

# Participating in Physical Activity

## HEALTH GOALS

- I will participate in regular physical activity.
- I will follow a physical fitness plan.

Any bodily movement produced by skeletal muscles that results in energy expenditure is **physical activity**. Physical activity provides many emotional and physical benefits. There are many types of physical activity that will help you enjoy the benefits of being physically active. A physical fitness plan can help motivate and guide you in your physical activity.



## What You'll Learn

1. Outline 11 benefits of regular physical activity. (p. 367)
2. Analyze at least ten ways to obtain a moderate amount of physical activity. (p. 370)
3. Outline six steps to design an individualized plan for health-related fitness. (p. 371)
4. Analyze the four parts of the FITT formula. (p. 371)
5. Design a FITT-ness Plan to develop health-related fitness. (p. 372)

## Why It's Important

Regular physical activity is a vital key to achieving these health goals: having energy, feeling happy and less stressed, controlling your weight, and being healthy now and for many years to come.

## Key Terms

- type II diabetes
- life expectancy
- premature death
- cardiac output
- high-density lipoproteins (HDLs)
- low-density lipoproteins (LDLs)
- blood pressure
- dynamic blood pressure
- physical fitness
- FITT formula

## What Would You Do?

**Writing About Fitness** Suppose a new 5-mile-long asphalt biking and walking path has opened near your home. You are excited about using it to get into better physical shape. How long and how hard should you run, walk, bike, or rollerblade to achieve your fitness goals? After you read the information about designing a plan for fitness, write a statement about the healthful behavior you plan to practice to reach your goal in your health journal.



# Physical Activity and Health Status



**P**hysical activity that is performed on most days of the week is called **regular physical activity**. People who usually are inactive can improve their health and well-being by becoming even moderately active on a regular basis. Physical activity does not have to be strenuous to achieve health benefits.

## What to Know About Physical Activity and Health Status

There are at least 11 benefits of regular physical activity.

**Reduces feelings of depression and anxiety** Regular physical activity improves circulation to the brain. As a result, a person feels more alert. Regular physical activity causes the body to produce higher levels of norepinephrine and beta-endorphins. **Norepinephrine** (NOR eh puh neh fruhn) is a chemical that helps transmit brain messages along certain nerves. **Beta-endorphins** are chemicals produced in the brain that create a feeling of well-being. These two chemicals are helpful in reducing the risk of depression.

Regular physical activity counterbalances the bodily changes that occur in the first stage of stress by using up the adrenaline that is secreted. This relieves anxiety and helps the body return to its normal state.

**Promotes psychological well-being** Performing regular physical activity promotes psychological well-being.

Improved appearance from muscle tone and reduced body fat may boost self-confidence. Regular physical activity increases self-discipline and self-respect. Completing a workout makes a person feel accomplished.

**Helps control weight** Inactivity is a major factor contributing to overweight and obesity. Regular physical activity increases metabolic rate, burns calories, and shrinks fat cells. Regular physical activity also helps regulate the hypothalamus in the brain. As a result, appetite is decreased.

Regular physical activity also affects body composition. **Body composition** is the percentage of fat tissue and lean tissue in the body. Having too much fat tissue is a risk factor for cardiovascular diseases, diabetes, cancer, and arthritis.

**Reduces the risk of developing type II diabetes** A type of diabetes in which the body produces insulin, but the insulin cannot be used by body cells is **type II diabetes**.

### Did You Know?

**BMI** Avoiding obesity can reduce the risk of developing chronic diseases. Body Mass Index (BMI) is calculated by the formula  $BMI = \frac{\text{Weight in pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \times 703$ . A BMI below 18.5 is considered underweight, 18.5–24.9 is normal, 25.0–29.9 is overweight, and 30.0 and above is obese. BMI is one factor in developing chronic diseases. Other factors include blood pressure and family history.



## Did You Know?

### Cardiovascular

**Disease** Cardiovascular disease (heart attacks, strokes) is the number one killer of men and women in the United States. Physically inactive people are twice as likely to develop coronary heart disease as regularly active people.

### Make the TEXAS Connection

**Physical Fitness** For more information on physical fitness, see page TX11 in the Texas Student Handbook.

Controlling weight is one benefit of regular physical activity. ▼

People who are overweight and who are physically inactive have the greatest risk of developing type II diabetes.

**Builds and maintains healthy bones, muscles, and joints** Weight-bearing physical activity is essential for normal skeletal development in children and teens and for maintaining peak bone mass as people age. A lifetime habit of activities, such as running, walking, or roller-blading, helps prevent osteoporosis. **Osteoporosis** is a condition in which bones become thin and brittle.

Regular physical activity helps joints as well as bones. Stretching helps muscles lengthen. This allows the joints to move freely and easily through the full range of motion. People who have arthritis also benefit. **Arthritis** is a painful inflammation of the joints. Moderate physical activity reduces the swelling around the joints. It increases the pain threshold and energy levels of people who have arthritis.

### Reduces the risk of premature death

The number of years a person can expect to live is **life expectancy**. Death before a person reaches his or her predicted life expectancy is **premature death**. However, you should know that participating in regular physical activity in early life will affect the quality of your life in middle and late adulthood. Prepare now to live a long and healthful life.

### Helps older adults become stronger and better able to avoid falling

Regular physical activity may help prevent accidents by improving muscular strength, balance, and reaction time.

### Reduces the risk of cardiovascular diseases

A disease of the heart and blood vessels is a **cardiovascular disease**. During physical activity, cardiac output increases to provide muscle cells with oxygen. **Cardiac output** is the amount of blood pumped by the heart each minute. Regular physical activity makes the threadlike muscle fibers of the heart thicker and stronger. As a result, the heart does not have to beat as often to maintain the same cardiac output. Resting heart rate is lowered.

Regular physical activity helps control cholesterol levels in the body. **High-density lipoproteins (HDLs)** are substances in blood that carry cholesterol to the liver for breakdown and excretion. **Low-density lipoproteins (LDLs)** are substances in blood that deposit cholesterol in body cells. The cholesterol is not excreted. Physical activity increases the number of HDLs and reduces the risk of developing atherosclerosis. Atherosclerosis is a



disease in which fat deposits collect on artery walls. This results in arteries becoming narrow and blood flow being reduced.

Regular physical activity decreases the clumping together of platelets to form a blood clot. The likelihood of developing coronary thrombosis is reduced. **Coronary thrombosis** is the narrowing of one of the coronary arteries by a blood clot. This causes a section of the heart muscle to die from lack of oxygen.

Regular physical activity improves coronary collateral circulation. **Coronary collateral circulation** is the development of additional arteries that can deliver oxygenated blood to the heart muscle. When you work out, your heart muscle needs more oxygen. Small arteries branch off existing arteries to provide the additional blood flow.

**Reduces the risk of developing high blood pressure** When your arteries remain elastic, they can dilate when your body needs more oxygenated blood. Resting blood pressure stays in normal range. **Blood pressure** is the force of blood against the artery walls. When your arteries are elastic, your dynamic blood pressure remains low.

**Dynamic blood pressure** is the measure of the changes in blood pressure during the day. Sudden changes in blood pressure can cause a stroke. A **stroke** is an event caused by a blocked or broken blood vessel in the brain and can be fatal.

**Reduces blood pressure in people who already have high blood pressure** People who already have high blood pressure must pay attention to the



▲ Lifetime habits of regular physical activity can be very rewarding.

risk factors over which they have control. Regular physical activity helps them maintain a desirable weight or lose weight if needed. Regular physical activity helps prevent plaque from collecting in artery walls. When arteries are clear, they remain elastic and can dilate when more oxygenated blood is needed. This helps prevent high blood pressure.

**Reduces the risk of developing colon cancer** Regular physical activity helps the movement of waste through the colon. As a result, a person is more likely to have daily bowel movements, which decreases the risk of colon cancer.

### Mini-Review

1. How does regular physical activity help control weight?
2. What is type II diabetes?

## Prevent and Improve Illnesses Through Regular Physical Activity

Millions of Americans suffer from illnesses that can be prevented or improved through regular physical activity.

- About 64 percent of Americans age 20 years and older are overweight and more than 44 million are obese.
- 17 million people have diabetes.
- About 105,500 people are newly diagnosed with colon cancer each year.
- About 61 million people live with cardiovascular disease including high blood pressure, coronary heart disease, stroke, and congestive heart failure.
- About 950,000 people die of cardiovascular disease each year.



# Healthful Physical Activities



Short sessions of strenuous activity are not the only way to achieve physical activity. The same amount of activity can be obtained in longer sessions of moderately intense activities such as brisk walking. If you already participate in moderate physical activity, you can benefit even more by increasing the time or intensity of your activity.

## Ways to Get a Moderate Amount of Physical Activity

### Make the Connection

**Exercise** For more information on exercise and health-related fitness, see page 375 in Lesson 34.

A moderate amount of physical activity can be achieved in a variety of different ways. You might choose to jump rope, ride a bike, or shovel snow for 15 minutes. Or perhaps you can run 1.5 miles in 15 minutes. How about washing and waxing a car or washing windows or floors for 45 minutes? You might choose to play

touch football for 30–40 minutes or a game of basketball for 15–20 minutes or volleyball for 45 minutes. You can accomplish the same results if you walk 1.75 miles in 35 minutes, swim laps for 20 minutes, do water aerobics for 30 minutes, or stair walk for 15 minutes. You can choose different activities at different times.

**TABLE 33.1** Achieving a Moderate Amount of Physical Activity

Activity	Time
 <p>Dance: Any kind of dancing can provide health benefits. Consider tap dancing, ballet, ballroom dancing, square dancing, Irish dancing, swing dancing, or salsa, or visit a dance club.</p>	30 minutes: You can break this up into three 10-minute periods of activity and still receive the same health benefits.
 <p>Rake leaves: Many people consider raking a chore, but it can be one of the most healthful ways to enjoy autumn weather. Bundle up, grab a rake, and take in the sight of the multicolored leaves still on the trees or covering the grass.</p>	30 minutes: You can break this up into three 10-minute periods of activity and still receive the same health benefits.
 <p>Play wheelchair basketball: Some people mistakenly assume that people who are disabled cannot exercise or play sports. They are wrong. Basketball is a popular sport among people who have physical disabilities.</p>	20 minutes: You can break this up into two 10-minute periods of activity and still receive the same health benefits.

# Physical Fitness Plans



The ability to perform physical activities and to meet the demands of daily living while being energetic and alert is called *physical fitness*. To become physically fit, you must participate in physical activities that develop each of the components of health-related and skill-related fitness. A *physical fitness plan* is a written plan of physical activities to develop each of the components of fitness and a schedule for doing them.

## What to Know About Physical Fitness Plans

Follow these steps to develop health-related and skill-related fitness.

**Design a physical fitness plan.** Include the goal or goals you want to reach and when you want to reach them.

**Use the FITT formula.** A formula in which each letter represents a factor for determining how to obtain fitness benefits from physical activity is the *FITT formula*: **F**-Frequency, **I**-Intensity, **T**-Time, and **T**-Type.

**Include a warm-up and cooldown.** Five to 10 minutes of easy physical activity to prepare the muscles to do more work is a *warm-up*. Five to ten minutes of reduced physical activity to help the body return to the nonexercising state is a *cooldown*. A warm-up and cooldown reduce the risk of physical activity-related injuries.

**Include aerobic exercises to develop cardiorespiratory endurance and a healthful body composition.** Do aerobic exercises three to five days a week at your target heart rate. If you want to lose weight, figure 1.8 calories for each pound of your body weight to calculate how many calories you should burn per session.

**Include resistance exercises to develop muscular strength and muscular endurance.** Lift your own weight, lift free weights, or lift weights on a weight machine. Do resistance exercises two to four days a week with a day of rest between workouts. Increase resistance gradually.

### Make the Connection

**FITT Formula** For more information about the FITT Formula, see page 378 in Lesson 34.

### Did You Know?

**Target Heart Rate** Your target heart rate is the number of beats per minute that will be safe and will provide you with maximum cardiovascular benefits. Target heart rate depends upon your age and physical fitness level. Talk to your doctor to determine your target heart rate.

Physical Fitness Plan
Today's date:
My goal:
Date to reach goal:
Plan: Warm-up, FITT formula

# Activity: Using Life Skills

## Using Goal-Setting and Decision-Making Skills: Creating a FITT-ness Plan

Follow these steps when you design your physical fitness plan to make sure you've included everything you need to stay healthy.

**1 Write your health goal.** Design a physical fitness plan. Decide which aerobic and strength-training exercises you want to do and how often you will do them.

**2 Make an action plan to meet your health goal.** Use the FITT formula. The FITT formula stands for F=Frequency, I=Intensity, T=Time, T=Type. This formula will make sure you are working out at the best pace to see results and prevent injury.

**3 Identify obstacles to your plan.** To reduce your chance of injury, you need to spend 5–10 minutes warming up your muscles before you do aerobic or strength training and 5–10 minutes cooling down after. Try a slow jog or do a less intense version of your workout to get your body prepared.



Running is an aerobic exercise that teens can incorporate into their physical fitness plans.

**4 Set up a time line to accomplish your health goal.** Do aerobic exercise three to five times a week. Determine your target heart rate with your doctor. Maintain continuous activity for a minimum of 15 minutes and continue for up to 60 minutes.

**5 Keep a chart or diary in which you record progress toward your health goal.** Do resistance training two to four days a week, working the upper and lower parts of your body and opposing muscle groups (like your abdominals and your back). Do three sets of 8–12 repetitions for each exercise and record your progress.

**6 Build a support system.** Enlist a friend or family member to work out with you. He or she can help you with stretching exercises, which you should do two to three times a week as part of your warm-up and cooldown. Hold each stretch for 15–30 seconds, then rest for 30–60 seconds. Perform each stretch three to five times. Do not bounce while you stretch.

**7 Revise your action plan or timeline, if necessary, and reward yourself when you reach your health goal.** Set a small goal at first and then set your sights a little higher. Keep track of your progress.

Perform three sets of 8–12 repetitions of each exercise with free weights or weight machines. Perform additional exercises when using your body for resistance.

**Include static stretching exercises to develop flexibility.** Perform various stretching exercises two to three days

a week. Hold each stretch for 30 seconds, then rest for 30–60 seconds. Repeat each stretch three to five times. Your flexibility workout should last for 15–30 minutes. Also include stretching exercises as part of your warm-up and cooldown to reduce the risk of injuries, such as sprains, strains, and tendonitis.

arthritis  
blood pressure  
cardiac output  
coronary thrombosis  
dynamic blood pressure  
FITT formula  
high-density lipoproteins (HDLs)  
life expectancy  
low-density lipoproteins (LDLs)  
physical fitness  
premature death  
type II diabetes



## Key Terms Review

Explain the relationship between the pairs of lesson Key Terms below. Do not write in this book.

- cardiac output—FITT formula
- life expectancy—premature death
- blood pressure—dynamic blood pressure
- physical fitness—type II diabetes
- high-density lipoproteins (HDLs)—low-density lipoproteins (LDLs)

## Recalling the Facts

- List three benefits of regular physical exercise.
- What is one of the greatest risk factors for developing type II diabetes?
- List five illnesses that can be prevented or improved through regular physical activity.
- List five examples of moderate physical activity.
- What is the FITT formula?
- How is regular physical activity related to osteoporosis and arthritis?
- Why does regular physical activity reduce the risk of cardiovascular diseases?
- What kind of exercise develops muscular strength and muscular endurance?
- What is arthritis?
- What is cardiac output?
- Explain how changes in blood pressure can cause a stroke.
- What is osteoporosis?
- How does regular physical activity help control weight?

## Critical Thinking

- What steps would you take to help a friend who does not exercise to design an individualized health plan for fitness?
- Explain the benefits of using the FITT formula.
- Discuss how the collection of plaque on the walls of arteries is related to blood pressure.
- Explain why it is important to keep a record of your progress when you set a health goal.

## Activities

### Responsible Decision Making

- Write** You usually are busy with school and a part-time job. You get a moderate amount of physical activity by walking to school every day. Your friends ask you to ride to school with them. They do not understand why you choose to walk to school rather than hang out with them. Write a response to this situation. Refer to the Responsible Decision-Making Model on page 61 for help.

### Real-Life Applications

- What are five activities you like to participate in that provide a moderate amount of physical activity?
- Which of the six steps to follow to design an individualized plan for health-related fitness do you have trouble doing and why?
- What would you include in your personal FITT-ness plan?
- Which benefit of regular physical activity is most meaningful to you? Explain.

### Sharpen Your Life Skills

- Advocate for Health** Your school district is changing its curriculum. Some people suggest dropping physical education from the curriculum, arguing that time will be better spent on more academic subjects. Write a letter to the editor of your local paper. Analyze the relationship between health promotion and disease prevention, and explain the importance of physical education.