Ana 202

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

The heart

The heart is a muscle as small as your fist it lays into the left of your breast bone or sternum. The purpose of the heart is to pump blood to the blood vessels, arteries and veins to all parts of the body.

The inside of the heart is divided into four chambers the top two are called the atrium; the atrium is the collector chamber for blood. The bottom two are called the ventricles they receive the blood from the atrium and pump it to the lungs and the body. The chambers are separated by valves which control the directions of blood flow they are four valves

1. The pulmonary valve
2. Tricuspate valve
3. Mitral valve
4. Atria valve

Circulation being at the right side of the heart where blood from the body comes to the right atrium this blood passes through the right ventricle where it is pumped to the lungs to receive oxygen it flows to the left ventricles and then to the left ventricles where it is pump to the aorta and to the rest of the body. On the right side of the heart the Tricuspate valve separates the right ventricle and the right aorta allowing blood to flow into the ventricles but not backwards into the aorta blood flows from the pulmonary valve to the to the lungs on the left side of the heart the mitral valve separates the left ventricle and left atrium blood flows from the left ventricle to the aorta through the aortic valves and to the rest of the body.

Arteries carry blood and oxygen and other nutrients throughout the body, veins take blood back to the heart which pumps into the lungs to be oxygenated the heart arteries coronary arteries provide oxygen and nutrient to the heart muscle the right coronary arteries supplies blood to the bottom and the back of the heart. The left coronary artery splits 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 throughout the heart to control its pumping the electrical signal starts in a sinoatrial node also known as the SA node which is located in the upper portion of the right atrium and it is known as the natural pace maker of the heart.

Electrical signal passes down to the lower chambers of the heart via the atrioventricular node also known as AV node which controls the signals so the atrium contracts before the ventricles in the ventricles pathways carry the signals throughout the muscle so that they contract at the same time pump blood to the lungs and throughout the body.

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

**Five common heart defects**

Some common congenital heart defects include:

* Ventricular septal defect
* Transposition of the great vessels
* Coarctation of aorta
* Tetralogy of Fallot
* Hypoplastic left heart syndrome.

**Ventricular septal defect**

Ventricular septal defect is the most common congenital heart defect in Victoria. The incidence is around one in every 344 births.   
  
The ventricles are the two lower pumping chambers of the heart. Ventricular septal defect means there is a hole in the wall between the ventricles. This hole lets oxygenated and deoxygenated blood mix.  
  
In a child with this condition, the heart has to work much harder than normal, and may enlarge. Symptoms include breathlessness, difficulty feeding, increased heart rate and failure to grow at the expected rate. Depending on the severity of the condition, the child may develop congestive heart failure and have an increased risk of developing pneumonia.

**Treatment**

Treatment for ventricular septal defect depends on the severity of the defect. If the hole is small, it may heal by itself with time, and no treatment – other than careful monitoring – is needed. Large defects, with symptoms in infancy, may require open-heart surgery. Closing the hole (usually with a ‘patch’) allows the blood to circulate normally, relieving strain on the heart. In some cases, generally in older children when the hole has not closed and is still causing strain on the heart, a catheter procedure may be possible and the defect closed with an implantable device.

**Transposition of the great vessels**

The incidence of transposition of the great vessels in Victoria is around one in every 2,000 births.  
  
Normally, blood from the heart’s right ventricle is taken to the lungs by the pulmonary artery. Blood from the left ventricle is taken to the body by the aorta (the main artery of the body).   
  
Transposition of the great vessels means this situation is reversed, with the pulmonary artery attached to the left ventricle and the aorta to the right. Oxygenated blood is pumped back to the lungs instead of around the body.   
  
This defect can be fatal in the early weeks of life if it is not treated. Some babies survive longer if there is a hole in the partition between the upper or lower chambers of the heart, allowing the blood to mix. The main symptom of transposition of the great vessels is cyanosis, the blue colouring to the skin caused by lack of oxygen.

**Treatment**

Treatment for transposition of the great vessels involves a procedure called balloon septostomy. This may need to be carried out to enlarge the small opening between the atria that is normally present at birth, so that more oxygenated blood can reach the body. Subsequent surgery will be organised, usually in the first two weeks of life, to reconnect the arteries normally.

**Coarctation of the aorta**

The incidence of Coarctation of the aorta in Victoria is around one in every 2,000 births. The aorta is the main artery of the body, and ‘Coarctation’ means it is narrowed or pinched, usually in the upper chest. This means that blood pressure in the lower body is lower than normal.   
  
This condition often leads to serious symptoms in the early weeks of life. Symptoms typically occur in the first week of life and include breathlessness and difficulty breathing, and may include collapse.  
  
Less commonly, this disorder may not be diagnosed in infancy and may be discovered much later in life during investigations for high blood pressure.

**Treatment**

Surgery will be needed to treat Coarctation of the aorta if the condition is severe and causes symptoms in early infancy. In older children, the narrowed section can sometimes be stretched open with special balloons or ‘stents’.

**Tetralogy of Fallot**

The incidence of Tetralogy of Fallot in Victoria is around one in every 2,000 births.   
When a child has Tetralogy of Fallot, their heart is affected by four main defects:

* A ventricular septal defect
* Blockage of blood flow out of the right ventricle
* Thickening of the wall of the right ventricle
* Displacement of the aorta towards the right ventricle.

These four defects allow oxygenated and deoxygenated blood to mix inside the heart. The main symptom is cyanosis (blue colouring) that develops in the early weeks or months of life.

**Treatment**

Treatment for Tetralogy of Fallot requires surgery to close the septal defect and remove obstruction to blood flow out of the right ventricle. Some infants with severe symptoms in early life may have a preliminary ‘shunt’ operation, which increases blood flow to the lungs and relieves cyanosis, but does not correct the underlying defect.

**Hypoplastic left heart syndrome**

The incidence of Hypoplastic left heart syndrome in Victoria is around one in every 4,000 births. In this condition, the entire left side of the heart, including valves and blood vessels, is underdeveloped. Without prompt treatment, the baby is likely to die within days or weeks of birth. Symptoms include a grey complexion and severe breathing difficulties.

**Treatment**

Hypoplastic left heart syndrome will require surgery. The techniques involved include a ‘Norwood’ operation, which allows the right ventricle to become the pumping chamber that supplies the body and lungs. The surgery is difficult and involves high risk. At least two further operations in early childhood will be needed to achieve normal heart function.