Indicate how frequently you engage in each of the following behaviors (1 = never; 2 = occasionally; 3 = most of the time; 4 = all of the time). Total your points, and then turn to p. 642.

1. I eat foods that are low in saturated fats and high in fiber.

2. I eat and drink foods that are low in added salt and sugar.

3. I exercise at least 60 minutes every day.

4. I avoid tobacco products and being in smoky environments.

5. I have yearly medical exams.

6. When outside, I wear sunscreen.

7. I eat at least 2 servings of fruit a day.
Even though Devon is only 16 years old, he is worried about his health. Both his father and one of his grandfathers have diabetes. Devon worries that he will also develop diabetes, but he doesn’t know what to do. He decides to talk to his doctor about ways to reduce his risk.

What Are Lifestyle Diseases?
A hundred years ago, the main causes of death in the United States were infectious diseases, such as tuberculosis (TB) and the flu. Today, however, we are better protected from infections because of good hygiene practices, better living conditions, and medical advances. So, although infectious diseases are still a serious health problem, the top causes of death in the United States today are lifestyle diseases.

Lifestyle diseases are diseases that are caused partly by unhealthy behaviors and partly by other factors.

What Causes Lifestyle Diseases?
Lifestyle diseases are so called because a person’s lifestyle (habits, behaviors, and practices) largely determine whether the person develops a lifestyle disease. Lifestyle diseases include cardiovascular disease, many forms of cancer, and two types of diabetes.

Personal habits, behaviors, and practices, however, are not the only factors that determine whether a person develops a lifestyle disease. Other factors that we cannot control, such as age, gender, and genes, also contribute to a person’s chances of developing a lifestyle disease.

It is important to know the factors that contribute to lifestyle diseases, because behaviors that lead to lifestyle diseases later in life can start when you are very young. In Devon’s case, diabetes runs in his family. The chance that Devon will develop diabetes is greater than it would be if there was not a history of diabetes in his family. However, by practicing a healthy lifestyle now, Devon can reduce his risk of developing diabetes.
Risk Factors for Lifestyle Diseases

When determining if a person might develop a disease, a doctor looks at the person’s risk factors. A *risk factor* is anything that increases the likelihood of injury, disease, or other health problems.

**Controllable Risk Factors**  Taking charge of the risk factors that you can control may greatly decrease your chances of developing a lifestyle disease. Controllable risk factors include habits, behaviors, and practices that you can change, as shown in Figure 1. For example, controllable risk factors include

- your diet and body weight
- your daily levels of physical activity
- your level of sun exposure
- smoking and alcohol abuse

Thus, exercising regularly, eating a healthy diet, and not smoking will help you reduce your risk of lifestyle diseases later in life. Because there are many risk factors that you have little or no control over, it is important to start healthy habits that you can control early.

**Uncontrollable Risk Factors**  Some risk factors that contribute to your chances of developing a lifestyle disease are out of your control. However, it is important to understand what these factors are and how they affect your health. Uncontrollable risk factors include

- **Age**  As you age, your body begins to change. As a result of aging, the body has a harder time protecting itself. Therefore, the chances of developing a lifestyle disease increase as you age.
Gender Certain diseases are more common among members of one gender. For example, men have a greater risk of heart disease than women do, especially earlier in life. Women have a greater risk of breast cancer than men do.

Ethnicity Your ethnicity can also influence your chances of developing a lifestyle disease. For example, African Americans are more likely to develop high blood pressure than individuals of European descent are. Mexican Americans have a higher risk of developing diabetes than individuals of European descent do. Asian Americans historically have had a lower incidence of heart disease than people of European decent have had. However, Asian Americans have recently begun to develop heart disease in greater numbers. It is believed that a change to eating a high-fat, low-fiber diet is the main reason for the increase.

Heredity In the same way that genes determine your natural hair color, genes can also determine your chances of developing certain lifestyle diseases. For example, in some families heredity may increase the chances that a family member will develop cancer.

However, it is important to remember that just because you have an uncontrollable risk factor for a lifestyle disease, you will not necessarily develop that disease. For example, if you have a hereditary tendency to develop heart disease, you can make healthy food choices and exercise regularly and you may never develop heart disease. You may, however, need to work harder to prevent heart problems than other people do.

Although we all have uncontrollable risk factors such as age, gender, ethnicity, and heredity, there are still many behaviors you can practice to help lower your risk of developing a lifestyle disease.

SECTION 1

REVIEW Answer the following questions on a separate piece of paper.

Using Key Terms
1. Define the term lifestyle disease.

Understanding Key Ideas
2. Describe how a person’s lifestyle can increase his or her chances of developing a lifestyle disease.
3. Identify the term for “anything that increases the likelihood of injury, disease or other health problems.”
   a. unavoidable chance  
   b. risk factor  
   c. hereditary tendency  
   d. none of the above
4. List three controllable risk factors for lifestyle diseases.
5. Classify each of the following risk factors as controllable or uncontrollable.
   a. age  
   b. smoking  
   c. diet  
   d. genes

6. Summarize how each of the following can increase your risk of developing a lifestyle disease.
   a. age  
   b. gender  
   c. ethnicity  
   d. heredity

7. LIFE SKILL Setting Goals Describe two actions you can take today to help reduce your chances of developing a lifestyle disease.

Critical Thinking
8. Why might a person who has lead a healthy lifestyle develop a lifestyle disease?
9. Do people have an obligation to take the best care of themselves that they can? Explain.
Xavier just got back from a physical exam. The doctor told Xavier that he had high blood pressure. Xavier knew that high blood pressure was common in his family. He felt that he had already taken some steps to lower his risk.

What Are Cardiovascular Diseases?

Together, the heart and blood vessels make up the cardiovascular system. The diseases and disorders that result from progressive damage to the heart and blood vessels are called cardiovascular diseases (CVDs). You may not have heard that term before, but you’ve probably heard of some kinds of cardiovascular disease: heart attack, stroke, atherosclerosis, and high blood pressure.

Cardiovascular disease is the leading cause of death in the United States. Nearly all of the people who die from CVD are over the age of 40. So why should you worry about CVD now? The damage that leads to CVD builds up over many years and may begin as early as childhood. So, the sooner you start taking care of your heart and blood vessels, the more likely you are to avoid developing a CVD.

Lifestyle and Cardiovascular Disease  Why do some people die from cardiovascular disease while others never have any problems? Genetic differences between people are one reason. But whether you develop a cardiovascular disease and how serious it becomes also depend on how you live. For example, smoking, being overweight, having high blood pressure, having high blood cholesterol, or having diabetes greatly increase your risk of developing a cardiovascular disease.
Types of Cardiovascular Diseases

About 60 million Americans have some form of cardiovascular disease. Heart attacks, strokes, and other kinds of cardiovascular disease kill about 1 million Americans every year. This number is twice the number of people who die from cancer.

Stroke

Each year about 160,000 people die from strokes. Strokes are sudden attacks of weakness or paralysis that occur when blood flow to an area of the brain is interrupted. In some cases, a blood clot (shown in yellow) lodges in one of the arteries in the brain. The clot cuts off circulation to nearby brain cells. If the clot isn’t removed, the cells begin to die. Strokes can also occur when a hole forms in one of the vessels inside the skull, and blood leaks into the brain. Internal bleeding can severely damage the brain.

Get medical help immediately if you or anyone around you has the following symptoms:

- sudden numbness or weakness of the face, an arm, or a leg
- trouble seeing in one or both eyes
- sudden dizziness or loss of coordination
- sudden, severe headache with no known cause

High Blood Pressure

Doctors call high blood pressure, or hypertension, the silent killer, because many people don’t know that their blood pressure is high until they have a heart attack or stroke. Blood pressure is the force that blood exerts against the inside walls of a blood vessel. When blood pressure is too high, it puts extra strain on the walls of the vessels and on the heart.

High blood pressure can injure the walls of the blood vessels, which can lead to other cardiovascular diseases. It also makes the heart work harder, which can cause the heart to weaken or fail. High blood pressure can eventually damage the kidneys and eyes, too.
Heart Attack

The narrow coronary arteries that cover the heart deliver the nutrients and oxygen that the cells of the hard-working heart require. If a blood clot gets stuck in one of the coronary arteries, it can sharply reduce or shut off blood flow to the heart. As the heart cells die from lack of oxygen, the victim often has a crushing pain in the chest. The result of the reduced blood flow is a heart attack. A heart attack is the damage and loss of function of an area of the heart muscle. About one-third of heart attacks injure the heart so badly that they are fatal. Heart attacks can happen at any time, and sometimes they happen without any previous symptoms. Therefore, it is important to know the warning signs of a heart attack.

Warning Signs of a Heart Attack

- Uncomfortable pressure, squeezing, or pain in the center of the chest that lasts for more than a few minutes
- Pain spreading to shoulders, neck, and arms
- Chest discomfort combined with lightheadedness, fainting, sweating, nausea, or shortness of breath

Atherosclerosis

If you looked inside an old water pipe, you might find it clogged with buildup. Much less water can flow through such a pipe than through a new, clean one. Something similar can happen inside blood vessels. Fatty deposits known as plaques build up on the inside walls of arteries and interfere with blood flow. The disease characterized by the buildup of fatty materials on the inside walls of the arteries is called atherosclerosis (ATH uhr OH skluh ROH sis).

Atherosclerosis is dangerous for two reasons. First, it can reduce or stop blood flow to certain parts of the body. Second, these deposits can break free and release clots into the bloodstream. If one of these clots gets stuck in one of the coronary arteries, the result is a heart attack. If the clot lodges in the brain, a stroke results.
Detecting and Treating Cardiovascular Diseases

The earlier you detect and treat a cardiovascular disease, the greater your chance of reducing the damage or danger of the disease.

Detecting Cardiovascular Diseases

Doctors today can diagnose CVD earlier and more accurately than they could before. Methods to detect CVD include:

- **Blood Pressure**
  
  To check your blood pressure, a healthcare provider wraps a cuff around your upper arm. The cuff is inflated until it is tight enough to stop bloodflow through the main artery in the arm. As air is slowly released from the cuff, the healthcare provider uses a stethoscope to listen for the heartbeat sound as blood begins to flow through the artery. He or she records the number that appears on the instrument recording the pressure. This number indicates the systolic pressure, the maximum blood pressure when the heart contracts.

  As the cuff deflates further, the healthcare provider listens until the sound of the heartbeat disappears and the blood flows steadily through the artery. He or she records this second number. The second number, the diastolic pressure, indicates the blood pressure between heart contractions.

Analyzing DATA

Checking Blood Pressure

Blood pressure is measured in millimeters of mercury (mm Hg). Blood pressure is expressed as two numbers. In the diagram, the number at the end of the red bar indicates the pressure.

1. The first number measured indicates the systolic pressure. Systolic pressure is the maximum pressure when the heart contracts.
2. The second number measured indicates the diastolic pressure. Diastolic pressure is the pressure between heart contractions.

**Your Turn**

1. What is this person’s systolic pressure?
2. What is this person’s diastolic pressure?
3. **CRITICAL THINKING** Does this person have high blood pressure? If so, what can he or she do to reduce it?
4. **CRITICAL THINKING** If a woman has a blood pressure of 100/70, what is the systolic pressure? What is the diastolic pressure? Is her blood pressure low, normal, or high?
Normal blood pressure generally falls between 80/50 and 130/85 mm Hg (a unit for measuring pressure). Blood pressure over 140/90 is considered high.

Electrocardiogram One of the most common cardiovascular tests is the electrocardiogram, sometimes called an ECG or EKG. An EKG measures the electrical activity of the heart. EKGs can detect damage to the heart and an irregular beat.

Ultrasound To look at the heart in action, doctors sometimes use ultrasound, which is also used to take pictures of babies in the womb. Doctors can see the pumping of the heart and the action of the heart valves.

Angiography Angiography (AN jee AHG ruh fee) is a test in which dye is injected into the coronary arteries. An instrument called a fluoroscope is used to see where the dye travels and to look for blockages in the coronary arteries.

Treating Cardiovascular Diseases Today, we have many choices for treating cardiovascular disease (CVD).

Diet and Exercise Changing the diet and exercise habits of a patient is an important step in treating CVD. A low-fat, low-salt, and a low-cholesterol diet, along with light physical activity, is often prescribed to people with signs of CVD. Exercise is normally carried out under a doctor’s supervision.

Medicines Many medicines are available to treat CVDs. For example, some medicines keep the blood vessels from constricting. This helps keep blood pressure down.

Surgery If the coronary arteries are badly clogged, doctors often perform a coronary artery bypass operation. Surgeons remove a length of vein from the patient and transplant it to the heart. They attach one end of the vein to the aorta and the other end to the coronary artery just below the blockage. Thus, blood can detour around the blockage and reach the heart muscle.

Angioplasty A technique called angioplasty requires a doctor to insert a tube with a balloon at the tip into a blood vessel in the patient’s leg. The tube and balloon are guided through vessels into the blocked artery. Once the balloon is in place, it is inflated to flatten the plaque and open the artery. Sometimes, a metal cage called a stent is left in the artery to prop open the artery walls.

Pacemakers Sometimes, the heart needs help to keep beating. If the heart cannot keep a steady rhythm, surgeons may implant an artificial pacemaker in the chest. Artificial pacemakers are small, battery-powered electronic devices that stimulate the heart to contract.

Transplants If the heart becomes so weak or diseased that it can’t do its job, surgeons may replace it. Depending on the emergency, doctors may use artificial hearts or hearts taken from people who gave permission for their organs to be removed after their death. An operation to replace a heart is called a heart transplant.
Preventing Cardiovascular Diseases

The doctors and surgeons who treat CVD would prefer that you protect your heart and blood vessels before you get sick. Because CVD can begin as early as childhood, it is important to take steps now, such as doing the healthy activity shown in Figure 2, to ensure a healthy future. The following advice can help you lower your risk of CVD.

- **Trim the fat, and hold the salt.** Limit your consumption of saturated fats, cholesterol, and salt. Instead, eat more fruits and vegetables, lean meats, and plenty of products made from whole grains.

- **Keep your weight near recommended levels.** Being overweight increases your risk of CVDs. Try to keep your weight near that recommended for your height and build.

- **Don’t smoke.** Smoking speeds up atherosclerosis and increases your risk of having a stroke or heart attack. If you don’t smoke, don’t start. If you do smoke, the sooner you quit, the better.

- **Get moving.** Regular exercise benefits your cardiovascular system in many ways. It helps you feel less stressed by daily life and is also a good way to keep your weight under control.

- **Watch those numbers.** Have your blood pressure and cholesterol checked regularly. If you have a family history of CVD, you should get checked now. It may be wise to start a program to control your cholesterol, even this early.

- **Relax.** Stress, feelings of aggression, hostility, and anger have been shown to increase the risk of CVD. The increase in risk may be due to the physical effects of stress, such as raised blood pressure, or due to smoking, drinking, or poor eating—behaviors people sometimes use to deal with stress.

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**Figure 2**
Exercising can help to lower your chance of developing a cardiovascular disease.

**ACTIVITY** List two exercise activities that you enjoy or might enjoy doing to keep your heart healthy.

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**SECTION 2 REVIEW**

**Using Key Terms**

1. **Identify** the term for “a disease or disorder that results from progressive damage to the heart and blood vessels.”

2. **Define** the term *stroke*.

3. **Name** the term for “the force that blood exerts against the inside walls of a blood vessel.”

**Understanding Key Ideas**

4. **Describe** how lifestyle contributes to cardiovascular disease.

5. **Name** four types of cardiovascular diseases.

6. **Compare** the meaning of systolic pressure and diastolic pressure readings.

7. **Classify** each of the following as either a detection method or a treatment for cardiovascular diseases.
   a. EKG
   b. angioplasty
   c. angiography
   d. heart transplant

8. **Life Skill** Practicing Wellness Identify the action that would help protect you from cardiovascular diseases.
   a. increasing salt intake
   b. smoking
   c. exercising regularly
   d. eating a high-fat diet

**Critical Thinking**

9. Why do you think cardiovascular diseases are so common in the United States?
Every day, millions of your body’s cells die. At the same time, millions of cells divide to take the place of the dying cells. Healthy cells divide at a regulated rate. Sometimes, the cells keep dividing uncontrollably. The result is a common but dangerous disease called cancer.

What Is Cancer?

Cancer is a disease caused by uncontrolled cell growth. More than 1 million people in the United States are diagnosed with cancer every year. Cancer is the second leading cause of death, after CVD.

Cancer begins when the way that the body normally repairs and maintains itself breaks down. To replace cells that have died or are worn out, your body makes new ones. This process is usually carefully controlled to produce only a limited number of replacement cells. Sometimes, however, these controls break down, and some cells continue to divide again and again. These out-of-control cells quickly grow in number.

Tumors 

As the body produces more and more of these faulty cells, they form a clump known as a tumor. A malignant tumor (muh LIG nuhnt TOO muhr) is a mass of cells that invades and destroys healthy tissue. When a tumor spreads to the surrounding tissues, it eventually damages vital organs.

Sometimes, masses of cells that aren’t cancerous develop in the body. A benign tumor (bi NIEN TOO muhr) is an abnormal, but usually harmless cell mass. Benign tumors typically do not invade and destroy tissue and do not spread. But these tumors can grow large enough that they negatively affect the nearby tissues and must be removed.
Cancer Cells Are Destructive  
Cancer cells are very destructive to the body. They tear through and crush neighboring tissues, strangle blood vessels, and take nutrients that are needed by healthy cells. But what makes cancer especially dangerous is that the cells travel, as shown in Figure 3. This process is called metastasis (muh TAS tuh sis). The cancer cells get into the blood or lymph and move to other parts of the body. They then settle down and grow into new tumors. For example, lung cancer cells typically travel to the brain. Breast and prostate cancer cells often travel to the bones. Sometimes, the cancer cells that spread, not the original tumor, are what kill a person.

What Causes Cancer?  
Uncontrolled cell growth comes from damage to the genes that regulate the making of new cells. Genes that regulate cell division can become damaged in a variety of ways. A person can inherit “damaged,” or mutated, genes from his or her parents. These genes make the person more likely to develop cancer than someone without those genes is. Cancer-causing agents or substances known as carcinogens can also be responsible for damaging genes. Some examples of carcinogens include:

- certain viruses, such as human papilloma virus (HPV)
- radioactivity and ultraviolet (UV) radiation, an invisible type of energy from the sun (people are exposed to ultraviolet radiation while outside or in a tanning bed)
- chemicals found in tobacco smoke (for example, arsenic, benzene, and formaldehyde)
- asbestos (a material used to make fireproof materials, electrical insulation, and other building supplies)

All of us are exposed to some carcinogens in our daily lives. They may be in our food, water, air, or environment. However, as you’ll learn later, many cancers are caused by carcinogens that you can avoid. You can control how close you come to many of these carcinogens. Choosing to work, study, and live somewhere free from these carcinogens can reduce your chance of developing cancer.
Types of Cancer

Although all kinds of cancer are the result of uncontrolled cell growth, each kind of cancer has its own characteristics. For example, cancer of the pancreas is very difficult to treat, while certain forms of skin cancer can be removed easily. Table 1 describes several types of cancer.

<table>
<thead>
<tr>
<th>Name of cancer</th>
<th>What is it?</th>
<th>Estimated new cases each year</th>
<th>Estimated deaths each year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast</td>
<td>▶ cancer of the tissue and organs of the breast; more common in women but can also be found in men</td>
<td>205,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Prostate</td>
<td>▶ cancer of the prostate, a part of the male reproductive system</td>
<td>189,000</td>
<td>30,200</td>
</tr>
<tr>
<td>Respiratory</td>
<td>▶ cancer of the respiratory organs, such as the lungs, larynx, and bronchus; most forms linked to the use of tobacco</td>
<td>183,200</td>
<td>161,400</td>
</tr>
<tr>
<td>Colon</td>
<td>▶ cancer of the colon, an organ in the digestive system</td>
<td>107,300</td>
<td>48,100</td>
</tr>
<tr>
<td>Urinary</td>
<td>▶ cancer of the urinary organs, such as the bladder and kidneys</td>
<td>90,700</td>
<td>24,900</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>▶ cancer of the lymph nodes or lymph tissue</td>
<td>60,900</td>
<td>25,800</td>
</tr>
<tr>
<td>Skin</td>
<td>▶ cancers that affect the skin, such as basal cell carcinoma and melanoma</td>
<td>58,300</td>
<td>9,600</td>
</tr>
<tr>
<td>Leukemia (loo KEE mee uh)</td>
<td>▶ cancer of the tissues that produce blood; more common in males than in females</td>
<td>30,800</td>
<td>21,700</td>
</tr>
<tr>
<td>Ovarian</td>
<td>▶ cancer of the ovaries, a part of the female reproductive system</td>
<td>23,300</td>
<td>13,900</td>
</tr>
<tr>
<td>Nervous system</td>
<td>▶ cancer of the brain, spinal cord, and other parts of the nervous system</td>
<td>17,000</td>
<td>13,100</td>
</tr>
<tr>
<td>Cervical (SUHR vi kuhl)</td>
<td>▶ cancer of the cervix, a part of the female reproductive system</td>
<td>13,000</td>
<td>4,100</td>
</tr>
</tbody>
</table>

Source: American Cancer Society.
Detecting and Treating Cancer

Although all cancers have similar characteristics, they differ in how they are detected, how they are treated, and how they affect the person with the cancer.

Detecting Cancer  In addition to annual medical exams, there are many ways that cancer is detected.

► Self-exams  Regular self-examinations of the skin, breasts, or testicles are important. Because skin cancer is so common, watch for any new growths; a sore that doesn’t heal; and for shape, size, texture, or color changes to a mole or wart.

► Biopsy  A biopsy is a sample of tissue taken from the body that is then examined. Biopsies are commonly used to determine what type of cancer a person has and whether a tumor is malignant or benign.

► X rays  An X ray of the breasts to detect tumors is called a mammogram. Doctors recommend regular mammograms for women over the age of 40. Computerized axial tomography (CAT scan or CT) takes multiple X rays of some part of the body, which a computer then assembles into one image.

► MRI  Magnetic resonance imaging, or MRI, uses a massive magnet and a computer to gather images of the body.

► Blood and DNA tests  Blood tests can detect some cancers. For example, older men are often given a prostate specific antigen (PSA) test. This test looks for a protein produced by the prostate, a small gland near the bladder. DNA tests are used to detect the likelihood of developing cancer. More tests will become available as we learn more about human genes and the ways in which cancer develops and spreads.

You and your parents should talk to your doctor about getting regular cancer-screening tests. Use the CAUTION acronym in the margin to help you remember the warning signs of cancer.

Treating Cancer  Cancer is most treatable when it is caught early. Doctors battle the disease with several weapons. Techniques used to treat cancer include the following.

► Surgery  An operation can remove some tumors. Surgery is most effective when the tumor is small, has not spread, and is located where removing it will not damage surrounding tissue.

► Chemotherapy  Chemotherapy (KEE moh THER uh pee) is the use of drugs to destroy cancer cells. Unfortunately, chemotherapy also kills some of the body’s healthy cells. It can cause side effects such as nausea, fatigue, vomiting, and hair loss.

► Radiation therapy  As you learned earlier, radiation can cause cancer. But doctors also use radiation to destroy cancer cells, an approach called radiation therapy. Usually, a beam of radiation is fired at the tumor from outside the body.
Often, doctors recommend a combination of surgery, chemotherapy, and radiation. The success of any treatment depends on the type of cancer, how long the tumor has been growing, and whether the cancer has spread to other parts of the body. One promising treatment scientists are developing is to “starve” tumors by cutting off their blood supply. Another possibility is to create a cancer “vaccine” that would stimulate the immune system to destroy cancer cells.

Living with Cancer  Cancer is difficult for the person who has cancer, as well as for loved ones. A person with cancer may often be tired or weak. They may also feel down. Children with cancer are often scared, confused, and upset by medical procedures and strange surroundings.

How can you help a person who has cancer? Be patient. Offer to spend time doing quiet things, such as talking, reading, or watching TV. Many people recover from cancer and go on to lead healthy lives. So, a positive outlook during the treatment process greatly helps.

**Using Community Resources**

The first step toward learning more about cancer is to use the resources in your community. Taking advantage of these resources will help you protect yourself from having cancer in the future.

1. Your doctor can help you find reliable information on cancer.
2. Find out about nonprofit organizations in your city that are devoted to cancer awareness, such as the American Cancer Society.
3. The Internet can also provide valuable resources related to cancer. But be careful when using the Internet. Although many Web sites have reliable information, some have misleading and false information.

For more information about evaluating health Web sites, see the Express Lesson on pp. 564–565 of this text.
Preventing Cancer

Taking charge of these five controllable risk factors can greatly reduce your risk of getting cancer.

1. **No butts about it: don't smoke.** Tobacco use is responsible for about one-third of the cancer deaths in the United States. People who use tobacco are prone to cancers of the mouth, throat, esophagus, pancreas, and colon. Despite what you might hear, there is no safe form of tobacco.

2. **Safeguard your skin.** Limit your exposure to the damaging UV radiation that causes skin cancer. You can do so by protecting exposed areas of skin with sunscreen and clothing, even on cloudy days. Do not sunbathe, use tanning beds, or use sunlamps.

3. **Eat your veggies, and cut the fat.** No diet can guarantee that you won't get cancer. However, people who eat large amounts of saturated fat are more likely to get cancer of the colon and rectum. Studies suggest that people who eat fruits, vegetables, and foods high in fiber have a lower risk of some cancers.

4. **Stay active, and maintain a healthy weight.** Studies have shown that regular physical activity helps protect against some types of cancers. Exercising also helps prevent obesity, another risk factor for developing cancer. Teens should get at least 60 minutes of activity daily.

5. **Get regular medical checkups.** Your doctor can answer questions you may have about cancer risk factors, preventions, and treatments. He or she will also be able to advise you on self-examinations and when to begin regular cancer screening tests.

When we make positive choices with regard to these controllable risk factors, we can work toward a healthy future for ourselves.

**SECTION 3**

**REVIEW**

**Using Key Terms**

1. **Define** the term cancer.
2. **Compare** a benign tumor to a malignant tumor.
3. **Define** the term chemotherapy.

**Understanding Key Ideas**

4. **Describe** how cancer cells differ from normal body cells.
5. **State** three common carcinogens.
6. **Identify** the form of cancer that has the highest death rate. (Hint: See Table 1 on p. 351.)
   a. pancreas  c. lung
   b. liver  d. colon

7. **Describe** three methods that doctors use to detect cancer.
8. **Describe** how chemotherapy works to treat cancer.
9. **Identify** which of the following actions would help reduce your chances of developing cancer.
   a. not smoking  c. eating fruits
   b. wearing sunscreen  d. all of the above

10. **LIFE SKILL** Practicing Wellness Identify one part of your lifestyle that you can change to decrease your chance of developing cancer.

**Critical Thinking**

11. Why do you think cancer is more common in some families than in others?
Estimates indicate that 16 million people in the United States have diabetes. Unfortunately, about 5 million people who have diabetes do not know that they have it and are not being treated for it.

What Is Diabetes?

When you eat, the nutrients in foods are broken down to provide your cells with energy. Carbohydrates are broken down to glucose which then enters your bloodstream where it can circulate to the rest of your body. Once glucose reaches the cells, it moves from the bloodstream into the cells. The cells then use the glucose for energy.

**Insulin** The body can’t use glucose without insulin. **Insulin** is a hormone that causes cells to remove glucose from the bloodstream. Thus, insulin lowers the amount of glucose traveling free in the bloodstream. Insulin is produced by special cells in the pancreas. When blood glucose levels are high, insulin is released into the bloodstream. When glucose levels are lower, insulin is no longer released into the bloodstream.

**Insulin and Diabetes** Sometimes, the pancreas doesn’t produce enough insulin, or the body’s cells don’t respond to insulin. The result is diabetes. **Diabetes** is a disorder in which cells are unable to obtain glucose from the blood such that high blood-glucose levels result. The kidneys excrete water, resulting in increased urination and thirst. Cells then use the body’s fat and protein for energy, which causes a buildup of toxic substances in the bloodstream. If this continues, a diabetic coma can result. A **diabetic coma** is a loss of consciousness that happens when there is too much blood sugar and a buildup of toxic substances in the blood. Without treatment, diabetic comas can result in death.

**OBJECTIVES**

- Describe the role of insulin in diabetes.
- Compare type 1 and type 2 diabetes.
- Identify two ways to detect and two ways to treat type 1 and type 2 diabetes.
- Name two ways that you can prevent type 2 diabetes.

**KEY TERMS**

- **insulin** a hormone that causes cells to remove glucose from the bloodstream
- **diabetes** a disorder in which cells are unable to obtain glucose from the blood such that high blood-glucose levels result
- **diabetic coma** a loss of consciousness that happens when there is too much blood sugar and a buildup of toxic substances in the blood

Testing blood glucose is one way that people with diabetes can deal with their illness. Blood glucose is the amount of glucose in the blood.
**Types of Diabetes**

The three most common forms of diabetes are type 1 diabetes, type 2 diabetes, and gestational diabetes. As shown in Table 2, each kind of diabetes has its own characteristics.

**Type 1 Diabetes**  Type 1 diabetes accounts for only 5 to 10 percent of diabetes cases in the United States. Type 1 diabetes develops when the immune system attacks the insulin-producing cells of the pancreas. Once these cells are destroyed, the body is unable to make insulin. Scientists believe that type 1 diabetes is caused by both genetic factors and viruses.

Type 1 diabetes is sometimes called *insulin-dependent* or *juvenile diabetes*. This type of diabetes is treated with daily injections of insulin and is usually diagnosed before the age of 18. Symptoms are usually severe and develop over a short period of time. Common symptoms include increased thirst, frequent urination, fatigue, and weight loss.

**Type 2 Diabetes**  The most common form of diabetes in the United States is type 2, sometimes called *noninsulin-dependent diabetes*. Unlike type 1 diabetes, type 2 diabetes is most common among adults who are over 40 years of age and among people who are overweight.

In type 2 diabetes, the pancreas makes insulin, but the body’s cells fail to respond to it. The result is the buildup of glucose in the blood and the inability of the body to use the glucose as a source of fuel. Common symptoms of type 2 diabetes include frequent urination, unusual thirst, blurred vision, frequent infections, and slow-healing sores. These symptoms usually appear gradually.

**Table 2 Types of Diabetes**

<table>
<thead>
<tr>
<th>Type of Diabetes</th>
<th>What is it?</th>
<th>Symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>diabetes resulting from the body’s inability to produce insulin</td>
<td>increased thirst, frequent urination, fatigue, weight loss, nausea, abdominal pain, and absence of menstruation in females</td>
<td>diet and insulin</td>
</tr>
<tr>
<td>Type 2</td>
<td>diabetes resulting from the inability of the body’s cells to respond to insulin</td>
<td>frequent urination, increased thirst, fatigue, weight loss, blurred vision, frequent infections, and slow-healing sores</td>
<td>diet, exercise, and occasionally insulin</td>
</tr>
<tr>
<td>Gestational</td>
<td>diabetes that develops during pregnancy</td>
<td>frequent urination, increased thirst, fatigue, weight loss, blurred vision, frequent infections, and slow-healing sores</td>
<td>diet and occasionally insulin</td>
</tr>
</tbody>
</table>
Gestational Diabetes Occasionally, a pregnant woman can develop diabetes near the end of her pregnancy. Usually, the diabetes goes away after the baby is born. Gestational diabetes can increase the chances of complications during the pregnancy. The symptoms are the same as those of type 2 diabetes but milder. The risk of developing gestational diabetes increases if the mother has a family history of diabetes, is obese, is over 25 years of age, or has previously given birth to a child who weighed more than 9 pounds at birth.

Detecting and Treating Diabetes

Detecting and getting medical care for diabetes as early as possible can decrease your chances of developing serious side effects.

Detecting Diabetes Early detection is important in cases of diabetes. Diabetes patients risk complications such as blindness, kidney disease, strokes, and amputations of the lower limbs. The first step in detecting diabetes is to see your doctor if you have symptoms. Your doctor will use a variety of lab tests, such as urinalysis, a glucose-tolerance test, or an insulin test to determine if you have diabetes. Once diagnosed, a person can work with his or her doctor to keep the diabetes under control. Unfortunately, there is no cure for diabetes yet.

Treating Type 1 Diabetes The goal of treatment is to keep blood-glucose levels as close to normal as possible. People who have type 1 diabetes usually must test their blood glucose several times a day. Many people who have type 1 diabetes also need several doses of insulin each day to keep their blood-glucose levels within a normal range. Most diabetics must learn to give themselves insulin injections.

Treating Type 2 Diabetes Although insulin is sometimes used to treat type 2 diabetes, more common control measures focus on diet and exercise. A healthy diet can help people with type 2 diabetes control the amount of glucose they eat and can help them control
their weight. Foods with sugar do not need to be avoided completely, but must be eaten in moderation. Physical activity is also important because it helps the body use more of the glucose in the blood and keeps the person’s weight at a healthy level.

**New Treatments** Researchers are working on new treatments for diabetes. The researchers are hoping that these new treatments will help diabetics monitor their blood-glucose better, will provide new methods of delivering insulin, and will help reduce the severity of symptoms. Scientists are also working on ways to transplant insulin-producing cells into people with type 1 diabetes.

**Preventing Diabetes**

As in so many diseases, genes play a role in diabetes. For example, people who have diabetes in their family are at a greater risk of developing diabetes. People in certain ethnic groups, particularly African Americans, Hispanics, and Native Americans, are also at a greater risk for developing certain forms of diabetes.

There is currently no way to prevent type 1 diabetes. But exercise, a healthy diet, and insulin injections as needed can allow a person to lead a healthy life.

There are several things a person can do to reduce his or her risk of developing type 2 diabetes including:

- Maintain a healthy weight. Exercise regularly and eat a healthy diet. Physical activity and a healthy diet can greatly reduce the risk of developing type 2 diabetes in people who are overweight.
- Avoid tobacco products.
- Reduce the amount of stress in your life.

**SECTION 4**

**REVIEW**

*Answer the following questions on a separate piece of paper.*

**Using Key Terms**

1. **Name** the term for “a hormone that causes cells to remove glucose from the bloodstream.”

2. **Define** the term diabetes.

3. **Define** the term diabetic coma.

**Understanding Key Ideas**

4. **Describe** the role of insulin in the body.

5. **Compare** type 1 and type 2 diabetes.

6. **Identify** when a person may develop gestational diabetes.
   a. as a child
   b. as a teen
   c. after age 65
   d. during pregnancy

7. **Name** three risk factors for developing type 2 diabetes.

8. **List** three symptoms that help a person detect type 1 and type 2 diabetes.

9. **Identify** which of the following is not a treatment for diabetes.
   a. urinalysis
   b. insulin injections
   c. healthy diet
   d. regular exercise

10. **Describe** why it is important for a person who has diabetes to eat a healthy diet.

**Critical Thinking**

11. Why do you think type 2 diabetes is more common in the United States than in other countries?
### Key Terms

**SECTION 1**

- **lifestyle disease** (340)

**SECTION 2**

- **cardiovascular disease (CVD)** (343)
- **stroke** (344)
- **blood pressure** (344)
- **heart attack** (345)
- **atherosclerosis** (345)

**SECTION 3**

- **cancer** (349)
- **malignant tumor** (349)
- **benign tumor** (349)
- **chemotherapy** (352)

**SECTION 4**

- **insulin** (355)
- **diabetes** (355)
- **diabetic coma** (355)

### The Big Picture

- Lifestyle diseases are caused partly by a person’s lifestyle, which includes habits and behaviors.
- Many risk factors, some controllable and some uncontrollable, contribute to a person’s chances of developing a lifestyle disease.
- Diet, physical activity, smoking, sun exposure, and body weight are controllable risk factors. Age, gender, ethnicity, and genes are uncontrollable factors.
- People who inherit a tendency for a lifestyle disease can still do a lot to reduce their chances of developing such a disease.

- A person’s lifestyle influences their chances of developing cardiovascular diseases such as strokes, high blood pressure, heart attacks, and atherosclerosis.
- Doctors use many different methods, such as EKG, ultrasound, and angiography, to diagnose cardiovascular diseases.
- There are many treatment options for cardiovascular diseases including a healthy diet, exercise, medicine, and surgery.
- Eating sensibly, avoiding cigarettes, exercising, and having your blood pressure and cholesterol checked regularly can help prevent cardiovascular diseases.

- Cancer occurs when cells divide uncontrollably. Certain “damaged” genes can make a person more likely to develop cancer. Exposure to viruses, radioactivity, ultraviolet radiation, and tobacco can damage genes.
- There are many types of cancer. Each type has its own characteristics.
- Early detection and treatment of cancer can increase a person’s chances of survival.
- Not smoking, protecting your skin from the sun, following a balanced diet, staying active, and getting regular medical checkups help reduce your chances of developing cancer.

- Diabetes occurs when cells are unable to obtain glucose from the blood such that high blood-glucose levels result.
- Type 1 diabetes is believed to be caused by an autoimmune response. Type 2 diabetes is usually the result of lifestyle choices.
- Although there is no cure for diabetes, lifestyle changes and medicines can often keep the disorder under control.
- The best way to prevent diabetes is to take control of the risk factors that you can change, such as diet, exercise, and weight.
Using Key Terms

atherosclerosis (345)  diabetes (355)
benign tumor (349)  diabetic coma (355)
blood pressure (344)  heart attack (345)
cancer (349)  insulin (355)
cardiocvascular disease lifestyle disease (340)
(CVD) (343) malignant tumor (349)
chemotherapy (352)  stroke (344)

1. For each definition below, choose the key term that best matches the definition.
   a. a disease caused by uncontrolled cell growth
   b. the force that blood exerts against the inside walls of a blood vessel
   c. an abnormal, but usually harmless cell mass
   d. a hormone that causes cells to remove glucose from the bloodstream
   e. the damage and loss of function of an area of the heart muscle

2. Explain the relationship between the key terms in each of the following pairs.
   a. malignant tumor and benign tumor
   b. insulin and diabetic coma

Understanding Key Ideas

Section 1

3. Explain why infectious diseases have become less common and why lifestyle diseases are the most common causes of death.

4. ____ are uncontrollable risk factors for lifestyle diseases.
   a. Tobacco use, gender, and age
   b. Genes, age, and gender
   c. Age, exercise level, and family history of disease
   d. Gender, exercise level, and tobacco use

5. To help prevent the development of a lifestyle disease, a person should
   a. not smoke.
   b. exercise.
   c. have a low-fat diet.
   d. All of the above

6. What two steps could you take during school to lower your risk of developing a lifestyle disease?

Section 2

7. How can lifestyle contribute to cardiovascular disease?

8. Which of the following is not a type of cardiovascular disease?
   a. stroke
   b. atherosclerosis
   c. cancer
   d. high blood pressure

9. Which of the following is not a treatment for cardiovascular disease?
   a. angioplasty
   b. bypass surgery
   c. heart transplant
   d. echocardiography

10. How can regular exercise reduce your chances of developing cardiovascular disease?

11. CRITICAL THINKING Smoking decreases the amount of oxygen that the blood can carry. How can this effect increase the chances that a smoker will develop cardiovascular disease?

Section 3

12. Describe what cancer is and why it is so dangerous.

13. Refer to Table 1 on p. 351. What is the main cause of the type of cancer that results in the most deaths each year?

14. ____ is not a method of detecting cancer.
   a. Prostate specific antigen testing
   b. MRI
   c. Regular self-examination
   d. Chemotherapy

15. Identify three cancer treatments used today.

16. What are two ways that a person can safeguard their skin from ultraviolet radiation?

Section 4

17. What is the relationship between insulin and glucose in diabetes?

18. What are the major differences between type 1 and type 2 diabetes?

19. What are two ways to detect and two ways to treat type 1 and type 2 diabetes?

20. List two steps you can take to lower your risk of developing type 2 diabetes.
Interpreting Graphics

Study the figure below to answer the questions that follow.

![Persons with Diabetes in the U.S.](image)

**21.** How many people were diagnosed with diabetes in 1978?

**22.** What is the difference in the number of people diagnosed with diabetes in 1988 and the number diagnosed in 1998?

**23.** **CRITICAL THINKING** Why do you think diabetes has become more common since 1958?

**Activities**

**24.** **Health and You** Make a list of the uncontrollable risk factors for lifestyle diseases. Create a poster that explains how a person can reduce the health risks posed by uncontrollable risk factors.

**25.** **Health and Your Community** Research one of the cancers listed in Table 1. Prepare an informational handout that describes how to detect, treat, and prevent the cancer.

**26.** **Health and You** Research a new approach to treating cancer. Write a one-page paper that describes what the approach is, how it works, and when it is expected to be available to cancer patients.

**Action Plan**

**27.** **Assessing Your Health** Establishing healthy patterns of living during adolescence reduces the risks of developing a lifestyle disease. Discuss two risk factors over which you have control. How can you reduce or eliminate these risk factors?

**28.** In this passage, the word *constitute* means

A. propose.
B. make up.
C. follow.
D. concern.

**29.** What can you infer from reading this passage?

E. There are more deaths due to heart disease in the United States than there are anywhere else in the world.
F. The number of deaths due to heart disease has not changed since 1985.
G. Changes in lifestyle risk factors have decreased the number of deaths due to heart disease.
H. Nothing can be done to prevent deaths from heart disease.

**30.** Write a paragraph describing how changes in lifestyle could reduce the number of deaths due to heart disease in the United States.

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**Standardized Test Prep**

Read the passage below, and then answer the questions that follow.

Heart disease is the leading cause of death in the United States. Heart disease causes over 900,000 deaths per year. These deaths **constitute** 40 percent of all deaths in the United States. Twenty-five percent of deaths due to heart disease occur in people under the age of 65. Death rates for the 10-year period ending in 1985 were 30 percent less than they were for the previous 10-year period. This decline in mortality is related to improvements in heart disease risk factor levels, as well as in diagnosis and treatment.
Making Sense of Genetic Technology

In 2001, scientists published a complete list of all human genes. Genes are the set of instructions found in every person’s body that describe how that person’s body will look, grow, and function. Many scientists have now turned their attention to figuring out what each gene does. The application of our knowledge about genes to help meet human needs is known as genetic technology.

Our Growing Knowledge of Human Genetics

Scientists are asking how our genes determine the kind of blood that we have, the way that our skin cells work, or the color of our eyes. In addition, other researchers are working hard to apply this new knowledge to detect and cure genetic disorders. There are many kinds of genetic disorders. Down syndrome, sickle cell anemia, hemophilia, cystic fibrosis, and muscular dystrophy are only a few well-known ones. In fact, more than 4,000 different human disorders are caused by errors in our genes. Someone you know might have cancer that has a genetic basis. In your lifetime, cures for cancers are likely to arise from today’s research in genetic technology.

In addition to studying genetic disorders, scientists are using techniques in genetic technology in other ways. For example, scientists in pharmaceutical companies use genetic technology with bacteria to produce medicines that help humans. Doctors treat dwarfism by using human growth hormones made with the new genetic technology. Drug companies are manufacturing new vaccines, by using modern techniques. In fact, so much genetic work is being done that understanding these new developments can seem overwhelming.
Genetics and Technology

Let’s look at some specific examples of the new genetic technology and see how it is affecting the world around us.

Transplanted Genes  It is possible to take a certain gene from one kind of organism, such as a human, and place it into another organism, such as a bacterium. This idea may seem strange, but the results can be remarkable. For example, a scientist can take the human gene that makes the hormone insulin out of a human cell and place it in a bacterial cell. Millions of these bacterial cells can then make pure human insulin.

Many very pure substances can be made in this way. The transfer of genes from one organism to another for medical or industrial use is called genetic engineering. Today genetic engineering is used to change the nature of many of our domestic plants and animals.

Genetic fingerprinting  Scientists are now able to take a sample of genetic material from a person and develop a “fingerprint” of that person’s genetic makeup. The genetic material is first broken up into smaller fragments. These fragments are then placed into a gelatinous substance, and under the influence of an electric current, the pieces of genetic material are separated from one another. The way in which they separate is unique to each person. The result is a “fingerprint.” Genetic fingerprinting can be used to research family trees, or to identify an adult who carries a gene that causes a genetic disorder. It can also be used as legal evidence in criminal trials.

Understanding a New Technology

As you get older, scientists will make more and more discoveries in genetics. These discoveries are likely to change the way you live. Genetic disorders, such as Tays-Sachs, sickle cell anemia, and thousands of other diseases, may be a thing of the past. The possibility of real change is awesome. For example, will you be able to ensure that your children have certain traits? Will you or your children be able to eliminate genetic diseases? Genetics is the most powerful and exciting science to affect our lives, and its effects will be more profound as the years go by. How do you make sense of so many important discoveries? Here are some suggestions:

Read the latest news about science in newspapers, in magazines, and on the Internet. The most important discoveries will be presented here for everyone to read and understand. However, be skeptical of what you read. So many exciting discoveries are being made that it is only natural that writers and reporters will sometimes exaggerate. Use your common sense. Get information from more than one source.

Use your research skills to look up information that you don’t understand. Books and reputable Internet sites are sources you can rely on to learn more about genetic technology.