



# Giardia

**Giardia for Cat Last updated:**  
Mar 14, 2018

## Synopsis

### CAPC Recommends

Parasite testing should be performed every 6 months especially those cases with diarrhea.

Treat all symptomatic and infected cats with recommended medication.

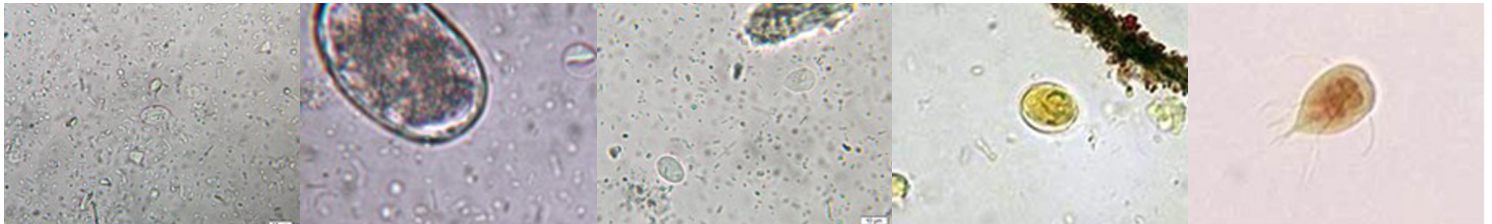
Follow up fecal flotation testing should be done 24-48 hours after the completion of therapy.

Treatment combined with bathing and proper feces removal from the environment should be instituted to prevent reinfection.

## Stages

Trophozoite - motile stage in small intestine

Cysts - resistant stage for environmental transmission



Giardia cyst 400X

Giardia cyst and  
Ancylostoma

Giardia cyst and  
trophozoite 400X

Cyst of Giardia sp. (iodine stain)  
Trophozoite of Giardia sp.  
(iodine stain)

**Giardia 20 sec iPhone**



# Prevalence

Giardia infection is common in cats.

Regional differences in Giardia prevalence exist, but infections in cats with clinical signs averaged 10.3% in cats in the US. A regional study in western Canada reported Giardia detection in 9.9% of samples.

[Click here to view our Prevalence Maps](#) and to sign up for updates on reported cases in your area

## Host Associations and Transmission Between Hosts

A Giardia species was first identified in cats by two investigators in 1925; one investigator named it Giardia cati and the other called it Giardia felis. It is now known that Giardia duodenalis is a species complex comprising at least eight major assemblages.

Giardia exists in different "assemblages," which vary in their infectivity for animals and humans. Cats have Assemblages A1 and F and humans are infected with Assemblages A2 and B.

The total number of Giardia strains and host-infectivity ranges is unknown.

Transmission occurs upon ingestion of cysts shed by animals or humans.

Cysts are acquired from fecal-contaminated water, food, or fomites or through self-grooming.

Cat strain (assemblage F) are not known to infect dogs, and dog strains (assemblage C and D) are not known to infect cats.

Human infections are primarily acquired from other humans; transmission from cats to humans appears to be rare except with infection involving assemblage A1.

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### Molecular Characterization

Each assemblage is capable of infecting certain species, and some assemblages are more commonly seen than others.

#### Assemblage A-I

Species affected: Humans and animals (cats, dogs, livestock, deer, muskrats, beavers, voles, guinea pigs, ferrets)

#### Assemblage A-II

Species affected: Humans (more common than A-I)

#### Assemblage A-III and A-IV

Species affected: Exclusively animals

#### Assemblage B

Species affected: Humans and animals (livestock, chinchillas, beavers, marmosets, rodents)

#### Assemblage C and D

Species affected: Dogs and coyotes

#### Assemblage E

Species affected: Alpacas, cattle, goats, pigs, sheep

#### Assemblage F

Species affected: Cats

#### Assemblage G

Species affected: Rats, mice

#### Assemblage H

Species affected: Seals

Source: CDC [https://www.cdc.gov/parasites/...](https://www.cdc.gov/parasites/)

# Site of Infection and Pathogenesis

Trophozoites attach to the surface of enterocytes in the small intestine, usually in the proximal portion.

Attachment causes damage to enterocytes, resulting in functional changes and blunting of intestinal villi, which leads to maldigestion, malabsorption, and diarrhea.

There are no intracellular stages.

There are no infections of other tissues, except very rare cases of ectopic infection following intestinal perforation attributable to other causes.

## Diagnosis

Most infected cats are afebrile, do not vomit, and have normal total protein and hemogram values. Cats may have subclinical infections and show no signs of disease.

Giardiasis is commonly misdiagnosed or underdiagnosed because of intermittent shedding and difficulty identifying cysts and trophozoites. Yeast may be mistaken for Giardia cysts due to their similar size and shape; however, yeast often show evidence of budding and do not have the internal structures seen in Giardia (i.e., median bodies, two to four nuclei).

Trophozoites are usually 12 to 18  $\mu\text{m}$  by 10 to 12  $\mu\text{m}$  in size. They are motile, flagellated organisms that are teardrop or pear-shaped. Trophozoites are bilaterally symmetrical, have a large ventral adhesive disc, and have two nuclei, each with a large endosome. They also have a pair of transverse, dark-staining median bodies.

Cysts are ellipsoidal, nonmotile, and contain two to four nuclei, along with long and short curved rods. They are 8 to 12  $\mu\text{m}$  by 7 to 10  $\mu\text{m}$  in size and possess a thick refractile wall.

Various tests are used, including direct smear (with or without a fixative stain), fecal flotation via centrifugation, fecal ELISA, and direct fluorescent antibody assay.

CAPC recommends testing symptomatic (intermittently or consistently diarrheic) dogs and cats with a combination of direct smear, fecal flotation with centrifugation, and a sensitive, specific fecal ELISA optimized for use in companion animals. Repeat testing performed over several (usually alternating) days may be necessary to identify infection.

Direct smear:

Direct smear is used primarily for detection of trophozoites in diarrheic stools.

Use a small sample of fresh, unrefrigerated feces (preferably less than 30 minutes old).

Mix sample into two to three drops of saline (not water) on a glass slide to make a fine suspension, and add a coverslip (a 22 by 40 mm coverslip works well).

A Lugol's iodine stain may be added to aid in identification.

Fecal flotation with centrifugation techniques:

This method is used primarily for detection of cysts in solid or semisolid stools.

Mix 1 to 5 g feces and 10 ml of flotation solution ( $\text{ZnSO}_4$  sp.gr. 1.18; sugar sp. gr. 1.25) and filter/strain into a 15-ml centrifuge tube.  $\text{ZnSO}_4$  is preferred, as sugar solution will collapse the Giardia cysts, albeit in a characteristic way.

Top off with flotation solution to form a slightly positive meniscus, add coverslip, and centrifuge for 5 minutes at 1500 to 2000 rpm.

If desired, a Lugol's iodine stain may be added to aid identification at 40x.

Fecal ELISA:

Giardia ELISA assays are approved and commercially available for patient-side testing in dogs and cats. Many diagnostic laboratories also use various ELISA microtiter well assays that have been internally validated for the detection of giardiasis in dogs and cats.

Commercially available fixative stains (e.g. Proto-fix™) are also useful for microscopic diagnosis.

Polymerase Chain Reaction (PCR) assays can also be used to amplify Giardia species DNA in feces and are available in commercial laboratories.

Some subassemblages have been shown to be zoonotic. Assemblage testing is commercially available.

# Treatment

No drugs are approved for treatment of giardiasis in cats in the United States.

Metronidazole is the most commonly used extra-label therapy; however, efficacies as low as 50% to 60% are reported. Safety concerns also limit the use of metronidazole in cats. Don't give metronidazole benzoate to pregnant or lactating cats, or those with liver disease.

Cats suffering from epilepsy and also taking phenobarbital for seizure control should not use metronidazole benzoate because it will potentially diminish the effectiveness of anti-seizure drugs when used in combination. There is potential for an increase of side effects when used with cimetidine.

Albendazole is effective against Giardia but is not safe in cats and should not be used.

CAPC recommendations for treatment of cats

Data on treatment of cats with Giardia are lacking. However, cats may be treated with either fenbendazole (50 mg/kg SID) for 5 days, metronidazole (25 mg/kg BID) for 5 days, or a combination of the two.

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## **Fenbendazole**

Species: Feline

Dose: 50 mg/kg

Route: PO (oral administration)

Interval: Q24h

Duration: 5 days

## **Metronidazole**

Species: Feline

Dose: 25 mg/kg

Route: PO (oral administration)

Interval: Q12h

Duration: 5-7 days

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There is anecdotal evidence that metronidazole benzoate is tolerated better in cats than metronidazole (USP).

Insufficient evidence is available for definitive recommendations in each clinical scenario; however, the majority opinion of the CAPC Board is that asymptomatic cats may not require treatment. If treatment is desired:

A cat without clinical signs that has been found to be infected with Giardia may be treated with a single course of anti-giardial therapy (see above).

If other pets live with an infected cat, all those of the same species may also be treated with a single course of anti-giardial therapy.

Repeated courses of treatment are not indicated in cats without clinical signs.

CAPC does not endorse routine vaccination of all pets for Giardia. However, preventive vaccination for Giardia may be useful in some specific control situations. Current data do not support the use of Giardia vaccines as part of a treatment protocol.

# Follow-up Testing

Follow up testing should be done 24-48 hours after the completion of therapy. It is recommended to perform a fecal flotation with centrifugation primarily for detection of cysts in solid or semisolid stools. ELISA tests may remain positive even after treatment for variable periods of time and should not be used as a guide to determine reinfection or failure of treatment.

# Refractory Treatment

Treatment failures may result from: reinfection, inadequate drug levels, immunosuppression, drug resistance and Giardia sequestration in the gallbladder or pancreatic ducts. The presence of immunosuppression, reinfection, or sequestration can usually be determined in a clinical setting. Certain immunosuppressed patients are abnormally susceptible to giardiasis and their infections are often difficult to cure. Reinfection is common in endemic regions with high environmental contamination.

## Control and Prevention

Concomitant with treatment, animals should be bathed with shampoo to remove fecal debris and associated cysts.

Remove feces daily and dispose of fecal material with municipal waste.

Environmental areas (e.g., soil, grass, standing water) are difficult to decontaminate, but surfaces can be sanitized by steam-cleaning or use of commercially available disinfectants. Allow surfaces to dry thoroughly after cleaning.

Post-treatment fecal examination by zinc sulfate centrifugation may be helpful in evaluating the success of therapy.

## Public Health Considerations

Human infection from a cat source has not been conclusively demonstrated in North America. Cats are not treated for the purpose of preventing zoonotic transmission.

Canine and feline strains of *G. duodenalis* are not known to be infective to immunocompetent human hosts. However, people with increased susceptibility to infection due to underlying disease should consider limiting their exposure to Giardia-infected pets.

Advise clients to seek medical attention if they develop gastrointestinal symptoms following exposure to an infected pet.

If both people and pets in the same household are infected, it does not necessarily imply zoonotic transmission.

An infected person should wash hands after using the toilet and before feeding or handling animals.

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