

# Heartworm Disease

## Protect your pet from this insidious disease carried by mosquitoes

### What are heartworms?

Heartworms are large worms that live in the hearts of dogs and cats. They are also found in other species, including ferrets, foxes, wolves, sea lions, and horses. Dogs are the common host for this parasite. This worm is also known as *Dirofilaria Immitis*. It is a long, spaghetti-like worm that can be anywhere from 6 to 10 inches in length (~17 - 27 cm).

### How are heartworms transmitted?

In addition to the animal 'host', heartworms need a mosquito to complete their life cycle.

1. A mosquito bites a heartworm-infected animal.
2. The mosquito is then carrying microscopic versions of the heartworm, called microfilariae.
3. When the mosquito bites another dog or cat, that animal is now infected with the heartworm microfilariae.
4. Within 70 to 90 days, the microfilariae have made it through the tissues to the animal's heart, where they reproduce (providing both male and female worms are present) and live for several years. If both sexes of worms are present, they will be producing their own little microfilariae within 6 - 7 months after that mosquito bite.
5. The cycle continues.

### What are the signs of heartworm disease?

The signs vary according to number of worms present, stage of life cycle, age and species of host. The heartworms live primarily in the right side of the heart and lung, and can cause significant damage and even death. Here are some general signs for the most common hosts, dogs and cats.

- **DOG - possible heartworm signs.**

*Acute disease* - usually no clinical signs (the dog just acquired the disease)

*Mild to moderate* - cough, reluctance/inability to exercise

*Severe* - marked shortness of breath, coughing, fainting episodes, weight loss, fever, abdominal swelling (ascites), death.

- **CAT - possible heartworm signs**

The signs of heartworm disease are different in the cat than the dog. Cats can present with sudden death (no other signs) or can live with the disease free of clinical signs. Most commonly, heartworm disease in the cat mimics feline asthma - coughing and difficulty breathing. Vomiting can be another sign of feline heartworm disease (vomiting is a common sign in many feline diseases).

### Could my dog or cat be at risk?

Yes, depending on your geographic location.

Heartworm disease is now worldwide, and mosquitoes are too.

### Diagnosis

Diagnosis is most commonly done by a blood test in your Veterinarian's office. Additionally, x-ray, ultrasounds, or other tests may be performed.

## Treatment

Treatment for heartworm is not without some risk. Bloods tests are used to assess kidney and liver function before initiating treatment. The worms are killed slowly, so as not to cause a sudden blockage in the heart or lungs, and the patient must be kept quiet. The next phase is medication to kill the remaining microfilariae.



## Prevention

Your veterinarian will first test your pet and find the heartworm status to be negative. You can then begin heartworm prevention. Annual re-testing is recommended. Prevention is in the form of a chewable daily or monthly tablet, given in the summer months or year round, depending on the climate where you live. The most commonly prescribed oral heartworm preventatives are: Heartgard®, Interceptor®, and Program®.

A topical treatment, Revolution™ (Selamectin), by Pfizer is effective against heartworms, fleas, ear mites, sarcoptic mange (dogs), hookworms (cats), roundworms (cats), and the American Dog Tick (*Dermacentor variabilis*) (dogs). The American Dog Tick is the principal vector for a Rickettsial disease, Rocky Mountain Spotted Fever, in dogs and humans. Revolution™ is typically applied once a month for parasite control.

Revolution™ works by absorbing through the skin to the bloodstream, where it prevents heartworms and treats intestinal parasites. Revolution™ also disperses from the blood to the sebaceous glands (microscopic oil glands in the skin) to act as a reservoir of drug for protection against fleas, ticks, and mites.

Drug precautions. This drug should not be used in animals that are sick, malnourished, debilitated, or underweight. For more information about this drug, please see the package insert.

## Treatment

There are a lot of misconceptions about heartworm treatment in dogs. One of the most common misconceptions is that using ivermectin-based heartworm preventive medications for a "slow kill" is the preferred way to treat canine heartworm disease.

### Options for the Treatment of Heartworm Disease in Dogs

Essentially, there are two distinctly different methods of treating heartworm disease in dogs.

- Treatment with melarsomine (Immiticide®), which kills the adult heartworms, is one method of treatment. There are different protocols that are used under different circumstances but the bottom line with this method of treatment is that the adult heartworms are killed in a relatively short timeframe. With this method of treatment, ivermectin-based preventives are also administered concurrently on a monthly basis to prevent new infections.
- Monthly administration of ivermectin-based heartworm preventive medications alone are sometimes used as a second method of heartworm treatment. This is referred to as the "slow kill" or "soft kill" method.

There is risk of complications occurring with both treatment methods.

### **What Are the Advantages of the "Slow Kill" Ivermectin Method of Canine Heartworm Treatment?**

Often, the "slow kill" method of heartworm treatment is used because of financial considerations. Unfortunately, the melarsomine treatment method is quite expensive. However, monthly ivermectin is affordable.

There are situations in which melarsomine treatment cannot be pursued due to other health issues. In these situations, in addition to monthly ivermectin administration functioning as a "slow kill" way to rid the infected dog of heartworms, it also clears the infected dog's blood stream of the larval form of heartworms (microfilaria). These microfilaria have the ability to infect mosquitoes which feed on the infected dog. The infected mosquito can then spread heartworms to other dogs. Monthly ivermectin administration stops this from happening and helps to protect other dogs in the area.

### **What Are the Disadvantages of the "Slow Kill" Ivermectin Method of Heartworm Treatment in Dogs?**

The American Heartworm Society does not recommend the use of monthly ivermectin products to treat dogs infected with heartworm disease. There are several reasons that using melarsomine to kill the adult heartworms is safer and more effective for your dog than using ivermectin monthly.

- The adult heartworm is responsible for the damage to heart and lungs that causes the symptoms of heartworm disease in dogs.
- Melarsomine is the only medication we have available that can kill these adult worms. Ivermectin kills the larval stages but not the adult worms. It also does not shorten their lifespan or render them sterile.
- With time, as long the larval stages do not survive and no new infections occur, the adult heartworms will die of "natural causes." However, this may take as long as two years to occur.
- As long as there are adult heartworms living in the heart and pulmonary arteries, the damage to these organs will continue. That means that while your dog is receiving only the monthly ivermectin medication, his heartworm disease will continue to progress and his heart and lungs can suffer severe damage.
- Another reason that monthly ivermectin treatment is not recommended for heartworm-infected dogs is that some parasitologists believe that the "slow kill" method has contributed to the development of strains of heartworms that are resistant to heartworm preventive medications. (Dr. Byron Blagburn, webinar, *Emerging Issues in Heartworm Prevention*, presented by DVM360, 4/20/2011)

In cases where melarsomine treatment is not practical for a dog with heartworms, monthly ivermectin is preferable to no treatment. However, it should be remembered that this method of heartworm treatment has serious short-comings and is not the preferred method of heartworm treatment.