

What is *Giardia*?

- *Giardia* is a protozoal parasite that infects the small intestine of cats and can cause diarrhoea.
- *Giardia* can infect a number of hosts including man.
- Two of the seven known biotypes (F and G) are regularly isolated from cats; two other biotypes known to infect man (A and B) can also occasionally infect cats.
- There is currently no evidence of transmission from cats to humans. However, it should be assumed that diarrhoeic faeces from all cats are a potential human health risk, especially in immunocompromised people.

Infection, epidemiology

- *Giardia* is transmitted by the faecal-oral route.
- Infection is most common in young cats particularly from multi-cat backgrounds.
- The life cycle of *Giardia* spp. includes two stages: trophozoites and cysts.
 - Trophozoites are excreted in the faeces and do not survive well in the environment and are unlikely to cause infection.
 - Cysts are highly infectious and successful transmission requires only a small number to be ingested. They can survive in the environment for up to several months in ideal conditions and indirect transmission via faecal contamination can occur.

Clinical signs

- Many infections remain sub-clinical and the importance of *Giardia* as a diarrhoeal pathogen in cats is not clear.
- Young cats are more susceptible to disease, with most clinical infections occurring in cats under one year of age.
- The parasite can cause damage to and loss of the epithelial cells of the lower small intestine leading to malabsorption and weight loss, which can be a prominent feature.
 - The diarrhoea is typically small intestinal in nature with passage of liquid or semi-liquid faeces but may sometimes show large intestinal features containing mucus/blood.
 - The clinical course may last for weeks.

Diagnosis

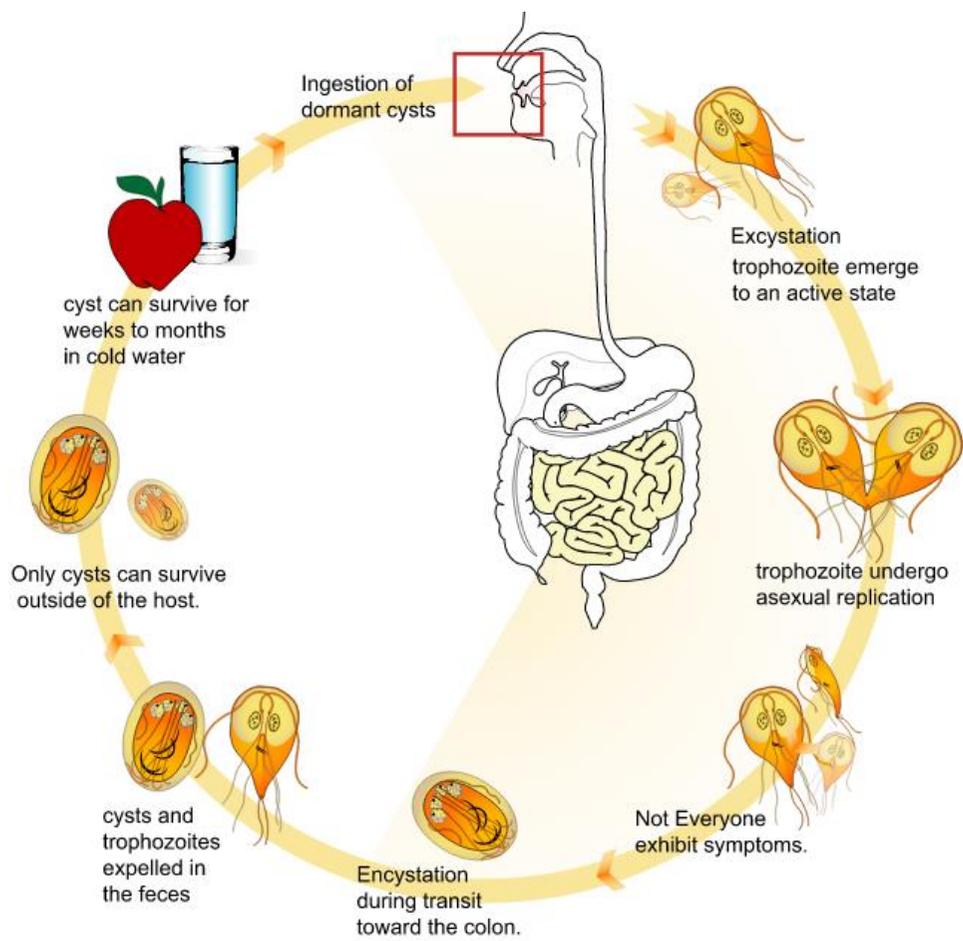
- The infection is diagnosed using:
 - faecal zinc sulfate flotation using faecal samples collected for several days (cyst detection)
 - faecal ELISA antigen assays
 - wet mount: direct examination of faecal smears (detection of trophozoites)
 - direct immunofluorescence on faecal smears (cyst detection)
 - PCR of faecal samples (possibility of subtype determination).
- Faecal flotation and faecal ELISA antigen detection (including in-practice tests) are the most sensitive and specific methods.

Disease management

- The standard treatment of *Giardia* infection is imidazole, e.g. fenbendazole given at 50 mg/kg for 5-7 days.
- Alternatively, metronidazole can be given at a dosage of 25 mg/kg for 5 days. Higher doses (50 mg/kg) carry an increased risk of side effects, including weakness, ataxia, disorientation and seizures.
- In case of repeated episodes of diarrhoea in a multi-cat environment, treatment of all cats should be considered.
- Regular removal of faeces, cleaning and disinfection of litter trays and cleaning of the affected cat's rear may help limit contamination in multi-cat environments. The parasite can be inactivated by quaternary ammonium compounds (1 minute contact time).
- Treatment of healthy, individually kept cats is not recommended:
 - There is a risk of bacterial and parasitic resistance occurring especially with metronidazole and fenbendazole.
 - All drugs can potentially cause side-effects
 - Animals with normal stools are not considered human health risks
 - Treatment is unlikely to eliminate infection
 - Re-infection can occur within days.

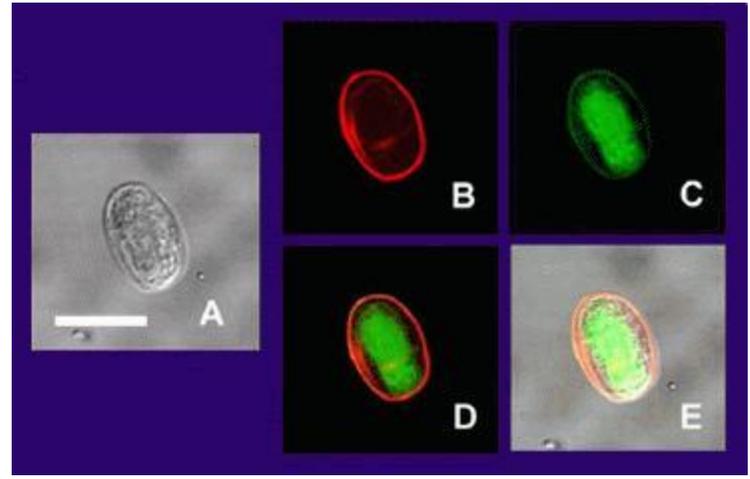
Prevention

- No vaccine is presently available in Europe.



■ Life cycle of *Giardia lamblia*.

Wikimedia commons:
https://en.wikipedia.org/wiki/Giardia_lamblia#/media/File:Giardia_life_cycle_en.svg



■ Multiple views of a *Giardia lamblia* cyst (bar = 10 micrometers). (A) transmission (differential interference contrast) microscopy, (B) cyst wall selectively imaged through use of fluorescent-labelled (TRITC) antibody; (C) cyst imaged through use of carboxy fluorescein diacetate, a viability stain; (D) composite image of (B) and (C). (E) is a composite image of (A), (B), and (C).

Wikimedia commons:
<https://commons.wikimedia.org/wiki/File:Giardia.jpg#/media/File:Giardia.jpg>



Image DPDx, CDC (www.cdc.gov)

■ *Giardia duodenalis* trophozoites in a Giemsa stained mucosal imprint.