

Feline Heart Disease

What does the heart normally do?

The heart functions as a pump to keep blood moving in a forward direction and deliver oxygen to the body. Blood enters the right side of the heart from the veins in the body. The heart pumps the blood to the lungs where oxygen enters the blood to be transported to the body. The blood then returns to the left side of the heart which pumps it through arteries to the body. This cycle repeats, with the blood always maintaining a *forward flow*.

What types of heart disease do cats get?

Cats can be afflicted with various forms of heart disease. Birth defects, while rare, can cause heart disease from a young age. The most common acquired form of heart disease in cats is a thickening of heart muscle called *hypertrophic cardiomyopathy*. *Restrictive cardiomyopathy* is much less common condition in which the heart muscle becomes scarred rigid. *Dilated cardiomyopathy* is a condition in which the heart muscle becomes weakened and thin causing severe heart enlargement. All of these diseases result in decreased heart function and ultimately changes in the forward flow of blood.

What causes heart disease?

Heart disease can be caused by many factors. In certain breeds, such as the Maine Coon and Ragdoll, heart disease has been shown to be genetic. Dilated cardiomyopathy has been shown to have a link to improper nutrition and taurine deficiency. Hyperthyroidism is a common hormonal abnormality that can negatively affect heart muscle. Elevated blood pressure, often present in cats secondary to other diseases, can also cause heart disease. As stated above, congenital (from birth) heart disease can result from developmental abnormalities. Most cats develop heart disease for unknown reasons.

What is heart failure?

Heart failure occurs when the heart can no longer maintain adequate forward flow of blood. This can occur on either or both the left (common) and right (rare) side of the heart. This causes increases in back-pressure and fluid accumulation in or around the lungs (common) or in the abdomen (rare). This causes most of the clinical signs we associate with heart disease.

- *Pulmonary edema* is fluid accumulation in the lungs
- *Pleural effusion* is fluid accumulation around the lungs (in the chest)
- *Ascites* is fluid accumulation in the abdomen

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What clinical signs does heart disease cause?

There are often no clinical signs in early heart disease. In many cases a heart murmur is the first sign of heart disease, but a fair percentage of cats will have no detectable abnormalities until a crisis occurs. In fact, the majority of cats presenting to veterinary hospitals with emergency signs of heart disease (shortness of breath due to heart failure or paralysis due to blood clot) do not have a known history of heart disease. Thus, the lack of heart murmur does not rule out heart disease in cats. A new blood test called NTproBNP has been shown to be able to detect occult heart disease in cats that do not have any abnormal physical exam findings. **Every cat with a heart murmur or abnormal NTproBNP should have a cardiac evaluation to check for heart disease.** As heart disease progresses, other signs may be seen.

Common signs include:

- ❖ Labored breathing
- ❖ Cyanosis
- ❖ Open-mouth breathing
- ❖ Hind-limb paralysis
- ❖ Lethargy

Cyanosis is the blue-purple discoloration of the gums and tongue that occurs when an animal in heart failure cannot get adequate oxygen

Hind-limb paralysis results from blood clots that form in the heart and travel to the rear limbs

What is aortic thromboembolism?

Feline aortic thromboembolism (FATE) is a severe complication of heart disease in cats. Cats with heart disease are prone to blood clot formation. The clot typically forms in the heart and often travels to other parts of the body. Blood clots can travel to any part of the body but often lodge in the end of the aorta, the major blood vessel that supplies blood to most of the internal organs and ultimately the rear limbs. Because of the anatomy of the aorta, blood clots that lodge in the aorta typically cause an acute rear limb paralysis. This is often sudden and painful and an indication of severe heart disease. Specific treatments to dissolve the clots are not rewarding and while some cats may regain hind limb function, most will recur with clinical signs within six months.

What laboratory changes does heart disease cause?

Heart disease rarely causes specific lab abnormalities. Despite this, it is still very important to perform labwork to rule out other diseases that may be present.

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What testing is recommended for heart disease patients?

In evaluating patients with heart disease, there are many things that need to be considered. Urinalysis, CBC and chemistry profile are performed to evaluate kidney function and look for other underlying diseases that may be present. Thyroid hormone levels are checked to evaluate for hyperthyroidism, a common exacerbating factor for certain forms of heart disease. The heart is evaluated with a combination of chest radiographs, echocardiogram, and electrocardiogram (ECG). Because elevations in blood pressure can also contribute to heart disease in cats, the blood pressure should also be checked.

Most patients evaluated for heart disease will need the following tests:

- ❖ Chemistry Profile
- ❖ Thyroid levels
- ❖ Urinalysis
- ❖ Complete Blood Count (CBC)
- ❖ Chest Radiographs
- ❖ ECG
- ❖ Blood Pressure
- ❖ Echocardiogram

- *Chest Radiographs* or x-rays are used to evaluate overall heart size and for fluid in or around the lungs.
- *Electrocardiogram (ECG)* is a non-invasive way to evaluate the electrical activity of the heart and check for arrhythmias and proper electrical conduction through the heart.
- *Echocardiogram* or *cardiac ultrasound* is a non-invasive test that uses sound waves to create images of the heart. This allows us to check the heart muscle thickness, the heart chamber size, the valves in the heart, and overall heart function.
- By evaluating all these tests *together*, we can confirm the diagnosis, provide an indication of severity of disease and prognosis, and help develop a treatment and monitoring plan

What treatment options are available for heart disease patients?

There are many medications that can be used in the treatment of heart disease and the individual treatment plan is dependent on the clinical signs, and type and severity of heart disease present. Although some less common heart diseases are amenable to non-invasive treatment through cardiac catheterization, most cats will be treated with medications.

A combination of medications is typically prescribed:

- *'Blood thinners'* such as aspirin or clopidogrel (Plavix®) may be recommended in some feline heart disease patients thought to be at risk of blood clot formation
- *Beta-blockers* are often used to control heart rate and potentially relax the heart muscle and improve heart function
- *Diuretics* are used in cases of heart failure to eliminate fluid accumulation in the body

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- *ACE inhibitors* may be used to reduce the risk of heart failure and slow progression of heart disease
- Several anti-arrhythmia medications are available to control unstable heart rhythms
- *Blood pressure* medications may be required in patients with elevated blood pressure
- Other supplements may also be used in certain cases of feline heart disease

What sort of long-term monitoring is recommended for heart disease patients?

General recommendations for cats with heart disease are highly variable and dependent on the type and severity of disease. Periodic rechecks for bloodwork, x-rays, and ultrasound are often recommended, but the frequency is case specific.

What is the prognosis with feline heart disease?

The prognosis with feline heart disease patients is highly dependent on the type and stage of heart disease present. With appropriate medical therapy many patients will live for years with these diseases, while others may only live for days or weeks after the time of diagnosis. Of course, we will strive to maintain the maximum quality of life and longevity of your pet.