Reducing the Risk of Cardiovascular Diseases

HEALTH GOAL
- **I will choose behaviors to reduce my risk of cardiovascular diseases.**

A disease of the heart and blood vessels is a ***cardiovascular disease.*** In this lesson you will learn about the risk factors you can and cannot control.

What You'll Learn

1. Identify characteristics of different cardiovascular diseases. *(p. 515)*
2. Identify cardiovascular disease risk factors that cannot be controlled. *(p. 518)*
3. Identify cardiovascular risk factors that can be controlled. *(p. 518)*
4. Describe medical diagnoses and treatments for heart disease. *(p. 520)*

Why It's Important

Heart disease, a type of cardiovascular disease, is the leading cause of death in the United States. You can take steps to reduce your risk of developing heart disease. This lesson will describe what you can do to keep your heart healthy.

⚷ Key Terms

- cardiovascular disease
- angina pectoris
- plaque
- arteriosclerosis
- arrhythmia
- pacemaker
- stroke
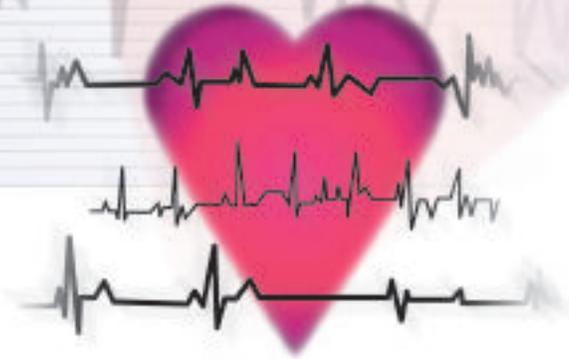- aneurysm
- prehypertension
- antihypertensives

What Would You Do?

Writing About Reducing Risk Suppose that several members of your family suffer from cardiovascular diseases. You know that you have a higher risk of developing a cardiovascular disease than people whose family health history does not include cardiovascular diseases. What can you do to lower your risk? After you read the information about reducing your risk on page 518, make a list in your health journal of ways you can reduce your risk of developing cardiovascular disease.

Michael Keller/CORBIS

Health TEKS covered by Lesson 47: 1C, 1I, 2A, 2B, 2D, 5D, 6A, 6B, 12A, 13F, 15A, 16A, 17B

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A Guide to Cardiovascular Diseases

T here are many different kinds of cardiovascular diseases. They have signs and symptoms that are unique to each. In this section you will learn about the characteristics of eight different kinds of cardiovascular diseases.

What to Know About Cardiovascular Diseases

Angina pectoris Chest pain that results from narrowed coronary arteries is ***angina pectoris*** (an JY nuh•PEK tuh ruhs). The pain occurs because the heart is not getting an adequate amount of oxygen. Sudden physical exertion, vigorous exercise, or excessive stress can cause angina pectoris in people with coronary heart disease. Many people with coronary heart disease take nitroglycerin pills to relieve chest pains. ***Nitroglycerin*** is a drug that widens the coronary arteries, allowing more oxygen to get to the cardiac muscle. A heart attack may occur if the narrowing that causes angina pectoris is very severe.
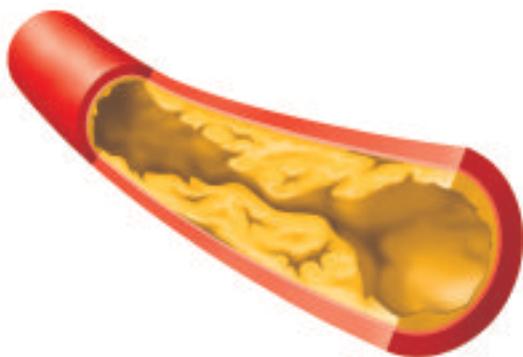
▲ This artery contains plaque buildup.

Congestive heart failure A condition that occurs when the heart's pumping ability is below normal capacity and fluid accumulates in the lungs and other areas of the body is ***congestive heart failure.*** Causes of congestive heart failure are heart attack, atherosclerosis, birth defects, high blood pressure, and rheumatic fever. Drugs that improve the heart's pumping ability and get rid of excess fluids are used to treat congestive heart failure. Reducing the amount of sodium in the diet is helpful.

Coronary heart disease A disease in which the coronary arteries are narrowed or blocked is ***coronary heart disease*** (CHD). A ***coronary artery*** is a blood vessel that carries blood to the heart muscles. The coronary arteries encircle the heart and continuously nourish it with blood. Plaque buildup in the coronary arteries causes coronary heart disease, which can cause a heart attack. ***Plaque*** is hardened deposits of fat and other materials in the walls of arteries throughout the body.

Did You Know?

Fish Oils Omega-3 fatty acids, found in fish oils, are good for the heart. Studies are underway to determine their effect on the health of the brain.

A pacemaker is used to treat arrhythmia.
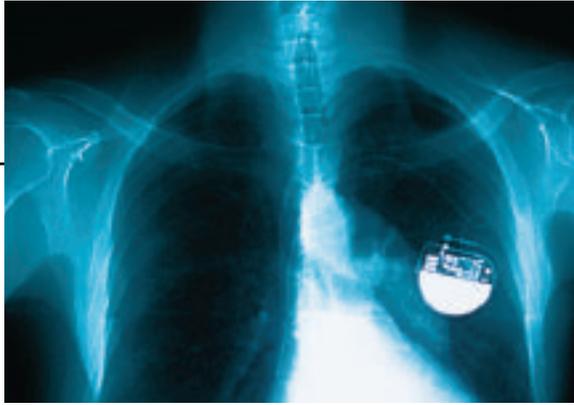
Arteriosclerosis and atherosclerosis A term used to describe hardening and thickening of the arteries is *arteriosclerosis* (ahr tee ree oh skluh ROH sis). Arteriosclerosis tends to occur naturally as people age. *Atherosclerosis* is a disease in which fat deposits collect on artery walls. The fatty deposits may harden and form plaque. Medical scientists believe that high blood cholesterol levels, a high-fat diet, high blood pressure, and smoking can cause injury to the lining of arteries and contribute to plaque buildup. The buildup of plaque in artery walls does not develop suddenly later in life, but may begin as early as age two. Both arteriosclerosis and atherosclerosis are types of coronary heart disease.

A physician can determine if a person's heartbeat is normal.

Heart rhythm abnormalities The heart must beat in rhythm to effectively pump blood throughout the body. A heart condition in which the heart may beat very slowly or very fast for no obvious reason is *arrhythmia* (ay RIHTH mee uh). The heart may skip beats or beat irregularly. Various drugs are available to treat arrhythmia. People who do not improve after taking drugs may need to have surgery to implant a pacemaker. A *pacemaker* is a device that is implanted in the heart to stimulate normal heart contractions.

Rheumatic fever An autoimmune action in the heart that can cause fever, weakness, and damage to the valves in the heart is *rheumatic fever.* The symptoms of rheumatic fever are painful, swollen joints, and skin rashes. Rheumatic fever is most common in children and teens. Prevention of rheumatic fever involves getting prompt treatment for strep throat. Permanent heart damage that results from rheumatic fever is called *rheumatic heart disease.*

Stroke A condition caused by a blocked or broken blood vessel in the brain is a *stroke,* or *cerebrovascular* (suh ree broh VAS kyuh luhr) *accident.* Brain cells in the area of the blocked or broken blood vessel are deprived of the oxygen they need. The brain cells die within minutes and the affected area of the brain and the parts of the body controlled by those brain cells cannot function. One of the most common causes of a stroke is a blood clot in an artery in the brain. Strokes also can be caused if an aneurysm in the brain bursts. An *aneurysm* (AN yuh rih zuhm) is a weakened area of a blood vessel.

Activity: Using Life Skills

Using Goal-Setting and Decision-Making Skills: Being Heart Healthy

One of the best things you can do to keep your heart healthy is to keep moving. Regular moderate to vigorous exercise strengthens your heart. It also helps control blood cholesterol and blood pressure and reduces stress. Remember that exercise that is good for your heart is aerobic. It makes your muscles use oxygen and causes your heart to pump harder to deliver oxygen to the muscles. Recognize that aerobic exercise is vigorous, repetitive, and sustained—lasting 20 minutes or more at a time. Here are some tips to help you fit more heart-healthy exercise into your weekly routine.

1 Write your health goal. For one week, keep a daily chart of your aerobic activities and the number of minutes spent on each one. Try to include a variety of aerobic exercises.

2 Make an action plan to meet your health goal. Review your chart. Rate your level of aerobic activity as low, medium, or high. A high level is three or more sessions per week of moderate to vigorous exertion lasting 20 minutes or more at a time.

3 Identify obstacles to your plan. If your rating is low or medium, set one or more goals for increasing your level of aerobic activity. For example, if you spend an hour or more each day playing video games, you could replace 20 minutes of that time with an aerobic activity.

4 Set up a timeline to accomplish your health goal and keep a chart or diary in which you record progress towards your health goal. As you set your goals, consider your schedule. Do you prefer to be active in the morning or evening? How can you make more time for exercise? Think about location. Will you exercise at home, at school, or somewhere else? Do you prefer exercising alone or with others?

5 Build a support system. Have fun while exercising. Choose activities that you will enjoy. This will make it easier for exercise to become a habit.
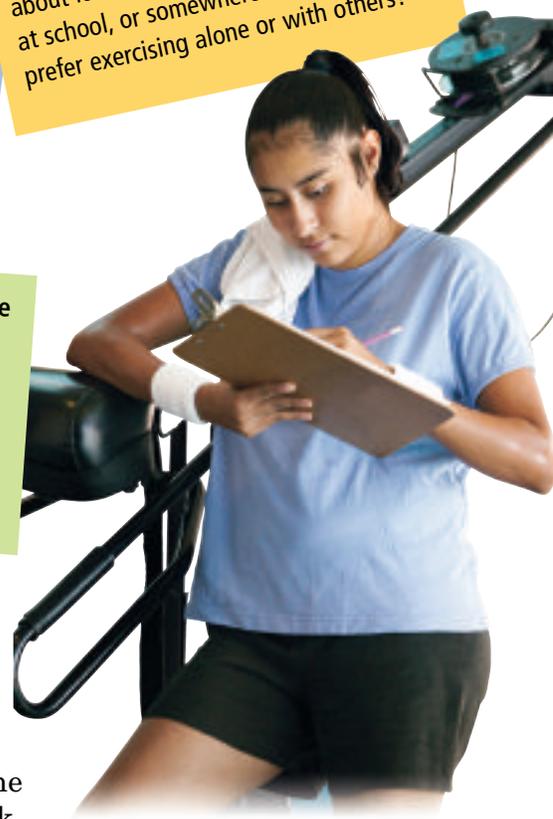
6 Revise your action plan or timeline if necessary and reward yourself when you reach your health goal. Lastly, be realistic. If you haven't exercised much, start with a low level of activity. As you adjust, you can increase the length or intensity of the exercise.

▲ Keep a daily log of your aerobic activities.

Strokes also can be caused by a head injury. A stroke may result in paralysis, disability, or death. High blood pressure, cigarette smoking, high blood cholesterol, and having heart disease or diabetes are major risk factors for having a stroke.

Heart attack The death of cardiac muscle caused by a lack of blood flow to the heart is a *heart attack.* The medical term for heart attack is myocardial infarction (my uh KAR dee uhl•in FARK shun) (MI). A coronary artery that is narrowed by plaque might become clogged by a blood clot, preventing blood flow to the heart muscle. A heart attack may result in disability or death. The warning signs include uncomfortable pressure or pain in the center of the chest that lasts for more than a few minutes; pain that spreads to the shoulders, neck, jaw, back, or stomach; lightheadedness; fainting; sweating; nausea; and shortness of breath.

Most heart attacks start with mild pain or discomfort and progress slowly. Others are sudden and intense. The American Heart Association (AHA) warns that not all of these signs occur in every heart attack. The AHA advises that a person should get medical help immediately when some of these symptoms occur.

Tim Fuller

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Reducing Your Risk

Characteristics of people and ways they might behave that increase the possibility of cardiovascular disease are ***cardiovascular disease risk factors.*** The greater the number of cardiovascular disease risk factors people have, the greater their risk of cardiovascular disease. The severity of a risk factor also determines its importance.

What to Know About Reducing Your Risk

Risk Factors You Cannot Control

Age, gender, race, and having blood relatives with cardiovascular disease are risk factors you cannot control. The risk of cardiovascular disease increases with age. Males generally have a higher incidence of cardiovascular disease than females.

Risk Factors You Can Control

Maintain a healthy blood cholesterol level. The risk of a heart attack rises as blood cholesterol level increases. ***Cholesterol*** is a fat-like substance made by the body and found in certain foods. People can check their blood cholesterol level by having a small amount of their blood analyzed and, if cholesterol is high, a lipoprotein analysis. A ***lipoprotein analysis*** is a measure of two main types of lipoproteins in the blood. ***Low-density lipoproteins*** (LDLs) are substances in the blood that carry cholesterol to body cells. ***High-density lipoproteins*** (HDLs) are substances in the blood that carry cholesterol to the liver for breakdown and excretion. The higher the HDL level in the blood, the lower the risk of developing heart disease. Reducing the amount of saturated fat in the diet can help lower blood cholesterol level. ***Saturated fat*** is a type of fat from dairy products, solid vegetable fat, and meat and poultry. Saturated fat raises LDL blood cholesterol level. Physical activity and quitting smoking help increase the level of HDLs.

Choose a heart-healthy diet. A low-fat diet rich in fruits, vegetables, whole grains, nonfat and low-fat milk products, lean meats, poultry, and fish is a heart-healthy diet. Choosing a heart-healthy diet can help control factors that influence the risk of cardiovascular disease. A heart-healthy diet includes foods that contain antioxidants. An ***antioxidant*** is a substance that protects cells from being damaged by oxidation.

Avoid tobacco products and secondhand smoke. Nicotine in tobacco products causes an increase in heart rate and blood pressure, which results in wear and tear on the heart and blood vessels. Smokers are about three times more likely than nonsmokers to die from coronary heart disease. Exposure to secondhand smoke also increases the risk of cardiovascular disease.

Make the Connection

Smoking Risks For more information on the dangers of secondhand smoke, see page 428 in Lesson 38.

Mini-Review

1. What is a cardiovascular disease?
2. What is the difference between a heart attack and a stroke?
3. What are risk factors for cardiovascular disease that you can control?

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Maintain healthful blood pressure. *Prehypertension* is a blood pressure range that places people at higher risk for heart disease and stroke. People with prehypertension have a blood pressure of between 120–139 over 80–89. Previously, this pressure reading was considered normal. High blood pressure remains at 140 over 90.

Two stages of high blood pressure High blood pressure ranging between 140–159 over 90–99 is *stage-one hypertension.* Blood pressure of more than 160 over 100 is *stage-two hypertension.* Both stage-one and stage-two hypertension require medical treatment. When a person has high blood pressure, the heart has to work extra hard to pump enough blood and oxygen to the body. This often contributes to scarred, hardened, and less elastic artery walls.

Symptoms of high blood pressure There usually are no symptoms of high blood pressure. The only way people can tell if they have high blood pressure is to have it checked. High blood pressure that is left untreated can contribute to heart attack, stroke, kidney failure, or vision problems.

Treatment of high blood pressure People can keep blood pressure low, or lower high blood pressure, by making lifestyle choices. They can lose weight if they are overweight; participate regularly in physical activity; avoid tobacco products and second-hand smoke; get an adequate amount of potassium, calcium, and magnesium in their diets; and choose foods low in saturated fat, cholesterol, and sodium. A physician may prescribe *antihypertensives* (an ty hy pur TEN sivhz), drugs that lower hypertension or high blood pressure.

Maintain a healthful body weight. Excess body weight increases the risk of cardiovascular disease. When overweight people lose weight, they lower levels of LDLs, increase levels of HDLs, and lower blood pressure.

Participate in regular physical activity. Physical activity helps control blood cholesterol, blood pressure, body weight, and diabetes. The Centers for Disease Control and Prevention (CDC) estimates that fewer people would die each year if half of all inactive people began to participate in moderate physical activity at least three times a week. Regular physical activity decreases the tendency to form blood clots, helps reduce stress, and contributes to a stronger cardiovascular system.

Manage stress. Stress causes the heart to work harder and increases resting blood pressure and blood cholesterol levels in some people. *Stress-management skills* are techniques to prevent and deal with stressors.

Make the Connection
Managing Stress For more information on managing stress, see page 98 in Lesson 10.

Make the TEXAS Connection
Tobacco For more information on tobacco, see page TX9 in the Texas Student Handbook.

It is important to have your blood pressure checked by a health-care ▼ professional.

Diagnosis and Treatment

Heart disease can have many different characteristics. In some people, heart disease may be present but there are no signs and symptoms. In others, there may be indications of heart disease and yet, a person may not be aware of the warning signs.

What to Know About Diagnosing and Treating Heart Disease

Many different procedures are used to diagnose heart disease. Treatments include diet and exercise, drugs, procedures, and surgery.

TABLE 47.1 Diagnosing and Treating Heart Disease	
Procedure	**Description**
Electro-cardiogram	In this test, electrodes that record the electrical activity of the heart are attached to the chest, arms, and legs to determine heart function.
Cardiac catheterization	A procedure in which a thin, plastic tube is inserted into a blood vessel in the groin. A hollow tube called a catheter is then inserted through the plastic tube to the arteries in the heart. Material is injected through the catheter to allow the physician to see if there is blockage in the blood vessels in the heart.
Exercise stress test	A stress test, also called a treadmill test, usually involves walking or running on a treadmill at increasing levels of difficulty. Heart action is monitored while this takes place.
Echocardiogram	A stress test that uses ultrasound to visualize the heart's walls and pumping action.
Thallium or nuclear stress test	A test that shows which parts of the heart function normally and which function abnormally. A radioactive substance is injected into the bloodstream and sends a signal that produces clear pictures on a monitor. The pictures show the health of the heart muscle.
Balloon angioplasty	A procedure in which a special catheter with a small balloon tip is guided to a narrowing artery in the heart. When the balloon is in place, it is inflated to compress the plaque in the artery wall. This stretches the artery open to increase blood flow to the heart. This procedure can reduce the risk of having a heart attack.
Stent	A procedure in which a small, stainless steel, mesh tube is placed through a catheter into an artery in the heart. A small balloon is inflated; it pushes the stent open inside the wall of the artery. When the balloon is deflated, the stent stays open to keep the artery expanded so that blood flow is strong.

aneurysm
angina pectoris
antihypertensives
arrhythmia
arteriosclerosis
cardiovascular
   disease
pacemaker
plaque
prehypertension
rheumatic fever
stent
stroke

⚲ Key Terms Review

Match the definitions below with the lesson Key Terms on the left. Do not write in this book.

1. deposits around an artery wall
2. drugs that lower blood pressure
3. a device placed into the heart to regulate heartbeat
4. chest pain caused by narrowed coronary arteries
5. a weakened area of a blood vessel
6. hardening of the arteries

7. a blocked blood vessel in the brain
8. a heart condition in which the heart may beat very slowly or very fast for no obvious reason
9. a blood pressure between 120–139 over 80–89
10. the general name for a disease of the heart and blood vessels

Recalling the Facts

11. What is cardiovascular disease?
12. Explain the cause of angina pectoris.
13. Explain what causes a stroke.
14. Describe four warning signs of a heart attack.
15. List three risk factors for cardiovascular disease that you can control.

16. What is the purpose of cardiac catheterization?
17. What are two methods of treating heart disease?
18. Distinguish between stage-one hypertension and stage-two hypertension.

Critical Thinking

19. How would a person know if there is a lack of oxygen to the heart?
20. Why would a person who has arteriosclerosis have trouble exercising for long periods of time?
21. What would happen if a heart could not beat regularly?
22. Why should a person with heart disease avoid eating fatty foods?

Real-Life Applications

23. What behaviors would you practice if you were at risk for hypertension?
24. What actions would you take if you suspect you might be at risk for heart disease?
25. What are some healthful things you might do to relieve stress?
26. Explain why having a physical exam before engaging in a sport is important.

Activities

Responsible Decision Making

27. **Write** Suppose you decide to follow a heart-healthy diet. You have lunch with some of your classmates. They suggest that you have pizza, soda, and cake instead of your grilled chicken salad, skim milk, and apple. What should you do? What should you say to your friends? Write a response to this situation. Refer to the Responsible Decision-Making Model on page 61 for help.

Sharpen Your Life Skills

28. **Access Health Services** The American Heart Association (AHA) has information on heart-healthy diets. Write or call the American Heart Association for suggestions on how to plan and eat a heart-healthy diet. Using their suggestions, plan a heart-healthy lunch diet for one week. Share your diet suggestions with your classmates.