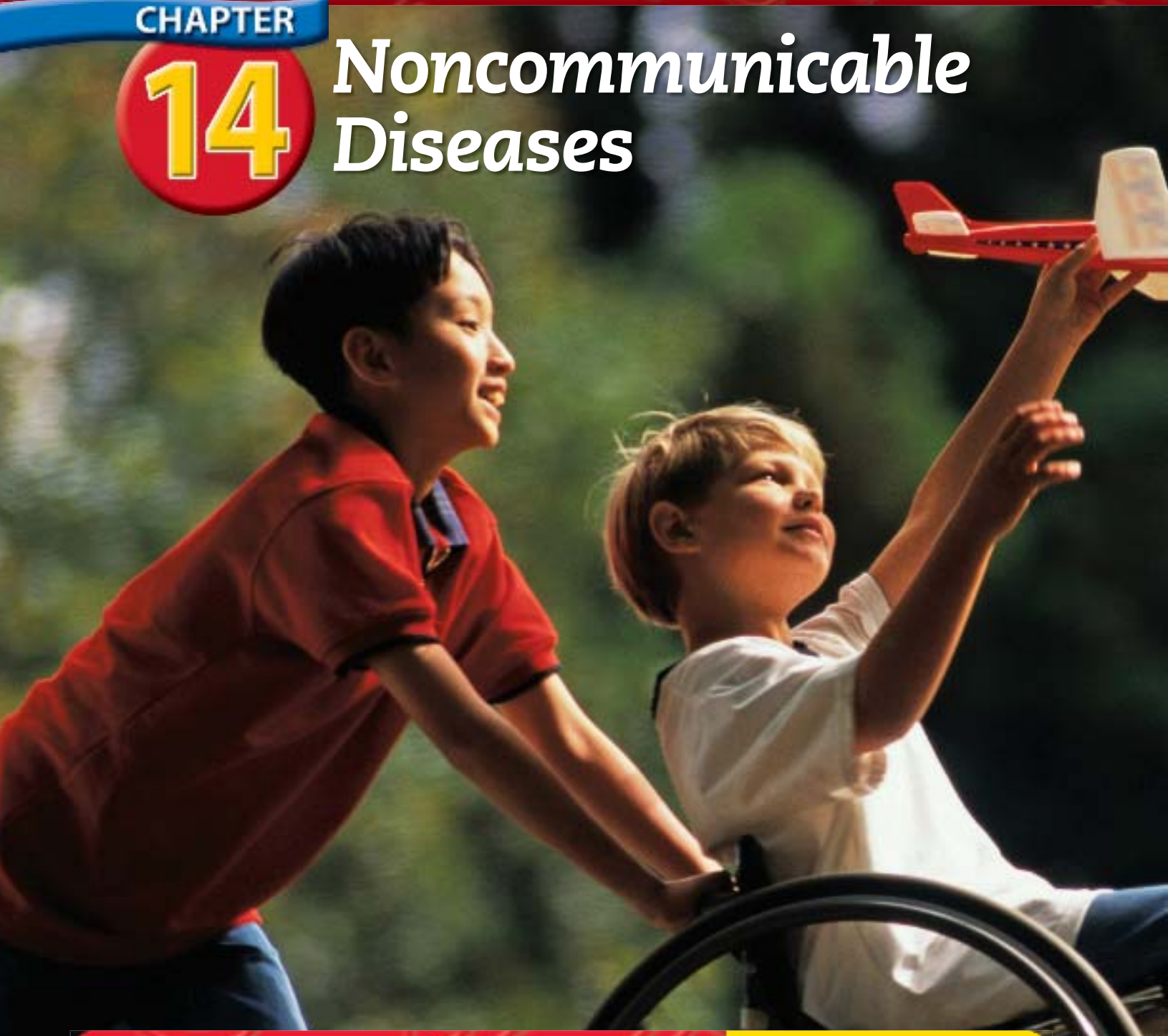
CHAPTER 14

Noncommunicable Diseases



Chapter Preview

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▲ Working with the Photo

A disabled person can lead a happy, active life. **What activities do you think this person enjoys doing?**

Michael Pole/CORBIS

Start-Up Activities

Before You Read What do you do to prevent disease? Take the short health survey below. Keep a record of your answers.

HEALTH INVENTORY

1. I participate in physical activity that helps my heart.
(a) always (b) sometimes (c) never

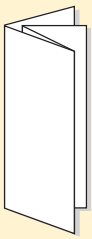
2. I apply sunscreen before going outdoors.
(a) always (b) sometimes (c) never

3. I eat a variety of fruits and vegetables each day.
(a) always (b) sometimes (c) never

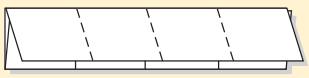
FOLDABLES® Study Organizer

As You Read Make this Foldable® to help you organize what you learn about allergies and asthma. Begin with a plain sheet of 11″ × 17″ paper.

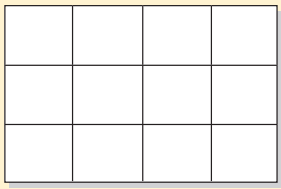
1 Fold a sheet of paper in half along the short axis, then fold in half again. This forms four columns.



2 Open the paper and refold it into thirds along the long axis. This forms three rows.



3 Unfold and draw lines along the folds.



4 Label the chart as shown.

Noncomm. Diseases	Causes	Effects	Treatment
Allergies			
Asthma			

Fill out the chart as you read lesson 1.

Go Online Visit glencoe.com and use the eFlashcards to preview Chapter 14 vocabulary terms.

Español

Lesson 1

Allergies and Asthma

Guide to Reading

Building Vocabulary

As you read this lesson, write each new highlighted term and its definition.

- noncommunicable disease (p. 440)
- chronic (p. 440)
- allergy (p.441)
- allergens (p. 441)
- pollen (p. 441)
- histamines (p. 442)
- antihistamines (p. 443)
- asthma (p. 443)
- bronchodilators (p. 445)

Focusing on the Main Ideas

In this lesson, you will be able to

- **identify** causes of noncommunicable diseases.
- **describe** what allergies are and how they are treated.
- **describe** what asthma is and how it is treated.
- **practice** healthful behaviors to manage asthma.

Reading Strategy

Skimming Look over all the headings of the lesson. Looking over the major and minor headings will give you an idea of what the lesson is about. Write down three main ideas of the lesson that you learned from skimming the headings.

FOLDABLES® Study Organizer Use the Foldable® on p. 439 as you read this lesson.

Quick Write

Write a sentence or two describing some of the symptoms of allergies.

What Are Noncommunicable Diseases?

When Jenna is at her friend Tracy's house, her eyes get red and itchy and she starts to sneeze. Why? Jenna is allergic to Tracy's cat. An allergy is one example of a **noncommunicable disease,** *a disease that cannot be spread from person to person.* Some noncommunicable diseases are chronic. **Chronic** diseases are *present continuously on and off over a long period of time.*

Causes of Noncommunicable Diseases

Some noncommunicable diseases, such as rheumatoid arthritis and Alzheimer's disease, have no known cause. However, scientists do know what causes many noncommunicable diseases.

People may be born with some diseases. Hereditary factors cause some diseases including cystic fibrosis and sickle cell anemia. Babies may be born with other diseases that result from problems before or during birth.

People may choose unhealthful behaviors. For example, smoking causes most cases of lung cancer. Eating high-fat foods is linked to many cases of heart disease.

The environment can cause some diseases or make others worse. For example, air pollution is an environmental factor linked to disease. Breathing polluted air can worsen respiratory problems such as asthma, emphysema, bronchitis, and even lung cancer.

Reading Check **Identify** Name three causes of noncommunicable diseases.

▲ When smog is especially heavy, people with asthma or other respiratory conditions should limit their time and activities outdoors. **What other environmental factors can cause disease?**

What Are Allergies?

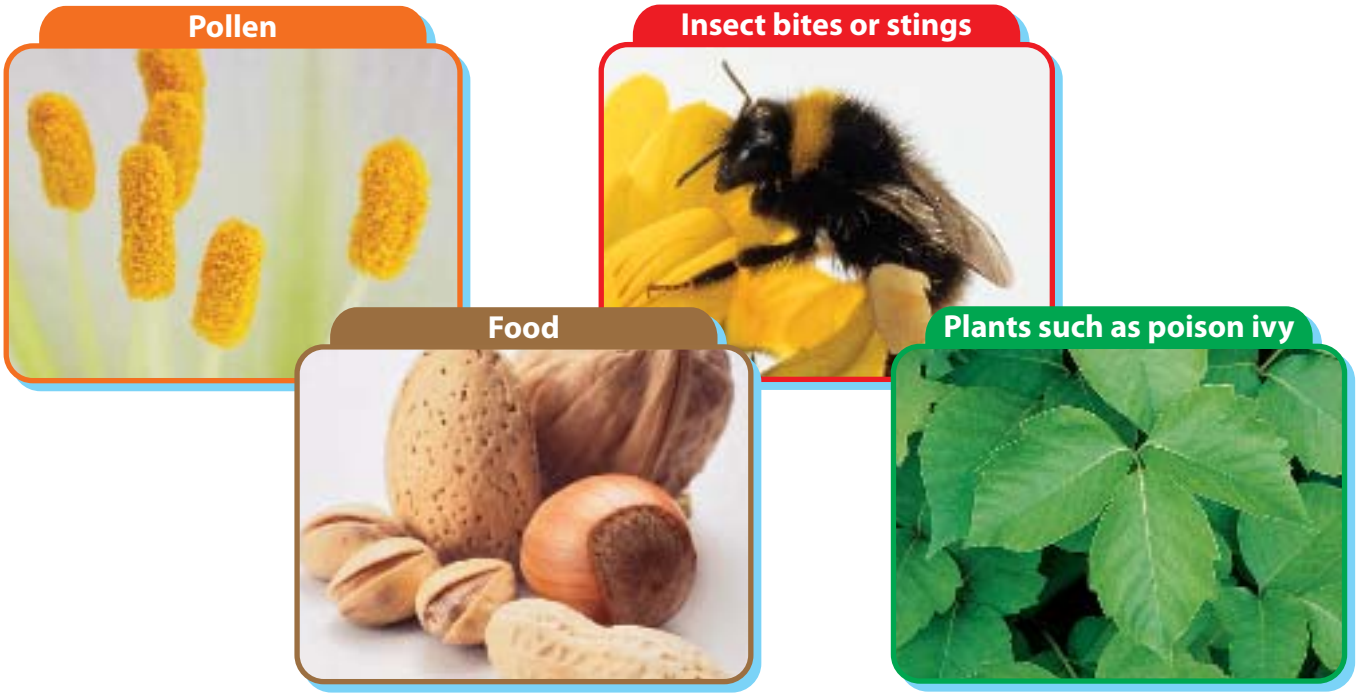
Your immune system keeps you healthy as it helps your body fight off foreign substances. However, some people's immune systems react to fairly harmless substances. These reactions are allergic responses. An **allergy** is *an extreme sensitivity to a substance.* Between 40 million and 50 million Americans are affected by allergies.

Substances that cause allergic responses are called **allergens.** For example, people who are allergic to ragweed are allergic to the tiny pollen grains from the ragweed plant. **Pollen** is *a powdery substance released by the flowers of some plants.* **Figure 14.1** shows some common allergens.

FIGURE 14.1

Common Allergens

Many different substances can be allergens. Some are easier to avoid than others. How could you avoid each of these allergens?



Allergic Reactions

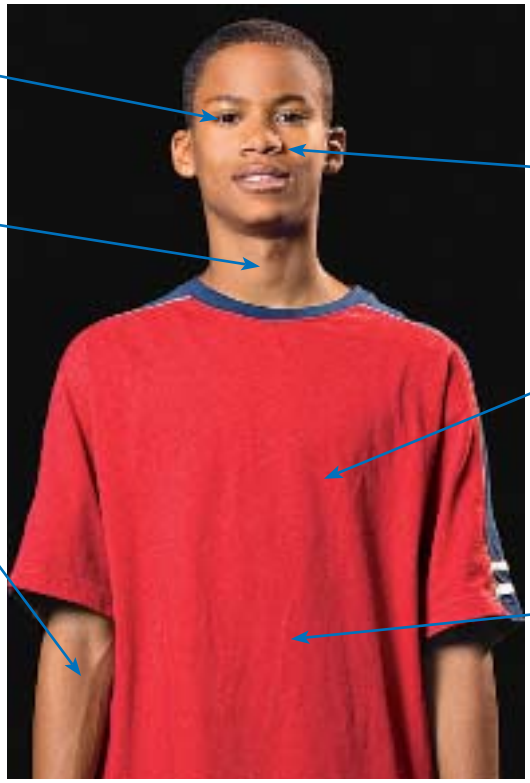
When you are allergic to something, your immune system reacts quickly. It thinks that your body is under attack! In order to protect your body, your immune system produces antibodies to the allergen. Antibodies are a special kind of protein that locks onto cells. Antibodies cause certain cells in the body to release **histamines** (HIS·tuh·meenz), *the chemicals that the immune cells release to draw more blood and lymph to the area affected by the allergen.* Histamines cause the symptoms of the allergic reaction. When you are exposed to the same allergen again, the same antibody response will occur. You'll have an allergic reaction every time you come into contact with that allergen.

Allergic reactions can be mild, like sneezing or a runny nose. Although they are uncomfortable, they are harmless. Other allergic reactions such as swelling of the throat can be life threatening. **Figure 14.2** shows some common allergic reactions. Learning how to control your allergies will help you avoid or reduce the symptoms of allergic reactions.

FIGURE 14.2

Common Allergic Reactions

Common allergic reactions vary depending on the allergen. Different people may also react differently to the same allergen. Which of the allergic reactions listed here do you think is the most serious?



Eyes can be red, watery, and itchy.

Throat can become irritated and swollen. With severe swelling the throat can close shut.

Skin can become irritated and break out in a rash or hives (itchy bumps).

Nose can be runny and irritated. Sneezing is common.

Respiratory system can become irritated. May lead to coughing and difficulty breathing.

Digestive system can be upset. Cramping, stomach pains, and diarrhea are common.

Managing Allergies

There are three basic steps to control allergies.

- **Avoid the allergen.** For example, if you know you are allergic to poison ivy, learn what it looks like and stay away from it. Wear long sleeves and pants if you go into the woods. If you have a food allergy, check the ingredient labels on food products. When you go to restaurants, ask about the ingredients of menu items you want to order. Nut allergies are dangerous because they often cause severe reactions. People with allergies to peanuts or other nuts need to be especially careful about what they eat or come into contact with.
- **Take medication.** Some allergens such as dust and pollen are nearly impossible to avoid. People with these allergies often take medicines to help reduce the symptoms. These medicines are known as **antihistamines,** *medicines that reduce the production of histamines.*
- **Get injections.** Sometimes a long-term series of injections can help people overcome allergies. The injections contain a tiny amount of the allergen. They can gradually desensitize the immune system to the allergen.

Reading Check **Describe** What are three ways to manage allergies?

What Is Asthma?

Asthma is *a chronic inflammatory disorder of the airways that causes air passages to become narrow or blocked, making breathing difficult.* Asthma is a growing problem in many countries. In the United States, more than 20 million people are reported to have asthma. More than 6 million of these asthma sufferers are people under the age of 18. Many substances and conditions can cause an asthma attack. Common triggers include:

- allergens such as mold, dust, pollen, and pets.
- physical activity.
- air pollutants such as paint and gas fumes, cigarette smoke, industrial smoke, and smog.
- infections of the respiratory system, such as colds and the flu.
- dramatic weather changes, especially when the air becomes colder.
- rapid breathing, which often happens under stress, when laughing, or when crying.

ACTIVITY

Connect To... Science

Epinephrine

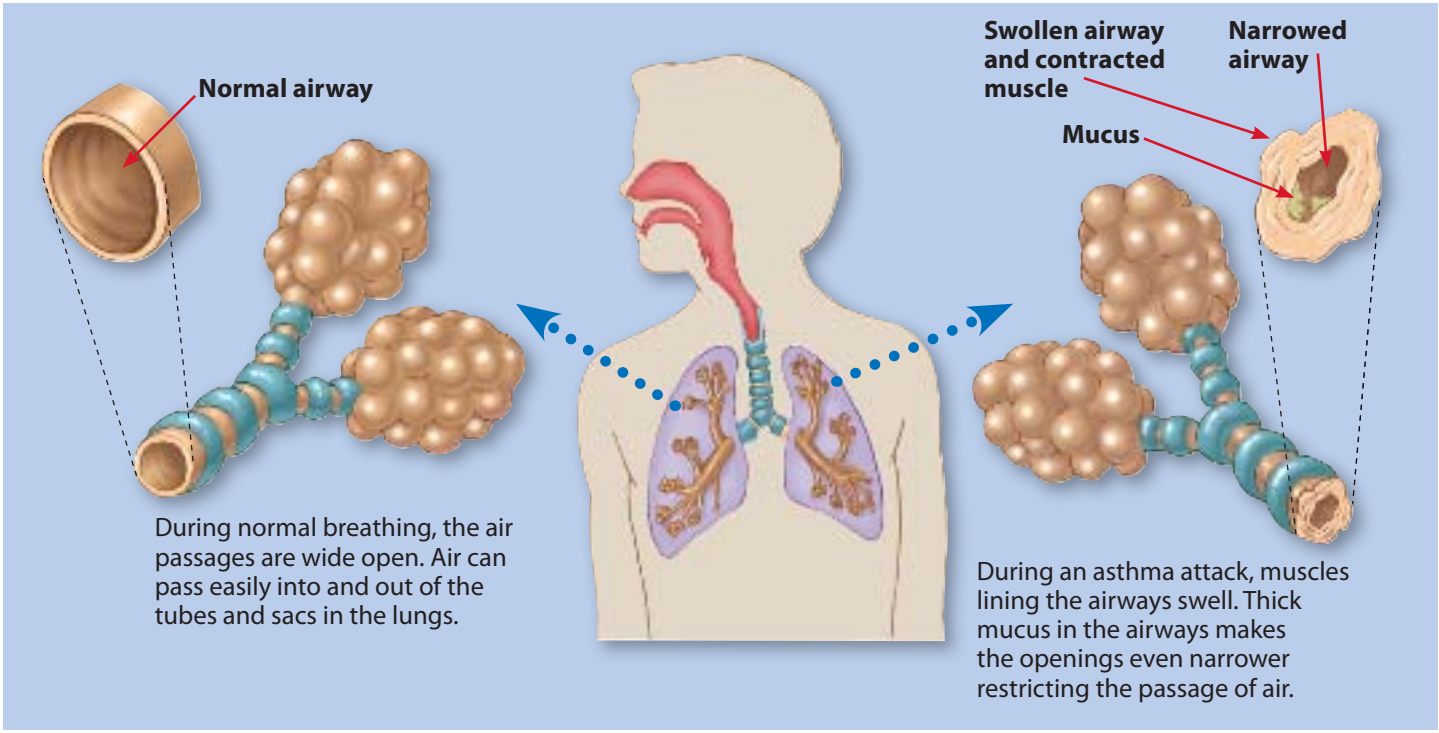
People who are at risk for severe allergic reactions such as bee stings or severe food allergies, often carry allergy medicine with them. The medicine may come in syringes preloaded with a substance called epinephrine (eh·pin·EFF·rihn).

Use the Internet to research epinephrine. What is it? How does it help people with severe allergic reactions? Report your findings to the class.

FIGURE 14.3

How an Asthma Attack Affects the Airways

An asthma attack makes breathing more difficult. Airways become narrower and clogged with mucus. **What are some symptoms of an asthma attack?**



Academic Vocabulary

monitor (MON i ter) *(verb)* to watch or pay attention to. *Calvin's mom has to monitor her blood sugar because she has diabetes.*

An Asthma Attack

What are the symptoms of an asthma attack? A person may wheeze, cough, or feel short of breath during an attack. Symptoms can also include tightness or fullness in the chest. **Figure 14.3** above shows how an asthma attack affects the airways.

Reading Check **Define** What is *asthma*?

Managing Asthma

People with asthma must take an active role in managing their condition. They can choose positive behaviors that will help them learn to avoid or control attacks. Examples include:

- **Monitor the condition.** People with asthma must pay attention to the early signs of an attack. That way, they can act quickly if they sense an attack coming. They also can track their long-term lung capacity, or ability to take in air. An instrument called an airflow meter measures lung capacity. When used regularly, an airflow meter helps people know when their airways are narrowing.

Go Online

Visit **glencoe.com** and complete the Interactive Study Guide for Lesson 1.

- **Manage the environment.** For example, if dust and mold trigger your asthma, reduce them in your environment. It helps to keep floors, bedding, and pets clean.
- **Manage stress.** Stress is a major cause of asthma attacks. Panicking during an attack can make it even worse. Relaxing and staying calm can help those with asthma avoid attacks. Relaxing will help even during an attack.
- **Take medication.** Two kinds of medicines can treat asthma: relievers and controllers. Relievers help reduce symptoms during an asthma attack. **Bronchodilators** (brahng·koh·DY·lay·turhz) are *reliever medications that relax muscles around the air passages.* People usually use an inhaler to take a bronchodilator. This small device sends medicine directly to the respiratory system. Controller medicines are taken daily, and help prevent attacks by making airways less sensitive to asthma triggers.

Reading Check **Describe** How can a person with asthma manage his or her condition?

Michael Newman/PhotoEdit

▲ Many people with asthma carry inhalers containing bronchodilators. These medicines ease breathing. **How does keeping their environment clean help people with asthma breathe easier?**

Lesson 1 Review

After You Read

Review this lesson for new terms, major headings, and Reading Checks.

What I Learned

1. ***Vocabulary*** Define *noncommunicable disease* and use it in a sentence that shows its meaning.
2. ***Give Examples*** What are examples of two diseases that a person may be born with?
3. ***Describe*** What are the symptoms of an asthma attack?
4. ***Identify*** List four common types of allergens.
5. ***Explain*** What is the difference between relievers and controllers as treatments for asthma?

Thinking Critically

6. ***Hypothesize*** Why do you think it's important for people with food allergies to be careful when eating out?
7. ***Synthesize*** What tools help people who have asthma manage their disease?

Applying Health Skills

8. ***Communication Skills*** Adrian wants to join the soccer team. He does not want anyone to know he has asthma. Write a short letter to Adrian telling him why you think he should make a healthful decision to tell his coach and his teammates that he has asthma.

Lesson 2

Heart Disease

Guide to Reading

Building Vocabulary

As you look at each vocabulary term, break down longer words into syllables. The smaller parts make words easier to pronounce and understand.

- arteriosclerosis (p. 447)
- atherosclerosis (p. 447)
- heart attack (p. 447)
- hypertension (p. 448)
- stroke (p. 448)
- angioplasty (p. 450)

Focusing on the Main Ideas

In this lesson, you will be able to

- **identify** types of heart disease.
- **explain** how to prevent heart disease.
- **describe** how heart disease is treated.
- **analyze** the influence of food advertising on heart health.
- **explain** how strokes and hypertension are related to heart disease.

Reading Strategy

Organizing information Take a look at all the major and minor headings in this lesson. Then use these headings to create an outline of the lesson.

Quick Write

Write down three ways to keep your heart healthy.

What Is Cardiovascular Disease?

Cardiovascular or heart disease is any condition that reduces the strength or function of the heart and blood vessels. Common forms include high blood pressure and hardening of the arteries. According to the American Heart Association, 13 million people in the United States have heart disease. Almost half a million people a year die from this condition. Heart disease leads to 38 percent of all deaths in the United States. Sometimes heart disease is due to heredity. However, most heart disease is related to lifestyle. People who smoke, get very little exercise, or have other unhealthy habits are more at risk for developing the disease.

Types of Coronary Heart Disease

Your heart is a muscle that pumps blood through your body. Because your heart is a muscle, it needs oxygen just like all your other organs. Coronary arteries on the surface of your heart supply it with oxygen-rich blood. Veins on your heart take oxygen-poor blood away. When the arteries are clear, the blood flows freely. When the coronary arteries are blocked, blood does not flow as well. At this point, coronary artery disease begins to develop.

Arteriosclerosis (ar·tir·ee·oh·skluh·ROH·sis) is *a group of disorders that cause a thickening and hardening of the arteries.* **Atherosclerosis** (a·thuh·roh·skluh·ROH·sis), a form of arteriosclerosis, is *a condition that occurs when fatty substances build up on the inner lining of the arteries.* When this buildup collects inside arteries, it takes up space needed for blood to flow through. **Figure 14.4** shows the difference between a healthy artery and a blocked artery. If the coronary arteries become blocked with too much buildup, the heart may not get enough oxygen.

A Heart Attack

If the heart does not get enough oxygen, a heart attack is likely. A **heart attack** *occurs when the blood supply to the heart slows or stops and the heart muscle is damaged.* **Figure 14.5** shows what happens during a heart attack. For males, symptoms include pain or pressure in the chest, or pain in the arms, jaw, back, or abdomen. Males may also be short of breath, have cold skin, throw up, feel tightness in the chest, or pass out. Females are more likely than males to also experience pain in the back or jaw.

What Teens THINK

Does your school lunch program offer enough healthy choices?

I believe it does. Every day we can get fruit or veggies. We also get dairy and protein. The reason they seem like unhealthy lunches is because kids choose the unhealthy choices. I don't know a single person who wouldn't choose fries over broccoli!

Michael B.
Centerville, IN

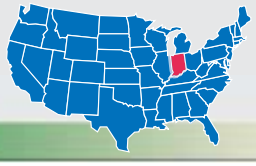


FIGURE 14.4

Atherosclerosis

The muscle tissue of the heart gets blood from the coronary arteries. Blocked arteries prevent the heart from getting all the blood it needs.
What happens when part of the heart does not get enough blood?

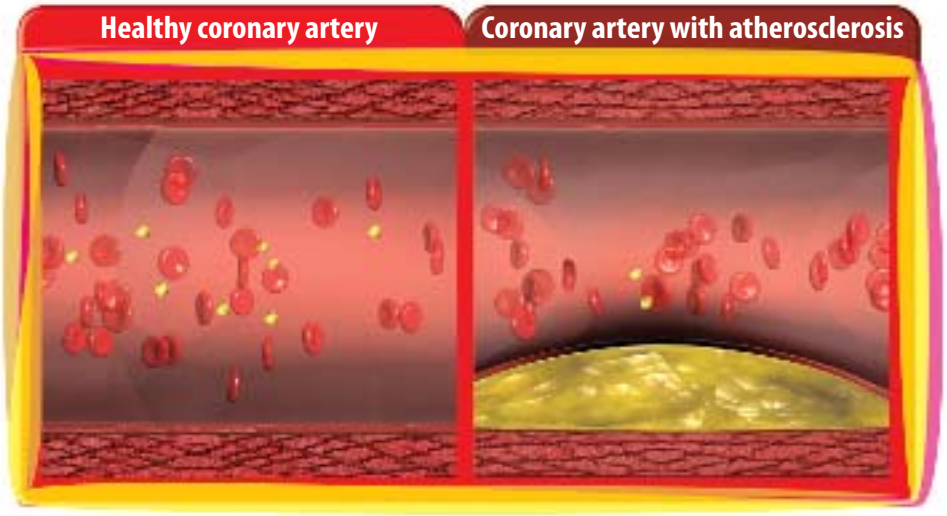
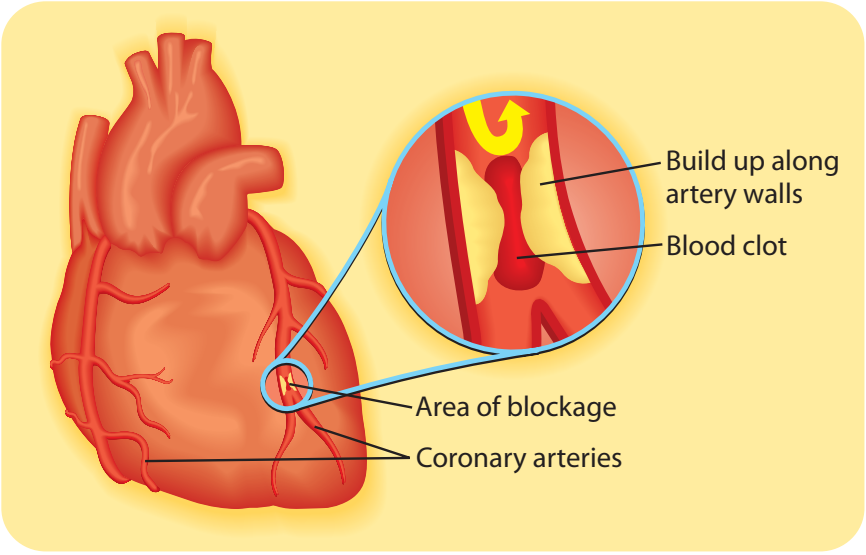


FIGURE 14.5

A Heart Attack

During a heart attack, a coronary artery becomes blocked. As a result, part of the heart dies because it does not get enough oxygen from the blood. What are the symptoms of a heart attack?



Regular physical activity is a positive behavior that strengthens the heart. It can help people with hypertension reduce their need for medication. **What kinds of physical activities strengthen the heart?**

Other Problems of the Circulatory System

Blood pushes against the walls of the blood vessels as it flows through them. One of the most common forms of heart disease is high blood pressure. High blood pressure, or **hypertension,** is *a disease in which the pressure of the blood on the walls of the blood vessels stays at a level that is higher than normal.* Hypertension can lead to a heart attack or a stroke. People with hypertension can manage the condition by following a healthful eating plan, exercising regularly, avoiding stress, and taking medicine if needed.

A **stroke** is *a serious condition that occurs when an artery of the brain breaks or becomes blocked.* Like the heart, the brain needs plenty of oxygen and nutrients to function. It's possible for an artery to leak or develop a thick mass called a clot. When this happens, blood flow to part of the brain is interrupted. That part of the brain is damaged as a result. The effects of a stroke depend on what part of the brain is damaged. A person who has had a stroke may have trouble moving or speaking.

Reading Check **Identify** What are two causes of strokes?

Kevin Dodge/Masterfile

Health Skills Activity

Analyzing Influences

What Ads Say About Fat

Many ads try to sell you foods high in saturated fats or trans fats. Some also feature foods that are "heart healthy." Find one print or television ad for a high-fat food and one for a heart-healthy food. Analyze the ads. What about the design of the ad makes the foods appealing? What language do they use? What do advertisers want you to believe about eating the food? How do these ads affect you?

With a Group

Think of a fast-food meal that has at least one item high in trans fats or saturated fats. Create a warning label for this fast-food meal. It should include facts about the dangers of eating a diet high in saturated fats and trans fats.

Preventing Heart Disease

To keep your heart and circulatory system healthy, follow these tips:

- **Eat healthful foods.** Choose plenty of fresh fruits and vegetables, whole grains, and lean sources of proteins.
- **Limit the amount of cholesterol, trans fats, and saturated fats that you eat.** Foods high in cholesterol, saturated fats, and trans fats are linked to cardiovascular disease such as atherosclerosis.
- **Participate in regular physical activity.** Regular physical activity makes your heart stronger.
- **Maintain a healthy weight.** Your heart works best if your weight is within a healthy range. Talk to a healthcare provider about the range that is best for you.
- **Manage stress.** Learning to relax will help you keep your blood pressure within a healthy range.
- **Stay tobacco free.** Chemicals in tobacco can cause heart disease, heart attacks, hypertension, and strokes. Staying tobacco free will help you avoid all of these problems.
- **Stay alcohol free.** Alcohol has been linked to high blood pressure and heart failure. Staying alcohol free helps you avoid these problems.

ACTIVITY

Connect To... Science

Trans Fats

Consuming too many trans fats is linked to high cholesterol levels and heart disease. Trans fats are produced when hydrogen is added to liquid vegetable oil to make it a solid. Packaged baked goods often contain trans fats.

Why do you think the Food and Drug Administration requires that packaged foods list the amounts of trans fats they contain?

Treating Heart Disease

Health care providers can usually treat heart disease with the following methods:

- **Angioplasty** (AN·je·uh·plas·tee) is *a surgical procedure in which an instrument with a tiny balloon, drill bit, or laser attached is inserted into a blocked artery to clear a blockage.* With the balloon method, doctors inflate the tiny balloon until it pushes the blockage up and against the artery wall. Lasers or drill bits cut or burn away the blockage.
- **Medications** can break up blood clots that may block arteries. They can also lower cholesterol levels.
- **Pacemakers** and implantable defibrillators are electronic devices placed inside the chest. A pacemaker sends electrical signals helping the heart beat regularly. An implantable defibrillator starts the heart beating when it has stopped.
- **Bypass surgery** creates new pathways for the blood. When a person has a blocked coronary artery, surgeons use a healthy blood vessel from another part of the body to set up a new route for blood to flow around the blockage.
- **Heart transplants** completely replace a damaged heart with a healthy heart from someone who has just died.

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Reading Check **List** What are two ways to treat heart disease?

Lesson 2 Review

After You Read

Review this lesson for new terms, major headings, and Reading Checks.

What I Learned

1. ***Vocabulary*** Define *arteriosclerosis* and *atherosclerosis*.
2. ***Explain*** What is angioplasty?
3. ***Describe*** What are the symptoms of a heart attack in females?

Thinking Critically

4. ***Hypothesize*** How is hypertension similar to putting too much air in a balloon?
5. ***Synthesize*** Why do you think that medical professionals focus on preventing heart disease even though there are so many treatments for it?

Applying Health Skills

6. ***Practicing Healthy Behaviors*** John wants to develop an eating plan to keep his heart healthy. What can John do to eat better?

Go Online For more Lesson Review Activities, go to glencoe.com.

Lesson 3

Cancer

Guide to Reading

Building Vocabulary

As you read this lesson, write each new highlighted term and its definition on separate cards. With a partner, take turns matching each term to its definition.

- cancer (p. 451)
- tumor (p. 451)
- benign (p. 452)
- malignant (p. 452)
- risk factors (p. 452)
- carcinogen (p. 453)
- biopsy (p. 455)
- radiation therapy (p. 456)
- chemotherapy (p. 456)

Focusing on the Main Ideas

In this lesson, you will be able to

- **identify** what cancer is.
- **give** examples of different kinds of cancer.
- **identify** some causes of cancer.
- **describe** how to reduce the risk of developing cancer.
- **explain** the ways that cancer is treated.
- **advocate** for ways to reduce cancer risk.

Reading Strategy

Predicting Look over the headings of the lesson. Write down two questions you have that you hope the lesson will answer. When you are done reading, look back at your questions to see if they were answered.

Quick Write

Write a sentence or two explaining why people need to apply sunscreen before going outdoors.

What Is Cancer?

Cancer is *a disease that occurs when abnormal cells multiply out of control.* Cancer is actually a collective term for more than 100 different diseases. Any tissue in the body can become cancerous. While doctors can successfully treat many cancers, it is still the second leading killer in the United States. Only heart disease kills more Americans each year.

How does cancer develop? The adult human body contains more than 100 trillion cells. These cells constantly divide to make more cells so the body can grow and repair itself. Most of the body's cells are normal at any given time. However, even in healthy bodies, some cells become abnormal. Your body's immune system usually destroys these cells. However, some abnormal cells can survive and begin to divide.

Some of these abnormal cells grow in clumps called tumors. A **tumor** (TOO·mer) is *a group of abnormal cells that form a mass.* Tumors are either benign (bi·NYN) or malignant (muh·LIG·nuht).

FIGURE 14.6

Common Types of Cancer

This chart lists some of the most common types of cancer. **Why do you think people with lymphoma usually struggle with other diseases, too?**

Form of Cancer	Important Facts
Skin cancer	The most common kind of cancer, usually caused by exposure to sunlight.
Breast cancer	Most often diagnosed in women over age 50 but can strike younger women as well as men.
Reproductive organ cancers	Cancers that affect the testicles and prostate gland in men, and the ovaries, cervix, and uterus in women.
Lung cancer	Closely tied to smoking; causes more cancer deaths in the United States than any other type of cancer.
Colon and rectal cancers	Affect the large intestine and rectum; better screening tests and early detection have reduced the number of cases of these kinds of cancer.
Leukemia	Causes cancerous white blood cells to multiply; these abnormal white blood cells interfere with the immune response of healthy white blood cells.
Lymphoma	Cancer of the tissues in the lymph system; can weaken the immune system, leaving the body unable to fight infections.

Benign tumors are *not cancerous* and do not spread. **Malignant** tumors are *cancerous*. They may multiply out of control and sometimes they also spread to other parts of the body.

Types of Cancer

Almost any tissue in the body can become cancerous. Some types of cancer are more common than others. **Figure 14.6** lists and describes some of the most common types of cancer. Skin cancer tops the list. More than a million new cases of skin cancer are reported every year in the United States. They make up about half of all the cancer cases reported. Luckily, most cases of skin cancer are highly curable if detected early and treated appropriately.

Lung cancer is the deadliest form of cancer. It kills an estimated 163,000 people per year. In 2005, about one of every three people who died from cancer had lung cancer. The good news is that this number has been falling in recent years.

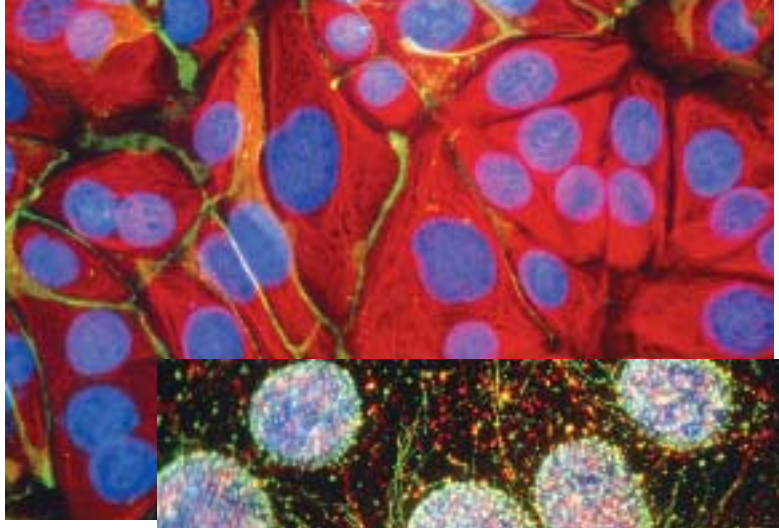
Risk Factors and Causes of Cancer

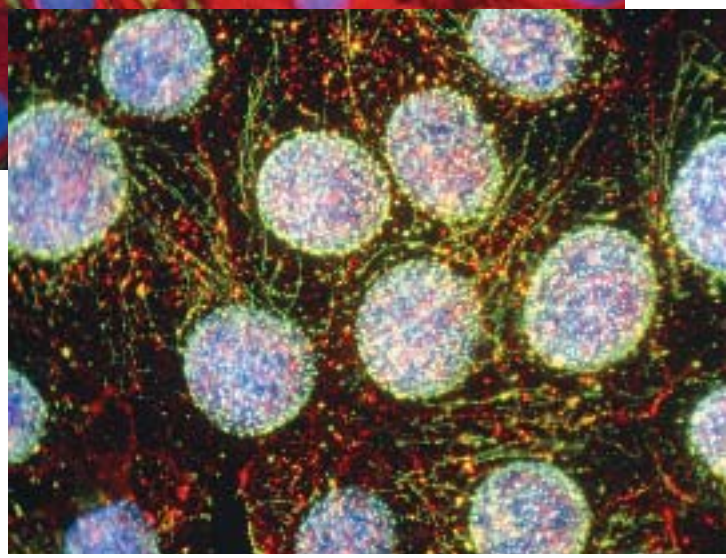
Some types of cancers develop for unknown reasons. However, doctors have identified specific risk factors for certain types of cancer. **Risk factors** are *characteristics or behaviors that increase the likelihood of developing a medical disorder or disease.*

Risk factors for cancers can include inherited traits, age, behavior choices, and environmental factors. For example, a high-fat, low-fiber diet may be a risk factor for developing colon and rectal cancers.

Some types of cancer have well-known causes. For example, asbestos is a mineral that once was used in construction and manufacturing. Breathing asbestos dust can cause lung cancer. Asbestos is a carcinogen (kar·SI·nuh·juhn). A **carcinogen** is *a substance that can cause cancer.* According to the American Cancer Society, about 90 chemicals are known carcinogens for humans. However, not all carcinogens are chemicals. For example, UV rays from the sun can cause skin cancer.

Reading Check **Identify** What are two carcinogens and the cancers they cause?





▲ Most cells divide at a controlled rate. Cancer cells divide at an uncontrolled rate. **The cells on top are healthy. Those below are cancerous cells. If these cells form a tumor, is the tumor benign or malignant?**

Reducing the Risk of Cancer

Anyone can get cancer, but you can protect yourself from some types of the disease. Staying tobacco free can greatly reduce your risk of developing lung cancer. Here are some more tips on how to reduce your cancer risk.

- **Eat well and exercise.** Many cancers, such as colon and rectal cancers, may be linked to diet. Eating well and staying fit can help you avoid these cancers.
- **Limit sun exposure.** UV rays from the sun can cause cancer. To protect yourself from UV rays, avoid being in the sun between 10:00 A.M. and 4:00 P.M. That's when the sun's rays are the strongest. If you need to be outdoors during this time, apply a sunscreen with an SPF of at least 15 before you go outdoors. Also, wear a hat that shades your neck and the tops of your ears. You should also avoid tanning beds. They give off UV rays that can lead to skin cancer and damage the immune system.
- **Perform self-examinations.** Females should perform a breast self-exam once a month. Males should perform a testicular self-exam once a month. Ask your health care provider about the correct way to perform these exams.

▲ It's important to apply sunscreen before going out in the sun. **What other steps can you take to protect your skin from the sun's rays?**

If you notice any unusual lumps, see a health care provider right away. Also, check all moles and other skin growths frequently. See a health care provider immediately if you notice any changes in them. Take a look at **Figure 14.7** to learn what to look for in moles.

- **Know the seven warning signs of cancer.** These signs are listed in **Figure 14.8.** The American Cancer Society has identified seven possible signs of cancer. The first letter of each sign spells the word CAUTION. You play the most important role in early cancer detection. If you notice any of the warning signs, tell a parent, guardian, or health care professional right away.

Reading Check **Explain** What do the letters in CAUTION stand for?

FIGURE 14.7

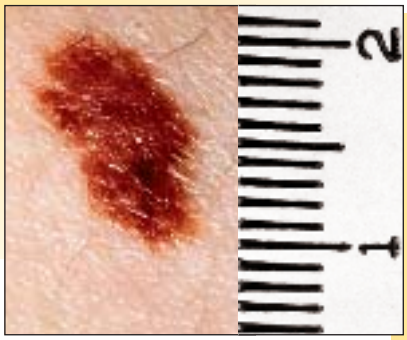
Check Your ABCDs

One way to prevent skin cancer is to check moles regularly. Follow the American Cancer Society's ABCDs. Check moles for asymmetry, border irregularity, color, and diameter. Any suspicious moles should be checked by a dermatologist right away. What is another way to reduce the risk of skin cancer?

Asymmetry
One side of a mole looks different from the other side.

Color
The color is not uniform, or the same, throughout. If a mole is tan and brown, black, or red and white, have it checked.

Border irregularity
The edges are jagged or blurred.



Diameter
The diameter is greater than 6 millimeters (about the size of a pencil eraser). A growth that has expanded to this size over time should be checked.

FIGURE 14.8

The Seven Warning Signs of Cancer

Knowing the warning signs of cancer can help you detect cancer in its early stages. Why is early detection helpful in treating cancer?

C hange in bowel or bladder habits

A sore that does not heal

U nusual bleeding or discharge

T hickening or lump in a breast or elsewhere

I ndigestion or difficulty swallowing

O bvious change in a wart or mole

N agging cough or hoarseness

Academic Vocabulary

detect (dee TEKT) *(verb)* to discover or catch. *Olympic athletes are often given a drug test to detect illegal drugs in their bodies.*

Diagnosing Cancer

Health care professionals use many methods to detect cancer. Some are very simple. For example, a doctor might spot a group of skin cells that don't look normal. He or she might feel a lump where the tissue should be soft. Health care professionals also use more involved methods. They can use X rays and other scanning equipment to look for unusual cell formations. If tissue shows a suspicious lump or formation, it usually undergoes a biopsy. A **biopsy** is *the removal of a sample of tissue from a person for examination.*

The tissue from a biopsy goes to a lab for careful examination to see if the cells are cancerous. If they are, technicians will do other tests to learn more about the cancer. Together, a team of health care providers and the patient can decide on a plan for treatment.

Reading Check **Explain** How is a biopsy used to help diagnose cancer?

▼ Health care professionals sometimes use X rays to look for signs of cancer. **How do X rays and other scanning tools help doctors detect more cases of cancer than they could without these tools?**

Steve Dunwell/Getty Images

ACTIVITY

Careers for the 21st Century

Oncologist

An oncologist is a doctor who specializes in the development, diagnosis, treatment, and prevention of cancer. Oncologists are in demand because cancer hasn't been cured yet. If you want to be an oncologist, you should take science classes. You can also volunteer at your local hospital or clinic.

What are the specialties within oncology? Go to *Career Corner* at glencoe.com to find out.

Treating Cancer

The most common cancer treatments include surgery, radiation therapy, and chemotherapy. Cancer patients usually receive at least two of these treatments and sometimes all three.

Surgery is used to treat some cancers, including breast, lung, and colon cancers. Surgery is most effective when the cancer is isolated in one part of the body.

Radiation therapy uses *X rays or other forms of radiation to kill cancer cells*. It works best to kill cancer cells limited to a single area and to kill those that may still remain after surgery. More than half of all people with cancer are treated with radiation therapy.

Chemotherapy is *the use of powerful medicines to destroy cancer cells*. Doctors use this therapy to fight cancers that have spread beyond one location or occur throughout the body.

Although cancer treatments are improving, all of them have side effects. Side effects of radiation therapy and chemotherapy include nausea, fatigue, and temporary hair loss. Side effects differ from person to person depending on age, the type of treatment, and the location of the cancer in the body.

Reading Check **Explain** What treatment is commonly used for a cancer that has spread?

▲ Radiation therapy is one way to treat some types of cancer. During radiation therapy, special machines direct powerful rays at groups of cancer cells. The radiation kills the cells. **What are two other ways to treat cancer?**

Go Online

Visit glencoe.com and complete the Interactive Study Guide for Lesson 3.

Health Skills Activity

Advocacy

Promote Ways to Reduce Cancer Risk

You can reduce the risk of getting certain cancers. Decisions you make now can help you reduce your risk of developing cancer later in life. Use reliable online and print sources to research how to help prevent certain types of cancer. Here is a head start:

- Lung cancer—stay tobacco free.
- Skin cancer—limit exposure to UV rays from the sun.
- Colon and rectal cancers—eat a diet rich in whole grains, fruits, and vegetables.

With a Group

Write and illustrate a booklet or create a computer slide show on ways to reduce cancer risks. Give your resource a catchy name, slogan, and logo. Share your booklet or slide show with the class.

Lesson 3 Review

After You Read

Review this lesson for new terms, major headings, and Reading Checks.

What I Learned

1. ***Vocabulary*** Define *cancer.*
2. ***Give Examples*** What are three types of cancer?
3. ***Identify*** Name three tools for diagnosing cancer.
4. ***Describe*** What is radiation therapy?

Thinking Critically

5. ***Synthesize*** Moles get larger when the skin cells in the mole divide. Why do you think moles larger than 6 millimeters might be a warning sign of cancer?
6. ***Apply*** Why are people who work in outdoor jobs at higher risk of skin cancer than people who work indoors?

Applying Health Skills

7. ***Communication Skills*** Write an editorial for the school newspaper on the importance of detecting cancer early. In your editorial, include information about the seven warning signs of cancer.

Lesson 4

Diabetes and Arthritis

Guide to Reading

Building Vocabulary

Write down each of the terms below. As you read this lesson, write the definition next to each term.

- diabetes (p. 458)
- insulin (p. 458)
- arthritis (p. 461)
- osteoarthritis (p. 462)
- rheumatoid arthritis (p. 462)

Focusing on the Main Ideas

In this lesson, you will be able to

- **describe** what diabetes is and how it is treated.
- **describe** what arthritis is and how it is treated.
- **access** information to find out about juvenile rheumatoid arthritis.

Reading Strategy

Organizing information Create a table like the one shown below. As you read the lesson, fill in the table with information about the different types of diabetes and arthritis.

Disorders	Important facts
Type 1 diabetes	Often begins in childhood.
Type 2 diabetes	
Rheumatoid arthritis	
Juvenile rheumatoid arthritis	
Osteoarthritis	

Quick Write

Write down two facts you know about diabetes.

What Is Diabetes?

Diabetes mellitus (dy·uh·BEE·teez MEH·luh·tuhs), or **diabetes,** is *a disease that prevents the body from converting food into energy.* Your body breaks down the food you eat to get the energy it contains. To do so, it turns food into a form of sugar called glucose. Your body then uses the glucose for energy.

After your body digests food, glucose levels in the bloodstream rise. Some of the glucose begins to enter cells with the help of a hormone in your body called *insulin*. **Insulin** (IN·suh·lin) is *a protein made in the pancreas that regulates the level of glucose in the blood.* Some people who have diabetes do not have enough natural insulin. As a result, glucose cannot get into cells. Other people make enough insulin, but the insulin does not do its job properly. In both cases, the glucose remains in the blood. This leads to many health problems. If left unmanaged, diabetes can cause diseases such as kidney disorders, blindness, and heart disease.

N. Aubrier/Age Fotostock

It is important for young people with type 1 diabetes to learn how to manage their condition. **Why is it helpful for young people with diabetes to take responsibility for managing their disease?**

The two main types of diabetes are known as type 1 and type 2 diabetes. Type 1 diabetes most often begins in childhood, but it can sometimes begin in adulthood. Researchers believe that in type 1 diabetes, the body's immune system attacks and kills the cells in the pancreas that make insulin. Without insulin, the body cannot control how much glucose is in the bloodstream. Between 5 and 10 percent of people with diabetes have type 1.

Between 90 and 95 percent of people with diabetes have type 2 diabetes. In type 2 diabetes, the body doesn't make enough insulin or the body's cells can't effectively use the insulin that is produced. This kind of diabetes most often begins in adulthood. However, it occurs more and more in today's children and teens. Type 2 diabetes is closely linked to poor food choices, lack of physical activity, and being overweight. Children and teens who are very overweight are at a higher risk of developing diabetes.

Reading Check

Identify What is the most common form of diabetes?

Managing Diabetes

All people with diabetes must deal with it as part of their daily lives. People with type 1 diabetes usually need to have injections of insulin or to receive insulin from an insulin pump attached to their bodies. Young people who have type 1 diabetes can learn

ACTIVITY

Go Online

Topic: Coping with Health Challenges

Visit glencoe.com for Student Web Activities where you will learn about a variety of noncommunicable diseases and how they are treated.

Activity: Using the information provided at the link above, choose one disease and create a pamphlet that discusses symptoms, treatments, and resources for teens who want to learn more.

FIGURE 14.9

Managing Diabetes

There is no cure for diabetes, so people who have it must make sure they manage the condition carefully. This includes keeping track of blood glucose levels. **What are some of the dangers of untreated diabetes?**

Healthful Eating Plan

A healthful eating plan can help keep blood glucose levels within a healthy range.

Weight Management

Regular physical activity helps people with diabetes maintain a healthy weight.

Insulin

People with type 1 diabetes and some people with type 2 diabetes receive insulin through a syringe or pump.

Medical Care

People with diabetes need to be under the care of a medical professional.

to take charge of their health. People who have type 2 diabetes may also need insulin or other medications. Many of them, however, can control their disease by practicing healthful habits. They can eat nutritious foods, watch their weight, and be active. **Figure 14.9** decribes strategies that people with diabetes can use to manage the condition.

Reading Check **Describe** How do people manage diabetes?

Health Skills Activity

Accessing Information

Juvenile Rheumatoid Arthritis

Juvenile rheumatoid arthritis (JRA) is actually a group of diseases that affect young people. Use the library and the Internet to learn more about these diseases. How are they diagnosed? What kinds of treatments work best? What challenges do children with JRA face? How do they meet those challenges? The Arthritis Foundation and the National Institutes of Health are two good places to start.

On Your Own

Many people are unaware that arthritis can affect young people. Create a public service announcement about JRA. Suggest how people can find out more about the disease.

What Is Arthritis?

Arthritis (ar·THRY·tus) is *a disease of the joints marked by painful swelling and stiffness*. More than 40 million people in the United States have arthritis.

You may think of arthritis as a disease that strikes older adults, but even children can develop it. There are two main types of arthritis: osteoarthritis (ahs·tee·oh·ar·THRY·tus) and rheumatoid (ROO·muh·toyd) arthritis. When rheumatoid arthritis affects a young person, it's called juvenile rheumatoid arthritis (JRA).

This teen has juvenile rheumatoid arthritis. The condition can make it difficult for a person to use his or her arms, legs, and hands. **What are the symptoms of JRA?**

Royalty-free/Masterfile

▲ You can see the effects of osteoarthritis in this older person's hands. Joints swell because the cartilage in the joints breaks down. **How can physical activity help people with osteoarthritis?**

Osteoarthritis

Osteoarthritis is *a chronic disease that is common in older adults and results from a breakdown in cartilage in the joints.* Osteoarthritis is the most common form of arthritis. Osteoarthritis develops as a result of wear and tear on the joints, such as those of the knees and hips. The hard, slippery tissue in the joints between the bones is called *cartilage.* When cartilage in a joint wears down, the bones in the joints rub against each other. This rubbing causes pain, swelling, and morning stiffness. Risk factors include age, genetic factors, and extra weight.

Rheumatoid Arthritis

Rheumatoid arthritis is *a chronic disease characterized by pain, inflammation, swelling, and stiffness of the joints.* Rheumatoid arthritis is usually more serious and disabling than osteoarthritis. People develop rheumatoid arthritis when their immune systems attack healthy joint tissue. These attacks damage joint tissue and cause painful swelling. Rheumatoid arthritis can affect any joint, including those in the hands, elbows, shoulders, hips, and feet. Symptoms include soreness, joint stiffness and pain, aches, and fatigue.

Juvenile Rheumatoid Arthritis (JRA)

JRA is the most common form of arthritis in young people. JRA appears most often in young people between the ages of 6 months and 16 years. Early symptoms include swelling and pain in the joints. The skin covering the joints may be red and warm to the touch. Children with JRA also typically get rashes and high fevers. Many children with JRA continue to have arthritis as adults. Some children with JRA, however, get better after puberty.

Reading Check **Name** What are two kinds of arthritis?

Managing Arthritis

There is no cure for arthritis, but people with arthritis can learn to manage the disease. They usually work with health care professionals to develop a plan to reduce the symptoms of arthritis. Many plans involve a combination of the following:

- **Physical activity and rest.** People with arthritis suffer less if they balance rest with low-impact physical activity. Rest helps handle fatigue that comes with the disease.

Physical activity reduces swelling in the joints and allows joints to bend more easily.

- **Maintain a healthy weight.** Maintaining a healthy weight reduces stress on arthritic joints in the knees and feet.
- **Joint protection.** People can wear braces and splints to support arthritic joints. This equipment wraps around the joint and holds it steady.
- **Heat and cold treatments.** Hot baths ease the pain of some kinds of arthritis. Cold treatments can help reduce the swelling.
- **Medication.** Medicine can help slow the progress of some kinds of arthritis. OTC medicines and prescription medicines can also help ease the pain and swelling of arthritic joints.
- **Massage.** A trained massage therapist can help some arthritis patients by gently massaging affected areas. This helps to relax the joints and increase blood flow to sore areas.
- **Surgery and joint replacement.** In extreme cases, surgeons can operate to repair a joint or correct its position. They may even replace the damaged joint with an artificial one.

Reading Check **Explain** How do physical activity and rest help people who have arthritis?

Go Online

Visit glencoe.com and complete the Interactive Study Guide for Lesson 4.

Lesson 4 Review

After You Read

Review this lesson for new terms, major headings, and Reading Checks.

What I Learned

1. ***Vocabulary*** What is *diabetes?*
2. ***Describe*** What practices can some people with type 2 diabetes use to manage their disease without medication?
3. ***Describe*** What happens to a person's joints when osteoarthritis develops?

Thinking Critically

4. ***Synthesize*** How are rheumatoid arthritis and type 1 diabetes similar?
5. ***Hypothesize*** What are two ways that staying physically active helps people with arthritis?

Applying Health Skills

6. ***Practicing Healthful Behaviors*** You can protect yourself from type 2 diabetes by staying physically active. List your favorite physical activities. Include everyday activities such as walking to school, as well as sports. Try to participate in one of these activities at least three times per week.

Building Health Skills

Accessing Information
Practicing Healthful Behaviors
Stress Management
Analyzing Influences
Communication Skills
Refusal Skills
Conflict Resolution
Decision Making
Goal Setting
Advocacy

What Is Goal Setting?

Goal setting is a five-step plan for improving and maintaining your personal health. Some goals are easy to reach while others may be more challenging.

The 5 Steps of the Goal-Setting Plan

- **Step 1:** Choose a realistic goal and write it down.
- **Step 2:** List the steps that you need to take to reach the goal.
- **Step 3:** Find others, like family, friends, and teachers who can help and support you.
- **Step 4:** Set checkpoints along the way to evaluate your progress.
- **Step 5:** Reward yourself once you have reached your goal.

Lifelong Good Health Habits: Emily's Walk

Royalty-free/Getty Images

Follow the Model, Practice, and Apply steps to help you master this important health skill.

1 Model

Read how Emily uses goal setting to get ready for a diabetes walkathon.

Emily wants to take part in a 10-mile walkathon to support diabetes research. Read the steps Emily took to reach this goal.

1. On a sheet of paper Emily wrote, "Walk 10 miles in the diabetes walkathon."
2. To reach this goal, Emily talked to her physical education teacher to outline a walk program. She also located a safe place to walk near her home.
3. Emily asked her friend to walk with her 3 times a week and also during the walkathon.
4. Each time Emily walked, she recorded her progress on a calendar.
5. After the walkathon, the girls wore their walkathon tee shirts to school to show their friends.

2 Practice

Read about Greg and practice goal setting by answering the questions below.

Greg knew that eating healthful foods could prevent heart disease later in life. He also knew that the chips and cookies he snacked on each day were not a healthy choice. He wanted to snack on healthier foods.

1. What is Greg's goal?
2. What are the steps Greg needs to take to reach his goal?
3. Who can help Greg reach his goal?
4. How can he evaluate his progress?
5. How can he reward himself for reaching his goal?

Michael Newman/PhotoEdit

ACTIVITY

3 Apply

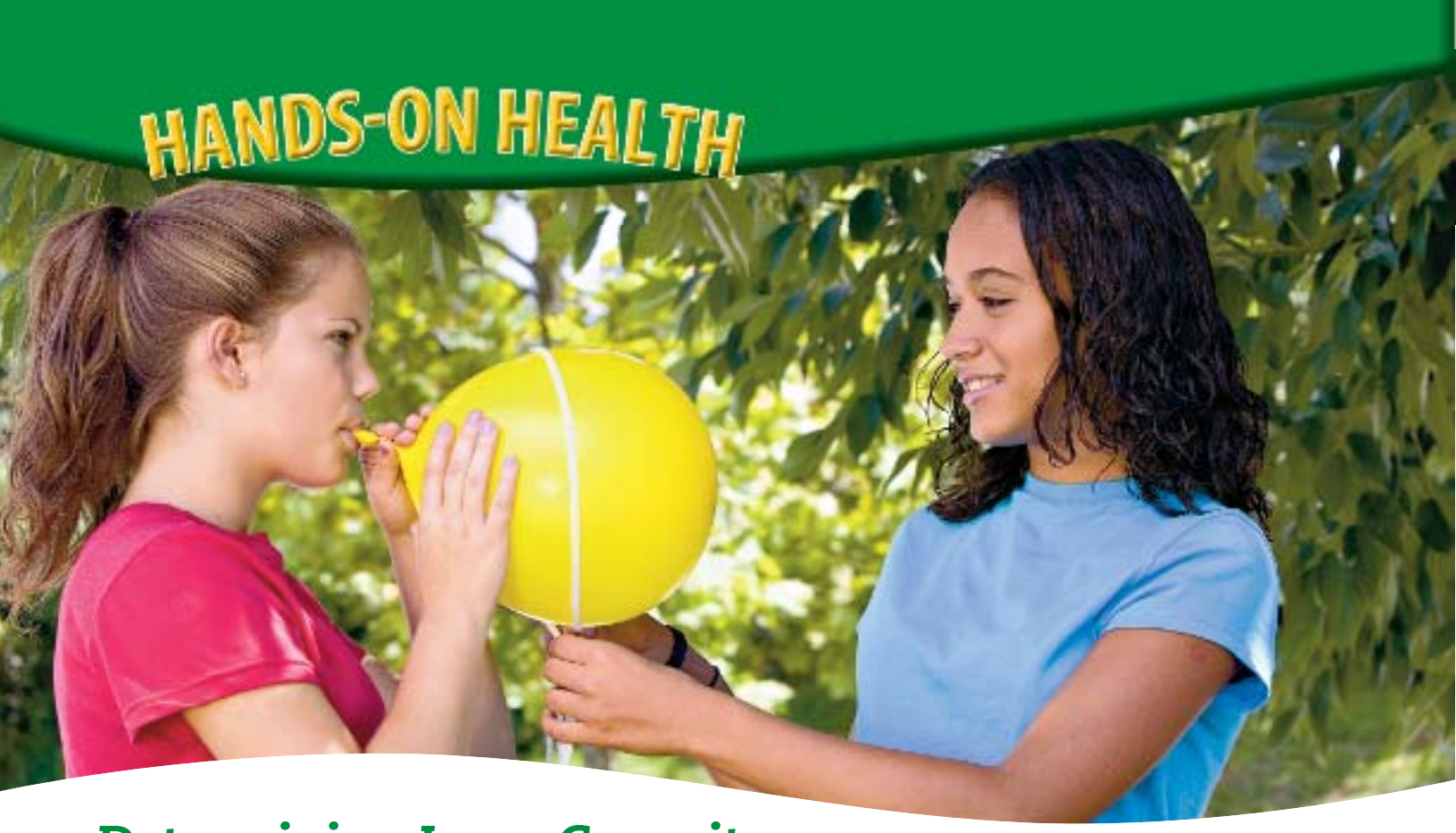
Use what you have learned about goal setting to complete the activity below.

Choose a health goal that can reduce your risk of getting a noncommunicable disease. Then create a one-page plan to post in your room as a reminder of how to achieve this goal. Write down your goal at the top of your plan and list everything you would need to be successful. Show who might help you and state how you will know whether or not you are making progress toward reaching your goal. At the bottom of the page, tell how you will reward yourself.

Self-Check

- Did I choose a goal that will reduce my risk of getting a noncommunicable disease?
- Did I include all of the goal-setting steps in my plan?

HANDS-ON HEALTH



Determining Lung Capacity

In this activity, you will work with a partner to measure the air capacity of your lungs, or their ability to take in air. Then you will graph the results so that you can see how air capacity is related to body size.

What You Will Need

- Round balloon for every student
- String
- Ruler
- Graph paper
- Strip of paper on the wall that is longer than the tallest student in class and that is marked in inches

What You Will Do

1. Your teacher will hand out the materials and divide the class into pairs.
2. Stretch the balloon several times to loosen the rubber. Take a deep breath and then exhale all of that air into the balloon to blow it up as far as you can.
3. Your partner will wrap the string around the widest part of the balloon, then measure the length of string with a ruler. This measurement is the balloon's diameter. Record this number.
4. Switch places with your partner and repeat steps 2 and 3.
5. Go to the measuring strip on the wall and determine your height in inches.
6. Make a graph on a sheet of paper. Mark the vertical (y) axis in inches or centimeters for balloon diameter. Mark the horizontal (x) axis in inches or centimeters for height.
7. Plot the results from steps 2 and 3 on the graph.

Wrapping It Up

The average adult is able to exhale about 4.5 liters, or 8.4 pints, of air. A well-trained athlete may be able to exhale 6.5 liters, or 12 pints, of air. Did you find a relationship between height and lung capacity? How would smoking affect lung capacity? How do you think lung capacity changes during an asthma attack?

Richard Anderson

CHAPTER 14

Reading Review

Visit glencoe.com to download quizzes and eFlashcards for Chapter 14.

FOLDABLES® Study Organizer

Foldables® and Other Study Aids Take out the Foldable® you created for Lesson 1 and any graphic organizers that you created for Lessons 1–4. Find a partner and quiz each other using these study aids.

Lesson 1 Allergies and Asthma

Main Idea Allergies and asthma are two kinds of noncommunicable diseases.

- Noncommunicable diseases are diseases that cannot be spread from one person to another.
- Heredity, unhealthful behaviors, and the environment can all cause noncommunicable diseases.
- Different people may react differently to the same allergen.
- Asthma is a chronic respiratory disease that narrows or blocks air passages and makes breathing difficult.

Lesson 2 Heart Disease

Main Idea Heart disease is any condition that reduces the strength or function of the heart.

- There are two types of coronary artery disease: arteriosclerosis and atherosclerosis.
- If the heart does not get enough oxygen, a heart attack is likely.
- Stroke and hypertension are circulatory problems.
- Strategies for preventing heart disease include getting regular physical activity, eating healthful foods, and staying tobacco free.
- Health care professionals can treat heart disease with angioplasty, medication, surgery, pacemakers, or transplants.

Lesson 3 Cancer

Main Idea Cancer is a noncommunicable disease that occurs when abnormal cells multiply out of control.

- Almost any tissue in the body can become cancerous.
- Risk factors for cancer include inherited traits, behavior choices, and environmental factors.
- People can cut the risk of cancer by staying tobacco free, avoiding UV rays, and knowing the seven warning signs of cancer.

Lesson 4 Diabetes and Arthritis

Main Idea Type 1 diabetes and juvenile rheumatoid arthritis often begin in childhood.

- Diabetes is a disease that prevents the body from converting food into energy.
- There are two main types of diabetes: type 1 and type 2. Both types need management, including medicine, diet, and exercise.
- Arthritis is a disease of the joints marked by painful swelling and stiffness.
- Arthritis can be managed with physical activity, rest, weight control, joint protection, heat and cold treatments, medication, massage, and surgery.

CHAPTER 14

Assessment

After You Read

HEALTH INVENTORY

Now that you have read the chapter, look back at your answers to the Health Inventory on the chapter opener. Is there anything that you should do differently?

Reviewing Vocabulary and Main Ideas

On a sheet of paper, write the numbers 1–9. After each number, write the term from the list below that best completes each statement.

- allergen
- asthma
- atherosclerosis
- chronic
- hypertension
- heart attack
- benign
- carcinogen
- tumor

Lesson 1 Allergies and Asthma

1. A _____ disease is one that is present on and off over a period of time.
2. Anything that causes an allergic response in people is a(n) _____.
3. _____ is a condition that makes breathing difficult.

Lesson 2 Heart Disease

4. A _____ can happen if the heart does not get enough oxygen-rich blood.
5. A condition in which a fatty substance builds up on the inner lining of the arteries is called _____.
6. When someone's blood pressure stays at a level that is higher than normal, that person has _____.

Lesson 3 Cancer

7. A _____ is a clump of abnormal cells.
8. A tumor that is not cancerous is _____.
9. A _____ is a substance that causes cancer.

Lesson 4 Diabetes and Arthritis

On a sheet of paper, write the numbers 10–12. Write **True** *or* **False** *for each statement below. If the statement is false, change the underlined word or phrase to make it true.*

10. Arthritis is a disease that prevents the body from converting food into energy.
11. Type 2 diabetes is the most common form of the disease.
12. Being active helps control diabetes.

On a sheet of paper, write the numbers 13 and 14. After each number, write the letter of the answer that best completes each statement.

13. Wear and tear on the joints causes
    - **a.** osteoarthritis.
    - **b.** rheumatoid arthritis.
    - **c.** juvenile rheumatoid arthritis.
    - **d.** all of the above
14. Treatments for arthritis include
    - **a.** insulin
    - **b.** radiation
    - **c.** heat and cold treatments
    - **d.** none of the above

Thinking Critically

Using complete sentences, answer the following questions on a sheet of paper.

15. **Apply** Why might playing the piano help people with arthritis in their hands?

16. **Hypothesize** Why do people with pollen allergies often have fewer symptoms in winter?

Write About It

17. **Expository Writing** Write an article for your school newspaper about the connection between weight and arthritis symptoms. Be sure that your article explains how a person's weight can affect the joints in the knees and feet. Explain the benefits of maintaining a healthy weight.

ACTIVITY

Applying Technology

Noncommunicable Diseases

Using Comic Life or Microsoft Word®, you and a partner will create a poster on one of the following topics: allergic reactions, asthma, arteriosclerosis, or cancer.

- Choose a topic and locate images or take digital photos that reflect your topic and what you want to say about it.
- Arrange your images on your poster. Add dialogue bubbles for each image. In a few sentences, explain what is going on in the picture and how it relates to your topic.
- Include local resources that can help people deal with the noncommunicable disease that your group has chosen.
- Edit for correct spelling, grammar, and accuracy of information.
- Save your project.

Standardized Test Practice

Math

Use the table to answer the questions.

Acute Lymphoblastic Leukemia (A.L.L.) is a disease that affects the white blood cells. The table below shows the survival rates of children with this disease.

Survival rates for children with A.L.L.

Year	Percentage of patients surviving at least 5 years
1965	5
2000	85

TEST-TAKING TIP

When trying to find trends in data from a chart, sometimes it helps to quickly sketch a line graph of the data.

1. What is a TRUE statement about A.L.L.?

A. A greater percentage of patients with A.L.L. survived in 1965 than in 2000.

B. A greater percentage of patients with A.L.L. survived in 2000 than in 1965.

C. Five patients with A.L.L. survived for at least five years in 1965.

D. 85 patients with A.L.L. survived for at least five years in 2000.

2. Suppose that 3500 people were diagnosed with A.L.L. in 1965 and that the same number were diagnosed in 2000. How many more patients would survive in 2000?

A. 2,075

B. 2,550

C. 2,800

D. 2,975