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## HEARTWORMS IN CATS

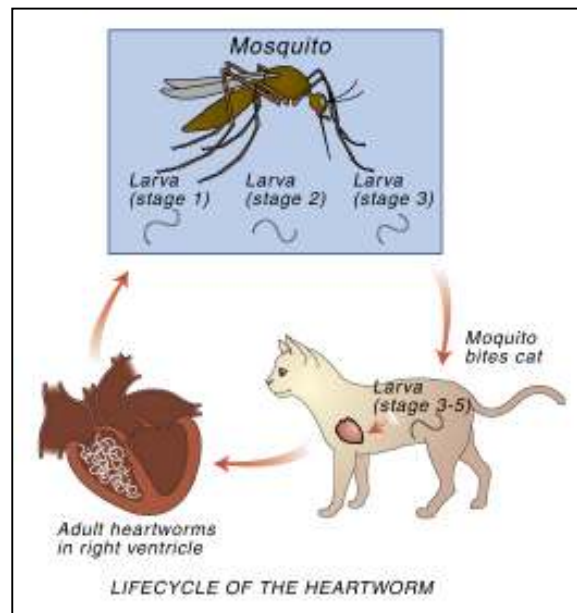
Heartworms are nine to eleven-inch long worms that live in a cat's heart or in the pulmonary arteries, the arteries leading to the lungs. Although heartworms occur commonly in dogs, most people do not consider them a problem for the cat. However, recent studies of cats with heart and respiratory diseases have found an incidence of heartworms that is far greater than previously thought. The prevalence of exposure to heartworm disease in indoor cats has been reported as high as 15% in certain geographical areas.

### ***How are heartworms transmitted to a cat?***

Heartworms are transmitted by mosquitoes. When an infected mosquito bites a cat, it deposits baby heartworms (larvae). The larvae migrate and mature for several months, ending up in the right side of the heart and the pulmonary arteries. They mature into adult heartworms about six months from the time they enter the cat. Shortly thereafter, they begin to release immature heartworms, known as microfilaria. Microfilariae live in the cat's blood for about one month. Mosquitoes ingest microfilaria by feeding on an infected cat or, more commonly, an infected dog. Because of this life cycle, it is necessary for a cat to be bitten by a mosquito in order to become infected with heartworms. Heartworms are not transmitted directly from one cat to another or from a dog directly to a cat.

### ***How are heartworms diagnosed?***

There are several methods used in diagnosing heartworms; unfortunately, none are 100% reliable so a combination of tests is often needed. The diagnostic sequence usually progresses as follows:



### Clinical Signs

One of the most challenging aspects of diagnosing feline heartworm disease is that there are no specific clinical signs. The most common signs are a sudden onset of coughing and rapid breathing. However, these clinical signs can be caused by several other diseases. Other common clinical signs include weight loss and vomiting, also common in other diseases. On occasion, an apparently normal cat may be found dead, or may develop sudden overwhelming respiratory failure. This is thought to happen due to a reaction within the lungs to the young heartworms, or when dead or live heartworms enter the pulmonary arteries and obstruct the flow of blood to the lungs.

## Blood Tests

1. There are two diagnostic tests that are proving to be very helpful in diagnosing heartworms. The **heartworm antibody test** determines that the cat's immune system has been exposed to heartworms. A positive test may indicate that an active infection is present. However, cats who have had heartworms but whose heartworms have died will also have antibodies for an unknown period of time. We currently believe that the antibodies persist for two to four months after the heartworms have died. Cats with late stage larvae that are not yet adults, and cats with adult heartworms in places other than the heart, may also test positive with the antibody test. This test is very sensitive, so it is used first. However, if it is positive the next test is performed.



2. The next test is the **heartworm antigen test**. This detects the presence of adult female heartworms. It is very specific, but not as sensitive. A positive test indicates that heartworms are present, but a negative test does not mean that they are absent. Because the cat must have at least two adult female worms present to make this test positive, a negative test may mean that the cat may only have a small number of worms or that all the worms present are male.

In summary, a diagnosis of heartworm infection is confirmed when **both** the antibody and antigen tests are positive. This information, combined with medical history and clinical signs, are most commonly used to diagnose feline heartworm disease.

3. Blood can be tested for the presence of **microfilariae**. However, less than 10% of cats with heartworms have microfilariae in their blood, and microfilariae are only present for one to four weeks. Although a positive test is diagnostic, a negative test means little.

4. Cats suspected of heartworms can also be tested for their level of **eosinophils**. Eosinophils are a type of white blood cells that occur in increased numbers when certain parasites are present. They are elevated in the presence of heartworms, but this elevation only occurs for a few months. This test is not specific, since cats with other parasites (intestinal worms, fleas, etc.) or allergies also commonly have increased eosinophil counts.

## Radiographs

**Radiographs** (x-rays) permit us to view the size and shape of the heart. They also allow us to measure the diameter of the pulmonary arteries. Many cats with heartworms have an increase in the size of the pulmonary arteries; they may suddenly come to an apparent stop (blunted) on their way to the lungs due to worms obstructing them. However, many other cats with heartworms have no abnormal findings on their radiographs, especially early in the infection.

An **angiogram** is an x-ray study in which contrast material (dye) is injected into the heart or veins and is seen as it goes through the pulmonary arteries. This illuminates the arteries so they can be better seen. There is some risk with this procedure so it is not used often.

## Ultrasound or Echocardiography

An **ultrasound** machine produces an image of internal organs and structures without the use of radiation. It is a testing procedure that is becoming more and more common in veterinary practices. With it, one is able to view the internal structures of the heart and the pulmonary arteries. In some cats, the actual heartworms can be seen; this finding confirms the presence of heartworms. However, in many cats the worms are not seen since there are generally only one or two worms present.

### ***Can feline heartworm disease be treated?***

There is no drug approved for treating heartworms in cats. One of the drugs for treating dogs has been used in cats, but there are potentially significant side-effects. Another problem is that when the heartworms die they pass through the pulmonary arteries to the lungs. This can result in sudden death. Thus, we have a dilemma when a cat is diagnosed with heartworms. One of two choices must be made:

1. Treat with the drug designed for dogs. However, this is a drug that has been shown to have side-effects in cats. These side-effects include acute pulmonary (lung) failure and death in a small percentage of cats.
2. Treat the symptoms of heartworm disease and hope the cat outlives the worms. Since heartworms live in a cat for about two years, several months of treatment are needed. When cats are in a crisis, they are treated with oxygen and corticosteroids ("cortisone") to relieve the reaction occurring in the pulmonary arteries and lungs, and, if needed, drugs to remove fluid from the lungs (diuretics). When they are stable, they are treated continuously or periodically with corticosteroids. However, the threat of an acute crisis or sudden death always exists.



### ***Is there a way to prevent heartworms?***

It is strongly recommended that all cats receive year-round monthly heartworm preventative in areas where mosquitoes are active all year round. Cats that live in colder areas, where mosquitoes are seasonal, should be on monthly preventative for at least 6 months of the year. There are excellent heartworm preventatives now available for cats, making prevention of heartworm disease safe and easy. The reasons that heartworm prevention should be considered for your cat are:

1. **Diagnostic Difficulty.** Diagnosing heartworms is not as easy in cats as in dogs.
2. **Unknown Incidence.** Heartworms are not nearly as common in cats as they are in dogs. However, they are probably more common than we realize. As we look more aggressively for heartworms in cats with better and better tests, we expect to find that the incidence is greater than previously thought. Many university studies have shown that up to 15% of all cats, indoor and outdoor alike, have been exposed to feline heartworm disease.
3. **There Is No Treatment.** There is simply no good treatment for heartworm-infected cats. Effective drugs are not available, and cats that seem to be doing well may die suddenly. Treating heartworm infections in cats is risky at best, and not treating these cats is just as risky.

It will take about two years for the parasitic infection to be eliminated in the cat, and serious clinical signs can suddenly appear at any time during this period.

**4. Prevention Is Safe and Easy.** Cats given heartworm prevention drugs have not shown signs of toxicity. There is a wide margin of safety, even in kittens as young as six weeks of age.

**5. Indoor Cats Get Heartworms, Too.** Exposure to mosquitoes is required for transmission. Cats do not have to be exposed to cats or dogs infected with heartworms. Obviously, cats that go outdoors are more likely to be exposed. However, an infected mosquito can easily get into the house and infect the cat.

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*This client information sheet is based on material written by Ernest Ward, DVM  
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