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**COLLEGE: MEDICINE AND HEALTH SCIENCES**

**DEPARTMENT: PHYSIOLOGY**

**COURSE CODE: ANA 202**

**QUESTIONS**

1. You will provided with a video, watch it and use it to describe the heart and its function.
2. Write on five different congenital anomalies of the heart.

**Description of the heart and its function**

The heart is a muscle. It is located at the behind the left side of the sternum. Its size is about the size of one’s fist. Its main function is to pump blood through blood vessels to every part of the body. The heart is divided into four chambers.

* The two atria; left atrium and right atrium. These two chambers are called the “collection chambers” because they receive blood.
* The two ventricles; the left ventricle and the right ventricle. These chambers receive blood from the atria.
* **The right atrium**: it receives deoxygenated blood from the body through the superior and inferior vena cava. The superior vena cava receives blood from the upper parts of the body while the inferior vena cava receives blood from the lower parts of the body. The blood is deoxygenated because the oxygen in it has been used up by the body. It then passes the blood to the right ventricle through the tricuspid valve.
* **The right ventricle:** it is below the right atrium and receives deoxygenated blood from it and sends it to the lungs for oxygenation through the pulmonic valve.
* **The left atrium:** it receives oxygenated blood from the lungs and sends it to the left ventricle via the mitral valve.
* **The left ventricle:** it receives oxygenated blood from the left atrium and sends it to the aorta and the other parts of the body through the aortic valve.

**The valves of the heart separate the chambers and prevent flow back of blood. The valves of the heart are;**

1. **The tricuspid valve:** it has three cusps. It allows flow of deoxygenated blood from the right atrium into the right ventricle and prevent flow back into the atrium.
2. **The pulmonic valve:** it allows flow of deoxygenated blood from the right ventricle into the lungs.
3. **The mitral valve:** it has two cusps. It allows the flow of oxygenated blood into the left ventricle from the left atrium.
4. **The aortic valve:** allows flow of oxygenated blood into the aorta and prevents flow back.

All arteries carry oxygenated blood and other nutrients throughout the body except the **pulmonary artery.** It is the only artery that carries deoxygenated blood because it takes it to the lung for oxygenation. The aorta is the largest artery in the body. The heart arteries:

**Coronary arteries;**

1. Right coronary artery supplies the back and bottom of the heart.
2. Left coronary artery splits into two vessels; one branch supplies the front of the heart and the other supplies the left side of the heart. While Veins carry deoxygenated blood to the heart except the pulmonary veins which carry oxygenated blood from the lungs. The largest vein in the body is the inferior vena cava.

Electric system transmits signals round the heart to control its pumping. The electric signal starts at the

* Sino atrial node (SA node); which is located in the upper portion of the right atrium. It is known as the **natural pacemaker of the heart.**
* The electrical signals passes down to the lower chamber of the heart by the Atrioventricular node (AV node); which controls the signal of the atria to contract before the ventricles. In the ventricles, the pathways carry the signals round the muscles so they allow contraction at the same time.

**Write on five different congenital anomalies of the heart.**

* **Atrial Septal Defect (ASD):** It is a hole in the wall between the upper chambers of the heart, i.e. the right and left atrium. This hole lets blood from the left atrium mix with that in the right atrium. Some ASDs close on their own. Then a doctor may need to repair a large ASD with open-heart surgery.
* **Complete Atrioventricular Canal Defect (CAVC):** This is the most serious septal defect. It is a hole in the heart that affects the four chambers; the left and right atrium and the left and right ventricles. This defect prevents oxygenated blood from going to the right places in the body. It can be repaired with patches or several surgeries.
* Ventricular Septal Defect (VSD): It is a hole in the part of the septum that separates the ventricles. This defect causes the blood to pump back to the lungs instead of going into the body. If a ventricular septal defect is small, it may close on its own.
* **Hole in the heart:** This is a hole in the septum that seperates the two sides of the heart which one is normally born with. It allows both oxygenated and deoxygenated blood to flow from the two sides and mix.
* **Tetralogy of fallot:** Sometimes, if one has holes in the heart, one might also have other heart anomalies. One of them is called tetralogy of fallot. **This is a combination of four defects, they include;**
1. Thickened wall around the right ventricle or lower chamber.
2. A large ventricular septal defect
3. Stiff pulmonary valve that prevents blood from flowing easily from the heart to the lungs.
4. Aorta located above the hole in the ventricular wall.