

Objectives

This chapter introduces the physiology and anatomy of the heart. The heart is a multi-chambered, muscular organ that pumps blood received from the veins into the arteries, thereby maintaining the flow of blood through the entire circulatory system. Martin Luther stated, "The human heart is like a ship on a stormy sea driven about by winds blowing from all four corners of heaven."

Review of Chapter Objectives

1. Describe the location and general features of the heart.
2. Trace the flow of blood through the heart, identifying the major blood vessels, chambers, and heart valves.
3. Identify the layers of the heart wall.
4. Describe the differences in the action potentials and twitch contractions of skeletal muscle fibers and cardiac muscle cells.
5. Describe the components and functions of the conducting system of the heart.
6. Explain the events of the cardiac cycle and relate the heart sounds to specific events in this cycle.
7. Define stroke volume and cardiac output and describe the factors that influence these values.

The Heart

Multiple Choice

-
- 1 . The "double pump" function of the heart includes the right side, which serves as the _____ circuit pump, while the left side serves as the _____ pump.
 - pulmonary; hepatic portal
 - hepatic portal; cardiac
 - pulmonary; systemic
 - systemic; pulmonary
 - none of the above
-
- 2 . The visceral pericardium, or epicardium, covers the:
 - endothelial lining of the heart

- vessels in the mediastinum
 - inner surface of the heart
 - outer surface of the heart
 - none of the above
-

3 . Atrioventricular valves prevent backflow of blood into the _____; semilunar valves prevent backflow into the:

- ventricles; atria
 - atria; ventricles
 - lungs; systemic circulation
 - capillaries; lungs
 - none of the above
-

4 . Blood flows from the left atrium into the left ventricle through the _____ valve.

- mitral
 - bicuspid
 - left atrioventricular
 - all of the above
 - none of the above
-

5 . When deoxygenated blood leaves the right ventricle through a semilunar valve, it is forced into the: [\[Hint\]](#)

- pulmonary veins
 - aortic arch
 - lung capillaries
 - all of the above
 - none of the above
-

6 . Blood from systemic circulation is returned to the right atrium by the superior and:

- pulmonary veins
- brachiocephalic veins
- inferior vena cava

- pulmonary arteries
 - none of the above
-

7 . Oxygenated blood from the systemic arteries flows into: [\[Hint\]](#)

- peripheral tissue capillaries
 - the right atrium
 - the left atrium
 - systemic veins
 - none of the above
-

8 . The lung capillaries receive deoxygenated blood from the:

- pulmonary veins
 - superior and inferior venae cavae
 - aorta
 - pulmonary arteries
 - none of the above
-

9 . One of the important differences between skeletal muscle tissue and cardiac muscle tissue is that cardiac muscle tissue is:

- comprised of unusually large cells
 - multinucleated
 - striated voluntary muscle
 - striated involuntary muscle
 - none of the above
-

10 . Cardiac muscle tissue:

- all of the above
 - will not contract unless stimulated by nerves
 - is under voluntary control
 - does not require nerve activity to stimulate a contraction
 - none of the above
-

11 . Blood from coronary circulation is returned to the right atrium of the heart via:

- anastomoses
 - the coronary sinus
 - the circumflex branch
 - the anterior interventricular branch
 - none of the above
-

- 12 The correct sequential path of a normal action potential in the heart is:
- SA node --> AV node --> bundle branches --> AV bundle --> Purkinje fibers
 - SA node --> AV bundle --> AV node --> Purkinje fibers
 - SA node --> AV node --> bundle of His --> bundle branches --> Purkinje fibers
 - AV node --> SA node --> AV bundle --> bundle of His
 - none of the above
-

- 13 The sinoatrial node acts as the pacemaker of the heart because these cells are:
- the only cells in the heart innervated by the autonomic nervous system
 - located in the wall of the left atrium
 - the ones that depolarize and reach threshold first
 - the only cells in the heart that can conduct an impulse
 - none of the above
-

- 14 After the AV node is depolarized and the impulse spreads through the atria, there is a slight delay before the impulse spreads to the ventricles. The reason for this delay is to allow:
- the ventricles to repolarize
 - nothing; there is no reason for the delay
 - a greater venous return
 - the atria to finish contracting
 - none of the above
-

- 15 The P wave of a normal electrocardiogram indicates:
- ventricular repolarization
 - atrial repolarization

- ventricular depolarization
 - all of the above
 - none of the above
-

16 The QRS complex of the EKG appears as the:

- atria repolarize
 - atria depolarize
 - ventricles depolarize
 - ventricles repolarize
 - none of the above
-

17 EKGs are useful in detecting and diagnosing abnormal patterns of cardiac activity called:

- cardiac arrhythmias
 - autorhythmicity
 - myocardial infarctions
 - all of the above
 - none of the above
-

18 The "lubb-dubb" sounds of the heart have practical clinical value because they provide information concerning:

- the relative time the heart spends in systole and diastole
 - the strength of ventricular contraction
 - the strength of the pulse
 - the efficiency of heart valves
 - none of the above
-

19 When a chamber of the heart fills with blood and prepares for the start of the next cardiac cycle, the heart is in:

- ventricular ejection
- systole
- contraction
- all of the above

none of the above

20 The amount of blood ejected by the left ventricle per minute is the:

- stroke volume
 - systolic volume
 - cardiac output
 - diastolic volume
 - none of the above
-

21 The heart is enclosed by the:

- visceral pericardium
 - mediastinum
 - parietal pericardium
 - all of the above
 - none of the above
-

22 The chordae tendineae and papillary muscles stabilize the:

- atrioventricular (AV) valves
 - aortic semilunar valve
 - pulmonary semilunar valve
 - all of the above
 - none of the above
-

23 Blood flow to both sides of the heart is balanced by:

- sympathetic and parasympathetic modulation
- common drainage into the coronary sinus
- anastomoses between the branches of the coronary arteries
- all of the above
- none of the above