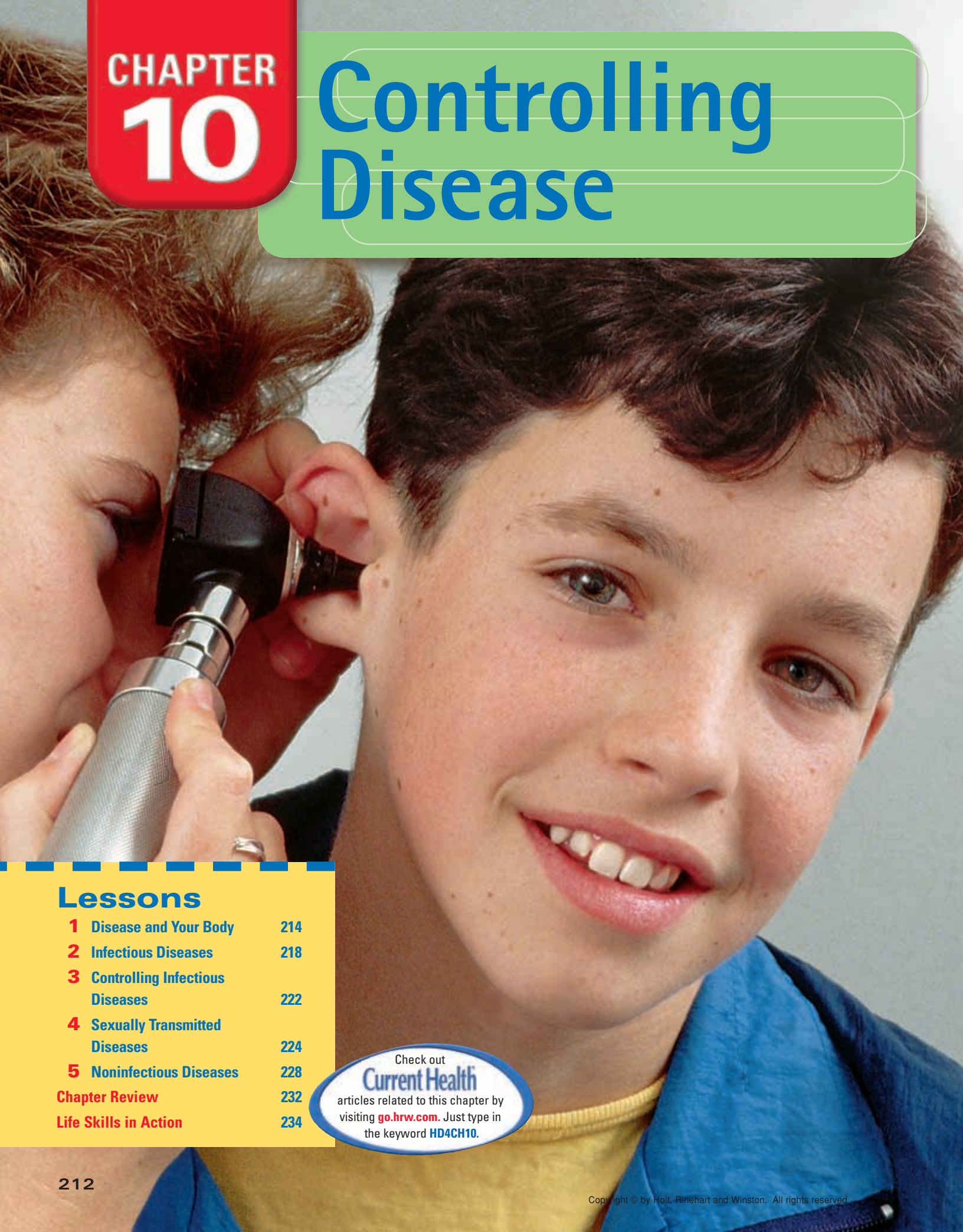
CHAPTER 10

Controlling Disease



Lessons

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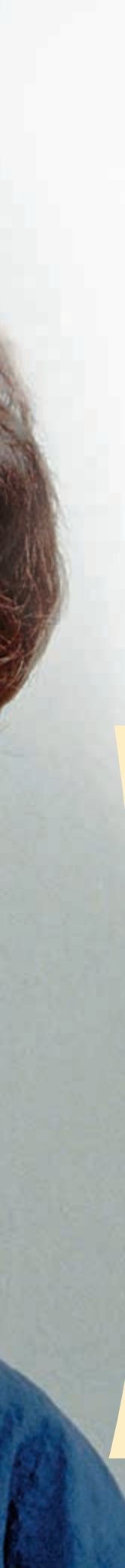


"I have **type 1 diabetes**. At first, I was **worried** that diabetes would mess up my life. Now, I go to my **doctor** for regular checkups. And I control my diabetes with medicine and my diet. As a result, I can do anything that anybody else can do."

Health IQ

PRE-READING

Answer the following true/false questions to find out what you already know about infectious and noninfectious diseases. When you've finished this chapter, you'll have the opportunity to change your answers based on what you've learned.

1. Infectious diseases are diseases that cannot be passed from person to person.
2. Some infectious diseases are caused by tiny organisms called bacteria.
3. Antibiotics are drugs that are used to stop noninfectious diseases.
4. A good way to help stop the spread of common colds is to wash your hands thoroughly.
5. One way to help prevent catching many viral diseases is to stay away from people who are sick with the disease.
6. Abstinence means avoiding any behavior that puts your health at risk.
7. AIDS is the most common STD.
8. You can always tell when someone has an STD.
9. Some people are born with diseases or conditions, such as asthma.
10. A person with some types of noninfectious diseases can lead almost completely normal lives.
11. Diabetes is a disease caused by eating too much sugar.

ANSWERS: 1. false; 2. true; 3. false; 4. true; 5. true; 6. true; 7. false; 8. false; 9. true; 10. true; 11. false

Lesson 1

Disease and Your Body

Jasmine had the flu. She took medicine to reduce her aches and pains; she stayed in bed and drank a lot of fluid. Jasmine was well a few days later.

Many years ago, Jasmine might have had a different experience. In the years 1918 and 1919, there was a worldwide outbreak of the flu that killed between 20 million and 50 million people, including millions of healthy young people.

What You'll Do

- **Describe** the difference between infectious and noninfectious diseases.
- **Describe** how the human body fights diseases.

Terms to Learn

- disease
- pathogen
- infectious disease
- noninfectious disease
- immune system

Start Off Write

What are some ways the human body protects itself against disease?

Disease

Influenza (IN floo EN zuh), also known as the flu, is a disease. A **disease** is any harmful change in the health of your body or mind. Many diseases, such as the flu and strep throat, are caused by pathogens. A **pathogen** is anything, especially a virus or microorganism, that causes disease. A *microorganism* (MIE kroh OR guhn IZ uhm) is a living thing so small that a microscope is needed to see it. Microorganisms include bacteria, fungi, and protozoa. Most viruses and microorganisms are harmless, but some are pathogens that cause serious diseases.

Other diseases are not caused by pathogens. Some diseases, such as muscular dystrophy (DIS truh fee), are inherited. In some diseases, such as one kind of arthritis, the body attacks its own tissues. Still other diseases, such as some forms of asthma, are triggered by something in the environment. And some diseases, such as hepatitis, have more than one cause. Alcohol abuse, infections, or exposure to certain chemicals or drugs may cause hepatitis. Finally, some diseases, such as Alzheimer's (AHLTS HIE muhrz) disease, do not have a known cause.

Figure 1 The flu virus can be spread from person to person. A flu shot is one way a person can be protected against the spread of this disease.

Figure 2 Examples of Infectious and Noninfectious Diseases

Infectious Diseases

- **Common cold** (virus)— head, nose, throat, lungs, muscles
- **Influenza** (virus)— throat, lungs, muscles
- **Chickenpox** (virus)— skin
- **Hepatitis** (virus)— liver
- **Strep throat** (bacteria)— throat
- **Tuberculosis** (bacteria)— lungs

Noninfectious Diseases

- **Sickle cell disease**— red blood cells
- **Cystic fibrosis**— lungs and digestive tract
- **Muscular dystrophy**— muscles
- **Type 2 diabetes**— kidneys and other organs
- **Allergies**— lungs, skin, eyes
- **Cerebral palsy**— brain and nerves, muscles

Infectious diseases can affect many parts of your body. For example, the flu directly affects your nose, throat, and lungs. But the flu's effects can also make asthma attacks and some heart conditions worse.

Noninfectious diseases, such as high blood pressure and cancer, can affect many parts of your body. Other noninfectious diseases strike only one organ or body system.

Infectious and Noninfectious Diseases

The flu, strep throat, and malaria are infectious (in FEK shuhs) diseases. An **infectious disease** is any disease that is caused by pathogens that invade the body. For example, viruses cause the flu. Bacteria cause strep throat. Tiny organisms called *protozoa* (PROHT oh ZOH uh) cause malaria. Some infectious diseases are *communicable* (kuh MYOO ni kuh buhl), which means that they can be passed directly from one person to another person. The flu is a communicable disease. The virus that causes the flu is easily passed from one person to another person. Malaria is not communicable. The pathogen that causes malaria is carried by certain kinds of mosquitoes.

Asthma, many cancers, and a wide variety of other diseases are not caused by pathogens. These diseases are called noninfectious diseases. A **noninfectious disease** is a disease that is not caused by a pathogen. Noninfectious diseases include diseases of specific body systems and nutritional disorders. Common noninfectious diseases include most types of heart disease, type 1 and type 2 diabetes, and Down syndrome. Injuries from accidents may also cause diseases. Many noninfectious diseases are chronic. A *chronic disease* is a disease that lasts a long time.

SOCIAL STUDIES ACTIVITY

Research the flu epidemic of 1918. Make a bulletin board that includes a time-line showing how the flu spread around the world. Include on your bulletin board news headlines and news stories that tell the story of the spread of the flu, the number of people affected, and the efforts made to stop the spread of the killer disease.

Figure 3 Your body has several defenses against disease, including your skin, nose hairs, eyelashes, and tears.

Defenses Against Disease

Your body's first lines of defense against infectious diseases include the following:

- **Skin** Your skin acts as a protective wall to keep organisms out. This wall includes the tiny hairs in your nose and your eyebrows and eyelashes.
- **Mucous Membranes** Mucous (MYOO kuhs) membranes produce *mucus*, a sticky fluid that traps pathogens. These tissues line your mouth, nose, eyes, throat, and other parts of your body.
- **Sweat, Saliva, and Tears** These body fluids contain chemicals that kill bacteria.
- **Stomach Acid** Sometimes pathogens enter your body through the food you eat or the liquids you drink. Most of the pathogens that enter your body in this way are killed by acid in your stomach.
- **Helpful Microorganisms** Most microorganisms are harmless to humans. Some microorganisms are even helpful. For example, helpful bacteria in your mouth take up most of the space and use up most of the food that invading bacteria could use. Harmful bacteria cannot live without food or space. And without the bacteria in your intestines, you couldn't completely digest your food.

Your body defenses keep out most viruses, bacteria, and other pathogens that can make you sick. But sometimes these invaders get through. Then, your immune system goes to work.

Health Journal

Have you ever had a bad cut or scrape? Did you have to get stitches? Describe an injury that you had that broke through your skin. Describe how the injury was treated and how long it took for the injury to heal.

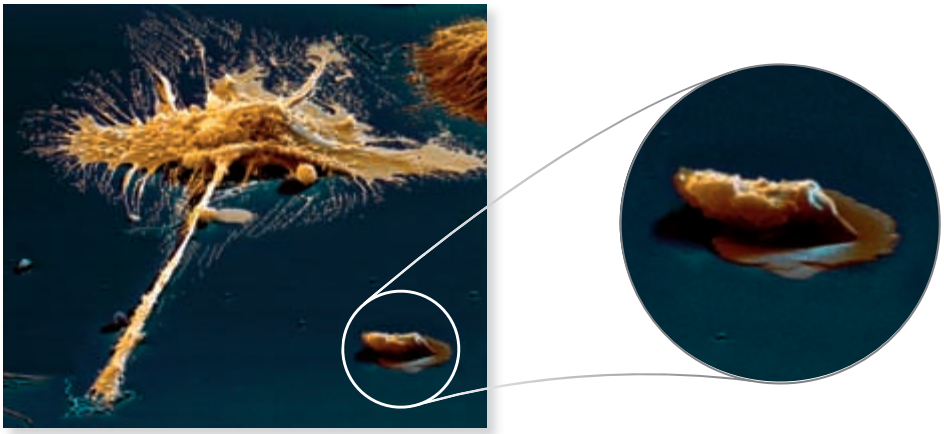


Figure 4 This white blood cell (large brown body) is attacking a bacterium (inset). Eventually, the white blood cell will destroy the bacterium.

The Immune System

The tissues, organs, and cells that fight pathogens make up your **immune system.** Your immune system consists of white blood cells and several organs, such as the *spleen*. White blood cells (WBCs) protect you against pathogens. One kind of WBC produces chemicals that stick to pathogens so that the pathogens cannot attack normal body cells. A second type of WBC either attacks pathogens directly or stimulates other WBCs to attack pathogens. A third kind of WBC, found in body tissues, surrounds and digests invading pathogens.

Your spleen also helps protect your body against pathogens. The spleen contains large numbers of WBCs. As blood flows through your spleen, WBCs remove pathogens in your blood and kill them. And the spleen releases WBCs into your blood to fight pathogens that may be in other parts of your body.

You must protect your immune system. The best way to take care of your immune system is to eat a healthy diet, get plenty of rest and exercise, and reduce stress as much as you can.

Lesson Review

Using Vocabulary

1. Define *disease*.

Understanding Concepts

2. What is the difference between infectious and noninfectious diseases?

3. What are pathogens, and how does the body fight them?

Critical Thinking

4. Making Inferences Why is your blood an important part of your immune system?

5. Drawing Conclusions Explain why you must maintain good health to protect yourself against disease.

Lesson 2

Infectious Diseases

Luis has a cold, so his mother won't let him play with his baby sister. Luis's mother is afraid that Luis will give his cold to his little sister.

Luis's cold is caused by a virus that can be passed to other people. The virus may not make Luis feel too bad, but it could make his baby sister very sick.

What You'll Do

- **Identify** four causes of infectious diseases.
- **Explain** how the spread of common infectious diseases can be prevented.

Terms to Learn

- virus
- bacteria
- protozoa
- fungi

Start Off *Write*

How can you keep from catching a cold?

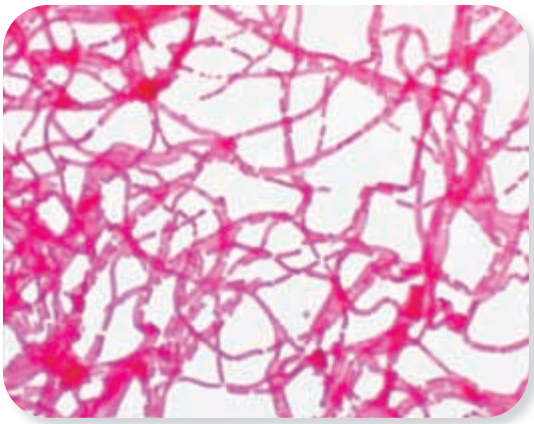
Viruses

Viruses cause some common infectious diseases. A **virus** is a tiny, disease-causing particle that invades a healthy cell and instructs that cell to make more viruses. Viruses are not living things. Viruses are so small they can only be seen with an electron microscope.

Some viruses, such as herpes, are spread by direct person-to-person contact, such as shaking hands or kissing. Other viruses are spread by indirect contact. For example, sneezing can allow viruses to move through the air from one person to another person. Flu and cold viruses are often spread this way. Viruses can also pass indirectly when a person uses a drinking glass or other object that has been used by someone with the virus. Some viruses, such as the West Nile virus, are spread indirectly by insects.

Some viruses are harmless. Other viruses cause diseases, such as AIDS and chickenpox. Some viral diseases, such as mumps and measles, can be prevented with vaccines. A *vaccine* (vak SEEN) is medicine that contains killed or weakened pathogens and is given to protect you against a particular disease. Vaccines stimulate your immune system to produce *antibodies*. An antibody is a chemical that your body produces to fight invading pathogens. Each type of antibody fights a particular pathogen.

Figure 5 These people are victims of the flu virus that spread around the world in 1918 and 1919. Millions of people died from the flu in those 2 years.



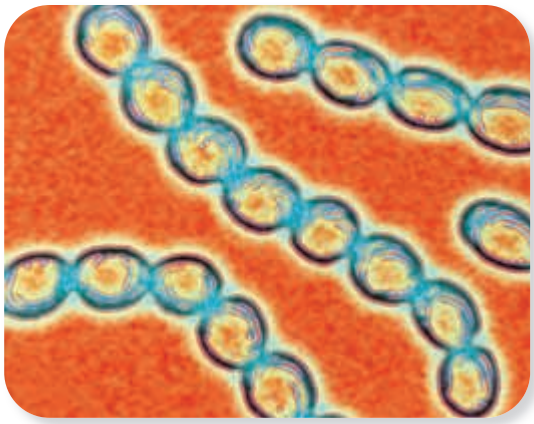


Figure 6 Bacteria come in a variety of shapes. Some types of bacteria cause diseases.

Bacteria

Bacteria are living things and are more complex than viruses. **Bacteria** are extremely small, single-celled organisms that do not have a nucleus. Most bacteria can live on their own. And they live everywhere. Bacteria spread the same way viruses do—through direct and indirect contact as well as through air, water, and soil. Most bacteria are harmless to humans. Several types of bacteria, such as those that live in your intestines, are helpful to humans. In fact, humans could not live without bacteria. But some kinds of bacteria cause serious illness.

Bacteria cause a wide range of diseases in humans. Some major bacterial diseases are whooping cough, cholera (KAHL uhr uh), anthrax, and tooth decay. Bacteria also cause some kinds of food poisoning and some kinds of ulcers.

You can control the spread of bacteria by washing your hands, by keeping your kitchen clean, by not sharing drinking glasses or eating utensils with someone who is sick, and by getting treatment for an illness before it spreads to other people. If the water supply has harmful bacteria in it, boiling the water or treating it with certain chemicals will help stop the spread of the bacteria.

Most bacterial diseases can be treated with antibiotics. An *antibiotic* is a medicine used to stop the growth of or to kill bacteria or other microorganisms. If you are ill, your doctor can tell you if you have a bacterial infection. If bacteria are the cause of your illness, your doctor may prescribe an antibiotic. Sometimes, your doctor may tell you that the best treatment is to get plenty of rest.

Antibiotics and viruses

Antibiotics and antibacterial soaps do not kill the viruses that cause many infectious diseases, such as the common cold. Antibiotics only work against bacteria and other living organisms.

Figure 7 Tiny parasitic worms cause fluid to build up in parts of the body, which makes limbs swell to many times their normal size.

Protozoa and Parasites

Protozoa (PROHT oh ZOH uh) cause some diseases. **Protozoa** are small, single-celled organisms that have a nucleus. They are more complex than bacteria. Most protozoa can be seen only through a microscope. Some kinds of protozoa are parasites. A *parasite* is an organism that gets its food from another organism, called the *host*, without killing the host.

Most protozoa are harmless to humans. But there are a few protozoa that cause illness. For example, the parasite *Giardia* (jee AHR dee uh) is found in water supplies. *Giardia* can cause stomach upset, stomach cramps, and diarrhea in humans. *Giardia* outbreaks are relatively rare in the United States, but if a water supply becomes contaminated with *Giardia*, the outbreak usually makes the news.

Another parasite, *Plasmodium* (plaz MOH dee uhm), causes malaria in humans. *Plasmodium* protozoa are carried by certain kinds of mosquitoes. A person bitten by one of these mosquitoes may become ill with malaria. Malaria is usually found in tropical countries and is not common in the United States.

You cannot see protozoa with the naked eye. This is one reason campers treat water from streams before drinking it. And travelers to other countries may get parasites from an insect bite, or by eating contaminated food or by drinking contaminated water. Fortunately, antibiotics and other drugs are available to treat most diseases caused by protozoa and other parasites.

Hands-on ACTIVITY

INFECTIOUS DISEASES

1. Go to the library or to the Internet and look up "infectious diseases."

2. Select one infectious disease and do research on it. Your research should include the name of the disease, where in the world the disease is found, what causes it, how it is transmitted, what its symptoms are, and what the treatment for it is.

3. Make a poster that displays the results of your research.

Analysis

1. Combine the results of your research with your classmates' results to make a map of the world showing where infectious diseases are most common.

2. Using a computer or graph paper, make a pie chart or bar graph showing the five most common ways that infectious diseases are spread.

Figure 8 The areas of redness and flaking skin are caused by athlete's foot, one of the most common diseases caused by a fungus.

Fungi

Some diseases are caused by fungi (FUHN JIE). **Fungi** (singular *fungus*) are complex organisms that cannot make their own food. Fungi break down other substances and absorb the nutrients from them. Fungi are everywhere—there are over 100,000 species of fungi. Most fungi are harmless to humans. Some fungi, such as yeast and edible mushrooms, are useful to humans. But some fungi cause diseases in humans. The most common fungal diseases are athlete's foot and yeast infections.

Some fungal diseases are spread by person-to-person contact. Other diseases are spread by fungal spores in the air, water, or soil. Most fungal diseases can be treated with medicines applied to the skin. For example, athlete's foot may be treated with antifungal creams or powders. To get rid of some fungal infections, such as toenail fungus, you must take medicine by mouth.

Lesson Review

Using Vocabulary

1. Identify and define four causes of infectious diseases.

Understanding Concepts

2. What is an antibiotic?
3. Why does your doctor need to know that the illness you have is caused by a virus?

Critical Thinking

4. **Making Inferences** In tropical countries, malaria kills 1 million to 2 million people every year. Why do you think it is so hard to stop this disease?
5. **Analyzing Ideas** Pathogens are all around you. How can you prevent the spread of common infectious diseases?

Lesson 3

Controlling Infectious Diseases

What You'll Do

- **Discuss** two ways to protect yourself from infectious diseases.
- **Identify** two ways to control the spread of infectious diseases.

Start Off Write

Why should you know basic ways to stop the spread of infectious disease?

Sandy's class visited a laboratory where scientists research antibiotics. The class learned that finding useful antibiotics is a very long and expensive process.

Sandy also learned that some of the best ways to stop the spread of infectious diseases do not involve antibiotics or vaccines. Sometimes, controlling infectious diseases is a matter of using common sense and good personal hygiene.

Protecting Yourself

One way to avoid pathogens is to stay away from people who are sick. Another way to avoid pathogens is to wash your hands. Washing with warm, soapy water will help protect you from colds and the flu. You can also help your body fight pathogens by maintaining a healthy diet and getting plenty of rest and exercise.

Vaccines provide protection against some infectious diseases. Many infants and children receive vaccinations against a variety of diseases. Most vaccinations are given to children between birth and six years of age. The following diseases are commonly prevented by vaccines:

- hepatitis B (HEP uh TIET is BEE)
- diphtheria (dif THIR ee uh), tetanus, and whooping cough
- poliomyelitis (POH lee OH MIE uh LITE is)
- measles, mumps, and rubella
- chickenpox

Figure 9 These children are getting shots of polio vaccine, which was introduced in the 1950s. Polio vaccines have since stopped the spread of polio.

Hands-on ACTIVITY

SPREAD OF PATHOGENS

1. Some students will be given surgical masks to wear during the activity.

2. Your teacher will spray some air freshener. The air freshener represents pathogens in a sneeze.

3. Using a seating chart and a stopwatch, record how much time it takes for each student to smell the air freshener.

Analysis

1. Using the data you collected with the seating chart and the stopwatch, draw a diagram showing the spread of the pathogens in the classroom.

2. What is the purpose of the surgical masks? Were they effective?

Protecting Others

After you have done what you can to protect yourself against pathogens, what can you do to protect others? Remember that pathogens usually spread by direct, person-to-person contact, by indirect contact with another person, through contaminated food or water, and through contact with insects and other animals.

The same steps you take to protect yourself from pathogens will also help protect other people. If you get a vaccination that protects you from a pathogen, you will not spread that pathogen to other people.

Communities take steps to stop the spread of pathogens. Some communities offer free flu shots before flu season. Many communities have vaccination programs for preschool children. And most communities have a health department that warns people when a disease outbreak is coming.

Public health officials sometimes use animals, such as chickens, to track the spread of diseases carried by insects. Often, these animals become infected before people do. By observing the animals, officials can tell when pathogens have reached a community.

Figure 10 This scientist is testing a sentinel chicken for infectious diseases.

Lesson Review

Understanding Concepts

1. Describe two ways to protect yourself from infectious diseases?

2. Identify two ways to control the spread of infectious diseases?

Critical Thinking

3. Making Predictions If the health department announced that your neighborhood was in the path of a disease carried by fleas, what steps would you take to protect yourself?

Lesson 4

Sexually Transmitted Diseases

What You'll Do

- **Describe** how HIV attacks the immune system.
- **Identify** five common STDs.
- **Describe** how to avoid getting STDs.

Terms to Learn

- sexually transmitted disease (STD)
- AIDS
- abstinence

Start Off Write

What causes AIDS?

Misaki's cousin Takumi has tested positive for HIV. Misaki is worried about him.

Human immunodeficiency (im MYOO noh di FISH uhn see) virus, or HIV, is the virus that causes AIDS. AIDS is a sexually transmitted disease. A **sexually transmitted disease,** or STD, is a disease that can be spread from person to person during sexual contact.

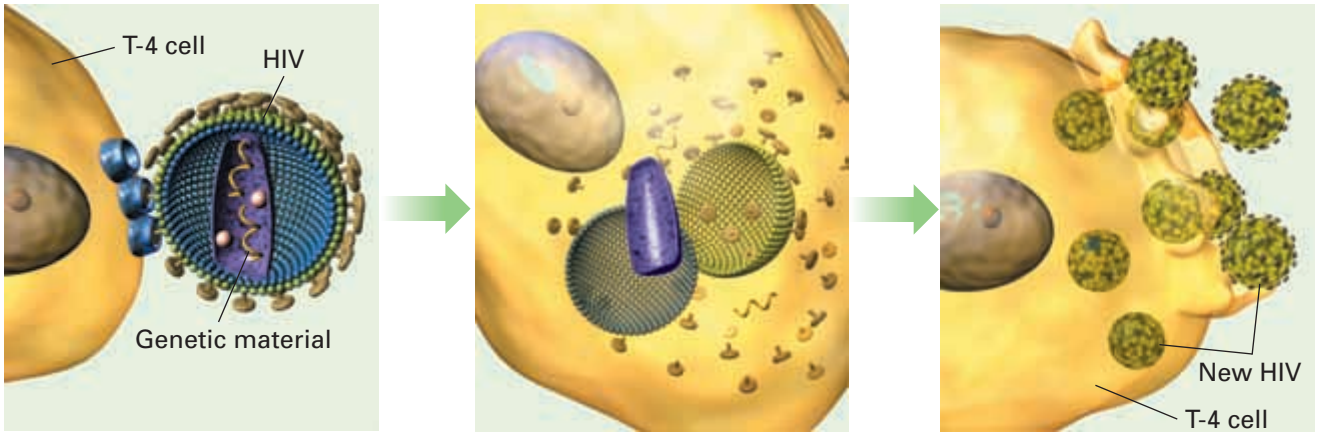
HIV and the Immune System

HIV is generally spread by sexual contact, from a mother to her baby, or from a contaminated blood product, usually from a needle shared by drug users.

HIV causes **AIDS,** or **acquired immune deficiency syndrome,** a deadly disease that weakens the body's ability to fight pathogens. A person whose immune system has been weakened by AIDS cannot fight off other diseases, such as some types of pneumonia and cancer. A person who has AIDS usually dies from a disease that a healthy immune system would resist.

A person infected with HIV may not develop AIDS for 10 years or more. But even if an HIV-infected person shows no signs of AIDS, he or she can spread the virus to other people.

Figure 11 Like other viruses, the HIV invades healthy cells and instructs them to make more copies of the HIV.



The HIV attaches to an immune system cell called a T-4 cell. The HIV then enters the T-4 cell.

Once inside, the HIV breaks apart and releases its genetic material. This material instructs the T-4 cell to make new HIV.

The new HIV leave the T-4 cell and look for more T-4 cells to infect. Each T-4 cell can produce many HIV.

STDs: More Than Just AIDS

You might think that HIV is the only STD or is the most common one. Herpes, chlamydia (kluh MID ee uh), genital warts, gonorrhea (GAHN uh REE uh), and trichomoniasis (TRIK uh muh NIE uh sis) are STDs that are more common among teens than HIV is. These common STDs are caused by a variety of pathogens. Bacteria cause chlamydia, syphilis (SIF uh lis), and gonorrhea. Viruses cause herpes, genital warts, and AIDS.

Each STD has specific symptoms. For example, the symptoms of chlamydia—for men and women—include a clear discharge, frequent urination, or burning when urinating. But people infected with chlamydia often do not have any symptoms. These people may not realize they have an STD. Even so, if a person with an STD has sexual contact with someone else, the STD can be spread.

Someone who suspects that he or she has an STD should see a doctor immediately. Viral STDs cannot be cured, but some can be treated. Bacterial STDs can be cured with antibiotics, and treatment should begin as soon as possible after infection. Often, drugs used to treat STDs, especially drugs used to treat HIV and AIDS, have unpleasant physical side effects. These side effects are one more reason to avoid STDs.

Myth & Fact

Myth: You can always tell when you or someone else has an STD.

Fact: No, you can't! Some STDs have no obvious symptoms. Anyone who has sexual contact with a person who has an STD can be infected by an STD. The only way to be sure you do not have an STD is to practice abstinence.

TABLE 1 Common Sexually Transmitted Diseases

Disease (cause)	Symptoms	Treatment
Chlamydia (bacteria)	burning during urination; discharge; may show no symptoms, but bacteria can still be spread	antibiotics are a cure
Genital herpes (virus)	fever; painful, itchy genital sores; burning feeling during urination	medicine can relieve symptoms; no cure
Genital warts (virus)	painless warts in genital area; warts usually appear 3 weeks to 6 months after infection; virus remains in body	warts can be removed by surgery or freezing; no cure
Gonorrhea (bacteria)	unusual discharge from penis or vagina; pain or burning feeling during urination; sometimes no symptoms, but bacteria can still be spread	antibiotics are a cure (but some types of gonorrhea bacteria are drug resistant)
Trichomoniasis (protozoa)	yellowish, foul-smelling discharge (females); itching (females); may have no symptoms (males)	antibiotics are a cure
Syphilis (bacteria)	moist, painless, red sores where bacteria enter body; rash; flulike symptoms; may cause brain damage	antibiotics are a cure

Figure 12 When you choose activities that do not put your health at risk, your life will be a lot more fun.

Abstinence and Preventing STDs

Disease control and prevention are important because no one wants to be sick. Some diseases are mild, other diseases are much more deadly. Infections caused by STDs can be especially painful and unpleasant. Some STDs, such as HIV and herpes, cannot be cured. You have to live with them forever. Some STDs, such as untreated syphilis and HIV that develops into AIDS, can kill you.

But the spread of STDs is easily prevented. In fact, there is one way you can be absolutely sure that you will not get an STD. The only way to avoid STDs is called *abstinence*. **Abstinence** is refusing to take part in any activity or behavior that puts your health and the health of other people at risk. Sexual activity is risky behavior. It puts you and other people in danger of becoming infected with an STD. Abstinence from sexual activity—making the decision not to take part in sexual activity—eliminates that danger.

Why is abstinence the best prevention? Most STDs are transmitted only by direct contact with other people's body fluids. These body fluids include saliva, blood, semen, and vaginal fluid. You can avoid other people's body fluids—and STDs—by

- not using alcohol or drugs, because people who are under the influence of alcohol or drugs are more likely to engage in sexual activity
- not sharing needles, because people who share a needle with an HIV-infected person expose themselves to HIV
- not having sexual contact

Abstinence has other benefits, too. These benefits include respecting yourself and being happy, being able to reach your personal goals, avoiding the risks of pregnancy, and respecting your parents.

LIFE SKILLS ACTIVITY

USING REFUSAL SKILLS

Make a list of all the things you want to do with your life that are good reasons for refusing to take part in sexual activity.

Figure 13 Myths and Facts About STDs

Lesson Review

Using Vocabulary

1. Define *STD*, and list five common STDs.
2. What is AIDS?

Understanding Concepts

3. Describe how HIV attacks the immune system.
4. Describe ways to avoid getting an STD.

Critical Thinking

5. **Making Inferences** A small number of people have been infected with HIV for 10 years or more and still show no symptoms of AIDS. Does this mean that these people do not have to worry about infecting another person? Explain your answer.
6. **Analyzing Ideas** How can two people show affection for each other and still practice abstinence?

Lesson 5

Noninfectious Diseases

Hunter has Down syndrome. He has the facial features, learning disabilities, and characteristics of most people who have Down syndrome. Hunter was born with Down syndrome, and he can't do anything to change it.

What You'll Do

- **Explain** the difference between genetic disease and congenital disease.
- **Identify** three common noninfectious diseases.

Terms to Learn

- noninfectious disease
- genetic disease
- congenital disease

Start Off Write

What is the difference between an infectious disease and a noninfectious disease?

Hunter's condition, Down syndrome, is one of many noninfectious diseases and disorders that affect people. A **noninfectious disease** is a disease or disorder that is not caused by a virus or living organism.

Causes of Noninfectious Diseases

Noninfectious diseases include some immune system disorders, diseases of specific organ systems, and nutrition disorders. Some noninfectious diseases, called *genetic and congenital diseases*, are present at birth. A **genetic disease** is a disease or disorder that is caused entirely or partly by genetic information passed on to a child from one or both parents. Hunter's condition, Down syndrome, is a genetic disorder. A **congenital disease** is a disease or disorder that is present at birth but is not a genetic disease. For example, some people are born with defects in parts of their heart. This condition is congenital heart disease.

Some noninfectious diseases are related to lifestyle choices. For example, using tobacco may cause heart disease or lung cancer. Other noninfectious diseases are related to factors in a person's surroundings. For example, air pollution may trigger asthma attacks or cause lung cancer.

Figure 14 Having a noninfectious disease doesn't have to stop you from having a happy life.

- **All over**—Cancer is a group of about 100 diseases that can affect any tissue or organ in the body.
- **Liver**—Liver disease, often the result of alcohol abuse, may be fatal.
- **Red blood cells**—Sickle cell disease damages red blood cells and it causes anemia and extreme pain.
- **Joints**—Arthritis causes joints to swell, which makes movement painful.
- **Muscles**—Muscular dystrophy is a group of diseases that weaken muscles, especially heart and skeletal muscles.

- **Brain**—Alzheimer's disease causes memory loss and behavior changes. Down syndrome causes mild mental retardation.
- **Heart**—Congenital heart disease may cause damage to heart valves or other parts of the heart. Other heart diseases, such as high blood pressure and arterial disease, may cause heart attacks and heart failure.
- **Lungs**—Emphysema, allergies, and asthma cause breathing difficulties.
- **Kidneys**—Type 1 and type 2 diabetes may cause severe kidney damage.

Figure 15 Noninfectious diseases affect many parts of the body.

Common Noninfectious Diseases

Some common noninfectious diseases include the following:

- **Heart Disease** High blood pressure, heart attacks, strokes, and artery diseases are types of heart disease. Heart disease is the leading cause of death in the United States.
- **Diabetes** Diabetes is a disease in which the body is not able to use sugar properly.
- **Cancer** Cancer is a group of diseases in which cells grow uncontrollably and invade and destroy healthy tissues. Cancer can attack any part of the body.
- **Allergy** An allergy is an overreaction of the immune system to something in your surroundings that is harmless to most people.
- **Asthma** Asthma is a breathing disease that can be triggered by allergies, infections, exercise, changes in weather, and smoke.
- **Alzheimer's disease** Alzheimer's disease is an incurable brain disease that causes a gradual and permanent loss of memory and other brain functions.

Brain Food

There are several types of congenital heart disease. Some types affect the valves in the heart. Other types affect the walls between parts of the heart. Still other types affect the aorta or other blood vessels of the heart.

Health Journal

What would you do if someone in your family had Down syndrome and other people picked on that family member? How would you react? What could you tell those people about your family member's condition that might help them understand the condition and your family member better? Write your answers in your Health Journal.

Living with Noninfectious Diseases

Some noninfectious diseases are serious or even fatal, while others have few effects. Some noninfectious diseases can be cured. For example, a congenital heart condition that affects a heart valve can usually be repaired with surgery. Even noninfectious diseases that cannot be cured can usually be treated. For example, heart disease caused by lifestyle choices can be managed by eating a healthy diet, not using tobacco, and getting plenty of exercise. Type 2 diabetes, a genetic disease, can often be controlled with exercise and proper diet.

A person living with a noninfectious disease may have to eat a special diet, take medicine, avoid certain activities, or have special medical care. But living with these diseases does not mean that person has to live an unhappy life or be alone. In fact, most people with these diseases lead relatively normal lives.

Every disease has both physical and mental effects. A person who has a noninfectious disease may be embarrassed by his or her condition. But, in fact, most people who have noninfectious diseases can live relatively normal, happy, and exciting lives. Even so, these people may sometimes be the target of teasing or insults. Teasing someone because he or she has a noninfectious disease is like teasing someone because he or she has a cold. Teasing is mean, and it is wrong.

Figure 16 Having a noninfectious disease doesn't have to stop you from becoming an outstanding athlete—or anything else!

Table 2 Controlling Noninfectious Diseases

Disease	Description	Control or treatment
Allergies	an overreaction by the body to things that are usually harmless	avoiding things to which you are allergic; taking medicine to relieve symptoms
Asthma	a disease of the respiratory system that causes shortness of breath, coughing, and wheezing	avoiding triggers, such as cigarette smoke; taking medicine to open airways
High blood pressure	a disease in which blood exerts too much force on walls of blood vessels	having a healthy diet; getting plenty of exercise; taking medicine to help reduce blood pressure
Cancer	a group of diseases that cause uncontrolled cell growth; can attack any tissue or organ	not using alcohol or tobacco, limiting exposure to the sun, and eating a healthy diet (prevention); chemotherapy, surgery, radiation therapy, and taking medicine (treatment)
Type 1 diabetes	a disease in which the body does not make enough insulin, so the body cannot use sugars from food for energy	taking daily insulin injections; having a healthy diet
Type 2 diabetes	a disease in which the body makes insulin, but cannot use it properly, so the body cannot use sugars from food for energy	controlling weight; getting plenty of exercise; having a healthy diet; taking medicine may help the body use insulin
Arthritis	a group of diseases that cause swelling and severe pain in the joints	taking medicine to control swelling and reducing pain; exercising to keep joints flexible; using heat or cold to reduce pain

Lesson Review

Using Vocabulary

1. Compare and contrast hereditary and congenital diseases.
2. What is a noninfectious disease?

Understanding Concepts

3. Name three common noninfectious diseases and the way in which each can be treated or controlled.
4. Why is it unfair to tease someone who was born with a genetic disorder?

Critical Thinking

5. **Making Inferences** Explain why someone who has asthma would want to avoid a friend who has an infectious disease such as the flu.
6. **Analyzing Ideas** Why might it be more difficult to treat a hereditary disease than to treat a case of athlete's foot?

10 CHAPTER REVIEW

Chapter Summary

■ Infectious diseases are caused by pathogens. ■ Pathogens are viruses, bacteria, protozoa and parasites, and fungi. ■ Noninfectious diseases are not caused by pathogens. ■ Your body has ways to protect against infectious diseases. ■ Antibiotics are drugs that kill bacteria or slow the growth of bacteria. ■ One of the easiest ways to protect yourself against infectious diseases is to wash your hands thoroughly. ■ HIV is not the most common STD. ■ Abstinence is the only way to be sure you will not get an STD. ■ Common noninfectious diseases include heart disease, diabetes, cancer, allergies and asthma. ■ Many noninfectious diseases cannot be cured, but they can often be treated.

Using Vocabulary

For each pair of terms, describe how the meanings of the terms differ.

1. infectious disease/noninfectious disease
2. bacteria/virus
3. AIDS/HIV
4. genetic disease/congenital disease

For each sentence, fill in the blank with the proper term from the word bank provided below.

HIV	antibiotic
genetic disease	pathogen
fungi	heart disease
influenza	abstinence

5. A drug that kills bacteria or slows the growth of bacteria is called a(n) ___.
6. A disease caused by genetic information passed to a child from his or her parents is a(n) ___.
7. The leading cause of death in the United States is ___.

Understanding Concepts

8. How can coughing or sneezing spread infectious diseases?
9. Why is your skin part of your defenses against diseases?
10. What is your immune system, and why is it important?
11. Do all people who have an STD get sick or show symptoms? Explain.
12. How does washing your hands and washing your drinking glasses help stop the spread of disease?
13. Why should you stay home from school if you have the flu or a bad cold?
14. What are two differences between communicable diseases and noninfectious diseases?
15. Explain what abstinence is and discuss why it is an important way to fight STDs.

Critical Thinking

Applying Concepts

16 If your doctor tells you that you are allergic to peanuts, what are two ways to control your allergy?

17 Does everybody infected with HIV also have AIDS? Explain.

18 Why are children often vaccinated against a variety of childhood diseases?

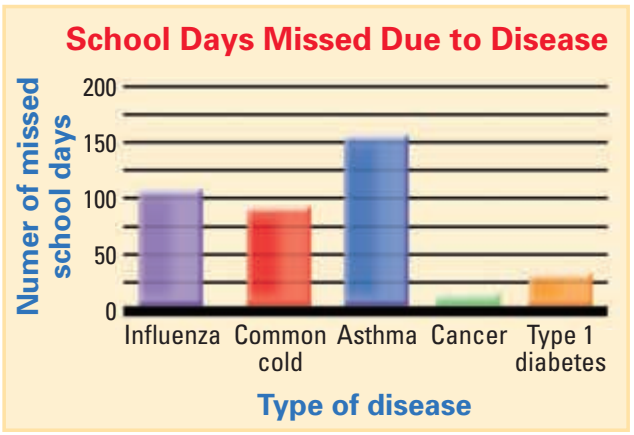
Making Good Decisions

19 A doctor speaks to your school about HIV. During her speech, she tells everybody that she is HIV positive, meaning that she is infected with HIV. After the speech, you want to shake the doctor's hand, but you are concerned that you might catch HIV. Should you shake the doctor's hand or not? Explain.

20 Your little sister has asthma. During your summer vacation, you want to take her to the park to spend the afternoon playing. You hear on the news that pollen levels and air pollution levels will be high during the day. Should this news affect your decision to take your sister to the park? Explain.

21 You go to the doctor with a sore throat and the doctor prescribes an antibiotic for you to take. The instructions for the medicine say that you should take it until it is gone. You take the antibiotic for a few days, and then you start feeling better. Do you think it is safe to stop taking the antibiotic as soon as you feel all better, even if the instructions say to take all of it? Explain.

Interpreting Graphics



The graph above shows the number of missed days at Braintree Middle School that were caused by each of five different diseases. Use this graph to answer questions 22–25.

22 Which disease caused almost 100 missed days of school?

23 Approximately how many fewer days were lost to type 1 diabetes than to influenza?

24 Which disease caused the most missed school days?

25 More students at the school caught common colds than had influenza, yet influenza caused more total missed days of school. What might the reason be?

Reading Checkup

Take a minute to review your answers to the Health IQ questions at the beginning of this chapter. How has reading this chapter improved your Health IQ?

Life Skills IN ACTION

Practicing Wellness

Practicing wellness means practicing good health habits. Positive health behaviors can help prevent injury, illness, disease, and even premature death. Complete the following activity to learn how you can practice wellness.

An Ounce of Prevention

ACT 1

Setting the Scene

It seems like almost everybody in Ken's math class is sick. Some people are staying home with the flu, while others are coming to school because they do not want to fall behind in their classes. Ken just doesn't want to get sick. He's going to be a starter at next week's basketball game, and he doesn't want to miss it because he's sick.

The 4 Steps of Practicing Wellness

1. Choose a health behavior you want to improve or change.
2. Gather information on how you can improve that health behavior.
3. Start using the improved health behavior.
4. Evaluate the effects of the health behavior.

Guided Practice

Practice with a Friend

Form a group of two. Have one person play the role of Ken, and have the second person be an observer. Walking through each of the four steps of practicing wellness, role-play Ken avoiding getting sick. Ken may speak to a doctor about what he can do to avoid getting sick. The observer will take notes, which will include observations about what the person playing Ken did well and suggestions of ways to improve. Stop after each step to evaluate the process.

Independent Practice

Check Yourself

After you have completed the guided practice, go through Act 1 again without stopping at each step. Answer the questions below to review what you did.

1. What are three things Ken can do to avoid getting sick? What are some health behaviors Ken may want to improve?
2. Beside talking to his doctor, where else can Ken get information about staying healthy?
3. How can Ken evaluate the effects of his health behaviors?

ACT 2

On Your Own

Ken avoids getting sick and gets to start in the basketball game. Because Ken wants to start in other games, he practices every day. After a few weeks, Ken's shins start hurting all the time. Make a flowchart that shows how Ken can use the four steps of practicing wellness to help him get on the road to recovery.