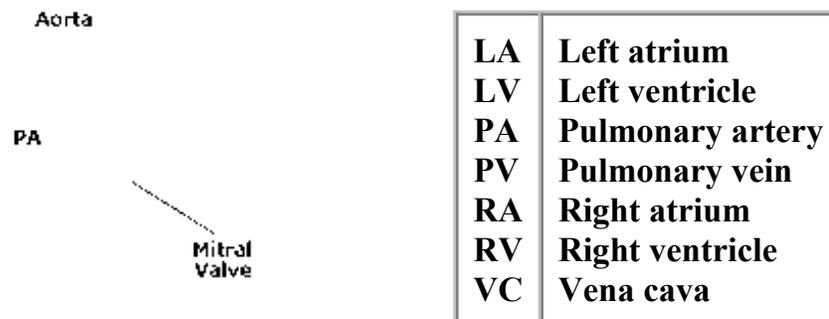


# Feline Hypertrophic Cardiomyopathy

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Before we discuss feline hypertrophic cardiomyopathy (FHCM), let's first discuss how the mammalian heart works. The heart is one of the most miraculous machines ever devised, capable of operating, non-stop, for many-many decades. The heart is actually the pump that is responsible for moving blood through the network of blood vessels found in the body. It is actually two pumps built into one divided into a right and left side. The right side of the heart is a smaller, lower pressure pump that receives blood from the body and delivers it to the lungs where the blood gives up carbon dioxide and is replenished with oxygen. The left side of the heart is a larger, more muscular pump and operates at a much higher pressure. It receives the oxygenated blood from the lungs and delivers it back to the body. This cycle continues non-stop during life. Each pump contains two chambers. The first chamber, called the atrium, is a staging area for the main pumping chamber called the ventricle. These chambers are separated by a valve that prevents the back-flow of blood during ventricular contraction. Additional valves are found in the vessels that carry the blood out of the ventricles. These valves also prevent the back-flow of blood.



The strength and speed of the heart's beat can be influenced by many factors including: exercise, emotions and disease conditions.

There are several forms of cardiomyopathy in cats. For the purpose of this article, we will concentrate on the most common form, hypertrophic cardiomyopathy.

What is feline hypertrophic cardiomyopathy (FHCM)?

Let's break these terms down so we can better understand their meaning. Hypertrophic means a general increase in the bulk of a part or an organ and cardiomyopathy means a disease of the heart muscle (cardio-heart, myo-muscle and pathy-disease). Therefore, a cat with HCM has a diseased heart as a result of the muscles of the ventricle bulking-up.

The heart is a muscle and like all muscles, increased use leads to an increased size. Generally speaking, increasing the size and strength of the heart is a positive thing. An important part of most athletes' training is to increase the strength of his or her heart. However, if the growth of the heart continues unchecked, the musculature of the ventricular wall will limit the capacity of the ventricular chamber to hold and pump blood and thereby reducing the heart's output. Reduced cardiac output can lead to heart failure with associated complications such as an abnormal accumulation of fluids in the lungs or in the body.

What causes feline hypertrophic cardiomyopathy?

In many cases, the cause of FHCM is idiopathic or unknown. We do know that there is a very strong genetic link to this disease and that it follows familial lines.

If a cat experiences systemic hypertension (high blood pressure), his heart must pump against greater resistance with greater effort. This results in an increase in the bulk of the heart muscle. Sometimes the opening from the ventricle is too narrow. This creates a similar situation; an increased workload produces a "bulking-up" of the heart muscle.

There are also hormonal conditions that lead to FHCM such as feline hyperthyroidism. In feline hyperthyroidism, excess thyroid hormone (T4) is excreted from a diseased thyroid gland. Increased T4 accelerates the heart rate which increases the work load on the heart which, in turn, increases the size of the ventricular wall.

Who gets feline hypertrophic cardiomyopathy?

Cats as young as six months or as old as 16 years have been observed with this disease. Most often FHCM does not become apparent until middle age. Males are affected more commonly than females.

The domestic short-hair (common house cat) is the breed most commonly diagnosed with this disease. In addition, some pure-bred cats such as Persian,



oriental breeds and American shorthairs are predisposed to FHCM. A specific mutation has been isolated in the genes of the Maine Coon cat. This mutation can be identified with a special test.



What are the symptoms of feline hypertrophic cardiomyopathy?

The symptoms of FHCM are variable and depend on the severity of the disease. Cats are masters at hiding symptoms of disease. Often times the symptoms may not become obvious until the disease has progressed. In a cat with FHCM, observant owners may notice a slight increase in their cat's respiratory rate and/or a decrease in appetite.

Cats with FHCM may present with a heart murmur. Murmurs are caused by turbulence in blood flowing through a malfunctioning valve in the heart. In FHCM, a heart murmur may be caused by an abnormal motion of the mitral valve (the mitral valve separates the left atrium from the left ventricle). Because of the abnormal growth of the ventricular wall in FHCM, the mitral valve becomes distorted and partially obstructs the outflow of blood from the left ventricle during contraction, causing a murmur. It is important to remember that not all heart murmurs in cats are caused by this condition.

Some cats may present with sudden rear-leg paralysis. Thrombi (or clots) may form in the left atrium as a result of FHCM. If these clots break loose, they will travel with the blood down the aorta until they become lodged. This usually occurs in the terminal aorta which supplies blood to the rear legs. The result is rear leg paralysis with severe pain.

Some cats with severe FHCM will go on to develop symptoms associated with heart failure. Sudden death may be a "symptom" of this disease. Some cats may not have any symptoms.

How is feline hypertrophic cardiomyopathy diagnosed?

A color echocardiogram of the heart offers the best means of diagnosing this disease. This diagnostic imaging device allows the veterinarian to "see" and measure the ventricular wall thickness, the size of the atrium, the condition of the heart valves (including the mitral valve) and possibly, the presence of a clot in the left atrium.

Radiographs of the cat's heart and lungs are helpful in determining the overall size of the heart and condition of the lungs.

In addition, the veterinarian may perform tests to check the cat for feline hyperthyroidism and systemic hypertension.

How is feline hypertrophic cardiomyopathy treated?

There is currently no evidence that any medication alters the course of idiopathic FHCM. However, if FHCM develops into heart failure with associated pulmonary edema (fluid in the lungs) and pleural effusion (free fluid in the chest), treatment would be indicated to relieve the symptoms of these conditions.

If FHCM is caused by hyperthyroidism, then medications to treat that condition often will return the cat's heart rate to normal and the ventricular wall should return to its normal size.

What is the prognosis for cats with feline hypertrophic cardiomyopathy?

At this point, it is very difficult for veterinarians to predict how fast FHCM may progress in any particular cat. The prognosis is much better in cats who have treatable hyperthyroidism.

#### Summary

FHCM is the most common form of heart disease in cats. Symptoms are often subtle or absent. Often there is no known cause. There appears to be a strong familial/genetic component to this disease. There is a genetic test available for Maine Coon cats. Accurate diagnosis and monitoring requires color echocardiography. Radiographs and additional tests may be needed. Treatment is generally symptomatic. Prognosis is difficult to predict.