

Q + A session on Cardio

With:

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A brief introduction of myself:

1992 - DVM at UC Davis

1993 - Completed a small animal internship at Michigan State University

1995 - Completed a cardiology residency at UC Davis

1996 - Became board-certified in veterinary cardiology, Currently in private practice as a veterinary cardiologist in Sacramento.

Q: I have lost two Dobses to cardio...both came up with different signs. One at 9 years, I found him on the floor with blood coming out of his mouth. I rushed him to emergency and kept him going for 4 months.....the other lost weight, although he didn't seem to lack interest in food, but he did lack energy, when he was taken to the Vet she said he had a faint heart murmur.....there had been no other sign that night he started the coughing and he was sent to the Bridge the next morning.....he had advanced cardio.

My questions:

Is there any way of being able to tell conclusively that a dog has Cardio.....are there signs, loss of weight, lack of energy..... something that would encourage us to take our dogs to the Vet. Can the Vets tell with a general test, or do they have to do x-rays.

A: Your sad stories are examples as to why Doberman dilated Cardiomyopathy (DCM) is such a devastating disease. One of its hallmarks is that it usually has a long (2-3 year) occult phase during which the dog shows absolutely no symptoms. Oftentimes the first indication that they have the disease is when they go into congestive heart failure or die suddenly from an arrhythmia. Owners often blame themselves that they should have noticed something earlier. They shouldn't because it is simply impossible to know from their outward appearance and activity level that the disease is brewing. Just having a vet listen to the heart or take chest X-rays still will not pick up most cases of occult DCM. An irregular heart beat is one of the earliest indicators that DCM is present. If frequent, the vet may hear it with a stethoscope or see it on an ECG strip. If infrequent, it would take a 24 hr ECG (Holter monitor) to detect it. Statistics show that 30% of Dobses in the occult phase of DCM die suddenly from their irregular heart beats (arrhythmias.)

Q: If caught in the early stages, can medication keep cardio in remission or will it automatically progress, regardless of medication and diet.

A: Most of the time the disease progresses no matter what supplements or medications are given, even if caught in the early stages. One study did show that less than 5 % of the time, there was a bit of improvement or regression of the disease when the dog was given a nutritional supplement called L-carnitine. The dose for an adult Dobie is 2 grams every 8 hours. If an arrhythmia is found, antiarrhythmic medications can be tried in an attempt to stave off sudden death. It's not always effective though.

Q: What is your opinion about the relationship of DCM to a low protein diet and possible taurine deficiency due to that diet?

A: Most Dobies with DCM do not have a taurine deficiency, although a serum or plasma taurine level is certainly worth doing and most veterinary diagnostic labs have this test available. A few dogs have been shown to have carnitine deficiencies. As far as I know, there is only one lab in the country that runs this test. It's almost easier to just supplement with carnitine and see if there is a positive response. I have not heard of DCM being due to a low protein diet, although it is important in any dog to make sure it is getting adequate protein.

Q: What echo criteria is are you using for the diagnosis of occult DCM?

A: There are published echo measurements that are used by cardiologists to make a diagnosis of occult DCM. The problem is that each author has their own opinion as to where the cut-off is between a normal dog and an abnormal dog. It can be very hard to differentiate between a dog who is normal with borderline low measurements and a dog who has mild occult DCM whose measurements are almost normal. It gets easier as the disease progresses of course. If you want one study's cut-off (Sandra Minors and Michael O'Grady in a paper published in 1998), they used a left ventricular internal dimension in diastole of greater than or equal to 46mm or a fractional shortening of less than or equal to 16%. All of these dogs were asymptomatic for the disease. I try to look at the whole picture and use several other measurements, such as the E-point septal separation, to form an opinion. The presence of ventricular arrhythmias would also make a dog more likely to have occult disease, even if the echo measurements were not within the occult DCM ranges. If the dog is a "gray zoner" then a recheck echo in 6 months is recommended to see if the measurements have changed.

Q: What therapy is recommending for occult DCM and you have any data with respect of slowing of progression to frank DCM with her chosen therapy?

A: There is nothing that has been proven to consistently stop or slow the progression of early DCM. I'll use antiarrhythmic drugs if ventricular arrhythmias are present and start digoxin when the heart muscle becomes significantly weak. ACE inhibitors are used for significant heart chamber dilation. Heart healthy supplements such as taurine, L-Carnitine, coenzyme Q10, and omega fatty acids are also recommended in the early stages, but there is no proof that they do a lot of good except in the rare truly deficient dog.

Q: If the incidence of occult DCM is as high as some centers have reported. Do you have any thought of prophylactic strategies for ALL Dobermans?

A: The best way to screen for early DCM is with a 24 hour Holter monitor once a year combined with a yearly echocardiogram. This is HIGHLY encouraged for active breeders and may also be recommended for pets. However, since we don't have a treatment that stops the disease from progressing, early detection in a pet may not help his overall survival, but certainly would prepare the owner for what lies ahead instead of being surprised. Efforts must be made to eliminate any breeders with DCM as this is the key to truly try to decrease the incidence of the disease.

Q: I have heard of some people that have had cardio diagnosed in their dog, others dogs just drop dead while playing etc...what are the signs that we should be paying attention to, if any?

A: No early symptoms are generally seen at home during the occult phase.

Q: Can the Holter monitor truly catch the early warning signs of cardio?

A: Yes. Ventricular arrhythmias are considered the earliest evidence that DCM is present. Greater than 50 abnormal beats in a 24 hour period would be highly suspicious of emerging DCM.

Q: Does health and exercise play a role in helping to decrease the odds of cardio (similar to heart attack) or are the genetics predetermined and eventually the heart will go regardless?

A: Unfortunately no. A supreme athlete will develop the disease just as easily as a couch potato if he is genetically predisposed.

Q: I have a 9 1/2 year old Dobe who is experiencing erratic heartbeats (discovered during routine exam). His heart has been checked by a cardiologist and I have been told that his heart function is good (and lungs clear), but that the erratic beats are very evident on his EKG and even through the stethoscope. The only medication he is receiving is Atenolol. I am told I will come home one day and likely find him dead. Is there anything at all that can be done to control this arrhythmia, and if he tries to die on me, should I attempt to revive him?

A: Beta blockers, such as atenolol, are the only class of drugs that in human studies were shown to decrease the incidence of sudden death from ventricular arrhythmias (which is most likely what your dog's erratic heart beat is due to.) So I think it is a good choice for your dog. However, dogs still die while taking any antiarrhythmic medication if their heart disease becomes bad enough. Omega 3 fatty acids (such as found in fish oil) were shown to have some protection for sudden death as well. If you see him collapse suddenly, try to determine if he is breathing or if his heart is still beating. Occasionally people mistake a fainting episode for a heart attack--if he faints, he will revive himself without assistance. If there is no heart beat or breathing, you could try mouth-to-nose resuscitation and chest compressions, but without a cardiac defibrillator, your chances of reviving him are slim.

Q: What's known about the inheritance pattern (if any) of cardio?

A: As far as I know, the mode of inheritance has not been established. However, I have e-mailed one of the experts on the subject (Dr. Calvert at UGA) to see if he is aware of any research that has not been published yet.

Q: Can a dog who suffers sudden death syndrome be resuscitated (spelling??) and has there been any cases where it was documented that the dog lived (and how long) afterward?

A: I've seen several Dobbies with severe DCM have cardiac arrest at clinics I have worked at. Just one was able to be resuscitated and lived an unknown time afterwards. There is more of a chance of the dog surviving for at least some period of time if it happens in a vet clinic with access to a cardiac defibrillator. If it happens at home, the chances are much less likely that he will survive.

Q: Do the dogs who drop dead suddenly do so from ventricular tachycardia, and if so, would it not be advisable to place implantable cardioverter-defibrillators (ICDs) in these dogs as soon as they start to show abnormal changes in EKGs.

A: Sudden death is usually caused by a sustained bout of ventricular tachycardia which then degenerates into ventricular fibrillation. It would be wonderful if we were able to implant cardiac defibrillators and there has been some discussion about trying to do so. However, I believe the cost of the ICDs is the major limiting factor unless, like with pacemakers, you have a human hospital that would donate used ICDs or those that have exceeded their shelf-life. Another problem, especially with Doberman DCM, is that if the arrhythmias don't end their lives, their heart disease will progress, usually shortly thereafter, to the congestive heart failure stages which will.

Q: In a recent discussion with a long time breeder - she says "older" Dobes (8+years) with congestive heart failure do NOT have the type of Cardiomyopathy that is hereditary and that CHF is a "normal" part of aging. Please you explain the difference between sudden death Cardiomyopathy and congestive heart failure.

A: Congestive heart failure is not a normal part of aging. I have echoed many ancient dogs (even a few Dobes!) with beautiful hearts. CHF, be it in geriatric people or dogs, is always due to true pathology (disease) of the heart.

Dilated Cardiomyopathy causing sudden death is the same disease as DCM causing congestive heart failure. They are just 2 different outcomes. With sudden death, the associated arrhythmias are the more lethal part of the disease, and cause the dog to drop over dead suddenly. 25-30% of Dobes with DCM die in this manner. The other 75% may also have ventricular arrhythmias but they are less aggressive and don't cause death. Instead, these dogs die eventually from congestive heart failure (fluid accumulation in the lungs and/or in the abdomen) or from side-effects of the medications being used to treat the CHF.

Q: What is her best guess at when DNA testing for cardio is likely to be available?

A: I am not involved directly in any research in this area and nothing, as far as I know, has been published regarding a DNA test. I am trying to contact the veterinarian who has published the most papers on Doberman DCM to see if he has any additional information. It would be great news if someone was getting close to developing this test.

Q: If one is to claim a dog is "Cardio Clear," must they do both & must it be done every year?

A: It really depends on how strict the breeder wants to be---there are no set rules. In general, we recommend a 24 hour Holter monitor and echocardiogram at least once a year for active breeders.

Q: If the SF in an echo is 30+ and a Holter shows 100 PVC's/hour, should this dog be on meds for acute sudden death?

A: Yes. Even though this dog's echo shows that it has normal heart function, the large number of premature ventricular contractions puts him at risk for sudden death.

Q: If an echo was all that was done, would you say this dog is Cardio clear?

A: No. Some dogs with normal echoes have significant ventricular arrhythmias on the Holter which is an indicator of occult DCM.

Q: Is a 5-10 minute EKG a false sense of security if it shows just a few PVC's?

A: Actually, quite the contrary. Even 1 PVC on a 10 minute EKG is abnormal.

Q: Is a 24 hour Holter the best indicator for an acute sudden death episode?

A: We think so, but there are certainly some dogs with lots of PVCs that don't die suddenly from them. We can't seem to correlate the number of PVCs with the chance for sudden death either, since one dog with 600 PVCs/24 hrs may experience sudden death while another with 2,000/24 hrs won't. There are other features on the Holter that we look for to try to predict a dog's risk for sudden death such as number of runs of rapid ventricular tachycardia (i.e., a lot of PVCs occurring one after another) and R-on-T phenomenon (when one PVC starts before the preceding one completely ends.)

Q: Cardio is a broad term for heart problems. In dogs that are 9 or older that develop heart problems or die suddenly, can it be plain Cardio, or is it DCM, an embolism, a stroke, or can it be just old dog heart?

A: The term "cardio" must have originated with breeders as that term is not used amongst veterinary cardiologists. Instead, we use the specific diagnosis for the actual heart disease. Sudden death in an older dog could be due to a number of different diseases,

cardiac-related or non-cardiac-related. Older dogs' hearts don't just wear out from old age. There is always an associated disease that causes problems such as disease of the heart valves which causes them to become leaky or disease of the heart muscle (DCM).

Q: Have you used Sotalol as a med in dogs with high numbers of PVC's?

A: In my practice I see more Boxers with DCM than Dobes. Thus I have placed a number of Boxers with ventricular arrhythmias on sotalol (trade name--Betapace.) I have been happy with the results. The high cost of the drug is a limiting factor for many of my clients. The one Dobe that I used it on died suddenly about 2 weeks later.

Q: What role the Natural Diet for dogs plays in cardio health in dogs (versus the commercial dog food)? I have my Dobe on the natural diet (raw meat/bones/veggies etc.)

A: I am assuming that you are referring to diets like the Bones And Raw Food diet. These diets have not been proven to prevent DCM, since a dog who has the genes for it will likely develop the disease no matter how healthy its heart is. However the diets won't hurt the heart and they may be useful for other health issues such as allergies.

Q: I have been giving my dogs Fish Oil from weaning on throughout their lives. Is there any truth to the theory that fish oil can help prevent heart muscle damage caused by cardio?

A: Again, no supplement or diet or exercise regime has been proven to prevent DCM. But studies have shown 2 benefits of using fish oil in dogs with DCM. It may help decrease the incidence of sudden death from ventricular arrhythmias (this was a human study, so it still may not apply to dogs, but we hope so) and seems to also help the severe muscle atrophy (cardiac cachexia) that is seen in dog with severe DCM.

Q: I bred a litter in Aug, 2000, and sold a puppy bitch to a couple in North Carolina. I took the puppy to the vet for a health certificate exam the day before she was to be shipped (She was 3 months old). The vet listened to her heart and identified an "irregular heartbeat" - not a murmur. This puppy had been to the vet twice before and her heartbeat was normal. They did an EKG at that time and the results showed several PVCs. My vet said the puppy needed to see a Cardiologist. I notified the buyers I couldn't send them the puppy. I took Mystic to a Cardiologist in the Chicago area about a week later. His exam showed the same result as my vet's - the EKG showed PVCs and her heartbeat was irregular. He did an ultrasound and said there was no evidence of Dilated

Cardiomyopathy. The cardiologist then put a Holter on the puppy for 24 hrs. The results showed 600 PVCs in 24 hrs. The conclusion was that the puppy does not have heart disease - this was something she could outgrow. The Cardiologist said to have an EKG taken six months later and then yearly. The next EKG was slightly irregular, the one following that was normal. I have kept her because I could not let someone else deal with this and the potential heartache of losing her at a young age.

My Question is:

Have you seen a young puppy have PVCs on an EKG and Holter test, but then have Normal EKG results a year later and go on to live a normal life with no evidence of Heart Disease?" or, alternatively, " Have you seen a puppy like this who now at age 20 months has a normal EKG and heart rate, but later, say age 5 or 6, develop Heart Disease?"

A: I have not personally seen a Doberman puppy with PVCs. It is certainly not typical of DCM, especially since the PVCs are decreasing instead of getting worse. There is an article in Kirk's Current Veterinary Therapy (p.749) that describes German Shepherds that develop PVCs and other ventricular arrhythmias between 4 and 12 months of age. This disease is called inherited sudden cardiac death in German Shepherds. About half die suddenly during the first year of life. Others do not, and if they can get past 2 years of age, their PVCs decrease and they tend to live normal lives. The theory in these dogs is that there is an imbalance in the nerves that affect the electrical conduction in the heart and that in some of the puppies the imbalance eventually corrects itself and the dogs normalize. Perhaps that is what happened in your pup. I don't think there is a guarantee though that your puppy will not develop DCM later in life, but I believe it would be a totally separate disease than what she experienced as a puppy.
