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 **MATRIC NO: 18/MHS05/009**

**DEPARTMENT: PHYSIOLOGY**

**COURSE: ANA 202**

**QUESTIONS:**

1. You will be provided with a video, watch it and use it to describe the heart and its functions

2. Write on five (5) different congenital anomalies of the heart

**ANSWERS:**

1. **THE HEART AND ITS FUNCTIONS.**

The heart is a muscle about the size of your fist, it lies behind, into the left of the sternum. The main function of the hear is to pump blood through blood vessels, arteries and veins to all parts of the body. The inside of the heart is divided into four chambers. The top two chambers are called the atria and are collecting chambers for blood. The bottom two chambers are called the ventricles and receive the blood from the atria and pump it to the lungs and the body (through the aorta). The chambers are separated by valves which control the direction of blood flow. There are four valves: **Tricuspid, Pulmonic, Mitral, and Aortic**. Circulation begins on the right side of the heart where blood from the body comes to the right atrium. This blood passes to the right ventricle where it is pumped to the lungs to receive oxygen, once oxygen is received, it flows to the left atrium and then to the left ventricle where it is pumped to the aorta and then to the rest of the body. On the right side of the heart, the tricuspid valve separates the right atrium from the right ventricle, allowing blood to enter the ventricle but not flow back. Blood flows through the pulmonic valve to go to the lungs. On the left side of the heart, the mitral valve separates the left atrium from the left ventricle, blood flows from the ventricle to the aorta through the aortic valve and to the rest of the body. Arteries carry blood with oxygen and nutrients throughout the body, veins carry blood back to the heart which takes it to the lungs to be oxygenated. The heart arteries, Coronary arteries, provide oxygen and nutrients to the heart muscles. The right coronary artery supplies blood to the bottom and back of the heart. The left coronary artery splits into two vessels, one branch supplies blood to the front of the heart while the other branch supplies blood to the left side of the heart. An electric system transmits signals throughout the heart to control its pumping, the electrical signals start in the Sinoatrial nodes (SA nodes) which is located on the upper portion of the right atrium, and is known as the natural pacemaker of the heart. The electrical signals pass to the lower chambers of the heart by the atrioventricular node (AV node) which controls the signals so the atria contract before the ventricles. In the ventricles, pathways carry the signals throughout the muscle so that they contract at the same time so that they can pump blood to the lungs and throughout the body.

1. **CONGENITAL ANOMALIES OF THE HEART (HEART DEFECTS):**
* **Atrial Septal Defects (ASD):** This is a birth defect of the heart in which there’s a hole in the wall (septum) that divides the upper chambers (atria) of the heart. As a baby’s heart develops during pregnancy, there are normally several openings in the wall dividing the upper chambers of the heart (atria). These usually close during pregnancy or shortly after birth, if one of these openings does not close, a hole is left, and it is called an atrial septal defect. The hole increases the amount of blood that flows through the lungs and over time, it may cause damage to the blood vessels in the lungs. Damage to the blood vessels in the lungs may cause problems in adulthood, such as high blood pressure in the lungs and heart failure. Other problems may include abnormal heartbeat, and increased risk of stroke.
* **Dextrocardia:** This is a rare heart anomaly in which the heart points towards the right instead of the left. There are several types of dextrocardia, many types involve other defects of the heart and abdomen. In the simplest type of dextrocardia, the heart is a mirror image of the normal heart and there are no other problems. When this occurs, the organs of the abdomen and the lungs will often also be arranged in a mirror image. For example, the liver will be on the left side instead of the right. The abdominal and chest organs in babies with dextrocardia may be abnormal and may not work correctly. A very serious syndrome that appears with dextrocardia is called heterotaxy. In this condition, many of the organs are not in their usual places and may not work properly. For example, the spleen may be completely missing. The spleen is an important part of the immune system, so babies born without this organ are in danger of severe bacterial infections and death. In another form of heterotaxy, several small spleens exist, but they may not work correctly.
* **Ectopia Cordis:** This is a rare condition in which the heart is in an abnormal location. In the thoracic form of ectopia cordis, the heart is partly or completely exposed on the thoracic wall. Ectopia cordis is usually associated with widely spread separated halves of the sternum (nonfusion) and an open pericardial sac. Death occurs in most cases during the first few days after birth, usually from infection, cardiac failure, or hypoxemia. If there are no severe cardiac defects, surgical therapy usually consists of covering the heart with skin. In some cases of ectopia cordis, the heart protrudes through the diaphragm into the abdomen.
* **Aorticopulmonary Septal Defect:** This is a rare condition in which there is an opening (aortic window) between the aorta and pulmonary trunk near the aortic valve. The aorticopulmonary defect results from a localized defect in the formation of the aorticopulmonary septum. The presence of pulmonary and aortic valves and an intact interventricular septum distinguishes this defect from the persistent truncus arteriosus defect.
* **Ventricular Septal Defect:** This is similar to the Atrial septal defect. It is caused by a hole in the heart, and it is a common heart defect that's present at birth. The hole occurs in the wall (septum) that separates the heart's lower chambers (ventricles) and allows blood to pass from the left to the right side of the heart. The oxygen-rich blood then gets pumped back to the lungs instead of out to the body, causing the heart to work harder. A small ventricular septal defect may cause no problems, and many small VSDs close on their own. Medium or larger VSDs may need surgical repair early in life to prevent complications.