

General Information About Dilated Cardiomyopathy in Doberman Pinschers

1. What is dilated cardiomyopathy (DCM)?

Dilated cardiomyopathy is an acquired disease that is characterized by a markedly enlarged and weakened heart muscle. In the Doberman it affects mainly the left ventricle and left atrium. It results in electrical abnormalities (irregular or abnormal or premature beats). These electrical abnormalities may result in sudden death (described below) as the very first clue of a problem in your dog. Most dogs experience symptoms of pulmonary edema with respiratory distress. DCM is observed in dogs, cats and humans, as well as a number of other species.

Dilated cardiomyopathy is always rapidly fatal in Dobermans.

2. What breeds of dogs are affected with DCM?

DCM is more common in large breed dogs than in small breed dogs. However we have observed DCM in a large variety of small breed dogs. In a study that attempted to enroll any dog with DCM throughout North America, more Dobermans were enrolled than all other breeds combined.

The following chart provides a listing of the breeds enrolled with DCM at that time:

| | |
|-----------------------|-------|
| Cocker Spaniels | 4.1% |
| Doberman Pinschers | 55.7% |
| German Shepherds | 5.7% |
| Great Danes | 7.1% |
| Irish Wolfhounds | 4.3% |
| Labrador Retrievers | 5.7% |
| Old English Sheepdogs | 4.3% |
| Terriers | 1.4% |
| Others | 11.4% |

As one can see more Dobermans were enrolled than all other breeds of dogs combined. I take this to suggest that there is more DCM in this breed than in all other breeds combined and to also mean that there must be a genetic predisposition for DCM in the Doberman.

3. What is the cause of DCM?

Most cases of DCM are called idiopathic. This means we do not know the cause of the DCM. Some cases of DCM are due to heart rate abnormalities such as when the heart rate is too high. Other cases are due to a nutritional disorder such as a deficiency of taurine. This does not appear to be the case in the Doberman.

In people, viruses are suspected to cause some cases of DCM. We looked for evidence of parvo virus in Dobermans with DCM and could not find evidence of this virus.

In people, an immune mediated disorder (somewhat like rheumatoid arthritis) has been speculated to cause DCM. We looked for evidence of an immune disorder in Dobermans with DCM and could not find evidence of this process at work.

In people, about 30% of cases of DCM are familial. Sounds somewhat similar for the Doberman.

4. What is the incidence of DCM in the Doberman Pinscher?

Work performed at the University of Guelph has demonstrated that about 50% of all symptom free Dobermans in our area will develop/acquire DCM. Reports out of the University of Georgia indicate that about 50% of symptom free Dobermans studied there will go onto develop/manifest DCM.

5. Does the incidence of DCM in the Doberman Pinscher vary with the sex of the dog?

Males are more affected than females. Our work suggests that about 60% of symptom free male Dobermans in our area will develop/acquire DCM. Also about 40% of symptom free female Dobermans will go onto develop DCM.

6. Does the incidence of DCM vary with the coat color of the Doberman Pinscher?

Our work indicates that red and tan Dobermans are equally affected compared with black and tan Dobermans. The other two phenotypes, blue and Isabella (fawn), are too infrequently studied to be able to address the incidence in these groups.

7. At what age do Dobermans get DCM?

The average age that Dobermans develop symptoms of DCM is 7.5 years of age. However 25% of our dogs developed symptoms of DCM over 10 years of age.

8. What are the usual symptoms of DCM in the Doberman?

Dobermans may manifest one of two common symptoms related to DCM. Respiratory distress, usually noted as a cough, wheeze, or labored breathing, is the most common symptom of DCM. The next common symptom is called sudden death. In sudden death owners usually observe that their dog was running in the yard then fell over and died. They are dead within a couple minutes. One third of all Dobermans destined to develop/acquire DCM will experience sudden death as the first symptom of their disease. A few dogs are noted to demonstrate a loss of stamina (also called exercise intolerance) as the main sign of DCM.

9. What is sudden death in Doberman Pinschers?

Sudden death is a common symptom of DCM in otherwise symptom free Doberman Pinschers. We presume that the dog developed a severe rhythm disturbance (ventricular fibrillation) which resulted in essentially no output from the heart and subsequent death. Sudden death is death that occurred within one hour of what appeared to be a stable individual. Essentially sudden death represents unexpected death.

Sudden death is the first and thus only symptom of DCM in one third of all Dobermans destined to develop/acquire DCM. The presence of frequent PVCs (or VPCs) likely identifies dogs at risk for sudden death. We believe that a Holter exam (a 24-hour ECG; it collects about 130,000 beats in 24 hours) is the best test one can perform to check for the risk of developing sudden death in a symptom free Doberman.

10. What is the prognosis for Dobermans with DCM?

The prognosis for Dobermans with DCM is much worse than for other breeds of dogs with DCM. It is reported that the average survival for Dobermans with congestive heart failure due to DCM is 90 days with the best of current medication (as of May 2000); whereas the average survival for non-Dobermans with congestive heart failure due to DCM is 280 days with the best of current medication (as of May 2000).

11. What is occult DCM?

Occult DCM refers to dogs that have some abnormality with their heart but demonstrate no symptoms for their owners. Thus the owners are unaware that within the chest a problem is stirring. Only when the cardiac disorder becomes more severe do dogs manifest symptoms of heart failure. The current criteria we have observed and are using to indicate that a dog is in the occult stage of DCM is evidence of heart enlargement on cardiac ultrasound (echocardiography) or the presence of irregularities in the heart rhythm (finding PVCs on the ECG).

All dogs that are destined to develop DCM and congestive heart failure manifest a time chart (or time line) that goes through three stages. The first stage is characterized by the absence of symptoms of heart disease and a normal heart on all clinical tests (including echocardiography, ECG, Holter, and other tests). The second stage, we are calling occult DCM, is characterized by the absence of symptoms of heart disease but evidence of DCM based on clinical tests (especially echocardiography, ECG, or Holter). The third stage, we are calling overt DCM, is characterized by symptoms of heart failure and evidence of DCM based on clinical tests.

As of today (May 2000), using markers of occult DCM developed at the University of Guelph, the average duration of this occult DCM stage is about 2 years.

We have also shown that the introduction of an angiotensin converting enzyme inhibitor during this occult stage of DCM will delay the progression to the third and final stage of DCM by at least an additional 1 year above and beyond the average two years for Dobermans not treated.

12. What is a Holter monitor?

A Holter monitor or recording (also called ambulatory electrocardiography) is a recorder (usually a cassette recorder although some now hold and use a small computer chip) that is placed or attached to the chest of the dog with bandage material. It enables one to collect all the heart beats a dog (or person) will produce in 24 hours. Also importantly this is done in the environment of the dog, that is in the dog's household and while the dog is running at the park, etc. Hence we are able to relate any abnormalities to the activity of the dog should there be a relationship.

13. What does a Holter examination tell us?

A Holter exam is used to tell us:

- If an apparently normal Doberman has reached the second stage of DCM (also called occult DCM). If this is the case it means the dog should be started on medication to delay the progression to the third and final stage of DCM.
- That the dog is at risk for developing sudden death.

As of today (May 2000), the Holter exam provides us with 24 hours of ECG (this will collect about 130,000 heart beats). This test will allow us to determine the presence and number and complexity of abnormal heart beats (called PVCs) (potentially a very strong marker for dogs in stage two of DCM and destined to die of DCM if the frequency and or complexity of PVCs is substantial). In addition, this test will allow us to measure Heart Rate Variability (a measure of the balance of adrenalin in the body and a risk marker for people and presumably dogs at risk for sudden death).

Most Holter exams are analyzed by human laboratories. As a result the data usually carries many errors, due to the differences between dogs and people. Overall, it should be able to tell you if PVCs were present or not but an accurate count is usually not available.

I recommend you have your Holter exam analyzed by a veterinary institution. At the University of Guelph we employ a rigorous quality control program on all analyses such that each 24-hour exam requires from 2 to 5 hours of work to correct/review the automated analysis by the analyzer to ensure an accurate report.

14. What are PVCs or VPCs?

PVCs refer to premature ventricular contractions. VPCs refer to ventricular premature contractions. These are identical; two short forms for the same thing. They can only be identified on the ECG whether it is a short study (up to 3 minutes) or a 24-hour study (Holter exam). PVCs occur in the second and third stages of DCM.

PVCs are of most interest to us in symptom free Dobermans because their presence serves as a marker for Dobermans in the second stage of DCM (occult DCM) if they are sufficiently frequent. We used to believe that all symptom free Dobermans with as few as 1 VPC on a 3 to 6-minute ECG identified dogs in stage two of DCM. However, we have observed a number of dogs with very few VPCs on a routine ECG that over many years never went onto develop DCM. Thus, dogs with very few VPCs may or may not be destined to acquire DCM.

15. Is a routine ECG better than a Holter Exam?

Both the routine ECG (a 3 to 6-minute exam) and the Holter are used to determine if PVCs are present so as to ascertain if that symptom free Doberman has occult DCM. PVCs can occur very intermittently. We have observed one dog that had 2 PVCs in a one hour period and had 2500 PVCs in the subsequent hour. So you can see how easy it could have been to miss the fact that lots of PVCs are occurring in that individual. It has been clearly demonstrated in people that at least 8 hours of Holter should be collected. So the answer to the question is without a doubt a Holter exam is profoundly superior to a routine ECG.

The only reason to use a routine ECG instead of a Holter exam is for those people that cannot have one performed on their Doberman. In the past it was difficult to obtain a Holter exam on Dobermans in certain areas of the country. With the current Holter Project at the University of Guelph, your dog can have a Holter performed as long as you have a postal address that directs the location for us to send the recorder.

You might have thought that a routine ECG might be substantially cheaper than a Holter. The cost of participating in the Holter Project at the University of Guelph is only \$60. The usual cost for this type of examination through your veterinarian is more than \$250.

16. Is a Holter study better than an ultrasound or chest x-ray?

I believe a Holter exam and a cardiac ultrasound (echocardiogram) are vastly superior to a routine chest x-ray to screen symptom free Dobermans for occult DCM. We have not tested whether on average the Holter exam is superior to the echocardiogram in screening symptom free Dobermans for occult DCM. Clearly we see some dogs that show enlargement before irregular beats (PVCs) and so echocardiography would be the better test in these cases. However, on average it is my belief that the Holter examination will identify dogs that have reached the second stage of DCM (occult DCM) earlier than the echocardiogram. Recognize that the earlier a Doberman can be recognized as in the occult stage of DCM the sooner therapies can be started to help him/her.

Note that one test identifies abnormalities of heart size and strength (the echocardiogram) and the other identifies electrical abnormalities (presence of PVCs) (the Holter exam). Hence, the best scenario is to do both tests.

Today the Holter examination is much cheaper (if performed as part of the Holter Project research performed at the University of Guelph, only \$60).

17. Should your Doberman have a Holter examination?

If you want to have an opportunity to identify the potential for your symptom free Doberman to develop DCM, then you should have a Holter exam performed.

If you want the chance to delay DCM by starting medication as soon as necessary, then you should have a Holter exam performed. If you participate in the Holter Project at the University of Guelph you are also given an opportunity to participate in a treatment trial that offers the potential for your dog to receive the very latest drugs.

If you want to be part of an effort to both help your Doberman and help all Dobermans, then you should have a Holter exam performed and have it performed by the Holter Project of the University of Guelph.

If you want to check your Doberman at your convenience and in your home, then you should have a Holter exam performed and have it performed by the Holter project of the University of Guelph.

If you live somewhat remote from a cardiologist that can perform a cardiac ultrasound examination, then a Holter exam is much easier to perform and much cheaper. As long as you have a postal address, anyone with a symptom free Doberman anywhere in the world can participate in the Holter Project research performed at the University of Guelph, only \$60.

Please see more information about this Holter Project at the University of Guelph. This project will Holter your symptom free Doberman once yearly.

18. Who should participate in a research project involving Doberman Heart Disease?

All Doberman fanciers should participate. "If we don't care to help make life better for our breed then who should." Participating in any prospective project gives you a chance to assess the status of your dog and the greatest chance to extend both the length and quality of life of your

dog. In addition, you are giving something back to the breed by supporting an effort to extend the life of all Dobes.

Please see more information about this Holter Project at the University of Guelph.

19. What do you as an owner get out of having your dog enrolled into a heart study? The Holter Study?

You get the opportunity to find out that your dog has stage two DCM (occult DCM) before you would ever know your dog has heart disease. This way you have a chance to extend the length of quality life for your dog with early treatment.

You also have a chance to participate in a large effort to find better ways to diagnose and treat Dobermans with occult DCM and overt DCM (congestive heart failure due to DCM).

20. What can you do as a Doberman fancier to help reduce heart disease in our breed?

Enroll your Doberman in a prospective study. Encourage other Doberman fanciers to participate in heart disease research. And finally, participate in efforts to raise funds to further efforts to reduce the significance of heart disease in the Doberman breed.

For information on how you can contribute to Doberman Heart Disease Research at the University of Guelph click [here](#).

21. What work is being done at the University of Guelph with respect to heart disease research in the Doberman Pinscher?

CURRENT WORK

THE WELL DOBERMAN PROJECT - This work began 11 years ago. We are studying the natural history of DCM in the Doberman breed. We have been and are continuing to ask the owners of symptom free Dobermans to allow us the opportunity to examine their dogs once yearly. Each examination consists of a physical exam, ECG, and cardiac ultrasound exam. We have examined over 800 dogs in this time period. The objectives of this work have been to:

- Determine the incidence of DCM in the Doberman breed
- Determine if there is a gender difference in the incidence of DCM in the Doberman breed
- Determine if there is a coat color difference in the incidence of DCM in the Doberman breed
- Identify markers of occult DCM
- Identify therapies to delay the development of congestive heart failure in dogs with occult DCM

THE CONGESTIVE HEART FAILURE DOBERMAN PROJECT - This work has also been in progress for the past 11 years. We are studying the ability of newer therapeutic measures to extend the length and quality of life for Dobermans in congestive heart failure (stage 3 DCM).

THE HOLTER PROJECT - This work has been underway for the past 6 months. The objectives of this work are to:

- Determine the incidence of DCM in Dobermans in various regions of the world.
- Identify markers of occult DCM in symptom free Dobermans
- Identify markers for sudden death in symptom free Dobermans

- Identify newer drugs to reduce the incidence of sudden death in symptom free Dobermans
- Identify newer drugs to delay the progression of occult DCM to overt DCM (congestive heart failure).

22. What are some of our future plans with respect to research into DCM of Doberman Pinschers?

I. To study the role of a new beta blocker, carvedilol, in Dobermans with occult DCM, to delay the progression to overt DCM. To date we have enrolled 15 Doberman Pinschers with occult DCM into this project.

II. To study the ability of pimobendan in Dobermans with overt DCM (congestive heart failure) to extend survival and improve the quality of life. To date we have enrolled 3 Doberman Pinschers with congestive heart failure due to DCM into this project.

III. To expand the Holter project via increased enrollment and begin the study of new antiarrhythmic agents to prevent / delay sudden death. Between July 2000 and July 2001 we are hoping to enroll 1000 symptom free Dobermans from around the world.

IV. We have made contact with a molecular biologist that has found the gene responsible for numerous disorders in people. He is an investigator at the Ottawa Heart Institute. We have begun discussions with a view to having his group find the genes responsible for DCM in Dobermans. We will know in the next month if his group will work with tissue samples from our dogs to find the culprit genes.

V. We will shortly examine the use of measures of diastolic function (measures of the ability of the heart to relax) to identify symptom free Dobermans as occult DCM at an earlier time than is currently possible.

VI. We will shortly examine the ability of a blood test, level of big endothelin, to predict dogs with occult DCM.

VII. We will shortly examine the ability of a blood test, level of big endothelin, to predict the length of survival for dogs with overt DCM.

VIII. Work with investigators at the Toronto General Hospital to determine the role of a nutritional cocktail supplement to protect Dobermans in congestive heart failure.

IX. To date there are more than 10 drugs worthy of studying in Dobermans with congestive heart failure with a view to determining if they can reduce mortality.

X. To date there are more than 8 drugs worthy of studying in Dobermans with occult DCM with a view to determining if they can delay the progression to overt DCM (stage 3 DCM).

23. List some of the projects we have previously undertaken in the area of DCM of Doberman Pinschers.

I. We studied the role of Enalapril to improve survival in Dobermans with congestive heart failure.

II. We studied the role of a neuroendopeptidase inhibitor (increase the availability of ANP) to improve survival in Dobermans with congestive heart failure.

III. We studied the role of pacemaker therapy (VDD pacing) to improve survival in Dobermans with congestive heart failure.

IV. We studied the role of heart rate variability to identify dogs with occult DCM.

V. We studied the role of stressing the heart with dobutamine to identify dogs with occult DCM.

VI. We studied the role of the plasma norepinephrine response to treadmill exercise to identify dogs with occult DCM.

VII. We studied the levels of myocardial myoglobin in Dobermans with occult DCM, overt DCM and normal Dobermans.

VIII. We began a study of the utility of the Batista Procedure (partial left ventriculectomy) in the treatment of congestive heart failure due to DCM in Doberman Pinschers.

IX. We studied the role of parvo virus infection as a cause for DCM in Doberman Pinschers.

X. We studied the role of antibodies directed against the heart as a cause for DCM in Doberman Pinschers.

XI. We collaborated with Iowa State University to determine the role of mitochondrial genetic material as a cause for DCM in Doberman Pinschers.

XII. We collaborated with Texas A&M University to determine the role of the dystrophin gene in the cause of DCM in Doberman Pinschers.

XIII. We collaborated with Texas A&M University in examining pedigrees of affected Doberman Pinschers to determine the mode of inheritance of DCM in this breed.

24. How is DCM diagnosed in Doberman Pinschers?

OVERT DCM (DOGS WITH CONGESTIVE HEART FAILURE DUE TO DCM):

The diagnosis of DCM is relatively easy in these dogs. These are dogs that present with respiratory distress symptoms. Physical examination reveals:

- A heart murmur in 100% of dogs
- An S3 gallop in most dogs
- Irregular beats in most dogs

An ECG reveals:

- A normal sinus rhythm in most dogs
- A few intermittent PVCs in most dogs
- Atrial fibrillation in 25% of dogs

Thoracic radiographs reveal:

- Generalized heart enlargement especially of the left ventricle and left atrium in all dogs
- Pulmonary edema in all dogs

Cardiac Ultrasound reveals:

- Dilation of the left ventricle and left atrium
- A very weak left ventricle
- Mitral valve insufficiency

OCCULT DCM:

The diagnosis of occult DCM can be difficult. These dogs are free of symptoms of heart disease, that is the owners believe their dogs are normal. The ideal tools to identify these dogs are cardiac ultrasound, routine ECG, and Holter monitoring.

Cardiac Ultrasound reveals:

- Left ventricular enlargement: in diastole > 49 mm, or in systole > 42 mm. Note that these measurements can vary tremendously depending on the experience of the technician that generates this data.

Routine ECG is a 3 to 6-minute rhythm trace. This reveals:

- At least 1 PVC/min. in most dogs.

24-hour Holter reveals:

- At this time we are uncertain as to the threshold of the frequency of PVCs that indicates dogs in the occult stage of DCM. Our present work with the Holter Project at the University of Guelph will shortly establish the thresholds indicating dogs affected with occult DCM. As of today, we believe a level of > 50 PVCs /hour indicates Dobermans affected with occult DCM.
- Other issues about PVCs such as degree of complexity (PVCs occurring as doublets and triplets, or runs of non sustained ventricular tachycardia) will undoubtedly be found to identify dogs with occult DCM. Our present work with the Holter Project at the University of Guelph will shortly establish the thresholds indicating dogs affected with occult DCM.

25. How should DCM be treated in Doberman Pinschers?

OCCULT DCM:

- Angiotensin converting enzyme inhibitors have been demonstrated to retard the progression to overt DCM. This effect has been much more dramatic in male Dobermans compared with female Dobermans
- We are currently working with a new beta blocker, carvedilol, to determine if it can confer additional protection beyond that provided by angiotensin converting enzyme inhibitors.
- In the near future we anticipate assessing many more agents.

OCCULT DCM WITH LOTS OF PVCs:

- PVCs are a common part of DCM in both the occult stage and overt stage. I assess the presence of these as more a sign of occult DCM as opposed to a sign of risk for sudden death. In the near future we hope to describe criteria concerning the nature of the PVCs (and not just their presence) that indicate a real risk for sudden death and not just that occult DCM is present. Once this has been determined, we will be assessing a range of drugs to determine their ability to reduce the risk of sudden death.
- Today (May 2000), we have been using sotalol to attempt to protect these dogs from sudden death, if we suspect (but unproven) that they are at an increased risk for sudden death.

CONGESTIVE HEART FAILURE WITH DCM:

- Today (May 2000), we administer angiotensin converting enzyme inhibitors and diuretics.
- The highest recommended dose of the angiotensin converting enzyme inhibitor appears to be the best dose.
- I am continually searching for the least dose of the diuretic that maintains ease of breathing. The lesser the dose we can use the better in the long run for the dog.
- I don't use digoxin. It is associated with a lot of toxicity and unproven efficacy.
- No other drugs are of proven benefit in the dog. However, we are learning to use the following agents:

Beta blockers, especially carvedilol. Carvedilol is proven to help people with overt DCM. This agent can initially and immediately make the dog worse. Hence, it appears we need to start the dog on a very low dose and increase it slowly. Also it may be best to start this agent after pulmonary edema has been corrected.

Spironolactone. This agent is more than a diuretic, in fact I find it is too weak a diuretic to be useful as such. However its other properties as an agent that blocks the hormone aldosterone appear to be responsible for its benefits in people with heart failure. We are only now learning how to use this agent.

- A vital part of the treatment of this disease is the follow-up. I recommend the first recheck occur on 3 to 5 days after first exam. The objective here is to attempt to reduce the dose of diuretic required. I routinely perform a lateral chest radiograph and a serum assessment of kidney function. I also check the heart rhythm for frequency of PVCs or atrial fibrillation. The next checkup occurs about 1 week after first examination, then at 2 weeks, 4 weeks, and then once monthly. The objective is always the same:

- To attempt to reduce the dose of diuretic. As the disease progresses the need for diuretic increases. I check a lateral chest x-ray and serum kidney test to help me decide to reduce the diuretic dose.

-To assess cardiac rhythm

ATRIAL FIBRILLATION AND CONGESTIVE HEART FAILURE WITH DCM:

In addition to the drugs described above, dogs with atrial fibrillation need to receive drugs with the objective of reducing the heart rate. Many Dobermans with atrial fibrillation have heart rates over 200 beats per minute. Our goal is to reduce the heart rate to about 160 beats per minute. Drugs to accomplish this are:

Beta blockers:

- * Atenolol
- * Carvedilol
- * Sotalol

Calcium channel blockers:

- * Diltiazem. As of today (May 2000), this may be our best agent to slow the heart rate.
- * Digoxin. This drug will probably not be effective if the heart rate is over 200 beats per minute before therapy. Hence, additional agents will likely be needed.

A vital part of the treatment of this disease is the follow-up just like above. In addition to the issues described above, the rechecks also focus on checking the heart rate with a view to determining if we have achieved the target heart rate. Some nervous dogs may be better assessed with a Holter exam, which will give us the heart rate at home and the trends in the rate throughout the day.

26. Is there anything I can do to prevent my Dobe from developing DCM?

Absolutely nothing.

About 50% of all Dobermans in North America can be expected to develop/acquire DCM. The most anyone can do is to enroll their Doberman in a prospective heart disease study such as the Holter Project underway at the University of Guelph. Enrollment in one of these studies will offer the owner an opportunity to determine if their dog is in the occult stage of DCM. If so, this will allow the owner an opportunity to start early therapy that will delay the progression of DCM. Thus, the most you can do to prevent your Dobe from getting DCM is to find out as soon as possible if your dog has occult DCM so you can start therapy ASAP to delay the progression of DCM.

27. What is Atrial Fibrillation?

Atrial fibrillation is a chaotic rhythm disturbance that is usually part of DCM. We often observe that Dobermans in the occult stage of DCM progress to the overt stage of DCM (that is congestive heart failure) with the development of atrial fibrillation. Thus atrial fibrillation is usually an added complication of DCM that pushes dogs into heart failure.

Atrial fibrillation is a more common complication of Dobermans with DCM than with DCM in other breeds of dogs.

28. Why is atrial fibrillation an issue for Doberman Pinschers?

Dobermans with atrial fibrillation and DCM die sooner than Dobermans with DCM without atrial fibrillation. Recall that the average survival for Dobermans with DCM and congestive heart failure and no atrial fibrillation is 90 days.

29. If my dog has a Holter or cardiac ultrasound and it is normal does this mean he will not get DCM?

A normal exam today (be it by Holter or cardiac ultrasound or even routine ECG [however, this

is markedly inferior to the other two tests]) does not ensure that the dog will be normal for the rest of his/her life. 25% of our dogs that developed DCM were over 10 years of age. Nevertheless this is the best you can do at this time. Our work indicates that it is profoundly unlikely that a dog that passes on one of these two exams will develop DCM within the next two years. Beyond two years we can not predict at this time. Thus all symptom free Dobermans should be in a yearly screening program.