

Feline Cardiomyopathies

Cats are prone to developing problems with their heart muscle, called cardiomyopathy (cardio = heart, myo = muscle, pathy = disorder). Cardiomyopathies are generally divided into categories in an attempt to better define the specific underlying problem, however, there can be much overlap between these categories, it is possible to have features of more than one type, and it can start as one type but later manifest as another type of cardiomyopathy. Treatment may differ depending on which type of cardiomyopathy is identified.

Hypertrophic Cardiomyopathy (HCM)

Hypertrophic cardiomyopathy refers to an underlying problem of the heart muscle at a microscopic level which causes the muscle to become thickened. A gene mutation causing HCM has been identified in Maine Coon and Ragdoll Cats. There are likely numerous gene mutations in cats which cause this disease. In people, over 900 gene mutations associated with HCM have been identified.

Cats with hypertrophic cardiomyopathy can develop problems secondary to the heart muscle thickening as a thickened muscle is typically very stiff. This stiffness prevents the heart from being able to relax properly. If the heart muscle cannot relax properly, the heart cannot fill with blood effectively, thus ultimately reducing the pumping function of the heart, and impairing blood flow to the body. The top chambers of the heart, called the atria, help the heart fill with blood. When filling is impaired, the blood can back up into the atria, causing them to become enlarged. The blood vessels from lungs and the lining of the chest drain into the atria, so if the function of the heart is significantly impaired, we can see an elevated pressure in these chambers and vessels. This can cause fluid to accumulate in the lungs or chest cavity, which is referred to as congestive heart failure. Cats with enlargement of the atria are also at risk for blood clot formation. If a clot forms within the heart, this can dislodge and travel in the blood stream, causing a heart attack, a stroke or sudden paralysis of the legs.

In addition to problems with the heart relaxing, some cats with hypertrophic cardiomyopathy can have abnormal motion of the mitral valve in the left side of the heart, resulting in an obstruction to the blood leaving the heart. This is referred to as an outflow obstruction and the condition is categorized as hypertrophic obstructive cardiomyopathy (HOCM). In some cases, a medication can be used to slow the heart rate and help alleviate the obstruction to blood flow, which can in some cases improve the heart muscle thickening. Outflow tract obstructions can be associated with angina (chest pain) in people, but it is unknown if it causes pain in cats.

Treatment of cats with HCM is typically aimed at reducing scar tissue formation, controlling salt and water retention and fluid accumulation, regulating heart rate (HOCM), and minimizing risk of blood clots.

There are other disease processes which may mimic hypertrophic cardiomyopathy. Cats with high

blood pressure (systemic hypertension), cats with an overactive thyroid gland (hyperthyroidism), or cats with excessive growth hormone (acromegaly) can also develop thickening of the heart muscle. Some of these other causes of cardiac hypertrophy can reverse with treatment of the underlying disorder. This is why it is always important to make sure that a cat that is diagnosed with hypertrophic cardiomyopathy also has a blood pressure and thyroid level evaluated.

Restrictive Cardiomyopathy (RCM)

Restrictive cardiomyopathy refers to an underlying problem of the heart muscle where there is fibrosis (scar tissue) in the muscle, causing it to be stiffened. The heart muscle is often normal thickness or may be mildly thickened. The muscle stiffness prevents the heart from being able to relax properly. If the heart muscle cannot relax properly, the heart cannot fill with blood effectively, thus ultimately reducing the pumping function of the heart, and impairing blood flow to the body. The top chambers of the heart, called the atria, help the heart fill with blood. When filling is impaired, the blood can back up into the atria, causing them to become enlarged. The blood vessels from lungs and the lining of the chest drain into the atria, so if the function of the heart is significantly impaired, we can see an elevated pressure in these chambers and vessels. This can cause fluid to accumulate in the lungs or chest cavity, which is referred to as congestive heart failure.

With restrictive cardiomyopathy, the atria of the heart are prone to becoming severely enlarged. If this occurs, blood can pool in these very large chambers, increasing the risk of forming blood clots. Cats with RCM are at a high risk for blood clot formation. If a clot forms within the heart, it can dislodge and travel in the blood stream. A clot that gets into the blood stream can be devastating as this can cause a heart attack, a stroke or sudden paralysis of the legs. Treatment for cats with this disease is typically aimed at using medications to reduce scar tissue, control fluid accumulation, and reduce risk of blood clots.

Dilated Cardiomyopathy (DCM)

Dilated cardiomyopathy refers to a primary problem of the heart muscle which results in weakening of the heart muscle and subsequent dilation of the heart chambers. This disease differs from the other types of cardiomyopathies in that the primary problem is that poor contraction of the heart results in poor blood flow, rather than it being a problem with the heart muscle relaxing. This disease is uncommon in cats. DCM can occur due a dietary deficiency of taurine if the cat is not fed a well-balanced diet that is supplemented with taurine, or it can be related to a genetic problem. If a heart is severely affected, fluid can accumulate in the lungs or chest cavity, resulting in congestive heart failure. Treatment is aimed at using medications to control salt and water retention as well as fluid accumulation, and improve the strength of the heart muscle.

Some cats with what appears to be dilated cardiomyopathy, may have actually started with hypertrophic or restrictive cardiomyopathy, but scar tissue formation in the heart and/or severe

damage to the heart muscle lead to weakening and dilation of the heart. This is more correctly referred to as intermediate or unclassified cardiomyopathy.

Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC)

This is a rare type of cardiomyopathy in cats and is more typically identified in dogs. This disease process causes fat and scar tissue to replace normal muscle on the right side of the heart. As a result, the right side of the heart becomes severely enlarged. This can cause fluid to accumulate in the chest or in the belly. Cats with this disease are also prone to developing abnormal heart rhythms, called arrhythmias.

Unclassified or intermediate cardiomyopathy (UCM)

Though we try to classify each cat's heart disease into one of the categories named above, there are often cats which have features of more than one disease process. For example, a cat may have thickening of the heart muscle, as with hypertrophic cardiomyopathy, but at the same time have dilation of the heart chamber and weakening of the muscle as seen with dilated cardiomyopathy. A cat which has a combination of these diseases is referred to as having unclassified or intermediate cardiomyopathy.