

CHAPTER TWENTY-TWO

Answers to WHAT DID YOU LEARN?

1. Arteries carry blood away from the heart, and veins carry blood back to the heart.
2. The pulmonary circuit consists of the chambers on the right side of the heart (right atrium and ventricle) as well as the pulmonary arteries and veins. It carries blood to and from the lungs. The systemic circuit consists of the chambers on the left side of the heart (left atrium and ventricle), along with all the other named blood vessels. It carries blood to all the organs and tissues of the body.
3. The space in the thoracic cavity between the lungs is the mediastinum.
4. The posterosuperior surface of the heart, formed primarily by the left atrium, is called the base of the heart. The inferior conical end is called the apex of the heart. It projects slightly anteroinferiorly toward the left side of the body.
5. The pericardium is composed of two layers: a fibrous pericardium attached to both the sternum and the diaphragm, and an inner serous pericardium. The two layers of the serous pericardium are a parietal layer, which lines the inner surface of the fibrous pericardium, and a visceral layer, which covers the outside of the heart. The space between the parietal and visceral layers is the pericardial cavity.
6. The epicardium is the outermost heart layer and is also known as the visceral layer of serous pericardium. The internal surface of the heart and the external surfaces of the heart valves are covered by a thin endothelium called the endocardium.
7. The myocardium is the middle and thickest layer of the heart wall and is composed of cardiac muscle tissue.
8. Differences between cardiac and skeletal muscle include: (1) the sarcoplasmic reticulum is less extensive and not as well organized in cardiac muscle; (2) cardiac muscle has no terminal cisternae; (3) a tight association of SER and T-tubules is lacking in cardiac muscle; (4) T-tubule distribution is reduced in cardiac muscle; and (5) T-tubules overlie Z lines in cardiac muscle instead of A-I junctions as in skeletal muscle.
9. The anterior part of each atrium is a wrinkled, flaplike extension called an auricle.
10. A relatively deep coronary sulcus extends around the circumference of the heart and separates the atria from the ventricles externally.
11. The superior vena cava, inferior vena cava, and coronary sinus empty into the right atrium.
12. Both the right and left ventricles are separated from the superior atria by AV valves, contain papillary muscles, and are lined by trabeculae carneae. The right ventricle has thinner walls and pumps blood into the pulmonary trunk, while the left ventricle has thicker walls and pumps blood into the aorta.
13. The chordae tendineae are thin strands of collagen fibers that attach to the cusp of the AV valve and prevent the valve from prolapsing (everting and flipping into the atrium) when the ventricle is contracting.
14. The aortic semilunar valves separate the left ventricle and aorta. The right AV valve separates the right atrium and right ventricle.

15. The contraction of a heart chamber is called systole. During this period, contraction of the myocardium forces blood either into another chamber (atrium to ventricle) or into a blood vessel (ventricle into the attached large artery). The relaxation phase of a heart chamber is termed diastole. During this period, the myocardium of each chamber relaxes between contraction phases, and the chamber fills with blood.
16. Late ventricular diastole is a continuation of ventricular relaxation. The AV valve opens, and passive filling of the ventricle from the atria begins.
17. The atrioventricular node is located in the floor of the right atrium, between the right AV valve and the coronary sinus opening.
18. Autorhythmic means that the heart itself (not external nerves) is responsible for initiating the heartbeat.
19. Sympathetic innervation increases the heart rate and the force of the heart contractions.
20. Flexibility and elasticity in connective tissue decrease with aging. As heart valves become slightly inflexible, both heart murmur and altered blood flow through the heart result.