The Normal Heart

Heart is a muscular organ that pumps blood to all the parts of the body tirelessly throughout our lifetime. Heart pumps blood which is rich in oxygen and nutrients into the circulatory system. This circulatory system consists of blood vessels, such as arteries, veins, and capillaries which take blood that is pumped from heart into organs and receive blood from organs to heart. Heart consists of an electrical system which uses electrical signals to contract the heart's walls. When the walls contract, blood is pumped into the blood vessels. Coronary arteries supply blood to heart muscle itself.

What is inside of the heart?

Heart consists of four chambers or the rooms. The two upper chambers of the heart are called the atria and they receive and collect blood. The two lower chambers of the heart are called ventricles and these ventricles pump blood out of the heart to other parts of your body. An internal wall of tissue called septum divides the right and left sides of the heart. Blood flow in the heart is unidirectional that is blood flows from organs to right side upper chamber (atrium) to right sided lower chamber (ventricle), then to lungs to left side of the heart back to all the organs. This unidirectional flow is maintained by structures called valves.
For the heart to work well the blood must flow in only one direction and heart's valves make this possible.

Heartbeat:

The electrical system of the heart guides the pumping action of the heart resulting in a heartbeat. The pumping action is felt as a pulse if it is of adequate volume. Problems with heartbeat can result in abnormally fast or slow rhythms. Norma heart rate is between 60-100 beats per minute. Cause of abnormal rhythm can be aging, heart attacks, or primary disorders of the electrical system of the heart. Abnormal rhythm is felt as palpitations, racing of the heart or skipped beats, dizziness or blackout. If the abnormal rhythm is due to block in coronary arteries, then there is associated chest pain. Primary rhythm abnormalities are often due to a tendency which is inborn.

Electrical system of the heart

Electrical system of the heart, which is also called cardiac conduction system, is behind the contraction and relaxation by which heart pumps blood to all over the body. Electrocardiogram also known as ECG records this electrical event from the surface of the body. Heart's electrical system consists of mainly

1. Sinoatrial node or SA node, which is called pacemaker of the heart, the heartbeat originates and spreads all over the heart.

2. This goes to another structure called Atrioventricular node or AV node, which transmits the heartbeat from the upper chamber (atrium) to the lower chamber (ventricle).

3. From the AV node the heartbeat gets conducted to two wires called bundle branches and through this structure both the ventricles receive the heartbeat and both the ventricles contract and pump the blood.

The S-A node normally produces 60-100 electrical signals per minute — this is the heart rate, or pulse. With each pulse, signals from the S-A node follow a natural electrical pathway through the heart walls. The movement of the electrical signals causes the heart's chambers to contract and relax. In a healthy heart, the chambers contract and relax in a coordinated way, or in rhythm. When the heart beats in rhythm at a normal rate, it is called sinus rhythm.

The left ventricle contracts an instant before the right ventricle. This pushes blood through the pulmonary valve (for the right ventricle) to your lungs and through the aortic valve (for the left ventricle) to the rest of your body.

As the signal passes, the walls of the ventricles relax and await the next signal. This process continues over and over as the atria refill with blood and more electrical signals come from the SA node.

When working well, the conduction system automatically responds to the body's changing need for oxygen. When we climb stairs, carry heavy objects, or take a walk, we need more oxygen; therefore, the heart beats at a faster heart rate.When we are sitting or sleeping, we need less oxygen; therefore, the heart beats at a slower rate.