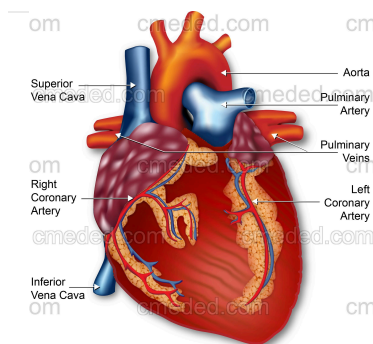
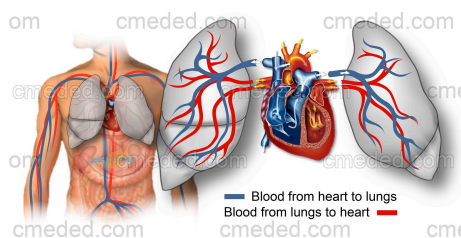
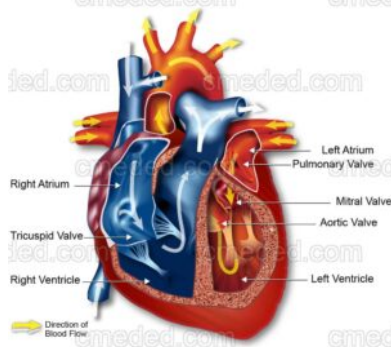


## Understanding Heart Conditions

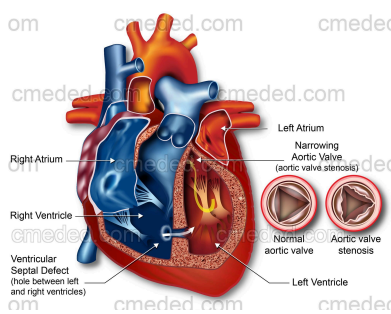


### The Heart

The heart is an organ that circulates blood and oxygen throughout the body. The heart beats about 60-100 times per minute when the body is at rest. Each time the heart beats, an electrical signal travels down the heart, signaling it to contract and pump blood. As blood travels through the heart, it passes through a series of chambers, valves, and vessels. Blood that is low in oxygen enters the right side of the heart and is pumped to the lungs to pick up oxygen. After the blood picks up oxygen from the lungs, it travels to the left side of the heart, which pumps the blood out of the heart through the aorta to deliver oxygen to the rest of the body. This cycle occurs every time the heart beats to ensure constant blood circulation and a constant supply of oxygen to the body's cells.



Abnormalities in the heart's structures and electrical system can cause heart conditions such as heart murmurs and cardiac arrhythmias. These conditions are sometimes harmless, but may be associated with life-threatening events in some instances.

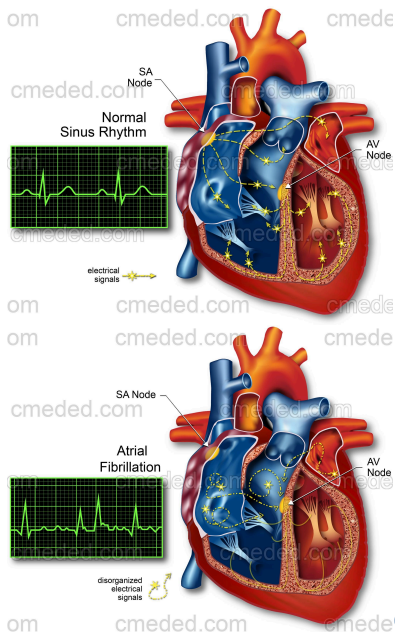


### Heart Murmur

A heart murmur is an **abnormal** "swooshing" sound heard during a heartbeat. Some heart murmurs are harmless ("innocent"), while others may cause serious medical problems. Innocent heart murmurs are normal sounds caused by blood flowing through the heart's blood vessels, chambers, and valves. Innocent heart murmurs are common in children and normally disappear after childhood. Harmful heart murmurs may be caused by a **congenital** or acquired heart defect such as a hole in the heart, a defective heart valve, a disease of the heart muscle, a narrowed heart vessel, or an **abnormal** heart chamber. With these defects, the blood flowing through the heart makes **abnormal** sounds as it flows backwards through a valve (regurgitation), flows through a hole in the wall of the heart (septal defect), or squeezes through a narrow artery or valve (stenosis).

### Cardiac Arrhythmia

A cardiac arrhythmia is an **abnormal** rate or rhythm of the heartbeat. Each time the heart beats, an electrical signal travels down the heart causing it to contract and pump blood. Problems with these electrical signals can cause a cardiac arrhythmia. These **abnormal** signals can cause the heart to beat too fast, too slow, or irregularly. Some arrhythmias are harmless,

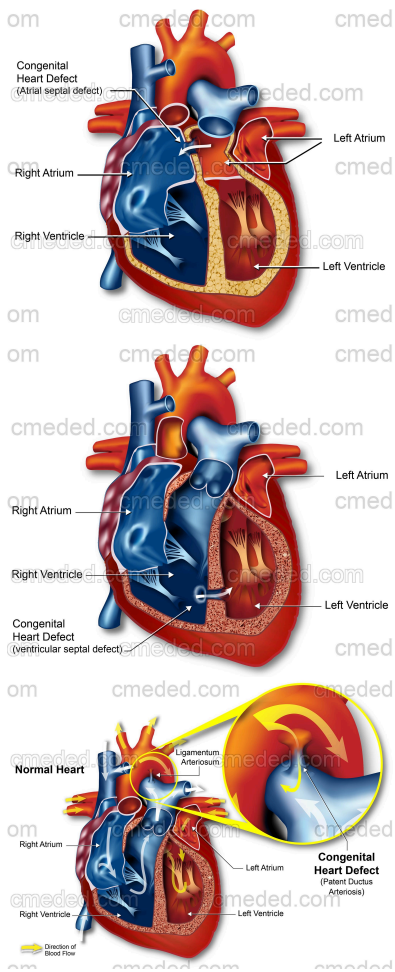


but others may be life-threatening if the heart is unable to pump enough blood to the body. Some common cardiac arrhythmias include:

- > **Tachycardia:** A tachycardia is an abnormally fast/rapid heartbeat.
- > **Bradycardia:** A bradycardia is an abnormally slow heartbeat.
- > **Atrial fibrillation:** Atrial fibrillation is a more serious type of arrhythmia in which **abnormal** electrical signals cause a very rapid and irregular heartbeat. In this condition, multiple electrical signals may occur in different parts of the atria (upper heart chambers) at the same time, and travel through the heart in a disorganized and chaotic way. This can cause the heart to quiver and contract rapidly, rather than contracting fully and pumping blood properly.
- > **Ventricular fibrillation:** Ventricular fibrillation is a condition in which multiple electrical signals may occur in the ventricles (lower heart chambers) in rapid succession and travel in a disorganized, chaotic way. This can cause the heart to quiver and contract rapidly, rather than contracting fully and it can't efficiently pump blood to the body. This is the most severe type of arrhythmia and can cause sudden cardiac arrest.

## Congenital Heart Defects

**Congenital** heart defects are abnormalities in the structure of the heart that are present at birth. **Congenital** heart defects may include a hole in a wall of the heart, a defective heart valve, or an **abnormal** blood vessel. Some defects are relatively harmless and require little treatment, while others may be life-threatening and may seriously disrupt the normal flow of blood through the heart. Some common **congenital** heart defects include:

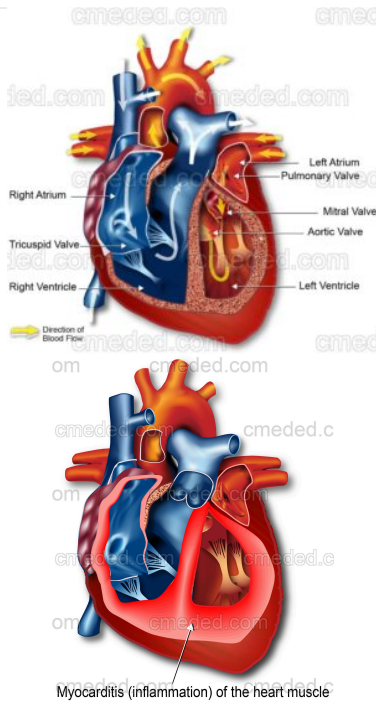


- > **Atrial septal defect:** An atrial septal defect is a hole in the wall (septum) that separates the left and right atria (upper heart chambers). This defect can cause **abnormal** flow of oxygen-rich blood from the left atrium to the right atrium, rather than the normal flow from left atrium to left **ventricle**. This oxygen-rich blood is then pumped back to the lungs, putting added strain on the heart.
- > **Ventricular septal defect:** A ventricular septal defect is a hole in the wall that separates the left and right ventricles (lower heart chambers). This defect can cause **abnormal** blood flow from the left **ventricle** to the right **ventricle**, which can cause oxygen-rich blood to mix with oxygen-depleted blood in the right **ventricle**. This can cause extra blood to be pumped to the lungs and can put added strain on the heart.
- > **Patent ductus arteriosus (PDA):** The ductus arteriosus is a blood vessel that connects the aorta and pulmonary artery before birth. This artery allows blood to pass around the lungs before the baby is born and starts breathing on its own. When the baby is born, this blood vessel normally disappears and the hole closes on its own. If the ductus arteriosus does not close, it can lead to an **abnormal** blood flow between the aorta and pulmonary artery, which allows oxygen-rich blood to flow back into the lungs, instead of to the rest of the body. This condition is a **congenital** heart defect known as patent ductus arteriosus (PDA). PDA can put extra strain on the heart and eventually lead to congestive heart failure and pulmonary hypertension, which is an increase in blood pressure in the lungs.

## Acquired Heart Defects

Acquired heart diseases are heart problems that develop as a result of illness or injury. Some common acquired heart defects include:

- › **Rheumatic heart disease:** Rheumatic heart disease is caused by rheumatic fever, which is caused by the streptococcal bacteria. This disease can cause scarring on the valves of the heart. Rheumatic fever most commonly affects children between the ages of 5 and 15.
- › **Kawasaki disease:** Kawasaki disease is a disease that causes **inflammation** of the blood vessels. This disease can damage the coronary arteries, causing aneurysms and other complications. Kawasaki disease is most common in children under the age of 5.
- › **Myocarditis:** Myocarditis is a condition that causes **inflammation** of the heart muscle (myocardium). Myocarditis can weaken the heart muscle and prevent it from effectively pumping blood throughout the body. This condition may be caused by viral infection, autoimmune disease, injury, or stimulant drug use (i.e. Ritalin, amphetamines, etc.).
- › **Cardiomyopathy:** Cardiomyopathy is a disease of the heart muscle. Heart muscle may become thickened and hardened, reducing ability to pump blood effectively. Cardiomyopathy may be caused by genetics and **inherited** from parents, or it may develop as a result of other conditions such as high blood pressure, heart attack, coronary artery disease, or stimulant drug use.



## Hypertension (high blood pressure)

Hypertension is when an individual has an abnormally high blood pressure; higher than 140 over 90 mmHg (millimeters of mercury). Blood pressure is determined by the amount of resistance to blood flow by the arteries. If the resistance is high, the blood pressure will increase eventually resulting in Hypertension, which can affect all structures of the heart. While Hypertension itself does not cause symptoms, possible complications of long-term narrowing of blood vessels are:

- › **Coronary Artery Disease:** Coronary artery disease causes arteries to narrow which prevents blood to flow freely. When the blood is restricted, this can cause arrhythmias, chest pain, or a heart attack.
- › **Cardiomegaly:** Cardiomegaly is more commonly known as Enlarged Heart. Hypertension and other conditions could cause the thickening of the heart muscle or dilation of a heart chamber which results in a larger heart. An enlarged heart may be temporary or permanent; usually an enlarged heart can be treated by correcting the cause but the patient should refer to physician for recommended treatment.
- › **Heart failure:** Too much strain on your heart causes your heart muscle to weaken and become less efficient. Continual strain increases the likelihood for heart failure.

Solutions to lowering blood pressure include: losing weight, eating less salt, taking medicine, being active, and continual blood pressure testing.

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