

Giardia

Giardia for Dog Last updated:
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Synopsis

CAPC Recommends

Parasite testing should follow general guidelines.

Treat all symptomatic dogs with recommended medication and protocol. See treatment section for more information on appropriate protocols.

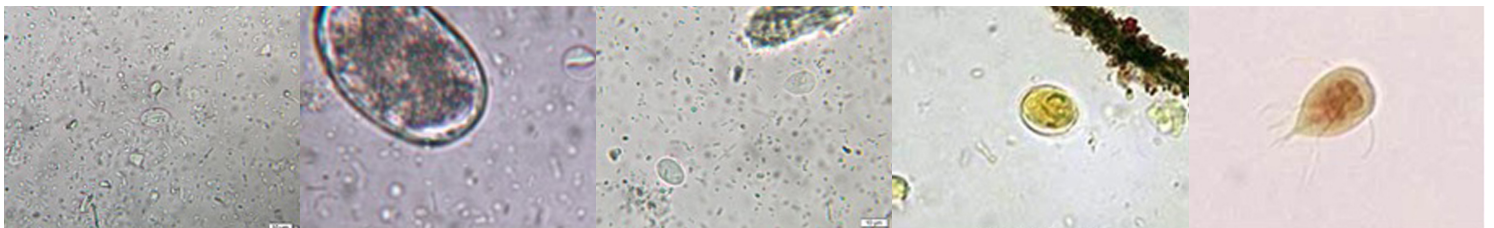
Follow up fecal flotation testing may be done after the completion of therapy if clinical signs have not resolved.

In cases where repeated infection is apparent, treatment combined with bathing and proper feces removal from the environment should be considered 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 duodenalis infection is common in dogs.

Regional differences in *Giardia* prevalence exist, but infections in dogs with clinical signs averaged 15.6% in dogs in the US. Overall, the most common intestinal parasite in dogs were *Giardia* (8.1%), and in urban parks *Giardia* spp. was present in 24.7% of dogs attending parks in Calgary, Canada.

Animals in shelters, breeding facilities, kennels and catteries are more likely to carry *Giardia duodenalis*, and studies have found an increased prevalence among dogs that visit dog parks.

[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

Giardia exists in different "assemblages," which vary in their infectivity for animals and humans. Dogs have mainly Assemblages A1, C and D. However, some studies have identified human Assemblages of *Giardia* in canine fecal samples.

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.

Dog strains are not known to infect cats, and cat strains are not known to infect dogs.

Human infections are primarily acquired from other humans; transmission from dogs to humans appears to be rare.

Molecular Characterization

Each assemblage (A-H) is capable of infecting certain species, and some assemblages are more commonly seen than others. Some sub-assemblages have been shown to be zoonotic. Assemblage testing is commercially available.

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

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 μm by 10 to 12 μm 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 μm by 7 to 10 μm in size and possess a thick refractile wall.

Dogs may have subclinical infections and show no signs of disease.

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 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 (ZnSO_4 sp.gr. 1.18; sugar sp. gr. 1.25) and filter/strain into a 15-ml centrifuge tube. 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.

Treatment

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

Metronidazole (10-25 mg/kg BID 5-8 days) is the most commonly used extra-label therapy; however, efficacies as low as 50% to 60% are reported. Albendazole is effective against Giardia but is not safe in dogs and should not be used.

Fenbendazole (50 mg/kg SID for 3 to 5 days) is effective in eliminating Giardia infection in dogs. Fenbendazole is approved for Giardia treatment in dogs in Europe, and available experimental evidence suggests that it is more effective than metronidazole in treating Giardia in dogs.

Alternatively, fenbendazole (50 mg/kg SID) may be administered in combination with metronidazole (25mg/kg BID) for 5 days. This combination therapy may result in better resolution of clinical disease and cyst shedding.

A combination of febantel, pyrantel pamoate, and praziquantel (DrontalPlus) is effective in treating *Giardia* in dogs when administered daily for 3 days using the dose bands indicated on the DrontalPlus label.

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

Factors to consider in the decision to treat include contact with vulnerable or immunocompromised humans or dogs, life style of the dog and prior treatment history. See Tynes et al, 2014 for additional information.

Follow-up Testing

Follow up testing may be done 24-48 hours after the completion of therapy if clinical signs have not resolved. 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 on the last day of treatment (Payne et al., 2002).

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 dog or cat source has not been conclusively demonstrated in North America. Canine 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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Giardiasis – The Center for Food Security and Public Health. www.cfsph.iastate.edu/Factsheets/pdfs/giardiasis.pdf.