

Recurrent *Giardia* Infection in a Dog

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Luci Lu, a 7-month-old spayed boxer, was presented for 2 days' duration of diarrhea; fecal flotation (zinc sulfate in-house without centrifugation) findings revealed *Giardia* species cysts (Figures 1–3).

History

Luci Lu was adopted from a pet store, was not taken to dog parks, and was supplied bottled water.

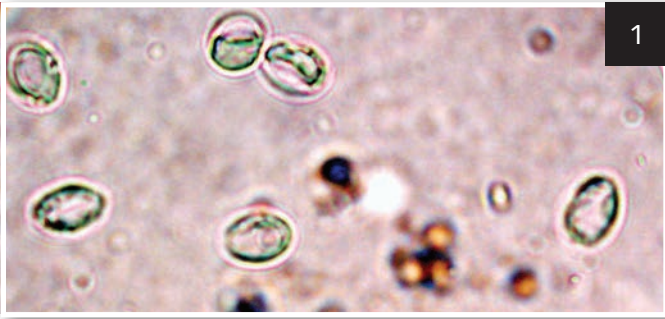
Treatment

Fenbendazole granules (50 mg/kg q24h on food) for 5 days and frequent bathing were prescribed. Zinc sulfate in-house fecal flotations without centrifugation were repeated 1 and 3 weeks later; both were positive for *Giardia* cysts. At 3 weeks' postpresentation, Luci Lu was treated with the same dose of fenbendazole for 5 days, a probiotic, and a high-fiber canned diet. Fecal flotation was negative 2 weeks later.

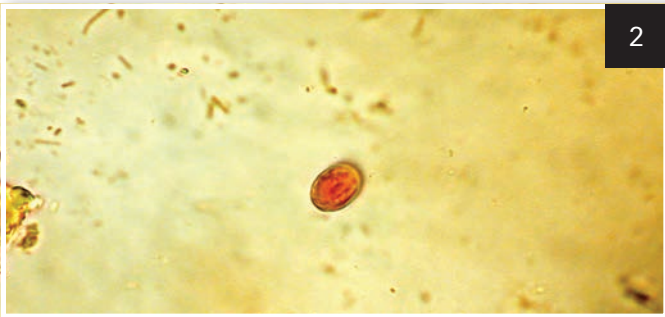
Seven weeks after initial presentation, Luci Lu was presented for mild lameness but no evidence of diarrhea. Fecal flotation was again positive for *Giardia* spp cysts, and she was treated with metronidazole at 15 mg/kg for 7 days, fenbendazole for another 5 days, a probiotic, and a high-fiber canned diet. Fecal flotation conducted 1 and 2 weeks later were negative. The importance of frequent bathing, especially the perineum, was reemphasized.

Luci had soft stools at 9 weeks' postpresentation, and the metronidazole and fenbendazole courses were repeated. A fecal flotation was negative after another 2 weeks. Over the next month, Luci Lu had 2 episodes of soft stools but negative fecal flotation (ELISA not performed); she responded to treatment with metronidazole (15 mg/kg q12h for 7 days) or tylosin (Tylan power at 1/8 teaspoon q12h with food for 7 days [recommended dose is 10–20 mg/kg q12h for 7 days]; Tylan powder is 2.5–2.7 grams per level teaspoon) and a high-fiber diet.

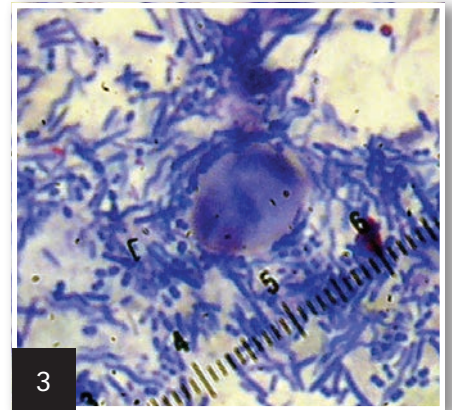
Five months later, Luci Lu again had soft stools and tested positive for *Giardia* cysts on fecal flotation. She was treated with metronidazole and fenbendazole at previous doses and durations. Three days later she still had diarrhea, so the current medications were discontinued and she was treated with azithromycin at 10 mg/kg PO q24h for 5 days.¹ The diarrhea resolved and all subsequent fecal flotation results were negative.



Giardia cysts



Giardia cyst, iodine stain (1000× magnification)



Giardia cyst, Diff-Quick, micrometer (1000× magnification)

Ask Yourself



What are the best options for managing cases of *Giardia* spp infection that are recurrent or refractory to fenbendazole and/or metronidazole treatment?

- A. Use metronidazole and/or fenbendazole at higher doses for longer durations.
- B. Switch to drugs used for treatment of human *Giardia* spp infection (eg, albendazole, tinidazole, nitazoxanide).
- C. Stop all medications and allow the immune system time to clear the organisms. Switch to other drugs used for treatment of other canine and feline intestinal infections (eg, ronidazole, azithromycin, tylosin); add probiotics or other supplements and change diet.

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Best Answer

C. Stop all medications and allow the immune system time to clear the organisms. Switch to other drugs used for treatment of other canine and feline intestinal infections (eg, ronidazole, azithromycin, tylosin); add probiotics or other supplements and change diet.

Metronidazole can be effective for uncomplicated cases but should not be given at high doses or for extended periods because of risks for adverse effects (eg, neurotoxicity).²⁻⁶ Treatment should not exceed 50 mg/kg/day for 7 days. Fenbendazole and febantel have had documented success in treating *Giardia* spp infections in dogs and cats.² Daily treatment for 3 or 5 days at standard deworming doses is usually effective, although following stringent hygiene measures is also necessary to prevent reinfection. While fenbendazole is well tolerated, no research supports exceeding the label recommendations.

Metronidazole, tinidazole, and nitazoxanide are recommended for human giardiasis; albendazole has been used. In addition to metronidazole, some of these drugs have been used in animals

as well. Albendazole has been effective in dogs,⁷ but adverse effects (eg, bone marrow toxicosis) have been reported.⁸ Tinidazole, a drug related to metronidazole, is absorbed after oral administration.⁹ Few anecdotal reports of success in dogs exist, but adverse effects are likely similar to those for metronidazole. Nitazoxanide, used anecdotally for dogs and cats and in limited studies in shelters, has been associated with vomiting.

Ronidazole has been used for treatment of feline trichomoniasis; one study indicated effectiveness when combined with stringent hygiene for *Giardia* infection at a dog kennel.¹⁰ Neurotoxicity has been reported in cats.¹¹ Azithromycin was successful in a dog previously treated with metronidazole and fenbendazole, although the mechanism of action remains unknown.¹ Antibiotics (eg, azithromycin, tylosin) are recommended to treat *Cryptosporidium* spp, another protozoan parasite.

Probiotics are popular for nonspecific diarrhea and intestinal infections in dogs and cats, although research is limited. One 6-week study showed no effect on *Giardia* cyst shedding with

Tx at a Glance

Oral Medications for *Giardia* spp Infections in Dogs & Cats*

Drug	Canine Dose	Feline Dose
Azithromycin	5–10 mg/kg q24h for 7 days	5–10 mg/kg q24h for 7 days
Febantel†	36 mg/kg q24h for 3–5 days†	56 mg/kg q24h for 3–5 days†
Fenbendazole	50 mg/kg q24h for 5 days	50 mg/kg q24h for 5 days
Metronidazole	15–20 mg/kg q12h for 5–7 days	15–20 mg/kg q12h for 5–7 days
Nitazoxanide	25 mg/kg q24h for 5–7 days	25 mg/kg q24h for 5–7 days
Ronidazole	30–50 mg/kg q24h for 7 days	30 mg/kg q24h for 7 days
Tinidazole	15–30 mg/kg q24h for 5–7 days	15 mg/kg q 24h for 5–7 days
Tylosin	10–20 mg/kg q12h for 7 days	10–20 mg/kg q12h for 7 days

* No drugs are FDA approved for *Giardia* spp in dogs or cats; fenbendazole and febantel are approved for treatment of several types of intestinal worms in dogs.

† For dogs and puppies, use label dose (drontal.com). For cats and kittens, use small dog tablet size (113.4 mg febantel) at ~0.5 tablet/kg.

the use of a commercial probiotic in naturally infected, research-colony dogs, although no signs (eg, diarrhea) developed.¹² In one study, silymarin with metronidazole demonstrated better efficacy with regard to cyst shedding than silymarin or metronidazole alone.¹³ No specific dietary studies for treatment of *Giardia* infection have been published, although alterations in the GI microbiome through diet change or supplementation (eg, fiber) may affect *Giardia* infection persistence.¹⁴

Another option for managing recurrent *Giardia* spp infections is to stop all drugs, especially antimicrobials, and wait for a natural immune response and repopulation of normal GI microorganisms. If there are no clinical signs (eg, diarrhea), discontinuing treatment in asymptomatic patients may be appropriate. Bathing to remove residual fecal material and cysts, cleanup, and proper disposal of feces are important.¹⁵ Zoonotic concerns when animals are shedding *Giardia* cysts are minimal. Direct transmission is rare, and most *Giardia* types (assemblages) are species specific.² ■ **cb**

The Take-Home



- *Giardia* spp infections can be difficult to clear.
- Alternative medications and treatment strategies, particularly when combined with stringent hygiene, are preferable to using increased doses or longer courses of treatments that have already failed.

See **Aids & Resources**, back page, for references & suggested reading.

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