

Heartworm Disease

Heartworm disease is caused by the worm *Dirofilaria immitis*, which is transmitted by mosquitos and then resides within the lungs and great blood vessels of affected dogs. Although heartworm disease was thought to only affect dogs in the southeastern Atlantic and Gulf Coast states, it has now been reported in every state of the United States, including Alaska and Hawaii, and every province in Canada.

An infected dog has adult heartworms present within the heart and within the blood vessels leading from the heart to the lungs. The female worm produce microfilaria (baby worms) and require microscopic examination to be seen. These microfilaria float in the bloodstream where they can circulate for up to two years. They pose a risk because if they are ingested by other mosquitos, the now infected mosquito can transmit the infection to other dogs. The adults stay in the heart, lungs and the major blood vessels, causing damage to the blood vessel lining and walls.

Mosquitos are the intermediate host. This is where the microfilaria change from baby worms to infective larvae. When the mosquito bites the dog, the infective larvae migrate down the mosquitos stinger and penetrate through the skin. The larvae remain under the skin for about two months then enter the bloodstream where they migrate to the heart. Once in the heart, the larvae will grow into adults. The adults will produce more microfilaria and the process starts all over again. The complete process takes about 6 months.

During the early stages of infection, most dogs appear normal. The first clinical signs may include lack of energy and/or exercise intolerance. Later signs of heartworm disease include a chronic cough, loss of appetite, abdominal distention, weight loss, and fatigue. Severe signs include heavy breathing, falling over, and coughing up blood. Unfortunately, these signs do not appear until the disease is well established. Usually by this time severe damage may have already occurred.

A number of blood tests are available for diagnosing heartworms. Different tests measure different aspects of infection. Usually more than one test is required to positively diagnose heartworm infection. A chest x-ray is the best test for determining the severity of the infection.

There are treatments for heartworm disease, but prevention is the best and preferred option. Heartworm is very easy to prevent, so its a shame that some pets remain unprotected and risk contracting the disease. For those pets that do have heartworm disease, treatments consist of killing the adult heartworms first using thiacetarsamide, an arsenic compound, intravenously for several treatments. Hospitalization is usually recommended as the treatment is not only toxic to the heartworms but to the dog itself. The second phase consists of killing the microfilaria. This is generally a one-time treatment and usually requires no overnight hospitalization. After about two weeks, the dog should be reevaluated with a blood test to ensure no more microfilaria are present. The third phase is prevention, which is the same treatment given to dogs to prevent heartworm infection in the first place.

The most popular heartworm preventative sold through veterinarians is Heartgard. Heartgard's active ingredient is Ivermectin. It is a chewable tablet given by mouth once a month, which makes it popular with owners. Iverhart is a generic version of Heartgard and is available through veterinarians. Ivermectin can have some adverse effects in some breeds of dog including the Collie and Shetland Sheepdog (Sheltie or Miniature Collie) so precaution should be taken. Heartgard is a very effective preventative but it is not a treatment.