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Dilated cardiomyopathy (DCM) in dogs

What is dilated cardiomyopathy (DCM)?

Dilated cardiomyopathy is a form of heart disease characterized by weakening of the heart muscle, resulting in poor cardiac pumping and heart chamber dilation. The most common form of DCM is idiopathic, which means 'cause unknown'. However, the majority of patients with idiopathic DCM likely have the disease as a result of genetic abnormalities. At least two genes known to cause DCM in Doberman Pinschers have already been identified. Dilated cardiomyopathy can also be caused by nutritional deficiencies (e.g. taurine deficiency), hypothyroidism, and



infectious/inflammatory disease. Although these causes are less common, they are always considered in any case of DCM. This brochure will predominantly focus on idiopathic DCM. Please see our website for more information regarding dilated cardiomyopathy associated with taurine deficiency and grain-free diets.

Idiopathic DCM is generally divided into three phases:

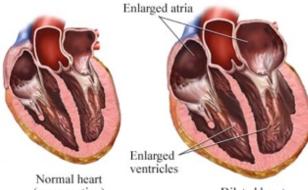
- 1) The genetically predisposed phase (Doberman Pinschers): If one or more copies of an abnormal gene associated with DCM have been identified via genetic testing, the dog is known to be at risk for developing overt DCM later in life even if the disease is not present at the time of genetic testing.
- 2) An occult phase, during which time disease is identified to be present but no clinical signs are present. This phase can last months to years.
- 3) An overt clinical phase, when symptoms develop. Clinical signs may include labored breathing, coughing, exercise intolerance, fainting/collapse, or lethargy

Breeds at increased risk of developing idiopathic DCM include:

- Doberman Pinscher
- Great Dane
- Irish Wolfhound

- Scottish Deerhound
- Large breed dogs, in general

Consequences and clinical signs



(cross section)

Dilated heart

Weakening of the heart muscle results in chronic sodium and fluid retention within the body. This can lead to congestive heart failure, which is the syndrome of leakage of fluid into tissues or body cavities secondary to cardiac dysfunction. Common clinical signs of congestive heart failure include coughing, labored breathing, weakness, fainting, and abdominal distension.

DCM can also lead to electrical instability and abnormal heart rhythms, or cardiac arrhythmias. Arrhythmias can lead to syncope (fainting) and even sudden death. Some dogs with DCM will develop both congestive heart failure and cardiac arrhythmias.



Echocardiogram



Holter Monitor

Diagnosis

Genetic predisposition:

At this time, two genetic abnormalities have been identified to cause DCM in Doberman Pinschers. Genetic testing can be performed to determine if a Doberman Pinscher carries either of these genes and is therefore predisposed to developing DCM later in life. If either of these genes is identified, screening for the presence of DCM is generally advised as early as the age of 4.

Genetic testing can be performed by veterinarians or by pet owners themselves. For more information, discuss with your pet's cardiologist or visit the North Carolina State Veterinary Genetics lab website:

https://cvm.ncsu.edu/genetics/doberman-pinscher-dilated-cardiomyopathy/

Occult phase:

Diagnosis of occult DCM requires identification of cardiac abnormalities on one or more appropriate diagnostic tests despite the patient appearing to be outwardly healthy.

The most common tests used to screen for occult DCM include:

- NT-proBNP testing (blood test)

- Ambulatory electrocardiography (Holter monitoring)
- Echocardiography (cardiac ultrasound)
- Thoracic radiographs (X-rays)

Clinical phase:

Diagnosis of DCM in dogs during the clinical phase occurs when the patient displays clinical signs in conjunction with abnormalities identified during some or all of the above diagnostic tests.

Treatment:

- There is no treatment initiated for patients who are identified to have abnormal genes predisposing them to developing DCM, but who have not developed the disease itself yet.
- Treatment *is* initiated for patients in the occult phase of the disease and usually includes medications that improve cardiac pumping efficiency [e.g. pimobendan (vetmedin)] and angiotensin-converting enzyme (ACE) inhibitors. It may also include medications to suppress cardiac arrhythmias (antiarrhythmics).
- Patients with the clinical phase of disease require additional treatments to control clinical signs. These therapies may include diuretics to treat congestive heart failure, antiarrhythmics, or both.

Prognosis

- Prognosis for dogs in the occult phase of DCM is guarded, as this phase may last up to three years before
 the onset of clinical signs. Evaluation by a board-certified veterinary cardiologist is recommended every
 6 months during the occult phase to monitor disease progression and determine the need for additional
 therapies.
- Prognosis for dogs in the clinical phase of DCM is guarded to poor, with survival generally between 5-8 months for patients with congestive heart failure. Many of these patients experience good quality of life during this time period with the appropriate medical therapy.

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