

SECTION 17-2

SECTION SUMMARY

A Closer Look at Blood Vessels

Guide for Reading

- ◆ What are the functions of arteries, capillaries, and veins?
- ◆ What causes blood pressure?

When blood leaves the heart, it travels through arteries. The right ventricle pumps blood into arteries that go to the lungs. The left ventricle pumps blood into the aorta. Every organ receives blood from arteries that branch off the aorta. The **coronary arteries** carry blood to the heart itself. Other arteries carry blood to the brain and other organs.

Artery walls are thick. They consist of three layers. The innermost layer is made of epithelial tissue. Its smooth texture allows blood to flow freely. The middle layer is mostly muscle tissue. These muscles act as control gates, adjusting the amount of blood sent to different organs. The outer wall of an artery is made of flexible connective tissue.

The pulse you feel on the inside of your wrist is caused by the expansion and relaxation of an artery wall. You can determine how fast your heart is beating by counting the number of times an artery pulses.

Blood eventually flows from small arteries into capillaries. **In the capillaries, materials are exchanged between the blood and the body's cells.** Capillary walls are only one cell thick. Substances can pass easily through them. Materials like oxygen and glucose pass from the blood into body cells. Cellular waste products move from cells into the blood. One way in which materials are exchanged between the blood and body cells is by diffusion. In **diffusion**, molecules move from an area where they are highly concentrated to an area where they are less concentrated.

After blood moves through capillaries, it enters larger blood vessels called veins, which carry blood back to the heart. The walls of veins have three layers with muscle in the middle layer. These walls are generally thinner than those of arteries. Several factors help move blood through veins. First, the muscles inside veins contract, pushing blood along. Second, many veins are located near skeletal muscles. The contraction of these skeletal muscles can also help push the blood along. Finally, the larger veins in your body contain valves that prevent blood from flowing backward.

Pressure is the force that something exerts over a given area. **Blood pressure** is the pressure that blood exerts on the walls of blood vessels. **Blood pressure is caused by the force with which the ventricles contract.** As blood moves away from the heart, its pressure decreases. Blood pressure is highest in the arteries. A **sphygmomanometer** is an instrument that measures blood pressure.

SECTION 17-2

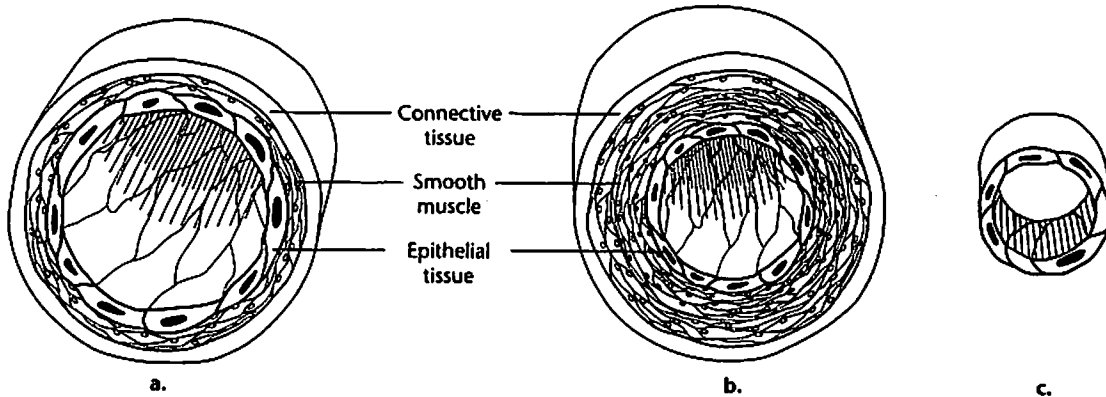
REVIEW AND REINFORCE

A Closer Look at Blood Vessels

◆ Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

1. Identify the three kinds of blood vessels shown in the diagram.



2. After blood leaves the heart, through what kinds of vessels and in what order does blood move?
3. In which kind of vessel is blood pressure usually highest?
4. Which vessel allows diffusion through its walls?
5. What causes blood pressure?
6. What factors help blood move through veins?

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition on the line beside the term.

- _____ 7. blood pressure
- _____ 8. pressure
- _____ 9. diffusion
- _____ 10. coronary artery
- _____ 11. sphygmomanometer

- a. the movement of molecules from an area in which they are highly concentrated to an area in which have a lower concentration
- b. the force that something exerts over a given area
- c. an instrument that measures blood pressure
- d. a vessel that supplies the heart itself with blood
- e. caused by the force with which the ventricles contract