



### **Hookworm Infection in Dogs**

Dogs have many parasites, both internal and external. Internal parasites are those which live in the various organs inside the dog's body. Some of the internal parasites migrate through a number of different organs. Intestinal parasites are internal parasites that live in the small or large intestine (colon). External parasites, such as fleas, ticks, and mites, live on the outside of the body.

Hookworms represent a common intestinal parasite of the dog.

#### **Prevalence**

Various species of hookworms are found on a worldwide basis. The most common hookworm of dogs in warm (tropical or subtropical) climates is called *Ancylostoma*. The canine hookworm found in cooler climates is called *Uncinaria*.

#### **Causes/Transmission**

Dogs may become infected with hookworms by four routes: orally, through the skin, through the mother's placenta, and through the mother's milk. The oral and transcolostral (through the mother's milk) routes are the most common. The latter is of particular importance for puppies.

It is important to note that if a pregnant dog has hookworms, the pregnancy may reactivate larvae. These larvae will enter the female's circulation and pass to the puppy through the placental blood flow.

#### **Clinical Signs**

Hookworms received their name because of the characteristic hook-like mouthparts that they use to attach to the lining of the intestinal wall. Because they are very small (about 1/8" in diameter), you have to be looking very carefully to see the adult worm. Despite this, they are one of the most pathogenic worms found in dogs because they suck blood from the tiny vessels in the intestinal wall. A large number of hookworms can cause anemia; this occurs especially in puppies, but it may even occur in some adult dogs.

A blood transfusion may be needed in some dogs because of the rather severe anemia that can be produced by hookworms. The presence of pale gums, weakness, and diarrhea (possibly with blood) might suggest the need to specifically determine the dog's red blood cell count. Iron deficiency anemia secondary to hookworm infection can be a life-threatening problem for puppies.

Skin irritation and itching can be one of the common signs of a heavily infested environment. The larvae burrow into the skin and cause the dog a great deal of discomfort. The most common hookworm of dogs does not appear to have this type of burrowing behavior.

#### **Diagnosis**

Finding hookworm eggs during microscopic examination of a stool sample is diagnostic for the parasite. Because eggs are produced on a daily basis, they are usually plentiful in number. The adult female hookworm is reported to produce as many as 20,000 eggs a day!

In puppies, adequate numbers of worms may not be present for production of ova. For this reason, fecal examination may be less reliable in puppies than in adult dogs.

### **Treatment**

There are a number of effective drugs that will kill hookworms. These are given by injection or orally and have few, if any, side effects. However, these drugs only kill the adult hookworms. Therefore, it is necessary to treat again in about 3-4 weeks to kill any newly formed adult worms that were larvae at the time of the first treatment.

Since the dog's environment can be laden with hookworm eggs and larvae, it may be necessary to treat it with a chemical to kill them. There are several available products that are safe to use on grass. Monthly heartworm preventative also prevents many intestinal parasitisms. Monthly treatment is recommended to prevent future infections.

### **Prognosis**

Hookworms can be life threatening for young puppies and for adult dogs lacking immunity to the parasite. Puppies who suffer severe hookworm infection may be stunted and never reach their full growth potential. In general, the prognosis is good for adult dogs.

### **Transmission to Humans**

Adult hookworms do not infect humans internally. However, the larvae can burrow into human skin. This causes itching, commonly called "ground itch," but the worms do not mature into adults. Direct contact of human skin to moist, hookworm infested soil is required. Fortunately, this does not occur very often if normal hygiene practices are observed.

In rare instances, the canine hookworm will penetrate into deeper tissues and partially mature in the human intestine. A few reports of hookworm enterocolitis (small and large intestinal inflammation) have surfaced in the recent past.

### **Prevention**

1. All new pups should be treated by 2-3 weeks of age. To effectively break the life cycle of the most common intestinal parasites, the pups should be dewormed on the schedule recommended by your veterinarian.
2. Prompt deworming should be given when parasites are detected; periodic deworming may be appropriate for pets at high risk for reinfection.
3. Prompt disposal of all pet feces, especially in yards, playgrounds, and public parks.
4. Strict hygiene is especially important for children. Do not allow children to play in potentially contaminated environments. Be mindful of the risk posed by public parks and non-covered sandboxes. Sandboxes that have fitted covers are popular and are recommended to prevent infection of children with intestinal parasites.
5. Nursing females should be treated concurrently with their pups; nursing may reactivate infection in the female.
6. Use of a heartworm preventative that contains medication for prevention/control of hookworms is advisable.