Cat Roundworms (Ascarids, Toxascaris leonina, Toxocara cati)

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Roundworms, often called 'ascarids,' are the most common parasite of the digestive tract in dogs and cats. Many young animals are infested with roundworms and when we look at the life cycle, we will understand why. All of these roundworms are widely distributed in North America. They are of considerable importance in young animals and in catteries. Because they can cause disease in humans, they are also very important to our health as well.

The adult roundworms all live in the small intestine of the host and their eggs look very similar. All the roundworms are prolific and an infested animal can pass millions of eggs in the feces each day. The roundworms differ, however, in their life cycles. These differences are very important when we look at how we can eliminate these parasites from our pets.

Even birds and reptiles can have roundworms, although they are a different genus and species than those found in dogs and cats.

What are the life cycles of the roundworms in dogs and cats?

There are 3 types of roundworms that affect dogs and cats and each has transport hosts.

Roundworm	Primary Host	Transport Host
Toxascaris leonina	Dog, cat, fox, and other wild carnivores	Small rodents
Toxocara canis	Dog, fox	Small rodents
Toxocara cati	Cat	Small rodents, beetles, earthworms

T. leonina: Of the roundworms, *T. leonina* has the simplest life cycle. After an animal ingests infective eggs, the eggs hatch and the larvae mature within the small intestine. The adult female worm lays eggs which are passed in the feces. The eggs become infective after remaining in the environment for at least 3-6 days. Animals become infected if they eat something contaminated with infected feces.

Mice can act as intermediate or transport hosts of *T. leonina*. The rodent ingests the eggs, the eggs hatch, and the larvae migrate through the tissues of the rodent. If a carnivore eats the mouse, the larvae are released in the digestive system of the carnivore and develop into adults in the intestine.

T. cati: Roundworms of the species *T. cati* have a more complicated life cycle and a very effective way of making sure its species will be passed from generation to generation. Let us take a look.

An animal can acquire a *T. cati* infection several ways: ingestion of eggs, ingestion of a transport host, or by larvae through the milk. First, let us follow the ingestion of infective eggs.

Ingestion of Eggs: After a cat eats the eggs, they hatch and the larvae enter the wall of the small intestine. The larvae migrate through the circulatory system and either go to the respiratory system or other organs or tissues in the body. If they enter body tissues, they can encyst (become walled off and inactive). They can remain encysted in tissues for months or years. This is the migration most commonly seen in older cats. In very young kittens, larvae move from the circulation to the respiratory system, are coughed up and swallowed. The larvae mature into adults. The adult worms lay eggs which pass out of the animal in the feces. The eggs need to remain in the environment 10-14 days before they become infective.

Ingestion of transport or intermediate host: If a cat ingests a transport host, such as an earthworm or beetle which has encysted larvae, the larvae are released from the transfer host when it is eaten and digested, and the larvae mature in the intestine. The same is true if a cat eats an intermediate host such as a mouse.

Larvae through the milk: During the perinatal period dormant larvae in the queen can start to migrate to the mammary glands and into the milk. The kittens can become infected through the milk while nursing. The swallowed larvae mature in the kitten's intestine. If the larvae are passed out in the kitten's feces before they can mature, they can infect the mother when she licks her kitten.

About 4 weeks after a cat eats an infective egg, the adult worm has matured in the animal's intestine and the next generation of eggs is passed.

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T. canis: The life cycle of *T. canis* is similar to that of *T. cati*. In addition to migrating to the mammary glands, the larvae that were dormant in the mother's tissues can migrate through the uterus and placenta and infect the fetal pup. This is called *in utero* transmission. The larvae enter the lungs of the fetal pup. When the pup is born, the pup will cough up the larvae and they will mature in the pup's intestine. This is why so many puppies have roundworms – they are infected before they are born.

The table below helps summarize the ways the different roundworms are transmitted.

	Eggs, through Ingestion	**Larvae, through the milk**	**Larvae, across the placenta**	**Larvae, by ingestion of transport or intermediate host**
T. leonina	X			X
T. cati	X	X		X
T. canis	X	X	X	X

Remember, for all roundworms, the eggs need to remain in the environment for days to weeks before they become infective. Larvae encysted in the host's tissues can remain dormant there for the host's lifetime.

How do roundworms cause disease in pets?

In the intestine, roundworms absorb nutrients from what the animal eats, interfere with digestion and can damage the lining of the intestine. Animals with mild infestations of roundworms may not show any signs of disease. Animals with more severe infestations may be thin, have dull hair coats, and develop a pot-bellied appearance. Some may become anemic and have vomiting, diarrhea, or constipation. Rarely, in severe infestations, the roundworms can cause obstruction of the intestines. A cough may be observed in some animals due to the migration of the larvae through the respiratory system. In young animals, the migration of the *T. canis* larvae in the lungs can cause pneumonia.

How are roundworm infestations in pets diagnosed?

Adult worms are usually 3-4 inches long, although some *T. canis* roundworms can be up to 7 inches. Adults may be seen in the feces or vomit. The worms are round on cross-section (hence the catchy name) and look a bit like spaghetti.

The eggs are identified in the feces. A flotation solution is used to separate the eggs from the rest of the stool, and the resulting sample is examined microscopically. Very slight differences in appearance of the eggs of the three roundworms can allow experienced persons to distinguish between them.

Surprise! Occasionally we will see eggs of *T. cati* in dog stool. How could that happen? The dog has made a raid on the cat's litter box and has eaten cat feces. The eggs pass through the digestive system of the dog and are found in its stool.

How are roundworm infestations in pets treated?

There are many wormers that kill roundworms. Most wormers, however, kill the adult worms but do not affect the migrating or encysted larvae. This is why most manufacturers of wormers advise repeating the worming 2-4 weeks after the first treatment. By that time, most larvae that were migrating during the first treatment have come back to the intestine where they can be killed by the second treatment.

Common wormers are listed below; those that are effective against roundworms have an 'R' in the 'Effective Against' column.

Oral Treatments for Gastrointestinal Parasites in Cats			
Ingredient(s)	**Example**	**Range of Efficacy***	**Minimum Age/Weight**

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piperazine salts	Hartz Advanced Care Liquid Wormer/Sergeants Worm Away	**R**	6 weeks
milbemycin oxime	Interceptor**	**R**,H	6 weeks/1.5 lbs
selamectin	Revolution**	**R**,H,EM,F	8 weeks
imidacloprid/moxidectin	Advantage Multi for Cats**	**R**,H,EM,F	9 weeks/2 lbs
pyrantel pamoate/praziquantel	Drontal	**R**,H,TT,FT	4 weeks/1.5 lbs
emodepside/praziquantel	Profender	**R**,H,TT,FT	8 weeks/2.2 lbs
ivermectin	Heartgard Chewables**	H	6 weeks
praziquantel	Droncit Feline Cestocide, Tradewinds Tapeworm Tabs	TT,FT	6 weeks
epsiprantel	Cestex	TT,FT	7 weeks

*Effective against these parasites:
R = Roundworms
H = Hookworms
EM = Ear mites
F = Fleas
TT = Taeniid tapeworms
FT = Flea tapeworms
**Also prevents heartworm

Strategic deworming is a practice recommended by the American Association of Veterinary Parasitologists (AAVP) and the Centers for Disease Control and Prevention (CDC).

Kittens*

- In kittens, because prenatal infection does not occur, egg excretion begins later than in puppies, and in most areas, the risk of roundworms and hookworms in cats is comparatively lower; deworming for kittens can be started effectively at 3 weeks of age and be repeated at 5, 7, and 9 weeks.

Nursing Queens

- Treat concurrently with kittens.

Adult Cats

- Treat regularly for prevention. Also monitor and eliminate parasites in pet's environment.

Newly Acquired Animals

- Worm immediately, after 2 weeks, and then follow above recommendations.

*** Drs. Foster and Smith suggest that owners of newly acquired kittens should obtain the deworming history of their**

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new pet and contact their veterinarian to determine if additional deworming is needed.

How can I prevent my pet from becoming reinfected?

Fecal exams can help detect what parasites a pet may have and how the pet should be treated. A fecal examination should be performed at the time the kittens are weaned, 4-8 weeks after the last treatment of an infestation, and before females are bred. A fecal exam should also be performed at a pet's annual exam and up to 3 additional times per year depending on the risk of exposure, the parasite control program being used, etc. The appropriate deworming schedule for your cat should be developed in consultation with your veterinarian, taking into account factors such as risk of exposure, immune status of family members, etc.

Many heartworm preventives such as Revolution and Interceptor treat or control infections with roundworms and are an important addition to a roundworm prevention program. Look at your preventive package to check its efficacy against roundworms.

The eggs of roundworms are extremely resistant to environmental conditions and can remain infective in the soil for months to years. Pets need to be discouraged from ingesting soil or anything contaminated with infective eggs. Because of the zoonotic potential of roundworms, and to protect your pet and others, all sources of infection should be reduced. For a discussion of cleaning the environment, see the section further below.

How do roundworms cause disease in humans?

T. cati and *T. canis* pose a significant health hazard to people. Thousands of people become infected with *Toxocara* in the United States every year. How do people become infected? Humans become infected when they ingest infective eggs from the soil or from their hands or another object. Large numbers of the eggs can accumulate in the soil where dogs and cats are allowed to defecate. The eggs are sticky, and can collect on the hands and under the fingernails of people. Children, and others who may not have good hygiene, are most prone to becoming infected.

Remember, *Toxocara* eggs need to be in the environment approximately two weeks, before becoming infective, so direct contact with an infected animal generally does not result in transmission. However, young animals may continually contaminate their entire litter area, and may even have infective eggs stuck to their coats. Adults and children who handle the mother or the young or who clean the area may be especially at risk.

If a human ingests *Toxocara* eggs, the subsequent larvae can migrate through the person’s tissues. This condition is called 'visceral larva migrans.' The larvae most commonly migrate through the liver, lungs, and brain. They can cause severe inflammation and actual mechanical damage to the organs. Signs of this disease include an enlarged liver, intermittent fever, loss of weight and appetite, and a persistent cough. Asthma or pneumonia may develop.

A unique form of this disease is called 'ocular larva migrans.' Larvae migrate through the eyes and can cause vision loss or even blindness. Ocular larva migrans usually occurs in children 7-8 years old, whereas, visceral larva migrans occurs in children ages 1-4 years. The reason for the difference among ages is unknown.

To prevent human infection, good hygiene is extremely important. Teach children, especially, to wash their hands after playing and before eating. Do not let children play in areas where cats or dogs may have defecated. Do not allow cats to use sandboxes or the garden as litter boxes. Worm your pets as recommended, keep the environment clean, and control rodent populations.

How do I eliminate roundworms from my breeding animals?

A good roundworm control program should be established for all catteries. The main sources of infection are larvae in the queens, eggs in the environment, and larvae in the tissues of transport hosts. All of these need to be addressed in a good control program.

Medical Treatment and Isolation: It is very difficult to eliminate encysted larvae from female dogs and cats in an attempt to prevent transmission to their offspring. It requires isolation of animals and repeated treatment of the mothers through multiple generations to prevent reinfection and reduce and finally eliminate larvae in the tissues. Breeders should consult with their veterinarians to determine the best parasite control program for their cattery.

Treating the Environment: Cages should be impervious so they are easier to clean. Roundworm eggs are resistant to almost all disinfectants.

Any feces outdoors should be picked up on a daily basis. If soil becomes contaminated, about the only alternative is to remove it and replace it, or turn it over to the depth of 8-12 inches.

Since mice and other rodents can serve as transport hosts, their control is important. Remember that mouse and rat poisons are poisons for dogs, cats, and other animals as well. If using one of these products, follow the manufacturer's recommendations and prevent access by your pets. Pets should be prevented from scavenging and preying on wildlife.

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