

# Parasitic infections of the GI tract

By : Nader Alaridah MD, PhD

- **Protozoa:**

- *Entamoeba histolytica*
- *Giardia lamblia*
- *Cryptosporidium parvum*

- **Helminthis:**

*Ascaris lumbricoides* , *Entrobium vermicularis*

*Echinococcus granulosus*

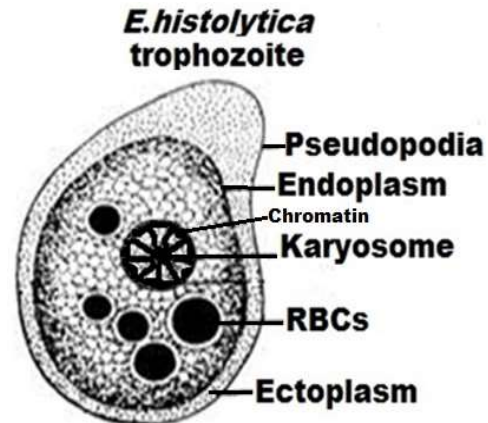
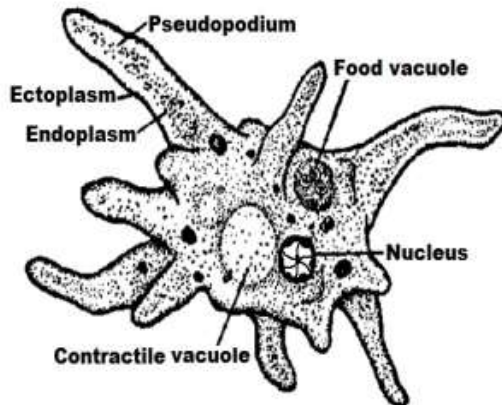
*Schistosomia mansoni*

## ***Entamoeba histolytica***

- ❖ **Geographical distribution:** Worldwide especially in the temperate zone and more common in areas with poor sanitary conditions.
- ❖ **Habitat:** Large intestine (caecum, colonic flexures and sigmoidorectal region).
- ❖ **D.H:** Man
- ❖ **R.H:** Dogs, pigs, rats and monkeys.
- ❖ **Disease:** Amoebiasis or amoebic dysentery

## Morphological characters

### 1- Trophozoite stage (Vegetative form or tissue form):



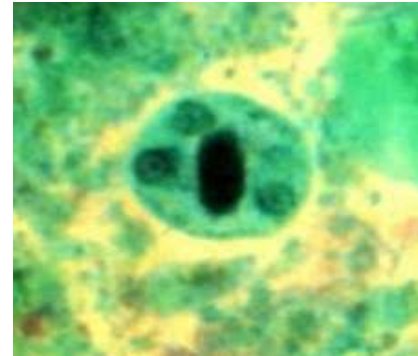
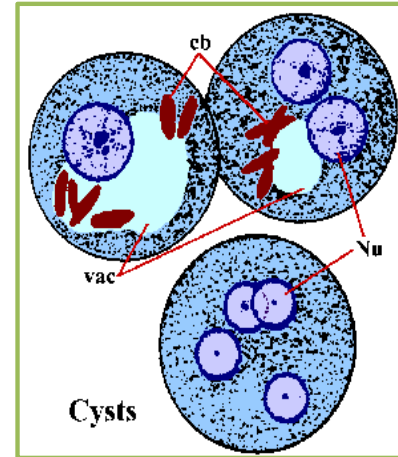
**2- Cyst stage (Luminal form):**

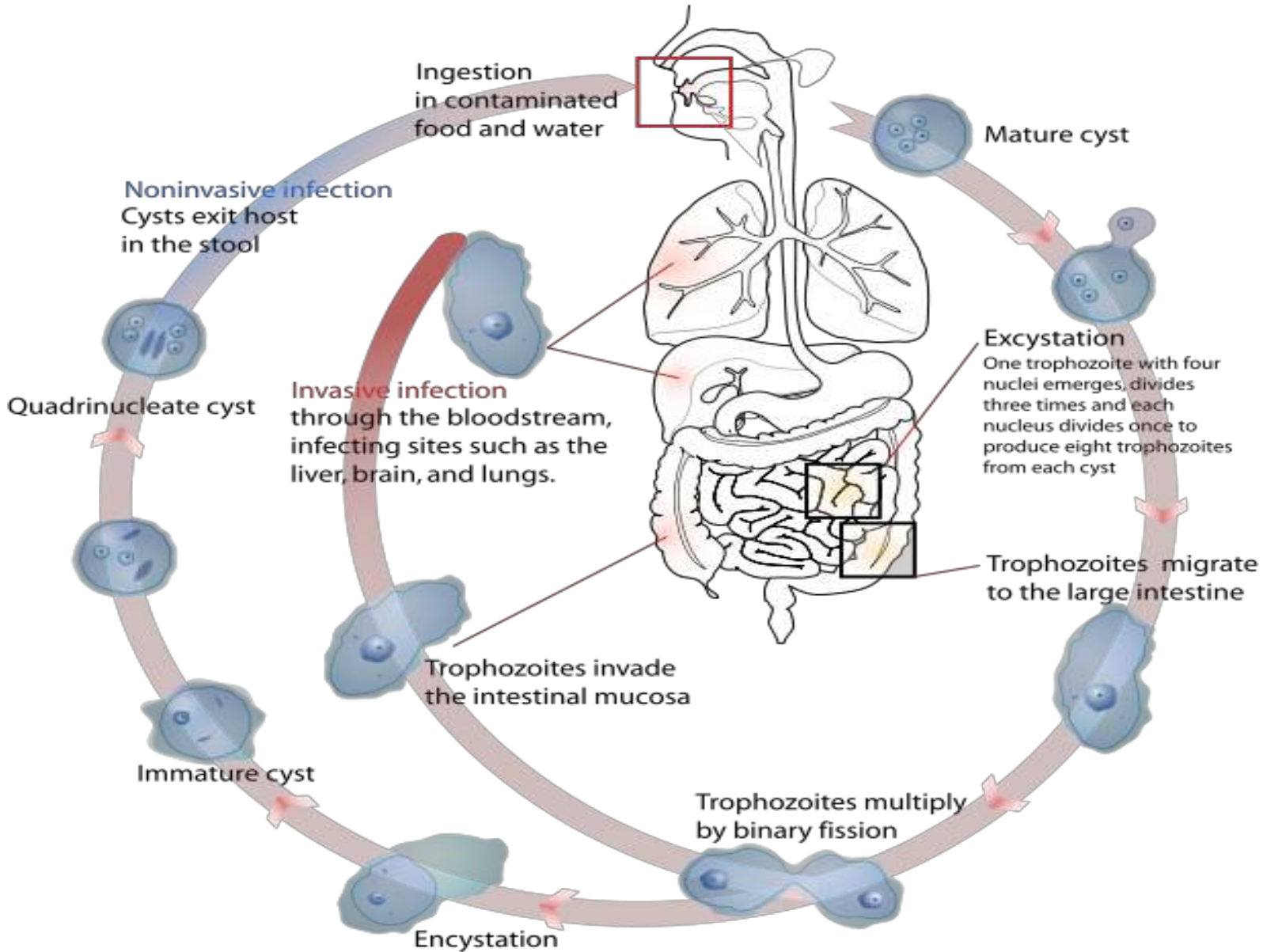
**(a) Immature cyst (Uninucleate cyst and Binucleate cyst):**

❖ **Uninucleate cyst (one nucleus)**

❖ **Binucleate cyst (2 nucleus)**

**b) Mature cyst (Quadrinucleate cyst)**





# Mode of infection

- 1- Contaminated water and foods (ex. green vegetables) or drinks or hands with human stool containing mature cyst.**
- 2- Handling food by infected food handlers as cooks and waiters.**
- 3- Flies and cockroaches that carry the cysts from faeces to exposed food.**
- 4- Autoinfection (faeco-oral or hand to mouth infection).**
- 5- Homosexual transmission.**

# Clinical pictures

## I) Intestinal amoebiasis

### 1-Asymptomatic infection

Most common and trophozoites remain in the intestinal lumen feeding on nutrients as a commensal without tissue invasion  
(Asymptomatic patient known as a healthy carrier and cyst passers)

### 2-Symptomatic infection

#### a) Acute amoebic dysentery

Presented with fever, abdominal pain, tenderness, tenesmus and frequent motions of loose stool containing **mucus, blood and trophozoites.**

#### b) Chronic infection

-Occurs if acute dysentery is not properly treated.  
-With low grade fever, recurrent episodes of diarrhea alternates with constipation.  
- **Only cysts are found in stool.**

### 3-Complications

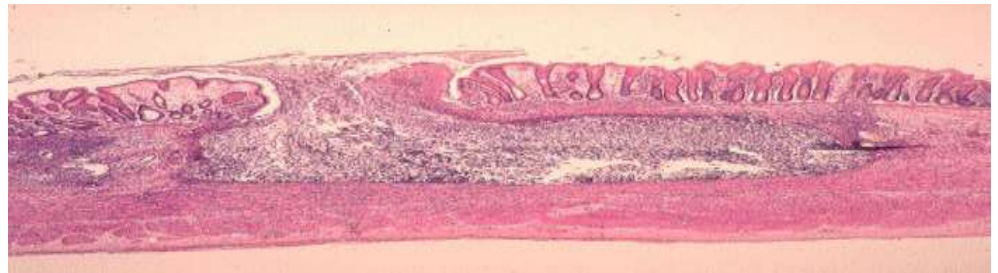
- **Haemorrhage** due to erosion of large blood vessels.
- **Intestinal perforation** ⇒ peritonitis.
- **Appendicitis.**
- **Amoeboma (Amoebic granuloma)** around the ulcer ⇒ stricture of affected area.



**With heavy infection and lowering of host immunity**

The trophozoites of *E. histolytica* invade the mucosa and submucosa of the large intestine by secreting lytic enzymes → amoebic ulcers

The ulcer is flask-shaped with deeply undermined edges containing cytolysed cells, mucus and trophozoites.



The most common sites of amoebic ulcers are caecum, colonic flexures and sigmoidorectal regions due to decrease peristalsis & slow colonic flow at these sites that help invasion.

## II) Extra-intestinal amoebiasis

Due to invasion of the blood vessels by the trophozoites in the intestinal ulcer → reach the blood → to spread to different organs as:

→ **Liver** →

-Amoebic liver abscess or diffuse amoebic hepatitis.  
-Affect commonly **right lobe** either due to spread via portal vein or extension from perforating ulcer in right colonic flexure.  
-**CP**: include fever, hepatomegaly and pain in right hypochondrium.

•Lung abscess, brain abscess ..

# Laboratory diagnosis

## I) Intestinal amoebiasis

### a) Direct

• **Macroscopic:** Offensive loose stool mixed with mucus and blood.

• **Microscopic:**

**1-Stool examination:** Reveals either trophozoites (in loose stool) or cysts (in formed stool) by direct smear, iodine stained & culture.

**2-Sigmoidoscopy:** To see the ulcer or the trophozoites in aspirate or biopsy of the ulcer.

**3-X-ray after barium enema:** to see the ulcer, deformities or stricture.

### b) Indirect

**-Serological tests:** antigen detection

# Treatment

1) Asymptomatic  
intestinal carrier

Luminal amoebicides

Paromomycin or  
Diloxanide furoate

2) Intestinal  
amoebiasis

Tissue  
amoebicides

Metronidazol (Flagyl) or  
tinidazole **is the drug of  
choice**

3) Extra-intestinal  
amoebiasis

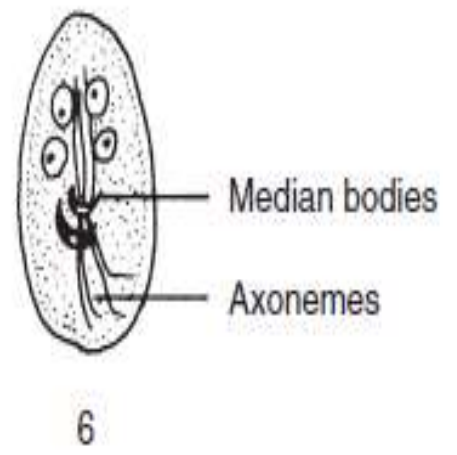
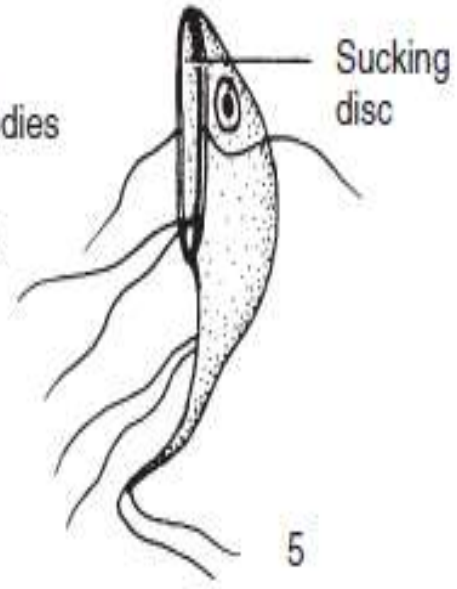
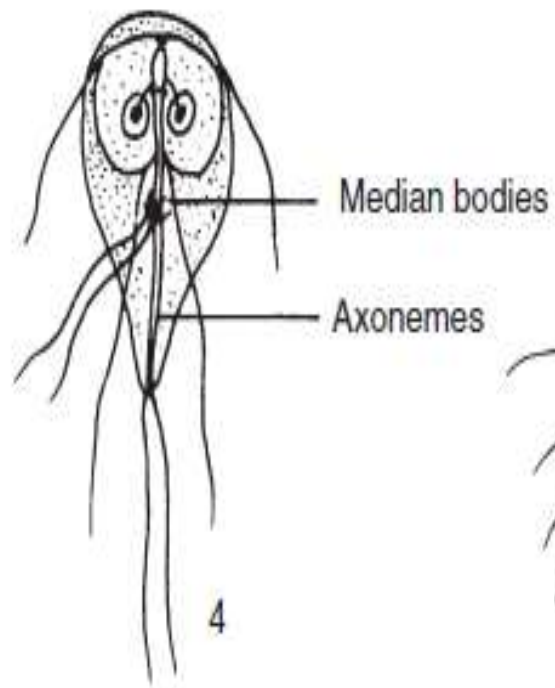
Tissue & luminal  
amoebicides

Metronidazol  
(Flagyl) +  
Paromomycin or  
Diloxanide furoate

- **Prevention:**
- Amoebic infection is prevented by eradicating fecal contamination of food and water
- Water is a prime source of infection and therefore the most contaminated foods are vegetables such as lettuce
- Amoebic cysts are not killed with low doses of chlorine or iodine
- Bringing water to a boil ensures the absence of amoeba

# *Giardia duodenalis*

- Common cause of intestinal infection worldwide
- Flagellated
- Both the trophozoite and the cyst are included in the life cycle.
- found most commonly in the crypts in the duodenum.
- Trophozoites are attached to the epithelium of the host villi by means of the **ventral disk**.
- Cyst formation takes place as the organisms move down through the jejunum after exposure to biliary secretions.



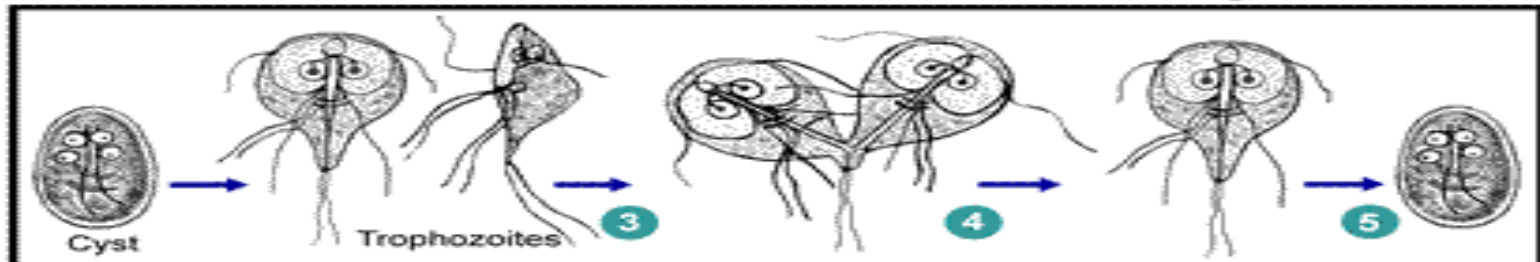
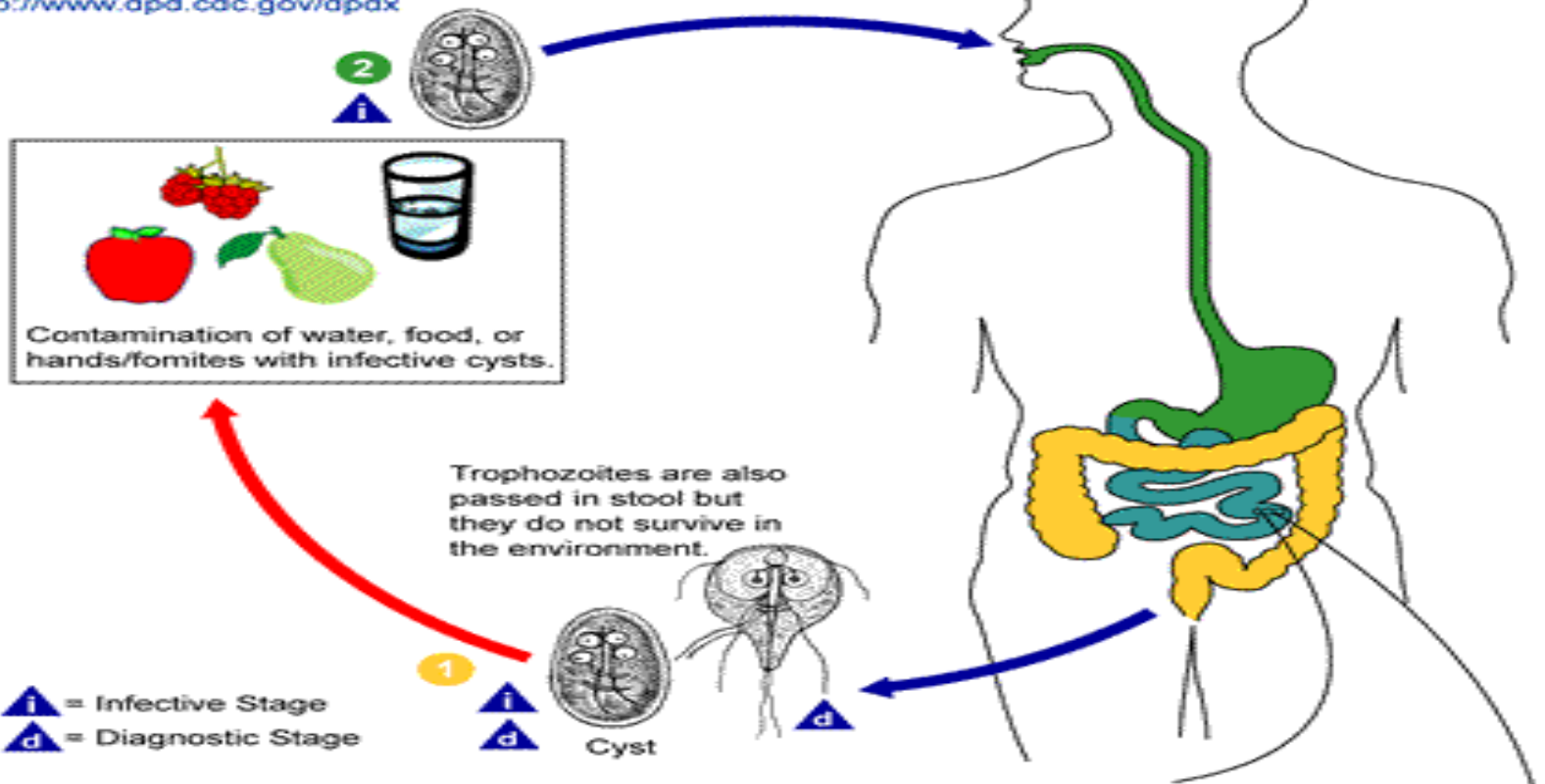
# Epidemiology

- Transmission of *G. lamblia* occurs by ingestion of viable cysts by fecal oral route
- high incidence of giardiasis occurs in patients with immunodeficiency syndromes.
- The incubation period ranges from approximately 1-2 weeks and infectious dose is 10.



## clinically

- Asymptomatic Infection (treatment not recommended)
- Symptomatic:
  - Diarrhea usually watery: profuse watery diarrhea that later becomes greasy foul smelling and may float (steatorrhea)
  - Abdominal cramps, bloating, malaise, weight loss,
  - Malabsorption and weight loss
  - Vomiting and tenesmus are not common



# Lab Diagnosis

- **Routine Methods:**

- Stool analysis: cysts and sometimes trophozoites

- **Antigen Detection:**

- Sensitive and specific in detecting *G. lamblia* in fecal specimens.

Treatment: Metronidazole or tinidazole

# *Cryptosporidium spp.*

- Intracellular enteric parasites that infect epithelial cells of the stomach, intestine, and biliary ducts.
- *C. parvum* (mammals, including humans) and *C. hominis* (primarily humans).
- infections begin with ingestion of viable oocysts, each oocyst releases four sporozoites, which invade the epithelial cells and develop into merozoites then oocyst.
- Prevalence of fecal oocyst 3-10%

- **Clinically:**

- Copious Diarrhea: These patients may have 3-17 liters of stool per day

- Abdominal pain and vomiting

- **Diagnosis:** oocyst in stool using modified acid fast stain

- **Treatment:**

- Usually self limited with Oral or intravenous rehydration.

- Nitazoxanide is used for immunocompromised individuals e.g HIV patients.

The End

Thank you