

Doberman Dilated Cardiomyopathy

Recent research and review of screening tests

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Prevalence of disease

Dilated cardiomyopathy (DCM) is a common disease in Dobermans. In a study surveying Dobermans >8 years of age, 44% of dogs were affected. If Dobermans of all ages were assessed then 58% had signs of disease. It was reported that both male and female dogs were equally affected although males tended to show signs of disease at an earlier age.¹

Disease course

DCM is a disease which is likely to have a long pre-clinical phase where there are no clinical signs or symptoms but there may be evidence of heart enlargement, deterioration in heart function and/or abnormal heart rhythms. During the clinical phase of the disease there are signs such as fainting or collapse, weight loss, breathlessness, coughing and/or fluid retention resulting in distension of the abdomen. Sadly Dobermans with DCM can also experience sudden death which is likely to be due to abnormal rapid heart rhythms.

The diagnosis of this disease is made based on the combination of the history mentioned above, clinical signs suggesting poor heart output, echocardiography (ultrasound of the heart), an ECG to record heart rhythm and also a Holter monitor which is a heart monitor that dogs can wear at home to record heart rate and rhythm over a longer period such as 24 hours.

The Holter monitor weighs about 150g and is attached to the dog using 3 adhesive pads called electrodes. The monitor is carried in a pouch inside a specially designed vest. By recording heart rate and rhythm over 24h and then analysing the recording we are screening for abnormal beats which may occur singly or as multiple consecutive beats - this abnormal rhythm is known as ventricular tachycardia (VT) which may be life threatening. Some dogs with abnormal heart rhythms require treatment with medication and follow up Holter monitoring to assess the effectiveness of therapy.



Other treatments for dogs with clinical disease include diuretics to reduce fluid retention, pimobendan ("Vetmedin") to increase the force of heart muscle contraction, ACE inhibitors to improve blood flow and also ameliorate the harmful side effects of diuretics.

Recent research - PROTECT Study

In this study a large number of Dobermans were screened using echocardiography and also Holter to detect dogs with pre-clinical DCM. These dogs were then treated with pimobendan or a placebo

drug and monitored regularly. We recorded the time until these dogs either died suddenly or developed signs of congestive heart failure. This study demonstrated that pimobendan prolongs survival and extends the time to onset of clinical signs or sudden death by about 9 months (718 days in pimobendan groups versus 441 days in the placebo group).²

Therefore screening dogs is of benefit to the individual as well as to the breed.

Screening

The ideal screening test is accurate and therefore detects all cases of disease with no false positives or negatives, it should be capable of detecting disease at a very early stage, the test should be non-invasive, widely available and also reasonably priced.

Accuracy

Test accuracy is often expressed in terms of sensitivity and specificity.

Sensitivity = the proportion of correctly identified positives. For example if 100 patients known to have disease were tested and 95 test positive then the test has a sensitivity of 95%. High sensitivity is important in tests used for screening.

Specificity = the proportion of correctly identified negatives. For example if 100 patients with no disease are tested and a negative result is obtained for 96 then the test has a specificity of 96%.

Suggested screening tests

1. Echo and Holter

These tests are the current gold standard for screening Dobermans for DCM.

2. NTproBNP

BNP is a substance released into the blood in response to stretching of the heart muscle.

New sample tubes are available so sample no longer needs to be transported frozen however this test can be affected by concurrent disease.

One study reported a sensitivity of 81% and a specificity of 75% to detect all stages of DCM in Dobermans.³

3. Troponin

This is a substance released into the blood in response to heart muscle damage.

One study reported sensitivity of 79% and specificity of 84%.⁴

4. 5 minute ECG

This test involves recording an ECG for 5 minutes and has been reported to have lower sensitivity (64%) and higher specificity (97%). The lower sensitivity suggests that it is less suitable as a screening test.⁵

5. Genetic test

A genetic test for this disease would be a fantastic development allowing us to detect cases at an earlier age. There are several tests marketed at present but the results are conflicting and further research is required.

As DCM is generally a disease of middle aged and older dogs, screening should be repeated annually.

Some dogs may have equivocal results which is an understandable source of frustration for both owners and vets. In these cases tests may have to be repeated at a later date.

Summary of performance of tests available for screening

	Certificate, echo and Holter	BNP and Holter ⁶	BNP ³	Troponin ⁴	5min ECG ⁵
Sensitivity (%)	Gold	94	81	79	64
Specificity (%)	Gold	87	75	84	97

Summary

- DCM is common in Dobermans.
- Screening to detect early disease is possible and beneficial both to the individual dog and also to the larger breeding population.
- Many screening tests are available with varying accuracy and cost.
- Screening needs to be done annually.

Further information

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About Author

I graduated from Edinburgh Vet School in 1996 and spent two years in general practice before starting a 3 year post-graduate training program in cardiology at Glasgow Vet School where I obtained the Royal College of vet Surgeons Certificate and Diploma in Veterinary Cardiology and also was awarded Royal College Specialist Status in 2003. Since then I have worked in private referral practice in Stirling from 2002 – 2009 and at Vets Now Glasgow from September 2011. I founded Holter Monitoring Service in 2005 and since then have gained a lot of experience in the diagnosis and management of abnormal heart rhythm in dogs.

I live in Dollar in Scotland with my husband, two children, a Labrador, 3 legged cat and our latest acquisition is a campervan.