

What are the Cardiac Chambers?

Worksheet

The cardiac chambers are the heart's four internal compartments: the right atrium, right ventricle, left atrium and left ventricle, separated by the interatrial and interventricular septa and one-way valves.

Questions

1. Which chamber pumps oxygenated blood into the aorta?
 - A) Right atrium
 - B) Right ventricle
 - C) Left atrium
 - D) Left ventricle
2. Which valve lies between the right atrium and right ventricle?
 - A) Mitral valve
 - B) Tricuspid valve
 - C) Aortic valve
 - D) Pulmonary valve
3. Why is the left ventricular wall much thicker than the right ventricular wall?
 - A) It pumps less blood
 - B) It must generate high pressure to reach the whole body
 - C) It has no valves
 - D) It receives blood from the lungs
4. Where does the left atrium receive blood from?
 - A) Vena cava
 - B) Coronary sinus
 - C) Pulmonary veins
 - D) Pulmonary artery
5. A healthy adult has a stroke volume of 70 mL per beat and a heart rate of 72 bpm. What is the cardiac output pumped out of the left ventricle each minute?
6. The left ventricular wall is about 8-11 mm thick, while the right ventricular wall is about 3-5 mm thick. Roughly how many times thicker is the LV wall?
7. The normal aortic valve area is about 3-4 cm. If a patient's valve area falls to 0.8 cm, is this considered severe aortic stenosis (threshold < 1.0 cm)?
8. Define: How many chambers does the heart have?
9. Define: Which chamber has the thickest wall?
10. Define: What separates the left and right ventricles?

Answer Key

1. D) Left ventricle - The left ventricle ejects oxygenated blood through the aortic valve into the aorta.
2. B) Tricuspid valve - The tricuspid valve (three cusps) separates the right atrium from the right ventricle.
3. B) It must generate high pressure to reach the whole body - The LV pumps against the high resistance of the systemic circulation, requiring a thicker, more muscular wall.
4. C) Pulmonary veins - The left atrium receives freshly oxygenated blood from the lungs via the four pulmonary veins.
5. Cardiac output = Stroke volume Heart rate $CO = 70 \text{ mL} \cdot 72 \text{ beats/min} = 5,040 \text{ mL/min} \approx 5.0 \text{ L/min}$
6. Take midpoints: LV 9.5 mm, RV 4 mm Ratio = $9.5 / 4 = 2.4$ The LV wall is roughly 2-3 times thicker, because it must generate enough pressure to push blood through the entire systemic circulation.
7. Compare 0.8 cm to the severe-stenosis threshold of 1.0 cm $0.8 \text{ cm} < 1.0 \text{ cm}$ Yes - this is severe aortic stenosis, meaning the left ventricle must work much harder to eject blood.
8. Four: right atrium, right ventricle, left atrium, left ventricle.
9. The left ventricle, because it pumps blood to the entire body at high pressure.
10. The interventricular septum.

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