

Heart Disease in Cats

**Briefly, how does the heart work?**

The heart has four chambers. The upper chambers are called atria (singular: atrium) and the lower chambers are called ventricles. In addition to the upper and lower chambers, the heart is also considered to have a right and left side.

Blood flows from the body into the right atrium. It is stored there briefly before it is pumped into the right ventricle. The right ventricle pumps blood into the lungs, where it receives oxygen. It then flows from the lungs into the left atrium and is held there before going into the left ventricle. The left ventricle contains the largest muscle of the heart, which pumps blood out to all other parts of the body.

**What is heart disease (cardiomyopathy)?**

Literally, the term "cardiomyopathy" means disease of the heart muscle. More specifically, cardiomyopathy, or CM, is a disease of the heart muscle in which either the heart walls thicken (hypertrophic and restrictive forms) or stretch (dilated form). In either form, the heart's function is significantly compromised and leads to an eventual state of heart failure.

**What causes cardiomyopathy?**

Hypertrophic cardiomyopathy (HCM) is the most common acquired heart disease in cats. HCM is a primary heart muscle disease in which the muscular walls of the ventricles become abnormally thickened (hypertrophied). Much like a similar disease in humans, HCM in cats is thought to be inherited. HCM is diagnosed once other secondary causes of left ventricular wall thickening, such as hyperthyroidism, systemic hypertension, aortic stenosis and others have been ruled out. Three other forms are recognized, but are not as common as HCM. In the case of dilated cardiomyopathy (DCM), the heart muscle weakens and the heart becomes large and contracts weakly. Restrictive cardiomyopathy (RCM) and unclassified cardiomyopathy (UCM) are lesser understood forms of heart disease. There are no specific known causes or treatments.

**What does a cat with cardiomyopathy look like?**

CM is a disease that can take several weeks, months or years to progress to a serious stage. During the early stages of the disease, the cat will probably look normal. Most often, the disease is recognized by the onset of a heart murmur, which can be recognized during a routine physical exam. These cats are often acting completely normal. This is the best time to diagnose and treat the disease.

Cats have a tendency to hide a serious illness until it reaches a crisis stage. Therefore, most cats that develop clinical signs of cardiomyopathy will appear to have been ill for only a few days. A few days of inactivity, hiding and poor appetite are common concerns that prompt an owner to bring the cat to a veterinarian. Just prior to the state of heart failure and death, the cat may become very inactive, cough and exhibit labored breathing. These occur due to insufficient oxygen to the body's tissues and a collection of fluid in or around the lungs.

**How is this disease diagnosed?**

Diagnosis of cardiomyopathy generally starts with a chest radiograph (X-ray). The heart will have an abnormal shape and fluid in or around the lungs may be detected. If a large amount of fluid is present around the lungs, it may be necessary to remove it and take more X-rays because the presence of this fluid interferes with evaluation of the heart.

In order to determine which form of cardiomyopathy your cat has, it will also be necessary to perform an echocardiogram, or ultrasound of the heart. This is a non-invasive method that uses sound waves to look at the heart while it is pumping. While X-rays can tell us about the size and shape of the heart, they unfortunately do not provide any information about heart function. An ultrasound can provide this information. The ultrasound will also allow measurement of the heart muscle to determine if it is too thick (HCM) or too thin (DCM). Finally, an electrocardiogram (EKG) is useful to evaluate the rhythm of the heart. All this information will help us determine which heart medication is best suited to treat the disease.

Determination of the level of thyroid hormone in the blood is often helpful in evaluating cats with hypertrophic CM. This simple blood test can help identify an overactive thyroid gland as the underlying cause of heart disease.

**What is involved with treatment?**

Currently, there is no cure for HCM. The changes occurring to the heart muscle are irreversible. However, if your pet's left ventricular hypertrophy is secondary to some other underlying heart disease, such as hyperthyroidism, treatment of the primary disease may result in some or complete resolution of the heart condition.

With medication, we aim to reduce the risk of heart failure and to help the heart function more efficiently. Drugs may be recommended that encourage relaxation of the heart muscle or slow down the heart rate to allow a longer time for the heart to fill or both. Drugs to treat congestive heart failure (diuretics and ACE inhibitors) are used in cats with heart failure secondary to any heart condition. When fluid builds up in the chest cavity, a veterinarian may physically remove the fluid with a catheter to help the cat breathe. Finally, drugs that are thought to reduce the risk of clot formation may be used.

As an owner of a cat with HCM, you should be very sensitive to changes in your pet's condition and should not hesitate to seek veterinary advice. Your veterinarian may show you how to monitor your cat's respiratory rate at home, as an increased rate may be a sign that congestive heart failure is developing or worsening. A cat that is having difficulty breathing or has loss of function of hind or front limbs requires veterinary care as soon as possible. In the acute setting, these problems may need specific treatments (oxygen therapy, injectable medication, anticoagulation medication or pain medication) that can only be offered by a veterinarian.

**Are there complications that may occur?**

As previously described, many cats with CM eventually develop signs of heart failure or produce blood clots within the heart. When these clots escape the heart , they travel through various arteries and eventually lodge in a narrow part of the vessel when the artery's diameter becomes too small (thromboembolism). The most common site for clots to lodge is the point at which the aorta splits before going into the rear legs. Thus, these cats often become paralyzed in the rear legs very suddenly and experience significant pain. In many cases, this paralysis and pain is the initial reason that medical treatment is sought. Some owners mistake this event for an uncomplicated lameness or even a broken leg. When these cats are examined, there are no pulses to one or both rear legs, the legs are cold and the footpads appear blue (cyanotic) due to the lack oxygen.

Although treatment to break down or remove the clot is available, death during administration of the drugs and the high recurrence rate of thromboembolism dissuades most owners from attempting this type of therapy. With supportive care, about 40 to 50 percent of patients with thromboembolic disease will break down clots on their own and regain limb function over time. However, despite the best medical efforts to prevent their recurrence, a cat that has survived a thromboembolic event has a significant risk of developing another over the following weeks to months. The prognosis for these cats is very guarded.

**What is the prognosis for cats with cardiomyopathy?**

The prognosis for CM is quite variable, depending on the form of the disease and the severity at the time of diagnosis. A cat with mild to moderate heart disease may enjoy an essentially normal life for a number of years. However, the prognosis is much more guarded once the cat has more severe disease. With HCM in particular, some cats may develop only mild hypertrophy and suffer little compromise of heart function, while others progress to more severe disease. HCM may worsen quickly over a period of months or it may progress slowly over several years. The severity may not change for many years and then suddenly worsen. Some cats with HCM die very suddenly even though they showed no clinical signs of heart disease. The only way to determine the progression of the disease is to monitor chest X-rays and perform follow-up ultrasounds as indicated.