



Prince George Veterinary Hospital
3827 18th Avenue
Prince George, BC
V2N 1B1
250-563-1541
Fax 250-563-1715
Email: info@princegeorgevet.ca
www.princegeorgevet.ca



HEART MURMURS

How does the heart function?

The heart consists of a left side and a right side. Both sides consist of an atrium and a ventricle. The left atrium fills up with oxygenated blood coming from the lungs. From the left atrium the blood is transported to the left ventricle. When the left ventricle contracts, blood is brought into the main circulation via the aorta and oxygenated blood perfuses the muscles, organs and brain. Here oxygen is used and poorly oxygenized blood is transported into the right atrium. From the right atrium the blood goes to the right ventricle. Then the right ventricle contracts and blood is distributed into the lungs via the main pulmonary artery. In the lungs blood will be filled up with oxygen again. In between the atria and the ventricles, the left ventricle and the aorta, and the right ventricle and the main pulmonary artery, there are valves that regulate the blood flow during different phases of the motion cycle of the heart.

What is a heart murmur?

An abnormal sound that the veterinarian notices while listening to your pet's heart with a stethoscope.

What causes a heart murmur?

In young animals a heart murmur can sometimes be considered normal and of no clinical importance. This mainly is the case with mild murmurs that tend to be caused by the different viscosity of a young animal's blood in comparison to an adult animal's blood. If this is suspected, in most cases your veterinarian will suggest to re-evaluate the heart at a later time.

In older animals a heart murmur is typically caused by conditions affecting the heart itself. These conditions can for instance be:

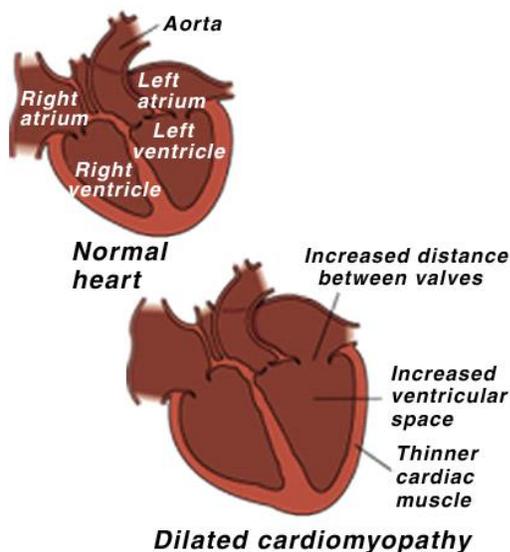
- Valves that are leaking. This condition is most common in older, small breed dogs. It can also be a birth defect in younger animals.
- A too thin heart muscle that is not able to contract effectively (dilated cardiomyopathy). This is more common in large breed dogs.
- A too thick heart muscle that leads to a heart that cannot fill up adequately with blood (hypertrophic cardiomyopathy). This is most common in older cats.
- Hyperthyroidism (the thyroid gland producing too much hormone) is often the cause of hypertrophic cardiomyopathy in older cats.
- An abnormal hole between compartments of the heart or the aorta and the main pulmonary artery are potential causes of a loud murmur in young animals.

Does a heart murmur mean my pet is sick?

A heart murmur means there is a disruption in the blood flow within the heart. In some cases this only is a very minor disruption. In some cases this disruption is more severe, but for instance by contracting more forcefully or more frequently the heart manages to deal with the problem and keep an adequate blood flow going. If the problem is more severe an animal can go into heart failure.

Heart failure is the inability of the heart to maintain sufficient blood circulation to meet the body's needs. Heart failure usually describes a failure of the heart muscle (myocardial failure) or heart's valve (mitral valve insufficiency most commonly). The most common clinical sign of congestive heart failure is coughing (more common in dogs) or difficulty breathing (often the most prominent in cats). This can be due to the accumulation of fluid in the lungs called *pulmonary edema*, or an accumulation of fluid in the chest, *pleural effusion*.

Additionally, many dogs with CHF will tire more easily, have reduced stamina and not engage in playing or walking as they once did. If any of these signs develop in a pet with a heart murmur, notify your veterinarian immediately.



My dog ran across the yard and suddenly dropped dead or my cat just was eating and dropped dead. The veterinarian said it was due to acute heart failure. What does this mean?

Sudden cardiac arrest can occur for a variety of reasons. Cardiomyopathy is the leading cause of acute heart failure in dogs and especially cats.

Is this the same as a heart attack?

In humans a "heart attack" usually refers to myocardial infarction (MI). This is death of the cells in an area of the heart muscle (myocardium). This is usually due to oxygen deprivation caused by obstruction of the coronary blood vessels. MI is not a common disease of dogs, but it can occur.

How can I know to what degree my pet's heart is affected?

The first assessment is the physical examination. In some cases besides the murmur additional symptoms can be noticed that indicate a more severe condition, but in a lot of cases further diagnostics are necessary. These generally don't require sedation and include but are not limited to:

- X-rays of the chest. On chest X-rays the size of the heart and the condition of the lungs can be assessed. Unfortunately chest X-rays do not tell us a lot about the condition of the heart muscle or the valves themselves. Chest X-rays can also function as a baseline to assess progression of a heart condition.
- An ultrasound of the heart. With ultrasound the actual movement of the heart muscle, the blood and the valves in the heart can be assessed. In cats ultrasound is more useful than radiographs when assessing the condition of the heart if there are no symptoms yet.
- A pro-BNP blood test measures if there is any evidence of excessive stretch to the heart tissue. This test is fairly accurate (but like any other test not 100%) in predicting if there is significant heart disease.
- An ECG tells us more about the rhythm of the heart.
- Blood pressure testing gives us information that might be necessary to determine the best course of action treatment wise.
- Blood tests can reveal potential underlying causes (like hyperthyroidism in cats).

Is treatment necessary?

Treatment depends on whether symptoms exist or not and what the tests mentioned above show. In pets that have symptoms, treatment almost always is necessary. In some cases medication can prevent rapid worsening of an initially mild condition.

What does treatment usually involve?

Today we have a wide selection of drugs that effectively aid the heart in its function. These include diuretics to remove fluid from the lungs and medications that act directly on the heart muscle, improving contraction and regulating rhythm. In addition, special drugs are used which dilate the arteries, sometimes also the veins, thus reducing load on the heart and reducing blood pressure. In cats that have a buildup of fluid in the chest this fluid needs to be drained ('thoracocentesis').

Is this treatment costly and is it long term?

Most animals will require treatment for the rest of their lives. Treatment is tailored according to each patient's needs and many of the drugs are relatively inexpensive and effective.

As a result of all the treatment, how much longer will my pet live?

This question is difficult to answer. It depends on the severity of the condition and the initial response to treatment. Many pets, once stabilized, will live for months to years with little reduction in quality of life. In general cats that already have a fluid buildup in their chest tend to do less well.

What can I do to monitor my pet's heart condition if there are no symptoms yet?

At home you can count the respiratory rate while your pet is asleep once a week. You count the number of times your pet breaths in (evidenced by the chest moving up) during one minute. The respiratory rate of a sleeping dog or cat should be at or below 30 breaths per minute. If the respiratory rate is over 30 breaths per minute OR there is a significant increase compared to what the respiratory rate of your pet usually is this can be an early indication of heart failure. Check the respiratory rate another time later during the day and if it is still higher than 30 or significantly higher than normal you should take your dog or cat to your veterinarian. This also is the case if other symptoms potentially related to the heart develop (for instance troubled/labored breathing, coughing, fainting or tiring out excessively easily).