

PREVENTION AND CONTROL OF ROUNDWORMS

IN PUPPIES:

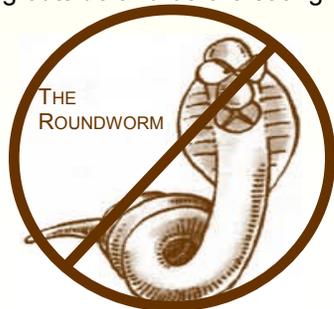
- Routine worming every two weeks from 2 to 8 weeks of age. Nursing dams should be treated at the same times.
- Fecal check at first checkup visit to look for all typical parasites.
- Repeat fecal checks and worming medication monthly until there are two negative fecal samples.
- Clean up and dispose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

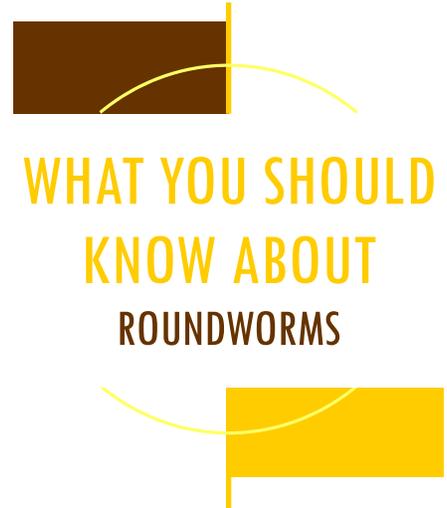



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*Caring for Pets and the
People Who Love Them*

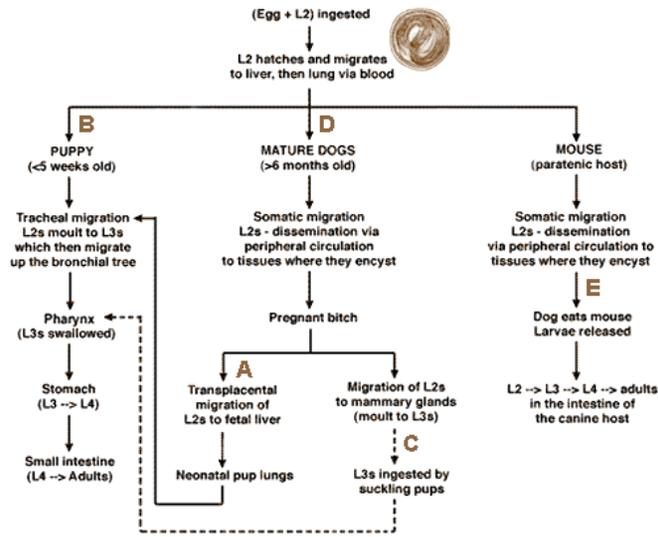
Roundworms are parasites that have evolved some remarkable strategies for survival. Unfortunately, their success is at the expense of not only our pets, but ourselves.

There are three species of roundworms that infect dogs and cats, *Toxocara canis* in dogs, *Toxocara cati* in cats, and *Toxascaris leonina* in both.

Toxocara species

The life cycles of *T. canis* and *T. cati* are very complex and well-suited to exploiting the resources of their host animals. It is no wonder that over 90% of puppies and a significant number of kittens are infected.

Toxocara canis Life Cycle



When an infected dog or cat defecates, microscopic eggs of *Toxocara* are present in the feces. These eggs are NOT infective immediately. They require a period of 3 to 4 weeks at environmental temperatures to develop into infective larvae (L2). By this time there is no evidence of the fecal material, but the larva-containing eggs are in the soil. The eggs can remain infective for years, even through harsh environmental conditions. They are nearly impossible to kill with household disinfectants.

Dogs and puppies swallow the infective eggs along with grass or dirt, or contaminated toys. Rodents that contain developing larvae are another source of infection for dogs and cats that prey on them.



CHILDREN MAY ALSO BECOME INFECTED BY EATING DIRT OR STICKING A DIRTY HAND OR TOY INTO THEIR MOUTHS. THIS CAN RESULT IN OCULAR OR VISCERAL LARVA MIGRANS, IN WHICH THE WORM LARVAE MIGRATE INTO THE EYES, CAUSING VISION LOSS, OR THROUGHOUT THE BODY, CAUSING GENERALIZED DISEASE.

Once an egg enters the intestinal tract of the dog or cat, the larva hatches out, then burrows out of the intestine and migrates through the animal's body. In very young puppies and kittens, it travels to the lungs, then the trachea, where it is coughed up and swallowed. Back in the intestines, the now-mature worm completes its life cycle by mating and laying eggs, which will be shed in the puppy's or kitten's stools. This entire cycle takes about 3 to 4 weeks.

If the dog or cat is over 5 weeks old, the larva does not go to the lungs, instead entering the bloodstream where it travels until it reaches other tissues, especially the liver. There it encloses itself within a cyst and becomes dormant until reactivated by stress, illness or suppression of the animal's immune system. During the last few weeks of pregnancy in dogs, the encysted larvae are stimulated to head to the uterus, through the placenta, and into the lungs of the developing puppies. In cats and dogs, larvae end up in the mammary glands and pass into the newborns as they nurse. Thus many puppies are born infected, and kittens can become infected at a very early age, even though the mother's stools tested negative for worm eggs before her pregnancy.

Toxascaris leonina

T. leonina has a simpler life cycle than *T. canis* and *T. cati*. Infection is by ingestion of infective eggs in the soil or rodents that contain developing larvae. Once ingested, the larva hatches out and remains in the intestinal tract for its entire life. **This parasite does not infect humans.**

HOW DID YOUR PET GET ROUNDWORMS?

T. canis can be acquired by:

- In-utero infection, through the placenta of the mother during pregnancy. This is the most common method.

T. canis and *T. cati* can be acquired by:

- Nursing from an infected mother.

All three worms can be acquired by:

- Consuming infective worm eggs from soil.
- Consuming a prey animal (usually a rodent) that is carrying developing worms.

WHY ARE ROUNDWORMS BAD FOR YOUR PET?

Roundworms live in the intestinal tract and consume the food intended for your pet. They may cause diarrhea, vomiting, weight loss (or lack of weight gain in puppies and kittens) and abdominal pain. A heavy infestation can even obstruct the intestinal tract. Large numbers of larvae migrating through the lungs may cause pneumonia.

HOW DO YOU KNOW IF YOUR PET HAS ROUNDWORMS?

Heavily infested puppies or kittens may pass the 7 to 10 inch-long worms in the feces or vomit. They are cream to tan in color and are frequently compared to spaghetti in appearance. It is safe to assume that almost any puppy or kitten has at least some roundworms. In most cases, the best way to find out is by routine fecal examinations.



Adult *Toxocara*

HOW DO WE DIAGNOSE ROUNDWORMS?

When you drop off a specimen of your pet's feces, our technicians take a small portion (about 1/2 teaspoon) and mix it thoroughly with a concentrated solution of a special salt. The mixture is then left to sit for 15 minutes in our vented laboratory hood. The eggs of the roundworms 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 *T. canis* (left) and *T. leonina* (right).

HOW DO WE TREAT ROUNDWORMS?

There are a number of medications that are effective against adult roundworms in the intestinal tract, but it is impossible to eliminate the encysted larvae or immature worms. That is why we request fecal rechecks, so we can "catch" the worms at a susceptible time to eliminate them.