

Common Protozoal infections of the GI tract

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Protozoa of the GI tract

❖ *Entamoeba histolytica*

❖ **Giardia Lamblia**

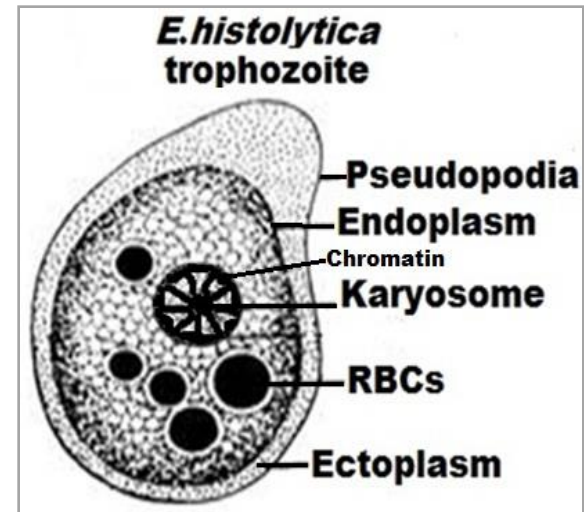
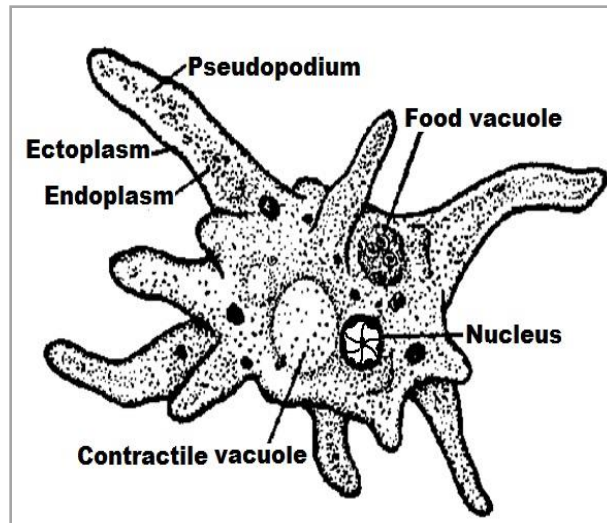
❖ **Cryposporidium**

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:** Man, Dogs, pigs, rats and monkeys.
- ❖ **Disease:** Amoebiasis or amoebic dysentery

Morphological characters

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



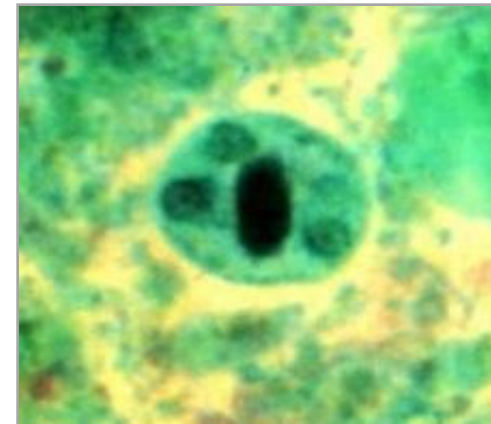
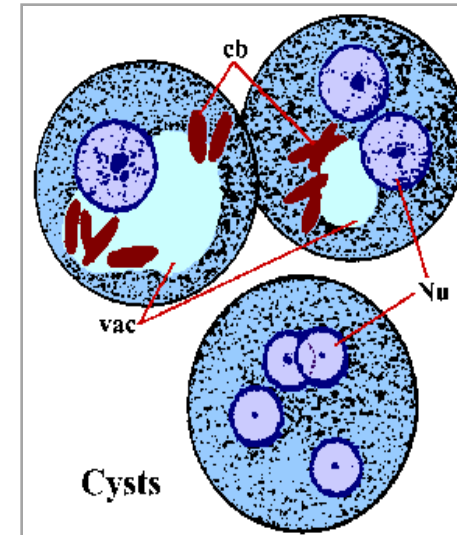
2- Cyst stage (Luminal form):

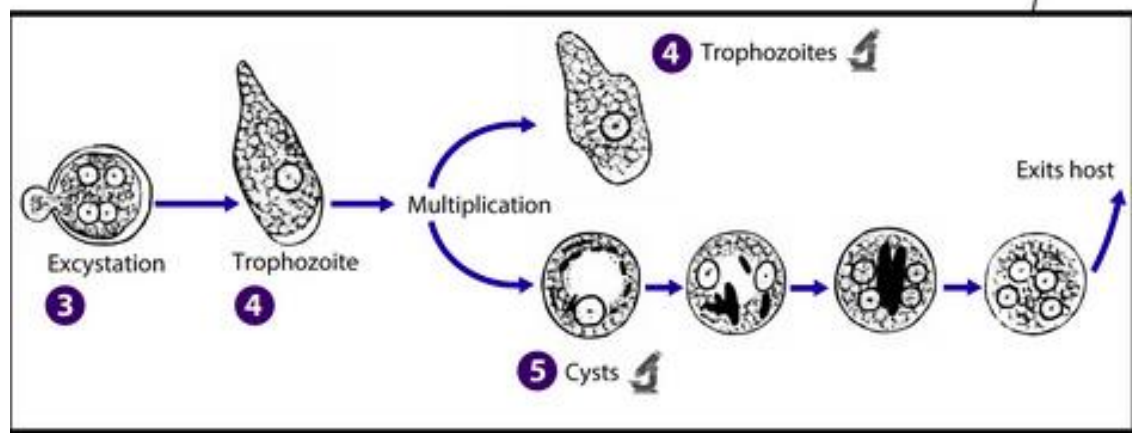
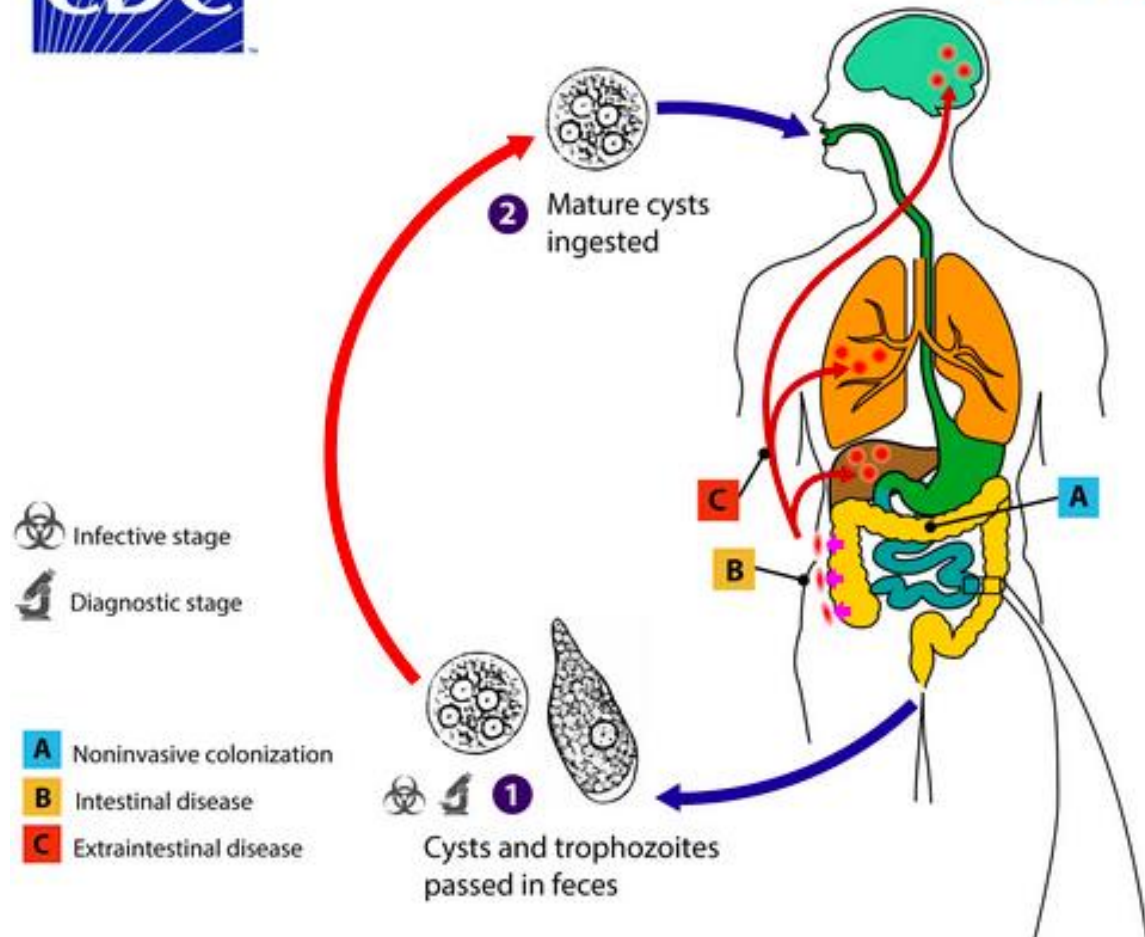
(a) Immature cyst (Uninucleate cyst and Binucleate cyst):

❖ **Uninucleate cyst (one nucleus)**

❖ **Binucleate cyst (2 nucleus)**

b) Mature cyst (Quadrinucleate cyst)



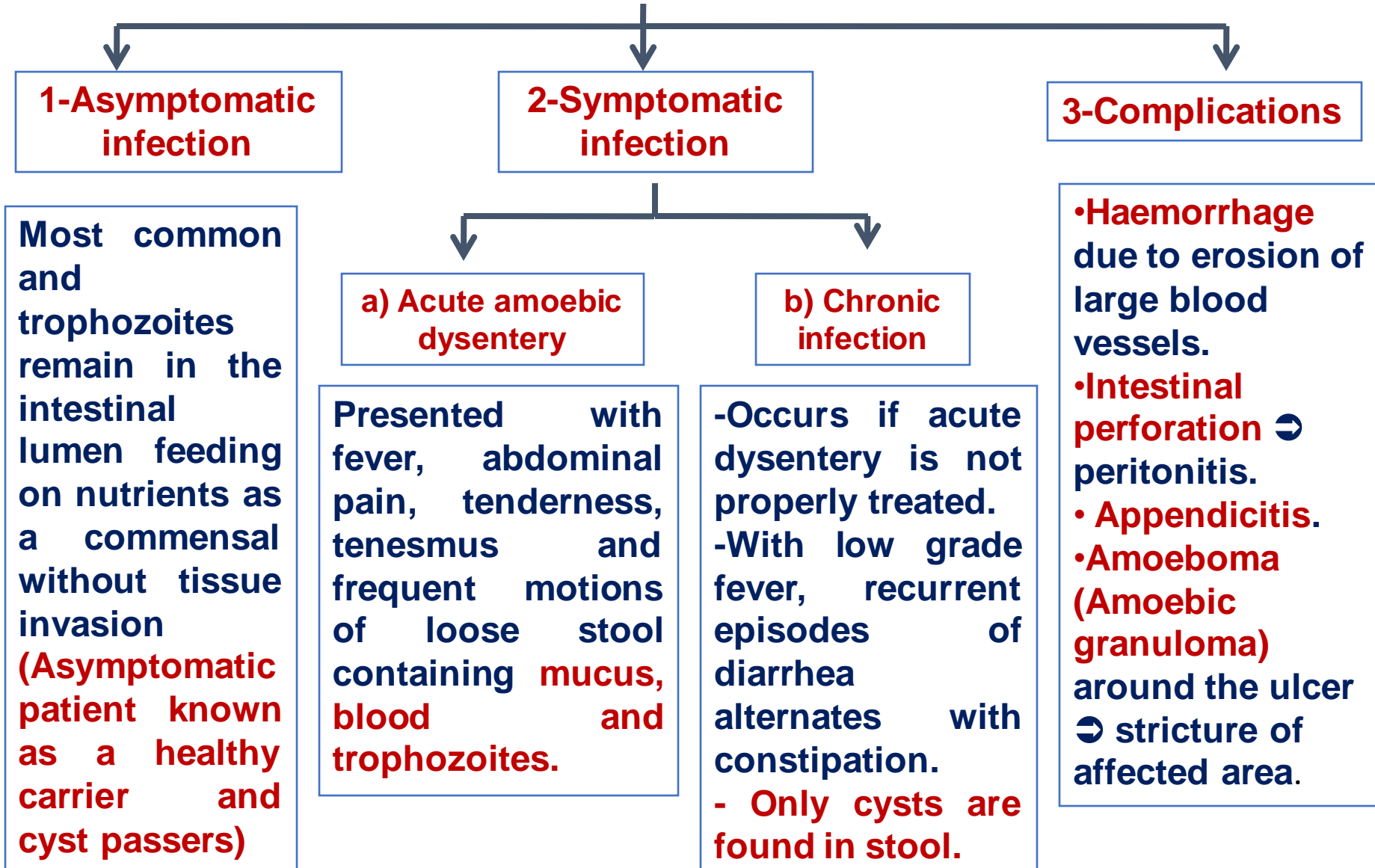


Mode of infection

- 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

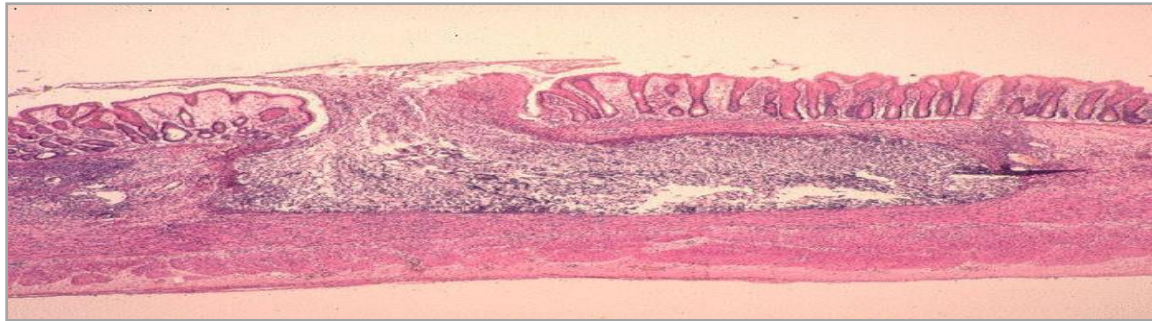
I) Intestinal amoebiasis



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

→ Lung

•Lung abscess → pneumonitis with chest pain, cough, fever.
•Amoebic lung abscess usually occur in the **lower part of the right lung** due to direct spread from the liver lesions through the diaphragm or very rarely trophozoites may reach the lung via blood.

→ **Brain** → Brain abscess ⇨ encephalitis (fatal).

→ **Skin** → **Cutaneous amoebiasis (Amoebiasis cutis)** due to either extension of acute amoebic colitis to the perianal region or through rupture on the abdominal wall from hepatic, colonic or appendicular lesions.

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:** CFT, IHAT, IFAT, ELISA and GDPT (gel-diffusion precipitin test).

N.B. These serological tests are positive only in invasive intestinal amoebiasis but negative in asymptomatic carriers.

II) Extra- intestinal amoebiasis

According to the organ affected

a) Direct

1- X- ray:

In liver ⇒ space occupying lesion.

In lung ⇒ pleuritis with elevation of the diaphragm

2- Ultrasonography, CT scan & MIR: For liver abscess.

3- Aspiration of abscess content: For liver abscess to detect trophozoites.

b) Indirect

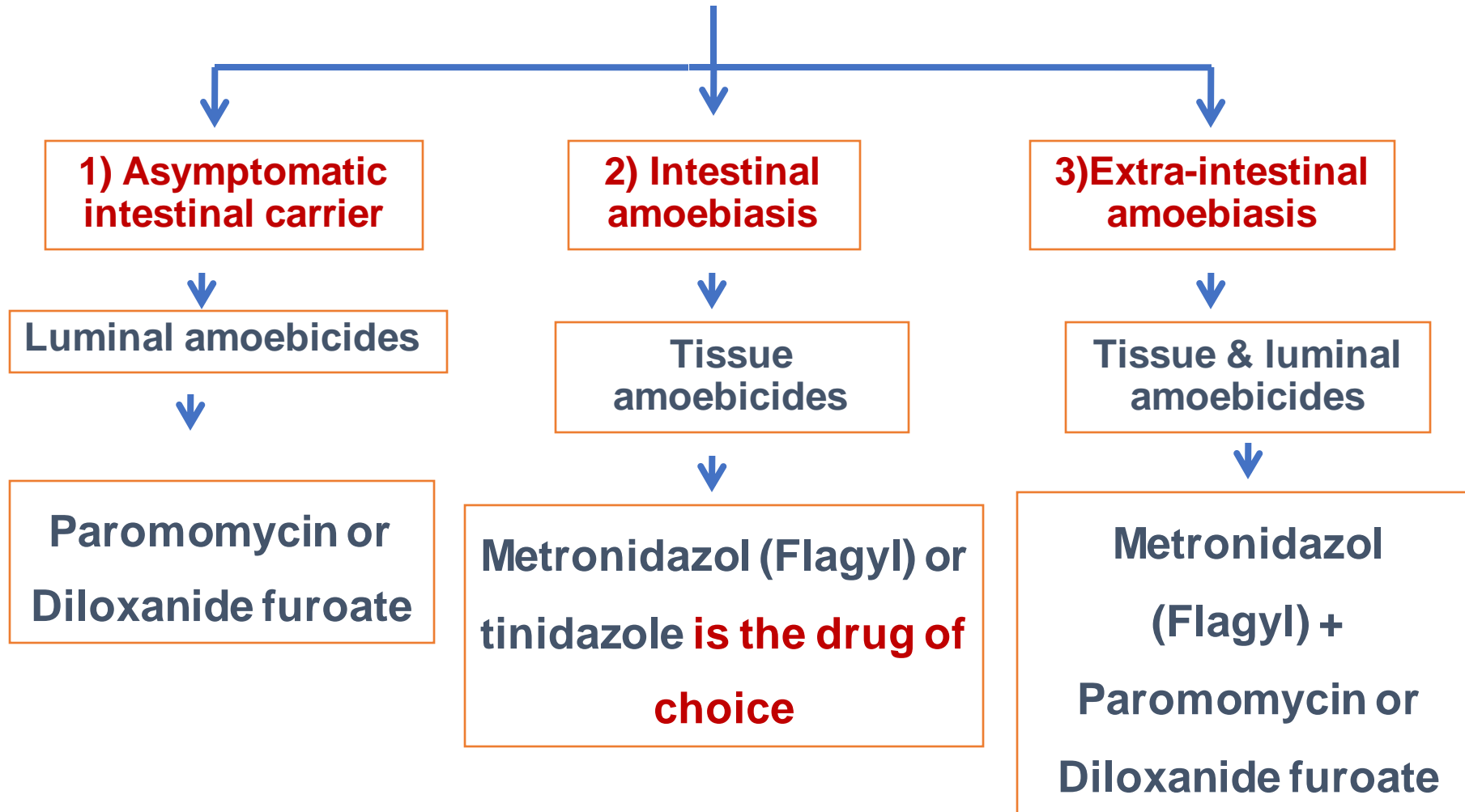
1- Serological tests: As intestinal amoebiasis. They are positive and can persist for years.

2- Molecular by PCR.

3- Blood examination: Leucocytosis.

4- Liver function tests: Increased in amoebic liver abscess.

Treatment

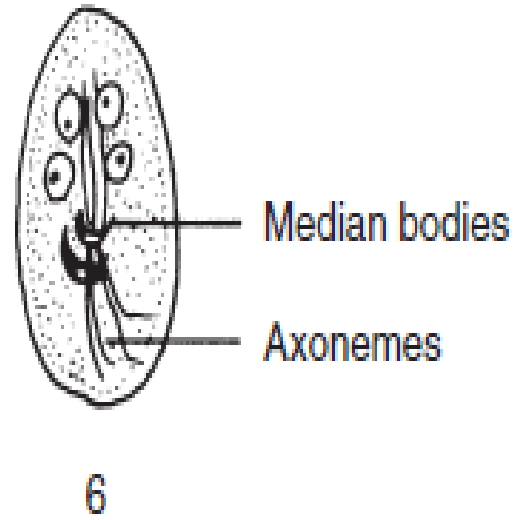
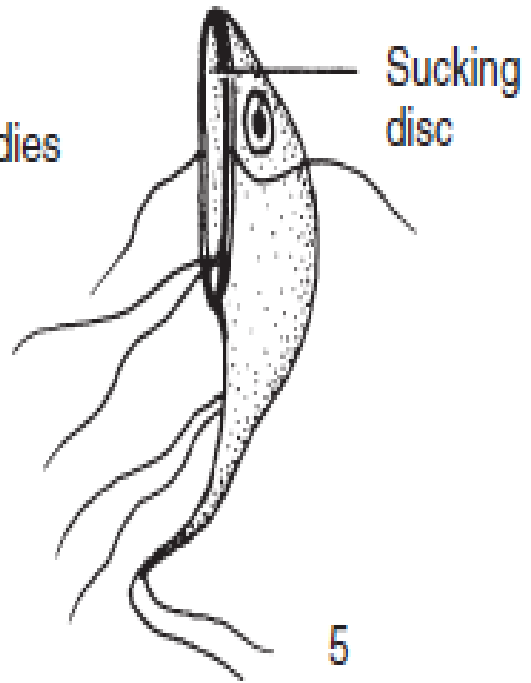
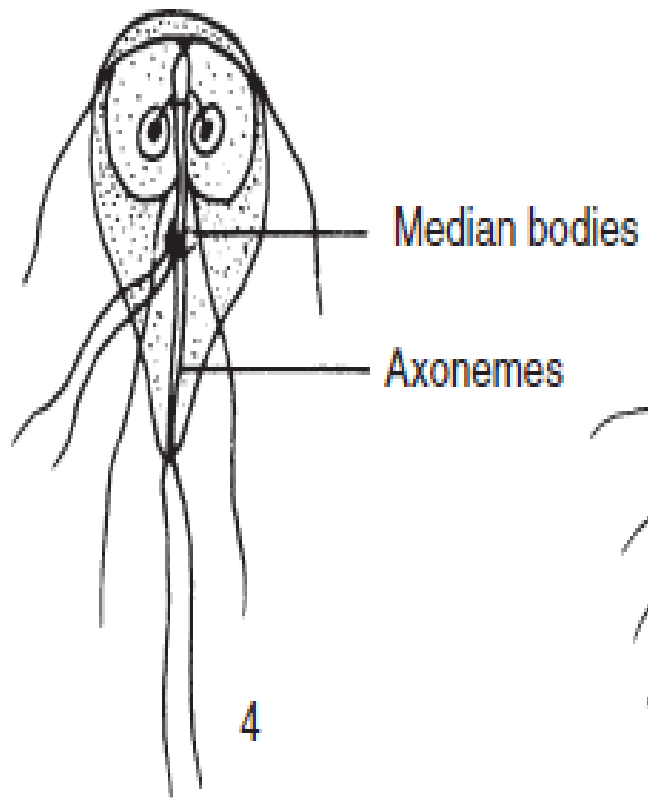


- **Prevention:**

- 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.

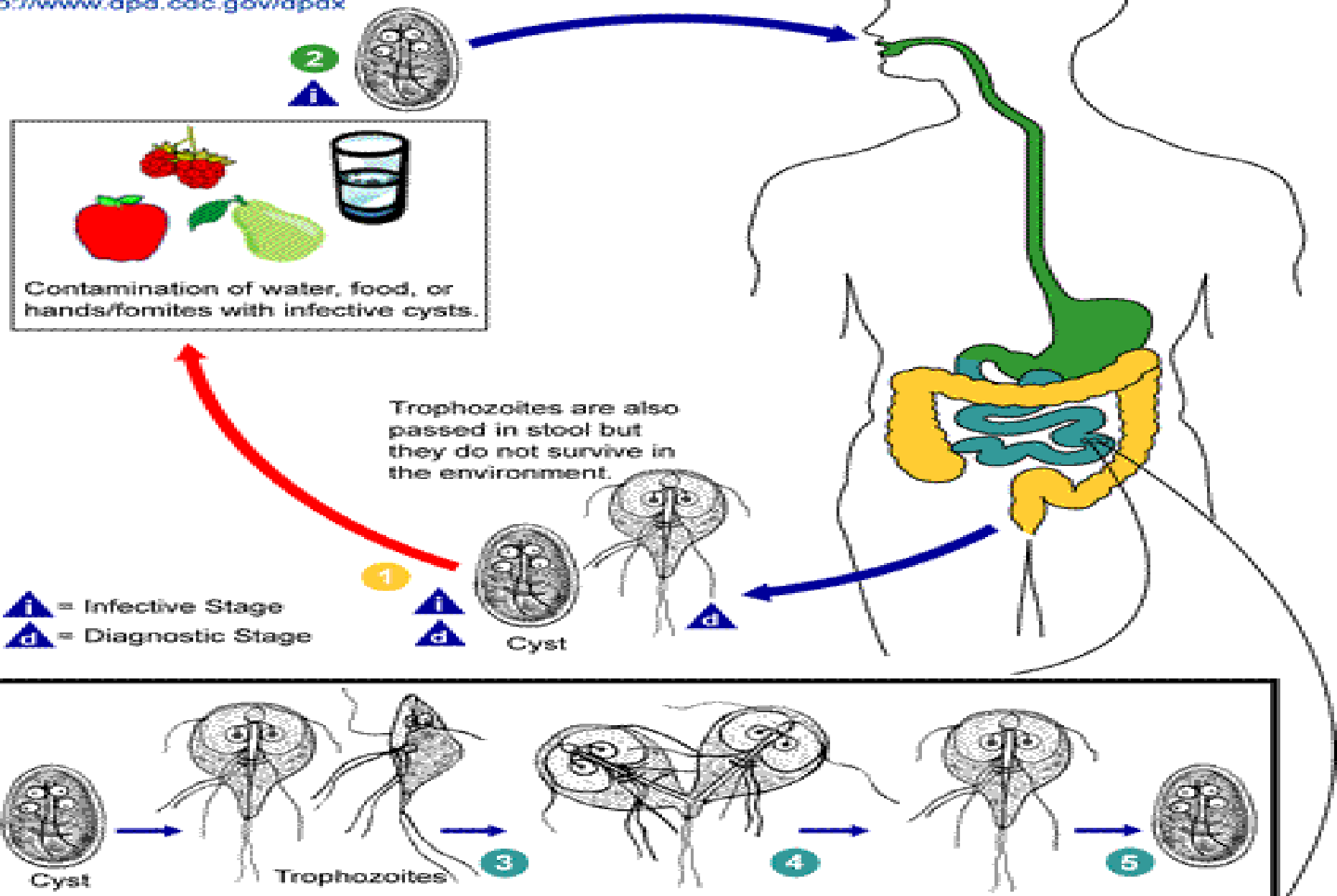


Epidemiology

- 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

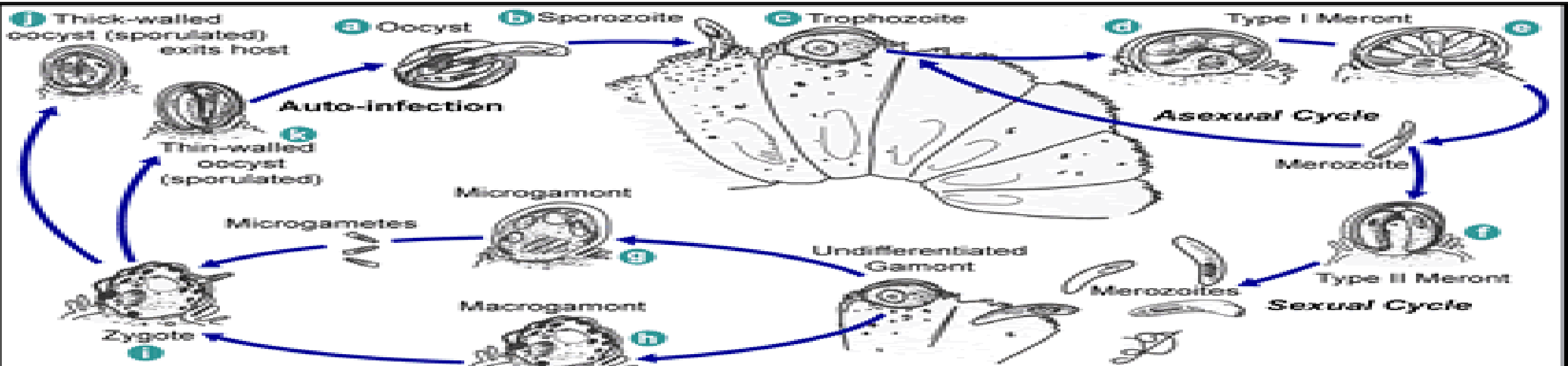
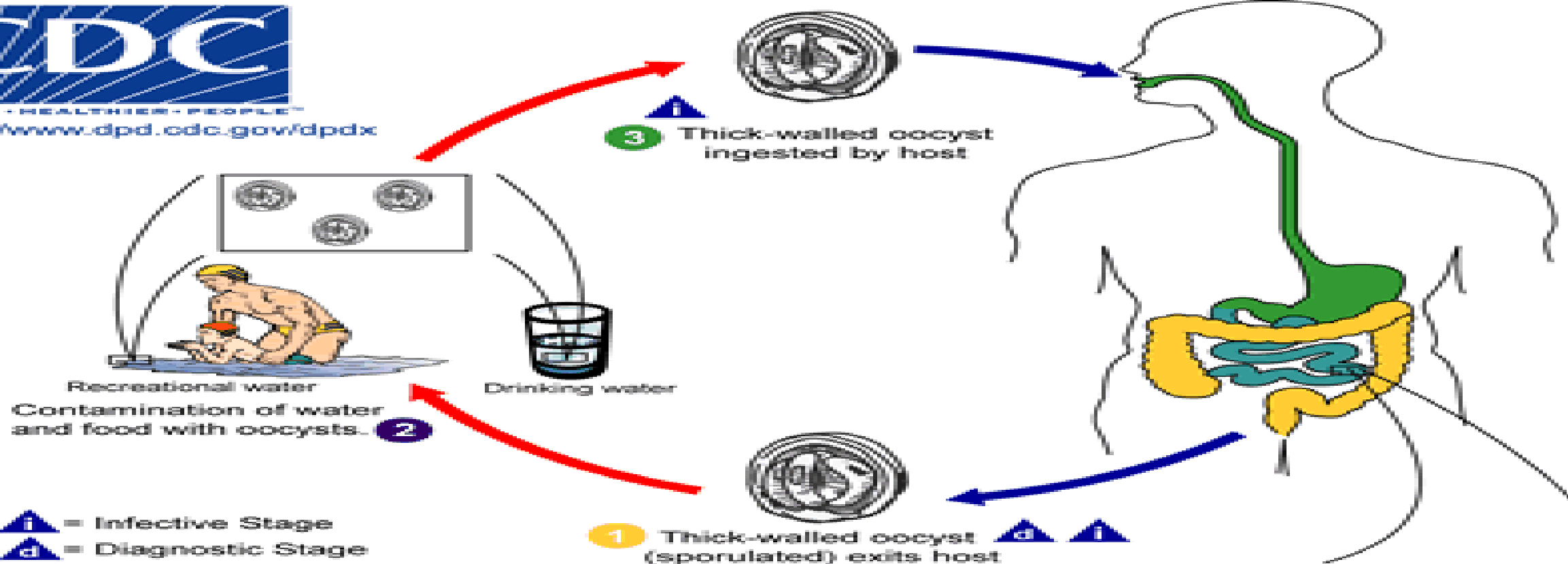
- **Antigen Detection:**

- 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