

CHAPTER TWENTY - TWO

Content Review

1. 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 conveys blood to the lungs via pulmonary arteries to exchange respiratory gases in the blood before returning to the heart in pulmonary veins. 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 peripheral organs and tissues of the body for nutrient and gas exchange before returning the blood to the right atrium.
2. The heart is rotated such that its right side (right atrium and ventricle) are located more anteriorly, while its left side (left atrium and ventricle) are located more posteriorly.
3. The parietal layer of serous pericardium is a serous membrane that lines the inner surface of the fibrous pericardium, which supports the heart in the mediastinum. The visceral layer of serous pericardium (also called the epicardium) is a serous membrane that covers the outside of the heart. Together, both layers produce serous fluid in the pericardial cavity to reduce friction as the heart moves during beating.
4. Cardiac muscle resembles skeletal muscle in that the fibers in both types of muscle are striated and have extensive capillary networks that supply needed nutrients and oxygen.
5. The fibrous skeleton of the heart is located between the atria and ventricles and is formed from dense irregular connective tissue. The functions of the fibrous skeleton include: (1) separating the atria and ventricles, (2) anchoring heart valves by forming supportive rings at the attachment point of the valves, (3) providing electrical insulation between the atria and the ventricles, and (4) providing a rigid framework for the attachment of cardiac muscle tissue.
6. The chordae tendineae are thin strands of collagen fibers that anchor into papillary muscles and attach to the cusp of each AV valve to prevent the valve from prolapsing (everting and flipping into the atrium) when the ventricle is contracting.
7. The atria are thin-walled because they do not need to generate high pressure to push blood into the ventricles. Most of the filling of the ventricles is passive, and the ventricles are inferior to the atria, so moving blood into the ventricles from the atria is relatively easy. The right ventricle wall is relatively thin with respect to the left ventricle wall because the right ventricle only has to pump blood through the pulmonary circuit to the lungs immediately lateral to the heart, whereas the left ventricle must generate enough pressure to drive blood through the entire systemic circuit.
8. The ventricles remain in diastole for a relatively long time in the cardiac cycle to ensure that proper filling occurs before the next cycle.
9. Sympathetic innervation increases both the heart rate and the force of the heart contractions. Parasympathetic innervation decreases the heart rate. Parasympathetic innervation tends to have no effect on the force of contractions, except in special circumstances.
10. The right coronary artery typically branches into a marginal artery (which supplies

the right border of the heart) and the posterior interventricular artery (which supplies the posterior surface of both the left and right ventricles). The left coronary artery typically branches into the anterior interventricular artery (also called the left anterior descending artery), which supplies the anterior surface of both ventricles and most of the interventricular septum, and the circumflex artery, which supplies the left atrium and ventricle.