

Subphylum: Sarcodina

Amebiasis, *Entamoeba histolytica*

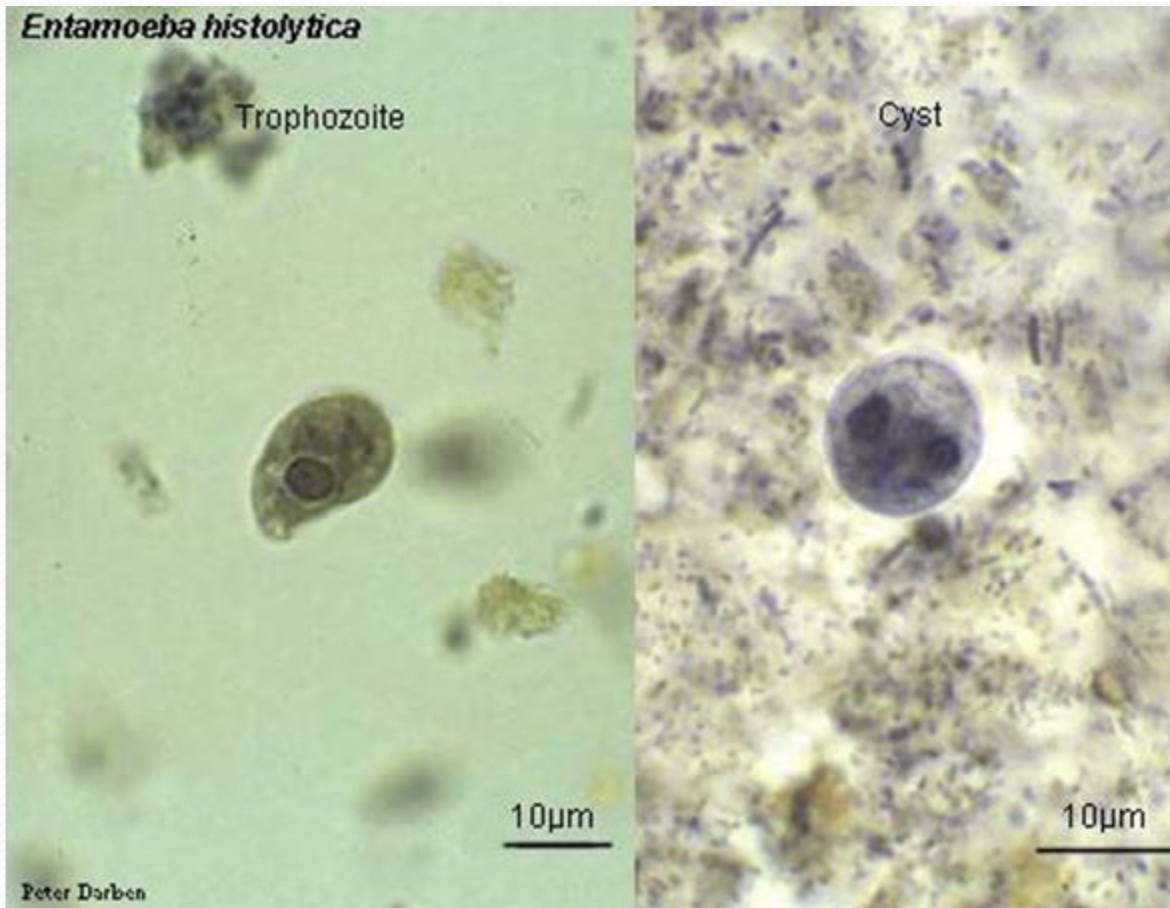
Amebic dysentery; Intestinal amebiasis

Amebiasis is an infection of the intestines caused by the parasite *Entamoeba histolytica*

Subphylum: Sarcodina

Morphology and Life Cycle

- Trophozoite: The active stage exists only in the host and in fresh loose feces, metabolically active invasive stage (the pathogenic stage causing disease), moves with pseudopodia, ingests RBC, lives in colon, large intestine, caecum and is found in fresh diarrheal stool; divides by binary fission.
The trophozoite diameter 10-60 μm cogwheel distribution of nuclear chromatin, hematophagous, unidirectional movement with pseudopodia
- cysts survive outside the host in water, in soils, and on foods, especially under moist conditions.
- The cysts are readily killed by heat and by freezing temperatures, and survive for only a few months outside of the host. When cysts are swallowed they cause infections by excysting (releasing the trophozoite)



cysts have been ingested inadvertently by the host -
through eating food or drinking water containing unknown
.fecal contamination

The cysts are unscathed by the harsh environment of the-
.gastric condition

The trophozoites (eight per cyst) exit the cyst in the small
-bowel with assistance of bile, proteases and pancreatic
.enzymes


The trophozoites inhabit the large bowel - most commonly-
.the right side including a particular affinity for the cecum

The amoeba then must attach to the surface mucosal lining-
and live in agreement and with the support of already
.resident gut bacteria

Entamoeba histolytica then invades the bowel wall destroying host -
.tissue with the aid of special enzymes and cytotoxins that it produces
These actions result in the tissue damage that produces the ulcers and -
– erosions seen endoscopically
the so called "flask-shaped ulcers". While the pathologic stages of -
infestation show an intuitive progression from a mild, nonspecific
colitis to deep ulceration with tissue necrosis, the fertile ground for
finding the organisms remains the surface exudates regardless of the
.pathologic stage

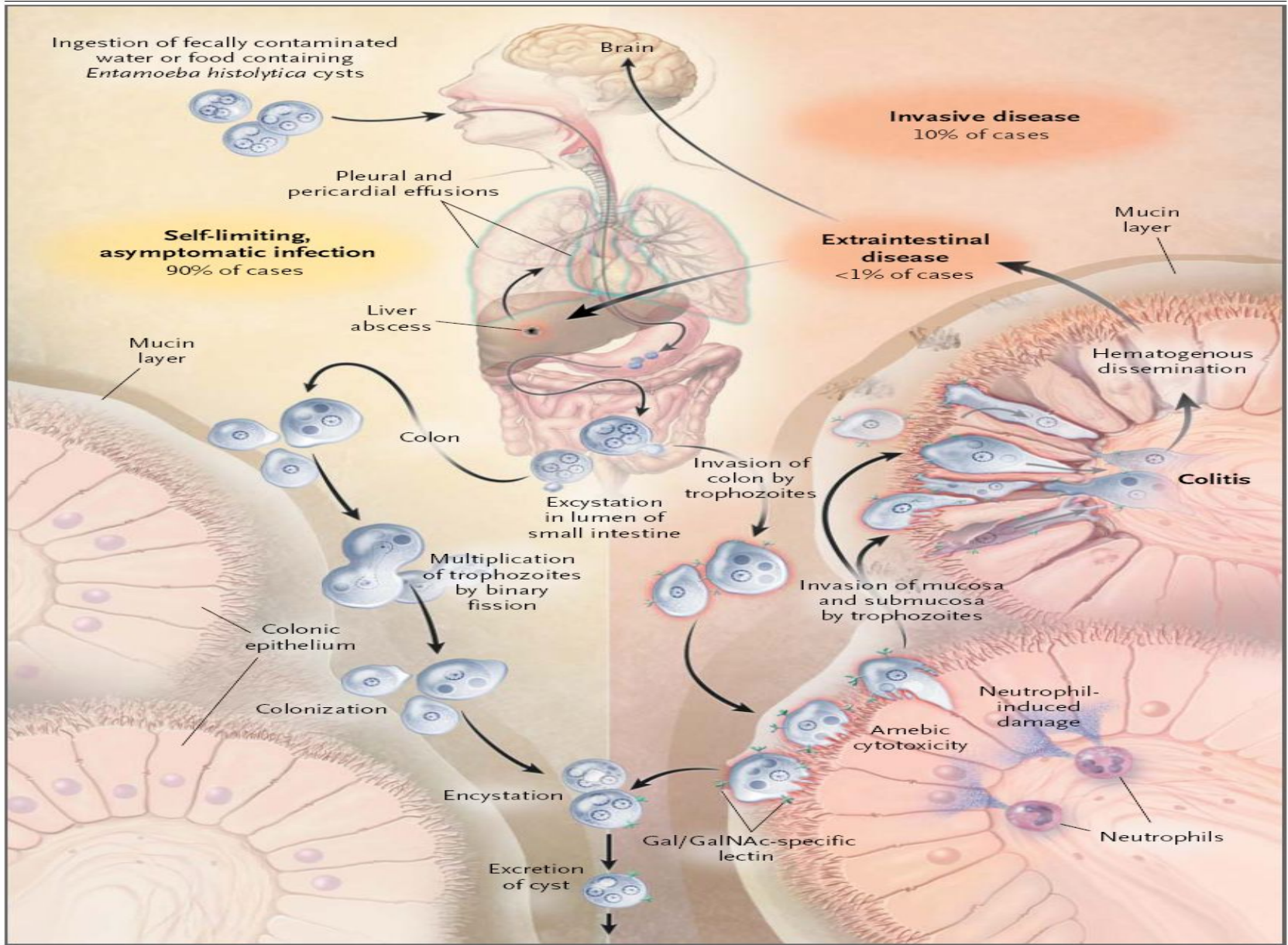
- The trophozoites may choose not to colonize the colonic mucosa. They may instead enter the portal circulation.
- If they do, they can then form amebic abscesses in the liver.
- The trophozoites themselves are not able to transmit the disease. While the cysts have no problem with gastric acid, trophozoites cannot survive that environment

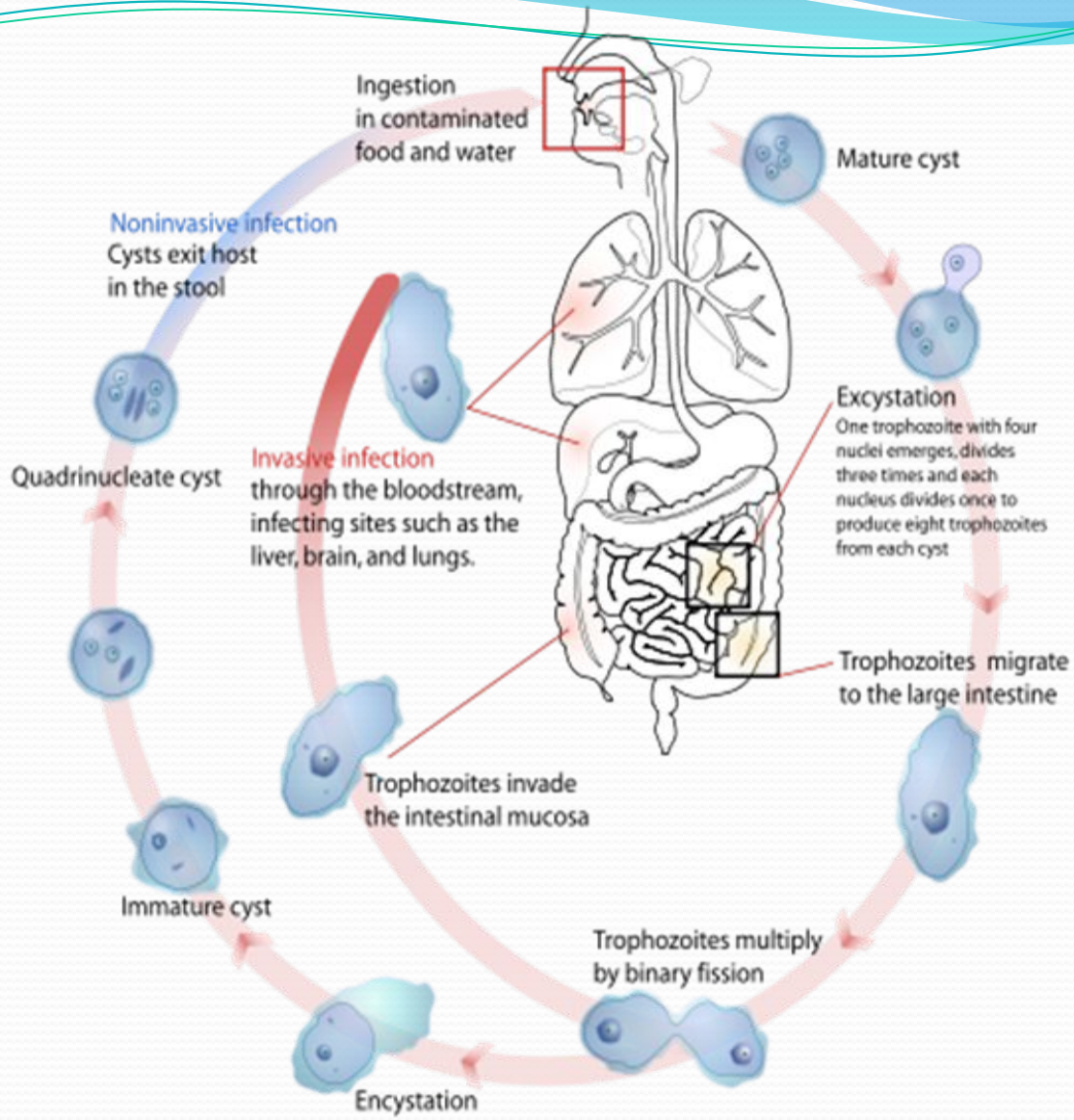




Quadrinulceate cysts are formed from the trophozoites (encystation) which then allows the disease transmission.

The liver abscess is the most frequent extraintestinal manifestation of disease and patients present with fever, right upper quadrant pain, hepatomegaly, weight loss, peripheral leukocytosis and elevated liver function tests, particularly alkaline phosphatase





Symptoms

:Mild symptoms ●

- Patients with *E. histolytica* present with diarrhea (sometimes bloody), abdominal pain, fever, tenesmus, weight loss and others may be relatively asymptomatic.



Abdominal cramps ●

Diarrhea ●

Passage of 3 - 8 semiformal stools per day ●

Passage of soft stools with mucus and occasional blood ●

Fatigue ●

Excessive gas ●

Rectal pain while having a bowel movement (tenesmus) ●

Unintentional weight loss ●



:Severe symptoms ●

Abdominal tenderness ●

Bloody stools ●

Passage of liquid stools with streaks of blood ●

Passage of 10 - 20 stools per day ●

Fever ●

Vomiting ●

- Severe cases of amebiasis do exist. The organisms can produce a mass which may be mistaken for a tumor.
- These so-called "amebomas" can be a diagnostic challenge and may be relatively asymptomatic until obstructive symptoms occur. -These lesions can result in toxic megacolon and show necrosis of the bowel wall with perforations.
- The cecum is the most frequent site for ameboma and may be palpable on physical examination. The most dreaded presentation of intestinal amebic colitis is a fulminant necrotizing colitis that carries a 50% death rate. Necrotizing colitis most commonly occurs in children, pregnant women and/or patients on corticosteroids.

- The aspects of pathogenesis which have been investigated experimentally can be broadly categorized into mechanisms involving
 - interactions with the intestinal flora.
 - lyses of target cell by direct adherence
 - lyses of target cell by release of toxins .
 - phagocytosis of target cells.
- functions related to pathogenesis include:
 - endocytosis and/or pinocytosis, exocytosis, tissue penetration, cytotoxic substances release or contact cytolysis of host cells.
 - Other host factors that may also influence the invasiveness of *E. histolytica* are the oxidation-reduction potential and gut contents pH both of which are largely influenced by the overall nutritional state of the host.

Complications

- Liver abscess
- Medication side effects, including nausea
- Spread of the parasite through the blood to the lungs, brain, or other organs

Risk factors for severe amebiasis

:include

- Alcoholism
- Cancer
- Malnutrition
- Older or younger age
- Pregnancy
- Recent travel to a tropical region
- Use of corticosteroid medication to suppress the immune system

Diagnosis

- Tests include:
- Microscope examination of stool samples, usually several days apart
- Examination of the inside of the lower large bowel (sigmoidoscopy)
- Blood test for amebiasis

Treatment

- Treatment depends on the severity of infection. Usually, metronidazole is given by mouth for 10 days.
- If there are vomiting, it may need to receive medications through a vein (intravenously) until tolerate them by mouth.
- Antidiarrheal medications are usually not given because they can make the condition worse.
- After treatment, the stool should be rechecked to make sure that the infection has been cleared.

Prevention

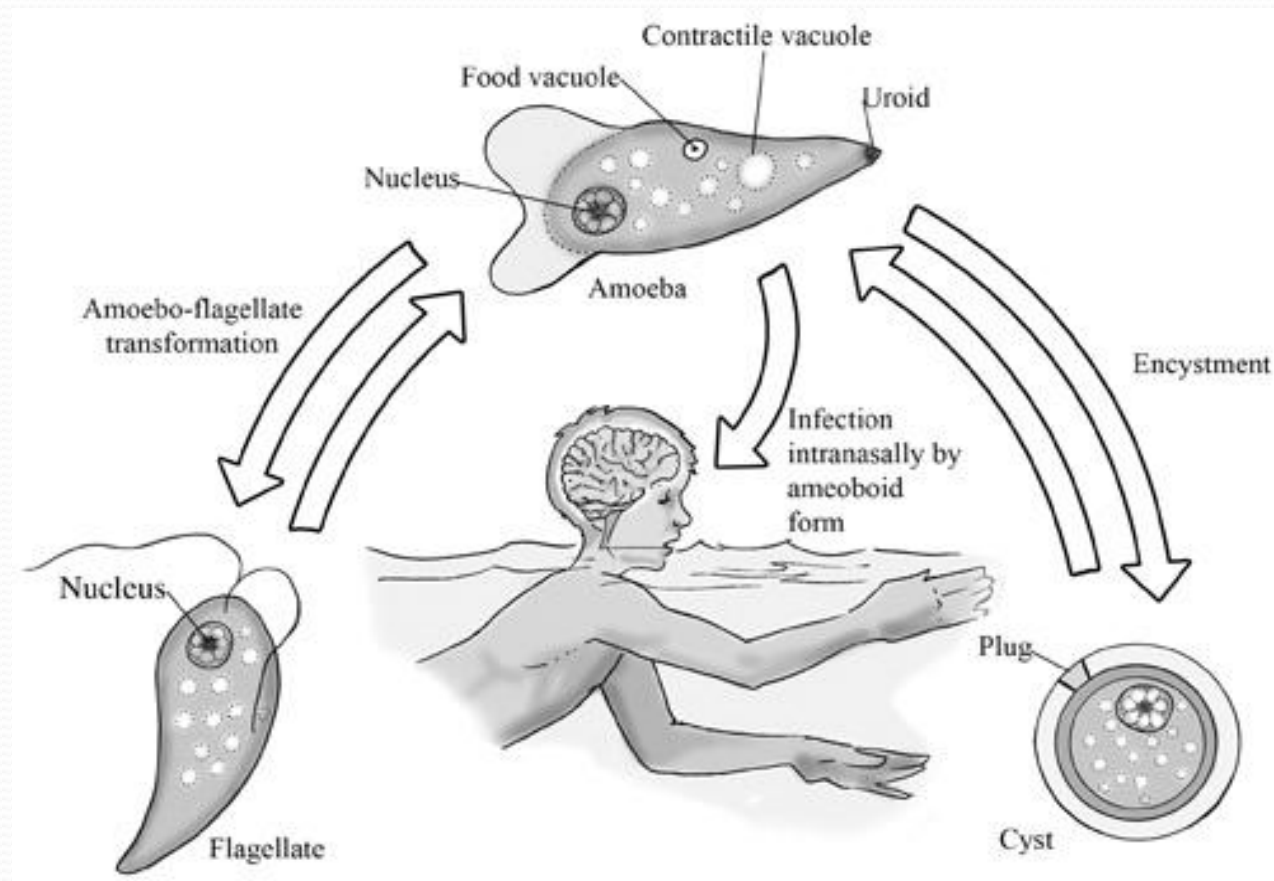
- When traveling in tropical countries where poor sanitation exists drink purified or boiled water and do not eat uncooked vegetables or unpeeled fruit.
- Public health measures include water purification, water chlorination, and sewage treatment programs.
- Safer sex measures, such as the use of condoms and dental dams for oral or anal contact, may help prevent infection.



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- **PATHOGENIC FREE-LIVING AMOEBAE**


Among the numerous free-living amoebae of soil and water habitats, certain species of *Naegleria sp.*, *Acanthamoeba sp.* and *Balamuthia sp.* are facultative parasites of man. Most human infections of these amoebae are acquired by exposure to contaminated water while swimming, inhalation of cysts from dust may account for some infections.

Naegleria fowleri- the trophozoites occur in two forms. Amoeboid forms with single pseudopodia and flagella forms with two flagella which usually appear a few hours after flooding water or in CSF.



● *Acanthamoeba* keratitis

- Is a rare but serious infection of the eye that can result in permanent visual impairment or blindness. This infection is caused by a microscopic, free-living amoeba (single-celled living organism) called *Acanthamoeba*. *Acanthamoeba* causes *Acanthamoeba* keratitis when it infects the transparent outer covering of the eye called the cornea. *Acanthamoeba* amoebas are very common in nature and can be found in bodies of water (for example, lakes and oceans), soil, and air.



The symptoms of *Acanthamoeba* keratitis can be very similar to the symptoms of other eye infections. These symptoms, which can last for several weeks or months, may include:

- Eye pain
- Eye redness
- Blurred vision (unclear).
- Sensitivity to light
- Sensation of something in the eye
- Excessive tearing

Patients should consult with their eye doctor if they have any of the above symptoms. *Acanthamoeba* keratitis will eventually cause severe pain and possible vision loss or blindness if untreated.

Thanks for

