Tapeworms of Cats

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Tapeworms of Cats Tapeworms in Cats

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Tapeworms are flat worms that are segmented. They consist of a head, neck, and then a number of segments. The head usually has suckers or muscular grooves that enable the tapeworm to attach itself to the animal's intestine.
Each tapeworm segment has its own reproductive organs. New segments are continually formed in the neck region of the worm while those at the end of the tapeworm are cast off as they mature. These mature segments contain large numbers of eggs which are often grouped into packets. The segments may often be seen near the anus of the cat or dog. These segments may move if recently passed, or if dried, they look like grains of uncooked rice or cucumber seeds. Tapeworm infections are usually diagnosed by finding these segments on the animal.

Tapeworms of cats and dogs all have life cycles that include an intermediate host. These hosts include fleas, fish, and domestic a domestic animals such as sheep and pigs. All of the adult forms of these tapeworms live in the cat's or dog's digestive system. It is interesting that tapeworms have no digestive systems themselves, but absorbnutrients through their skin.

The most common tapeworms that infect cats and dogs are:

- *Dipylidium caninum*
- *Taenia* species
- *Echinococcus granulosus* and *E. multiocularis*
- *Diphyllobothrium latum*
- *Spirometra mansonoides*

DIPYLIDIUM CANINUM (FLEA TAPEWORM, DOUBLE-PORED TAPEWORM, CUCUMBER SEED TAPEWORM, COMMON DOG TAPEWORM)

The adult form of *D. caninum* lives in cats, dogs, fox, and occasionally humans. It is found throughout the world. Fleas and lice serve as intermediate hosts.

What is the life cycle of *D. caninum*?

The adult worm, which can be up to 20 inches long, lives in the small intestine. The segments, full of eggs, are passed in the feces. While warm, the segments are active, but as they dry, they break open and liberate the eggs inside. Either an adult louse or a flea larva ingests the eggs. The egg develops into an immature form in the insect. When a cat or dog eats the insect, the immature form develops into an adult and the life cycle is completed.

How is an infection with *D. caninum* diagnosed?

The diagnosis of a *D. caninum* infection can be diagnosed by finding the moving segments, dried segments, and occasionally by seeing eggs in the feces if the segment had ruptured.

What are the signs of a *D. caninum* infection?

In heavy infections, we may notice abdominal discomfort or nervousness in the animal. The animal may vomit. The active segments around the anal area may cause an animal to lick or 'scoot' on the floor.

What signs of infection do we see in humans?

Usually, it is children who become infected with this tapeworm by ingesting flea larvae or adult lice. In general, we rarely see symptoms in humans. In severe infections, abdominal discomfort, diarrhea, and pruritus (itching) in the perianal area may be present.

How do we treat and prevent infections with *D. caninum* in cats and dogs?

The most common treatment is praziquantel which is found in Droncit and Tradewinds Tapeworm Tabs. The dose is determined by number of tablets per body weight. The drug epsiprantel (Cestex) is also effective, but cannot be used in kittens and puppies less than 7 weeks of age. For more information see the table on Treatments of Gastrointestinal Parasites at the end of this article.

The most important preventive measures are flea control and lice control. Numerous products are on the market which can be used for this purpose. It is recommended to not only treat the animals but also the environment in an attempt to kill as many flea larvae as possible.

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TAENIA SPECIES

There are 9 major species of Taenia tapeworms in North America, 7 of which have cats or dogs as the definitive hosts (animals which harbor the adult form of the parasite).

Latin Name	Common Name	Definitive Host	Intermediate Host
T. saginata	Unarmed tapeworm; beef tapeworm	Man	Cattle
T. solium	Armed tapeworm; pork bladderworm	Man	Pig
T. hydatigena	Thin-necked bladderworm	Dog, Bear	Sheep, goat, cattle, pig, deer
T. krabbei		Dog	Reindeer
T. multiceps (Also known as *Multiceps multiceps*)		Dog	Sheep
T. ovis		Dog	Sheep, goat
T. pisiformis		Dog	Rabbit, rodent
T. serialis (Also known as *Multiceps serialis*)	Bladderworm	Dog	Rabbit, hare
T. taeniaeformis	Feline tapeworm	Cat	Rodent

Are the life cycles of the different *Taenia* species similar?

Yes. The segments of the worm pass out with the feces of the cat or dog. Often, eggs are released from the segments before they are passed. The intermediate host ingests the eggs which are immediately infective. In the intermediate host, the parasite embryo is released in the small intestine and the immature form migrates through the body to various organs, depending on the species of *Taenia*. The immature form develops a small fluid-filled sac, called a bladder, which surrounds it and provides nourishment. When the 'bladder' is ingested by the definitive host, the head of the tapeworm is released, attaches itself to the intestinal wall, grows, and segments.

Cats and dogs may remain infected for a year or more, and the tapeworms can grow to be over 6 feet long.

What are the signs and symptoms of *Taenia* infection?

Even in severe infections, there is little evidence of infection other than pruritus around the anal area and finding the segments

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attached to the animal's fur. Rarely, intestinal obstruction may occur. In general, the intermediate host shows many more signs of illness than the definitive host.

How is an infection with *Taenia* species diagnosed?

Because the eggs are often released from the segments before the segments pass out through the feces, the main method of diagnosis is through microscopic fecal examination. All *Taenia* eggs look alike and are very difficult to distinguish from each other.

How is a *Taenia* infection treated and prevented?

Taenia spp. are more susceptible to antihelmintics than other tapeworms. Effective treatments include Droncit, Tradewinds Tapeworm Tabs, and Cestex. For more information see the table on Treatments of Gastrointestinal Parasites at the end of this article.

Prevention methods must be based on prohibiting cats and dogs from eating raw meat or offal, and preying on wild animals. The immature forms in the intermediate hosts are killed by freezing or cooking. Rodent control is important.

ECHINOCOCCUS GRANULOSUS, E. MULTIOCULARIS (HYDATID TAPEWORM)

Dogs and wild canids serve as the definitive hosts of *Echinococcus granulosus*. Herbivores such as sheep are the intermediate hosts. Cats, dogs, and fox are definitive hosts for *E. multiocularis*, and voles, lemmings, and shrews serve as the intermediate hosts. Humans can also serve as intermediate hosts for both species of *Echinococcus*. The infection in humans causes a severe, sometimes fatal disease called 'hydatid disease' or echinococcosis.

Both of these tapeworms are found in limited areas in North America. *E. granulosus* is more common in geographical areas with large numbers of sheep, but is still quite rare. Originally, *E. multiocularis* was only found in the northern states; more recently it has been found as far south as Illinois, Indiana, and Ohio.

What is the life cycle of *Echinococcus* tapeworms?

The intermediate host ingests the *Echinococcus* eggs which are passed in the feces of the definitive host. The eggs hatch and the immature forms penetrate the intestinal wall of the intermediate host and migrate to various organs, usually the lungs and liver. Large cysts, 2-5 inches in diameter, develop and contain thousands of infective forms, called 'hydatid sand.'

When the cysts are ingested by a definitive host, each of the infective forms contained in the cyst can develop into an adult tapeworm, which is usually less than 7 mm long. The adult worms attach themselves to the small intestine and may live there up to two years.

What are the signs of *Echinococcus* infections in animals?

As with *Taenia* tapeworms, the definitive hosts rarely show signs of disease unless the tapeworms are present in high numbers. Usually, the intermediate hosts do not show signs of infection either.

How is infection with *Echinococcus* diagnosed, treated, and controlled in cats and dogs?

Eggs of this tapeworm are not uniformly passed in the stool. If eggs are found, it is virtually impossible to distinguish them from the eggs of *Taenia*, which is a much more common tapeworm.

Praziquantel at a dose of 5 mg/kg is the treatment of choice in cats and dogs infected with *Echinococcus*. For more information see the table on Treatments of Gastrointestinal Parasites at the end of this article.

Control of *Echinococcus* is centered around preventing cats and dogs from eating parts or all of the intermediate hosts. Animals should not be fed offal or uncooked meat. Rodent populations should be controlled.

How do humans become infected with *Echinococcus*?

Humans become accidentally infected by ingesting food items contaminated with the eggs of *Echinococcus*. This can occur through eating contaminated vegetation such as nuts, berries, and herbs. Hands could become contaminated by gardening or otherwise working in soil contaminated with cat, dog, fox, or other canid feces. Be sure to wash all fruits and vegetables and wash hands thoroughly with soap and water as well.

Signs of infection may not be evident until years after ingestion of the eggs.

What are the signs of disease in humans infected with *Echinococcus*?

Humans, unlike animals, often show signs of infection with *Echinococcus*, and the signs vary depending on the organs infected. Parasitic tumors may develop in the brain, heart, lungs, and liver. If these cystic tumors in a human would rupture, anaphylactic shock may occur. Surgery is often the treatment of choice in humans infected with *Echinococcus*. Newer drug therapies such as albendazole and albendazole with praziquantel are often used in conjunction with surgery, or alone, if surgery is not an option.

The diagnosis of hydatid disease in humans is often made through sophisticated testing using CAT scans and MRI. Serologic tests are also available.

DIPHYLLOBOTHRIUM LATUM (BROAD FISH TAPEWORM)

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As with other tapeworms, *D. latum* lives in the small intestines of its definitive hosts which include cats, dogs, fox, bear, other fish-eating mammals, and man. It is found in the Great Lakes area, in some southern Gulf areas, and in the Arctic. Unlike other tapeworms already discussed, it has two intermediate hosts.

What is the life cycle of *D. latum*?

The adult worms, which can reach the length of ten meters, are found in the small intestine of the definitive host. Instead of passing segments filled with eggs, *D. latum* eggs are discharged through a small 'uterine pore' in each segment. Segments which have released all their eggs are often shed in chains instead of individually.

After the eggs are passed, they need to remain in water for 8 days before they are infective to the first intermediate hosts which are copepods, a type of freshwater crustacean. The *D. latum* embryos develop into second stage larvae inside the copepods. One copepod can contain large numbers of these second stage larvae.

The copepods are often eaten by minnows in which third stage *D. latum* larvae develop. Often larger fish, such as perch, walleye, trout, and pike, will eat the minnows and the third stage larvae will move into the larger fish's tissues. A definitive host becomes infected by eating the infected minnows or larger fish.

Do pets and humans infected with *D. latum* show any signs of disease?

Even though the adult tapeworm can grow very large, there are minimal signs of infection in cats and dogs.

The adult tapeworm can live for up to 20 years in people. In humans, *D. latum* absorbs a large amount of Vitamin B12 from the intestinal contents. This results in a Vitamin B12 deficiency in some humans. Vitamin B12 is necessary for the proper production of red blood cells, and a deficiency in the vitamin can result in the development of pernicious anemia.

Humans with severe infestation may also have diarrhea, obstructions of the intestine and bile ducts, and sometimes show toxic symptoms.

How is an infection with *D. latum* diagnosed?

Diagnosis of a infection with the broad fish tapeworm is generally made through finding the eggs in the feces. Care must be taken to differentiate the eggs from another tapeworm called *Spirometra* and a lung fluke, *Paragonimus kellicotti*.

What is the treatment for *D. latum* infection and what prevention measures can be used?

Praziquantel is often the treatment of choice for broad fish tapeworm infections in cats and dogs. Although not FDA approved for this use in cats and dogs, it is a common and accepted practice to use the medication for this purpose. Recommended dosages vary. Humans are treated with praziquantel or niclosamide.

Prevention of *D. latum* infections can be accomplished by not allowing pets access to raw or undercooked fish.

SPIROMETRA MANSONOIDES

S. mansonoides more commonly infects cats and bobcats, but can also infect dogs and raccoons. Its life cycle and eggs are very similar to *Diphyllobothrium.* It is found in the southern United States in Florida and along the Gulf Coast.

What is the life cycle of *S. mansonoides*?

The adult worms, which are around 25 cm in length, are found in the small intestine of the definitive host. As with *D. latum*, eggs are discharged through a small 'uterine pore' in each segment.

After the eggs are passed, and become infective, they are eaten by the first intermediate hosts which are copepods, a type of freshwater crustacean. The *S. mansonoides* embryos develop into second stage larvae inside the copepods.

The copepods are eaten by birds, snakes, reptiles, amphibians, or rodents. The third stage *S. mansonoides* larvae develop in these second intermediate hosts. Definitive hosts become infected by eating the infected snakes, rodents, or other second intermediate host.

Do animals infected with *S. mansonoides* show signs of disease?

Usually infections of pet animals with *S. mansonoides* are asymptomatic. In more severe cases, cats may have weight loss, irritability, and changes in appetite.

How is an infection with *S. mansonoides* diagnosed?

Diagnosis of an infection with *S. mansonoides* is generally made through finding the eggs in the feces. Care must be taken to differentiate the eggs from *D. latum* the lung fluke, *Paragonimus kellicotti*.

How are *S. mansonoides* infections treated and prevented in pets?

Treatment for *S. mansonoides* infections is the same as that for *D. latum*, praziquantel. Although not FDA approved for use in cats and dogs for the treatment of *S. mansonoides* infections, it is a common and accepted practice to use the medication for this purpose.

The only way a *S. mansonoides* infection can be prevented in animals is by not allowing them to scavenge or prey on the

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second intermediate hosts (birds, snakes, reptiles, amphibians, or rodents).

Can humans become infected with *S. mansonoides*?

Rarely, humans have become infected with the second stage larvae by inadvertently eating the copepods. When this occurs, the second stage larvae migrate to muscles and other tissues and develop into third stage larvae just as they would in a snake or rodent. In addition, rarely in humans who have ingested infected reptiles or birds, the third stage larvae do not develop into adults in the intestine, but travel through the intestine and into the tissues. The human condition of having third stage larvae in muscle and subcutaneous tissues is called 'sparganosis.' Symptoms include pruritus (itching), urticaria (hives), and pain at the site of the nodules that develop. Treatment is usually by surgical removal of the nodules containing the third stage larvae. A similar condition may also occur in dogs.

Common wormers are listed below; those that are effective against tapeworms have a 'TT' and/or 'FT' in the 'Effective Against' column.

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

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TT = Taeniid tapeworms
FT = Flea tapeworms
**Also prevents heartworm

References

Blagburn, BL; Conboy, G; Jutras, P; Schantz, PM; Villeneuve, A. Strategic control of intestinal parasites: Diminishing the risk of zoonotic disease. Supplement to the Compendium on Continuing Education for the Practicing Veterinarian. 1997;19(6):8-9, 18-19.

Bolette, DP. Worming their way in: Identifying cestodes, trematodes and acanthocephala. Veterinary Technician. 1998; 19(8):510-527.

Bryan, RT; Schantz, PM. Echinococcus (hydatid disease). In Zoonoses updates from the Journal of the American Veterinary Medical Association. American Veterinary Medical Association. Schaumburg, IL; 1995:70-73.

Georgi, JR; Georgi, ME. Canine Clinical Parasitology. Lea & Febiger. Philadelphia, PA; 1992;123-150.

Griffiths, HJ. A Handbook of Veterinary Parasitology. University of Minnesota Press. Minneapolis, MN; 1978;110-127.

Hendrix, CM. Diagnostic Veterinary Parasitology. Mosby, Inc. St. Louis, MO; 1998;66-73, 83-102.

Sherding, RG; Johnson, SE. Diseases of the intestine. In Birchard, SJ; Sherding, RG (eds.) Saunders Manual of Small Animal Practice. W.B. Saunders Co. Philadelphia, PA; 1994;698-699.

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