



## Mansfield Animal Clinic

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# Heartworm Disease in Dogs – Testing

## What is heartworm disease? How does a dog become infected?

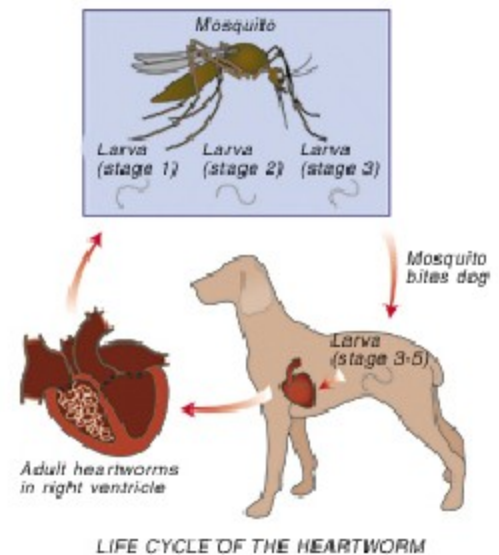
Heartworm disease is a disease caused by the internal parasite *Dirofilaria immitis*, better known as the heartworm. These parasites are long thin worms that live in the right side of the heart and the pulmonary arteries, the blood vessels that carry blood from the right side of the heart to the lungs. Dogs become infected when they are bitten by an infected mosquito that is carrying immature worms called **larvae**. Once they enter the dog, the larvae move through the tissues of the body, eventually entering the blood stream and migrating to the right side of the heart. Within the heart, the worms complete their maturation, mate, and produce immature worms called **microfilariae**, which circulate in the blood stream. When the infected dog is bitten by another mosquito, the microfilariae will pass from the dog into the mosquito. It takes about 5 to 6½ months for the heartworm life cycle to be complete.

## Where is heartworm infection most common?

Heartworm disease is widespread in the United States and is particularly common along the eastern and gulf coasts and in the Mississippi River valley. In Canada, heartworm infection is more localized, with most cases reported in southern Ontario, southern Manitoba, and southern Quebec.

"The risk of infection is greatest when mosquitoes are actively feeding."

The risk of infection is greatest when mosquitoes are actively feeding. This typically requires an average daily temperature of more than 64°F (18°C) for a month. In areas that experience killing frosts, the risk of contracting heartworm disease is limited to the warmer months from late spring to early autumn, even though mosquitoes may appear in the early spring. By comparison, in subtropical United States heartworm infection can be a year round risk.



## Can infection be spread directly from one dog to another, or from a dog to a person?

No. Dogs can only get heartworm from an infected mosquito. There is no direct transmission of this infection from dog to dog, dog to cat, or dog to people.

## What are the clinical signs of heartworm disease?

In the early stages of disease, dogs often have no clinical signs, especially if they have only a small number of worms in the heart. For example, in Canada, at least 80% of infections go undetected because infected dogs usually carry only small numbers of worms.

"In advanced disease, dogs develop congestive heart failure."

However, as the disease progresses clinical signs become more noticeable, and include reluctance to exercise, rapid fatigue with exercise, coughing, or collapse. In advanced disease, dogs develop congestive heart failure. Dogs in congestive heart failure lose weight, have a poor body condition, breathe rapidly or with difficulty, and develop a build up of fluid in the abdomen.

## How is heartworm disease diagnosed in the dog?

Heartworm is usually diagnosed with a simple blood test. There are two main tests for detecting heartworm infection; one test detects adult worms and the other detects microfilaria.



**Testing for Adult Worms:** The American Heartworm Society recommends that a **Heartworm Antigen Test** should be the primary method of testing for adult heartworm infection. This type of test is specific for the adult female worm. Antigen is detectable by 6½ to 7 months after infection and positive results are possible with as few as 1-3 adult females. Antigen tests will be falsely negative if infection has been present for less than 5 months, or if the worms are either all male or all immature females.

**Testing for Microfilaria:** Any antigen test that is positive or weak positive should ideally be followed up with a test for microfilaria. The presence of microfilaria confirms the presence of mature adult worms in the heart and indicates the need for specific treatment to kill microfilaria. The best tests for detecting microfilariae are called **concentration tests**, in which specially prepared samples are examined microscopically. One common concentration test, called the modified Knott's test, involves centrifuging the sample to concentrate the microfilariae, while another involves passing the sample through a very fine filter that traps the microfilaria on the filter. Microfilaria tests may be falsely negative for several reasons including: all the adults are immature and have not yet mated, all the adult worms are of one sex, or there are too few microfilariae in the bloodstream to be detected.

In some infected dogs, the blood tests are negative even though there are heartworms in the heart. If a dog is suspected of having an 'occult' (hidden) heartworm infection, your veterinarian may either recommend x-rays to look for changes that indicate the presence of heartworm or an ultrasound to examine the heart structure and function directly.

## Do all dogs need to be tested?

"Puppies less than 6-7 months of age do not need to be tested."

No. Puppies less than 6-7 months of age do not need to be tested. Adult worms are not present before this time and both antigen tests and microfilaria tests will be negative.

## **Is there treatment for heartworm disease?**

Yes. Treatment usually involves two stages; the first stage of treatment kills the adults, and the second stage, if it is needed, kills the microfilaria. Treatment of adult worms is usually effective although there may be side effects because of dead worms being pumped out of the heart into the lungs. Dogs undergoing treatment must be kept very quiet during the treatment period and for 3-4 weeks following treatment. If complications arise, hospitalization for further treatment may be needed.

Once the treatment for adult worms is complete, medication to kill the microfilaria may be warranted. Side effects of treatment are possible, especially if large numbers of microfilaria are present.

## **How can I prevent heartworm disease in my dog?**

Several excellent products are available to prevent heartworm disease in dogs. Your veterinarian is the best person to advise you on which product is most suitable for your pet, and what type of dose schedule you should follow. Dogs in the southern edge of continental United States are at risk for heartworm year round, while dogs in Canada and northern United States are most at risk from June through October. Dogs that travel south in the winter with their owners should receive preventive medications during these times of potential exposure.

*This client information sheet is based on material written by: Kristiina Ruotsalo, DVM, DVSc, Dip ACVP & Margo S. Tant, BSc, DVM, DVSc*

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