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Anatomy

ANA 202

**HEART AND ITS FINCTIONS**

The heart is a muscle about the size of the fist. It lies behind and left to the sternum. The purpose of the heart is to pump blood through arteries and veins to and from all parts of the body.

The heart is divided into 4 chambers;

* Two at the top, Atria for collection of blood
* Two at the bottom, Ventricles for pumping blood to the lungs and rest of the body

**HEART VALVES**

The heart has 4 valves. They are present to prevent backflow of blood

The chambers of the heart being separated by;

* Mitral and
* Tricuspid valve

And the right and left ventricle having the

* Pulmonary and
* Aortic valve respectively

BLOOD CIRCULATION THROUGH THE HEART

Circulation begins at the right side of the heart where blood from the body enters the right atrium. The blood then moves to right ventricle through the tricuspid valve and from there pumped to the lungs for oxygenation through the pulmonary valve. The blood after being oxygenated flows to the left atrium through the mitral valve moves to the left ventricle. Blood is then pumped into the aorta after passing through the aortic valve.

Blood is taken away from the heart with oxygen and nutrients by the artery and returned back to the heart by the veins which gets oxygenated again.

Arteries of the heart:

* Aorta
* Coronary artery which carries oxygen and nutrients is divided into two;

**Left and right**

The **left** is further divided into two, one branch which supplies the front of the heart and the other branch supplies the left of the heart.

The **right** branch of the coronary artery supplies the bottom and back of the heart.

ELECTRICAL IMPULSES

There are impulses that control the pumping of the heart.

These impulses start at the Sinoatrial valve (SA node) also known as the pace maker of the heart. It is located at the upper part of the right atrium. Impulses are then passed to the AV node, located at the lower portion of the right atrium. It passes impulses to the lower portion.

This accounts for why the atria contracts before the ventricles

CONGENITAL ANOMALIES

### Atrial Septal Defect (ASD)

A "hole" in the wall that separates the top two chambers of the heart.

This defect allows oxygen-rich blood to leak into the oxygen-poor blood chambers in the heart. ASD is a defect in the septum between the heart's two upper chambers (atria). The septum is a wall that separates the heart's left and right sides.

**Coarctation of the Aorta (CoA)**

A narrowing of the major artery (the aorta) that carries blood to the body.

This narrowing affects blood flow where the arteries branch out to carry blood along separate vessels to the upper and lower parts of the body. CoA can cause high blood pressure or heart damage.

**Complete Atrioventricular Canal defect (CAVC)**

A large hole in center of the heart affecting all four chambers where they would normally be divided. When a heart is properly divided, the oxygen-rich blood from the lungs does not mix with the oxygen-poor blood from the body. A CAVC allows blood to mix and the chambers and valves to not properly route the blood to each station of circulation.

**Transposition of the great arteries**

A heart in which the two main arteries carrying blood away from the heart are reversed.

A normal blood pattern carries blood in a cycle: body-heart-lungs-heart-body.

When a d-transposition occurs, the blood pathway is impaired because the two arteries are connecting to the wrong chambers in the heart.

This means that the blood flow cycle is stuck in either:

* body–heart –body (without being routed to the lungs for oxygen) or
* lungs–heart–lungs (without delivering oxygen to the body)

Without surgery, the only way to survive this condition temporarily is to have leakages that allow some oxygen-rich blood to cross into the oxygen-poor blood for delivery to the body. A hospital facility can also catheterize a patient until corrective surgery can be performed.

**Ebstein's Anomaly**

A malformed heart valve that does not properly close to keep the blood flow moving in the right direction. Blood may leak back from the lower to upper chambers on the right side of the heart. This syndrome also is commonly seen with ASD (or a hole in the wall dividing the two upper chambers of the heart).