	3	2	1	<input type="text"/>		
diet	3	2	1		<input type="text"/>	
stress in my life	3	2	1			<input type="text"/>
3. I set realistic and attainable goals for: (goal setting)						
physical activity	3	2	1	<input type="text"/>		
eating behaviors	3	2	1		<input type="text"/>	
reducing stress in my life	3	2	1			<input type="text"/>
4. I have a personal written or formal plan for: (self-planning)						
regular physical activity	3	2	1	<input type="text"/>		
what I eat	3	2	1		<input type="text"/>	
managing stress in my life	3	2	1			<input type="text"/>
5. I possess the skills to: (performance skills)						
perform a variety of physical activities	3	2	1	<input type="text"/>		
analyze my diet	3	2	1		<input type="text"/>	
manage stress (e.g., progressive relaxation)	3	2	1			<input type="text"/>
6. I have positive attitudes about: (balancing attitudes)						
my ability to stick with an activity plan	3	2	1	<input type="text"/>		
my ability to stick to a nutrition plan	3	2	1		<input type="text"/>	
my ability to manage stress in my life	3	2	1			<input type="text"/>
7. I can overcome barriers that I encounter: (overcoming barriers)						
in my attempts to be physically active	3	2	1	<input type="text"/>		
in my attempts to stick to a nutrition plan	3	2	1		<input type="text"/>	
in my attempts to manage stress in my life	3	2	1			<input type="text"/>

The Self-Management Skills Questionnaire	Very true	Somewhat true	Not true	Activity Score	Nutrition Score	Stress Score
8. I know how to identify misinformation: (consumer skills)						
relating to fitness and physical activity	3	2	1	<input type="text"/>		
relating to nutrition	3	2	1		<input type="text"/>	
relating to stress management	3	2	1			<input type="text"/>
9. I am able to get social support for my efforts to: (social support)						
be active	3	2	1	<input type="text"/>		
stick to a healthy nutrition plan	3	2	1		<input type="text"/>	
manage stress in my life	3	2	1			<input type="text"/>
10. When I have problems, I can get back to: (relapse prevention)						
my regular physical activity	3	2	1	<input type="text"/>		
my nutrition plan	3	2	1		<input type="text"/>	
my plan for managing stress	3	2	1			<input type="text"/>
11. I am able to adapt my thinking to: (coping strategies)						
stick with my activity plan	3	2	1	<input type="text"/>		
stick with my nutrition plan	3	2	1		<input type="text"/>	
stick with my stress-management plan	3	2	1			<input type="text"/>
12. I am able to manage my time to: (time management)						
stick with my physical activity plan	3	2	1	<input type="text"/>		
shop for and prepare nutritious food	3	2	1		<input type="text"/>	
perform stress-management activities	3	2	1			<input type="text"/>
<b>Total Activity Score</b>				<input type="text"/>		
<b>Total Nutrition Score</b>					<input type="text"/>	
<b>Total Stress Score</b>						<input type="text"/>

# Preparing for Physical Activity

## LEARNING OBJECTIVES

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

- ▶ Identify and describe key factors for safely participating in a moderate to vigorous physical activity program.
- ▶ Describe the warm-up, the workout, and the cool-down and explain why each is important.
- ▶ Explain the potential risks associated with exposure to heat, cold, and altitude and describe precautions that can be taken to prevent problems.
- ▶ Identify the factors that contribute to soreness and injury from physical activity and describe steps that can be taken to recover from them.
- ▶ Identify and describe the common positive and negative attitudes about physical activity and explain how they relate to regular participation.
- ▶ Identify related national health goals and show how meeting personal goals can contribute to reaching national goals.
- ▶ Assess your readiness for physical activity and demonstrate appropriate warm-up activities.

*Proper preparation can help make physical activity enjoyable, effective, and safe.*



For people just beginning a physical activity program, adequate preparation may be the key to persistence. For those who have been regularly active for some time, sound preparation can help reduce risk of injury and make activity more enjoyable. For long-term maintenance, physical activity must be something that is a part of a person's normal lifestyle. Some factors that will help you prepare for and make physical activity a part of your normal routine are presented in this concept.

## Factors to Consider Prior to Physical Activity

**Screening before beginning regular physical activity is important to establish medical readiness.**

The most recent guidelines for exercise testing and prescription of the American College of Sports Medicine (ACSM) suggest that there are two types of pre-participation screening: self-guided screening and professionally guided screening. For self-guided screening, the ACSM endorses the basic recommendation of the *Surgeon General's Report on Physical Activity and Health*, that “previously inactive men over age of 40 and women over age 50, and people at high risk of cardiovascular disease (CVD) should first consult a physician before embarking on a program to which they are unaccustomed.”

An alternative method of self-screening involves the use of the Physical Activity Readiness Questionnaire (PAR-Q). This seven-item questionnaire was designed by the British Columbia (Canada) Ministry of Health to help people know when it is advisable to seek medical consultation prior to beginning or altering an exercise program. The goal is to prevent unnecessary medical examinations while helping people to be reasonably assured that regular moderate physical activity is appropriate. Other self-administered surveys recommended by the ACSM include those given at a physician's office or those administered by certified health and fitness professionals (e.g., AHA/ACSM Pre-participation Screening Questionnaire). If a pre-participation questionnaire indicates the need, medical clearance is recommended. A **clinical exercise test** may also be appropriate. Those who do not identify health concerns using a self-screening questionnaire (e.g., all “no” answers on the PAR-Q) typically are cleared for moderate self-planned activity programs. For more vigorous exercise and sports, additional screening may be appropriate.

ACSM has developed additional guidelines to standardize professionally guided screening (e.g., assessments conducted by a medical doctor or certified health/fitness professional). As noted in Table 1, the ACSM divides people into three general risk categories: low, moderate, and high risk. Some of the risk factors used



A clinical exercise test—an example of professionally guided screening—is recommended for some individuals to ensure they can exercise safely.

**Table 1 ► American College of Sports Medicine Risk Stratification Categories and Criteria**

Stratification Category	Criteria
Low risk	People who have no heart disease symptoms and have no more than one of the risk factors listed below
Moderate risk	People without heart disease symptoms who have two or more of the risk factors listed below
High risk	People with known pulmonary or metabolic disease, OR one or more signs or symptoms in the list below

### Risk Factors

Family history of heart disease; smoker; high blood pressure (hypertension); high cholesterol; abnormal blood glucose levels; obesity (high BMI, excess waist girth); sedentary lifestyle; low HDL cholesterol level; men age 45 or older; women age 55 or older

### Signs and Symptoms

Chest, neck, or jaw pain from lack of oxygen to the heart; shortness of breath at rest or in mild exercise; dizziness or fainting; difficult or labored breathing when lying, sitting, or standing; ankle swelling; fast heartbeat or heart palpitations; pain in the legs from poor circulation; heart murmur; unusual fatigue or shortness of breath with usual activities

Source: American College of Sports Medicine.

to identify risk categories are identifiable without professional consultation (e.g., age, family history, smoking, sedentary lifestyle), while others may require professional screening (e.g., blood cholesterol, blood glucose). Many health clubs now offer professional screening for these variables. Individuals found to be at risk are then referred to medical follow-up. Low-risk people who are apparently healthy are typically cleared for moderate and many forms of vigorous activity without a medical exam or an exercise test. Those with moderate risk can participate in low to moderate activity without a medical exam or exercise test; however, both are recommended before initiating vigorous programs. For those in the high-risk category, a comprehensive medical exam is necessary before starting either a moderate or high-intensity program and before taking an exercise test. For those just beginning a program or those resuming physical activity after an injury or illness, consultation with a physician is always wise, no matter what your age or medical condition.

Consideration should also be given to altering exercise patterns if you have an illness or a temporary sickness, such as a cold or the flu. The immune system and other body systems may be weaker at this time, and medicines (even over-the-counter ones) may alter responses to exercise. It is best to work back gradually to your normal routine after illness.

There is no way to be absolutely sure that you are medically sound to begin a physical activity program. Even a thorough exam by a physician cannot guarantee that a person does not have some limitations that may cause a problem during exercise. Use of the PAR-Q (see Lab 3A) and adherence to the ACSM guidelines are advised to help minimize the risk while preventing unnecessary medical cost. However, if you are unsure about your readiness for activity, a medical exam and a clinical exercise test are the surest ways to make certain that you are ready to participate.



**It is important to dress properly for physical activity.** Clothing should be appropriate for the type of activity being performed and the conditions in which you are participating. Comfort is a much more important consideration than looks. Table 2 provides guidelines for dressing for activity.

**Shoes are an important consideration for safe and effective exercise.** Decisions about shoes should be based on intended use (e.g., running, tennis), shoe and foot characteristics, and comfort. Shoes are designed for specific activities, and performance will typically be best if you select and use them for their intended purpose and fit, rather than how they look. Hybrid shoes, known

**Table 2 ▶ Selecting Appropriate Clothing for Activity**

**General Guidelines**

- Avoid clothing that is too tight or that restricts movement.
- Material in contact with skin should be porous.
- Clothing should protect against wind and rain but allow for heat loss and evaporation—e.g., Gortex, Coolmax.
- Wear layers so that a layer can be removed if not needed.
- Wear socks for most activities to prevent blisters, abrasions, odor, and excessive shoe wear.
- Socks should be absorbent and fit properly.
- Do not use nonporous clothing that traps sweat to lose weight; these garments prevent evaporation and cooling.

**Special Considerations**

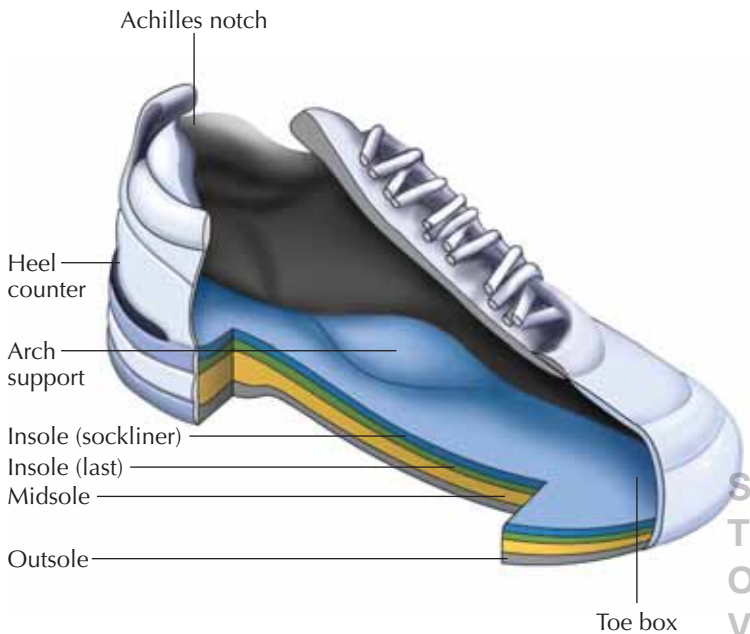
- Consider eye protection for racquetball and other sports.
- Women should wear an exercise bra for support.
- Men should consider an athletic supporter for support.
- Wear helmets and padding for activities with risk of falling, such as biking or inline skating.
- Wear reflective clothing for night activities.
- Wear water shoes for some aquatic activities.
- Consider lace-up ankle braces to prevent injury.
- Consider a mouthpiece for basketball and other contact sports.

as “cross-trainers,” can be a versatile option, but they typically don’t provide the needed features for specific activities. For example, they may lack the cushioning and support needed for running and the ankle support for activities such as basketball. Features of common activity shoes are highlighted in Figure 1.

Most shoes have very thin sockliners, but supplemental inserts can be purchased to provide more cushioning and support. Custom orthotics can also be used to correct alignment problems or minimize foot injuries (e.g., plantar fasciitis). A very important, and frequently neglected, consideration is to replace shoes after extended use. Runners typically replace shoes every 4 to 6 months (or 400 to 600 miles), even if the outer appearance of the shoe is still good. The main functions of athletic shoes are to reduce shock from impact and protect the foot—one of the best prevention strategies for avoiding injuries is to replace your shoes on a regular basis.

**PAR-Q** An acronym for Physical Activity Readiness Questionnaire; designed to help determine if you are medically suited to begin an exercise program.

**Clinical Exercise Test** A test, typically administered on a treadmill, in which exercise is gradually increased in intensity while the heart is monitored by an EKG. Symptoms not present at rest, such as an abnormal EKG, may be present in an exercise test.



**Achilles notch:** Protects tendon

**Heel counter:** Cradles heel to provide movement control; reduces slippage and blistering; a stiff counter reduces pronation

**Arch support:** Supports arch; height and shape of arch should vary with foot characteristics

**Insole (sockliner):** Removable layer for additional shock and sweat absorption; can be replaced periodically and/or customized

**Insole (last):** Refers to shape of shoe bed; curved (allows more mobility; better for those with high, rigid arches); straight (controls excessive motion, better for those with abnormal pronation); or semicurved (moderate flexibility and stability)

**Midsole:** Provides cushion, stability, and motion control; important for shock absorption

**Outsole:** Provides traction; determines shoe flexibility; type depends on intended purpose of shoe

**Toe box:** Should have adequate height to wiggle toes and prevent rubbing on top of toes and adequate length so toes do not contact front of shoe

**Figure 1** ► Anatomy of an activity shoe.

## Factors to Consider during Daily Physical Activity

**There are three components of the daily activity program: the warm-up, the workout, and the cool-down.** The key component of a fitness program is the daily workout. Experts agree, however, that the workout should be preceded by a warm-up and followed by a cool-down. The warm-up prepares the body for physical activity, and the **cool-down** returns the body to rest and promotes effective recovery by aiding the return of blood from the working muscles to the heart (see Figure 2).

**A general warm-up is recommended prior to vigorous exercise.** ACSM recommends a general aerobic and muscular endurance **warm-up** consisting of a minimum of 5 to 10 minutes of low-to-moderate aerobic and muscular endurance activity prior to a vigorous workout. Some examples of warm-up activities include walking, slow jogging, slow swimming, slow biking, or low-intensity sport specific movements (e.g., a layup drill in basketball). The general warm-up is intended to prepare the heart, blood vessels, muscles, and other bodily systems for more vigorous activity to follow. The ACSM indicates that the general warm-up increases body temperature and reduces the potential for after-exercise muscle soreness and stiffness, as well as allowing the body to adapt to the demand of the workout that follows. This general warm-up also decreases the risk of irregular heartbeats associated with poor coronary circulation. For those performing moderate activities for their workout (e.g., walk, bike ride, swim), no special general warm-up is necessary since the activity itself is light to moderate in nature. Starting at a slower pace and gradually increasing intensity is recommended.

**Consider a muscle-stretching warm-up.** Until recently, a muscle-stretching warm-up (stretch warm-up) was recommended after the general warm-up and prior to the workout. A stretch warm-up was thought to help reduce risk of injury, reduce soreness after exercise, and improve performance in sports activities. Recent studies have questioned the value of the stretch warm-up in preventing injury. A recent review also indicates that while stretching may reduce soreness in some, reductions in soreness are only modest. Several studies have indicated that stretching before sports and other types of activities that require strength and power can result in reduced performance. A recent review, however, indicates that performance is only affected if the stretches last 60 seconds or longer. As noted in Concept 10, the recommended length of stretching exercises is 15 to 30 seconds.

The recent evidence, however, does not mean that you should not do a stretch warm-up. Those planning to participate in sports such as gymnastics and diving typically perform a stretch warm-up as do those who perform recreational activities such as dance. For those who have been doing a stretch warm-up prior to other activities, and enjoy it, there is no reason not to continue. A sample of a stretch warm-up is included in Lab 3B. For best results, the stretch warm-up should be done after the general warm-up because stretch is most effective when the muscles are warm. If you plan to do activities in your

## TECHNOLOGY UPDATE

### Minimalist Running

Running shoes have historically emphasized high-tech shock absorption and cushioning technology, but “minimalist” running and even barefoot running have become increasingly popular. One company best known for making shoe soles has captured runners’ imagination with a line of shoes known as the Vibram FiveFingers®. The shoes (which look more like slippers or gloves for your feet) are designed to simulate the feeling of barefoot running while providing protection. They allow you to more easily adopt a forefoot running style rather than striking first on your heel. This change in stride is thought to improve balance, reduce impacts, and improve propulsion. Some studies show that the shoes may reduce chronic knee problems, but it is too early to determine the long-term effects on health or performance. While there is some evidence to support this new approach, experts note that it takes time to retrain your gait. Runners that switch too abruptly can expect to experience considerable soreness, particularly in the calf muscle. Almost all shoe companies now make minimalist shoes or forefoot running shoes and there are varieties for different sports or activities. Advocates of forefoot running include Alberto Salazar, a former U.S. marathon runner and current running coach. Search “minimalist running” or “forefoot running” on the Internet to learn more.

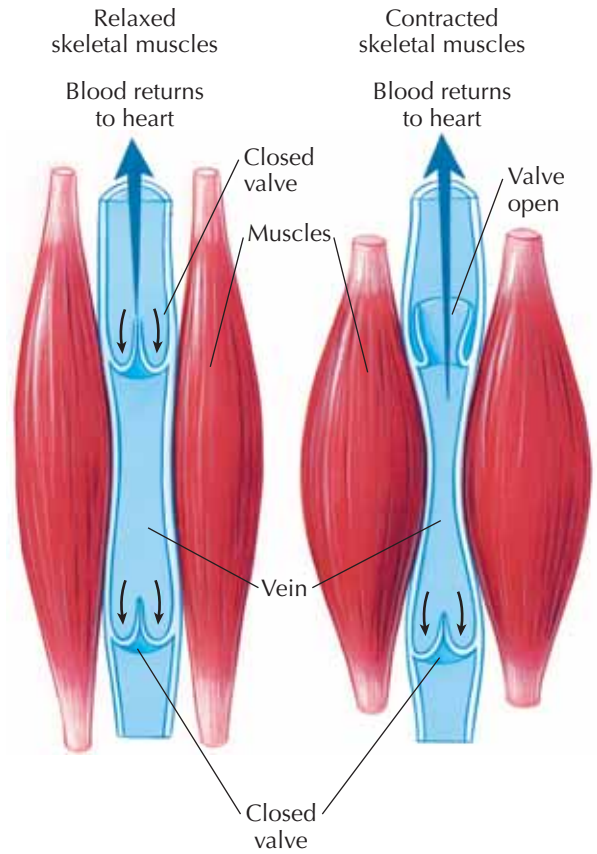
*How open would you be to minimalist shoes or forefoot running?*



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workout that involve strength and power, you should not do stretches that last longer than 60 seconds.

The stretch warm-up is not intended to substitute for a regular program of stretching to build flexibility. In other words, if you have not trained regularly to build flexibility, a warm-up is not the best way to get flexible.



**Figure 2** ▶ Muscle contractions help the veins return blood to the heart.

You may choose to do flexibility exercises as part of your workout or after your workout (as part of the cool-down).

**Consider other warm-up options.** People who plan to perform resistance training or play a vigorous sport should consider a **dynamic warm-up** or a **sport-specific warm-up**. A dynamic warm-up includes the performance

**Cool-Down** Light to moderate activity done after a workout to help the body recover; often consisting of the same exercises used in the warm-up.

**Warm-Up** Light to moderate physical activity performed before a more vigorous workout, including a general aerobic/muscular endurance warm-up and often a stretch warm-up.

**Dynamic Warm-Up** The performance of calisthenics of gradually increasing intensity (e.g., jumping jacks, jumping, skipping).

**Sport-Specific Warm-Up** The performance of sports-related movements of gradual intensity (e.g., layup drill in basketball, swinging a club in golf or racket in tennis).



of calisthenics of gradually increasing intensity. Those interested in high-level performance (e.g., movements requiring great force, and fast movements) should choose a dynamic warm-up of calisthenics that simulates the types of movements to be used in the vigorous phase of the workout or event. The sport-specific warm-up includes sports-related movements of gradual intensity. Examples include performing layup, shooting, and other drills before a basketball game or swinging a golf club or tennis racket before playing. A general warm-up may be performed before the dynamic and sports-related warm-up or may be used as a general warm-up; however, the initial activities should be of moderate intensity and gradually increase in intensity. As noted previously, if the workout is of moderate intensity, no warm-up is necessary (e.g., 30-minute brisk walk). Some people who plan to perform a more vigorous workout may prefer only a general warm-up.

**The workout is the principal component of an activity program and occurs after the warm-up and before the cool-down.** The **workout**, also referred to as the conditioning phase of a training session, is the component of the physical activity program that is designed to provide health and other benefits, depending on the type of activity performed (see Concept 4). Workout information, including appropriate frequency, intensity, and length of time for many types of physical activities in the physical activity pyramid (Concept 5), is included in subsequent concepts.

**A cool-down after the workout promotes an effective recovery from physical activity.** The ACSM recommends a 5- to 10-minute cool-down similar to the general warm-up (e.g., light to moderate activity) after a vigorous workout. In addition to helping reduce metabolic by-products, the general cool-down helps the cardiovascular system (heart rate and blood pressure) return to a normal state.

**During physical activity, the heart pumps a large amount of blood to supply the working muscles with the oxygen necessary to keep moving.** The muscles squeeze the veins (see Figure 2), which forces the blood back to the heart. Valves in the veins prevent the blood from flowing backward. As long as exercise continues, muscles move the blood back to the heart, where it is once again pumped to the body. If exercise is stopped abruptly, the blood is left in the area of the working muscles and has no way to get back to the heart. In the case of a runner, the blood pools in the legs. Because the heart has less blood to pump, blood pressure may drop. This can result in dizziness and can even cause a person to pass out. The best way to prevent this problem is to slow down gradually after exercise and keep moving until blood pressure and heart rate have returned to

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

Exercising can lead to serious heat-related problems if the body becomes dehydrated. The body's thirst mechanism usually lags behind the true need for fluids. Experts recommend drinking 1 to 2 cups of water or another hydrating liquid before exercise and then an additional cup every 20 minutes thereafter.

*Do you follow these guidelines or could you be dehydrated during or after your typical exercise sessions? What strategies can you use to drink more water?*

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near resting values. This phase is especially important for those with cardiovascular risk factors or disease.

**The cool-down can also include a stretching phase.** Stretching the muscles at the end of the workout, or after the workout, can help relieve muscle spasms in fatigued muscles, and stretching is more effective in building flexibility when the muscles are warm. The ACSM recommends 10-plus minutes for stretching to build flexibility. To be effective, as a complete flexibility program, stretching performed in a cool-down would need to be personalized and include exercises for all muscle groups (see Concept 10).

## Physical Activity in the Heat and Cold

**Physical activity in hot and humid environments challenges the body's heat loss mechanisms.** During vigorous activity, the body produces heat, which must be dissipated to regulate body temperature. The body has several ways to dissipate heat. *Conduction* is the transfer of heat from a hot body to a cold body. *Convection* is the transfer of heat through the air or any other medium. Fans and wind can facilitate heat loss by convection and help regulate temperature. The primary method of cooling is through *evaporation* of sweat. The chemical process involved in evaporation transfers heat from the body and reduces the body temperature. When conditions are humid, the effectiveness of evaporation is reduced, since the air is already saturated with moisture. This is why it is difficult to regulate body temperature when conditions are hot and humid.

**Heat-related illness can occur if proper hydration is not maintained.** Maximum sweat rates during physical activity in the heat can approach 1–2 liters per hour. If this fluid is not replaced, **dehydration** can occur. If



## A CLOSER LOOK

### CPR Guidelines and AEDs

To be prepared for physical activity, you also need to be prepared for emergencies. For example, it is important to know basic first aid and cardiopulmonary resuscitation (CPR) if needed. Guidelines from the American Heart Association (AHA) have been revised, shifting the order used for performing CPR. The previous method used the A-B-C method to denote *airway*, *breathing*, and *compressions*. The new guidelines emphasize doing compressions first (C-A-B). Proper certification is recommended, but the guidelines were revised to get more people to help even when not certified (some CPR is better than no CPR). If a person is unresponsive, call for help and begin chest compressions immediately, then open the airway and give mouth-to-mouth rescue breaths along with alternating compressions. Also, automated external defibrillators (AED) are available in many public places, including fitness centers and schools. The AHA offers free online training for CPR and AED devices (visit [www.heart.org](http://www.heart.org) and search for “Heartsaver® First Aid CPR AED”). The AHA also has a 3-minute video on YouTube titled *AHA Guidelines for CPR* that shows the basic steps.



**Compressions**  
Push hard and fast on the center of the victim’s chest



**Airway**  
Tilt the victim’s head back and lift the chin to open the airway



**Breathing**  
Give mouth-to-mouth rescue breaths

American Heart Association  
*Learn and Live*

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*How might the revised guidelines encourage more bystanders to help in a crisis situation? Would you be more inclined to provide aid?*



dehydration is not corrected with water or other fluid-replacement drinks, it becomes increasingly difficult for the body to maintain normal body temperatures. At some point, the rate of sweating decreases as the body begins to conserve its remaining water. It shunts blood to the skin to transfer excess heat directly to the environment, but this is less effective than evaporation. **Hyperthermia** and associated heat-related problems can result (see Table 3).

One way to monitor the amount of fluid loss is to monitor the color of your urine. The American College of Sports Medicine indicates that clear (almost colorless) urine produced in large volumes indicates that you are hydrated. As water in the body is reduced, the urine



*Adequate hydration is critical for safe exercise in the heat.*

**Table 3 ▶ Types of Heat-Related Problems**

Problem	Symptoms	Severity
Heat cramps	Muscle cramps, especially in muscles most used in exercise	Least severe
Heat exhaustion	Muscle cramps, weakness, dizziness, headache, nausea, clammy skin, paleness	Moderately severe
Heatstroke	Hot, flushed skin; dry skin (lack of sweating); dizziness; fast pulse; unconsciousness; high temperature	Extremely severe

**Workout** The component of a total physical activity program designed to produce health, wellness, fitness, and other benefits using appropriate amounts of different types of physical activity.

**Dehydration** Excessive loss of water from the body, usually through perspiration, urination, or evaporation.

**Hyperthermia** Excessively high body temperature caused by excessive heat production or impaired heat loss capacity. Heatstroke is a hyperthermic condition.

Find air temperature on the top; then find the humidity on the left. Find the heat index where the columns meet.

Relative Humidity (%)	Air Temperature (Degrees F)											
	70	75	80	85	90	95	100	105	110	115	120	
100	72	80	91	108	132							
95	71	79	89	105	128							
90	71	79	88	102	122							
85	71	78	87	99	117	141						
80	71	78	86	97	113	136						
75	70	77	86	95	109	130						
70	70	77	85	93	106	124	144					
65	70	76	83	91	102	119	138					
60	70	76	82	90	100	114	132	149				
55	69	75	81	89	98	110	126	142				
50	69	75	81	88	96	107	120	135	150			
45	68	74	80	87	95	104	115	129	143			
40	68	74	79	86	93	101	110	123	137	151		
35	67	73	79	85	91	98	107	118	130	143		
30	67	73	78	84	90	96	104	113	123	135	148	
25	66	72	77	83	88	94	101	109	117	127	139	
20	66	72	77	82	87	93	99	105	112	120	130	
15	65	71	76	81	86	91	97	102	108	115	123	
10	65	70	75	80	85	90	95	100	105	111	116	
5	64	69	74	79	84	88	93	97	102	107	111	
0	64	69	73	78	83	87	91	95	99	103	107	

“Apparent Temperatures” (Heat Index)

- = Extreme danger zone
- = Danger zone
- = Extreme caution zone
- = Caution zone
- = Safe

**Figure 3** ► Heat index values (apparent temperatures).

Source: Data from National Oceanic and Atmospheric Administration.

becomes more concentrated and is a darker yellow color. This indicates dehydration and a need for fluid replacement. Dietary supplements that contain amphetamine derivatives and/or creatine may contribute to undetected dehydration among some individuals.

**Acclimatization improves the body’s tolerance in the heat.** Individuals with good fitness will respond better to activity in the heat than individuals with poor fitness. With regular exposure, the body adapts to the heat. The majority of the adaptation to hot environments occurs in 7 to 14 days, but complete acclimatization can take up to 30 days. As you adapt to the heat, your body becomes conditioned to sweat earlier, to sweat more profusely, and to distribute the sweat more effectively around the body, and the composition of sweat is altered. This process makes it easier for your body to maintain a safe body temperature.

**Precautions should be taken when doing physical activity in hot and humid environments.** The **heat index** (also referred to as apparent temperature) combines temperature and humidity to help you determine

when an environment is safe for activity. The combination of high temperature and humidity presents the greatest risk of heat-related problems in exercise. Physical activity is safe when the apparent temperature is below 80°F (26.7°C). Figure 3 shows the risk of exercise at progressively higher apparent temperatures.

Consider the following guidelines for exercising in the heat and humidity.

- Limit or cancel activity if the apparent temperature reaches the danger zone (see Figure 3).
- Drink fluids before, during, and after vigorous activity. Guidelines suggest about 2 cups before activity and about 1 cup for each 15–20 minutes during activity. After activity, drink about 2 cups for each pound of weight lost. The thirst mechanism lags behind the body’s actual need for fluid, so drink even if you don’t feel thirsty. Fluid-replacement beverages (e.g., Gatorade, Powerade) are designed to provide added energy (from carbohydrates) without impeding hydration. If you choose to use one of these beverages, select one that contains electrolytes and no more than 4 to 8 percent carbohydrates.



Wind, cold, and altitude present some additional challenges for winter exercise.

STOVER CAROL

- Avoid extreme fluid intake. Drinking too much water can cause a condition called **hyponatremia**, sometimes referred to as “water intoxication.” It occurs when you drink too much water, resulting in the dilution of the electrolytes in the blood; interestingly, it has symptoms similar to those of dehydration. If left untreated, it can result in loss of consciousness and even death.
- Gradually expose yourself to physical activity in hot and humid environments to facilitate acclimatization.
- Dress properly for exercise in the heat and humidity. Wear white or light colors that reflect rather than absorb heat. Select wickable clothes instead of cotton to aid evaporative cooling. Rubber, plastic, or other nonporous clothing is especially dangerous. A porous hat or cap can help when exercising in direct sunlight.
- Watch for signs of heat stress (see Table 3). If signs are present, stop immediately, get out of the heat, remove

excess clothing, and drink cool water. Seek medical attention if symptoms progress. Consider cold water immersion for heat stroke.

**Physical activity in exceptionally cold and windy weather can be dangerous.**

Activity in the cold presents the opposite problems as exercise in the heat. In the cold, the primary goal is to retain the body’s heat and avoid **hypothermia** and frostbite. Early signs of hypothermia include shivering and cold extremities caused by blood shunted to the body core to conserve heat. As the core temperature continues to drop, heart rate, respiration, and reflexes are depressed. Subsequently, cognitive functions decrease, speech and movement become impaired, and bizarre behavior may occur. Frostbite results from water crystallizing in the tissues, causing cell destruction.

**When doing activity in cold, wet, and windy weather, precautions should be taken.**

A combination of cold and wind (windchill) poses the greatest danger for cold-related problems during exercise. Research conducted in Canada, in cooperation with the U.S. National Weather Service, produced tables for determining **windchill factor** and the time of exposure necessary to get frostbite (see Figure 4). Consider the following guidelines for performing physical activity in cold and wind:

- Limit or cancel activity if the windchill factor reaches the danger zone (see Figure 4).
- Dress properly. Wear light clothing in several layers rather than one heavy garment. The layer of clothing closest to the body should transfer (wick) moisture away from the skin to a second, more absorbent layer.

**Heat Index** An index based on a combination of temperature and humidity that is used to determine if it is dangerous to perform physical activity in hot, humid weather (also called apparent temperature).

**Hyponatremia** A condition caused by excess water intake, called “water intoxication,” that results in a dilution of electrolytes, leading to serious medical complications.

**Hypothermia** Excessively low body temperature (less than 95°F), characterized by uncontrollable shivering, loss of coordination, and mental confusion.

**Windchill Factor** An index that uses air temperature and wind speed to determine the chilling effect of the environment on humans.

Actual Temperature Reading (Degrees F)	Estimated Wind Speed (mph)									Minutes to Frostbite
	Calm	5	10	15	20	25	30	35	40	
40	40	36	34	32	30	29	28	27	27	
30	30	25	21	19	17	16	15	14	13	
20	20	13	9	6	4	3	1	0	-1	
10	10	1	-4	-7	-9	-11	-12	-14	-15	
0	0	-11	-16	-19	-22	-24	-26	-27	-29	30
-10	-10	-22	-28	-32	-35	-37	-39	-41	-43	10
-20	-20	-34	-41	-45	-48	-51	-53	-55	-57	5
-30	-30	-46	-53	-58	-61	-64	-67	-69	-71	
-40	-40	-57	-66	-71	-74	-78	-80	-82	-84	

= Caution Zone   
  = Risk Zone   
  = High Risk Zone   
  = Extreme Danger Zone

**Figure 4** ► Windchill factor chart.

Source: National Weather Service.

Polypropylene and capilene are examples of wickable fabrics. A porous windbreaker keeps wind from cooling the body and allows the release of body heat. The hands, feet, nose, and ears are most susceptible to frostbite, so they should be covered. Wear a hat or cap, mask, and mittens. Mittens are warmer than gloves. A light coating of petroleum jelly on exposed body parts can be helpful.

- Keep from getting wet in cold weather. If you get wet because of unavoidable circumstances, seek a warm place to dry off.



## Physical Activity in Other Environments

**High altitude may limit performance and require adaptation of normal physical activity.** The ability to do vigorous physical tasks is diminished as altitude increases. Breathing rate and heart rates are more elevated at high altitude. With proper acclimation (gradual exposure), the body adjusts to the lower oxygen pressure found at high altitude, and performance improves. Nevertheless, performance ability at high altitudes, especially for activities requiring cardiovascular fitness, is usually less than would be expected at sea level. At extremely high altitudes, the ability to perform vigorous physical activity may be impossible without an extra oxygen supply. When moving from sea level to a high altitude, vigorous exercise should be done with caution. Acclimation to high altitudes requires a minimum of 2 weeks and may

not be complete for several months. Care should be taken to drink adequate water at high altitude.

**Exposure to air pollution should be limited.** Various pollutants can cause poor performance and, in some cases, health problems. Ozone, a pollutant produced primarily by the sun's reaction to car exhaust, can cause symptoms, including headache, coughing, and eye irritation. Similar symptoms result from exposure to carbon monoxide, a tasteless and odorless gas, caused by combustion of oil, gasoline, and/or cigarette smoke. Most news media in metropolitan areas now provide updates on ozone and carbon monoxide levels in their weather reports. When levels of these pollutants reach moderate levels, some people may need to modify their exercise. When levels are high, some may need to postpone exercise. Exercisers wishing to avoid ozone and carbon monoxide may want to exercise indoors early in the morning or later in the evening and avoid areas with a high concentration of traffic.

Plant pollens, dust, and other pollutants in the air may cause allergic reactions for certain people. Weather reports of pollens and particulates may help exercisers determine the best times for their activities and when to avoid vigorous activities.

## Soreness and Injury

**Understanding soreness can help you persist in physical activity and avoid problems.** A common experience for many exercisers is a certain degree of muscle soreness that occurs 24–48 hours after intense

exercise. This soreness, termed delayed-onset muscle soreness (**DOMS**), typically occurs when muscles are exercised at levels beyond their normal use. Some people mistakenly believe that lactic acid is the cause of muscle soreness. Lactic acid (a by-product of anaerobic metabolism) is produced during vigorous exercise, but levels return to normal within 30 minutes after exercise, while DOMS occurs 24 hours after exercise. DOMS is caused by microscopic muscle tears that result from the excessive loads on the muscles. Soreness is not a normal part of the body's response to exercise but occurs if an individual violates the principle of progression and does more exercise than the body is prepared for. While it may be uncomfortable to some, it has no long-term consequences and does not predispose one to muscle injury. To reduce the likelihood of DOMS, it is important to progress your program gradually.

**The most common injuries incurred in physical activity are sprains and strains.** A strain occurs when the fibers in a muscle are injured. Common activity-related injuries are hamstring strains that occur after a vigorous sprint. Other commonly strained muscles include the muscles in the front of the thigh, the low back, and the calf.

A sprain is an injury to a ligament—the connective tissue that connects bones to bones. The most common sprain is to the ankle; frequently, the ankle is rolled to the outside (inversion) when jumping or running. Other common sprains are to the knee, the shoulder, and the wrist.

Tendonitis is an inflammation of the tendon; it is most often a result of overuse rather than trauma. Tendonitis can be painful but often does not swell to the extent that sprains do. For this reason, elevation and compression are not as effective as ice and rest. A physician should be consulted for an appropriate diagnosis.

**Being able to treat minor injuries will help reduce their negative effects.** Minor injuries, such as muscle strains and sprains, are common to those who are persistent in their exercise. If a serious injury should occur or if symptoms persist, it is important to get immediate medical attention. However, for minor injuries, following the **RICE** formula will help you reduce the pain and speed recovery. In this acronym, *R* stands for *rest*. Muscle sprains and strains heal best if the injured area is rested. Rest helps you avoid further damage to the muscle. *I* stands for *ice*. The quick application of cold (ice or ice water) to a minor injury minimizes swelling and speeds recovery. Cold should be applied to as large a surface area as possible (soaking is best). If ice is used, it should be wrapped to avoid direct contact with the skin. Apply cold for 20 minutes, three times a day, allowing 1 hour between applications. *C* stands for *compression*.

Wrapping or compressing the injured area also helps minimize swelling and speeds recovery. Elastic bandages or elastic socks are good for applying compression. Care should be taken to avoid wrapping an injury too tightly because this can result in loss of circulation to the area. *E* stands for *elevation*. Keeping the injured area elevated (above the level of the heart) is effective in minimizing swelling. If pain or swelling does not diminish after 24 to 48 hours, or if there is any doubt about the seriousness of an injury, seek medical help. Some experts recommend adding a *P* to RICE (**PRICE**) to indicate that *prevention* (*P*) is as important as treatment of injuries. Building strength and flexibility, warming up, beginning gradually when starting a new activity, and wearing protective equipment, such as lace-up ankle braces, are simple methods of prevention.



Taking over-the-counter pain remedies can help reduce the pain of muscle strains and sprains. Aspirin and ibuprofen (e.g., Excedrin, Motrin) have anti-inflammatory properties. However, acetaminophen (e.g., Tylenol) does not. It may reduce the pain but will not reduce inflammation.

**Muscle cramps can be relieved by statically stretching a muscle.** Muscle cramps are pains in the large muscles that result when the muscles contract vigorously for a continued period of time. Muscle cramps are usually not considered to be an injury, but they are painful and may seem like an injury. They are usually short in duration and can often be relieved with proper treatment. Cramps can result from lack of fluid replacement (dehydration), from fatigue, and from a blow directly to a muscle. Static stretching can help relieve some cramps. For example, the calf muscle, which often cramps among runners and other sports participants, can be relieved using the calf stretcher exercise, which is part of the warm-up in this concept.

## Attitudes about Physical Activity

**Knowing the most common reasons for inactivity can help you avoid sedentary living.** Most people want to be active but find many barriers get in the way.

**DOMS** An acronym for delayed-onset muscle soreness, a common malady that follows relatively vigorous activity, especially among beginners.

**RICE** An acronym for rest, ice, compression, and elevation; a method of treating minor injuries.

**Table 4 ▶ Common Reasons People Give for Not Being Active**

Reason	Description	Strategy for Change
<b>I don't have the time.</b>	This is the number one reason people give for not exercising. Invariably, those who feel they don't have time know they should do more exercise. They say they plan to do more in the future when "things are less hectic." Young people say they will have more time to exercise in the future. Older people say they wish they had taken the time to be active when they were younger.	Planning a daily schedule can help you find the time for activity and avoid wasting time on things that are less important. Learning the facts in the concepts that follow will help you see the importance of activity and how you can include it in your schedule with a minimum of effort and with time efficiency.
<b>It's too inconvenient.</b>	Many who avoid physical activity do so because it is inconvenient. They say, "It takes too long to get to the gym" and "It makes me sweaty and messes up my hair."	If you have to travel more than 10 minutes to do activity or if you do not have easy access to equipment, you will avoid activity. Locating facilities and finding a time when you can shower is important.
<b>I just don't enjoy it.</b>	Many do not find activity to be enjoyable or invigorating. These people may assume that all forms of activity have to be strenuous and fatiguing.	There are many activities to choose from. If you don't enjoy vigorous activity, try more moderate forms of activity, such as walking.
<b>I'm no good at physical activity.</b>	"People might laugh at me," "Sports make me nervous," and "I am not good at physical activities" are reasons some people give for not being active. Some people lack confidence in their own abilities. This may be because of past experiences in physical education or sports.	With properly selected activities, even those who have never enjoyed exercise can get hooked. Building skills can help, as can changing your way of thinking. Avoiding comparisons with others can help you feel successful.
<b>I am not fit, so I avoid activity.</b>	Some people avoid exercise because of health reasons. Some who are unfit lack energy. Starting slowly can build fitness gradually and help you realize that you can do it.	There are good medical reasons for not doing activity, but many people with problems can benefit from exercise if it is properly designed. If necessary, get help adapting activity to meet your needs.
<b>I have no place to be active, especially in bad weather.</b>	Regular activity is more convenient if facilities are easy to reach and the weather is good. Opportunities have increased considerably in recent years. Some of the most popular activities require little equipment, can be done in or near home, and are inexpensive.	If you cannot find a place, if it is not safe, or if it is too expensive, consider using low-cost equipment at home, such as rubber bands or calisthenics. Lifestyle activity can be done by anyone at almost any time.
<b>I am too old.</b>	As people grow older, many begin to feel that activity is something they cannot do. For most people, this is simply not true! Properly planned exercise for older adults is not only safe but also has many health benefits—e.g., longer life, fewer illnesses, an improved sense of well-being, and optimal functioning.	Older people who are just beginning activity should start slowly. Lifestyle activities are a good choice. Setting realistic goals can help, as can learning to do resistance training and flexibility exercises.

The most common reasons given by people who do not do regular physical activity are listed in Table 4. Experts consider many of these attitudes to be barriers that can be overcome. In fact, as mentioned in Concept 2, a key self-management skill that predicts long-term behavior change is the ability to overcome barriers. The strategies in Table 4 can help inactive people become more active.

**connect**  
VIDEO 5

**Knowing the reasons people give for being active can help you adopt positive attitudes toward activity.** To enhance the promotion of physical activity in society, many researchers have sought to determine why some people choose to be active and others do not. The most common reasons for physical activity are highlighted in Table 5. The table also offers strategies for changing behaviors.

**connect**  
VIDEO 6

**Table 5 ▶ Common Reasons for Doing Regular Physical Activity**

Reason	Description	Strategy for Change
<b>I do activity for my health, wellness, and fitness.</b>	Surveys show this is the number one reason for doing regular physical activity. Unfortunately, many adults say that a “doctor’s order to exercise” would be the most likely reason to get them to begin a program. For some, however, waiting for a doctor’s order may be too late.	Gaining information contained in this book will help you see the value of regular physical activity. Performing the self-assessments in the various concepts will help you determine the areas in which you need personal improvement.
<b>I do activity to improve my appearance.</b>	In our society, looking good is highly valued; thus, physical attractiveness is a major reason people participate in regular exercise. Regular activity can contribute to looking your best.	Setting realistic goals and avoiding comparisons with others can help you be more successful.
<b>I do activity because I enjoy it.</b>	A majority of adults say that enjoyment is of paramount importance in deciding to be active. Statements include the “peak experience,” the “runner’s high,” or “spinning free.” The sense of fun, well-being, and general enjoyment associated with physical activity is well documented.	People who do not enjoy activity often lack performance skills or feel that they are not competent in activity. Improving skills with practice, setting realistic goals, and adopting a new way of thinking can help you be successful and enjoy activities.
<b>I do activity because it relaxes me.</b>	Relaxation and release from tension rank high as reasons people do regular activity. It is known that activity in the form of sports and games provides a catharsis, or outlet, for the frustrations of daily activities. Regular exercise can help reduce depression and anxiety.	Activities such as walking, jogging, or cycling are ways of getting some quiet time away from the job or the stresses of daily living. In a later concept, you will learn about exercises that you can do to reduce stress.
<b>I like the challenge and sense of personal accomplishment I get from physical activity.</b>	A sense of personal accomplishment is frequently a reason for people doing activity. In some cases, it is learning a new skill, such as racquetball or tennis; in other cases, it is running a mile or doing a certain number of crunches. The challenge of doing something you have never done before is apparently a powerful experience.	Taking lessons to learn skills or attempting activities new to you can provide the challenge that makes activity interesting. Also, adopting a new way of thinking allows you to focus on the task rather than on competition with others.
<b>I like the social involvement I get from physical activities.</b>	Physical activity can have social benefits. People say, “It is a good way to spend time with members of my family.” “It is a good way to spend time with close friends.” “Being part of the team is satisfying.” Activity settings can also provide an opportunity for making new friends.	If you find activity to be socially unrewarding, you may have to find activities that you, your family, or your friends enjoy. Taking lessons together can help. Also, finding a friend with similar skills can help. Focus on the activity rather than the outcome.
<b>Competition is the main reason I enjoy physical activity.</b>	“The thrill of victory” and “sports competition” are two reasons given for being active. For many, the competitive experience is very satisfying.	Some people simply do not enjoy competing. If this is the case for you, select noncompetitive individual activities.
<b>Physical activity helps me feel good about myself.</b>	For many people, participation in physical activity is an important part of their identity. They feel better about themselves when they are regularly participating.	Physical activity is something that is self-determined and within your control. Participation can help you feel good about yourself, build your confidence, and increase your self-esteem.
<b>Physical activity provides opportunities to get fresh air.</b>	Being outside and experiencing nature are reasons that some people give for being physically active.	Many activities provide opportunities to be outside. If this is an important reason for you, seek out parks and outdoor settings for your activities.





## In the News

### National Physical Activity Plan

Public health experts realize that comprehensive efforts are needed to increase participation in physical activity in society. The Centers for Disease Control and Prevention (CDC) led efforts to create a National Physical Activity Plan to provide a framework for coordinated action ([www.physicalactivityplan.org](http://www.physicalactivityplan.org)). The plan includes specific strategies for how activity can be promoted through different settings (business, education, health care, mass media, parks/recreation, public health, transportation, and nonprofits). Each sector presents strategies aimed at

promoting physical activity. Each strategy also outlines specific tactics that communities, organizations and agencies, and individuals can use to address the strategy. Separate strategies for promoting physical activity are provided for each sector. Recommendations are also provided to help communities, organizations, agencies, and individuals apply these strategies.

**Does this type of coordinated effort help increase participation in physical activity? Why or why not?**



## Strategies for Action

### Screening for risks can help make activity safer.

Athletes in competitive sports often undergo pre-participation physical examinations to screen for potential cardiac arrhythmias or conditions known to increase risks during exercise. Recreational athletes may not take the same precautions. The best advice is to get a physical prior to beginning serious training. This is especially critical if you have a family history of heart problems. Lab 3A will help you determine if you should consult a physician.

**A proper warm-up can prepare your body for activity and a gradual cool-down can improve recovery.** Lab 3B

provides a sample flexibility-based warm-up and cool-down routine that may be helpful. Determine what works best for your needs.

**Assess your attitudes concerning physical activity.** Active people generally have more positive attitudes than negative ones. This is referred to as a “positive balance of attitudes.” The questionnaire in Lab 3C gives you the opportunity to assess your balance of attitudes. If you have a “negative balance” score, you can analyze your attitudes and determine how you can change them to view activity more favorably.



## Web Resources

American College of Sports Medicine (ACSM) Position Statements [www.acsm.org/access-public-information/position-stands](http://www.acsm.org/access-public-information/position-stands)

- Exercise and Acute Cardiovascular Events
- Exertional Heat Illness during Training and Competition
- Exercise and Fluid Replacement
- Prevention of Cold Injuries during Exercise

ACSM's Fit Society Page [www.acsm.org/access-public-information/newsletters/fit-society-page](http://www.acsm.org/access-public-information/newsletters/fit-society-page)

ACSM's Health and Fitness Journal [www.acsm.org/access-public-information/acsm-journals/acsm's-health-fitness-journal](http://www.acsm.org/access-public-information/acsm-journals/acsm's-health-fitness-journal)

American Red Cross (AED information) [www.redcross.org](http://www.redcross.org)

Med Watch [www.fda.gov/medwatch](http://www.fda.gov/medwatch)

National Athletic Trainers Association [www.nata.org](http://www.nata.org)

WebMD [www.webmd.com](http://www.webmd.com)

## Suggested Readings

ACSM. 2010. *ACSM's Guidelines for Exercise Testing and Prescription*. 8th ed. Philadelphia: Lippincott, Williams & Wilkins.

ACSM. 2010. *ACSM's Resource Manual for Guidelines for Exercise Testing and Prescription*. 6th ed. Philadelphia: Lippincott, Williams & Wilkins.

Barwood, M. J., Thelwell, R. C., and M. J. Tipton. 2008. Psychological skills training improves exercise performance in the heat. *Medicine and Science in Sports and Exercise* 40(2):387–396.

Bernardot, D. 2007. Timing of energy and fluid intake. *ACSM's Health and Fitness Journal* 11(4):13–19.

Carlson, M. 2012. Exercising in the cold. *ACSM's Health and Fitness Journal*. 16(1):8–12.

Fradkin, A., et al. 2009. Warm-up and physical performance: What is the relationship? A systematic review with meta analysis (abstract). *Medicine and Science in Sports and Exercise* 41(5 Supplement):151–152.

Henschke, N., and C. C. Lin. 2011. Stretching before or after exercise does not reduce delayed-onset muscle soreness. *British Journal of Sports Medicine* 45:1249–1250.

Herbert, R. D., de Noronha, M., and S. J. Kamper. 2011. Stretching to prevent or reduce muscle soreness after exercise. *Cochrane Database Systematic Reviews* 7:CD0045771.

Kay, A. D., and A. J. Blazevich. 2011. Effect of acute static stretch on maximal muscle performance: A systematic review. *Medicine and Science in Sports and Exercise* 44(1):154–164.

Lowry, R., et al. 2007. Physical activity–related injury and body mass index among U.S. high school students. *Journal of Physical Activity and Health* 4(3):225–342.

Perberdy, M. A., and J. P. Ornato. 2008. Progress in resuscitation: An evolution, not a revolution. *Journal of the American Medical Association* 299(10):1188–1190.

Rea, T. D., et al. 2010. CPR with chest compression alone or with rescue breathing. *New England Journal of Medicine* 363(5):423–433.

Stover, B., and B. Murray. 2007. Drink up: Science of hydration. *ACSM's Health and Fitness Journal* 11(3):7–12.

Walter, T., et al. 2011. Active movement warm-up routines. *Journal of Physical Education Recreation and Dance* 82(3):23–31.

Young, S. 2010. From static stretching to dynamic exercise: Changing the warm-up paradigm. *Strategies* 24(1):13–17.

## 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.

- Reduce sports and recreation injuries.
- Reduce injuries from overexertion.
- Reduce emergency department visits for nonfatal injuries.

- Increase the proportion of public and private schools that require students to wear appropriate protective gear when engaged in school-sponsored physical activities.
- Increase health literacy of the population.

**A national goal is to reduce sports and recreational injuries, as well as injuries from overexertion. Explain how using the information related to preparing for exercise can help you and others contribute to meeting this national goal.**



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# Lab 3A Readiness for Physical Activity

Name

Section

Date

**Purpose:** To help you determine your physical readiness for participation in a program of regular exercise

## Procedures

1. Read the directions on the “PAR-Q & You” on page 60.
2. Answer each of the seven questions on the form.
3. If you answered “yes” to one or more of the questions, follow the directions just below the PAR-Q questions regarding medical consultation.
4. If you answered “no” to all seven questions, follow the directions at the lower left-hand corner of the PAR-Q.
5. Answer the five questions about physical readiness for sports or vigorous training in Chart 1 below.
6. Record your scores below and answer the question in the Conclusions and Implications section.

## Results

### Chart 1 Physical Readiness for Sports or Vigorous Training

Answer the PAR-Q before using this chart. If your answer to any of these questions is “yes,” you should consult with your personal physician by telephone or in person to determine if you have a potential problem with sports or vigorous training.

Yes No

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Do you plan to participate on an organized team that will play intense competitive sports (e.g., varsity team, professional team)?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. If you plan to participate in a collision sport (even on a less organized basis), such as football, boxing, rugby, or ice hockey, have you been knocked unconscious more than one time? |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Do you currently have symptoms from a previous muscle injury?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Do you currently have symptoms from a previous back injury, or do you experience back pain as a result of involvement in physical activity?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Do you have any other symptoms during physical activity that give you reason to be concerned about your health?   |

Determine your PAR-Q score. Place an X over the circle that includes the number of “yes” answers that you had for the PAR-Q (see page 60).

- 0   
  1   
  2   
  3   
  4   
  5   
  6   
  7

Determine your readiness for sports or rigorous training (see Chart 1 above). Place an X over the number of “yes” answers that you had for the Physical Readiness for Sports or Vigorous Training chart.

- 0   
  1   
  2   
  3   
  4   
  5

**Conclusions and Implications:** In several sentences, discuss your readiness for physical activity. Base your comments on your questionnaire results and the types of physical activities you plan to perform in the future.

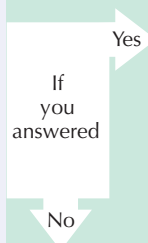
# PAR-Q & YOU

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of fifteen and sixty-nine, the PAR-Q will tell you if you should check with your doctor before you start. If you are over sixty-nine years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	NO	
<input type="checkbox"/>	<input type="checkbox"/>	1. Has your doctor ever said that you have a heart condition <u>and</u> that you should only do physical activity recommended by a doctor?
<input type="checkbox"/>	<input type="checkbox"/>	2. Do you feel pain in your chest when you do physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	3. In the past month, have you had chest pain when you were not doing physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
<input type="checkbox"/>	<input type="checkbox"/>	5. Do you have a bone or joint problem that could be made worse by a change in your physical activity?
<input type="checkbox"/>	<input type="checkbox"/>	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
<input type="checkbox"/>	<input type="checkbox"/>	7. Do you know of <u>any other reason</u> you should not do physical activity?



**YES to one or more questions**

Talk with your doctor by phone or in person **BEFORE** you start becoming much more physically active or **BEFORE** you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want—as long as you start slowly and build up gradually. Or you may need to restrict your activities to those that are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his or her advice.
- Find out which community programs are safe and helpful for you.

**NO to all questions**

If you answered **NO** honestly to all PAR-Q questions, you can be reasonably sure that you can

- Start becoming much more physically active—begin slowly and build up gradually. This is the safest and easiest way to go.
- Take part in a fitness appraisal—this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively.

**DELAY BECOMING MUCH MORE ACTIVE:**

- If you are not feeling well because of a temporary illness, such as a cold or a fever—wait until you feel better or
- If you are or may be pregnant—talk to your doctor before you start becoming more active.

**Please note:** If your health changes so that you then answer YES to any of the above questions, tell your fitness or health professional. Ask whether you should change your physical activity plan.

Informed Use of the PAR-Q: The Canadian Society for Exercise Physiology, Health Canada, and their agents assume no liability for persons who undertake physical activity, and if in doubt after completing this questionnaire, consult your doctor prior to physical activity.

You are encouraged to copy the PAR-Q but only if you use the entire form

\*Developed by the British Columbia Ministry of Health.  
Produced by the British Columbia Ministry of Health and the Department of National Health & Welfare

Physical Activity Readiness Questionnaire • PAR-Q (revised 2002)

**Note:** It is important that you answer all questions honestly. The PAR-Q is a scientifically and medically researched pre-exercise selection device. It complements exercise programs, exercise testing procedures, and the liability considerations attendant with such programs and testing procedures. PAR-Q, like any other pre-exercise screening device, will misclassify a small percentage of prospective participants, but no pre-exercise screening method can entirely avoid this problem.

# Lab 3B The Stretch Warm-Up and Cool-Down

Name

Section

Date

**Purpose:** To familiarize you with a sample group of stretch warm-up and cool-down exercises

### Procedures

1. Perform a 2- to 5-minute cardiovascular warm-up (walk, jog, slow jump rope, swim).
2. Perform the exercises in Chart 1 on page 62, including the alternative exercises, three times each. Hold the stretch for 15 to 30 seconds.
3. Complete the Results section below and answer the questions in the Conclusions and Implications section.

**Results:** In the following, put an X over the circle that represents the amount of tightness you felt when performing each of the stretching warm-up and cool-down exercises. Tightness indicates that you may have shortness of a specific muscle group and that stretching exercises at times other than the warm-up or cool-down are needed.

	<b>Amount of Tightness</b>		
	None	Moderate	Severe
Calf stretch	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Hamstring stretch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leg hug	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seated side stretch	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Zipper	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<b>Alternative Exercises</b>			
Side stretch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hip and thigh stretch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
One-leg stretch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Conclusions and Implications:** The general cardiovascular warm-up is recommended for all people. In addition, you may want to consider a stretch warm-up and stretch cool-down (as shown in this lab), or a dynamic or sport-specific warm-up option. In several sentences, discuss your experiences with the warm-up/cool-down and what you would plan to use in the future.

**Chart 1** Sample warm-up and cool-down exercises

The exercises shown here can be used before a workout as a warm-up or after a workout as a cool-down. Perform these exercises slowly, preferably after completing a cardiovascular warm-up. Do not bounce. Hold each stretch for at least 15–30 seconds. Perform each exercise at least once and up to three times. Other stretching exercises are presented in the concept on flexibility, and they can be used in a warm-up or cool-down.

**Cardiovascular Warm-Up**

Before you perform a vigorous workout, walk or jog slowly for 2 minutes or more. After exercise, do the same. Do this portion of the warm-up prior to muscle stretching.



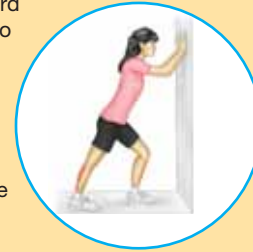
**Leg Hug**

This exercise stretches the hip and back extensor muscles. Lie on your back. Bend one leg and grasp your thigh under the knee. Hug it to your chest. Keep the other leg straight and on the floor. Hold. Repeat with the opposite leg.



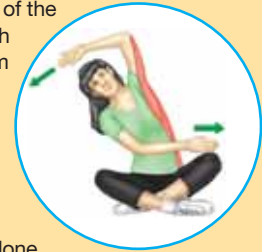
**Calf Stretch**

This exercise stretches the calf muscles (gastrocnemius and soleus). Face a wall with your feet 2 or 3 feet away. Step forward on your left foot to allow both hands to touch the wall. Keep the heel of your right foot on the ground, toe turned in slightly, knee straight, and buttocks tucked in. Lean forward by bending your front knee and arms and allowing your head to move nearer the wall. Hold. Repeat with the other leg.



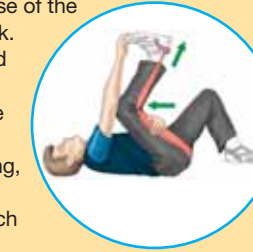
**Seated Side Stretch**

This exercise stretches the muscles of the trunk. Begin in a seated position with the legs crossed. Stretch the left arm over the head to the right. Bend at the waist (to right), reaching as far as possible to the left with the right arm. Hold. Do not let the trunk rotate. Repeat to the opposite side. For less stretch, the overhead arm may be bent. This exercise can be done in the standing position but is less effective.



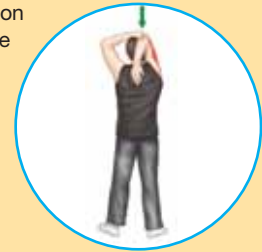
**Hamstring Stretch**

This exercise stretches the muscles of the back of the upper leg (hamstrings) as well as those of the hip, knee, and ankle. Lie on your back. Bring the right knee to your chest and grasp the toes with the right hand. Place the left hand on the back of the right thigh. Pull the knee toward the chest, push the heel toward the ceiling, and pull the toes toward the shin. Attempt to straighten the knee. Stretch and hold. Repeat with the other leg.



**Zipper**

This exercise stretches the muscle on the back of the arm (triceps) and the lower chest muscles (pecs). Lift the right arm and reach behind the head and down the spine (as if pulling up a zipper). With the left hand, push down on the right elbow and hold. Reverse arm position and repeat.

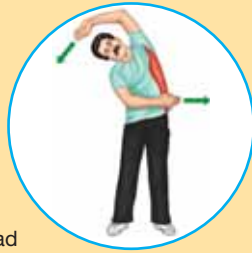


**ALTERNATE EXERCISES**

Because of location (wet or hard surface), you may choose to substitute exercises that do not require you to lie down. The side stretch (standing) can be substituted for the seated side stretch, the hip and thigh stretch for the leg hug (does not stretch the same muscles), and the one-leg stretch (standing) for the hamstring stretch.

**Side Stretch**

This exercise stretches the trunk lateral flexors. Stand with feet shoulder-width apart. Stretch left arm overhead to right. Bend to right at waist reaching as far as possible with left arm; reach as far as possible with right arm. Hold. Do not let trunk rotate or lower back arch. Repeat on opposite side. Note: This exercise is made more effective if a weight is held down at the side in the hand opposite the side being stretched. More stretch will occur if the hip on the stretched side is dropped and most of the weight is borne by the opposite foot.

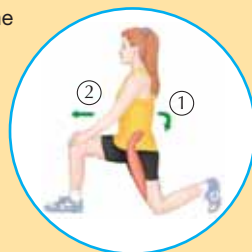


**Hip and Thigh Stretch**

This exercise stretches the hip (iliopsoas) and thigh muscles (quadriceps) and is useful for people with lordosis and back problems. Place right knee directly above right ankle and stretch left leg backward so knee touches floor. If necessary, place hands on floor for balance.

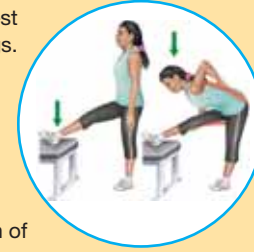
1. Tilt the pelvis backward by tucking in the abdomen and flattening the back.
2. Then shift the weight forward until a stretch is felt on the front of the thigh; hold. Repeat on opposite side.

Caution: Do not bend front knee more than 90 degrees.



**One-Leg Stretch**

This exercise stretches the lower back muscles. Stand with one foot on a bench, keeping both legs straight. Contract the hamstrings and gluteals by pressing down on bench with the heel for three seconds; then relax and bend the trunk forward, toward the knee. Hold for 10–15 seconds. Return to starting position and repeat with opposite leg. As flexibility improves, the arms can be used to pull the chest toward the legs. Do not allow either knee to lock. This exercise is useful in relief of backache and correction of swayback.



# Lab 3C Physical Activity Attitude Questionnaire

Name

Section

Date

**Purpose:** To evaluate your feelings about physical activity and to determine the specific reasons you do or do not participate in regular physical activity

**Directions:** The term *physical activity* in the following statements refers to all kinds of activities, including sports, formal exercises, and informal activities, such as jogging and cycling. Make an X over the circle that best represents your answer to each question.

	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Item Score	Attitude Score
1. I should do physical activity regularly for my health.	1	2	3	4	5	<input type="text"/>	Health and Fitness Score
2. Doing regular physical activity is good for my fitness and wellness.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
3. Regular exercise helps me look my best.	1	2	3	4	5	<input type="text"/>	Appearance Score
4. I feel more physically attractive when I do regular physical activity.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
5. One of the main reasons I do regular physical activity is that it is fun.	1	2	3	4	5	<input type="text"/>	Enjoyment Score
6. The most enjoyable part of my day is when I am exercising or doing a sport.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
7. Taking part in physical activity helps me relax.	1	2	3	4	5	<input type="text"/>	Relaxation Score
8. Physical activity helps me get away from the pressures of daily living.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
9. The challenge of physical training is one reason I do physical activity.	1	2	3	4	5	<input type="text"/>	Challenge Score
10. I like to see if I can master sports and activities that are new to me.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
11. I like to do physical activity that involves other people.	1	2	3	4	5	<input type="text"/>	Social Score
12. Exercise offers me the opportunity to meet other people.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
13. Competition is a good way to make physical activity fun.	1	2	3	4	5	<input type="text"/>	Competition Score
14. I like to see how my physical abilities compare with those of others.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
15. When I do regular exercise, I feel better than when I don't.	1	2	3	4	5	<input type="text"/>	Feeling Good Score
16. My ability to do physical activity is something that makes me proud.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>
17. I like to do outdoor activities.	1	2	3	4	5	<input type="text"/>	Outdoor Score
18. Experiencing nature is something I look forward to when exercising.	1	2	3	4	5	<input type="text"/>	= <input type="text"/>



**Procedures**

1. Read and answer each question in the questionnaire.
2. Write the number in the circle of your answer in the box labeled “Item Score.”
3. Add scores for each pair of scores and record in the “Attitude Score” box.
4. Record each attitude score and a rating for each score (use Rating Chart) in the chart below.
5. Record the number of good and excellent scores in the box provided. Use the score in the box to determine your rating using the Balance of Feelings Rating Chart.

**Results:** Record your results as indicated in the Procedures section.

**Physical Activity Attitude Questionnaire Results**

Attitude	Score	Rating
Health and fitness		
Appearance		
Enjoyment		
Relaxation		
Challenge		
Social		
Competition		
Feeling good		
Outdoor		

How many good or excellent scores do you have?

Balance of Feeling Score

Having 5 or more in the box above indicates that you have a positive balance of feelings (more positive than negative attitudes).

In a few sentences, discuss your “balance of feelings” rating. Having more positive than negative scores (positive balance of feelings) increases the probability of being active. Include comments on whether you think your ratings suggest that you will be active or inactive and whether your ratings are really indicative of your feelings. Do you think that the scores on which you were rated poor or very poor might be reasons you would avoid physical activity? Explain.

**Attitude Rating Chart**

Rating Category	Attitude Score
Excellent	9–10
Good	7–8
Fair	5–6
Poor	3–4
Very poor	2

**Balance of Feelings Rating Chart**

Rating Category	Balance of Feelings Score
Excellent	6–9
Good	5
Fair	4
Poor	2–3
Very poor	0–1

# The Health Benefits of Physical Activity

## LEARNING OBJECTIVES

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

- ▶ Define the term *hypokinetic* and explain how physical activity can reduce risk of hypokinetic diseases and conditions.
- ▶ Identify several cardiovascular diseases/conditions associated with physical inactivity and explain how physical activity can help to reduce risk.
- ▶ Describe metabolic syndrome and explain how physical activity can help to reduce risk of this hypokinetic condition.
- ▶ Describe additional hypokinetic conditions and explain how physical activity can help reduce risk of them.
- ▶ Explain the role of physical activity in preventing conditions associated with aging.
- ▶ Explain the role of physical activity in promoting optimal wellness.
- ▶ Present an overview of the health and wellness benefits of physical activity and fitness.
- ▶ Identify related national health goals and show how meeting personal goals can contribute to reaching national goals.
- ▶ Assess your heart disease risk factors.

*Physical activity and good physical fitness can reduce the risk of illness and contribute to optimal health and wellness.*



The landmark *Surgeon General's Report on Physical Activity and Health* informed the general public of the risks of sedentary living and the health benefits of physical activity. Since that document was published, even more evidence has accumulated supporting the benefits of an active lifestyle. The first chapter of ACSM's *Guidelines for Exercise Testing and Prescription* and Chapter 2 of the 2008 *Physical Activity Guidelines for Americans* are devoted to the benefits and risks associated with physical activity. Both *Healthy People 2020* and *Achieving Health for All* (Canada) highlight the importance of regular physical activity for improving population health in the 21st century. This concept summarizes the health benefits of regular physical activity and good fitness.

## Physical Activity and Hypokinetic Diseases

**Regular physical activity and good fitness can promote good health, help prevent disease, and be a part of disease treatment.** There are three major ways in which regular physical activity and good fitness can contribute to optimal health and wellness. First, they can aid in disease/illness prevention. There is considerable evidence that the risk of **hypokinetic diseases or conditions** can be greatly reduced among people who do regular physical activity and achieve good physical fitness. Virtually all **chronic diseases** that plague society are considered to be hypokinetic, though some relate more to inactivity than others. Nearly three-quarters of all deaths among those 18 and older are a result of chronic diseases. Leading public health officials have suggested that physical activity may offer the most promising public health solution to control chronic diseases, such as immunization controls infectious diseases.

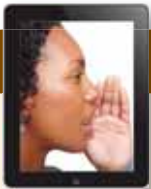
Second, physical activity and fitness can be significant contributors to disease/illness treatment. Even with the best disease prevention practices, some people will become ill. Regular exercise and good fitness have been shown to be effective in alleviating symptoms and aiding rehabilitation after illness for such hypokinetic conditions as diabetes, heart disease, and back pain.

Finally, physical activity and fitness contribute to quality of life and wellness, the positive component of good health. In the process, they aid in meeting many other national health goals.

**Too many adults suffer from hypokinetic disease, and the economic cost is high.** In 1961, Kraus and Raab coined the term *hypokinetic disease* to describe health problems associated with lack of physical activity. They showed how sedentary living, or as they called it, “take it easy” living, contributes to the leading killer diseases in our society.

A public advocacy group coined the term **sedentary death syndrome (SeDS)** to describe inactive living and associated hypokinetic disease risk factors. They indicate that SeDS is responsible for the epidemic of chronic disease in our society and resulting increases in health costs. In the next few years, expenditures for health care are expected to account for one-fifth of all spending in the United States.

**Regular physical activity over a lifetime may overcome the effects of inherited risk.** People with a family history of disease may believe they can do nothing because their heredity works against them. There is no doubt that heredity significantly affects risk for early death from hypokinetic diseases. New studies of twins, however, suggest that active people are less likely to die early than inactive people with similar genes. This suggests that long-term adherence to physical activity can overcome other risk factors, such as heredity.



### In the News

#### The Surgeon General's Vision for a Healthy and Fit Nation

A government report by the Surgeon General's Office (*The Surgeon General's Vision for a Healthy and Fit Nation*) emphasizes the importance of healthy lifestyles for improving our nation's health. The report specifically focuses on “helping Americans lead healthier lives through better nutrition and regular physical activity.” Combating overweight and obesity through healthy choices is the major goal. The report emphasizes that the current

epidemic of overweight and obesity threatens the historic progress we have made in increasing the quality and years of healthy life in Americans. Projections suggest that if trends continue, the current generation will have a shorter lifespan (on average) than their parents.

**Does this projected outcome surprise you? What needs to happen to reverse this trend?**

## Physical Activity and Cardiovascular Diseases

**The various types of cardiovascular disease are the leading killers in automated societies.** There are many forms of **cardiovascular disease (CVD)**. Some are classified as **coronary heart disease (CHD)** because they affect the heart muscle and the blood vessels that supply the heart. **Coronary occlusion** (heart attack) is a type of CHD. **Atherosclerosis** and **arteriosclerosis** are two conditions that increase risk for heart attack and are considered to be types of CHD. **Angina pectoris** (chest or arm pain), which occurs when the oxygen supply to the heart muscle is diminished, is sometimes considered to be a type of CHD, though it is really a symptom of poor circulation.

**Hypertension** (high blood pressure), **stroke** (brain attack), **peripheral vascular disease**, and **congestive heart failure** are other forms of CVD. Inactivity relates in some way to each of these types of disease.

In the United States, CVD accounts for more than 34 percent of all deaths. More than 81 million people currently have one or more forms of CVD. Men are more likely to suffer from heart disease than women, although the differences have narrowed in recent years. African American, Hispanic, and Native American populations are at higher than normal risk. Heart disease and stroke death rates are similar in the United States, Canada, Great Britain, Australia, and other automated societies.



**There is a wealth of statistical evidence that physical inactivity is a primary risk factor for CHD.** Much of the research relating inactivity to heart disease has come from occupational studies that show a high incidence of heart disease in people involved only in sedentary work. There are limitations in some of these studies but they collectively present convincing evidence that the inactive individual has an increased risk for coronary heart disease. A study summarizing all of the important occupational studies shows a 90 percent reduced risk for coronary heart disease for those in active versus inactive occupations.

The American Heart Association, after carefully examining the research literature, elevated sedentary living from a secondary to a primary risk factor, comparable to high blood pressure, high blood cholesterol, obesity, and cigarette smoke. The reason for this change is that inactivity increases risk in multiple ways and large numbers of adults are sedentary and vulnerable to these risks. The *Surgeon General's Report*

on *Physical Activity and Health* concluded that “physical inactivity is causally linked to atherosclerosis and coronary heart disease.”

**Hypokinetic Diseases or Conditions** *Hypo-* means “under” or “too little” and *kinetic* means “movement” or “activity.” Thus, *hypokinetic* means “too little activity.” A hypokinetic disease or condition is associated with lack of physical activity or too little regular exercise. Examples include heart disease, low back pain, and Type II diabetes.

**Chronic Diseases** Diseases or illnesses associated with lifestyle or environmental factors, as opposed to infectious diseases; hypokinetic diseases are considered to be chronic diseases.

**Sedentary Death Syndrome (SeDS)** A group of symptoms associated with sedentary living, including low health-related fitness (low cardiovascular fitness and weak muscles), low bone density, and the presence of metabolic syndrome (poor metabolic fitness).

**Cardiovascular Disease (CVD)** A broad classification of diseases of the heart and blood vessels that includes CHD, high blood pressure, stroke, and peripheral vascular disease.

**Coronary Heart Disease (CHD)** Diseases of the heart muscle and the blood vessels that supply it with oxygen, including heart attack.

**Coronary Occlusion** The blocking of the coronary blood vessels; sometimes called heart attack.

**Atherosclerosis** The deposition of materials along the arterial walls; a type of arteriosclerosis.

**Arteriosclerosis** Hardening of the arteries due to conditions that cause the arterial walls to become thick, hard, and nonelastic.

**Angina Pectoris** Chest or arm pain resulting from reduced oxygen supply to the heart muscle.

**Hypertension** High blood pressure; excessive pressure against the walls of the arteries that can damage the heart, kidneys, and other organs of the body.

**Stroke** A condition in which the brain, or part of the brain, receives insufficient oxygen as a result of diminished blood supply; sometimes called apoplexy or cerebrovascular accident (CVA).

**Peripheral Vascular Disease** A lack of oxygen supply to the working muscles and tissues of the arms and legs, resulting from decreased blood flow.

**Congestive Heart Failure** The inability of the heart muscle to pump the blood at a life-sustaining rate.

## Physical Activity and the Healthy Heart

**Regular exercise increases the heart muscle's ability to pump oxygen-rich blood.** A fit heart muscle can handle extra demands placed on it. Through regular exercise, the heart muscle gets stronger, contracts more forcefully, and therefore pumps more blood with each beat. The heart is just like any other muscle—it must be exercised regularly to stay fit. The fit heart also has open, clear arteries free of atherosclerosis (see Figure 1).

The “normal” resting heart rate is said to be 72 beats per minute (bpm). However, resting rates of 50 to 85 bpm are common. People who regularly do physical activity typically have lower resting heart rates than people who do no regular activity. Some endurance athletes have heart rates in the 30 and 40 bpm range, which is considered healthy or normal. Although resting heart rate is *not* considered to be a good measure of health or fitness, decreases in individual heart rate following training reflect positive adaptations. Low heart rates in response to a standard amount of physical activity *are* a good indicator of fitness. The bicycle and step tests presented later in this book use your heart rate response to a standard amount of exercise to estimate your cardiovascular fitness.

connect  
VIDEO 2

## Physical Activity and Atherosclerosis

**Atherosclerosis, which begins early in life, is implicated in many cardiovascular diseases.** Atherosclerosis is a condition that contributes to heart attack, stroke, hypertension, angina pectoris, and peripheral

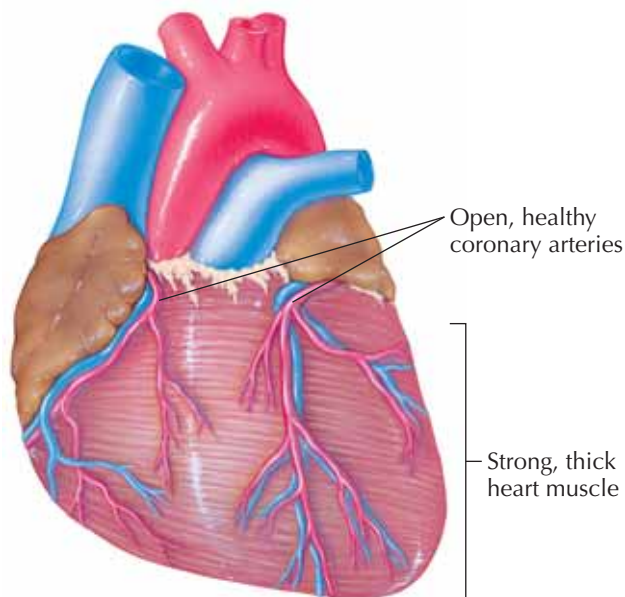


Figure 1 ► The fit heart muscle.

vascular disease. Deposits on the walls of arteries restrict blood flow and oxygen supply to the tissues. Atherosclerosis of the coronary arteries, the vessels that supply the heart muscle with oxygen, is particularly harmful. If these arteries become narrowed, the blood supply to the heart muscle is diminished, and angina pectoris may occur. Atherosclerosis increases the risk of heart attack because a fibrous clot is more likely to obstruct a narrowed artery than a healthy, open one.

Current theory suggests that atherosclerosis begins when damage occurs to the cells of the inner wall, or endothelium, of the artery (see Figure 2). Substances associated with blood clotting are attracted to the damaged area. These substances seem to cause the migration of smooth muscle cells, commonly found only in the middle wall of the artery (media), to the endothelium. In the later stages, fats (including cholesterol) and other substances are thought to be deposited, forming plaques, or protrusions, that diminish the internal diameter of the artery. This process was once thought to occur later in life but research indicates that the first signs of atherosclerosis begin in early childhood.

**Regular physical activity can help prevent atherosclerosis by lowering blood lipid levels.**

There are several kinds of **lipids** (fats) in the bloodstream, including **lipoproteins**, phospholipids, triglycerides, and cholesterol. Cholesterol is the most well known, but it is not the only culprit. Many blood fats are manufactured by the body itself, whereas others are ingested in high-fat foods, particularly saturated fats (fats that are solid at room temperature).

As noted earlier, blood lipids are thought to contribute to the development of atherosclerotic deposits on the inner walls of the artery. One substance, called

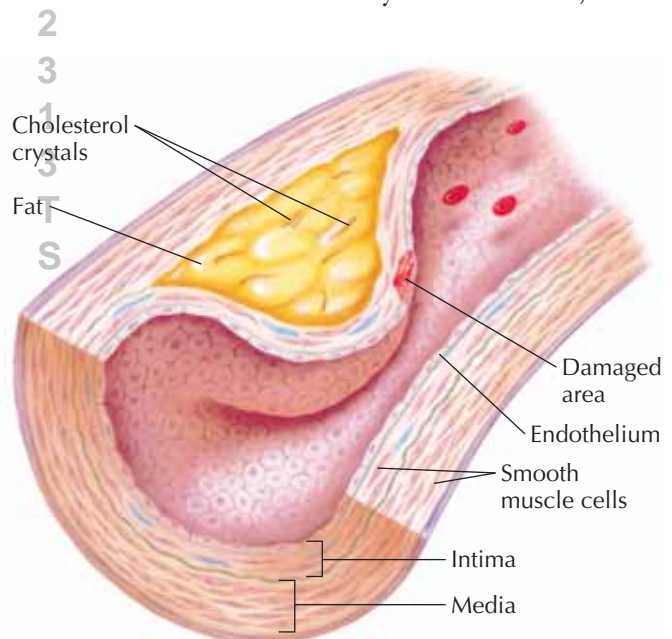


Figure 2 ► Atherosclerosis.

**low-density lipoprotein (LDL)**, is a major contributor to the development of atherosclerosis. LDL is basically a core of cholesterol surrounded by protein and another substance that makes it water soluble. The benefit of regular exercise is that it can reduce blood lipid levels, including LDL-C (the cholesterol core of LDL). People with high total cholesterol and LDL levels have a higher than normal risk for heart disease (see Table 1). New evidence indicates that there are subtypes of LDL cholesterol (characterized by their small size and high density) that pose even greater risks. These subtypes are hard to measure and not included in most current blood tests, but future research will no doubt help us better understand and measure them.

**Triglycerides** are another type of blood lipid. Elevated levels of triglycerides are related to heart disease. Triglycerides lose some of their ability to predict heart disease with the presence of other risk factors, so high levels are more difficult to interpret than other blood lipids. Normal levels are considered to be 150 mg/dL or less. Values of 151 to 199 are borderline, 200 to 499 are high, and above 500 are very high. It would be wise to include triglycerides in a blood lipid profile. Physical activity is often prescribed as part of a treatment for high triglyceride levels.

**Regular physical activity can help prevent atherosclerosis by increasing HDL in the blood.** Whereas LDLs carry a core of cholesterol that is involved in the development of atherosclerosis, **high-density lipoprotein (HDL)** picks up cholesterol and carries it to the liver, where it is eliminated from the body. HDL is often called the “good cholesterol” and is desirable. When having a blood test, ask for information about HDL as well as the other measures included in Table 1. Individuals who have regular physical activity usually have lower total cholesterol, lower LDL, and higher HDL levels than inactive people.

**Table 1 ► Cholesterol Classifications (mg/dL)\***

	Total (TC)	LDL-C	HDL-C	TC/HDL-C
Optimal	----	<100	----	
Near optimal	----	100–129	----	----
Desirable	<200	----	60+	----
Borderline	200–239	130–159	40–59	3.6–5.0
High risk	240+	160–189	<40	5.0+
Very high risk	----	>190	----	----

Source: Third Report of the National Cholesterol Education Program.  
 \*Different classification systems are used for each of the four measures (two to five categories). Blank (---) spaces are included for categories not used for each measure.

**Regular physical activity can help prevent atherosclerosis by reducing blood coagulants.**

**Fibrin** and platelets (types of cells involved in blood coagulation) deposit at the site of an injury on the wall of the artery, contributing to the process of plaque buildup, or atherosclerosis. Regular physical activity has been shown to reduce fibrin levels in the blood. The breakdown of fibrin seems to reduce platelet adhesiveness and the concentration of platelets in the blood.

**Other indicators of inflammation of the arteries are predictive of atherosclerosis.**

Recently, a number of other constituents in the blood have been shown to be associated with risk for cardiovascular disease. Among these are indicators of inflammation inside the arteries, such as C-reactive protein (CRP), interleukin-6 (IL-6), Chlamydia pneumonia heat shock protein (Cp-HSP60), and tumor necrosis factor-a (TNF-a). These compounds are not necessarily causes of atherosclerosis, but they are indicators of inflammatory processes that lead to plaque formation. Inflammatory processes also soften existing plaque and increase the likelihood of plaque rupture or the formation of clots, which can directly precipitate heart attacks.

The inner wall of the artery (endothelium) was once thought to be a relatively passive layer of tissue that merely lines the artery. However, recent evidence suggests that it is an active layer of tissue that functions in several ways in addition to providing a protective barrier. For example, sensing units in the endothelium stimulate production of agents that regulate blood flow by dilating and constricting the artery. The released substances can help prevent the buildup of deposits on the arterial wall. However, when the inner wall of the artery ceases to function effectively, it increases the risk of plaque buildup.

CRP is one of the most studied indicators of a dysfunctional endothelium. Screening for elevated levels of CRP is now commonly done to identify patients that may be at risk

**Lipids** All fats and fatty substances.

**Lipoproteins** Fat-carrying proteins in the blood.

**Low-Density Lipoprotein (LDL)** A core of cholesterol surrounded by protein; the core is often called “bad cholesterol.”

**Triglycerides** A type of blood fat associated with increased risk for heart disease.

**High-Density Lipoprotein (HDL)** A blood substance that picks up cholesterol and helps remove it from the body; often called “good cholesterol.”

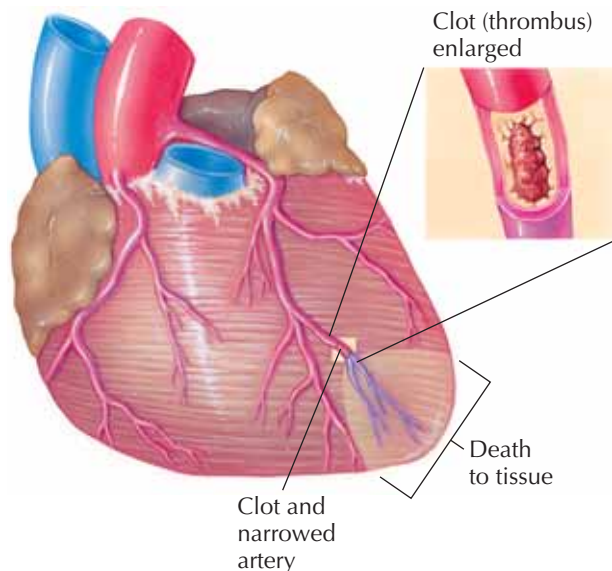
**Fibrin** A sticky, threadlike substance that, in combination with blood cells, forms a blood clot.

for heart disease. Preliminary standards from the American Heart Association suggest that levels below 1 mg/L indicate low risk, levels between 1 mg/L and 3 mg/L indicate moderate risk, and above 3 mg/L indicate high risk.

High levels of the amino acid homocysteine have also been associated with increased risk for heart disease, though the American Heart Association says it is too early to begin screening for it. Tentative fasting values have been established at 5 to 15 millimoles per liter of blood for the normal range, 16 to 30 as moderate, 31 to 100 as intermediate, and above 100 as high. Recent research suggests that healthy lifestyles can help reduce the risk of arterial inflammation. For example, studies show that regular physical activity can promote endothelial health, and nutrition can help reduce markers of inflammation. Adequate levels of folic acid, vitamins B-6 and B-12 help prevent high blood homocysteine levels, so eating foods that ensure adequate daily intake of these vitamins is recommended.

## Physical Activity and Heart Attack

**Regular physical activity reduces the risk for heart attack, the most prevalent and serious of all cardiovascular diseases.** A heart attack (coronary occlusion) occurs when a coronary artery is blocked (see Figure 3). A clot, or thrombus, is the most common cause, reducing or cutting off blood flow and oxygen to the heart muscle. If the blocked coronary artery supplies a major portion of the heart muscle, death will occur within minutes. Occlusions of lesser arteries may result in angina pectoris or a nonfatal heart attack.



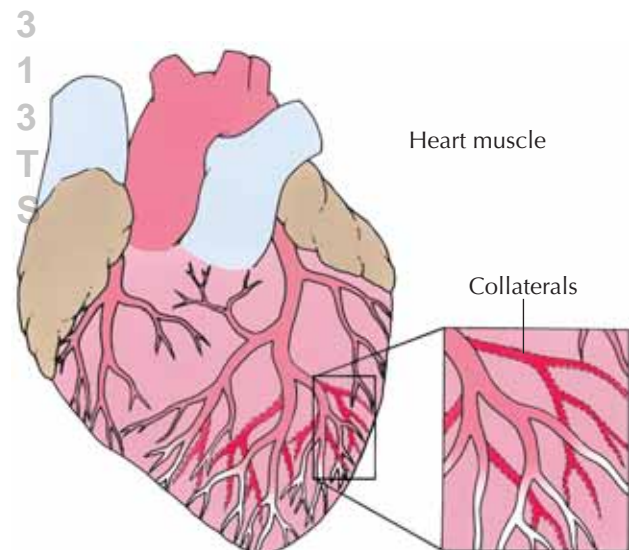
**Figure 3** ► Heart attack.

People who perform regular physical activity have half the risk for a first heart attack, compared with those who are sedentary. Possible reasons are less atherosclerosis, greater diameter of arteries, and less chance of a clot forming.

**Regular exercise can improve coronary circulation and, thus, reduce the chances of a heart attack or dying from one.** Within the heart, many tiny branches extend from the major coronary arteries. All of these vessels supply blood to the heart muscle. Active people are likely to have greater blood-carrying capacity in these vessels, probably because the vessels are larger and more elastic. Also, the active person may have a more profuse distribution of arteries within the heart muscle (see Figure 4), which results in greater blood flow. A few studies show that physical activity may promote the growth of “extra” blood vessels, which are thought to open up to provide the heart muscle with the necessary blood and oxygen when the oxygen supply is diminished, as in a heart attack. Blood flow from extra blood vessels is referred to as **coronary collateral circulation**.

Improved coronary circulation may provide protection against a heart attack because a larger artery would require more atherosclerosis to occlude it. In addition, the development of collateral blood vessels supplying the heart may diminish the effects of a heart attack, as these extra (or collateral) blood vessels may take over the function of regular blood vessels.

**The heart of an inactive person is less able to resist stress and is more susceptible to an emotional storm that may precipitate a heart attack.** The heart is rendered inefficient by one or more of the following circumstances: high heart rate, high blood pressure, and excessive stimulation. All of these conditions require the



**Figure 4** ► Coronary collateral circulation.

heart to use more oxygen than is normal and decrease its ability to adapt to stressful situations.

The inefficient heart beats rapidly because it is dominated by the **sympathetic nervous system**, which speeds up the heart rate. Thus, the heart continuously beats rapidly, even at rest, and never has a true rest period. High blood pressure also makes the heart work harder and contributes to its inefficiency.

Research indicates that regular physical activity can:

- lead to dominance of the **parasympathetic nervous system**, which slows heart rate and helps the heart work efficiently;
- help the heart rate return to normal faster after emotional stress;
- strengthen the heart muscle, making it better able to weather an **emotional storm**;
- reduce hormonal effects on the heart, thus lessening the chances of circulatory problems;
- reduce the risk of sudden death from ventricular fibrillation (arrhythmic heartbeat).

**Regular physical activity is one effective means of rehabilitation for a person who has coronary heart disease or who has had a heart attack.** Not only does regular physical activity seem to reduce the risk of developing coronary heart disease, but those who already have the condition may reduce the symptoms of the disease through regular exercise. For people who have had heart attacks, regular and progressive exercise can be an effective prescription when carried out under the supervision of a physician. Remember, however, that exercise is not the treatment of preference for all heart attack victims. In some cases, it is harmful.

## Physical Activity and Other Cardiovascular Diseases

**Regular physical activity is associated with a reduced risk for high blood pressure (hypertension).** “Normal” **systolic blood pressure** is 120 mm Hg or less and normal **diastolic blood pressure** is 80 mm Hg or less. Prehypertension is a condition that exists when your blood pressure is higher than normal but not high enough to be considered hypertension (see Table 2). Prehypertension has been linked to higher than normal risk of heart attack and, though not as serious as hypertension, should be taken seriously. Nearly one-third of American adults have high blood pressure. High blood pressure is associated with heart disease, stroke, diabetes, and many other diseases. African Americans, Hispanics, and Native Americans have higher incidence than White non-Hispanics. Older people have higher incidence than younger people.

**Table 2 ▶ Blood Pressure Classifications for Adults\***

Category	Systolic Blood Pressure (mm Hg)	Diastolic Blood Pressure (mm Hg)
Normal	<120	<80
Prehypertensive	121–139	81–89
Stage 1 hypertension	140–159	90–99
Stage 2 hypertension	>160	>100

Source: National Heart, Lung, and Blood Institute.  
 \*Not taking antihypertensive drugs and not acutely ill. When the systolic and diastolic blood pressure categories vary, the higher reading determines the blood pressure classification.

High blood pressure is sometimes referred to as the “silent killer” because nearly one-third of people with elevated blood pressure do not know they have it. It is important to monitor your blood pressure on a regular basis. With practice and good equipment, you can accurately measure your own blood pressure. Because blood pressure can be elevated by emotions and circumstances, a single measurement may not be accurate, so at least two separate measurements are recommended. While self-assessments can be helpful, they are not a substitute for periodic assessments by a qualified medical person.

Exceptionally low blood pressures (below 100 systolic and 60 diastolic) do not pose the same risks to health as

**Coronary Collateral Circulation** Circulation of blood to the heart muscle associated with the blood-carrying capacity of a specific vessel or development of collateral vessels (extra blood vessels).

**Sympathetic Nervous System** The branch of the autonomic nervous system that prepares the body for activity by speeding up the heart rate.

**Parasympathetic Nervous System** The branch of the autonomic nervous system that slows the heart rate.

**Emotional Storm** A traumatic emotional experience that is likely to affect the human organism physiologically.

**Systolic Blood Pressure** The upper blood pressure number, often called working blood pressure. It represents the pressure in the arteries at its highest level just after the heart beats.

**Diastolic Blood Pressure** The lower blood pressure number, often called “resting pressure.” It is the pressure in the arteries at its lowest level occurring just before the next beat of the heart.



## TECHNOLOGY UPDATE

### Heart360

Physical inactivity is one of the primary risks for cardiovascular disease. The American Heart Association has released a free, Web-based tracking tool ([www.Heart360.org](http://www.Heart360.org)) that allows individuals to record and monitor changes in key risk factors over time, including blood pressure, cholesterol, blood glucose, inactivity, and body mass index (BMI). With this tool, you create a secure “health vault” account to save confidential health data. The site evaluates your risk profiles and provides links to educational resources. If your physician has a provider account, you can share results with your physician.

*Would this type of tool help you adopt heart-healthy lifestyles? Would the connection with your physician make you more accountable?*



high blood pressure but can cause dizziness, fainting, and lack of tolerance to change in body positions.

A recent research summary indicates that the effects of physical activity on blood pressure are more dramatic than previously thought and are independent of age, body fatness, and other factors. Inactive, less fit individuals have a 30 to 50 percent greater chance of being hypertensive than active, fit people. Regular physical activity can also be one effective method of reducing blood pressure for those with prehypertension or hypertension. Physical inactivity in middle age is associated with risk for high blood pressure later in life. The most plausible reason is a reduction in resistance to blood flow in the blood vessels, probably resulting from dilation of the vessels.

**Regular physical activity can help reduce the risk for stroke.** Stroke is a major killer of adults. People with high blood pressure and atherosclerosis are susceptible to stroke. Since regular exercise and good fitness are important to the prevention of high blood pressure and atherosclerosis, exercise and fitness are considered helpful in the prevention of stroke.

**Regular physical activity is helpful in preventing peripheral vascular disease.** People who exercise regularly have better blood flow to the working muscles and other tissues than inactive, unfit people. Since peripheral vascular disease is associated with poor circulation to the extremities, regular exercise can be considered one method of preventing this condition.

**Many factors in addition to healthy lifestyle have led to a significant reduction in cardiovascular disease deaths in recent years.** While lifestyle changes such as being active, eating well, managing stress, and abstaining from tobacco use are important in the prevention and treatment of cardiovascular diseases, a variety of other factors have contributed to the recent decrease in deaths associated with the diseases. Heart disease is still the leading killer of both men and women.

In the late 1990s deaths exceeded one million per year, but death rates from heart disease have decreased by more than 29 percent. Some of the reasons for that decline, other than healthy lifestyle change, include earlier and better detection (e.g., exercise tests, angiograms,

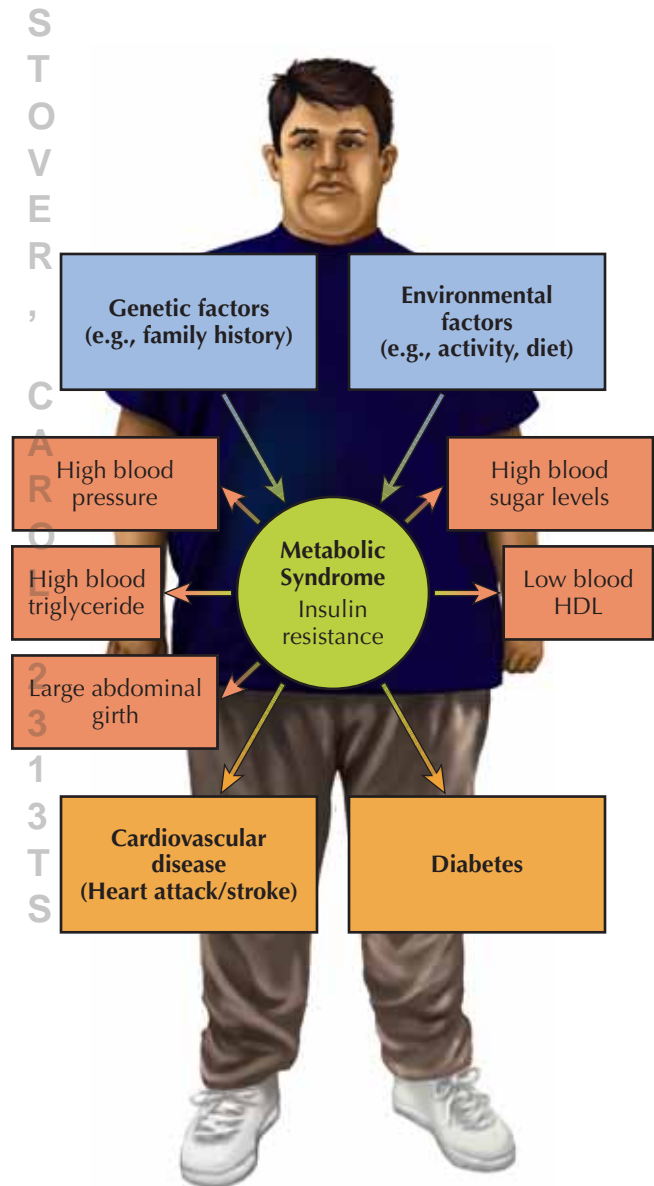


Figure 5 ► Mechanism and effects of metabolic syndrome.

CT scans) and better emergency care. Improved medications for lowering blood fat levels (e.g., blood thinners, including aspirin) and lowering blood pressure levels have also played a role and less invasive surgical methods (e.g., angioplasty, stents) and improvements in postcoronary care.

## Physical Activity and Metabolic Syndrome

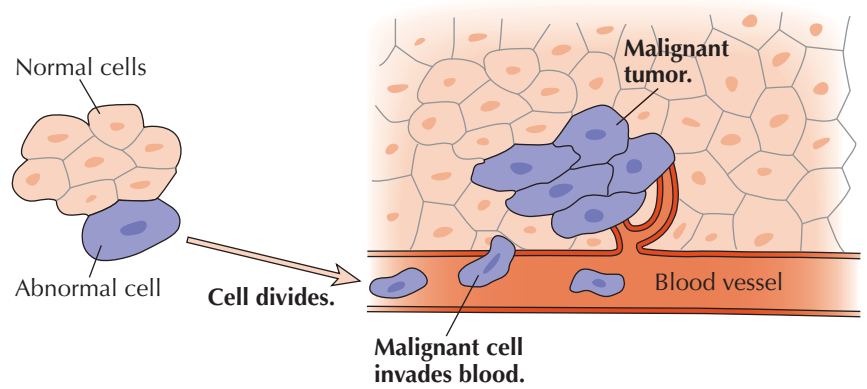
**Physical inactivity is associated with metabolic syndrome.** Metabolic

syndrome is the opposite of good metabolic fitness, as discussed in Concept 1. Several groups, including the American Heart Association and the American Medical Association, have defined the characteristics of metabolic syndrome (see Figure 5). People with at least three of the following characteristics have metabolic syndrome: blood pressure above 130/85, a fasting blood sugar level of 100 or higher, blood triglycerides of 150 or above, a low blood HDL level (less than 40 for men and less than 50 for women), and/or a high abdominal circumference (equal to or above 40 inches for men or 35 inches for women).

**People with metabolic syndrome have a higher than normal risk of chronic diseases, such as diabetes, heart disease, and stroke.** A questionnaire developed by researchers who conducted the Framingham Heart Study uses metabolic measures and several other measures to predict heart disease. This questionnaire is better at predicting heart disease than metabolic syndrome alone, but metabolic syndrome is a better predictor of diabetes. Lab 4A at the end of the concept can be used by those who do not have the necessary metabolic syndrome measures, though having a metabolic fitness assessment is advised periodically, especially as you grow older.

## Physical Activity and Other Hypokinetic Conditions

**Physical activity reduces the risk of some forms of cancer.** According to the American Cancer Society (ACS), cancer is a group of many different conditions characterized by abnormal, uncontrolled cell growth. As illustrated in Figure 6, the abnormal cells divide, forming **malignant tumors (carcinomas)**. If the abnormal cells reach the blood, they can spread, causing tumors elsewhere in the body. **Benign tumors** are generally



**Figure 6 ▶** The spread of cancer (metastasis).

not considered to be cancerous because their growth is restricted to a specific area of the body by a protective membrane. The first editions of this book did not include any form of cancer as a hypokinetic disease. We now know, however, that overall death rates from some types of cancer are lower among active people than those who are sedentary. These cancers are described in Table 3 with possible reasons for the cancer/inactivity link. The

**Table 3 ▶** Physical Activity and Cancer

Cancer Type	Effect of Physical Activity
Colon	Exercise speeds movement of food and cancer-causing substances through the digestive system, and reduces prostaglandins (substances linked to cancer in the colon).
Breast	Exercise decreases the amount of exposure of breast tissue to circulating estrogen. Lower body fat is also associated with lower estrogen levels. Early life activity is deemed important for both reasons. Fatigue from therapy is reduced by exercise.
Rectal	Similar to colon cancer, exercise leads to more regular bowel movements and reduces "transit time."
Prostate	Fatigue from therapy is reduced by exercise. Regular exercise, especially vigorous exercise, may reduce death rate.

**Malignant Tumors (carcinomas)** An uncontrolled and dangerous growth capable of spreading to other areas; a cancerous tumor.

**Benign Tumors** An abnormal growth of tissue confined to a particular area; not considered to be cancer.

entries in Table 3 are listed in order based on the strength of evidence supporting the cancer/inactivity link.

As indicated in Concept 1, cancer is a leading cause of death. In the United States cancer causes more than 560,000 deaths annually. However, the five-year survival rate for people diagnosed with cancer is up 50 percent over the past three decades. Many factors are responsible, including early diagnosis and improved medical treatments. Healthy lifestyles can also play a role. The American Cancer Society (ACS) guidelines highlight the importance of regular physical activity and a healthy diet in preventing cancer and early death. Physical activity is also considered to be important to the wellness of the cancer patient in many ways, including improved quality of life, physical functioning, and self-esteem, as well as less dependence on others, reduced risk for other diseases, and reduced fatigue from disease or disease therapy. The ACS and the Lance Armstrong Foundation ([www.Livestrong.org](http://www.Livestrong.org)) are two good sources of information about cancer and cancer treatments.



**Physical activity plays a role in the management and treatment of Type II diabetes.** Diabetes mellitus (diabetes) is a group of disorders that results when there is too much sugar in the blood. It occurs when the body does not make enough **insulin** or when the body is not able to use insulin effectively.

Type I diabetes, or insulin-dependent diabetes, accounts for a relatively small number of the diabetes cases and is not considered to be a hypokinetic condition. Type II diabetes (often not insulin-dependent) was formerly called “adult-onset diabetes.” Reports indicate more cases of Type II diabetes among children than in the past, in part because of better record keeping but also because of increases in obesity among children in recent years.

Diabetes is the seventh leading cause of death among people over 40. It accounts for at least 10 percent of all short-term hospital stays and has a major impact on health-care costs in Western society. According to the American Diabetes Association (ADA), there are nearly 24 million people in the United States with diabetes (7.8 percent of the population). Unfortunately, 5.7 million of those don’t know it. An estimated additional 57 million are prediabetic; they have metabolic profiles characteristic of those with diabetes (see Web Resources, ADA, or Canadian Diabetes Association, for more statistics).

People who perform regular physical activity are less likely to suffer from Type II diabetes than sedentary people. For people with Type II diabetes, regular physical activity can help reduce body fatness, decrease **insulin resistance**, improve **insulin sensitivity**, and improve the body’s ability to clear sugar from the blood

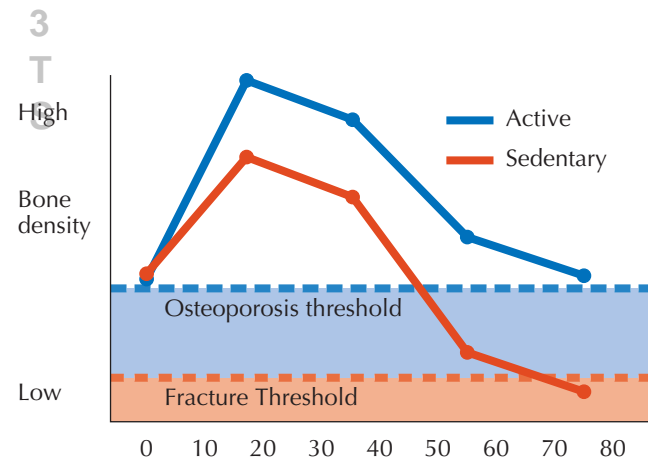
in a reasonable time. With sound nutritional habits and proper medication, physical activity can be useful in the management of both types of diabetes.



**Regular physical activity is important to maintaining bone density and decreasing risk for osteoporosis.**

As noted in Concept 1, some experts consider bone integrity to be a health-related component of physical fitness. Bone density cannot be self-assessed. It is measured using a dual X-ray absorptiometry (DXA) machine, an expensive and sophisticated form of X-ray machine that can also be used to measure body fatness. Healthy bones are dense and strong. When bones lose calcium and become less dense, they become porous and are at risk for fracture. The bones of young children are not especially dense, but during adolescence and early adulthood (see Figure 7), bones increase in density to a level higher than any other time in life (peak bone density). Though bone density often begins to decrease in young adulthood, it is not until older adulthood that bone loss becomes dramatic. Over time, if bone loss continues, older adults become susceptible to a condition called **osteoporosis** (bone density drops below the osteoporosis threshold). Some will have crossed the fracture threshold, putting them at risk for fractures, especially to the hip, vertebrae, and other “soft” or “spongy” bones of the skeletal system. Active people have a higher peak bone mass and are more resistant to osteoporosis (see blue line in Figure 7) than sedentary people (see red line in Figure 7).

Women, especially postmenopausal women, have a higher risk of osteoporosis than men, but it is a disease of both sexes. Although Figure 7 reflects the combined bone density status for men and women, males typically have a higher peak bone mass than females, and for this reason, males can lose more bone density over time without reaching the osteoporosis or fracture thresholds. More women reach the osteoporosis and fracture thresholds at



**Figure 7** ► Changes in bone density with age.

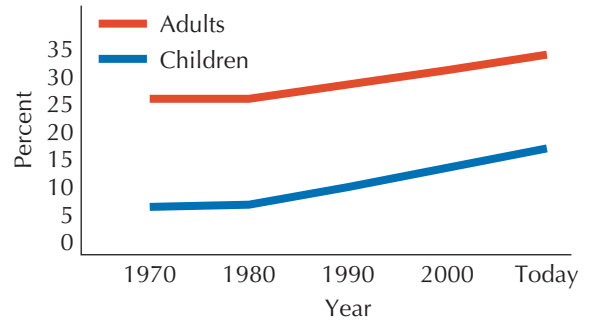
earlier ages than men. Other risk factors for osteoporosis are age, family history/heredity, frame size, smoking, caffeine use, alcohol use, current or previous eating disorders, early menstruation, low dietary calcium intake, low body fat, amenorrhea, and extended bed rest.

The National Osteoporosis Foundation (NOF) recommends five steps to bone health and osteoporosis prevention:

- Get daily recommended amounts of calcium and vitamin D. Eat a diet rich in both nutrients. Exposure to the sun provides a source of vitamin D. The NOF recommends 1,000 mg of calcium daily for people under 50, and 1,200 mg for those over 50. Adults under age 50 need 400–800 IU of vitamin D, and adults over 50 need 800–1,000 units. If you have difficulty getting enough of these nutrients from food or sunlight, your health-care provider may recommend a supplement.
- Engage in regular weight-bearing exercise. Weight-bearing exercise (e.g., walking, dancing, jogging) and resistance training are good choices. The load bearing and pull of muscles build bone density.
- Avoid smoking and excessive alcohol.
- Talk to your health-care provider about bone health.
- When appropriate, have a bone density test and take medication. There is no cure for osteoporosis, but the FDA has approved a variety of treatments for osteoporosis to help reduce bone loss over time. When appropriate, a physician may prescribe FDA-approved medications such as raloxifene (sold as Evista), alendronate (sold as Fosamax), or other approved drugs. Hormone treatments such as thyroid-based Calcitonin treatments and estrogen are approved. Estrogen replacement therapy (ERT), also known as hormone replacement treatment (HRT), can reduce risk of osteoporosis among postmenopausal women, but may increase risk for cancer and other diseases. Medical consultation based on individual factors is recommended.



**Active people who possess good muscle fitness are less likely to have back and musculoskeletal problems than are inactive, unfit people.** Because few people die from it, back pain does not receive the attention given to such medical problems as heart disease and cancer. But back pain is the second leading medical complaint in the United States, second only to headaches. Only the common cold and the flu cause more days lost from work. At some point in our lives, approximately 80 percent of all adults experience back pain that limits the ability to function normally. In National Safety Council data, the back was the most frequently injured of all body parts, and the injury rate was double that of any other part of the body.



**Figure 8** ► Incidence of obesity.

Source: National Center for Health Statistics.

The great majority of back ailments are the result of poor muscle strength, low levels of endurance, and poor flexibility. Tests on patients with back problems show weakness and lack of flexibility in key muscle groups.

Lack of fitness is probably the leading reason for back pain in Western society. Other factors also increase the risk of back ailments, including poor posture, improper lifting and work habits, heredity, and disease states such as scoliosis and arthritis.

**Physical activity is important in maintaining a healthy body weight and avoiding the numerous health conditions associated with obesity.** National studies indicate that more than two-thirds of adults are overweight and more than one-third are obese (32.2 percent of men and 35.5 percent of women). Nearly a third of children are either overweight or obese. From 1950 through 1980, obesity (15 percent) and overweight were fairly stable but increased dramatically from 1980 to the present. In the past few years the rate of increase in overweight and obesity has not been as dramatic as during the previous decade (see Figure 8). Obesity is not a disease state in itself but is a hypokinetic condition associated with a multitude of far-reaching complications. Research has shown that fat people who are fit

**Insulin** A hormone secreted by the pancreas that regulates levels of sugar in the blood.

**Insulin Resistance** A condition that occurs when insulin becomes ineffective or less effective than necessary to regulate sugar levels in the blood.

**Insulin Sensitivity** A person with insulin resistance (see previous definition) is said to have decreased insulin sensitivity. The body’s cells are not sensitive to insulin, so they resist it and sugar levels are not regulated effectively.

**Osteoporosis** A condition associated with low bone density and subsequent bone fragility, leading to high risk for fracture.

are not at especially high risk for early death. However, when high body fatness is accompanied by low cardiovascular and low metabolic fitness, risk for early death increases substantially. For more information on obesity, see Concept 13.

**Physical activity reduces the risk and severity of a variety of common emotional/mental health disorders.** Nearly half of adult Americans will report having a mental health disorder at some point in life. A recent summary of studies revealed that there are several emotional/mental disorders associated with inactive lifestyles.

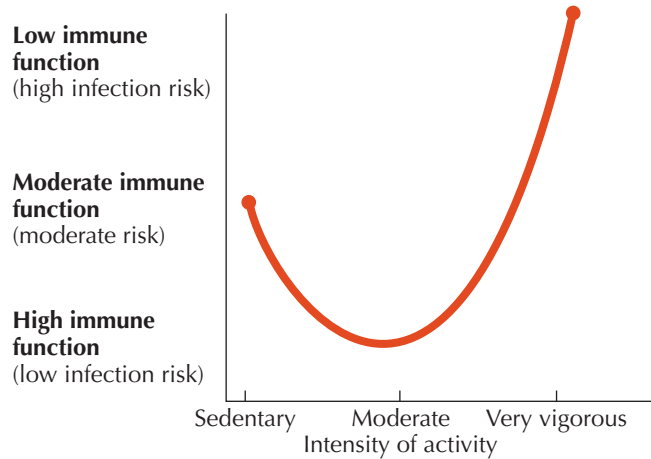
Depression is a stress-related condition experienced by many adults. Thirty-three percent of inactive adults report that they often feel depressed. For some, depression is a serious disorder that physical activity alone will not cure; however, research indicates that activity, combined with other forms of therapy, can be effective.

Anxiety is an emotional condition characterized by worry, self-doubt, and apprehension. More than a few studies have shown that symptoms of anxiety can be reduced by regular activity. Low-fit people who do regular aerobic activity seem to benefit the most. In one study, one-third of active people felt that regular activity helped them cope better with life's pressures.

Physical activity is also associated with better and more restful sleep. People with insomnia (the inability to sleep) seem to benefit from regular activity if it is not done too vigorously right before going to bed. A recent study indicates that 52 percent of the population feel that physical activity helps them sleep better. Regular aerobic activity is associated with reduced brain activation, which can result in greater ability to relax or fall asleep.

A final benefit of regular exercise is increased self-esteem. Improvements in fitness, appearance, and the ability to perform new tasks can improve self-confidence.

**Physical activity can help the immune system fight illness.** Until recently, infectious disease and other diseases of the immune system were not considered to be hypokinetic. Recent evidence indicates that regular moderate to vigorous activity can actually aid the immune system in fighting disease. Each of us is born with an “innate immune system,” which includes anatomical and physiological barriers, such as skin, mucous membranes, body temperature, and chemical mediators that help prevent and resist disease. We also develop an “acquired immune system” in the form of special disease-fighting cells that help us resist disease. Figure 9 shows a J-shaped curve that illustrates the benefits of exercise to acquired immune function. Sedentary people have more risk than those who do moderate activity, but with very high and sustained vigorous activity, such as extended high performance training, immune system function actually decreases.



**Figure 9** ► Physical activity and immune function.

Regular moderate and reasonable amounts of vigorous activity have been shown to reduce incidence of colds and days of sickness from infection. The immune system benefit may extend to other immune system disorders as well. There is evidence that regular physical activity can enhance treatment effectiveness and improve quality of life for those with HIV/AIDS. However, as Figure 9 indicates, too much exercise may cause problems rather than solve them.



**Physical activity during pregnancy can benefit both the mother and the child.** In the not too distant past, exercise during pregnancy was discouraged. Over the years, evidence has shown that appropriate exercise (including resistance training and moderate to vigorous aerobic exercise) by pregnant women can help prevent excess weight gain, help retain pre-pregnancy fitness levels, and result in shorter, less complicated labor. Physical activity does not cause damage to the baby or miscarriage and may help the baby developmentally.

Pregnant women are nearly twice as likely to be sedentary (fail to meet current activity guidelines) than other women in spite of the fact that guidelines from the American College of Obstetricians and Gynecologists indicate that most women should meet national guidelines as described in this book. More intense exercise is appropriate in many cases but should be done with “close medical supervision.”

**Regular physical activity can have positive effects on some nonhypokinetic conditions.** The following non-hypokinetic conditions can benefit from physical activity:

- **Arthritis.** Many, if not most, arthritics are in a deconditioned state resulting from a lack of activity. The traditional advice that arthritics should avoid physical activity is now being modified in view of the findings that carefully prescribed exercise has a variety

of benefits. Common problems for both those with rheumatoid arthritis (RA) and osteoarthritis (OA) are decreased strength, loss of range of motion, and poor cardiovascular endurance. Well-planned exercise, designed to meet the needs of the specific type of arthritis of the individual, can be beneficial in preventing and treating impairments, and enhancing function, general fitness, and well-being.

- *Asthma.* Asthmatics often have physical activity limitations, but with proper management activity can be part of their daily life. In fact, when done properly, activity can reduce airway reactivity and medication use. Because exercise can trigger bronchial constriction, it is important to choose appropriate types of activity and to use inhaled medications to prevent bronchial constriction caused by exercise or other triggers, such as cold weather. Asthmatics should avoid cold weather exercise.
- *Premenstrual syndrome (PMS).* PMS, a mixture of physical and emotional symptoms that occurs prior to menstruation, has many causes. However, changes in lifestyle, including regular exercise, may be effective in relieving PMS symptoms.
- *Cystic fibrosis.* A recent review indicates that exercise helps cystic fibrosis patients by facilitating systemic improvements and, more importantly, enhancing quality of life.
- *Other conditions.* Low- to moderate-intensity aerobic activity and resistance training are prescribed for some people who have chronic pain (persistent pain without relief) and/or fibromyalgia (chronic muscle pain). Evidence also suggests that active people have a reduced chance of having gallstones than inactive people. Activity may also decrease risk of impotence.

## Physical Activity and Aging

**Regular physical activity can improve fitness and functioning among older adults.** Approximately 30 percent of adults age 70 and over have difficulty with one or more activities of daily living. Women have more limitations than men, and low-income groups have more limitations than higher-income groups. Nearly one-half of these adults also get no assistance in coping with their limitations.

The inability to function effectively as you grow older is associated with lack of fitness and inactive lifestyles. This loss of function is sometimes referred to as “acquired aging,” as opposed to “time-dependent” aging. Because so many people experience limitations in daily activities and find it difficult to get assistance, it is especially important for older people to stay active and fit.

In general, older adults are much less active than younger adults. Losses in muscle fitness are associated with loss of balance, greater risk of falling, and less

ability to function independently. Studies also show that exercise can enhance cognitive functioning and perhaps reduce risk for dementia. Though the amount of activity performed must be adapted as people grow older, fitness benefits discussed in the next section and throughout this book apply to people of all ages.

### Regular physical activity can compress illness into a shorter period of our life.

An important national health goal is to increase the years of healthy life. Living longer is important, but being able to function effectively during all years of life is equally—if not more—important. *Compression of illness*, also called compression of morbidity, refers to shortening the total number of years that illnesses and disabilities occur. Healthy lifestyles, including regular physical activity, have been shown to compress illness and increase years of effective functioning. Inactive people not only have a shorter lifespan, but also have more years of illness and disability than active people.

### Recent evidence indicates that Alzheimer’s disease and dementia are hypokinetic conditions.

More than a few studies indicate that factors relating to heart health also contribute to brain health. The studies indicate that physical and challenging mental activities are especially important for preventing decline in cognitive function and reducing the risk of developing Alzheimer’s and dementia. Although additional research is needed, this is important news for physicians and public health officials looking for ways to reduce the prevalence of Alzheimer’s disease.

## Physical Activity, Health, and Wellness

### Good health-related physical fitness and regular physical activity contribute to optimal wellness.

Regular physical activity and good fitness not only help prevent illness (see Figure 10) and disease but also promote quality of life and wellness. Good health-related physical fitness can help you look good, feel good, and enjoy life. Specific benefits of wellness associated with good fitness are the following:

- *Good physical fitness can help an individual work effectively and efficiently.* A person who can resist fatigue, muscle soreness, back problems, and other symptoms associated with poor health-related fitness is capable of working productively and having energy left over at the end of the day.
- *Good physical fitness can help an individual enjoy leisure time.* A fit person is more likely to get and stay involved in leisure-time activities than an unfit person. Enjoying your leisure time may not add years to your life but can add life to your years.



Regular physical activity promotes healthy aging and high quality of life.

- *Good physical fitness is essential to effective living.* Although the need for each component of physical fitness is specific to each individual, every person requires enough fitness to perform normal daily activities without undue fatigue. Whether it be walking, performing household chores, or merely enjoying the simple things in life without pain or fear of injury, good fitness is important to all people.
- *Physical fitness is the basis for dynamic and creative activity.* Though the following quotation by former President John F. Kennedy is more than 50 years old, it clearly points out the importance of physical fitness:

“The relationship between the soundness of the body and the activity of the mind is subtle and complex. Much is not yet understood, but we know what the Greeks knew: that intelligence and skill can only function at the peak of their capacity when the body is healthy and strong, and that hardy spirits and tough minds usually inhabit sound bodies. Physical fitness is the basis of all activities in our society; if our bodies grow soft and inactive, if we fail to encourage physical development and prowess, we will undermine our capacity for thought, for work, and for the use of those skills vital to an expanding and complex America.”

President Kennedy’s belief that activity and fitness are associated with intellectual functioning has now been backed up with research. A recent research summary suggests that, though modest, the effect of activity

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

The benefits associated with regular physical activity are enormous and have been well documented—but participation in exercise and physical activity still remains low. A YouTube video by Dr. Mike Evans called “23 and ½ Hours” presents a compelling challenge to viewers—commit 30 minutes a day to physical activity to ensure that you get the basic health benefits that come from physical activity. The video features the research of Dr. Steve Blair, the editor of the *Surgeon General’s Report on Physical Activity and Health*. (Search for “23 and 1/2 Hours” on the Internet.)

**STOVE REACT** Do you think this type of video would change people’s perception of activity if it went viral?

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and fitness on intellectual functioning is positive. One study shows activity to foster new brain cell growth. Time taken to be active during the day has been shown to help children learn more, even though less time is spent in intellectual pursuits.

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VIDEO 7

- *Good physical fitness may help you function safely and handle unexpected emergencies.* Emergencies are never expected, but, when they do arise, they often demand performance that requires good fitness. For example, flood victims may need to fill sandbags for hours without rest, and accident victims may be required to walk or run long distances for help.

## Physical activity is a major part of most employee health promotion programs.

Companies have come to understand the importance of promoting healthy lifestyles among their employees. Work-site health promotion programs typically use a broad focus on promoting a variety of healthy lifestyles, but physical activity is considered the mainstay of most programs. To facilitate active lifestyles, many companies build their own fitness centers inside the workplace or provide free or reduced-cost memberships for employees. Work-site programs that promote activity can reduce risk factors in employees and help companies control the high cost of health care. Companies that offer comprehensive programs frequently save more than \$4 for each dollar invested. The expansion of work-site health programs is viewed as a critical public health priority and one of the most promising approaches for controlling health-care costs.

## Too much activity can lead to hyperkinetic conditions.

The information presented in this concept points out the health benefits of physical activity performed in appropriate amounts. When done in excess or incorrectly, physical activity can result in



**Figure 10** ► Health and wellness benefits of physical activity and fitness.

**hyperkinetic conditions.** The most common hyperkinetic condition is overuse injury to muscles, connective tissue, and bones. Recently, anorexia nervosa and body neurosis have been identified as conditions associated with inappropriate amounts of physical activity. These conditions will be discussed in the concept on performance.

**Hyperkinetic Conditions** Diseases/illnesses or health conditions caused, or contributed to, by too much physical activity.



### Physical activity is now recognized as effective “medicine” for prevention of chronic disease.

Since physical activity is still not widely prescribed or promoted by medical professionals, the American College of Sports Medicine (ACSM) initiated a program called “Exercise Is Medicine (EIM)” designed to “encourage primary care physicians, and other health care providers, to assess and review every patient’s physical activity program at every visit.” The initiative has taken off both in the United States and internationally. The website ([www.exerciseismedicine.org](http://www.exerciseismedicine.org)) provides information to the general public, health-care providers, health and fitness professionals, and the media.

**There are many positive lifestyles that can reduce the risk for disease and promote health and wellness.** Inactivity, poor nutrition, smoking, and inability to cope with stress are all risk factors associated with various diseases (see Table 4). Changing these behaviors can dramatically reduce the risk for chronic diseases. Recognize, however, that three risk factors (age, heredity, and gender) are not within your control.

By adopting healthy lifestyles, you can take control over the preventable disease risks. For example, controlling body fatness reduces the risk for diabetes, hypertension, and back problems. Altering your diet can reduce the chances of developing high levels of blood lipids and reduce the risk for atherosclerosis. Being active and adopting healthy lifestyles is a proactive approach to health and wellness. While reducing risk can alter the probability of disease, it does not assure disease immunity.



## A CLOSER LOOK

### Exercise Is Medicine

Although the health benefits of physical activity are readily accepted by scientists, it is not always integrated into medical practice. The “Exercise Is Medicine” initiative from the American College of Sports Medicine offers considerable promise for advancing the promotion of physical activity. Specific programming is also targeted for college campuses. Visit the website ([www.exerciseismedicine.org](http://www.exerciseismedicine.org)) to review the overall goals of this bold international health initiative.

**Think of the title “Exercise Is Medicine” and explain why you believe it was chosen. Would you take exercise more seriously if it was recommended by your physician?**

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**Table 4 ► Hypokinetic Disease Risk Factors**

#### Factors That Cannot Be Altered

1. *Age.* As you grow older, your risk of contracting hypokinetic diseases increases. For example, the risk for heart disease is approximately three times as great after 60 as before. The risk of back pain is considerably greater after 40.
2. *Heredity.* People who have a family history of hypokinetic disease are more likely to develop a hypokinetic condition, such as heart disease, hypertension, back problems, obesity, high blood lipid levels, and other problems. African Americans are 45 percent more likely to have high blood pressure than Caucasians; therefore, they suffer strokes at an earlier age with more severe consequences.
3. *Gender.* Men have a higher incidence of many hypokinetic conditions than women. However, differences between men and women have decreased recently. This is especially true for heart disease, the leading cause of death for both men and women. Postmenopausal women have a higher heart disease risk than premenopausal women.

#### Factors That Can Be Altered

4. *Regular physical activity.* Regular exercise can help reduce the risk for hypokinetic disease.
5. *Diet.* A clear association exists between hypokinetic disease and certain types of diets. The excessive intake of saturated fats, such as animal fats, is linked to atherosclerosis and other forms of heart disease. Excessive salt in the diet is associated with high blood pressure.
6. *Stress.* People who are subject to excessive stress are predisposed to various hypokinetic diseases, including heart disease and back pain. Statistics indicate that hypokinetic conditions are common among those in certain high-stress jobs and those having Type A personality profiles.
7. *Tobacco use.* Smokers have five times the risk of heart attack as nonsmokers. Most striking is the difference in risk between older women smokers and nonsmokers. Tobacco use is also associated with the increased risk for high blood pressure, cancer, and several other medical conditions. Apparently, the more you use, the greater the risk. Stopping tobacco use even after many years can significantly reduce the hypokinetic disease risk.
8. *Body (fatness).* Having too much body fat is a primary risk factor for heart disease and is a risk factor for other hypokinetic conditions as well. For example, loss of fat can result in relief from symptoms of Type II diabetes, can reduce problems associated with certain types of back pain, and can reduce the risks of surgery.
9. *Blood lipids, blood glucose, and blood pressure levels.* High scores on these factors are associated with health problems, such as heart disease and diabetes. Risk increases considerably when several of these measures are high.
10. *Diseases.* People who have one hypokinetic disease are more likely to develop a second or even a third condition. For example, if you have diabetes,\* your risk of having a heart attack or stroke increases dramatically. Although you may not be entirely able to alter the extent to which you develop certain diseases and conditions, reducing your risk and following your doctor’s advice can improve your odds significantly.

\*Some types of diabetes cannot be altered.



## Strategies for Action

**A self-assessment of risk factors can help you modify your lifestyle to reduce risk for heart disease.** The Heart Disease Risk Factor Questionnaire in Lab 4A will help you assess your personal risk factors for heart disease. It is not a substitute, however, for a regular medical exam that includes an assessment of other cardiovascular disease risk factors, such as cholesterol and blood glucose. This will allow you to use more sophisticated and accurate risk factor assessments (see the Heart360.org tool highlighted in the *Technology Update* feature).

**It is never too early to start being active to improve health.** Many of the studies presented in this concept indicate that being “active for a lifetime” prevents health problems. Young

adults often think “I’ll worry about these problems when I get older.” But what you do early in life has much to do with your current health, as well as your health later in life.

Subsequent concepts in this book cover the different components of health-related fitness and the type and amount of activity needed to improve these components. The lab activities in each of these concepts and the culminating lab activity at the end of this book are designed to help you begin planning *now* for lifelong physical activity.

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## Web Resources

Alzheimer’s Association [www.alz.org](http://www.alz.org)  
 American Cancer Society [www.cancer.org](http://www.cancer.org)  
 American Congress of Obstetricians and Gynecologists  
[www.acog.org](http://www.acog.org)  
 American Diabetes Association [www.diabetes.org](http://www.diabetes.org)  
 American Heart Association [www.americanheart.org](http://www.americanheart.org)  
 American Lung Association [www.lungusa.org](http://www.lungusa.org)  
 Arthritis Foundation [www.arthritis.org](http://www.arthritis.org)  
 Canadian Diabetes Association [www.diabetes.ca](http://www.diabetes.ca)  
 Centers for Disease Control and Prevention [www.cdc.gov](http://www.cdc.gov)  
 Exercise Is Medicine [www.exerciseismedicine.org](http://www.exerciseismedicine.org)  
 Framingham Heart Study Risk Questionnaires and  
 Surveys [www.framinghamheartstudy.org](http://www.framinghamheartstudy.org)  
*Healthy People 2020* [www.healthypeople/2020/](http://www.healthypeople/2020/)  
 Lance Armstrong Foundation [www.livestrong.org](http://www.livestrong.org)  
 National Osteoporosis Foundation [www.nof.org](http://www.nof.org)  
 National Stroke Association [www.stroke.org](http://www.stroke.org)  
 Physical Activity 360 [www.physicalactivity360.org](http://www.physicalactivity360.org)  
 Surgeon General [www.surgeongeneral.gov](http://www.surgeongeneral.gov)  
 Women’s Health Initiative [www.nhlbi.nih.gov/whi/](http://www.nhlbi.nih.gov/whi/)  
 U.S. Physical Activity Guidelines <http://www.health.gov/paguidelines/>  
 YouTube video (“23 and 1/2 Hours”) by Mike Evans <http://www.youtube.com/watch?v=aUaInS6HIGo>

## Suggested Readings

ACSM. 2010. *ACSM’s Guidelines for Exercise Testing and Prescription*. 8th ed. Philadelphia: Lippincott, Williams & Wilkins, Chapter 1.

- Baker, L. D., et al. 2010. Effects of aerobic exercise on middle cognitive impairment. *Archives of Neurology* 67(1):71–79.
- Blanchard, C. M. 2012. Heart disease and physical activity: Looking beyond patient characteristics. *Exercise and Sports Sciences Reviews* 40(1):30–36.
- Chodzko-Zajko, W. J., et al., 2009. Exercise and physical activity for older adults. *Medicine & Science in Sports & Exercise* 41(7):1510–1530.
- Egan, B. M., et al. 2010. US trends in prevalence, awareness, treatment, and control of hypertension, 1988–2008. *Journal of the American Medical Association* 303(20):2043–2050.
- Flegal, K. M. 2010. Prevalence and trends in obesity among US adults. *Journal of the American Medical Association* 303(3):235–241.
- Geda, Y. E., et al. 2010. Physical exercise, aging, and mild cognitive impairment. *Archives of Neurology* 67(1): 80–86.
- Gunter, K. B., et al. 2012. Physical activity in childhood may be key to optimizing lifespan skeletal health. *Exercise and Sports Sciences Reviews* 40(1):13–21.
- Ogden, C. L., et al. 2010. Prevalence of high body mass index in U.S. children and adolescents. *Journal of the American Medical Association* 303(3):242–249.
- Regensteiner, J. G., et al. (Eds.). 2009. *Diabetes and Exercise*. Totowa, NJ: Humana Press.
- Sorace, P., et al. 2010. Peripheral arterial disease. *ACSM’s Health and Fitness Journal* 14(1):16–22.
- Tangka, F. K., et al. 2010. Cancer treatment costs in the United States. *Cancer*. Published online May 10, 2010, [www.canceronlinejournal.com](http://www.canceronlinejournal.com)
- Umpierre, D., et al. 2011. Physical activity advice only or structured exercise training and association with HbA<sub>1c</sub>

levels in Type 2 Diabetes: A systematic review and meta-analysis. *Journal of the American Medical Association* 305(17):1790–1799.

U.S. Department of Health and Human Services. 2008. *2008 Physical Activity Guidelines for Americans*. Washington, DC: USDHHS. Available at [www.health.gov/paguidelines](http://www.health.gov/paguidelines)

Wheatley, C. M., Wilkins, B. W., and Snyder, E. M. 2011. Exercise is medicine in cystic fibrosis. *Exercise & Sport Sciences Reviews*. 39(3):155–160.

Willey, J. Z., et al. 2011. Lower prevalence of silent brain infarcts in the physically active: The Northern Manhattan Study. *Neurology* 76(24):2112–2118.

## 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.

- Attain high-quality, longer lives free of preventable disease, injury, and premature death.
- Increase overall cardiovascular health; reduce heart disease, stroke, high blood pressure, and high blood cholesterol; increase screening; increase awareness; and increase emergency treatment by professionals or bystanders.
- Reduce cancer incidence and death rates, increase cancer patient longevity, increase survivor’s quality of life, and increase cancer screening.
- Reduce diabetes incidence and death rates; increase diabetes screening, education, and care.
- Reduce depression and increase screening for depression and mental health.
- Reduce osteoporosis (related hip fractures), pain of arthritis, and limitations from chronic back pain.
- Increase percentage of college students receiving risk factor information.
- Decrease activity limitations, especially in older adults and disabled.
- Increase percentage of physicians who counsel or educate patients about exercise.

***A national goal is to increase the percentage of college students receiving risk factor information. How can your campus or community health center have a bigger impact on student health and wellness? Provide suggestions along with examples of current efforts.***

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# Lab 4A Assessing Heart Disease Risk Factors

Name

Section

Date

**Purpose:** To assess your risk of developing coronary heart disease. See page 84 for directions.

## Heart Disease Risk Factor Questionnaire

	Risk Points				Score
	①	②	③	④	
<b>Unalterable Factors</b>					
1. How old are you?	30 or less	31–40	41–54	55+	<input type="text"/>
2. Do you have a history of heart disease in your family?	None	Grandparent with heart disease	Parent with heart disease	More than one with heart disease	<input type="text"/>
3. What is your gender?	Female		Male		<input type="text"/>
	<b>Total Unalterable Risk Score</b>				<input type="text"/>
<b>Alterable Factors</b>					
4. Do you get regular physical activity?	4–5 days a week	3 days a week	Fewer than 3 days a week	No	<input type="text"/>
5. Do you have a high-fat diet?	No	Slightly high in fat	Above normal in fat	Eat a lot of meat and fried and fatty foods	<input type="text"/>
6. Are you under much stress?	Less than normal	Normal	Slightly above normal	Quite high	<input type="text"/>
7. Do you use tobacco?	No	Cigar or pipe	Less than 1/2 pack a day or use smokeless tobacco	More than 1/2 pack a day	<input type="text"/>
8. What is your percentage of body fat?*	F = 17–28% M = 10–20%	29–31% 21–23%	32–35% 24–30%	35+% 30+%	<input type="text"/>
9. What is the systolic number in your blood pressure?	120	121–140	141–160	160+	<input type="text"/>
10. Do you have other diseases?	No	Ulcer	Diabetes**	Both	<input type="text"/>
	<b>Total Alterable Risk Score</b>				<input type="text"/>
	<b>Extra Points</b>				<input type="text"/>
	<b>Grand Total Risk Score</b>				<input type="text"/>

Extra Points: Add points for as many of the following test results as you have available: 1 point for CRP above 3, 1 point for homocysteine above 100, 3 points for LDL above 130, 3 points for TC/HDL-C above 4. If only total cholesterol is available, add 1 point for a score of 200–240 or 3 points for scores above 240.

Adapted from *CAD Risk Assessor*, William J. Stone. Reprinted by permission.

\*If unknown, estimate your body fat percentage or see Lab 13A.

\*\*Diabetes is a risk factor that is often not alterable.

**Procedures**

1. Complete the 10 questions and the extra points, if available, on the Heart Disease Risk Factor Questionnaire by circling the answer that is most appropriate for *you* (see front of this lab).
2. Look at the top of the column for each of your answers. In the box provided at the right of each question, write down the number of risk points for that answer.
3. Determine your unalterable risk score by adding the risk points for questions 1, 2, and 3.
4. Determine your alterable risk score by adding the risk points for questions 4 through 10.
5. Determine your total heart disease risk score by adding the scores obtained in steps 3 and 4.
6. Look up your risk ratings on the Heart Disease Risk Rating Scale and record them in the Results section. Answer the questions in the Conclusions and Implications section.

**Results:** Write your risk scores and risk ratings in the appropriate boxes below.

Heart Disease Risk Scores and Ratings		
	Score	Rating
Unalterable risk		
Alterable risk		
Total heart disease risk		

Heart Disease Risk Rating Chart			
Rating	Unalterable Score	Alterable Score	Total Score
Very high	9 or more	21 or more	31 or more
High	7–8	15–20	26–30
Average	5–6	11–14	16–25
Low	4 or less	10 or less	15 or less

**Conclusions and Implications:** The higher your score on the Heart Disease Risk Factor Questionnaire, the greater your heart disease risk. In several sentences, discuss your risk for heart disease. Which of the risk factors do you need to control to reduce your risk for heart disease? Why?