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Anatomy

The description of the heart

The human heart has four chambers: two upper chambers (the atria) and two lower ones (the ventricles), The right atrium and right ventricle together make up the "right heart," and the left atrium and left ventricle make up the "left heart." A wall of muscle called the septum separates the two sides of the heart.

A double-walled sac called the pericardium encases the heart, which serves to protect the heart and anchor it inside the chest. Between the outer layer, the parietal pericardium, and the inner layer, the serous pericardium, runs pericardial fluid, which lubricates the heart during contractions and movements of the lungs and diaphragm.

The heart's outer wall consists of three layers. The outermost wall layer, or epicardium, is the inner wall of the pericardium.  The middle layer, or myocardium, contains the muscle that contracts. The inner layer, or endocardium, is the lining that contacts the blood.

The tricuspid valve and the mitral valve make up the atrioventricular (AV) valves, which connect the atria and the ventricles. The pulmonary semi-lunar valve separates the right ventricle from the pulmonary artery, and the aortic valve separates the left ventricle from the aorta. The heartstrings, or chordae tendinae, anchor the valves to heart muscles.

The sinoatrial node produces the electrical pulses that drive heart contractions.

Functions of the heart

The heart circulates blood through two pathways: the pulmonary circuit and the systemic circuit.

In the pulmonary circuit, deoxygenated blood leaves the right ventricle of the heart via the pulmonary artery and travels to the lungs, then returns as oxygenated blood to the left atrium of the heart via the pulmonary vein.

In the systemic circuit, oxygenated blood leaves the body via the left ventricle to the aorta, and from there enters the arteries and capillaries where it supplies the body's tissues with oxygen. Deoxygenated blood returns via veins to the venae cavae, re-entering the heart's right atrium.

The heart’s blood-pumping cycle, called **cardiac cycle**, ensures that blood is distributed throughout the body. The oxygen distribution process begins when oxygen-free blood enters into the heart through the right atrium, goes into the right ventricle, enters the lungs for oxygen refill and release of carbon dioxide, and transfers into the left chambers, ready for redistribution. About 5.6 liters of blood circulate the body and three cardiac cycles are completed per minute.

The performance of the heart could now be easily monitored when any cardiovascular problem or disorder is suspected. For instance, a regularly abnormal heartbeat or beats per minute are characteristic of a heart-related illness. This is because a heartbeat is a manifestation of the oxygen-reloading process in the heart that is made up of two phases.

The **systole** is a short period that occurs when the tricuspid and mitral valves close; the **diastole** is a relatively longer period when the aortic and pulmonary valves close. The systole-diastole relationship is the reference in measuring blood pressure. Other ways of physically determining the regular functioning of the heart is through examining the pulse rate (beats per minute). A normal heart rate of an adult is at 72 beats per minute, while children normally yield higher heart rates.

Different congenital anomalies of the heart

## Hole in the Heart (Septal Defect)

This means you’re born with a hole in the wall, or septum, that separates the left and right sides of your heart. The hole lets [blood](http://www.webmd.com/a-to-z-guides/rm-quiz-blood-basics) from the two sides mix.

## Atrial Septal Defect (ASD)

An ASD is a hole in the wall between the upper chambers, or the right and left atria, of your heart. A hole here lets blood from the left atrium mix with blood in the right atrium.

Some ASDs close on their own. Your doctor may need to repair a medium or large ASD with open-heart surgery or another procedure.

He might seal the hole with a minimally invasive catheter procedure. He inserts a small tube, or catheter, in your blood vessel all the way to your heart. Then he can cover the hole with a variety of devices.

## Ventricular Septal Defect (VSD)

A [VSD](http://www.webmd.com/heart-disease/ventricular-septal-defects) is a hole in the part of your septum that separates your heart’s lower chambers, or ventricles. If you have a VSD, blood gets pumped back to your [lungs](http://www.webmd.com/lung/picture-of-the-lungs) instead of to your body.

A small VSD may also close on its own. But if yours is larger, you may need surgery to repair it.

## Complete Atrioventricular Canal Defect (CAVC)

This is the most serious septal defect. It’s when you have a hole in your heart that affects all four chambers.

**Stenosis.** When your valves become narrow or stiff, and won’t open or allow blood to pass easily.