

## Hookworm Infection in Dogs

### What are hookworms?

Hookworms (*Ancylostoma caninum*, *Ancylostoma braziliense*, *Uncinaria stenocephala*) are intestinal parasites of the cat and dog that get their name from the hook-like mouthparts they use to anchor themselves to the lining of the intestinal wall. They are only about 1/4" to 3/4" (1–1.9 cm) long and so small that it is very difficult to see them with the naked eye. Despite their small size, they ingest large amounts of blood from the tiny blood vessels in the intestinal wall. A significant number of hookworms can cause inflammation in the dog's intestine, as well as a life-threatening decrease of red blood cells (anemia). Anemia is most common in puppies but can occur in adult dogs.



Hookworms are more common in warm, moist environments. Conditions of overcrowding and poor sanitation contribute to infection.

### How do dogs get hookworms?

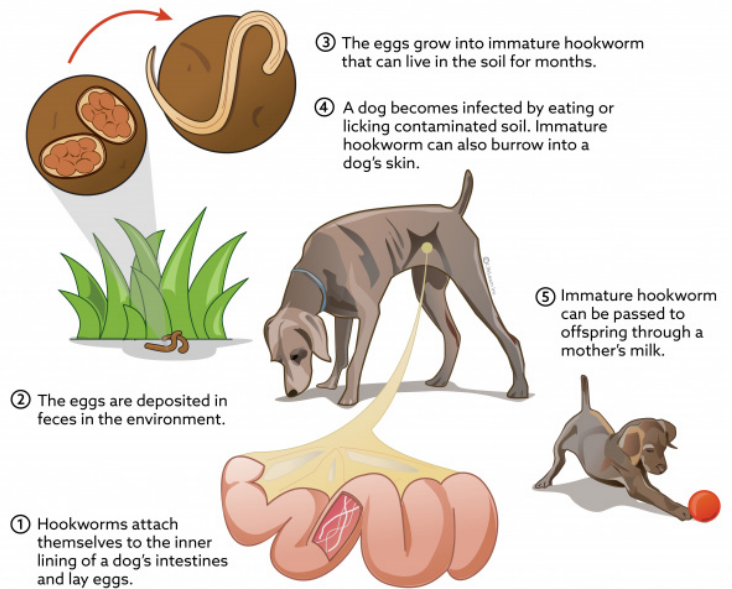
Dogs may become infected with hookworms by one or all of four of the following routes:

- oral ingestion
- through the skin
- through the mother's placenta before birth (in utero)
- through the mother's milk

Female hookworms pass hundreds of microscopic eggs in the feces of infected dogs, where they contaminate the environment. Larvae hatch from the eggs and can remain infective in the soil for weeks to months. A dog may become infected when it inadvertently swallows hookworm larvae, often by grooming its feet or from sniffing feces or contaminated soil.

**"A dog may become infected when it inadvertently swallows hookworm larvae, often by grooming its feet or from sniffing feces or contaminated soil."**

### The Hookworm Lifecycle



Most ingested larvae will move to the dog's intestinal tract to complete their lifecycle. A few larvae may make their way into the trachea (windpipe) and are then coughed up and swallowed. The larvae may also burrow into the skin if the dog walks or lies on contaminated ground. Once in the host's body, the larvae migrate to the lungs and trachea. The dog will then cough up and swallow the larvae which then migrate to the intestinal tract, where they mature and complete their life cycle. Part of the hookworm lifecycle involves migration through muscle tissues, where they may become dormant (alive, but temporarily inactive).

If a pregnant dog had hookworms in the past, the pregnancy may reactivate dormant larvae, which then enter the female's bloodstream and infect the puppies in the uterus (prenatal infection). Puppies may also become infected after birth through mother's milk (transmammary) during nursing. Prenatal and transmammary infections are an important route of infection for puppies.

Dogs can also become infected if they eat a transport host (such as a cockroach) that is carrying the infective larvae.

### What are the clinical signs of hookworm infection in dogs?

The most significant clinical signs are related to intestinal distress and anemia. The parasites anchor themselves to the intestinal lining so that they can feed on tissue fluids and blood while injecting an anticoagulant substance that prevents the blood from clotting. This can cause continued bleeding after the hookworm has detached from the feeding site. Therefore, the dog can suffer blood loss from the hookworms feeding, as well as continued bleeding into the bowel from the attachment sites. Pale gums and weakness are common signs of anemia.

Some dogs experience significant weight loss, bloody diarrhea, dull and dry coat, or, in puppies, failure to grow properly. It is not uncommon for young puppies to die from severe hookworm infections. Skin irritation and itching, especially of the paws, caused by larvae burrowing into and along the skin, can be signs of a heavily infested environment. Dogs may also exhibit coughing in severe cases.

**"It is not uncommon for young puppies to die from severe hookworm infections."**

### How is hookworm infection diagnosed?

Hookworm infection is diagnosed using a technique called fecal flotation. The stool is mixed with a solution that causes the parasite eggs to float to the top of the solution and adhere to a glass slide placed on its surface. Since there are many eggs produced daily and the eggs have a unique appearance, hookworm infections are easily detected. It takes two to three weeks for hookworm larvae to mature and begin producing eggs. For this reason, a fecal examination may be less reliable in very young puppies than in adult dogs. Adult hookworms are small and firmly attach to the intestinal wall, which is why they are rarely detected in stool.

## How is a hookworm infection treated?

There are several effective drugs, called anthelmintics, that will eliminate hookworms. Most are given orally and have few, if any, side effects. However, these drugs only kill adult hookworms. Therefore, it is necessary to treat an infected dog again in two to three weeks to kill any new adult worms that were larvae at the time of the first treatment. In rare cases, a blood transfusion may be necessary for dogs with severe anemia.

**"...it is necessary to treat an infected dog again in two to three weeks to kill any new adult worms that were larvae at the time of the first treatment."**

## Are canine hookworms infectious to people?

Adult hookworms do not infect humans; however, the larvae can burrow into human skin (usually through bare feet). This causes itching, commonly called 'ground itch', but the worms do not mature into adults and will die within several weeks. More dangerous is the condition in which hookworm larvae migrate throughout the human body, damaging the eyes and internal organs. This is called visceral larval migrans. Direct contact of human skin to moist, hookworm-infested soil is required. Fortunately, this is extremely rare if normal hygiene practices are observed.

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

## How can I keep myself and my dog safe against hookworms?

Prevention of hookworm infection should include the following measures:

- All puppies should be treated with a veterinary-approved anthelmintic product at two to three weeks of age. In addition, prompt deworming should be given if the parasites are detected. Periodic deworming may be appropriate for pets at high risk for infection.
- Prompt disposal of dog feces should occur, especially in yards, playgrounds, and public parks.
- Strict hygiene is important, especially for children. Do not allow children to play in potentially contaminated environments. Frequent hand washing and bathing are essential in preventing human infections.
- Nursing female dogs should be dewormed at the same time their puppies are. Pregnancy and nursing may reactivate a dormant hookworm infection in the female dog, which will then infect her puppies.
- Most heartworm prevention products contain medication to treat hookworm infections. Some of these products kill the adults, while others will also kill larval stages and prevent infestations. Your veterinarian can advise you on the best product for your dog.

*© Copyright 2022 LifeLearn Inc. Used and/or modified with permission under license. This content written by LifeLearn Animal Health (LifeLearn Inc.) is licensed to this practice for the personal use of our clients. Any copying, printing or further distribution is prohibited without the express written consent of LifeLearn. This content does not contain all available information for any referenced medications and has not been reviewed by the FDA Center for Veterinary Medicine, or Health Canada Veterinary Drugs Directorate. This content may help answer commonly asked questions, but is not a substitute for medical advice, or a proper consultation and/or clinical examination of your pet by a veterinarian. Please contact your veterinarian if you have any questions or concerns about your pet's health.*