

Canine Cardiomyopathy: An Update for the MCOA

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Cardiomyopathy, generally defined as a disease of the heart muscle that causes circulatory issues,¹ can be a silent killer, and it is imperative for dog owners to be aware if their breed is at risk. This article will serve as an overview of cardiomyopathy, as well as risk factors, with an emphasis on issues pertinent to large-breed dogs such as Mastiffs.

Two main types of cardiomyopathy occur in dogs: hypertrophic cardiomyopathy (HCM) and dilated cardiomyopathy (DCM).² HCM, defined by thickening of ventricle walls,³ is rare in dogs when compared to high prevalence in cats,^{3,4} and it lacks common diagnostic factors characteristic of the disease in humans.⁴ In a recent retrospective study, symptoms common to HCM were exercise intolerance, syncope, and collapse, and the breeds afflicted ranged in size from small terriers to large shepherds.⁴ Due to the low prevalence in dogs, the causes and breeds most commonly affected with HCM remain unclear.

DCM is the most common primary myocardial disease in dogs⁵ and is most often seen in large breeds such as the Doberman Pinscher, the Great Dane, and the Boxer.⁶ DCM is a primary disease of the heart muscle, characterized by dilation of the ventricles and a decrease in cardiac function.^{6,7} DCM in dogs is most commonly a genetic disease^{5,6,8} and has also been linked to dietary amino acid deficiencies, such as carnitine deficiency in Boxers⁶ and taurine deficiency in Cocker Spaniels^{6,8,9} and Golden Retrievers.¹⁰ In recent years, an increase in the number of “atypical” breeds of dogs eating grain-free or diets high in legumes and/or potatoes led to the acknowledgement of a newer dietary associated form of DCM.⁸ The exact etiology of this dietary associated DCM still remains unclear.¹¹ Secondary causes of DCM include progression

of diseases that affect systolic function including myocarditis (inflammation of heart muscle), hypothyroid disease (hormone dysregulation), and tachycardia (increased heart rate).⁵

DCM in its early stages is difficult to detect and affected animals have few to no symptoms. Later in the disease progression, dogs may show signs of exercise intolerance, congestive heart failure, syncope, and even sudden cardiac death.⁵ These symptoms are linked to the heart's decreasing ability to act as a pump and the resulting decrease of oxygen, which can lead to the development of potentially fatal cardiac arrhythmias.⁶ Additional symptoms related to the development of fluid in the lungs, such as labored respiration, coughing, or a distended abdomen may also be observed.^{6,7,12}

For dogs with breed-specific risk or cardiovascular symptoms, veterinarians can use a variety of diagnostic tools to establish whether cardiomyopathy is the cause. Physical exam and auscultation are the first step, as this method allows the practitioner to identify heart murmurs if present.^{7,12,5} This exam can be supplemented by radiographs to observe any gross enlargement of the heart (in DCM) or any fluid accumulation in the lungs or abdomen.^{5,7} Blood and urine tests can be helpful to direct treatment in the case of heart failure, and taurine serum concentrations can also be obtained if a dietary deficiency is suspected.^{5,11} An echocardiogram is a critical tool to examine the size of the heart chambers, thickness of its muscle walls, and systolic function.^{5,7} Treatment is guided by the results of the physical examination and imaging. If arrhythmias are present, a Holter monitor (24 hour ambulatory electrocardiogram) can be used to determine the severity of the arrhythmia and direct treatment.⁵⁻⁷

Treatment of cardiomyopathy varies depending on suspected cause and symptom severity. For dogs with suspected breed-related dietary causes (Golden Retrievers, Cocker Spaniels, and Boxers), supplementation of their existing diet may function as a long-term

management tool.⁹⁻¹¹ Similarly, for dogs with comorbid hypothyroidism or tachycardia, medical management can aim to address the primary disease with supplemental treatment of symptoms specific to cardiomyopathy.⁵ However, for dogs with more severe disease progression, treatment centers on symptom management and quality of life, with potential use of diuretics to prevent fluid accumulation, angiotensin converting enzyme (ACE) inhibitors to lower blood pressure, and pimobendan to improve the strength of heart muscle.^{5,7} For dogs with arrhythmias, anti-arrhythmic drugs such as calcium channel blockers or sotalol can be added to the regimen.^{5,7}

For all dog owners, awareness of cardiomyopathy can facilitate early diagnosis and successful treatment, and this can in turn lead to a better long-term prognosis. There does not appear to be a breed-specific risk for the Mastiff. In the face of potential dietary causes and links to endocrine disease, Mastiff owners should talk to their veterinarian about preventative measures should their dog be diagnosed with a condition linked to DCM. In conclusion, cardiomyopathy has many potential causes and some pathways require additional research to support the existing theories. As research develops, Mastiff owners should be cognizant of cardiomyopathy symptoms, but there is currently not inherent breed-specific concern.

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