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

The heart is a muscle about the size of your fist, it lies behind into the left of your breast bone or sternum. The purpose of the heart is to pump blood, through blood vessels, arteries and veins to all parts of your body. The inside of the heart is divided into four chambers, the top two chambers are called the atria and are collection chambers for blood, the bottom two chambers are called ventricles and receive the blood from the atria and bump it into the lungs and the body. The chambers are seperated by valves which control the first tin of the blood flow.

Valves of the Heart

They are four valves;

Tricuspid valves

The right atrioventricular orifice is closed during ventricular contraction by the **tricuspid valve** (**right atrioventricular valve**), which is so-named because it usually consists of three cusps or leaflets.

Pulmonary valve

At the apex of the infundibulum, the outflow tract of the right ventricle, the opening into the pulmonary trunk is closed by the **pulmonary valve**, which consists of three **semilunarcusps** with free edges

projecting upward into the lumen of the pulmonary trunk.

Mitral valve

The left atrioventricular orifice opens into the posterior right side of the superior part of the left ventricle

Aortic valve

The aortic vestibule, or outflow tract of the left ventricle, is continuous superiorly with the ascending aorta.

Circulation begins at 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 it receives oxygen it flows to the left atrium and the to the left ventricle where it is pumped to the aorta and the rest of the body. On the right side of the heart the tricuspid valve separates the right atrium and the right ventricle allowing blood to enter the ventricle but not flow backwards to the atrium. 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 and the left ventricle, blood flow from the left ventricle to the aorta through the aortic valve and to the rest of the body. Arteries carry blood with oxygen and other nutrients through out the body. Veins take blood back to the heart which pumps it to the heart to be oxygenated. The heart arteries, coronary arteries,provides oxygen and nutrients to the heart muscle, the right coronary arteries supplies blood to the bottom and the back of the heart the left coronary arteries split into two vessels, one branch supplies blood to the front of the heart the other branch delivers blood to the left side of the heart. An electric system transmits signals through out the heart, to control its pumping the electrical system starts in the sinoatrial or SA node, which is located at the upper portion of the right atrial and is known as the natural pace maker of the heart. The electrical signal passes down to the lower chambers of the heart by the atrial ventricular or AV node,which controls the signal so the atria contracts before the ventricles, in the ventricles pathways carries the signal through the muscle, so they contract at the same time to carries signal to the lungs and through the body.

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

1.

Ventricular septal defects

A ventricular septal defect (VSD), a hole in the heart, is a common heart defect that's present at birth (congenital). The hole (defect) 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.

Symptoms

- Poor eating, failure to thrive
- Fast breathing or breathlessness
- Easy tiring
- Poor weight gain
- Sweating
- pale skin coloration
- frequent respiratory infections
- a bluish skin color, especially around the lips and fingernails

Causes

The most common cause of a VSD is a congenital heart defect, which is a defect from birth. Some people are born with holes already present in their heart. They may cause no symptoms and take years to diagnose.

A rare cause of a VSD is severe blunt trauma to the chest. For example, a serious car accident with direct, forceful, or repeated trauma to the chest may cause a VSD.

Diagnosis

- A transesophageal echocardiogram (TEE) is a picture taken by numbing the throat and then sliding a thin tube containing an ultrasound device down the throat and into the esophagus, close to the heart.
- An echocardiogram with an agitated saline bubble test is an ultrasound taken of the heart while saline bubbles are injected into the bloodstream.
- An MRI involves the use of radio and magnetic waves to take images of the heart.

Treatment

- **Wait-and-Watch Approach**

If the VSD is small and not causing any symptoms, your doctor may recommend a wait-and-watch approach to see if the defect corrects itself. Your doctor will carefully monitor you or your baby's health to make sure your condition improves.

- **Surgery**

In more severe cases, surgery is required to repair the damage. Most surgeries to correct a VSD are open-heart surgery. You'll be anesthetized and put on a heart-lung machine. Your surgeon will make an incision in your chest and close the VSD with either stitches or a patch.

A catheter procedure involves inserting a thin tube, or catheter, into a blood vessel in the groin and then guiding it all the way up to the heart for closure of the VSD.

Other surgeries involve a combination of these two procedures.

If the VSD is large, you or your child may need medication to control symptoms before surgery. Medication may include digoxin, a drug made from the foxglove plant, Digitalis lanata, and possibly diuretics as well.

2.

Atrial septal defect

An atrial septal defect (ASD) is a hole in the wall (septum) between the two upper chambers of your heart (atria). The condition is present at birth (congenital).

Small defects might be found by chance and never cause a problem. Some small atrial septal defects close during infancy or early childhood.

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.

Symptoms

- Shortness of breath, especially when exercising
- Fatigue
- Swelling of legs, feet or abdomen
- Heart palpitations or skipped beats
- Stroke
- Heart murmur, a whooshing sound that can be heard through a stethoscope

Causes

The causes of heart defects such as atrial septal defect among most babies are unknown. Some babies have heart defects because of changes in their genes or chromosomes. These types of heart defects also are thought to be caused by a combination of genes and other risk factors, such as things the mother comes in contact with in the environment or what the mother eats or drinks or the medicines the mother uses.

Diagnosis

If the ASD is large, your doctor may hear an abnormal heart murmur when listening to your heart. In smaller ASDs, these may not be heard. Because many individuals with uncorrected secundum ASDs do not have significant symptoms, the ASD may not be found until later in childhood or adulthood.

The most common diagnostic test used to confirm an ASD is an echocardiogram (echo) or ultrasound of the heart. Other tests your doctor may want you to have might include:

- Chest X-ray
- Electrocardiogram (EKG)
- Cardiac Magnetic Resonance Imaging (MRI)
- Transesophageal Echo (TEE)
- Heart Catheterization

Treatment

Many atrial septal defects close on their own during childhood. For those that don't close, some small atrial septal defects might not require treatment. But many persistent atrial septal defects eventually require surgery.

- Medical monitoring

If you or your child has an atrial septal defect, your cardiologist might recommend monitoring it for a time to see if it closes on its own. Your doctor will decide when you or your child needs

treatment, depending on your condition and whether you or your child has other congenital heart defects.

- **Medications**

Medications won't repair the hole, but they may be used to reduce some of the signs and symptoms that can accompany an atrial septal defect. Drugs may also be used to reduce the risk of complications after surgery. Medications may include those to keep the heartbeat regular (beta blockers) or to reduce the risk of blood clots (anticoagulants).

- **Surgery**

Many doctors recommend repairing a medium to large atrial septal defect diagnosed during childhood or adulthood to prevent future complications. However, surgery isn't recommended if you have severe pulmonary hypertension because it might make the condition worse.

For adults and children, surgery involves sewing closed or patching the abnormal opening between the atria. Doctors will evaluate your condition and determine which of two procedures to use:

- **Cardiac catheterization**

Doctors insert a thin, flexible tube (catheter) into a blood vessel in the groin and guide it to the heart using imaging techniques. Through the catheter, doctors place a mesh patch or plug to close the hole. The heart tissue grows around the mesh, permanently sealing the hole. This type of procedure is used to repair only the secundum type of atrial septal defects. Some large secundum atrial septal defects, however, might require open-heart surgery.

- **Open-heart surgery**

This type of surgery is done under general anesthesia and requires the use of a heart-lung machine. Through an incision in the chest, surgeons use patches to close the hole. This procedure is the only way to repair primum, sinus venous and coronary sinus atrial defects. This procedure can be done using small incisions (minimally invasive surgery) and with a robot for some types of atrial septal defects.

- **Follow-up care**

Follow-up care depends on the type of defect, the treatment suggested and whether other defects are present. Repeated echocardiograms are done after hospital discharge, one year later and then as requested by your or your child's doctor. For simple atrial septal defects closed during childhood, only occasional follow-up care generally is needed.

Adults who've had atrial septal defect repair need to be monitored throughout life to check for complications, such as pulmonary hypertension, arrhythmias, heart failure or valve problems. Follow-up exams are typically done yearly.

3.

Complete atrioventricular canal defect

Complete atrioventricular canal (CAVC) is a severe congenital heart disease in which there is a large hole in the tissue (the septum) that separates the left and right sides of the heart. The hole is in the center of the heart, where the upper chambers (the atria) and the lower chambers (the ventricles) meet.

A CAVC allows blood to mix and the chambers and valves to not properly route the blood to each station of circulation.

Causes

An AV canal defect is a congenital heart defect. This means it is a problem with the heart's structure that your child was born with.The exact cause is unknown. Children with Down syndrome (trisomy 21) are at higher risk of having this heart defect.

Symptoms

★Tiredness
★ Trouble breathing or rapid breathing
★ Trouble feeding
★ Poor weight gain and growth
★ Sweating
★ Blue or purple coloring of the lips, skin, and nails (cyanosis)
★ Heart murmur

Diagnosis

- **Chest X-ray**. X-rays are used to take a picture of the heart and lungs.
- **Electrocardiogram (ECG)**

The test records the electrical activity of the heart.

- **Echocardiogram (echo)**

Sound waves (ultrasound) are used to create a picture of the heart and look for structural defects.

- **Pulse oximetry**

The test looks at how much oxygen is in the blood.

- **Cardiac catheterization**

The test measures blood pressure and oxygen inside the heart. It also lets the doctor look at the inside of the heart. The test is done with a long thin tube (catheter) that is put in through a blood vessel in the groin or other area and moved to the heart.

- **Cardiac MRI**

This test gives 3-D images of the heart. It can show any defects.

Treatment

Complete atrioventricular canal defects require surgery, usually within the first two or three months of life. The surgeon will close the large hole with one or two patches. The patches are stitched into the heart muscle, and as the child grows, the tissue grows over the patches.

The surgeon will also separate the single large valve into two valves and will reconstruct the valves so they are as close to normal as possible, depending on the child's heart anatomy.

4.

Pulmonary valve stenosis

Pulmonary valve stenosis is a condition in which a deformity on or near your pulmonary valve narrows the pulmonary valve opening and slows the blood flow. The pulmonary valve is located between the lower right heart chamber (right ventricle) and the pulmonary arteries. Adults occasionally have pulmonary valve stenosis as a complication of another illness, but mostly, pulmonary valve stenosis develops before birth as a congenital heart defect.

Symptoms

●Heart murmur

An abnormal whooshing sound heard using a stethoscope, caused by turbulent blood flow

●Fatigue

●Shortness of breath, especially during exertion

●Chest pain

●Loss of consciousness (fainting)

●prominent and enlarged jugular vein

●bluish tint to the skin

●Heart palpitations

● Failure to thrive

● Difficult breathing

Causes

Pulmonary valve stenosis usually occurs when the pulmonary valve doesn't grow properly during fetal development. Babies who have the condition may have other congenital heart abnormalities, as well. It's not known what causes the valve to develop abnormally.

Other contributing conditions

Sometimes other medical conditions or having an artificial valve can cause the condition.

Carcinoid syndrome

A combination of signs and symptoms, including flushing of the skin and diarrhea results from the release of a chemical, serotonin, from growths called carcinoid tumors in the digestive system.

Rheumatic fever

This complication of an infection caused by streptococcus bacteria, such as strep throat, may injure the heart valves.

Diagnosis

The most common diagnostic test used to confirm pulmonary stenosis is an echocardiogram. Cardiac MRI, chest X-Ray, electrocardiogram is becoming more important.

Treatment

● prostaglandins to improve blood flow

● blood thinners to reduce clotting

● water pills to reduce excess fluid in the blood stream

● pills that prevent irregular heart rhythms

A surgical procedure known as a **valvuloplasty** can stretch the pulmonary valve's walls to improve blood flow. This treatment option involves inserting a catheter that has a balloon on the end that can inflate and stretch the heart's walls.

In severe cases, surgery may be required to replace the pulmonary valve. It may be replaced with either a mechanical valve or a biological valve made from cow or pig valves.

5.

Teratology of Fallot

Tetralogy of Fallot (TOF) is a type of heart defect present at birth.Tetralogy of Fallot (TOF) is a

cardiac anomaly that refers to a combination of four related heart defects that commonly occur together. The four defects are:

Ventricular septal defect (VSD): a hole between the right and left pumping chambers of the heart

Overriding aorta: the aortic valve is enlarged and appears to arise from both the left and right ventricles instead of the left ventricle as in normal hearts

Pulmonary stenosis: narrowing of the pulmonary valve and outflow tract or area below the valve that creates an obstruction (blockage) of blood flow from the right ventricle to the pulmonary artery

Right ventricular hypertrophy: thickening of the muscular walls of the right ventricle, which occurs because the right ventricle is pumping at high pressure

The pulmonary stenosis and right ventricular outflow tract obstruction seen with tetralogy of Fallot usually limits blood flow to the lungs. When blood flow to the lungs is restricted, the combination of the ventricular septal defect and overriding aorta allows oxygen-poor blood ("blue") returning to the right atrium and right ventricle to be pumped out the aorta to the body.

This "shunting" of oxygen-poor blood from the right ventricle to the body results in a reduction in the arterial oxygen saturation so that babies appear cyanotic, or blue. The cyanosis occurs because oxygen-poor blood is darker and has a blue color, so that the lips and skin appear blue.

The extent of cyanosis is dependent on the amount of narrowing of the pulmonary valve and right ventricular outflow tract. A narrower outflow tract from the right ventricle is more restrictive to blood flow to the lungs, which in turn lowers the arterial oxygen level since more oxygen-poor blood is shunted from the right ventricle to the aorta.

Treatment for Tetralogy of Fallot is surgical in nature. Timing of the surgical procedure and which treatment option is used is based on the individual condition of the patient.

Symptoms

* A bluish coloration of the skin caused by blood low in oxygen (cyanosis)
* Shortness of breath and rapid breathing, especially during feeding or exercise
* Loss of consciousness (fainting)
* Clubbing of fingers and toes — an abnormal, rounded shape of the nail bed
* Poor weight gain
* Tiring easily during play or exercise
* Irritability
* Prolonged crying
* A heart murmur

Diagnosis of tetralogy of Fallot

When a newborn with significant cyanosis is first seen, he or she is often placed in supplemental oxygen. The increased oxygen improves the child's oxygen levels in cases of lung disease, but breathing extra oxygen will have little effect on the oxygen levels of a child with tetralogy of Fallot.

Failure to respond to this "hyperoxia test" is often the first clue to suspect a cyanotic cardiac defect. Infants with tetralogy of Fallot can have normal oxygen levels if the pulmonary stenosis is mild (referred to as "pink" tetralogy of Fallot). In these children, the first clue to suggest a cardiac

defect is detection of a loud murmur when the infant is examined.

Once congenital heart disease is suspected, echocardiography can rapidly and accurately demonstrate the four related defects characteristic of tetralogy of Fallot.

Cardiac catheterization is occasionally required to evaluate the size and distribution of the pulmonary arteries and to clarify the branching patterns of the coronary arteries. Catheterization can also demonstrate whether patients have pulmonary blood flow supplied by an abnormal blood vessel from the aorta (aortopulmonary collateral).