

## **Parasitology:** from **parasitism**

Parasitism: relationship between 2 dissimilar organisms that is beneficial to the parasite and harmful to the host

### **Parasites:**

#### **Types:**

Ectoparasite: live on or in the skin of the host

Endoparasite: inside the host and can be intracellular

Obligate parasite: completely dependant on the host. At least one stage is parasitic

Facultative parasite: can live free and can be parasitic

Accidental parasite: parasite of animal can cause infection to human but it does not complete its life cycle using the human host.

## **Types of host:**

Final or definitive: the host that contains the mature stage (adult) of the parasite

Intermediate host: The host that contains the immature stage(s)

vector: transmitter of the disease, arthropod

reservoir: an animal on which the parasite depends to survive in nature and represents a source of infection to other susceptible animals

## **Epidemiology :**

A science concerned with the factors that determine prevalence and incidence of infection

Prevalence: old plus new cases of a disease in a population

Incidence: new cases

Endemic disease: with a stable rate of prevalence in human population

Epidemic or outbreak: sudden increase in number of cases of an infection in human population.

Sporadic disease: scattered cases of the disease

## **Parasitic groups of importance in Medical Parasitology**

Protozans:

Intestinal flagellates

Blood and tissue flagellates

Parasitic ciliates

Amoebae

Apicomplexa

Helminths:

Platyhelminthes (flat worms)

Trematoda

Cestoda

Nematoda (round worms)

Arthropoda

Arachnida

Insecta

## GIARDIASIS (lambliasis)

### Etiology

*Giardia lamblia* (an intestinal flagellate)

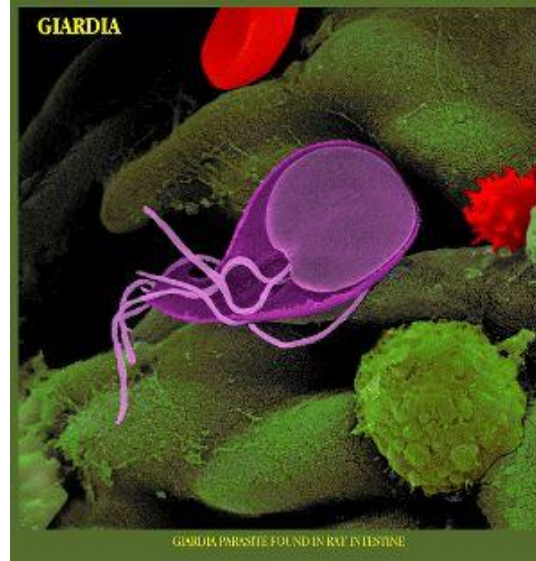
### Epidemiology

Giardia has worldwide distribution.

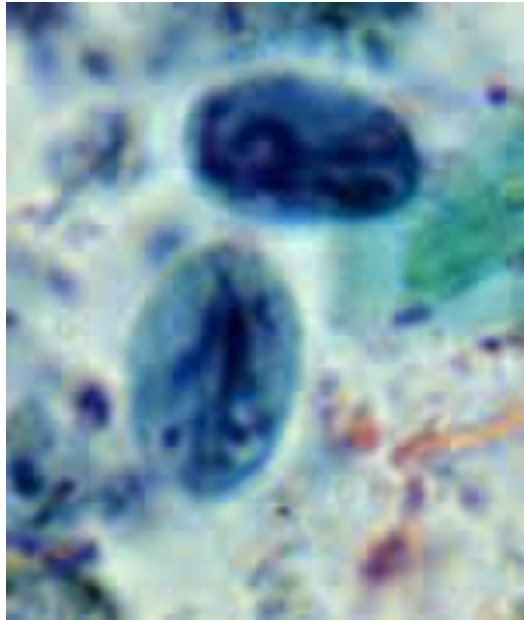
Mainly a water-borne disease

## Morphology

Trophozoite: Giardia is a 12 to 15 micrometer, 8 flagella, two suction discs. The cytoplasm contains two nuclei (Figure 7).



Cyst: Giardia cysts are 9 to 12 micrometer .  
The cytoplasm contains four nuclei.



## Life cycle

Infection occurs by ingestion of cysts, usually in contaminated water.

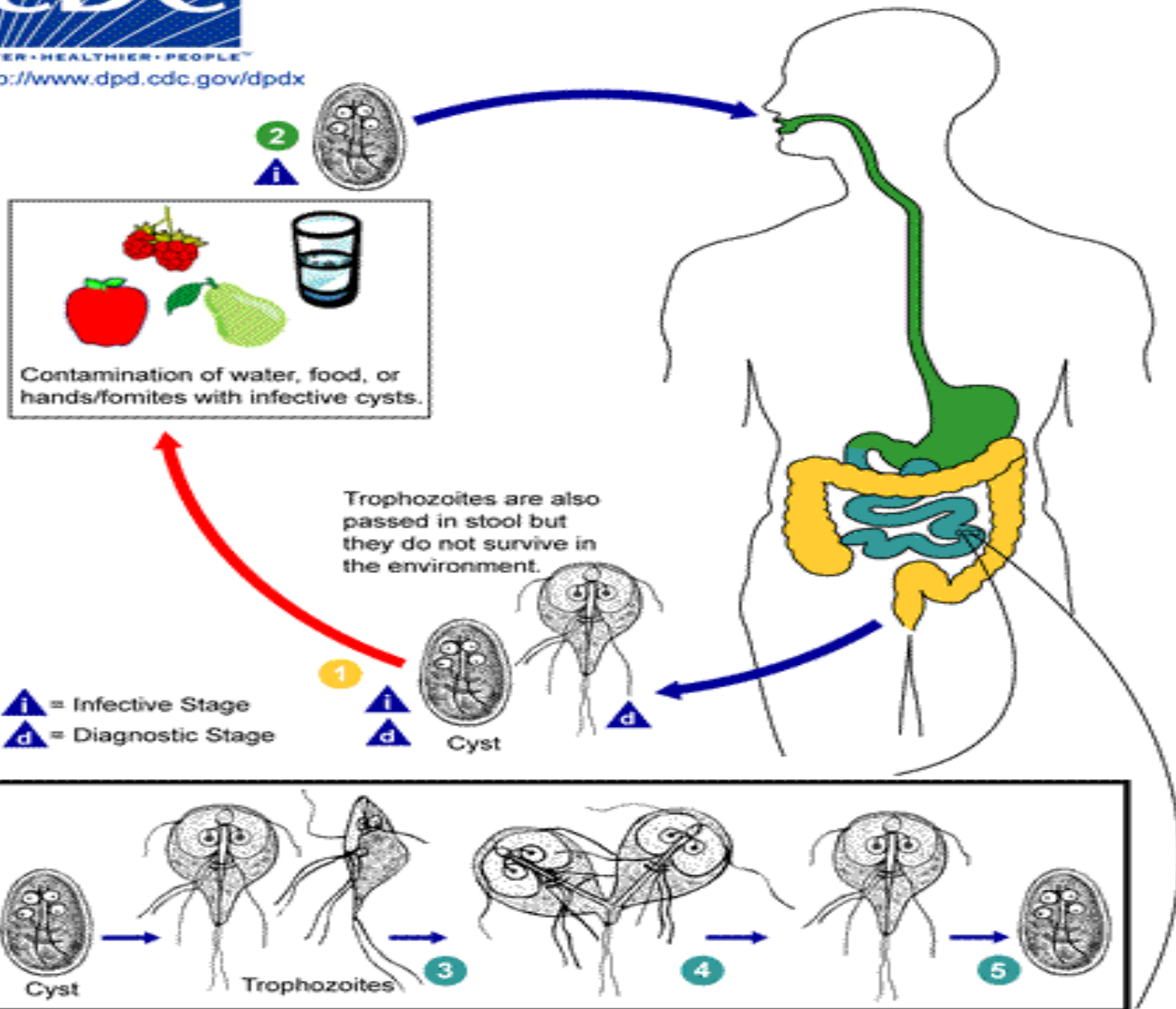
Decystation occurs in the duodenum and trophozoites (trophs) colonize the upper small intestine where they may swim freely or attach to the sub-mucosal epithelium via the ventral suction disc. The free trophozoites encyst as they move down stream and mitosis takes place during the encystment.

The cysts are passed in the stool. Man is the primary host although beavers, pigs and monkeys are also infected and serve as reservoirs.



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## Symptoms

Early symptoms include flatulence, abdominal pain, nausea and foul-smelling bulky, explosive, often watery, diarrhea. The stool contains excessive lipids but very rarely any blood or necrotic tissue. The more chronic stage is associated with vitamin B12 malabsorption

## Pathology

Covering of the intestinal epithelium by the trophozoite and flattening of the mucosal surface results in malabsorption of nutrients.

## Diagnosis

Giardia cause diarrhea that is distinct from dysenteries due to lack of mucus and blood in the stool. It lacks high fever.

Cysts in the stool and trophs in the duodenum can be identified microscopically. Stool or biopsy from duodenum.

## Treatment

Metronidazole is the drug of choice.

## Prevention and control

Wash vegetables

Boil water

Cyst is resistant to chlorination

# TRICHOMONIASIS

## Etiology

*Trichomonas vaginalis*

## Epidemiology

*Trichomonas vaginalis* has a world-wide distribution; incidence is as low as 5% in normal females and as high as 70% among prostitutes and prison inmates.

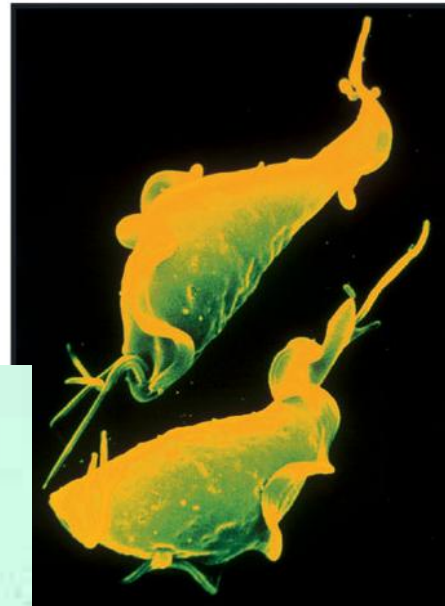
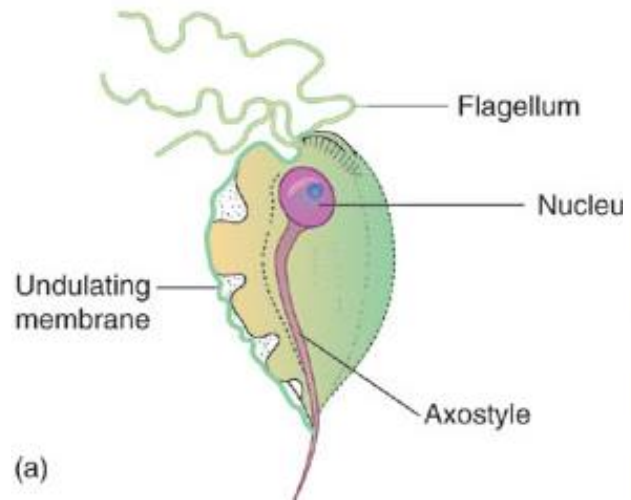
## Morphology

The trophozoite form is 15 to 30 micrometers in diameter

Has a single nucleus, four anterior flagella and a lateral flagellum attached by an undulating membrane.

axostyle

The organism does not encyst.



## Life cycle

*T. vaginalis* colonizes the vagina and urethra of women and the urethra (sometimes prostate) of men.

Infection occurs primarily via sexual contact

They divide by binary fission which is favored by low acidity (pH > 5.9; the normal pH is 3.5 to 4.5).

There is no non-human reservoir.

## Symptoms

*T. vaginalis* infection is rarely symptomatic in men, although it may cause mild urethritis or occasionally prostatitis.

In women, it is often asymptomatic, but heavy infections may cause mild to severe vaginitis with foul-smelling yellowish discharge

## Pathology

The organism causes contact-dependent damage to the epithelium of the infected organ.

## Diagnosis

Clinical suspicion may be confirmed by finding the organism in Giemsa-stained smears (or trichrom stain) of vaginal discharge or, in difficult cases, by cultivation of a swab sample in Diamond's medium.

## Treatment

Metronidazole (although teratogenic) is effective in both males and females. Vinegar douche may be useful.

## Prevention

Personal hygiene and the use of condoms are helpful.