

current heartworm status. Because it is more difficult to detect heartworms in cats, additional testing may be necessary to make sure the cat is not infected.

Testing must then be repeated at appropriate intervals. The next test should be performed about 6 months after starting the preventive treatment, to confirm that your pet was not infected prior to beginning prevention (remember, tests only detect adult worms). Heartworm tests should be performed annually to ensure that your pet doesn't subsequently become infected with the disease and to ensure the appropriate amount of medication is being prescribed and administered. There have been reports of pets developing heartworm infection despite year-round treatment with a heartworm preventive, so having your pet tested regularly is the best way to keep them protected.

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*For more information, visit,*  
American Veterinary Medical Association  
[www.avma.org](http://www.avma.org)

American Heartworm Society  
[www.heartwormsociety.org](http://www.heartwormsociety.org)

## And Now A Note On Your Pet's *General Good Health*

A healthy pet is a happy companion. Your pet's daily well-being requires regular care and close attention to any hint of ill health. The American Veterinary Medical Association suggests that you consult your veterinarian if your pet shows any of the following signs:

- Lumps or swelling
- Reduced or excessive appetite or water intake
- Marked weight loss or gain
- Limping, stiffness, or difficulty getting up or down
- Difficult, discolored, excessive or uncontrolled waste elimination (urine and feces)
- Abnormal discharges from any body opening
- Head shaking, scratching, licking, or coat irregularities
- Changes in behavior or fatigue
- Foul breath or excessive tartar deposits on teeth



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# Heartworm Disease



*Brought to you by your veterinarian and the  
American Veterinary Medical Association*

*Heartworm is a preventable, but serious and potentially fatal, parasite that primarily infects dogs, cats and ferrets. It can also infect a variety of wild animals, including wild canids (e.g., foxes, wolves, coyotes), wild felids (e.g. tigers, lions, pumas), raccoons, opossums, and pinnipeds (e.g., sea lions and seals), as well as others. There have been documented human infections, but they are thought to be rare and do not usually result in signs of illness.*

## How is heartworm transmitted and what does it cause?

Heartworms can only be transmitted from animal to animal by mosquitoes.

When a mosquito bites an infected animal, young heartworms called microfilariae enter into that mosquito's system. Within two weeks, the microfilariae develop into infective larvae inside the mosquito; these infective larvae can be transmitted to another animal when this mosquito takes its next blood meal. Unlike dogs, infected cats do not

often have microfilariae circulating in their blood, and an infected cat is not likely to transfer the heartworm infection to another mosquito.

The infective larvae mature into adult heartworms in approximately six months. During the first three months, the larvae migrate through the animal's body, eventually reaching the blood vessels of the lungs. During the last three months, the immature worms continue to develop and grow to adults, with females growing to lengths of up to 14 inches. The worms damage the blood vessels, and reduce the heart's pumping ability, resulting in severe lung and heart disease. When the animal shows signs of illness due to adult heartworm infection, it is called heartworm disease.

If adult worms (5-7 months post-infection) of both sexes are present, they will mate and produce new microfilariae. The microfilariae can cause the animal's immune system to mount a reaction; this immune reaction can actually cause damage to other organs. This life cycle continues when a mosquito bites the infected animal and becomes infected by the microfilariae. After development of the microfilariae to infective larvae within the mosquito (10 days to 2 weeks later) the infective heartworm larvae are capable of infecting another animal. Adult heartworms can survive for 5 to 7 years in dogs and several months to years in cats.

## Where are heartworms found?

Geographically, heartworms are a potential threat in every state as well as in many other countries around the world. All dogs, regardless of age, sex, or living environment, are susceptible to heartworm infection. Indoor, as well as outdoor, cats are also at risk for the disease. If you plan to travel with your dog or cat to a different part of the country, or another country, ask your veterinarian about the risk of heartworm infection in the area where you are going to relocate or visit.

## What pets should be tested for heartworm?

Because heartworms are spread by mosquitoes, any pet exposed to mosquitoes should be tested. This includes pets that only go outside occasionally.

## How can I tell if my pet has heartworm infection or disease?

DOGS: If your dog has been recently or mildly infected with heartworms, it may show no signs of illness until the adult worms have developed in the lungs and signs of heartworm disease are observed. As the disease progresses, your dog may cough, become lethargic, lose its appetite or have difficulty breathing. You may notice that your dog seems to tire rapidly after only moderate exercise.

Numerous diagnostic tests are available for your veterinarian to detect the presence of adult heartworm infection (> 6 month old infections) in your dog. Antigen tests detect the presence of adult female heartworms, and antibody tests determine if your pet has been exposed to heartworms. The antigen test is most commonly performed, and is very accurate in dogs. Further tests, such as chest radiographs (x-rays), a blood profile and an echocardiogram (an ultrasound of the heart), may be necessary to confirm the diagnosis, to evaluate the severity of the disease, and to determine the best treatment plan for your dog.

CATS: Signs of possible heartworm disease in cats include coughing, respiratory distress, and vomiting. In rare cases, a cat may suddenly die from heartworms.

The diagnosis of heartworm infection in cats is more difficult than it is with dogs. A series of different tests may be needed to help determine the likelihood of heartworm infection as the cause of your cat's illness and, even then, the results may not be conclusive. In general, both antigen and antibody tests are recommended for cats to give the best chances of detecting the presence of heartworms.

## How can my pet be treated?

DOGS: As with most medical problems, it is much better to prevent heartworm infection than to treat it. However, if your dog does become infected with heartworms there is an FDA-approved treatment available. There is substantial risk involved in treating a dog for heartworms. However, serious complications are much less likely in dogs that are in good health and when you carefully follow your veterinarian's instructions.

The goal of heartworm treatment is to kill the adult worms and microfilariae present in your dog, as safely as possible. However, when a dog is treated it is important to consider that heartworms are dying inside the dogs lungs. While your dog is treated, it will require complete rest throughout hospitalization and for some time following the last treatment. Additionally, other medications may be necessary to help control the body's inflammatory reaction as the worms die and are broken down in the dog's lungs.

CATS: There is currently no effective and safe medical treatment for heartworm infection or heartworm disease in cats. If your cat is diagnosed with heartworms, your veterinarian may recommend medications to reduce the inflammatory response and the resulting heartworm disease, or surgery to remove the heartworms.

## Can heartworms be surgically removed?

Surgical removal of heartworms from dogs and cats is a high-risk procedure and is typically reserved for severe cases. However, in many cases surgical removal of heartworms may be necessary to afford the best opportunity for the pet's survival.

## Can heartworm disease be prevented?

Heartworm infection is almost 100% preventable in dogs and cats. There are several FDA-approved heartworm preventives available in a variety of formulations. Your veterinarian can recommend the best method of prevention based upon your pet's risk factors and lifestyle. Of course, you have to remember to give your pet the preventive in order for it to work!

The preventives do not kill adult heartworms, and will not eliminate heartworm infection or prevent signs of heartworm disease if adults are present in the pet's body. Therefore, a blood test for existing heartworm infection is recommended before beginning a prevention program to assess the pet's