

### 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 some cases surgical removal of heartworms may be necessary to save the pet's life.

### CAN HEARTWORM DISEASE BE PREVENTED?

Heartworm infection is preventable. There are several FDA-approved heartworm preventives available in a variety of forms including pills, soft chews, topical (spot-on) treatments, and injections. Some products even combine heartworm preventives with medications that kill internal and external parasites. Your veterinarian can recommend the best method based on your pet's risk factors and lifestyle. Of course, you have to remember to give your pet the preventive for it to work: skipping or delaying just one dose can lead to infection in high-risk areas.

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. 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, antigen tests only detect adult worms). Heartworm testing should be performed annually to ensure that your pet doesn't subsequently become

**The American Heartworm Society recommends testing pets every 12 months for heartworm and giving your pet a heartworm preventive 12 months a year.**

infected. There have been reports of pets developing heartworm infection despite being on a heartworm preventive, so having your pet tested regularly and keeping them on preventives year-round is the best way to keep them protected.

You can also help reduce your pet's risk of infection by reducing outdoor activities during times of peak mosquito activity, using mosquito repellents and insecticides, and eliminating standing water sources that permit mosquito larvae to grow.

### FERRETS AND HEARTWORM

Ferrets, even those kept indoors, are also at risk of heartworm infection. The signs are similar to those seen in dogs, but they develop more rapidly. Just one worm can cause serious disease in a ferret. Your veterinarian can prescribe heartworm medication approved for use in ferrets. The American Heartworm Society recommends year-round heartworm prevention for ferrets.



### FOR MORE INFORMATION:

**American Veterinary Medical Association**  
avma.org/Heartworm

**American Heartworm Society**  
heartwormsociety.org

# HEARTWORM DISEASE

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Heartworm is a preventable, but serious and potentially fatal, parasite spread by mosquitos. It primarily infects dogs, cats and ferrets. It also can infect a variety of wild animals, including wild canids (e.g., foxes, wolves, coyotes), felids (e.g., tigers, lions, pumas), raccoons, opossums, and pinnipeds (e.g., sea lions and seals).

## HOW ARE HEARTWORMS TRANSMITTED AND WHAT PROBLEMS DO THEY CAUSE?

Heartworms can only be transmitted from animal to animal by mosquitoes. An infected dog or cat cannot directly pass heartworms to another dog or cat. When a mosquito bites an infected animal, the mosquito becomes infected with young heartworms called microfilariae. Within two weeks, these develop into infective larvae inside the mosquito; they 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 a 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 adult worms live mainly in the arteries of the lungs, but in severe infections they also can be found in the heart chambers. The worms damage the blood vessels and reduce the heart's pumping ability, resulting in severe and potentially fatal lung and heart disease. When the animal shows signs of illness due to adult heartworm infection, it is called heartworm disease.

If adult worms 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, which can cause damage to other organs. This life cycle continues when a mosquito bites the infected animal and becomes infected by the microfilariae. The microfilariae develop into infective larvae within the mosquito, which is then capable of infecting another animal. Adult heartworms can survive for 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 and cats, regardless of age, sex, or living environment, are susceptible to heartworm infection. Both indoor and outdoor cats are 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.

## HOW CAN I TELL IF MY PET MIGHT HAVE HEARTWORM INFECTION OR DISEASE?

**DOGS:** If your dog has been infected recently with heartworms or has a mild infection, he/she may show no signs of illness until the adult worms have developed. As the disease progresses, your dog may cough, become lethargic, lose his/her appetite, or have difficulty breathing. You may notice that your dog seems to tire rapidly after only moderate exercise. Dogs with severe infections may collapse suddenly and die.

Testing can detect heartworms, even before they have done enough damage to cause the obvious signs of heartworm disease. Blood tests are performed by your veterinarian to detect the presence of adult heartworm infection (> 6-month-old infections) in your dog. The antigen test is most commonly performed, and is very accurate in dogs. If the antigen test is positive, an additional test is usually performed to confirm the infection. 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.

**CATS:** Signs of possible heartworm disease in cats include coughing, respiratory distress, vomiting, lack of appetite, or weight loss. In some cases, a cat may die suddenly from heartworms.

Diagnosing 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.

## 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, as well as those that stay inside at all times. Remember that mosquitoes can also get into homes, putting indoor-only pets at risk as well. The American Heartworm Society recommends testing all dogs on a yearly basis.

## HOW IS HEARTWORM DISEASE TREATED?

Heartworm is a progressive, life-threatening disease. The longer adult heartworms remain in your pet's body, the greater the damage, and the greater the risk of illness and death. The earlier they are detected and treated, the better the chances that your pet will recover and have fewer complications.

**DOGS:** As with most medical problems, it is much better – and much less expensive – 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, but serious complications are less likely in dogs that are in overall good health and when you strictly 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 dog's body. While your dog is treated, it will require complete rest (crate restriction is commonly recommended) during and for some time following the last treatment. Additionally, other medications may be necessary to manage or treat the clinical signs, reduce the risk of complications, and help control the inflammatory reaction as the worms die and are broken down in the dog's body.

**CATS:** There is currently no effective and safe medical treatment for heartworm infection or 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.

## What about “slow-kill” heartworm treatments?

Some people advocate treating heartworm disease with only a continuous administration of heartworm preventives, believing that a “slow” kill of the adults might reduce complications. While monthly heartworm preventives are important to keep your pet from developing heartworm infection, this approach for treating an existing infection is not recommended by the experts of the American Heartworm Society for several reasons. First, while this approach can shorten the lifespan of the adult worms, it may require several years to eliminate the worms – during which time, the heartworm-induced damage to the pet's heart and lungs becomes worse. Pets must be on strict exercise restriction for the entire time. This method also may increase the risk of the heartworms developing resistance to treatment.

## Are there natural preventives or treatments for heartworm infection and disease?

According to the American Heartworm Society, there are no “natural” or herbal therapies that have been shown to be safe and effective for the prevention or treatment of heartworm infection or disease.

