



Heart Clinic

12th October 2018

Hosted by the Dalmatian Club of New South Wales

Frequently Asked Questions

Part 1 - What is heart disease?



Q: What are the signs of heart disease?

A: The signs of heart disease can be subtle and easily mistaken for changes associated with aging, and dogs and cats are affected differently. You and your veterinarian should watch for any of the following signs in your pet:

- Reluctance to exercise or play
- Overly tired, lethargic
- Breathlessness or difficulty breathing
- Coughing
- Collapsing or fainting

Remember, some signs of heart disease can only be detected by your veterinarian as part of a thorough examination. These include:

- Gallop rhythm (in cats)
- Irregular heartbeat (arrhythmia)
- Audible sounds between the heartbeat (murmur)

Q: What is DCM (Dilated Cardiomyopathy)?

A: Dilated cardiomyopathy (DCM) is a disease of the heart muscle that is characterized by an enlarged heart that does not function properly. With DCM, both the upper and lower chambers of the heart become enlarged, with one side being more severely affected than the other. When the ventricle, or lower chamber, becomes enlarged, its ability to pump blood out into the lungs and body deteriorates. When the heart's ventricle does not pump enough blood into the lungs, fluid begins to accumulate in the lungs. An enlarged heart soon becomes overloaded, and this often leads to congestive heart failure (CHF). The incidence of DCM in dogs increases with age, usually affecting dogs between four and ten years old.

The major symptoms of DCM include lethargy, anorexia, rapid and excessive breathing, shortness of breath, coughing, abdominal distension, and transient loss of consciousness. In some cases, dogs with preclinical (prior to the appearance of symptoms) DCM may be given a questionable diagnosis because it appears to be in fine health. On the other hand, a thorough physical exam can make apparent some of the subtle symptoms of DCM, such as pulse deficits, ventricular or supraventricular premature contractions (within the ventricles and above the ventricles, respectively), and slow capillary refill time. The dog's breathing sounds may also have a muffled or crackling sound due to the presence of fluid in the lungs.

Q: What is HCM (H Cardiomyopathy)?

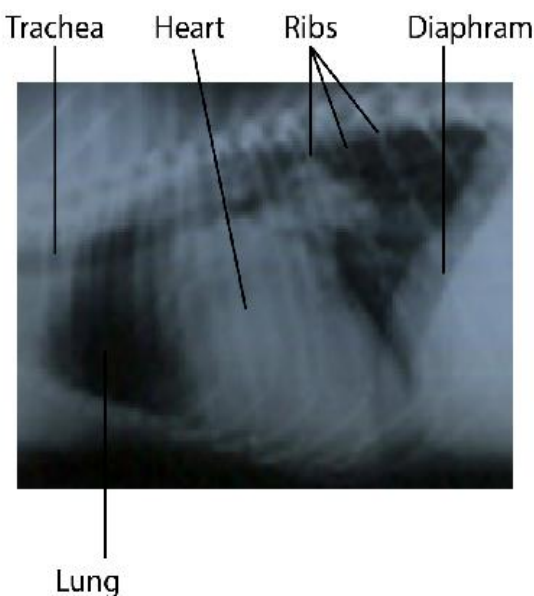
A: Hypertrophic cardiomyopathy (HCM) is a rare form of heart muscle disease in dogs. It is characterized by a thickening of the walls of the heart, which leads to an inadequate amount of blood being pumped out into the body when the heart contracts during the systolic phase (pushing blood out into the arteries). When the heart relaxes between contractions during the diastolic phase (taking blood in from the vessels), an insufficient amount of blood will fill the chambers of the heart. Ultimately, HCM often will lead to congestive heart failure. This disease more typically affects young male dogs that are younger than three years old.

Most dogs with HCM will not exhibit any symptoms of the disease. If your dog is symptomatic, it will exhibit signs of congestive heart failure. These include exercise intolerance, shortness of breath, coughing, and a bluish discoloration of the skin. Very rarely, a dog with HCM may experience a transient loss of consciousness, or fainting, during a high level of activity or exercise. During a physical veterinary examination, a dog with HCM may exhibit systolic heart murmur, and a heart gallop. Unfortunately, in most cases, the most commonly reported clinical sign of HCM is sudden, fatal heart failure.

Q: How is the condition diagnosed?

A: Before a diagnosis of dilated cardiomyopathy is made, several tests are performed to assess different aspects of heart function.

Auscultation. Listening to the chest with a stethoscope allows the veterinarian to identify murmurs due to the improper closure of heart valves. The murmur's location and intensity helps determine its significance. Heart rhythm is also assessed during auscultation, and if there are concerns, the veterinarian may simultaneously palpate or feel the pulse to determine its strength and rhythm. Auscultation is also used to evaluate the lungs.



Blood and urine tests. We are especially concerned about liver and kidney function because these organs are often impaired in heart disease.

Chest X-rays. Chest radiographs allow us to examine the lungs and measure the size and shape of the heart. Dilated cardiomyopathy usually causes obvious enlargement of the heart, particularly the left side.

Electrocardiogram (ECG). This is an assessment based on the electrical activity of the heart. It allows us to accurately determine heart rate and to diagnose any abnormal rhythms.

Ultrasound examination (echocardiogram). This gives the most accurate determination of each heart chamber's size and thickness of the heart walls. Measurements of the heart contractions can be taken to evaluate the heart's pumping efficiency.

Q: Can dilated cardiomyopathy be cured?

A: Unfortunately, there are no guarantees in medicine. DCM is a serious disease that must be accurately diagnosed and aggressively treated. Some dogs with DCM do well with treatment; however, some dogs will never resume a normal lifestyle. Dogs that have developed clinical signs of heart failure have a worse prognosis than those that are put onto cardiac medication in the early stages of the disease. Your veterinarian will guide you through the diagnostic and treatment process to ensure that your pet receives the highest standard of care.

Q: Is there a treatment for heart failure caused by dilated cardiomyopathy?

A: If the dog has a sudden onset of heart failure, rapid administration of the proper drugs is essential to survival. The following drugs may be used at various stages of treatment.

1. **Diuretics.** These drugs stimulate the kidneys to remove excess fluid from the body. Frusemide is most commonly used, although others will be selected in certain circumstances.
2. **Enzyme blockers.** This is a relatively new class of drugs which can directly block the compensation system that has gone out of control.
3. **Vasodilators.** These drugs dilate the arteries and/or the veins of the body so that the heart doesn't have to generate as much pressure to eject blood. They are effective long-term to stabilise the patient.
4. **Digitalis glycosides.** These drugs improve heart function in several ways. They regulate excess hormones that have been released, slow the heart rate, and strengthen each contraction of the heart.
5. **Bronchodilators** which help breathing in a fluid compromised lung.

Q: Is DCM in dogs inherited/Genetic?

A: [Dilated cardiomyopathy (DCM) in dogs--pathological, clinical, diagnosis and genetic aspects].

Dilated cardiomyopathy (DCM) is a heart disease which is often found in humans and animals. The age of onset of this progressive disease varies between 3 and 7 years of age. A juvenile form of DCM has been found in Portuguese Water Dogs and Doberman Pinscher Dogs. Some breeds such as Doberman pinscher, Newfoundland, Portuguese Water dog, Boxer, Great Dane, Cocker Spaniel and Irish Wolfhound exhibit a higher prevalence to DCM. There also seems to be a sex predisposition as male dogs are affected more often than female dogs and in Great Danes an X-linked recessive inheritance is likely. In Newfoundland and Boxer an autosomal dominant inheritance was found whereas an autosomal recessive inheritance was described in Portuguese Water Dogs. Atrial fibrillation as a cause or consequence of DCM is assumed for certain breeds. The causes of DCM are widely unknown in dogs. A genetic basis for this heart disease seems to exist. Apart from a few exceptions the mode of inheritance and the possible underlying gene mutations are not known for DCM in dogs. In humans mutations in several genes responsible for DCM have been identified. Comparative genetic analyses in dogs using genes causing DCM in men and a genome-wide scan with anonymous markers were not able to detect causative mutations or genomic regions harboring gene loci linked to DCM. The investigation of the genetic basis of canine DCM may lead to new insights into the pathogenesis of DCM and may result in new therapeutic approaches and breeding strategies.

Q: Are there any Dalmatians affected by DCM and HCM in Australia?

A: Within the last 12 months there has been 11 reported cases of Dalmatians dying of DCM (Dilated Cardiomyopathy) and 6 definite, but possibly more, from HCM (Hypertrophic cardiomyopathy) Not all of these were from within the 11 month period but over a period of time. There is possibly many more that we have not heard about.





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Frequently Asked Questions

Part 2 - Why run this clinic?

Q: Why is this clinic being run?

A: This clinic and breed study has been organised as the result of determined breeders throughout Australia who are concerned about the increasing cases of heart problems in our beloved breed. Lee-Anne Osmond has been the driving force behind this clinic after having a very tragic experience with her first and only litter, that resulted in multiple heart problems in some of the pups.

Breeders and pet owners alike are concerned about the direction of these increasing rates of heart problems and want to help to put a stop to it before it becomes a serious problem throughout the breed, such as in Dobermans and Cavalier King Charles Spaniels, just to name a couple.

Thus this clinic is step one in the process to be able to prevent this heart disease from becoming a serious problem, rather than waiting and acting after it has happened. Losing our beloved pets at a ripe old age is hard enough. Losing them early in life from disease is even more heartbreaking for their families. Through genetics and science this condition is preventable, so together, let's take steps to help keep our Dalmatians healthy, happy and safe.

Q: What is the purpose of this clinic?

A: The immediate purpose of this clinic being run at the Nationals is to test as many ANKC registered Dalmatians as possible to build up a testing data base and hopefully find some affected dogs or potential carriers. From this data base and annual testing for approximately five years, we will identify the exact condition affecting our breed, which is currently suspected to be DCM (dilated cardiomyopathy).

A subsequent purpose of this clinic is to offer testing to all breeds of dogs and their owners to test their dog/s heart, either via an auscultation test or a full echocardiogram.

Q: What is the final goal of this breed study?

A: The ultimate goal of this study, after the heart condition has been firmly identified, is to then identify the related genes that are causing the condition and passing through the generation. Thus a simple, one off DNA test will become available to all Dalmatian owners to test their dogs.

Q: Why should I, as a breeder, be concerned about this?

A: As a breeder, our basic aim is to produce quality dogs. As part of this, there is no doubt that we all wish to be producing healthy dogs as part of this aim. As biological creatures, dogs will succumb to health problems from time to time, some that we have zero control over, others that we do. As a hereditary issue, the trends of heart issues currently observed in our breed are in our control to prevent. Hence we need to take action now to protect our breed before this issue becomes wide spread and incredibly detrimental.

Q: Why should I, as a pet owner, be concerned about this?

A: When we introduce a new dog into our homes and life it is becoming a family member. We want to see our new pet thrive and live a happy and healthy life. When they become unwell, it is emotionally distressing and can cost a lot of money to get our pet better again. Hence it is important to buy our Dalmatians from registered breeders who are also responsible breeders.

Hence as pet owners, it is in our best interests to be aware of potential problems and assist where possible to help prevent heartbreaking events. Without developing this genetic test, we cannot definitively isolate the gene and remove it from breeding programs, hence the risk of having a pup with this genetic heart condition will remain.

Q: How will this study run over time?

A: The study will commence with the first clinic being held at the Dalmatian Nationals this year on the 12th of October. The clinic will be run over the course of the day for all dogs booked in. The results of the test per dog will be confidential and held by cardiologist Dr Niek Beijerink DVM PhD Dipl. ECVIM-CA.

Once per year, dogs participating in the study will need to be retested by Dr Beijerink. Details are in the process of being finalised, of which we will update you as soon as they are firm in the coming weeks. The current aim is for Dr Beijerink to travel each year to capital cities (providing that there is a sufficient number of dogs to test at each location) on his own time to perform the testing. In the years that there are Nationals being held (2018, 20220, 2022), we may try to hold the clinic at the National again. Dates and locations are dependent upon Dr Beikerink's calendar, and thus plans will be released as soon as possible, with exact dates and locations released closer to each clinic.

The testing will be run over roughly a five year period. At the conclusion of the five year period, the results will be compiled and a grant applied for. After the grant is approved, genetic studies will take place to isolate the gene responsible for passing on the heart condition.

Once identified, a simple DNA test will be available through laboratories for all Dalmatians owners to have access to. This simple once off test will be readily affordable and become an important part in breeding kennels to identify carriers and affected dogs, then adjust breeding programs to prevent the disease being passed onto offspring.

Q: Who is Dr Niek Beijerink?

A: Dr Beijerink is the leading cardiologist who is undertaking this study. He graduated from Utrecht University in The Netherlands with his veterinary degree. He completed a PhD (canine endocrinology and reproduction) in 2007 and then a residency in Small Animal Cardiology in 2010. He is a Diplomate of the European College of Veterinary Internal Medicine (Cardiology).

His current study is "Genetic exploration of Congestive Heart Failure and other complex phenotypes in Canines", and hence where this Dalmatian study is an offset of his main works. He is a dedicated and well respected cardiologist as an Associate Professor at the University of Sydney. He is currently also working closely with the Cavalier King Charles Spaniel breed clubs as he further investigates the genetics behind mitral valve disease that the breed is suffering from.





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Frequently Asked Questions

Part 3 - How can I participate?

Q: How do I participate?

A: The best thing that you can do to participate is to book your dog into the clinic! To do so, you can contact Lee-Anne Osmond on either 0412 062 527 or at leeanne727@iprimus.com.au to schedule a time that suits you on the 12th of October. It is best to book early to secure the most suitable time for yourself.

Q: What test should I have conducted for my Dalmatian?

A: If participating as part of the full study, you must book your Dalmatian in for an Echocardiography.

Q: If I don't have a Dalmatian, what test should I book in for?

A: To get a full comprehensive result, it is best to book in for an echocardiography. Some clubs however will perform an auscultation first and then move onto an echocardiography if results of the auscultation dictate it. Please refer back to your relevant breed club for relevant recommendations based on the afflictions of your own breed.

Q: What if I can't attend the clinic at the Nationals, but want to be a part of the study?

A: If you can't commit to commencing testing this year, but can in future years, as much as it is preferable to start this year, joining in next year will still help the study. Finalised details will be released as to when clinics will run in following years in the coming weeks.

Q: Does my dog have to be ANKC registered to participate in the study?

A: Any dog can be tested at the clinic, however only Dalmatians that are ANKC registered can participate in the study, as we need to be able to trace parentage. The ANKC (Australian National Kennel Council) is the only recognised dog registry in Australia. For your Dalmatian to be ANKC registered, they must be purebred and come from a registered breeder. You will have been given your dogs papers at the time of purchase.

Q: Do I have to be a member of the ANKC/relevant state body to participate?

A: You do not need to be a member of your relevant state body to have your dog tested at this clinic (ie; DogsVictoria, DogsNSW, DogsQueensland, DogsACT, DogsWest, Dogs Tasmania or DogsNT).

Q: If my dog is from a back yard breeder, can I still participate in the study?

A: If your dog is from a back yard breeder, you are welcome to still book in at the clinic and have your dog tested. However, at this point in time the data will not be a part of the full study.

Q: What do I need to bring to the clinic?

A: You only need to bring your dog and a copy of his/her pedigree.

Q: What do I do if I have lost my dog's pedigree papers?

A: Your breeder may have kept a copy of the paper, however you can request a duplicate from your relevant state body.

Q: What do I need to take to the clinic?

A: All you need to bring to the clinic is your Dalmatian/s and their pedigree/s.

Q: What do I need to do for the study?

A: Be available and commit your dog/s to testing once per year over the five year period.

Q: What will happen at the clinic?

A: At the clinic, you will go into the rotunda with Dr Beijerink where it is quieter. He will perform the testing that you have booked in for on your dog/s. Dalmatian's participating in the full study will also have a small blood sample taken for later possible genetic analysis.

Q: How long will the test take?

A: Testing will only take 15-20 minutes.

Q: What will I get out of the clinic and study?

A: After each test, you will receive a report/certificate from Dr Beijerink detailing the results of your study.

Q: What if I can't afford to get all of my dogs tested, how do I chose which one/s to book in?

A: If you can't commit to testing all of your dogs if you have multiple, testing even just one dog is incredibly beneficial to the study. As Dr Beijerink explains, an older dog will give a more honest result, so if choosing just one, a dog that is 8-8 years of age is slightly more beneficial. (A 12 year old dog isn't likely to survive the full duration of the study).

If choosing multiple dogs, choosing some from varying lineages is preferable to get a diverse range of pedigrees tested.



Q: Does it matter if my dog is desexed?

A: No, it does not matter if your dog is entire or desexed.

Q: How do I pay?

A: You can either pay cash on the day, or with your booking, request banking details to make a direct debit anytime before the day of the clinic (funds must be cleared before the 12th of October 2018).

Q: What if I can't participate in the study but want to help?

A: If you can't bring an ANKC registered Dalmatian along to the study, after the Nationals this year we will commence fund raising efforts to help subsidise the cost of testing for participating Dalmatian owners.

If you can offer assistance on the day or leading up with running a heart testing clinic in your state, please get in touch and we will see how you can help.





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Frequently Asked Questions

Part 4 - Echocardiogram in Dogs (Cardiac Ultrasound)

What to expect at your dog's appointment.

An ultrasound (echocardiogram) is a non-invasive procedure used to evaluate the internal organs of dogs and other animals. An echocardiogram is commonly referred to as an "Echo". Ultrasound examinations can be used to examine the heart, abdominal organs, eyes and reproductive organs in dogs. Ultrasound applied to the heart is called an "echocardiogram".

For many problems, both ultrasound and X-rays are recommended for optimal evaluation. The X-ray shows the size, shape and position of the heart and chest contents, and also permits the veterinarian to examine the lungs. In contrast, the echocardiogram cannot be used to examine the lungs, but this ultrasound exam allows the veterinarian to see inside the heart. For moving organs such as the heart, the size, tissue character, and muscle function can be assessed in what is called a "real time" examination that resembles a motion picture. Components of the echocardiogram can include the two-dimensional exam (to see lesions and overall cardiac structure), the M-mode study (used to measure heart size and function), and the Doppler examination (used to evaluate blood flow). These examinations are complementary.

An echocardiogram is indicated to evaluate pets with a suspicion of congenital or acquired heart disease. An echocardiogram may be performed when indicated by the results of an X-ray, when there is a suspicion of heart disease based on physical examination. For example, detection of a heart murmur or irregular heart rhythm might be an indication for an echocardiogram.

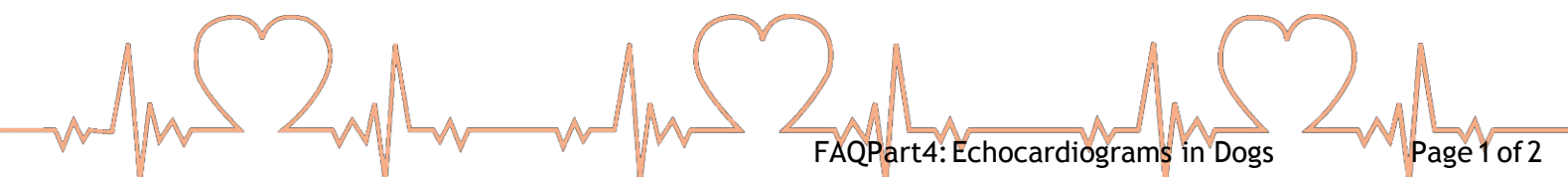
Many veterinarians refer dogs needing an echocardiogram to a specialist because performing the procedure requires particular skills and equipment. Some clinics do have ultrasound facilities on-site, while others use the services of mobile specialists who come to the clinic to perform echocardiograms. There is no real contraindication to performing this test. Even normal results help determine health or exclude certain diseases.

What Does an Echocardiogram Reveal in Dogs?

Echocardiograms help to evaluate the structure and function of the heart. This test can be extremely useful for identifying birth defects, diseases of the heart valves, and heart muscle diseases (cardiomyopathy). The exam also can be used to identify fluid around the heart (pericardial effusion), cardiac tumours, and certain types of heartworm infections. The chest cavity and cranial mediastinum (upper chest cavity) also can be evaluated, though in most cases the lungs cannot be visualized (due to the air in this organ).

How Is an Echocardiogram Done in Dogs?

Specialized (and very expensive) equipment is required to perform an ultrasound exam. The hair on the chest may need to be clipped. The dog is placed on his side on a padded table and held so the chest



surface over the heart is exposed to the examiner. A conductive gel is placed on a probe (transducer) that is attached to the ultrasound machine. The examiner places the probe on the skin between the ribs and moves it across the surface to examine the heart from different perspectives. Ultrasound waves are transmitted from the probe and are either absorbed or echo back from the heart structures. Based on how many sound waves are absorbed or reflected, an image of the heart is displayed on a computer screen. With proper training and sufficient experience, the sonographer (examiner) can create consistent images of the heart to create a three dimensional reconstruction of this organ and recognize departures from normal. Echocardiography is a safe procedure and generally takes about 30 to 60 minutes to complete. Additional time is spent measuring heart values.

Is an Echocardiogram Painful to Dogs?

No pain is involved. The procedure is non-invasive.

Is Sedation or Anaesthesia Needed for an Echocardiogram?

Neither sedation nor anaesthesia is needed in most dogs; however, some dogs resent lying on their sides, and may require some sedation to allow a diagnostic procedure. Sedation also can be advisable if there is difficulty in breathing due to heart or lung disease to reduce any stress associated with an unfamiliar procedure



What to expect on the day.

As you can see your dog will be placed on a special table so the cardiologist can get his ultra sound to his or her heart and this will be done on both sides of the dogs. The echocardiogram takes approximately 20 minutes and the auscultation is 5 minutes. An all clear certificate we be given if your dog is clear for the auscultation testing but the written results to the echocardiogram will be sent out by the cardiologist the following week due to this system being portable.

In no way will sedation be used on any dogs at this clinic, blood samples may be asked to be taken for the use of the cardiologists research into DCM in Dalmatians in which we are hoping that if owners continue to get their Dalmatians tested every year we may have a DNA test available after a 5 year period with funding available.

