

## **Heartworms**

It is spring and with spring comes wet weather and mosquitoes. Unfortunately, with mosquitoes comes the risk of heartworm disease in dogs. Heartworm disease is a serious and potentially fatal disease caused by a blood-borne parasite called *dirofilaria immitis*. Adult heartworms are found in the heart and adjacent large vessels of the lungs of infected dogs. The adult worms are 6-14 inches long and 1/8 inch wide and one dog may have as many as 300 worms.

The disease is not spread directly from dog to dog. An intermediate host, the mosquito, is required for transmission. As many as 30 species of mosquito can transmit heartworms. The adult heartworms produce microfilaria which are ingested with the blood as the mosquito feeds. After 10-30 days in the mosquito, they develop into infective larvae which enter the dog's bloodstream as the mosquito feeds again. At this point the infective larvae enter the heart, grow to maturity and after 2-3 months become adults and start reproducing, completing the full life cycle.

In the United States, heartworm disease is mainly seen where there are high mosquito populations such as the south and southeast regions, and along the Mississippi River. However, with our mobile population and particularly after rescues of infected dogs from hurricane affected areas such as New Orleans and Houston, many other previously unaffected areas are at risk today.

Adult heartworms cause disease by clogging the heart and major blood vessels leading from the heart. They interfere with the valve action in the heart. By clogging the main blood vessels the blood supply to the lungs, liver and kidneys are reduced leading to failure of these organs.

Most dogs infected with heartworms do not show any signs of the disease for as long as 2 years. Unfortunately, by the time the clinical signs are present, the disease is well advanced. The most obvious signs are a soft, dry cough, shortness of breath, weakness, listlessness and loss of stamina. Weight loss is also commonly seen.

Heartworm disease is diagnosed by a simple blood test done in your veterinarian's office or sent to a veterinary laboratory. If positive, further lab work such as complete blood counts and liver and kidney function tests

are done as well as chest x-rays. These tests allow a determination of how much damage has been done, which treatment protocol to use, and the potential for adverse side effects during treatment.

There is some risk involved with treating dogs for heartworm disease, although fatalities are rare. A newer drug is now available that does not have the toxic side-effects of the previous arsenic containing drugs. It is also given by injection in the muscle vs. intravenously. The success rate, depending on the severity of the disease is in the 90-95% range. The typical treatment protocol is to start the dog on antibiotics for a period of time, give one injection of the heartworm medication, and follow up in 1 month with 2 further injections of the heartworm medication separated by 24 hours. Confinement for 4 weeks is also necessary as the worms break down to reduce the chance of thromboemboli. Monthly heartworm medication is begun 2 weeks after treatment and maintained for life as the treatment does not protect against future infections. A heartworm test is done 4 months later to confirm that the treatment was successful in eliminating the heartworms. Other treatments and medications may be needed depending on the severity of the infection, organ damage due to the heartworms, and side effects of the treatment such as thromboemboli in the lungs. Between the cost of diagnostic tests, hospitalization and treatment, the resulting costs can be significant. Also, the drug to treat heartworm is in short supply and is often rationed on a case by case basis.

The good news is that heartworm disease can easily be prevented by using one of the readily available, safe, and effective monthly oral or topical medications. There is also an injection which can be given at 6 month intervals. A side benefit is that these medications also treat internal parasites such as roundworms, hookworms and, with some medications, whipworms. The medications are typically started when puppies are 4-6 months old. Even in areas where mosquitoes may not be year round, it is best to keep your dog on heartworm medication year round. Yearly heartworm blood tests are recommended as a precaution as sometimes doses are missed or the dog spits them out.