

Anatomy Review: The Heart

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Page 1. Introduction

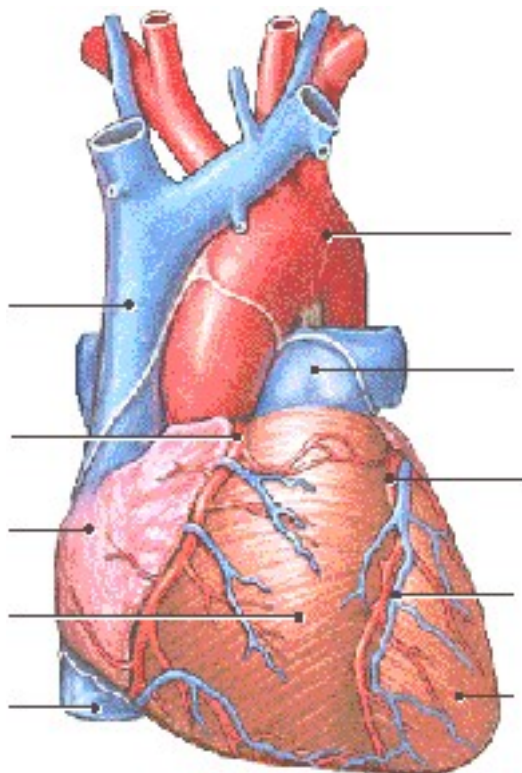
- The heart is the transport system pump; the delivery routes are the blood vessels. Using blood as the transport medium, the heart propels oxygen, nutrients, wastes, and other substances to and past the body cells.

Page 2. Goals

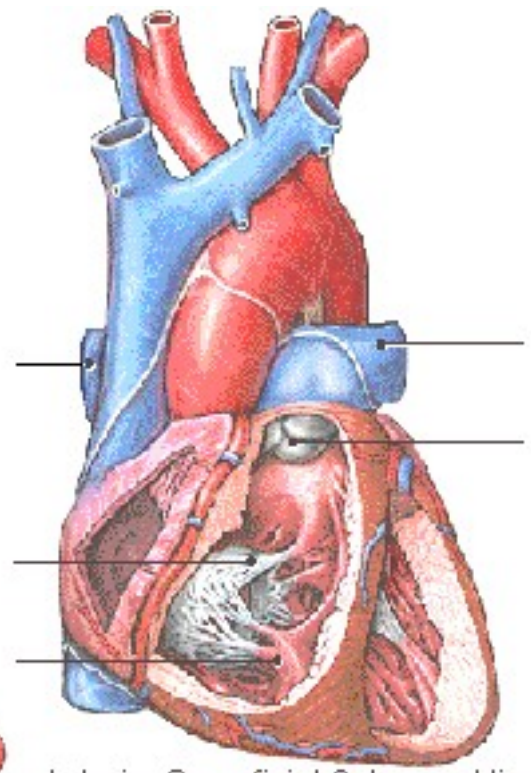
- To review the anatomy of the heart.
- To review the pulmonary and systemic circuits.
- To review the anatomy of cardiac muscle cells.

Page 3. Heart Views

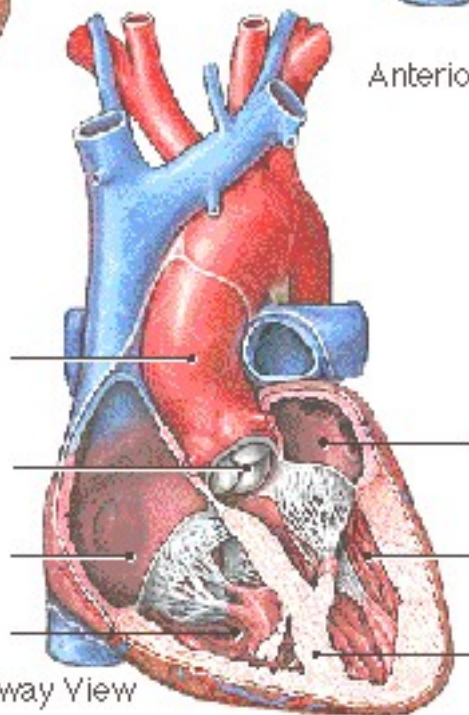
- Label the diagrams of the heart below:



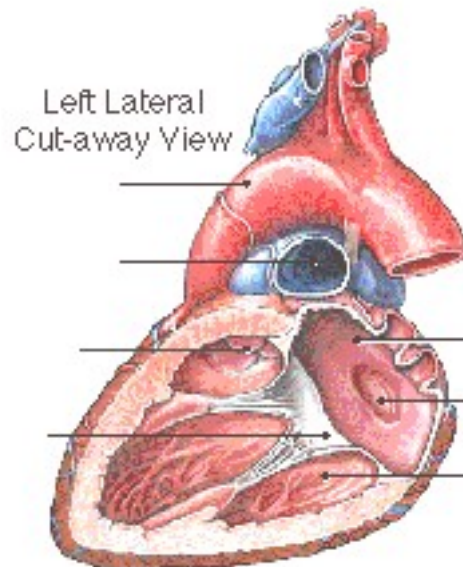
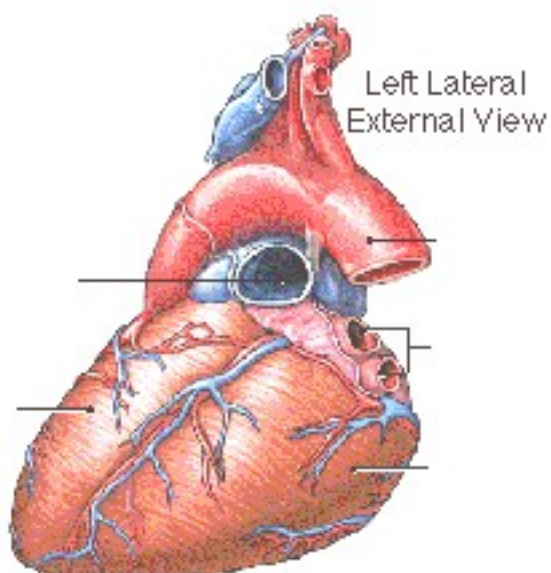
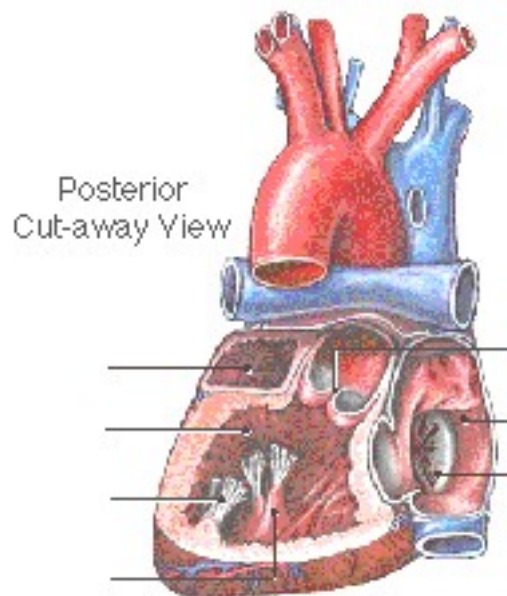
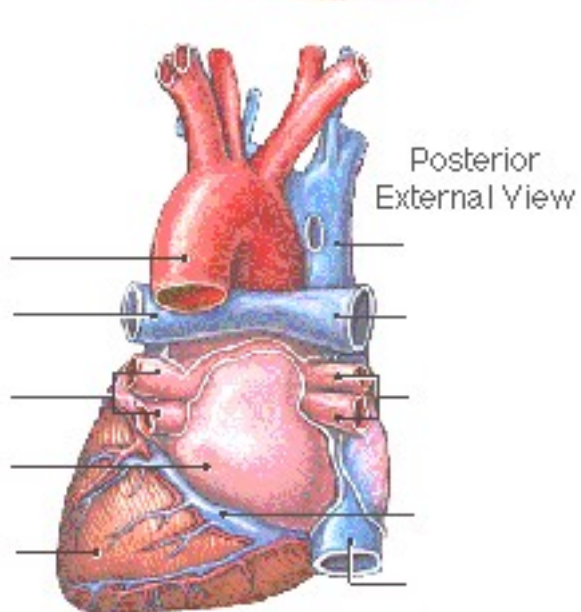
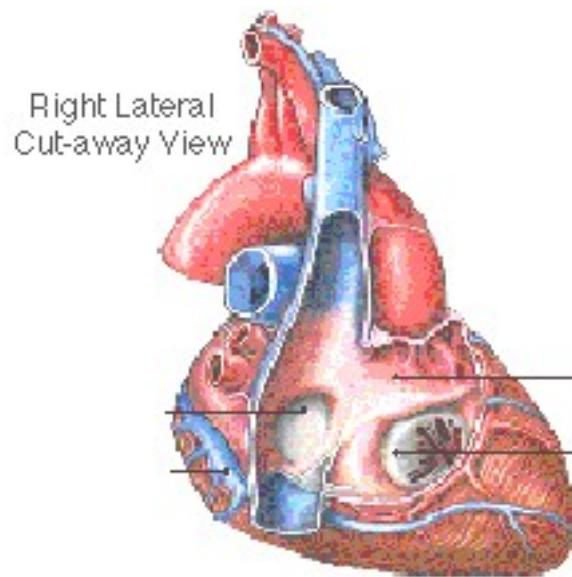
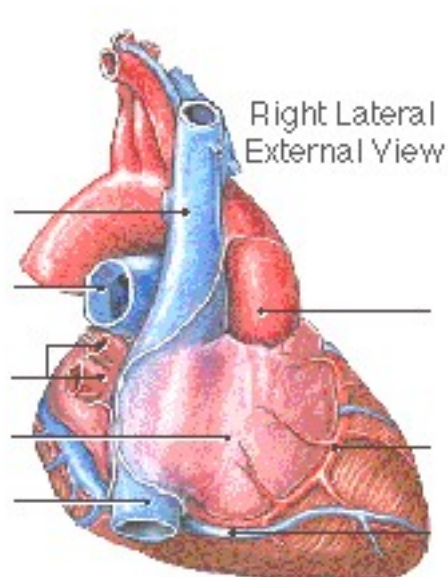
Anterior External View



Anterior Superficial Cut-away View



Anterior Deep Cut-away View

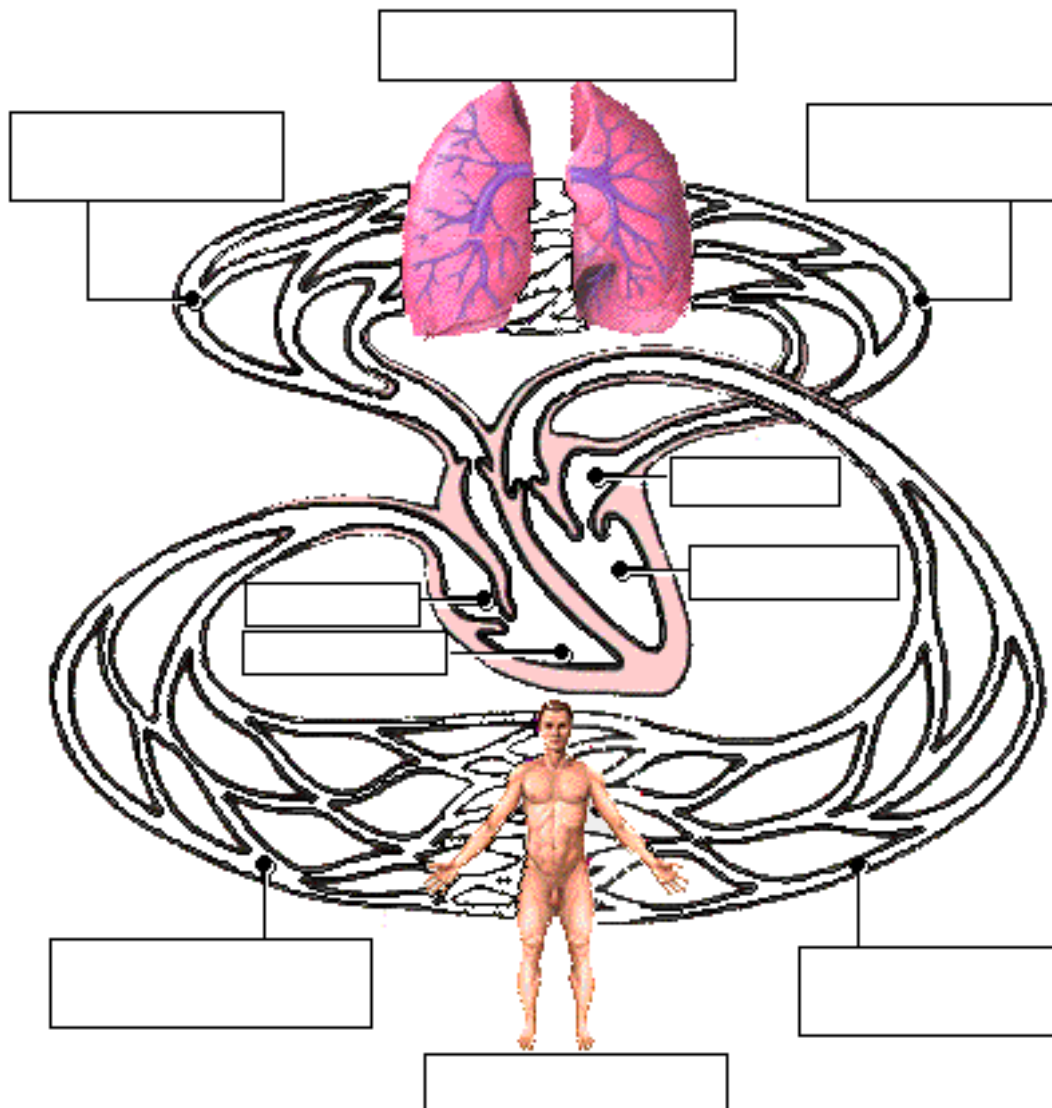


Page 4. External Heart

- The heart consists of two side by side pumps. The blood vessels are the "pipes" that carry blood throughout the body. The right atrium and right ventricle pump oxygen-poor, CO₂-rich blood to the lungs. In the lungs the blood receives oxygen, eliminates carbon dioxide, and travels back to the left atrium of the heart. From the left atrium the oxygen-rich, CO₂-poor blood is pumped out to the body by the left ventricle. When the body has depleted the blood's oxygen, the veins return the blood to the right side of the heart and the cycle continues.

Page 5. Circulation

- Oxygen-poor blood is pumped from the right side of the heart to the lungs. Here it receives oxygen and travels back to the heart. This pathway is the pulmonary circuit. The pathway for the systemic circuit includes the entire body as the left side of the heart pumps oxygen-rich blood out to the body's tissue and organs. After the blood's oxygen is depleted, it returns to the right side of the heart via the venous system.
- On the diagram below, color the oxygen-rich blood red and the oxygen-poor blood blue. Label the parts:



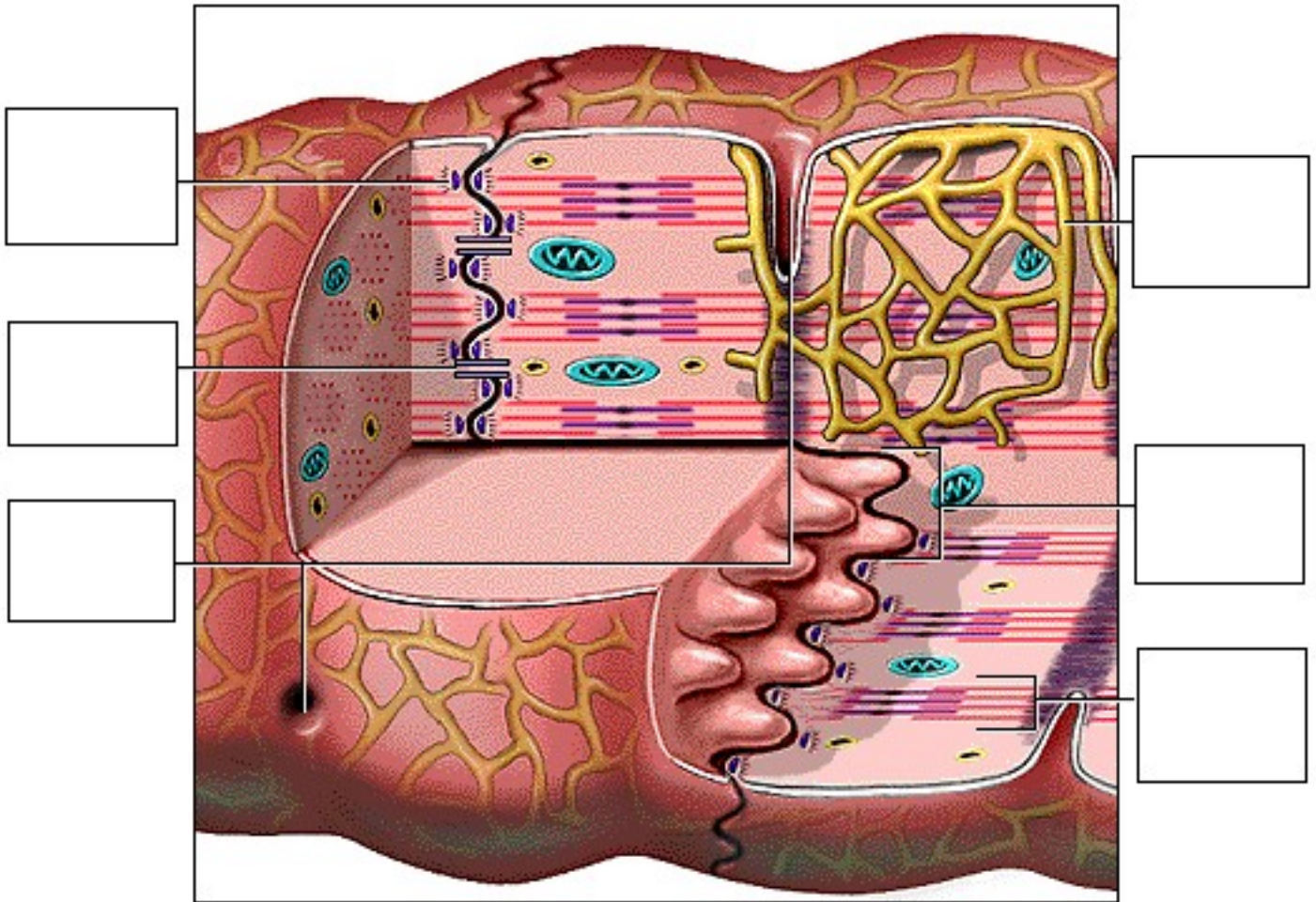
Page 6. Cardiac Histology

- Three features of the histology of cardiac muscle:
 1. Nuclei

2. Intercalated Disks
3. Cardiac Myofibrils

Page 7. Cardiac Muscle Cells

- There are two kinds of cell junctions and the intercalated disks.
 - The desmosomes are anchoring junctions that hold adjacent cells together. When the muscle cell contracts, they pull on each other. If it wasn't for the desmosomes, the heart would literally pull itself apart in doing its job.
 - The gap junctions allow the stimulating impulse to move across the heart from cell-to-cell so the heart beats as an entire unit. If each cardiac muscle cell were allowed to do its own thing the heart would be useless as a pump.
- Label the parts on the diagram below:



Page 8. Summary

- The heart consists of four chambers: the right atrium, right ventricle, left atrium, and left ventricle.
- The right atrium receives oxygen-poor blood from the systemic veins; blood moves to the right ventricle and is pumped out the pulmonary arteries to the lungs.
- The left atrium receives oxygenated blood from the pulmonary veins; blood moves to the left ventricle and is pumped out the systemic arteries to the body tissues.

Study Questions on Anatomy Review: The Heart:

1. (Page 4.) What's the difference between the blood in the right side of the heart and the left side of the heart?
2. (Page 5.) a. Where does the blood go that is pumped out of the right heart? b. What happens to the blood in the lungs?

- c. Where does the blood go that is pumped out of the left heart?
- 3. (Page 5.) What is the pulmonary circuit and the systemic circuit?
- 4. (Page 6.) What three structural features are found on histological images of cardiac muscle?
- 5. (Page 7.) What are the names of the two types of cell junctions in cardiac muscle cells?
- 6. (Page 7.) What is the function of desmosomes?
- 7. (Page 7.) What is the function of gap junctions?