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Heart Murmurs in Dogs

What is a heart murmur?

A heart murmur is an abnormal heart sound, usually heard by listening to the heart with a stethoscope.

What causes a heart murmur?

A heart murmur is caused by turbulent blood flow within the heart. Sometimes a murmur is determined to be 'innocent' or 'physiologic', while other times the murmur is determined to be pathologic or caused by disease. Pathologic heart murmurs can be caused by a structural problem within the heart (i.e., cardiac disease), or can be due to a problem that is 'extracardiac' (i.e., not caused by heart disease).

Do all murmurs sound the same?

No. The loudness of a murmur reflects the amount of turbulence that is present in the heart. However, the loudness of a heart murmur does not always correlate directly with the severity of disease.

Murmurs are graded by their intensity, usually on a scale of I–VI. A Grade I murmur is very soft or quiet, may only be heard intermittently, and is usually only heard in one location on the chest, while a Grade VI murmur is very loud, heard everywhere that the heart can be heard, and can be felt when a person places their hand on the chest in the area of the heart (in cardiac terminology, this is called a 'thrill').

Murmurs are also characterized by the time in which they occur during the heart cycle, and by whether they are long or short. Most murmurs are also characterized by their location, or where they are the loudest.

The majority of murmurs in the dog occur during systole, the phase of the heart cycle when the heart is contracting to pump blood out.

The specific characteristics of the murmur, along with any symptoms that your dog might be showing, will help your veterinarian to determine what is causing the murmur.

What is an innocent or physiologic heart murmur?

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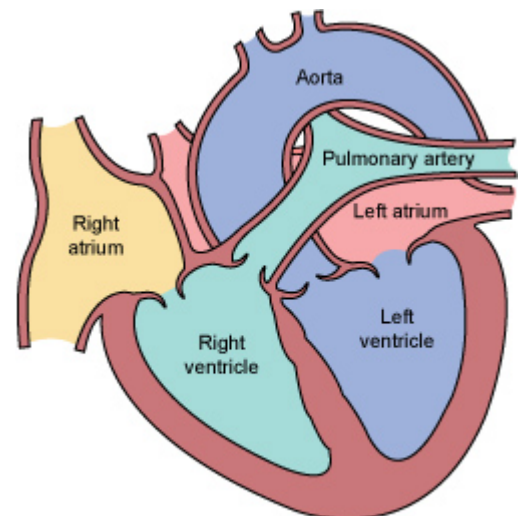
It is very common for young puppies, especially large breed puppies, to develop an innocent heart murmur while they are growing rapidly. The murmur may first appear at 6–8 weeks of age, and a puppy with an innocent heart murmur will usually outgrow it by about 4–5 months of age. This type of murmur is benign.

In general, a physiologic or innocent heart murmur will have a low intensity (usually Grade I–II out of VI), and does not cause any symptoms or clinical signs.

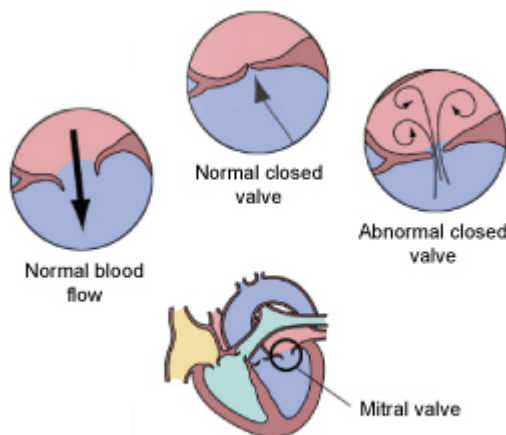
What structural heart problems cause a heart murmur?

The heart is composed of four chambers – the left atrium, the left ventricle, the right atrium, and the right ventricle. Blood flows from the right side of the heart through the pulmonary artery to the lungs where it is oxygenated, and then the oxygenated blood goes through the left side of the heart and into the aorta, where it is pumped to the rest of the body. Between each of the chambers and main blood vessels there is a valve that functions to prevent blood flowing back into the chamber as the heart pumps.

With structural heart disease, there is some sort of abnormal structure or defect that is disturbing the flow of blood, creating turbulence. The abnormality in the heart may be a leaky heart valve, a thickening or narrowing of a valve or large blood vessel, or an abnormal hole between the heart chambers or between two arteries that are not normally connected.



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Structural heart problems may be congenital (the dog is born with a defective heart) or acquired (a structural heart problem develops later in life). Some of the congenital heart diseases in dogs are hereditary in certain breeds of dogs, and include diseases such as 'sub-aortic stenosis', 'pulmonic stenosis', and 'patent ductus arteriosus'. Other congenital heart diseases are not as well documented as being hereditary, including 'ventricular septal defects', 'atrial septal defects' and 'Tetralogy of Fallot'. The most common cause of an acquired heart murmur in the dog is 'mitral insufficiency' (also called 'mitral regurgitation'), a condition in which the mitral valve becomes thickened and begins leaking (see our handout 'Mitral Valve Disease in Dogs') – mitral insufficiency tends to be more common in small breed dogs. Other causes of an acquired heart murmur in older dogs include bacterial endocarditis, caused by a bacterial infection that localizes on a heart valve and dilated cardiomyopathy (see our handouts 'Endocarditis in Dogs' and 'Dilated

Cardiomyopathy in Dogs').

What extracardiac problems cause a heart murmur?

Some extracardiac problems can cause what is called a 'functional heart murmur'. A functional heart murmur may be due to anemia (low levels of red blood cells), hypoproteinemia (low protein levels in the blood), fever or infection, or by conditions such as pregnancy, obesity or emaciation. With anemia or hypoproteinemia, the blood is too 'watery' so turbulence is created as it flows through the valves.

With young puppies, anemia and/or hypoproteinemia can be caused by a heavy infestation of parasites such as intestinal worms, blood parasites, fleas or ticks. Adult dogs may become anemic because of blood loss or may have a serious underlying disorder.

How is a heart murmur detected?

In most cases, a heart murmur is detected when your veterinarian auscultates or examines your dog's heart with a stethoscope.

How do we find out if a murmur is due to a significant problem?

Most murmurs are detected with a stethoscope during a routine veterinary examination. If your veterinarian detects a heart murmur, you will be asked a series of questions about your dog's health and then your veterinarian will assess your dog's general physical condition to determine whether or not there are any symptoms or clinical signs that indicate the need for further diagnostic testing.

If your pet is still a young puppy and the murmur is of low intensity, your veterinarian may recommend a re-examination in a few weeks time to track whether the murmur has decreased in intensity or disappeared, indicating that it was likely an innocent murmur. Similarly, if your adult dog appears to be extremely stressed at the time of a routine health examination and the murmur is of low intensity, your veterinarian may recommend a re-evaluation at a later time when the dog is calmer. In some cases, if a dog is extremely excited or is panting heavily, it can be difficult to determine if abnormal sounds are being caused by a heart murmur or are just related to the elevated heart rate or panting.

A dog with a heart murmur that is caused by a structural heart disease or an extracardiac problem will generally have some sort of symptoms or clinical signs that can be attributed to the disease. The most common symptoms that are observed with a dog that has a clinically significant heart murmur are poor appetite, weight loss (or stunted growth in a kitten), breathing problems, often occurring in the middle of the night or after the dog has been lying down for a period of time, poor exercise tolerance, collapse or fainting spells, pale gums, and/or coughing. During a physical examination, if your veterinarian detects an abnormal rhythm to the heartbeat, or finds that your dog has weak pulses or irregular pulses, it will be more likely that the murmur is caused by an underlying problem. If your veterinarian determines or suspects that the heart murmur is caused by structural heart disease or an extracardiac problem, further diagnostic testing will be recommended. In the majority of these cases, further diagnostic testing should be performed immediately so that any treatment can be started as soon as possible.

What other tests may be recommended?

Depending on what other clinical signs are present in your dog, your veterinarian will usually recommend x-rays, an electrocardiogram, or an ultrasound examination of the heart (called an echocardiogram). If your veterinarian suspects that the heart murmur is secondary to another disease, blood tests or other extensive tests might be recommended.

An echocardiogram that includes a Doppler examination is the most useful test to determine the location of a heart murmur. With an echocardiogram, the heart is imaged while it is beating, allowing the examiner to evaluate the heart's size and movement. A Doppler examination is a specialized type of echocardiogram in which the speed and direction of blood flow can be measured across the heart valves and in the heart chambers. The Doppler examination will usually pinpoint the location of the turbulence that is causing the murmur.



How is a heart murmur treated?

Heart murmurs are simply abnormal heart sounds caused by turbulent blood flow, and treatment depends upon the underlying cause of the heart murmur or the turbulent blood flow.

Physiologic heart murmurs do not require any treatment; however, regular monitoring of a dog that has evidence of a physiologic murmur is advised to ensure that no other problems develop.

If the heart murmur is caused by an underlying problem, the treatment plan will be based on the diagnosis, and may include a combination of specialized diets, medications and supportive care. Some congenital heart defects can be surgically corrected – these include pulmonic stenosis and patent ductus arteriosus. Your veterinarian will be the best person to advise you on the appropriate course of action to meet your dog's unique needs.

What is the prognosis?

"The prognosis ranges from excellent to grave, depending on the cause of the murmur."

The prognosis ranges from excellent to grave, depending on the cause of the murmur. If the murmur is physiologic, no treatment is required and the prognosis is generally good to excellent. If the murmur is caused by extracardiac disease or a functional problem that can be treated, the murmur may resolve over time. The long-term prognosis for a dog with a murmur caused by congenital heart disease is extremely variable, depending on the specific type of defect that is present; if the defect can be surgically corrected the prognosis is very good. A dog with mitral insufficiency can usually be managed with long-term medications. The prognosis for a dog with dilated cardiomyopathy varies – if the dog is showing symptoms of heart failure the prognosis will be grave. The prognosis for a dog with bacterial endocarditis will vary with the severity of the infection and the valve that is affected. The need for good dental care, including regular professional dental cleaning under general anesthesia cannot be overemphasized as a means of preventing endocarditis (see our handout "Dental Disease in Dogs").

Since each case is different, your veterinarian will discuss the prognosis and treatment options for your dog, based on the results of diagnostic testing. In all cases, ongoing monitoring and periodic diagnostic testing will be necessary to track the progress of the condition.

This client information sheet is based on material written by: Cheryl Yuill, DVM, MSc, CVH

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