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# All About Heartworm Disease In Dogs

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**A thorough understanding of heartworm disease will help you protect your dog and understand the signs, symptoms and diagnostics.**

If you have a dog, you already know something about heartworm disease. But there are several misunderstandings surrounding this disease that need clarification. In the first of this two-part article, we'll look at the difference between heartworm infection and disease, risk factors and symptoms, and how heartworm is diagnosed.

## Infection or disease?

To start with, it's important to know the difference between heartworm *infection* and *disease*.

1. **Heartworm infection** occurs when an infected mosquito deposits immature larval heartworms into the dog while feeding on him. These dogs are not clinically ill, do not act sick, and appear totally normal. Usually, a diagnosis of heartworm infection is made through the dog's annual blood work. People are usually shocked to discover that their healthy dogs are infected with heartworms and are at risk of developing heartworm disease. Most dogs I see with "heartworm" have heartworm infection, not disease.
2. **Heartworm disease** results when a dog infected with heartworms develops clinical signs (see next section). Fortunately, I very rarely see dogs with heartworm disease. Treatment requires much more aggressive and expensive therapies; dogs with heartworm disease are more likely to suffer side effects from the traditional medication used in treatment than those with heartworm infection.

## Signs and symptoms

Clinical signs of heartworm disease usually represent pathology of the heart and lungs. In fact, "heartworms" are really "lungworms". In most cases, the worms are found in the large blood vessels of the lungs, not the



heart. The worms only “back up” from the lung blood vessels in severe infections, in which case they end up in the chambers of the heart (right side) and caudal vena cava blood vessel. When the disease was first discovered, so many worms were found in animals that they had in fact backed up into the heart, so the disease was named heartworm when it would be more accurate to call it lungworm.

Clinical signs, especially early in the disease, involve coughing, most often when the dog is active. The coughing is due to the presence of worms in the pulmonary blood vessels, and the associated inflammation the worms produce. With time, the disease may progress and cause more severe signs of lung and/or heart infection and inflammation, such as weakness, more serious and constant coughing, weight loss, decreased appetite, and - fluid accumulation in the chest and abdomen (signs that predispose the dog to sudden death). In some cases, however, the only sign of heartworm disease is sudden death.

### Diagnosics have improved

Heartworm infection is usually easily diagnosed with a simple blood test. However, there is still some confusion among veterinarians and their clients on what the “best” test is.

Three types of blood test can be used to diagnose the presence of heartworms in a dog’s body.

1. When heartworms were originally discovered in animals in the 1970s, the blood test for it involved simply examining a drop of blood under the microscope for the presence of heartworm microfilariae (baby heartworms produced by female worms in the dog’s body). While this test would often reveal the presence of microfilariae, there were two limitations. First, another species of microfilariae (most commonly one that does not cause disease in dogs) was often found.

Second, it was discovered that many heartworm infections (in some cases up to 70%) are occult infections, meaning that adult worms are present but microfilariae are not. Using this test meant that many heartworm infections were missed or misdiagnosed if another type of microfilariae was detected in the blood sample, or if no microfilariae were seen.

2. The second type of heartworm test to be developed was the filter test. In this instance, a 1 ml to 3 ml sample of the animal’s blood is pushed through a filter apparatus, and then a second sample of tap water is used to flush the filter. The filter is removed, sometimes with a microbiological stain, and is examined microscopically. While this test was better than simply examining a drop of blood under the microscope, it too had the same limitations.

Because of the limitations associated with these two tests, they are not recommended as the sole way to diagnose heartworm infection. However, they should be run if there are positive results on the occult test, to determine if additional treatment is needed to kill the microfilariae.

3. ***The most accurate and commonly run test is called an occult heartworm test. It is an antigen-antibody test that determines the presence of antigen from female heartworms in the dog’s body.*** Unlike the other two tests, it is very accurate and can pick up infections when only a few worms are present, even if no microfilariae are seen. This test should be done annually on healthy dogs six months of age and older (the test is inaccurate in younger dogs, as it takes a minimum of six months from the time of a mosquito bite before the dog would test positive). This test should also be done on any dog suspected of having heartworm infection/disease. It is also done following heartworm treatment to ensure success, usually six months after the dog finishes the treatment.

If heartworm disease is suspected, or if infection has been proven via blood testing, other tests should be done before proceeding with treatment. This testing is vital to determine the stage of the disease/infection, and to uncover any problems that might complicate or postpone treatment.

***Heartworm disease is diagnosed when clinical signs of the disease are present after a diagnosis of infection via the testing just discussed.*** Laboratory tests needed to confirm and stage the disease include chest radiographs (X-rays), a blood chemistry profile, CBC, urinalysis, and an EKG. Dogs with heartworm infection will be normal on all of these tests, whereas dogs with heartworm disease will show some abnormalities. Even if clinical signs of heartworm disease are not present when infection is diagnosed, it is imperative to run these additional tests prior to beginning treatment. Normal test results mean that treatment can begin, severe side effects are not likely to occur, and a baseline value for each test is established in the event complications occur during therapy.

In the second part of this article (June-July), we'll look at how heartworm is treated and prevented, and what steps you can take to protect your companion from infection.

### Is Your Dog At Risk?

All dogs (and other animals) are at risk of developing heartworm infection. Since exposure to infected mosquitoes is necessary for infection to occur, dogs that spend more time outdoors are at increased risk. Also, because mosquito activity occurs as the temperature increases, there is often a seasonal trend to exposure and infection. As an example, it's warm all year here in Texas (with occasional daily exceptions), so year-round heartworm prevention is important. In other areas of North America, the warm season is shorter and transmission is less likely to occur year round. Often, heartworm prevention is only needed during the warmer months or not at all, depending on heartworm populations in your area, and your veterinarian's advice.

Heartworm has been found in all 50 states, and across Canada, but some areas are much more prone to it than others. In the US, the prevalence of heartworm is highest in the southeast (including Texas east to Florida), and lowest in the Midwest. ***In Canada, heartworm is most prevalent in southern Ontario and the Winnipeg region of Manitoba.*** Wherever you live, it's important to find out what the heartworm numbers are like in your region, so you and your veterinarian can decide if and/or when your dog needs preventative medication.

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