

PREVENTION AND CONTROL OF HOOKWORMS

IN PUPPIES:

- Routine worming every two weeks from 2 to 8 weeks of age. Nursing dams should be treated at the same times.
- Fecal check at first checkup visit to look for all typical parasites.
- Repeat fecal checks and worming medication monthly until there are two negative fecal samples.
- Clean up and dispose of all stools to prevent contamination of the soil with worm eggs.

IN KITTENS:

- Routine worming at 3, 5, 7 and 9 weeks of age. Nursing queens should be treated at the same times.
- Fecal check at first checkup visit to look for all typical parasites.
- Repeat fecal checks and worming medication monthly until there are two negative fecal samples.
- Clean litter box of fecal matter at least once daily. Empty, disinfect and refill with fresh litter at least once weekly.

IN CHILDREN:

- Follow the above directions to prevent contamination of the environment with worm eggs.
- Instruct children not to put soil or toys contaminated with soil into their mouths.
- Keep children away from cats' litter boxes and from dogs' elimination areas in the yard.
- Cover children's sandboxes when not in use to prevent their use as a litter box by neighborhood cats.
- Make sure children wash their hands thoroughly after playing outside and before eating.



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**WHAT YOU SHOULD
KNOW ABOUT
Hookworms**

Indian Walk Veterinary Center, P.C.



*Caring for Pets and the
People Who Love Them*

Hookworms are not as common as roundworms or tapeworms in dogs and cats, but they are seen regularly and can cause severe disease. Some types of hookworm can be transmitted from animals to humans.

There are three main types of hookworm important to dogs, cats and people:

Ancylostoma caninum	mainly infects dogs
A. tubaeforme	mainly infects cats
A. braziliense	mainly infects dogs & cats
A. duodenale	mainly infects humans
Uncinaria stenocephala	mainly infects dogs & cats
Necator americanus	mainly infects humans

HOW DID YOUR PET GET HOOKWORMS?

A. caninum can be acquired by:

- Nursing from an infected mother, as early as 4 days after birth. This is the most common route in puppies.
- In-utero infection, through the placenta of the mother during pregnancy. This is rare.

All species of hookworm can be acquired by:

- Consuming infective juvenile worms from the soil
- Penetration of infective juvenile worms through the skin, usually of the feet.
- Consuming a prey animal (usually a rodent) that is infected with hookworms. This is not common.

WHY ARE HOOKWORMS BAD FOR YOUR PET?

Hookworms are voracious blood-sucking parasites. They attach to the wall of the intestinal tract with large hook-like mouthparts and suck blood and tissue fluids. As they graze, they leave bleeding pinpoint ulcerations along the intestinal walls.



Each adult *A. caninum* can consume up to 0.2 ml of blood per day. This may not sound like much, but multiplied by a typical number of worms in a dog, **this can result in the loss of 25% of the dog's blood volume every day!**

In nursing puppies, this can quickly result in a fatal anemia. Even in adult dogs, the blood loss can be significant. In addition, there are disruptions of digestion and intestinal motility that cause weight loss, vomiting, diarrhea, inappetence and dehydration.

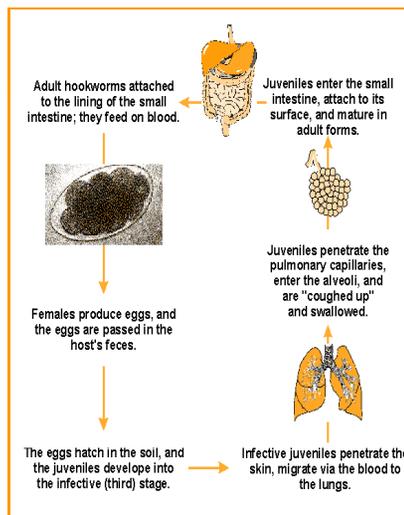
Ancylostoma caninum is the most important hookworm in terms of the amount of damage it can cause. The other species cause less blood loss and fewer signs of illness in our pets, but are still a threat to humans.

LIFE CYCLE OF HOOKWORMS

An infected animal passes massive numbers of hookworm eggs in the feces, **up to 28,000 per day!** These eggs hatch into larvae which feed on the bacteria in the fecal matter surrounding them. These larvae molt twice within 3 weeks to become the infective L3 form.

Whether the larva enters the animal through the mouth or the skin, it travels through the blood stream through the heart to the lungs, where it penetrates into the lung tissues. It is then coughed up and swallowed. Once it reaches the small intestine it attaches to the wall and matures into the adult form.

The period between infection and passing of eggs in the stool is 3 to 4 weeks. Puppies and kittens can become extremely ill within 2 weeks, prior to passing any eggs.



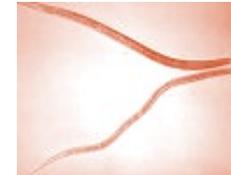
HUMANS CAN BECOME INFECTED BY CONTACT WITH CONTAMINATED SOIL. THE WORMS PENETRATE THE SKIN AND MIGRATE LOCALLY IN THE SKIN INSTEAD OF MIGRATING TO THE LUNGS. THIS CONDITION IS CALLED CUTANEOUS LARVA MIGRANS.

INFECTION CAN OCCUR WHEN WALKING BAREFOOT ON THE LAWN OR SUN-BATHING ON THE SAND. CHILDREN MAY BE INFECTED THROUGH THE SKIN OR BY INGESTION AS THEY PLAY IN CONTAMINATED AREAS. ALSO AT RISK ARE ELECTRICIANS, PLUMBERS AND OTHER WORKERS WHO MAY NEED TO CRAWL BENEATH RAISED BUILDINGS IN THE COURSE OF THEIR WORK.



HOW DO YOU KNOW IF YOUR PET HAS HOOKWORMS?

Signs of severe Hookworm infection include pale gums due to anemia, diarrhea (can be bloody, dark or tarry), weakness and weight loss. Itchy feet may result from the larvae burrowing into the pads of the paws. As larvae migrate through the lungs, they may cause a mild cough.



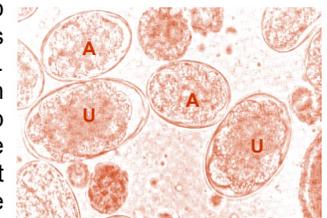
Adult *Ancylostoma*

In very young puppies and kittens the first sign may be sudden death. In otherwise healthy adults, there may not be noticeable signs of infection.

Hookworms average about 10 mm in length and are very thin, so don't expect to see them in your pet's stool or vomit. The best way to find out is by routine fecal examinations.

HOW DO WE DIAGNOSE HOOKWORMS?

When a specimen of your pet's feces (about 1/2 teaspoon) is submitted to our laboratory, the technicians mix it thoroughly with a concentrated solution of a special salt, then centrifuge it. The eggs of the hookworms are lighter than the salt solution, so they float to the top of the small container and stick to a glass cover slip that is placed across the top of the fluid. The technician then places the cover slip onto a microscope slide and examines it under the microscope for eggs.



Microscope view of eggs of *A. caninum* (A) and *U. stenocephala* (U)

HOW DO WE TREAT HOOKWORMS?

There are a number of medications that are effective against adult hookworms in the intestinal tract, but repeat treatment is often necessary to eliminate immature migrating or dormant larvae as they mature. That is why we recommend fecal rechecks, to make sure that the worms are eliminated by the medication.