

What is cardiomyopathy?

Cardiomyopathy refers to disease of the heart muscle (the myocardium) without malformation of the heart or its valves. There is a breed predisposition to dilated cardiomyopathy in giant breeds, as well as in Doberman pinschers and boxers. Cardiomyopathy can also develop as a result of some toxins or infections.

There are 3 types of cardiomyopathy:

dilated cardiomyopathy. This is by far the most common type in the dog. There is dilation of the chambers of the ventricles of the heart with some increase (hypertrophy) in the heart muscle mass, and a loss of the normal contracting abilities of the ventricles.

hypertrophic cardiomyopathy. In this form of cardiomyopathy, there is a tremendous increase in the mass of the heart muscle in the ventricles, with a resultant decrease in chamber size. Relatively few cases of hypertrophic cardiomyopathy in dogs have been reported, and no significant breed predisposition has been identified. Most of the dogs affected have been male.

restrictive. This type has not been reported in dogs.

The heart works harder to compensate for the loss of contractility, eventually leading to congestive heart failure. The abnormalities in the heart muscle cells give rise to irregular heart rhythms which may cause sudden death.

How is cardiomyopathy inherited? The pattern of inheritance is not known.

What breeds are affected by cardiomyopathy?

Dilated cardiomyopathy is seen more often in Doberman pinschers than in all other breeds combined. It also occurs in giant breed dogs including the Great Dane, St. Bernard, Irish wolfhound, and Scottish deerhound. A distinctive form of cardiomyopathy occurs in the boxer, with extensive changes in the heart muscle and serious rhythm abnormalities, but without the dramatic dilation of the ventricles seen in other breeds.

Dilated cardiomyopathy is also seen in English cocker spaniels. In all breeds affected, it is more common in males.

For many breeds and many disorders, the studies to determine the mode of inheritance or the frequency in the breed have not been carried out, or are inconclusive. We have only listed breeds for which there is a strong consensus among those investigating in this field and among veterinary practitioners, that the condition is significant in this breed.

What does cardiomyopathy mean to your dog & you?

Giant breeds with dilated cardiomyopathy typically show signs associated with abnormalities of heart rhythm (particularly atrial fibrillation) and generalized heart failure. These signs may include weakness, loss of appetite, weight loss, depression, episodes of collapse, respiratory difficulties, a soft cough (especially at rest), and an enlarged abdomen. There is severe enlargement of all 4 chambers of the heart. Dogs are affected in middle-age on average, although they may be affected as early as a few months of age. Abnormalities may be seen on an electrocardiogram before there are any clinical signs.

In addition to signs of heart failure as outlined above, a distinctive feature of this disorder in Doberman pinschers and boxers is that the abnormal heart rhythms that are seen originate most commonly in the ventricles, and are quite serious. As well, Dobermans often have left atrial rather than generalized enlargement of the heart and boxers may show no heart enlargement.

In Doberman pinschers there is a relatively long period of 2 to 4 years without clinical signs of illness (the "occult" phase), during which changes occur in the heart muscle and rhythm disturbances progressively worsen. Sudden death occurs in about 25% of these dogs. Others will go on to develop congestive heart failure. Weight loss is often sudden and dramatic in these dogs. Death usually occurs fairly soon after clinical signs develop, often within 6 months.

In boxers, there are 3 distinct stages of cardiomyopathy:

Stage I. An irregular heart rhythm is discovered incidentally during a routine examination, or examination for other purposes. The dog has no clinical signs of illness.

Stage II. These dogs are examined because of intermittent episodes of collapse or weakness. On examination, an abnormal heart rhythm (generally originating in the ventricles) is found.

Stage III. These dogs show signs of heart failure which may include weakness, depression, exercise intolerance, a soft cough (particularly at rest or at night), a loss of appetite, weight loss which may be dramatic, and fainting or collapse.

The episodes of fainting, collapse, or weakness are generally due to abnormal rhythms in the heart, because of the damaged heart muscle. For this reason, regular monitoring by electrocardiogram is the best way of assessing the progression of cardiomyopathy in these dogs. Dogs in either of the first stages may develop heart failure at any time.

For all dogs with dilated cardiomyopathy, the arrhythmias that can cause fainting or collapse can also cause sudden death. Up to 50% of affected dogs die suddenly, often without having shown any other signs of the disorder.

Once dogs with cardiomyopathy develop congestive heart failure, the prognosis is poor.

How is cardiomyopathy diagnosed?

X-rays generally show an enlarged heart, predominantly on the left side. Boxers may show no abnormalities on radiographs.

In both Dobermans and boxers with cardiomyopathy, there may be no abnormalities on radiographs, on physical exam, or on the resting electrocardiogram. If cardiomyopathy is suspected and all routine diagnostic tests are normal, a 24 hour ambulatory electrocardiogram (a Holter monitor) is recommended. The unobtrusive monitor is worn by the dog during its normal activities, and records irregular heart rhythms.

FOR THE VETERINARIAN:

RADIOGRAPHS: see generalized cardiomegaly with left atrial and ventricular enlargement predominating. In Dobermans, only left atrial enlargement may be evident. In boxers, thoracic radiographs may be normal, or there may be mild to moderate cardiomegaly.

ELECTROCARDIOGRAM: atrial fibrillation is seen in 75 to 80 per cent of giant-breed dogs with dilated cardiomyopathy. There may be subtle changes such as high amplitude or widened QRS complexes (left ventricular enlargement), or widened P waves (left atrial enlargement). In Dobermans and boxers, one sees ventricular premature contractions of variable frequency, singly or in runs, and, later, paroxysms of ventricular tachycardia.

ECHOCARDIOGRAM: reduced contractility, ventricular dilation (may not be seen in boxers).

PHYSICAL EXAM: occasional to frequent premature beats, pulse deficits, paroxysmal tachyarrhythmias or a totally irregular ventricular rhythm, variability in femoral pulse strength.

How is cardiomyopathy treated?

Decisions about treatment are based on several factors: whether the dog is showing clinical signs such as weakness or collapse, what arrhythmias are seen on the electrocardiogram, and whether congestive heart failure is present. If your dog has an abnormal heart rhythm without any evidence of congestive heart failure, your veterinarian may prescribe anti-arrhythmic drugs, depending on the severity of the arrhythmia.

Episodes of collapse indicate a serious arrhythmia and must be treated as an emergency.

Treatment for dogs with signs of congestive heart failure involves rest, diet restrictions, and drugs to stabilize and support the failing heart as well as to control the arrhythmias. If low doses of anti-arrhythmic drugs are effective, then the heart can often be stabilized. Serious ventricular arrhythmias that can only be controlled by high doses of anti-arrhythmic drugs have a poorer prognosis.

New treatments are being used in Dobermans and boxers with cardiomyopathy in an attempt to delay the onset of congestive heart failure or sudden death.

Breeding advice :

Affected individuals and their parents should not be used for breeding. Siblings should only be used after careful screening.

How can cardiomyopathy be controlled?

There are ways to approach the control of this disease. Although signs of heart failure are often not evident until middle age, abnormalities on the electrocardiogram are often apparent earlier. In affected breeds with a family history of cardiomyopathy and in ALL Doberman pinschers, breeding animals should be evaluated yearly for evidence of cardiac arrhythmias, using an ambulatory (Holter) monitor if possible. Dogs in which occult dilated cardiomyopathy has been identified (ie. no clinical signs) should not be used for breeding.