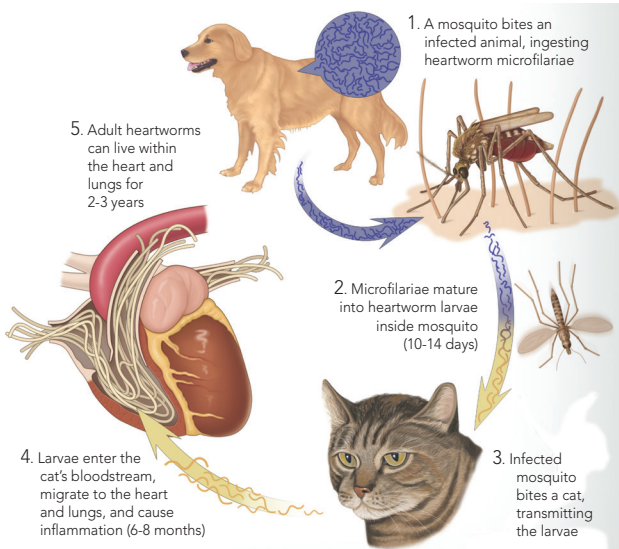


HEARTWORM LIFE CYCLE

Adult female heartworms release their baby worms, called *microfilariae*, into the bloodstream of an infected animal, typically a dog or wild canid. As mosquitoes take a blood meal from infected animals, they ingest the microfilariae. Larvae develop into an infective stage inside the mosquito within 10 to 14 days during hot weather, and more slowly with cooler temperatures. Then, when the mosquito bites another susceptible host, infective larvae are deposited on the skin and enter the bite wound. The larvae grow rapidly and begin to migrate in the tissue of the animal, eventually reaching the vessels of the lungs. In the cat it takes 6 to 8 months for heartworm larvae to fully mature into adult worms and those worms are thought to live approximately 2 to 3 years (in dogs they can live for 5 to 7 years).

Microfilariae cannot develop into adult heartworms in our pets without first developing in the mosquito into a larval stage 1 (L1), then molting into a larval-stage 2 (L2) and molting again into an infective third-stage larva (L3). The L3 is the only stage capable of infecting cats or dogs and potentially developing into adult heartworms.



A MESSAGE TO TAKE TO HEART

While the risk of infection in cats 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 cats in every state except Alaska. Unprotected dogs, foxes, coyotes, and wolves are the primary reservoirs, or sources, for the spread of this serious disease. The relocation of infected pets, as with humanitarian efforts following natural disasters, can introduce heartworms to non-endemic parts of the country. Unprotected pets traveling with owners to high-incidence areas will be at risk of getting infected with heartworms. Because many factors influence the spread of heartworms, the best approach is prevention.

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



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HEARTWORM
DISEASE
in CATS



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WHAT IS HEARTWORM DISEASE?

Feline heartworm disease develops after a cat is bitten by a mosquito infected with microscopic larvae of a parasite called *Dirofilaria immitis*. As a mosquito feeds on a cat, these larvae emerge from the mosquito onto the skin and quickly enter the cat's body through the bite wound, eventually reaching the cat's bloodstream. Young worms then migrate to the pulmonary (lung) arteries and the right side of the heart, where they may either die or continue to full development. In cats, only a few worms typically survive to adulthood, unlike dogs where large numbers of worms can develop to maturity. Unfortunately, whenever heartworms (young or old) die in the pulmonary arteries of a cat, the resulting inflammatory reaction can lead to severe lung disease or possibly even sudden death. This syndrome in cats is known as heartworm-associated respiratory disease (HARD) and is due to the strong immune response of the cat. Because the death of even a single heartworm can have fatal consequences, the use of routine preventive medication in cats is critical.

Previously thought to cause disease primarily in dogs and other wild canids (foxes, wolves, and coyotes), studies demonstrate that feline heartworm infection is more common than generally believed. Even indoor cats are at risk of infection because mosquitoes are often found inside homes. Although easy to prevent, heartworm disease continues to be a major health problem in the United States and throughout the temperate and tropical regions of the world.

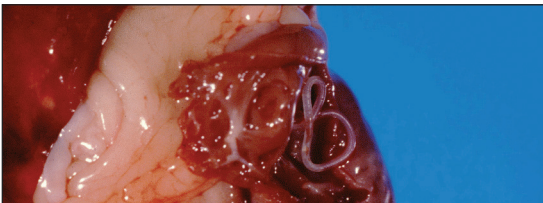


Photo courtesy of Dr. Ray Dillon, Auburn University, College of Veterinary Medicine

SIGNS OF HEARTWORM-ASSOCIATED RESPIRATORY DISEASE (HARD) IN CATS

Signs of feline heartworm-associated respiratory disease can mimic many common conditions of cats such as hairballs, asthma, or pneumonia. These signs range from mild and subtle in appearance to severe and life threatening, and may include loss of appetite, sluggishness, intermittent vomiting (not associated with eating), coughing, wheezing, and respiratory distress. Because these clinical signs are often associated with adult heartworm or larval death, signs of HARD can occur when no definitive evidence of infection exists.

Clinical disease in cats can occur during any stage of heartworm infection; however, experts concur that most signs are associated with the following three events:

- 1 The arrival and development of immature heartworms in the blood vessels of the lungs may lead to lethargy, anorexia, vomiting and respiratory disease. These signs may begin as early as 3 or 4 months after infection while the worms are still extremely small. Even if all the worms die before growing into adults, respiratory signs can develop and might persist for the remainder of the cat’s life.
- 2 Worms that survive can continue to develop to adult stages. While earlier clinical signs can persist, some infected cats will show no signs and appear clinically normal, as long as the heartworms are living.
- 3 Eventually, as adult worms die, many cats will have violent reactions to the dead worms, causing rapidly developing signs of respiratory distress and shock that can lead to sudden death of some cats.

DETECTING HEARTWORM INFECTION

Two types of blood tests are currently available to assist in diagnosing heartworms in cats. Unfortunately, test results do not always produce clear answers, even with professional interpretation. Positive tests can indicate heartworms were present, but do not necessarily mean the pet is still infected. Moreover, because tests cannot detect very early infection or those infections caused by only one or two worms, negative test results are not always accurate.

Even when feline heartworm disease is highly suspected, confirming a diagnosis can be difficult. Multiple blood tests along with chest x-rays and ultrasound imaging of the heart and lungs are often needed by the veterinarian to make a diagnosis.

The best option is the routine use of heartworm preventives.

TREATMENT

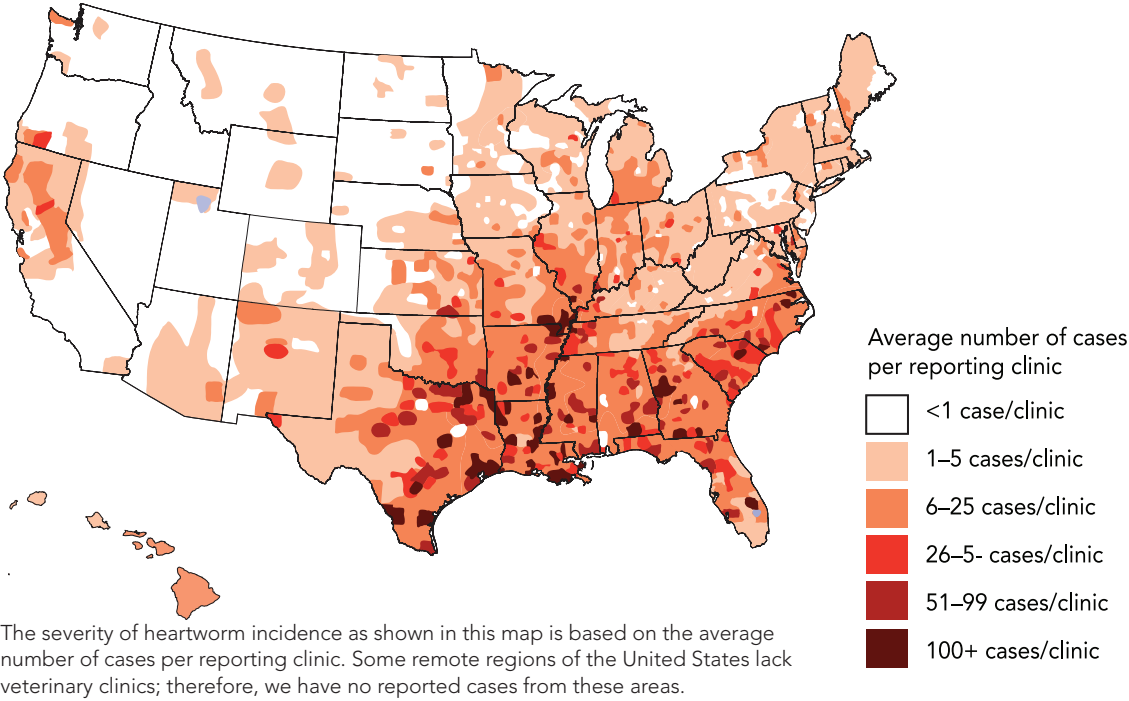
Unfortunately, no medications exist for the safe treatment of adult heartworms in cats. In some circumstances, surgical removal of heartworms has been effective; however, few surgical specialists have experience in successfully performing this difficult procedure.

Because no safe treatment exists for elimination of heartworms in cats, the best option is the routine use of heartworm preventives to inhibit development of new infections.

PREVENTION

Various heartworm preventives are available, including monthly oral and topical formulations. All feline heartworm preventive medications were

HEARTWORM INCIDENCE MAP



developed to work by affecting heartworm larvae acquired during the month prior to each treatment, before larvae develop into adult worms. These products are highly effective, safe, and inexpensive, and many provide treatment for additional parasites.

It is your responsibility to faithfully maintain the preventive program recommended for your cat by your veterinarian. The best way to eliminate the risk of heartworm infection in any of your susceptible pets is to institute a year-round prevention program as recommended by your veterinarian.

RETESTING

Testing is recommended for monitoring the success of any heartworm prevention program. Individual risk factors, clinical signs, and testing limitations might warrant different testing frequencies. The frequency of testing your cat should be discussed with your veterinarian.

