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CANINE HEARTWORM DISEASE

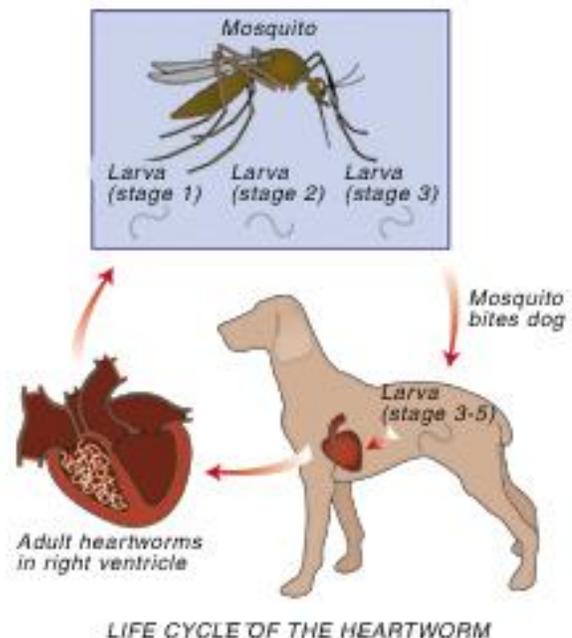
What causes heartworm disease?

Heartworm disease (dirofilariasis) is a serious and potentially fatal disease in dogs. It is caused by a blood-borne parasite called *Dirofilaria immitis*.

How do heartworms get into the heart?

Adult heartworms normally live in the heart and pulmonary arteries of infected dogs. The female worm is 6 to 14 inches long (15 to 36 cm) and 1/8 inch wide (5 mm). The male is about half the size of the female. One dog may have as many as 300 worms.

The worms live up to five years and, during this time, the female produces millions of offspring (microfilaria). These microfilariae live mainly in the small vessels of the bloodstream. The microfilaria are not infective (cannot grow to adulthood) in the dog they must complete part of the life cycle in a mosquito. The female mosquito bites the infected dog and ingests the microfilariae during a blood meal. The microfilariae develop further for 10 to 30 days in the mosquito and then enter the mosquito's mouthparts. The microfilariae are now called infective larvae. When the mosquito bites another dog, the infective larvae enter the bloodstream and move to the heart and adjacent vessels where they grow to maturity in two to three months and start reproducing, thereby completing the full life cycle.



Why do we NOT need to put dogs on heartworm preventive medications in Prince George at this time?

It is important to note that the development of the heartworm inside the mosquito is temperature dependent. For example, it would require 29 consecutive days of temperatures of 18 degrees C (24 hours a day) for microfilaria larvae to develop within the mosquito. As soon as the temperature drops below 14 degrees C at any point in the day, development stops. Below a sustained temperature of 12 degrees C the microfilariae die. This means, that even if a dog with heartworm traveling through the Prince George area was to be bit by an appropriate species of mosquito, the microfilariae would not have time to mature within the mosquito to become infective to another dog. With climate changes, and changes to the heartworm itself, this may change in the future.

Where are heartworms found?

Canine heartworm disease occurs all over the world. The disease is spreading and is now found in most regions of the United States and many regions in Canada, particularly where mosquitoes are prevalent and the summertime temperatures are high enough to support the life cycle through the mosquito. Prince George is not yet considered a heartworm endemic area as our summers are too cold and short for the larvae to mature into the infective stage. **If you are traveling into the Okanagan, into the states, east to Winnipeg or Toronto (just to name a few examples) you should definitely put your dogs on heartworm prevention.**

What do heartworms do to the dog?

Adult heartworms cause disease by clogging the heart and major blood vessels leading from the heart which reduces the blood supply to other organs of the body, particularly the lungs, liver and kidneys, leading to malfunction of these organs. They also interfere with the valve action in the heart.

Microfilariae circulate throughout the body but remain primarily in the small blood vessels. Because they are as wide as the small vessels, they may block blood flow in these vessels. The body cells being supplied by these vessels are deprived of the nutrients and oxygen normally supplied by the blood. The lungs and liver are primarily affected.

Most dogs infected with heartworms do not show any signs of disease for as long as two years. By the time clinical signs are seen, the disease is well advanced. The most obvious signs are a soft, dry cough, shortness of breath, weakness, and loss of stamina. Some dogs may even faint. Severely infected dogs may die suddenly during exercise or excitement. Cirrhosis of the liver causes jaundice, anemia, and general weakness because this organ is essential in maintaining a healthy animal. The kidneys may also be affected and allow poisonous wastes to accumulate in the body. It is important to remember that many other diseases can cause identical signs. Unless your dog has been to a heartworm endemic area it is very unlikely for these signs to be due to heartworm.

How is heartworm infection diagnosed?

In most cases, diagnosis of heartworm disease can be made by a blood test run in the veterinary hospital. This is a serological test for antigens (proteins) produced by adult female heartworms. There must be at least five female worms present for the most common heartworm test to diagnose heartworm disease.

How are dogs treated for heartworms?

Once the serologic test has shown the presence of heartworms, further diagnostic procedures are essential to determine if the dog can tolerate heartworm treatment. Depending on the case, we will recommend further blood tests including complete blood counts and blood tests for kidney and liver function to determine the health of the dog's organs prior to treatment. Also, X-rays help reveal the condition of the heart, lungs, and vessels which allow us to predict an increased possibility of complications related to treatment. An electrocardiogram (EKG or ECG) is a tracing of the electric currents generated by the heart needed to determine the presence of abnormal heart rhythms. And finally, an echocardiogram is an ultrasonic examination that allows us to see into the heart chambers and even visualize the heartworms.

Based on the above tests, some dogs are diagnosed with advanced heartworm disease. This means that the heartworms have been present long enough to cause substantial damage to the heart, lungs, blood vessels, kidneys, and liver. A few of these cases will be so advanced that it will be safer to treat the organ damage rather than risk treatment to kill the heartworms. Dogs in this condition are not likely to live more than a few weeks or months.

Treatment to kill adult heartworms

There is some risk involved in treating dogs with heartworms, although fatalities are rare. We can now successfully treat more than 95% of dogs with heartworms. An injectable drug to kill adult heartworms is given. The adult worms die in a few days and start to decompose. As they break up, they are carried to the lungs, where they lodge in the small blood vessels and are eventually reabsorbed by the body. This can be a dangerous period so it is absolutely essential that the dog be kept quiet and not be allowed to exercise for one month following treatment. The first week after the injections is critical because the worms are dying. A cough is noticeable for seven to eight weeks after treatment in many heavily infected dogs.

Prompt treatment is essential if the dog has a significant reaction in the weeks following the initial treatment, although such reactions are rare. If a dog shows loss of appetite, shortness of breath, severe coughing, coughing up blood, fever, and/or depression, you should notify us. Response to antibiotics, cage rest, supportive care and intravenous fluids is usually good in these cases.

Treatment to kill microfilaria

Approximately one month following treatment to kill the adults, the dog is returned to the hospital for administration of a drug to kill the baby heartworms or microfilariae. Your dog needs to stay in the hospital for the day.

Other treatments

In dogs with severe heartworm disease, it may be necessary to treat them with antibiotics, special diets, diuretics to remove fluid accumulations, and drugs to improve heart function prior to treatment for the heartworms. Dogs with severe heart disease may need lifetime treatment for the heart failure, even after the heartworms have been killed.

Response to treatment: Dog owners are usually pleasantly surprised at the change in their dog following treatment for heartworms, especially if the dog had been showing signs of heartworm disease. The dog has a renewed vigor and vitality, improved appetite, and weight gain.

How can I prevent this from happening again?

When a dog has been successfully treated for heartworms, it is essential to begin a heartworm prevention program to prevent future recurrence. With the safe and affordable heartworm preventives available today, no pet should ever have to endure this dreaded disease.