

# Ventricular Arrhythmias in Doberman Pinschers

Mass Veterinary Cardiology Services (MVC)  
Pembroke, MA  
Email: [NancyMorris@verizon.net](mailto:NancyMorris@verizon.net)  
Office Phone/Fax: 781-826-7608

By Nancy Morris DVM, Diplomate ACVIM Cardiology

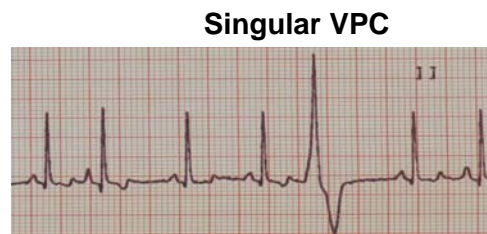
25-30% of affected Dobermans die suddenly of ventricular tachycardia-fibrillation prior to the onset of congestive heart failure (CHF).<sup>(1-3)</sup> Ventricular tachycardia may also occur when the heart dilates and the left ventricular function worsens. Sustained ventricular tachycardia at fast heart rates can cause acute worsening of heart function rapidly over days to weeks if they remain untreated. This can precipitate the acute onset of coughing and fluid in the lungs or pulmonary edema, as DCM worsens.

## Doberman Cardiomyopathy: What is Ventricular Tachycardia?

The heart has an electrical generator system, conduit, and electrical switching station, within it. When an electrical impulse is transmitted this causes the heart to beat or contract. When the ventricles of the heart are diseased, the electrical impulse that causes the heart muscle to contract is transmitted abnormally and it results in an electrical waveform recording on either EKG or 24 hour Holter monitor that is usually faster than the baseline heart beats. The abnormal beats arising from the diseased ventricles do not behave like normal heart beats. They may be very fast or in strings of ventricular premature beats, called ventricular tachycardia.

Singular ventricular premature beats (VPC's) are considered abnormal if there are more than 50 to 100 of them recorded during a 24 hour holter monitor study. An EKG is a short recording of the electrical activity of the heart but it only records up to 2 minutes out of a 24 hour period.

If the EKG is normal, the 24 hour holter monitor recording may be abnormal because of the prolonged recording time. EKG's are generally a poor means of identifying ventricular arrhythmias in Doberman Pinschers unless the arrhythmias are frequent or severe. Singular VPC's when, compared with couplets, triplets or runs of ventricular tachycardia, are not as dangerous as the latter. The risk for sudden death from arrhythmias increases as the numbers of couplets, triplets or runs of ventricular tachycardia increase on a 24 hour holter study. These abnormal heart beats may be sustained and occur at rates that are so fast that the pumping of the heart is ineffective and oxygen is not carried to the dogs brain adequately. When this occurs the dog will faint or experience syncope, when he exerts.



**Ventricular Tachycardia**

If the abnormally fast heart beats slow down, the dog will wake up or experience aborted sudden death. If the fast and abnormal rhythm continues for just a few minutes continuously, the dog will die.

There are many medicines that may be used to treat ventricular tachycardia with the goal being to improve the abnormal beats and revert the heart rhythm to more normal and regular beating. The second reason to treat arrhythmias is to try to prevent sudden death from lethal arrhythmias. A famous medical scientific study performed in people in the 1980's called the Cardiac Arrhythmia Suppression Trial (CAST) demonstrated that some of the drugs used to treat ventricular arrhythmias could actually worsen the arrhythmias and the trial was stopped because people receiving certain medications had a higher incidence of sudden death than those not receiving medications. The CAST study spawned a series of studies on these drugs and the findings showed that it was not possible to predict which person will benefit from which medicine to treat abnormal heart beats. Further research in people has led to knowledge of which medications are most likely to result in improvement in specific patient populations such as patients with arrhythmia and dilated cardiomyopathy (DCM). Most antiarrhythmic medications have the ability to cause "proarrhythmias" or worsening of the arrhythmias they are being used to treat. The same drug that causes proarrhythmia in one person may not in another person. Another important finding of all of these studies, in people, is that no drug used to treat ventricular tachycardia has been shown to prevent sudden death, even if it improves symptoms of syncope or fainting and even if the ventricular arrhythmias are markedly improved on the medication. To complicate matters even more, none of these kinds of studies have been performed in dogs. Dogs are similar to people but they sometimes do not react to medication as a person would.



**Doberman wearing a holter**

### **Ventricular Tachycardia with Collapse**



sustained ventricular tachycardia. Dogs that are experiencing symptoms or fainting are always put on medications to try to improve these symptoms. Monitoring of arrhythmias after treatment is always advisable to ensure that medications are helping and not worsening the abnormal rhythms. Follow-up 24 hour holter monitoring is often the best way to achieve this goal. Generally, singular VPC's even relatively high numbers on a 24 hr holter study are not treated with medications. We do not know if medications to treat ventricular tachycardia in dogs results in a decrease in the incidence of sudden death. In addition, the natural day to day variation in numbers of VPC's and severity of ventricular arrhythmias without treatment remains unknown in Doberman Pinschers. The 24 hour holter monitoring study is typically used to determine drug efficacy. All veterinary cardiologists make the assumption that if the holter study is improved on medications that the medication is responsible for the improvement. However, we do not know if this is actually the case. With the support and help of Doberman Pinscher owner/breeders we will know shortly.

For the reason's cited above, treatment of ventricular tachycardia with medications is generally reserved for dogs experiencing many couplets, short runs of fast ventricular tachycardia or

Mass Veterinary Cardiology Services of Pembroke, MA and Dr. Nancy Morris are performing a study, now in Dobermans with known ventricular arrhythmias, to determine

the day to day variation in abnormal heart beats without treatment. The study involves Doberman Pinschers with known abnormal holter results, that are receiving no antiarrhythmic medications, but maybe receiving other cardiac medications. Each dog has 7 days of continuous holter recording performed. Three Dobermans have participated and completed the study to date. Our goal is to enroll 7 more dogs for this study before March 2007. Findings from this study may provide the foundation to determine which drugs are best used in Dobermans, and which drugs if any decrease the incidence of sudden death. Preliminary results will be presented in the next issue of Doberman Digest. Please consider volunteering your dog for this study, if you know that he or she has abnormal ventricular arrhythmias, and/or dilated cardiomyopathy. Contact Susan Krom, Director of Cardiology Services, at 413-530-6819 for more information.

## References

1. Calvert CA, Wall M: Results of ambulatory electrocardiography in overtly healthy Doberman Pinschers with equivocal echocardiographic evidence of dilated cardiomyopathy. *J Am Vet Med Assoc.* 2001 Sept 15;219 (6): 782-784.
2. Calvert CA, Jacobs G, Pickus CW, Smith DD: Results of ambulatory electrocardiography in overtly healthy Doberman Pinschers with echocardiographic abnormalities. *J Am Vet Med Assoc.* 2000 Nov 1;217 (9): 1328-1332.
3. Calvert CA, Jacobs G, Smith D, Rathbun S, Pickus C: Association between results of ambulatory electrocardiography and development of cardiomyopathy during long-term follow-up of Doberman Pinschers. *J Am Vet Med Assoc.* 2000 Jan 1; 216(1): 34-39.