Giardia cati in Cats

Drs. Foster & Smith Educational Staff

Giardia are protozoa (one-celled organisms) that live in the small intestine of cats and dogs. *Giardia* are found throughout the United States and in many other parts of the world. Infection with *Giardia* is called 'giardiasis.'

There are many things we do not know about this parasite. Experts do not agree on how many species of *Giardia* there are and which ones affect which animals. Veterinarians do not even agree on how common *Giardia* infections are and when they should be treated. Generally, it is believed that infection with *Giardia* is common, but disease is rare. There is much about the life cycle we do not know either.

How do *Giardia* reproduce and how are they transmitted?

A cat becomes infected by eating the cyst form of the parasite. In the small intestine, the cyst opens and releases an active form called a trophozoite. These have flagella, hair-like structures that whip back and forth allowing them to move around. They attach to the intestinal wall and reproduce by dividing in two. After an unknown number of divisions, at some stage, in an unknown location, this form develops a wall around itself (encysts) and is passed in the feces. The *Giardia* in the feces can contaminate the environment and water and infect other animals and people.

Giardia multiply by dividing.

What are the signs of a *Giardia* infection?

Most infections with *Giardia* are asymptomatic. In the rare cases in which disease occurs, younger animals are usually affected, and the usual sign is diarrhea. The diarrhea may be acute, intermittent, or chronic. Usually, the infected animals will not lose their appetite, but they may lose weight. The feces are often abnormal, being pale, having a bad odor, and appearing greasy. In the intestine, *Giardia* prevents proper absorption of nutrients, damages the delicate intestinal lining, and interferes with digestion.

Can *Giardia* of cats infect people?

This is another unknown. There are many species of *Giardia*, and experts do not know if these species infect only specific hosts. Sources of some human infections have possibly been linked to beavers, other wild animals, and domestic animals. Until we know otherwise, it would be wise to consider infected animals capable of transmitting *Giardia* to humans.

You may have heard about *Giardia* outbreaks occurring in humans due to drinking contaminated water. Contamination of urban water supplies with *Giardia* is usually attributed to (human) sewage effluents. In rural settings, beavers most often get the blame for contaminating lakes and streams. *Giardia* outbreaks have also occurred in day care centers fueled by the less than optimal hygienic practices of children.

How do we diagnose giardiasis?

Giardiasis is very difficult to diagnose because the protozoa are so small and are not passed with every stool. Tests on serial stool samples (one stool sample every day for three days) are often required to find the organism. Special diagnostic procedures, beyond a routine fecal examination, are necessary to identify *Giardia*. The procedures we use to identify roundworms and hookworms kill the active form of *Giardia* and concentrate the cyst form.

To see the active form, a small amount of stool may be mixed with water on a microscope slide and examined under high magnification. Because these forms have flagella, you can see them move around on the slide. The active forms are more commonly found in loose stools. If you ever have the opportunity to see the active form of *Giardia* under the microscope, take it. It is an interesting-looking creature. It is pear-shaped and its anatomy makes it look like a cartoon face, with eyes (which often look crossed), nose, and mouth. Once you see it, you will not forget it.

Cysts are more commonly found in firm stools. Special solutions are used to separate the cysts from the rest of the stool. The portion of the solution that would contain the cysts is then examined microscopically.

In spring, 2004, a diagnostic test using ELISA technology became available. This test uses a very small fecal sample, and can be performed in 8 minutes in a veterinarian's office. It is much more accurate than a fecal examination.

We have done the tests, now what?

Now we come to how to interpret the test results. It can be a dilemma for your veterinarian. What you see (or do not see) is not always a correct indication of what you have. A negative test may mean the animal is not infected. However, few, if any, laboratory tests are 100% accurate. Negative test results can also occur in some infected animals. If a negative test occurs, your veterinarian will often suggest repeating the test.

What about a positive test? That should not be hard to interpret, right? Wrong. *Giardia* can be found in many cats with and without diarrhea. If we find *Giardia*, is <u>it</u> the cause of the diarrhea or is it just coincidence we found it? The animal could actually have diarrhea caused by a bacterial infection, and we just happened to find the *Giardia*. Test results always need to be interpreted in light of the signs, symptoms, and medical history.

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If we find *Giardia*, how do we treat it?

Here we go again; treatment is controversial too. There is a question about when to treat. If *Giardia* is found in a cat without symptoms, should we treat the animal? Since we should not know if *G. cati* can infect man, we often err on the side of caution and treat an asymptomatic-infected animal to prevent possible transmission to people.

If we highly suspect infection with *Giardia*, but can not find the organism, should we treat anyway? This is often done. Because it is often difficult to detect *Giardia* in the feces of cats with diarrhea, if there are no other obvious causes of diarrhea, we often treat the animal for giardiasis.

There are several treatments for giardiasis, although some of them have not been FDA-approved for that use in cats. Fenbendazole is an antiparasitic drug that kills some intestinal worms and can help control giardia. It may be used alone or with metronidazole. Metronidazole can kill some types of bacteria that could cause diarrhea. So if the diarrhea was caused by bacteria, and not *Giardia*, the bacteria can be killed and the symptoms eliminated. Unfortunately, metronidazole has some drawbacks. It has been found to be only 60-70% effective in eliminating *Giardia* from infected dogs, and probably is not 100% effective in cats, either. In some cats, it can cause vomiting, anorexia, and some neurological signs. It also can be toxic to the liver in some animals. It is suspected of being a teratogen (an agent that causes physical defects in the developing embryo), so it should not be used in pregnant animals. Finally, it has a very bitter taste and many animals resent taking it – especially cats.

Quinacrine hydrochloride has been used in the past, but is not very effective and can cause side effects such as lethargy, vomiting, anorexia, and fever.

Furazolidone has been used effectively in treating giardiasis in cats. It can cause vomiting and diarrhea and should not be used in pregnant cats.

Now we come to yet another unknown. It is possible these treatments only remove the cysts from the feces, but do not kill all the *Giardia* in the intestine. This means even though the fecal exams after treatment may be negative, the organism is still present in the intestine. This is especially true of the older treatments. So treated animals could still be a source of infection for others.

How can I prevent my pet from becoming infected with *Giardia*?

The cysts can live several weeks to months outside the host in wet, cold environments. So lawns, parks, kennels, and other areas that may be contaminated with animal feces can be a source of infection for your pet. You should keep your pet away from areas contaminated by the feces of other animals. This is not always easy.

As with other parasites of the digestive system, prevention of the spread of *Giardia* centers on testing and treating infected animals and using sanitary measures to reduce or kill the organisms in the environment. Solutions of quaternary ammonium compounds are effective against *Giardia*.

How do I control *Giardia* in my cattery?

Infection with *Giardia* can be a big problem in catteries, and a multi-faceted approach is needed.

Treat Animals: Treat all nonpregnant animals. On the last day of treatment, move them to a holding facility while a clean area is established. When the animals are moved back to the clean area, treat them once again.

Decontaminate the Environment: Establish a clean area. If possible, this can be the whole facility. Otherwise, create a few clean runs or cages, separate from the others. Remove all fecal material from the areas since the organic matter in feces can greatly decrease the effectiveness of many disinfectants. Steam clean the area. Quaternary ammonium disinfectants used according to manufacturer's directions or a 1:5 or 1:10 solution of bleach can usually kill the cysts within one minute. Allow the area to dry for several days before reintroducing the animals. These solutions can also be used to clean litterboxes. Rinse out very well and allow to dry before reusing. **NOTE:** Use extreme caution when using quaternary ammonium compounds and bleach solutions. Use proper ventilation, gloves, protective clothing and follow your veterinarian's recommendations.

Clean the Animals: Cysts can remain stuck to the haircoats of infected animals. So before moving the treated animals to the clean area, they should be shampooed and rinsed well. Especially concentrate on the perianal area.

Prevent Reintroduction of *Giardia*: *Giardia* can be brought into the cattery either by introducing an infected animal or on your shoes or boots. Any new animal should be quarantined from the rest of the animals and be treated and cleaned as described above. You should either use disposable shoe covers or clean shoes/boots and use a footbath containing quaternary ammonium compounds to prevent people from reintroducing *Giardia*.

Remember, *Giardia* of cats may infect people, so good, personal hygiene should be used by adults when cleaning litter boxes or picking up the yard, and by children who may play with pets or in potentially contaminated areas.

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