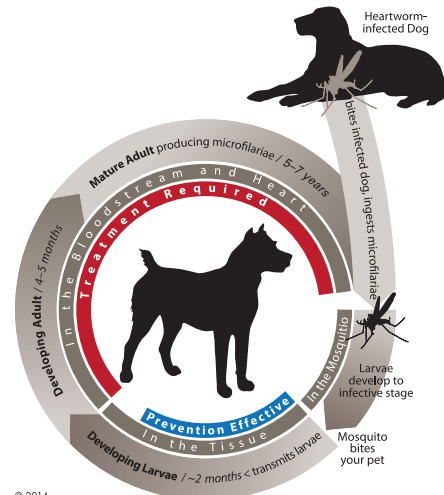


When a dog has a mature heartworm infection, female worms release their young (microfilariae) directly into the dog's bloodstream. When a mosquito bites a dog with microfilariae in the blood, it ingests the microfilariae along with the blood. Over the following 10 to 14 days, these microfilariae develop and mature into infective larvae inside the mosquito. When the mosquito bites another dog, the larvae are left behind to enter the fresh wound. In 6 to 7 months, these infective larvae migrate inside the dog, eventually reaching the heart and vessels of the lungs, where they continue to grow to full maturity. The mature adult worms produce microfilariae of their own, which are available in the dog's blood to infect other mosquitoes. Because heartworms may live for 5 to 7 years in the dog, each mosquito season can lead to increasing numbers of worms as they accumulate in unprotected dogs.



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While the risk of infection in dogs varies from one region of the country to another and even from one community to another, one fact remains: heartworm disease is a threat to unprotected dogs in every state, even some parts of Alaska. Unprotected dogs, foxes, coyotes, and wolves act as reservoirs, or sources, for the spread of this serious disease. The relocation of dogs, as with humanitarian efforts following natural disasters such as Hurricane Katrina, can introduce heartworm disease into parts of the country where it is not normally found. Furthermore, unprotected dogs traveling with their owners to areas where heartworms exist will be at risk for heartworm exposure. Heartworm disease is a complicated and deadly illness—the best approach is prevention.

This brochure highlights many general aspects of heartworm disease but cannot address every detail. Comprehensive guidelines providing the most up-to-date heartworm information have been prepared to assist you and your veterinarian. Please visit the website of the American Heartworm Society (www.heartwormsociety.org) for more in-depth information regarding prevention, diagnosis, and management of heartworm disease.



**AMERICAN
HEARTWORM
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EST. 1974

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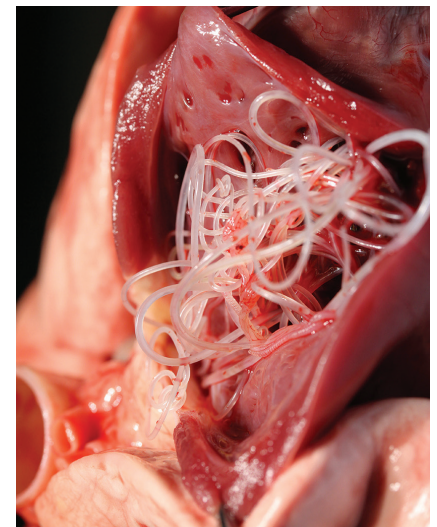
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Canine heartworm disease develops when a dog is bitten by a mosquito carrying microscopic larvae of a parasite called *Dirofilaria immitis*. As a mosquito feeds, these microscopic larvae infect and begin their migration into the dog's bloodstream, where they grow into adult worms. Adult female heartworms are larger than male heartworms and can grow 10 to 12 inches in length. They make their home in the right side of the heart and vessels of the lungs (pulmonary arteries), often causing lung disease and heart failure.

Although easy to prevent, heartworm disease continues to be a major health problem for dogs living in the United States and wherever mosquitoes live. If you ever see or get bitten by mosquitoes, your dog is at risk!



HEARTWORM DISEASE IN DOGS



SIGNS OF HEARTWORM DISEASE

Some dogs can be infected for several years before symptoms develop, so heartworm disease in younger dogs may not be obvious. As heartworms slowly cause damage to the pulmonary arteries of the lungs, signs of disease may include a mild persistent cough, reluctance to exercise, fatigue after moderate activity, decreased appetite, and weight loss. Eventually, as blood flow through the diseased lungs becomes more restricted, some dogs can develop heart failure. This is commonly recognized by a buildup of fluid in the abdomen and the appearance of a “swollen belly.” Although less common, a large number of heartworms can lead to a sudden obstruction of blood flow through the heart and lungs. This blockage often becomes a life-threatening form of heart failure referred to as *caval syndrome*. Signs of caval syndrome often include a sudden onset of labored breathing, pale gums, dark red or “coffee-colored” urine, and an inability or unwillingness to move. Most dogs suffering from caval syndrome will not survive without prompt surgical removal of the heartworm blockage.

DETECTING HEARTWORM INFECTION

Numerous blood tests are available for detecting heartworm infections in dogs, and your veterinarian will perform the test most appropriate for your dog. Keep in mind that no diagnostic test can accurately detect all heartworm infections. For example, tests cannot consistently detect infection until heartworms are at least 7 months old. Some heartworm infections may not be picked up by routine tests and more extensive testing, such as x-rays or ultrasound imaging, may be required if the

doctor suspects heartworms. Your veterinarian might also repeat the blood test at suggested intervals.

WHO SHOULD BE TESTED?

Annual testing is recommended for all dogs to ensure that heartworm prevention is achieved and maintained. If an infection is diagnosed in its early stages, the disease may be less severe and easier to treat.

All dogs 7 months of age and older should be tested for heartworms prior to beginning a preventive program. More frequent testing might be necessary in some cases—for example, if you know that a dose of the preventive medication has been missed, if you have switched from one preventive medication to another, or if your dog has clinical signs of heartworm infection or other individual risk factors. The frequency of testing should be discussed with your veterinarian. At a minimum, retesting is recommended 6 months after first starting on the preventive medication or a missed dose, and annually thereafter.

TREATMENT

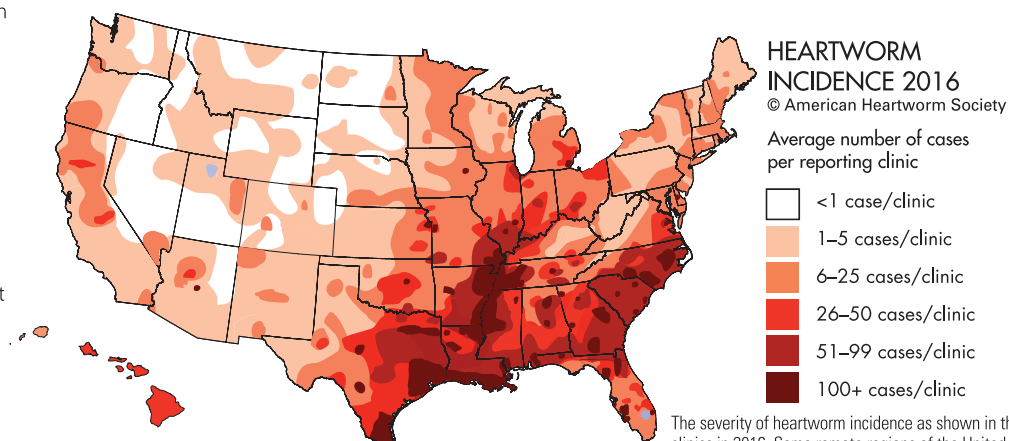
Without treatment, heartworm disease will worsen and may lead to more serious illness. Unless medical reasons identify a dog as a poor candidate, heartworm-positive dogs should be treated. Treating dogs for heartworms can also lead to serious health concerns, however, as the dead parasites can cause further injury to the lungs and pulmonary arteries. A thorough physical examination, x-rays, and blood and urine tests may be needed prior to treatment to assess your dog’s level of risk. To reduce complications, your veterinarian will educate you in great detail before initiating treatment of your dog. While the heartworm medication melarsomine hydrochloride is extremely effective in eliminating adult worms, some dogs will not be completely cleared with a single course of treatment. Testing is recommended 6 months after treatment to ensure all heartworms were killed. If tests are still positive, additional testing and further treatment may be indicated.

PREVENTION

Heartworm preventive medications are very effective when given properly on the prescribed schedule. It is important to monitor your pet’s weight to ensure your pet falls within the weight range listed on the package. All approved heartworm preventives are safe, very easy to use, relatively inexpensive, and some provide treatment for additional parasites. Prevention is always safer and more affordable than treating adult heartworm infections.

It is your responsibility to faithfully give your dog the preventive medication as prescribed. The best way to reduce the risk of heartworm infection in your dog is to give preventive medication year-round. In addition, you can take steps to minimize mosquito exposure by limiting outdoor activity during peak mosquito times and by utilizing approved mosquito repellants.

Be certain to have all dogs tested prior to initiating or restarting any heartworm prevention program as administration of preventives can cause life-threatening reactions when given to heartworm-infected pets. Routine testing is critical to avoid a delay in detecting early infection and starting life-saving therapy.



The severity of heartworm incidence as shown in this map is based on the average number of cases in dogs and cats from reporting clinics in 2016. Some remote regions of the United States lack veterinary clinics; therefore, we have no reported cases in these areas.

Annual testing

is recommended for all dogs to ensure that heartworm prevention is achieved and maintained.