

**University of Tikrit**  
**College of nursing**  
**Basic Nursing Sciences**



**Second year 2023/2024**

**Parasitology**

*Entamoeba Coli*

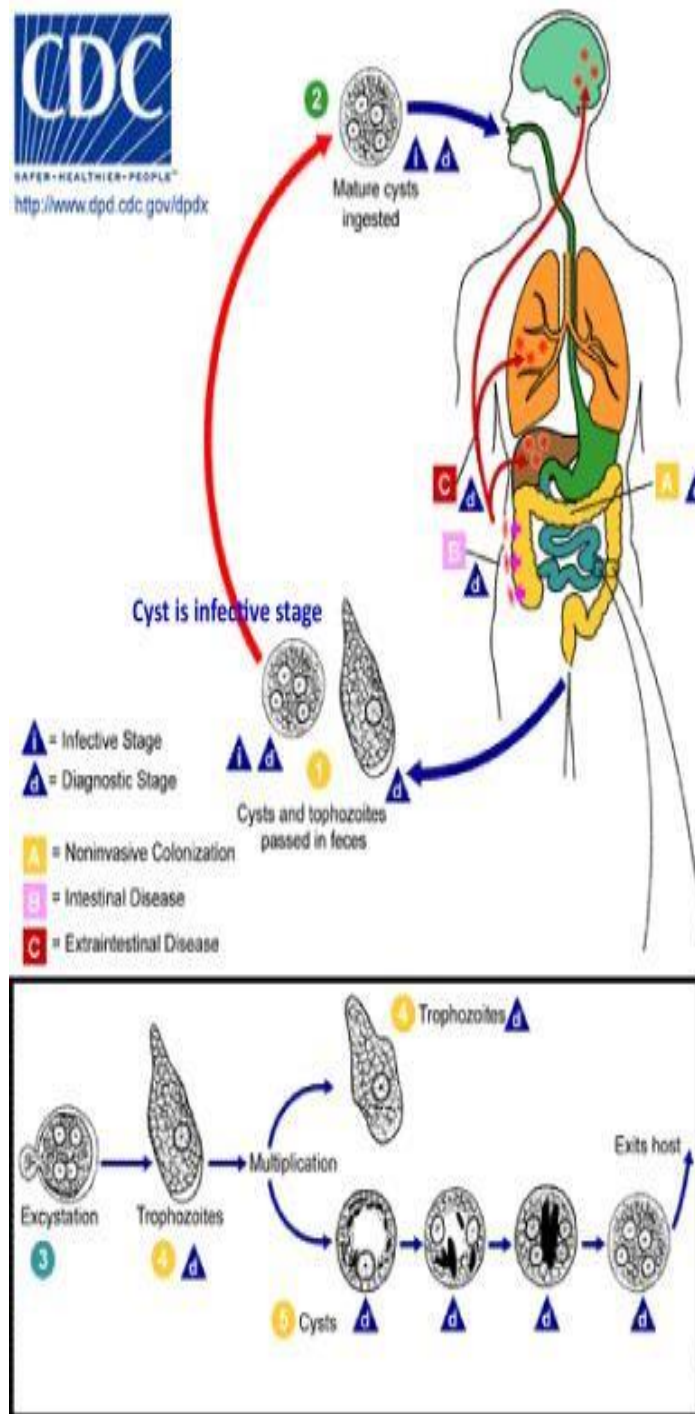
**By:**

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## **1. *Entamoeba coli***

The life cycle stages include; trophozoite, precyst, cyst, metacyst, and metacystic trophozoites. Typically the movements of trophozoites are sluggish, with broad short pseudopodia and little locomotion, but at a focus the living specimen cannot be distinguished from the active trophozoite of *E.histolytica*. However, the cysts are remarkably variable in size. *Entamoeba coli* is transmitted in its viable cystic stage through faecal contamination. *E.coli* as a lumen parasite is non-pathogenic and produces no symptoms. The mature cyst (with more than four nuclei) is the distinctive stage to differentiate *E.coli* from the pathogenic *E.histolytica*. Specific treatment is not indicated since this amoeba is non-pathogenic. The presence of *E.coli* in stool specimen is evidence for faecal contamination. Prevention depends on better personal hygiene and sanitary disposal of human excreta.

# Entamoeba histolytica



## DIRECT LIFE CYCLE

- No vectors required
- No intermediate hosts
- Trophozoite in large intestine receives signal to encyst
- Secretes hyaline membrane around itself (environmentally resistant membrane)
- Cyst undergoes 2 nuclear divisions
- Cyst w/ 4 nuclei passes out with feces
- Must be ingested to infect new host
- When ingested, undergoes cytoplasmic division and excysts as 4 small amoeba in small intestine
- These immediately divide by binary fission to form 8
- The 8 small trophozoites are carried to the large intestine where they feed on the host, mature and reproduce.

# **Mastigophora**

Flagellates are unicellular microorganisms. Their locomotion is by lashing a tail-like appendage called a flagellum or flagella and reproduction is by simple binary fission. There are three groups of flagellates:

- **Luminal flagellates**

*Giardia lamblia*

- **Hemoflagellates** Trypanosoma species. Leishmania species.

- **Genital flagellates**

*Trichomonas vaginalis*

### **Luminal flagellates *Giardia lamblia* disease: Giardiasis**

#### **Morphology:-**

The life cycle consists of two stages, the trophozoite and cyst. The trophozoite is 9-12  $\mu\text{m}$  long and 5-15 $\mu\text{m}$  wide anteriorly. It is bilaterally symmetrical, pear-shaped with two nuclei (large central karyosome), four pairs of flagella, two axonemes, and a suction disc with which it attaches to the intestinal wall. The oval cyst is 8-12 $\mu\text{m}$  long and 7-10 $\mu\text{m}$  wide, thick-walled with four nucleus and several internal fibers. Each cyst gives rise to two trophozoites during excystation in the intestinal tract. Transmission is by ingestion of the infective cyst.

#### **Life cycle:-**

Infection occurs by ingestion of cyst, usually in contaminated water. Decystation occurs in the duodenum and trophozoite can attach to the intestinal villi by the ventral sucking discs without penetration of the mucosa lining, but they only feed on the mucosa secretion. 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 pigs and monkeys are also infected and serve as reservoirs.

**Pathogenesis:-**

Infection with *G.lamblia* causes mild inflammation of the duodenum mucosa leading to hypertrophy and villous flattening damage of the epithelial cells, This results malabsorption of food. Children are more affected than adults.

**Epidemiology:-**

*Giardia lamblia* has a worldwide distribution, particularly common in the tropics and subtropics. Transmitted by ingestion of contaminated food and water, uncooked vegetables or fruits, or person-to-person spread by the faecal-oral route. The cyst stage is resistant to chlorine in concentrations used in most water treatment facilities.

**Clinical features:-**

Symptomatic giardiasis ranges from mild diarrhea to severe malabsorption syndrome. Usually, the onset of the disease is sudden and consists of foul smelling, watery diarrhea, abdominal cramps, flatulence, and streatorrhoea. Blood & pus are rarely present in stool specimens, a feature consistent with the absence of tissue destruction.

**Laboratory diagnosis:-**

Examination of diarrhoeal stool- trophozoite or cyst, or both may be recovered in wet preparation. In examinations of formed stool (e.g. in asymptomatic carriers) only cysts are seen. Infections can also be diagnosed by enzyme-linked immunosorbent assays (ELISAs) and PCR assays can detect *Giardia* in clinical samples.

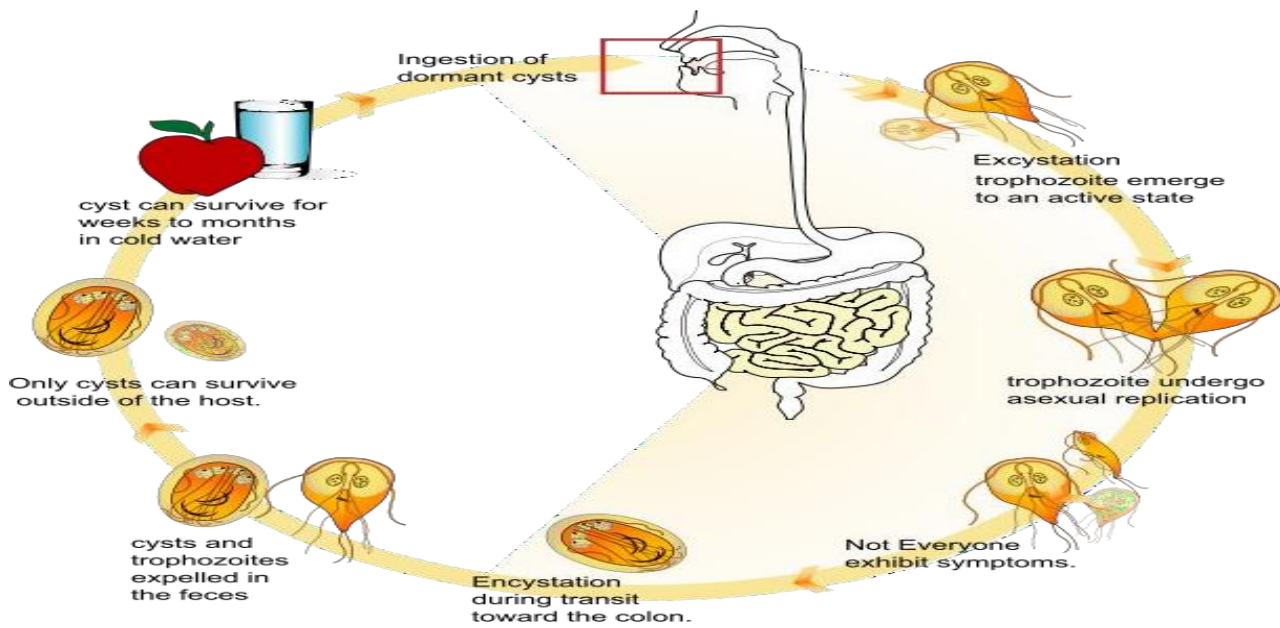
Serology has been used in epidemiologic investigations and other research. *Giardia* can be cultured *in vitro*, but this technique is used only in research.

**Treatment:-**

For asymptomatic carriers and diseased patients the drug of choice is metronidazole.

**Prevention:-**

- Asymptomatic reservoirs of infection should be identified & treated.
- Avoidance of contaminated food and water.
- Drinking water from lakes and streams should be boiled.
- Proper waste disposal and use of latrine.



**Life cycle of *Giardia lamblia***