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## Animal Specialty Hospital of Florida

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### Hypertrophic Cardiomyopathy

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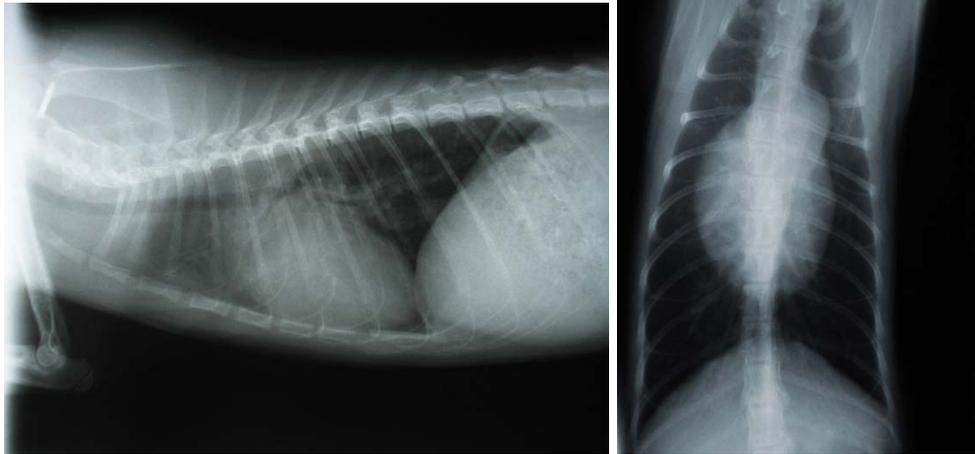
Hypertrophic cardiomyopathy (HCM) is a disease of the heart muscle and most commonly affects cats. It rarely occurs in dogs. HCM is the result of one or more specific genetic defects that results in abnormal heart muscle proteins. This eventually leads to heart muscle thickening, usually affect the left ventricle of the heart. Thickening of the heart muscle makes it more difficult for the heart to relax properly. This leads to elevated pressures within the heart, and can result in secondary heart chamber enlargement, congestive heart failure and even clot formation.

Patients with mild heart muscle thickening and no chamber enlargement may not require any medication. Sometimes, the heart muscle thickening causes a relative narrowing of the outflow tract of the left side of the heart. This condition is referred to as hypertrophic obstructive cardiomyopathy (HOCM). Medication may be recommended for cats with HOCM to help keep the heart rate under control in an attempt to minimize the degree of obstruction. Patients that are at a high risk for heart failure and clot formation may benefit from medication for blood pressure and blood thinners. Cats with congestive heart failure secondary to HCM require diuretics in addition to other medications.

Cats with HCM are diagnosed with an ultrasound examination of the heart (echocardiogram). This allows the veterinarian to assess the heart muscle wall thicknesses, as well as evaluate for any heart chamber enlargement, clot formation or obstructions. Chest x-rays are used to check the patient for any fluid accumulation in the lungs (pulmonary edema) or free fluid in the chest (pleural effusion) from congestive heart failure. Bloodwork is used to monitor kidney function, which is important in patients that need cardiac medication.

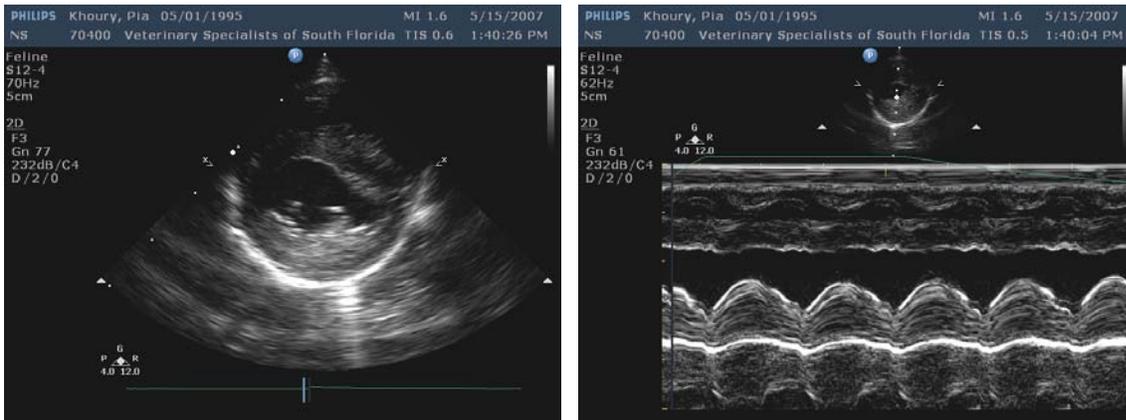
A specific blood test for a genetic defect affecting *protein myosin C* is available for Maine Coon cats. Those testing positive for this defect have a greater chance of developing HCM. Cats with a single copy of the faulty gene (termed *heterozygous*) are at less risk than those with both copies of the defective genes (*homozygous*). Importantly, there are Maine Coon and many other breeds of cats that have developed HCM despite being negative for this particular genetic defect, limiting its diagnostic utility. Hundreds of specific gene defects have been identified in humans with HCM, and it is obvious that more than one is involved in feline HCM.

Your veterinarian may recommend a specific blood test called *NT pro-BNP*. This is a hormone released by the heart when it becomes diseased, and may have some clinical utility in identifying cats at risk for heart disease. Cats with abnormally elevated NT pro-BNP levels should be further evaluated (i.e. with echocardiography).



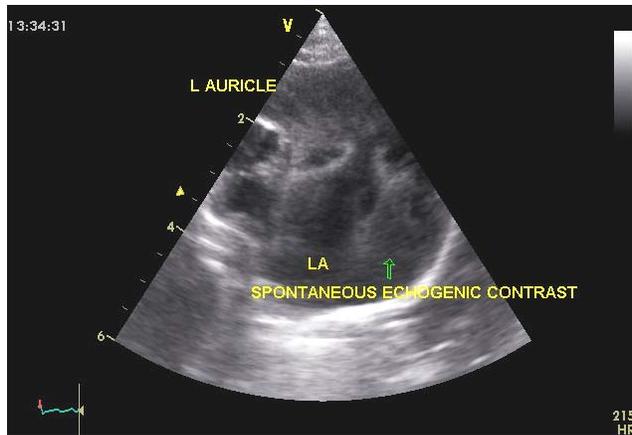
Chest x-rays of a cat with severe HCM. The shadow of the heart, termed the *cardiac silhouette*, is severely enlarged.

Heart muscle thickening may be the result conditions other than HCM, such as congenital heart defects (aortic stenosis), high blood pressure, hyperthyroidism, and cancer (lymphoma). Blood pressure evaluation and serum thyroid levels are recommended in such patients. Echocardiography can rule-out congenital heart disease. Cats with cardiac lymphoma may have specific changes present on echocardiography, including pericardial effusion, in which case fluid analysis may be diagnostic.



Echocardiographs of a cat with HCM. The heart muscle can easily be measured with ultrasound. This cat has severe heart muscle thickening consistent with HCM.

Cats with HCM may live for months to years before ever developing symptoms. Once a cat has symptoms such as exercise intolerance, difficult or labored breathing, then medication is required. Unfortunately, cats with severe heart chamber enlargement for whatever reason are at risk for clot formation. A clot may form in the heart, break off, travelling out of the heart and lodging in a vessel far away from the heart, most commonly in a leg. Some cats have a large clot that blocks the blood flow to both rear legs, and this typically results in quite severe pain and paralysis, and even self-mutilation requiring humane euthanasia.



Echocardiographs of cats with HCM. To the left, a close-up of one of the heart chambers, called the left atrium, shows smoke-like material, termed *spontaneous echogenic contrast*. This occurs in patients with severe heart chamber enlargement, and is a precursor to clot formation. To the right, a large, round formed clot or *thrombus* is visualized within one of the heart chambers.

Cats may live for months to years with congestive heart failure, but they do require lifelong medication. Those that have a history of clot formation and stroke often have a worse prognosis. Consultation with a veterinary cardiologist is generally advised for patients with HCM.