



**Cardiomyopathy is a disease affecting the heart muscle. There are two main forms of the disease - hypertrophic cardiomyopathy (HCM) and dilated cardiomyopathy (DCM). HCM commonly affects middle-aged cats and is more common in male cats than females. Cardiomyopathy is commonly associated with signs of heart failure and abnormal heart rhythms.**

### **How does the heart work?**

The cat's heart, like that of humans, is a muscular pump with four separate chambers. The right side of the heart sends blood to the lungs where it picks up oxygen. The left side receives blood from the lungs and pumps it around the rest of the body.

### **What is cardiomyopathy?**

Cardiomyopathy literally means disease of the heart muscle (cardio = heart and myopathy = muscle disease). There are 2 basic forms of the disease (although lots of variations of these are also recognised).

The most common form of cardiomyopathy is HCM, in which the heart muscle becomes abnormally thick which prevents the heart from working properly and reduces the amount of blood flowing through it. Another form of cardiomyopathy is DCM that is caused by stretching of the heart muscle. This is often seen in cats whose diet contains insufficient amounts of a chemical called taurine. However, DCM is much less common now because pet food manufacturers add extra taurine to their cat foods.

### **What causes HCM?**

When any muscle has to work harder it becomes bigger (why else do we work out at the gym?) and the heart muscle is no exception. This expansion is called hypertrophy. Some relatively common diseases of cats force the heart muscle to work harder. Older cats with diseases of the thyroid gland or kidneys may develop HCM because of high blood pressure. The disease is much more common in some breeds, eg Persians, which suggests that it may be inherited in some cases. It is inherited in Maine Coons, and American shorthair cats. If there is an underlying cause the condition is called secondary HCM. However, HCM can also occur in otherwise healthy cats and where there is no apparent cause and this is termed idiopathic or primary HCM.

As the heart muscle becomes thicker the chambers within the heart get smaller and so can hold a smaller volume of blood. Although the heart contracts quite strongly it can only pump a small volume of blood into the circulation. The thickened heart muscle cannot relax properly and so between contractions the chambers do not expand and fill with blood. HCM usually affects the whole heart, but in some cases one part of the wall is affected more severely than the rest. The thickened heart muscle requires a lot of energy and oxygen but often its blood supply is poor. If the heart muscle is starved of oxygen some of the cells may die and form a small scarred area. This scar may cause irritation and the development of abnormal heartbeats.

### **What causes DCM?**

In this disease the heart muscle becomes stretched causing the heart to swell (like a balloon filled with water). DCM was once more common in cats and research showed that many cases were due to a dietary deficiency of taurine. Taurine is an essential amino acid only found in meat protein. Since this discovery cat foods have been supplemented with taurine and the disease has virtually disappeared in cats. In DCM the contractions of the heart muscle become very weak so blood is not pumped around the body effectively.

### **What are the signs of heart disease?**

The truth is - you may not know your cat has heart problems until it is too late! Cats are usually good at concealing ill health and there may be no evidence of any problems until the condition is very advanced.

There are lots of signs that can be associated with heart disease. If the heart starts to fail fluid may build up in the lungs or in the chest making it difficult for your cat to breathe. Collapse and reluctance to exercise (poor blood supply to the brain and muscles) can be caused by the heart not working properly or fluid build up in the chest.



Often the first signs noticed by an owner do not appear to be related to heart disease, eg blindness or problems with the back legs.

Because of the abnormal blood flow within the heart the blood may start to clot within the heart chambers. Pieces of these clots may break off at any time and pass out into the circulation (emboli). These emboli are carried in the blood until they reach the smaller blood vessels where they become lodged, causing an obstruction - often in the blood vessels supplying the back legs (causing paralysis); or in the brain (causing neurological signs). Heart disease can be associated with increased blood pressure (hypertension) that may cause blood vessels to burst. If the blood vessels in the eye are affected your cat may go blind.

### How do vets diagnose cardiomyopathy?

A thorough examination of your cat will often be enough to tell your vet that it has heart disease. When listening with a stethoscope your vet might hear changes in the heart sounds (a 'heart murmur') or an abnormal heart rhythm. Your vet may be able to see other changes in your cat's appearance that suggest that heart disease is present. X-rays will usually be needed to see if the heart is enlarged or abnormally shaped. However, since most of the enlargement of the muscle walls occurs inside the heart in HCM, the external appearance of the heart shadow may not change much. Secondary changes associated with heart failure may also be present, eg fluid in the chest or belly.

The best way to diagnose cardiomyopathy is with ultrasound. Ultrasound scans allow your vet to measure the heart muscle to see if it is too thick or has become stretched. An electrocardiogram (ECG) records the electrical activity when the heart beats, and in cardiomyopathy the heart may have an abnormal or irregular beat which can be seen on the ECG.

Diagnosis of cardiomyopathy should be followed by investigation to search for underlying causes. If your cat has HCM its blood pressure should be measured (to detect hypertension) and routine screening tests performed. Thyroid hormone assays are essential to screen for an overactive thyroid gland.

### Can cardiomyopathy be treated?

If your vet is able to identify an underlying cause of the problem and this can be treated then your cat may make a full recovery. Cats with an overactive thyroid often have HCM but this will resolve if the thyroid problem is treated. If your cat had DCM caused by taurine deficiency then taurine supplements will allow the heart muscle to recover. In these cases your cat will need to be treated for heart disease initially but can eventually come off medication as the heart recovers. Sadly, in most cases, no underlying disease is discovered (or if it is there is no treatment). If the heart disease is recognised early enough long-term medication and other measures can slow the disease down but they will not stop it completely. It may help to change your cat's lifestyle to eliminate stress (although most cats lead pretty stress-free lives already).

Long-term treatment for heart failure includes controlling exercise and administering oral diuretics and ACE inhibitors to reduce fluid build up in the lungs. In HCM the heart rate is usually very fast and slowing the heart rate allows the heart muscle more time to relax and fill with blood (and reduces oxygen requirement). The drugs most often used to slow the heart are beta-blockers (propranolol or atenolol). Calcium channel blockers (diltiazem) are also sometimes used although the extent of their benefits has been questioned. In DCM the main problem is that the heart muscle is not contracting properly so drugs can be given to increase the strength of contractions. If abnormal heart rhythms are present drugs can be given to correct these.

There is much debate on the best way of preventing blood clots and emboli in cats with cardiomyopathy. Most vets treat all animals with cardiomyopathy with a low daily dose of aspirin. Aspirin reduces the risk of blood clots forming but if the clot is already present aspirin treatment will not do much to dissolve it. Cats do not tolerate human medications very well and often need much lower doses than you would expect. Never give medication to your cat unless specifically instructed to do so by your vet.

Kidney function, and other blood tests should be performed regularly in patients receiving treatment.

### How long will my cat live?

It is difficult to predict how long your cat will live if it has heart disease or how good its quality of life will be. A lot depends on how far the disease has progressed. On average it is likely that your cat will survive for about six months after diagnosis but the time may vary between a few weeks and several years. Some

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animals with HCM die suddenly (probably as a result of developing severe cardiac rhythm disturbances or significant emboli).

Prognosis in cats with DCM is also poor and most only survive for a few months.

**If you want any other information on health issues concerning your cat please contact Dalehead Veterinary Group on (01729) 823538 and we will be happy to advise you.**