



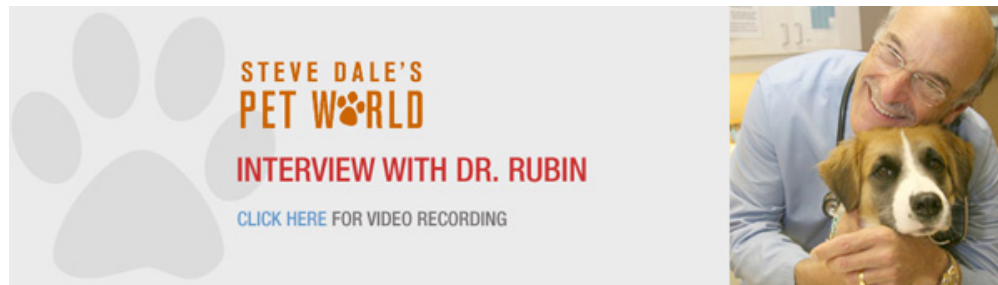
# What Is Heartworm Disease?

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## AVMA's "Animal Tracks" Podcast by Dr. Rubin

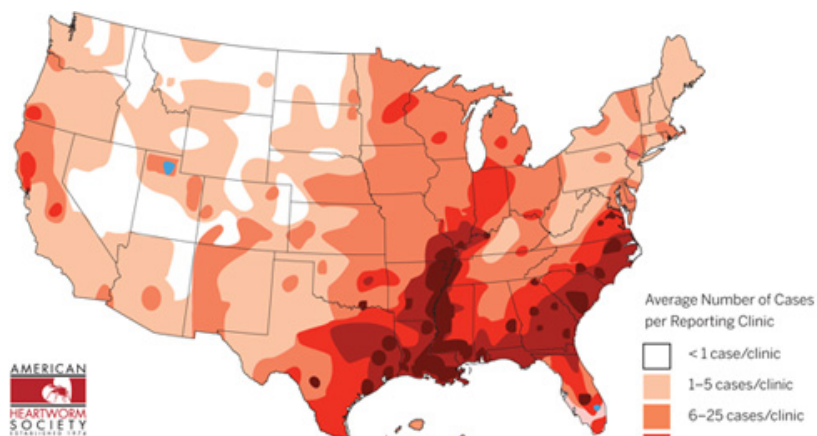
Heartworm Society President, Dr. Sheldon Rubin discusses heartworm disease for the AVMA's "Animal Tracks". ([Listen here: MP3](#)) to hear Dr Rubin explain transmission, treatment and prevention. Podcast provided courtesy of the AVMA.



Heartworm disease is a serious and potentially fatal condition caused by parasitic worms living in the arteries of the lungs and occasionally in the right side of the heart of dogs, cats and other species of mammals, including wolves, foxes, ferrets, sea lions and (in rare instances) humans. Heartworms are classified as nematodes (roundworms) and are filariids, one of many species of roundworms. Dogs and cats of any age or breed are susceptible to infection. [Learn more...](#)

## Where is Heartworm Disease?

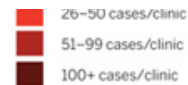
Heartworm disease has been reported in all 50 states. The map below shows particularly endemic areas based on the number of cases reported by clinics.



## HEARTWORM INCIDENCE 2007

© American Heartworm Society

The severity of heartworm incidence as shown in this map is based on the average number of cases per reporting clinic. Some remote regions of the United States lack veterinary clinics, therefore we have no reported cases from these areas.



## History

The first published description of heartworm in dogs in the United States appeared more than 100 years ago in an issue of "The Western Journal of Medicine and Surgery."<sup>1</sup> Heartworm in cats was first described in the early 1920's.<sup>2, 3</sup>

Since then, naturally acquired heartworm infection in cats and dogs is identified as a worldwide clinical problem. Despite improved diagnostic methods, effective preventives and increasing awareness among veterinary professionals and pet owners, cases of heartworm infection continue to appear in pets around the world.

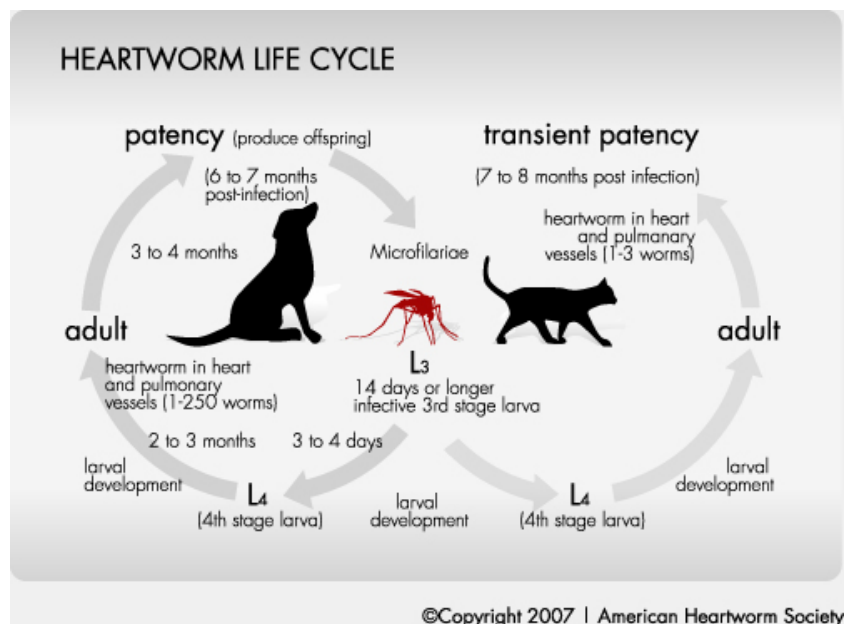
<sup>1</sup> Osborne, TC. Worms found in the Heart and Bloodvessels of a Dog; Symptoms of Hydrophobia. The Western Journal of Medicine and Surgery, 1847.

<sup>2</sup> Riley, WA. *Dirofilaria immitis* in the heart of a cat. J Parasitol 1922;9:48

<sup>3</sup> Travassos, LP. Notas Helminthologicas. Brazil-Med. An. 1921;35 2(6):67

## How Heartworm Happens: The Life Cycle

First, adult female heartworms release their young, called microfilariae, into an animal's bloodstream. Then, mosquitoes become infected with microfilariae while taking blood meal from the infected animal. During the next 10 to 14 days, the microfilariae mature to the infective larval stage within the mosquito. After that, the mosquito bites another dog, cat or other susceptible animal, and the infective larvae enter through the bite wound. It then takes a little over 6 months for the infective larvae to mature into adult worms. In dogs, the worms may live for up to 7 years. Microfilariae cannot mature into adult heartworms without first passing through a mosquito.



## What Are the Signs of Heartworm Disease?

For both dogs and cats, clinical signs of heartworm disease may not be recognized in the early stages, as the number of heartworms in an animal tends to accumulate gradually over a period of months and sometimes years and after repeated mosquito bites.

Recently infected dogs may exhibit no signs of the disease, while heavily infected dogs may eventually show clinical signs, including a mild, persistent cough, reluctance to move or exercise, fatigue after only moderate exercise, reduced appetite and weight loss.

Cats may exhibit clinical signs that are very non-specific, mimicking many other feline diseases. Chronic clinical signs include vomiting, gagging, difficulty or rapid breathing, lethargy and weight loss. Signs associated with the first stage of heartworm disease, when the heartworms enter a blood vessel and are carried to the pulmonary arteries, are often mistaken for feline asthma or allergic bronchitis, when in fact they are actually due to a syndrome newly defined as **Heartworm Associated Respiratory Disease (HARD)**.

## How Do You Detect Heartworm Disease?

Heartworm infection in apparently healthy animals is usually detected with blood tests for a heartworm substance called an "antigen" or microfilariae, although neither test is consistently positive until about seven months after infection has occurred.

Heartworm infection may also occasionally be detected through ultrasound and/or x-ray images of the heart and lungs, although these tests are usually used in animals already known to be infected.

## Prevention

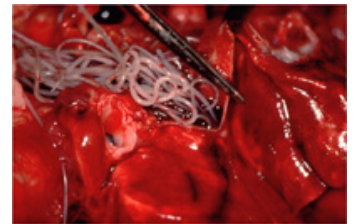
Because heartworm disease is preventable, the AHS recommends that pet owners take steps now to talk to their veterinarian about how to best protect their pets from this dangerous disease. Heartworm prevention is safe, easy and inexpensive. While treatment for heartworm disease in dogs is possible, it is a complicated and expensive process, taking weeks for infected animals to recover. There is no effective treatment for heartworm disease in cats, so it is imperative that disease prevention measures be taken for cats.

There are a variety of options for preventing heartworm infection in both dogs and cats, including daily and monthly tablets and chewables, monthly topicals and a six-month injectable product available only for dogs. All of these methods are extremely effective, and when administered properly on a timely schedule, heartworm infection can be completely prevented. These medications interrupt heartworm development before adult worms reach the lungs and cause disease.

*It is your responsibility to faithfully maintain the prevention program you have selected in consultation with your veterinarian.*

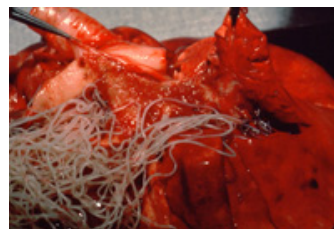
## Treatment

Usually, all but the most advanced cases of heartworm disease can be successfully treated in dogs. Currently, there are no products in the United States approved for the treatment of heartworm infection in cats. Cats have proven to be more resistant hosts to heartworm than dogs, and often appear to be able to rid themselves of infection spontaneously. Unfortunately, many cats tend to react severely to the dead worms as they are being cleared by the body, and this can result in a shock reaction, a life-threatening situation. Veterinarians will often attempt to treat an infected cat with supportive therapy measures to minimize this reaction; however it is always best to prevent the disease.



Heartworms in the heart of a dog

Adult heartworms in dogs are killed using a drug called an adulticide that is injected into the muscle through a series of treatments. Treatment may be administered on an outpatient basis, but hospitalization is usually recommended. When the dog is sent home, exercise should be limited to leash walking for the duration of the recovery period, which can last from one to two months. This decreases the risk of partial or complete blockage of blood flow through the lungs by dead worms.



Heartworms in the Pulmonary Artery of a dog

Re-infection during treatment is prevented by administration of a heartworm preventive. These preventives may also eliminate microfilariae if they are present. Dogs in heart failure and those with caval syndrome require special attention.

This is intended as a short summary. Please refer to the canine and feline section information, or glossary for more detailed information.

## Cats versus Dogs

	Cats	Dogs
<b>Parasite</b>	<u>Dirofilaria immitis</u>	<u>Dirofilaria immitis</u>
<b>Transmission</b>	Mosquito	Mosquito
<b>Susceptibility to infection</b>	Lower than dogs - 61% to 90% of cats exposed to infective <u>larvae</u> become infected	Very high - virtually 100% of dogs exposed to infective <u>larvae</u> become infected
<b>Longevity of worms</b>	2-3 years	5-7 years
<b>Ectopic infections</b>	Not uncommon	Occasionally
<b>Number of worms</b>	Usually less than 6, 1-2 worms most common	Not uncommon to find more than 30
<b>Single-sex infections in</b>	Common	Unusual

<b>meso- to high-endemic areas</b>		
<b>Microfilaremia</b>	<ul style="list-style-type: none"> <li>• Transient (Lasts about 1 month)</li> <li>• Seen in less than 20% of naturally infected cats</li> </ul>	<ul style="list-style-type: none"> <li>• Persistent</li> <li>• Very common (80%-90%)</li> <li>• Can last years, even after death of adult worms</li> </ul>
<b>Organ with greatest pathology</b>	Lungs	Heart and lungs
<b>Clinical importance of small worm burdens</b>	Potentially fatal	Clinical importance depends on the size of the dog, the size of the worm burden, and exercise level
<b>Diagnosis</b>	Complex	Relatively simple
<b>Treatment</b>	<ul style="list-style-type: none"> <li>• None approved</li> <li>• High risk of complications</li> </ul>	<ul style="list-style-type: none"> <li>• 1 compound approved</li> <li>• Complications manageable</li> </ul>
<b>Compounds for prevention</b>	4 approved in US	Several approved in US

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