

# Heart Murmurs

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## What Is a Heart Murmur?

A heart murmur is an extra or unusual sound heard during your heartbeat. Murmurs range from very faint to very loud and sometimes sound like a whooshing or swishing noise. Normal heartbeat sounds--"lub-DUPP" or "lub-DUB"--are the sounds of valves closing as blood moves through the heart. (Go to the section on "How the Heart Works" for more information about how the normal heart works.)

A heart murmur is not a disease; it is a sound that the doctor hears with the stethoscope. It may be normal for your child, or it could be a sign that something may be wrong. Most heart murmurs are harmless. Some are a sign of a heart problem, especially if other signs or symptoms of a heart problem are present.

## Types of Murmurs

**Innocent (harmless) murmurs.** A person with an innocent murmur has a normal heart and usually has no other symptoms or signs of a heart problem. Innocent murmurs are common in healthy children.

**Abnormal murmurs.** A person with an abnormal murmur usually has other signs or symptoms of a heart problem. Most abnormal murmurs in children are due to congenital heart disease--heart defects present at birth. In adults, abnormal murmurs are most often due to heart valve problems caused by infection, disease, or aging.

## Other Names for Heart Murmurs

### Innocent heart murmurs

- Normal heart murmurs
- Benign heart murmurs
- Functional heart murmurs
- Physiologic heart murmurs
- Still's murmur
- Flow murmur

### Abnormal heart murmurs

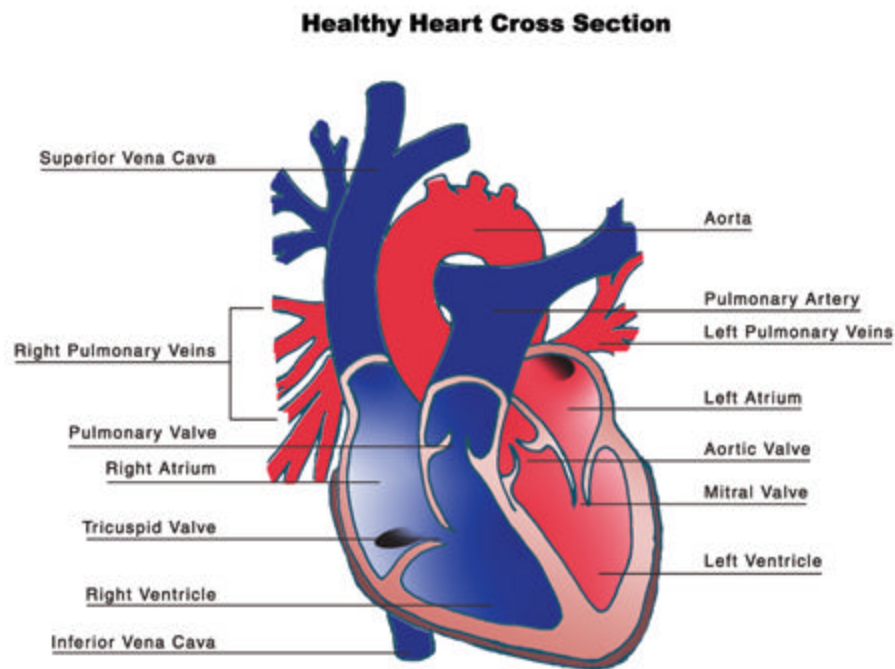
- Pathologic heart murmurs

## How the Heart Works

The heart is a muscle about the size of your fist. It works like a pump and beats about 100,000 times a day.

The heart has 2 sides, separated by an inner wall called the septum. The right side of the heart pumps blood to the lungs to pick up oxygen. Then, oxygen-rich blood returns from the lungs to the left side of the heart, and the left side pumps it to the body.

The heart has 4 chambers and 4 valves, and is connected to various blood vessels. Veins are the blood vessels that carry blood from the body to the heart, while arteries are the vessels that carry blood away from the heart to the body.



## Heart Chambers

The heart has 4 chambers or "rooms,"--2 on the left side of the heart and 2 on the right.

- The **atria** (AY-tree-uh) are the two upper chambers that collect blood as it comes into the heart.
- The **ventricles** (VEN-trih-kuls) are the two lower chambers that pump blood out of the heart to the lungs or other parts of the body.

## Heart Valves

Four valves control the flow of blood from the atria to the ventricles and from the ventricles into the two large arteries connected to the heart.

The four valves are:

- The **tricuspid** (tri-CUSS-pid) valve in the right side of the heart, between the right atrium and the right ventricle
- The **pulmonary** (PULL-mun-ary) valve in the right side of the heart, between the right ventricle and the entrance to the pulmonary artery that carries blood to the lungs

- The **mitral** (MI-trul) valve in the left side of the heart, between the left atrium and the left ventricle
- The **aortic** (ay-OR-tik) valve in the left side of the heart, between the left ventricle and the entrance to the aorta, the artery that carries blood to the body.

Valves are like doors that open and close. They open to allow blood to flow through to the next chamber or to one of the arteries, and then they shut to keep blood from flowing backwards.

When your heart valves open and close, they make the familiar "lub-DUB" or "lub-DUPP" sounds that your doctor can hear using a stethoscope.

- The first sound is made by the tricuspid and mitral valves closing at the beginning of systole (SIS-toe-lee). Systole is when the heart contracts, or squeezes, and pumps blood out of the heart.
- The second sound is made by the aortic and pulmonary valves closing at beginning of diastole (di-AS-toe-lee). Diastole is when the heart relaxes and fills with blood.

## Arteries

The arteries are the major blood vessels connected to your heart.

- The **pulmonary artery** carries blood pumped from the right side of the heart to the lungs to pick up a fresh supply of oxygen.
- The **aorta** is the main artery that carries oxygen-rich blood pumped from the left side of the heart out to the body.
- The coronary arteries are the other important arteries attached to the heart. They carry oxygen-rich blood from the aorta to the heart muscle, which must have its own blood supply to function.

## Veins

The veins are also major blood vessels connected to your heart.

- The **pulmonary veins** carry oxygen-rich blood from the lungs to the left side of the heart so it can be pumped out to the body.
- The **vena cava** is a large vein that carries oxygen-poor blood from the body back to the heart.

## What Causes Heart Murmurs?

### Innocent Heart Murmurs

Innocent murmurs are heard when blood moves noisily through a normal heart. Sometimes these murmurs occur when:

- Blood is flowing faster than usual through the heart and blood vessels attached to the heart
- There is an increased amount of blood flowing through the heart.

Illnesses or conditions that can cause blood to flow faster than usual through the heart include:

- Fever
- Anemia
- Too much thyroid hormone in the body (hyperthyroidism).

Many, if not most, children will have a heart murmur heard by their doctor at some time in their lives. After childhood, the most common cause of an increased amount of blood flowing through the heart is pregnancy. Most murmurs found in pregnant women are innocent. They are due to the extra blood women's bodies make while they are pregnant.

Innocent murmurs are sometimes due to changes to the heart resulting from **heart surgery** or from **aging**.

## Abnormal Heart Murmurs

The most common cause of abnormal murmurs is congenital heart disease. Congenital heart disease occurs when the heart, heart valves, or blood vessels attached to the heart do not develop normally before a baby is born. Some babies are born with a combination of heart defects. Common defects that cause murmurs include:

- **Congenital septal defects**, which are holes in the wall (septum) that separates the right and left sides of the heart. They account for more than half of abnormal murmurs in children.
- **Congenital valve defects**, which include narrow valves that do not allow enough blood to flow through them and leaking valves that do not close properly.

Infections and other conditions that damage heart valves or other structures of the heart also may cause murmurs. These include:

- Rheumatic fever, a serious illness that can develop after a person has an untreated or incompletely treated infection caused by the bacteria that cause "strep" throat or scarlet fever. Rheumatic fever can lead to permanent damage to the heart. If your doctor diagnoses strep throat, be sure your child takes all of the antibiotics prescribed, even if he or she feels better before the antibiotics run out.
- Endocarditis, an inflammation of the inner lining of the heart and valves that is usually caused by a bacterial infection. Endocarditis is a serious disease that can lead to permanent heart damage and other complications. Endocarditis usually occurs in an abnormal heart.
- Calcification (hardening and thickening) of valves as a result of aging. The hardened and thickened heart valves do not work as they should.

## What Are the Signs and Symptoms of Heart Murmurs?

Most people with a heart murmur do not have any other signs and symptoms of a heart problem. The murmur is usually innocent (harmless).

Some people with a heart murmur also have signs and symptoms of a heart problem. The signs and symptoms may include:

- Blue coloring of the skin, especially on the fingertips and inside the mouth
- Poor eating and failure to grow normally (in infants)

- Fast breathing
- Excessive sweating
- Chest pain
- Dizziness
- Shortness of breath
- Fainting
- Fatigue (feeling very tired).

The signs and symptoms depend on the cause and the severity of the problem causing the murmur.

## How Are Heart Murmurs Diagnosed?

Doctors use a stethoscope (STETH-uh-sko-pe) to listen to heart sounds and hear murmurs. They often notice innocent heart murmurs during routine checkups or physical exams.

Doctors may also find abnormal murmurs during routine checkups. Murmurs caused by congenital heart disease are often heard at birth or during infancy. Doctors may hear murmurs caused by other heart problems at any age.

Doctors usually refer people with abnormal murmurs to a heart specialist (a pediatric cardiologist or a cardiologist) for further evaluation and testing.

## Physical Examination

Doctors listen carefully to the heart with a stethoscope to help decide if a murmur is innocent or abnormal. They listen to the loudness, location, and timing of the murmur in order to classify and describe the sound. This helps the doctor begin to diagnose the cause of the murmur.

The doctor also:

- Takes a medical and family history
- Does a complete physical exam, looking for signs of illness or physical problems (such as blue coloring of the skin, delayed growth, and feeding problems in an infant)
- Asks about symptoms such as chest pain, shortness of breath (especially with exercise), dizziness, or fainting.

## Evaluation of Murmurs

When evaluating a heart murmur, the doctor pays attention to a number of things, including:

- How faint or loud the sound is. The doctor grades the murmur on a 1-6 scale (1 is very faint and 6 is very loud).
- When the sound occurs in the cycle of the heartbeat.
- Exactly where the sound is heard in the chest and if it can also be heard in the neck or back.

- Whether the sound has a high, medium, or low pitch.
- How long the sound lasts.
- How breathing, exercise, or change of body position affects the sound.

## Classification of the Murmur

Doctors classify murmurs as:

- **Systolic**--heard when the heart is squeezing and pumping blood out of the heart.
- **Diastolic**--heard when the heart is relaxing and filling with blood. Diastolic murmurs are often a sign of a heart defect or heart disease and should be further evaluated.
- **Continuous**--heard during the entire heartbeat. These are often a sign of a heart defect or heart disease and should be further evaluated.

## Tests

When doctors hear a murmur that might be abnormal, they order tests such as:

- Chest x-ray. A chest x-ray takes a picture of your heart and lungs. It can show if the heart is enlarged and can show some problems of the heart and lungs.
- Electrocardiogram (ECG). This test is used to measure the rate and regularity of your heartbeat. The ECG can help rule out a variety of heart problems.

A heart specialist--a pediatric cardiologist or a cardiologist--will most likely do the followup testing. These tests might include:

- Echocardiogram, a test that uses ultrasound (sound waves) to allow doctors to view your heart as it pumps and relaxes. The echocardiogram is more detailed than an x-ray image and shows the structure and function of the heart. In some cases, transesophageal (tranz-ih-sof-uh-JEE-ul) echocardiography (TEE) might be needed to get a better view of the heart. In TEE, the doctor inserts an ultrasound probe down the throat into the esophagus after the patient is sedated.
- Cardiac catheterization and angiography. Cardiac catheterization is a procedure in which a catheter, a thin flexible tube, is passed through an artery or vein at the top of your leg (groin) or in your arm to reach the heart, after you are sedated. This allows measurement of pressure inside the heart and blood vessels. Angiography involves injecting a dye that can be seen using x-ray. This helps the doctor see the flow of blood through the heart and blood vessels.

## How are Heart Murmurs Treated?

### Innocent Murmurs

Healthy children with innocent murmurs do not need treatment because they have a normal heart. If your child has an innocent murmur, alert your pediatrician during regular checkups. Pregnant women with innocent murmurs due to increased blood volume also do not need treatment.

If you have an innocent murmur due to an illness or condition such as anemia, hyperthyroidism, or fever, the murmur will go away once the illness or condition is treated.

### Abnormal Murmurs

The treatment for heart problems that cause abnormal murmurs varies depending on the specific heart problem.

The treatment of congenital heart disease is based on the type and severity of the heart defect or defects causing the murmur. Treatment may include medications or surgery. Children with congenital heart disease are treated by doctors who specialize in treating children's heart problems (pediatric cardiologists). See [Congenital Heart Disease](#) for more information.

The treatment of heart problems caused by infection or disease depends on the type and severity of the damage to the heart and may include medications or surgery.

### Summary

- A heart murmur is an extra or unusual sound heard during your heartbeat. Murmurs range from very faint to very loud and sometimes sound like a whooshing or swishing noise.
- Most heart murmurs are harmless (innocent).
- Sometimes a heart murmur indicates a heart problem, especially if other signs or symptoms of a heart problem are present.
- Innocent, harmless murmurs are common in healthy children. A child or adult with an innocent murmur has a normal heart.
- Doctors listen carefully to the heart with a stethoscope to help decide if a murmur is innocent or abnormal.
- Doctors listen to the loudness, location, and timing of the murmur in order to classify and describe the sound.
- Most abnormal murmurs in children are due to congenital heart disease—heart defects present at birth.
- In adults, abnormal murmurs are most often due to heart valve problems caused by infection, disease, or aging.

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