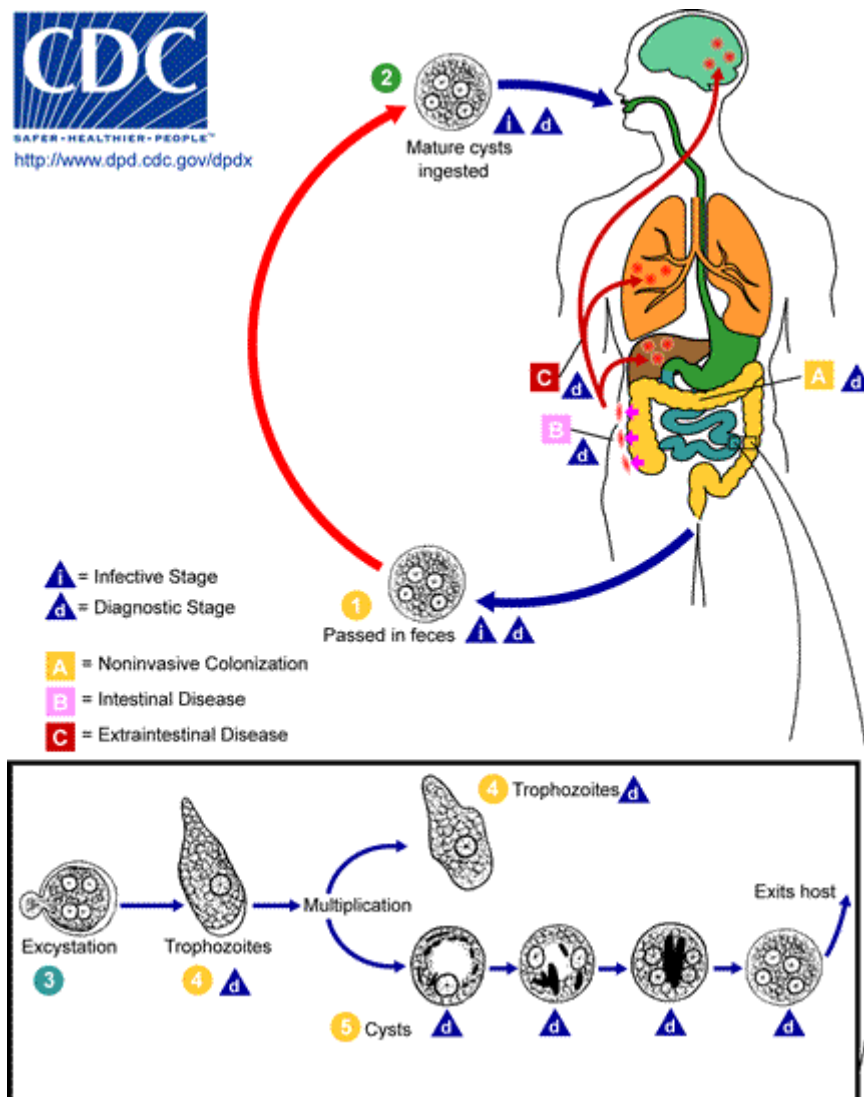


Amebiasis

Causal Agent:

Several protozoan species in the genus *Entamoeba* infect humans, but not all of them are associated with disease. *Entamoeba histolytica* is well recognized as a pathogenic ameba, associated with intestinal and extraintestinal infections. The other species are important because they may be confused with *E. histolytica* in diagnostic investigations.

Life Cycle:



Cysts are passed in feces (1). Infection by *Entamoeba histolytica* occurs by ingestion of mature cysts (2) in fecally contaminated food, water, or hands. Excystation (3) occurs in the small intestine and trophozoites (4) are released, which migrate to the large intestine. The trophozoites multiply by

binary fission and produce cysts **5**, which are passed in the feces **1**. Because of the protection conferred by their walls, the cysts can survive days to weeks in the external environment and are responsible for transmission. (Trophozoites can also be passed in diarrheal stools, but are rapidly destroyed once outside the body, and if ingested would not survive exposure to the gastric environment.) In many cases, the trophozoites remain confined to the intestinal lumen (**A**: noninvasive infection) of individuals who are asymptomatic carriers, passing cysts in their stool. In some patients the trophozoites invade the intestinal mucosa (**B**: intestinal disease), or, through the bloodstream, extraintestinal sites such as the liver, brain, and lungs (**C**: extraintestinal disease), with resultant pathologic manifestations. It has been established that the invasive and noninvasive forms represent two separate species, respectively *E. histolytica* and *E. dispar*, however not all persons infected with *E. histolytica* will have invasive disease. These two species are morphologically indistinguishable. Transmission can also occur through fecal exposure during sexual contact (in which case not only cysts, but also trophozoites could prove infective).

Geographic Distribution:

Worldwide, with higher incidence of amebiasis in developing countries. In industrialized countries, risk groups include male homosexuals, travelers and recent immigrants, and institutionalized populations.

Clinical Features:

A wide spectrum, from asymptomatic infection ("luminal amebiasis"), to invasive intestinal amebiasis (dysentery, colitis, appendicitis, toxic megacolon, amebomas), to invasive extraintestinal amebiasis (liver abscess, peritonitis, pleuropulmonary abscess, cutaneous and genital amebic lesions).

Laboratory Diagnosis:

Entamoeba histolytica must be differentiated from other intestinal protozoa including: *E. coli*, *E. hartmanni*, *E. gingivalis*, *Endolimax nana*, and *Iodamoeba buetschlii* (the nonpathogenic amebas); *Dientamoeba fragilis* (which is a flagellate not an ameba); and the possibly pathogenic *Entamoeba polecki*. Differentiation is possible, but not always easy, based on morphologic characteristics of the cysts and trophozoites. The nonpathogenic *Entamoeba dispar*, however, is morphologically identical to *E. histolytica*, and differentiation must be based on isoenzymatic or immunologic analysis. Molecular methods are also useful in distinguishing between *E. histolytica* and *E. dispar* and can also be used to identify *E. polecki*. Microscopic identification of cysts and trophozoites in the stool is the common method for diagnosing *E. histolytica*. This can be accomplished using:

- Fresh stool: wet mounts and permanently stained preparations (e.g., trichrome).
- Concentrates from fresh stool: wet mounts, with or without iodine stain, and permanently stained preparations (e.g., trichrome). Concentration procedures, however, are not useful for demonstrating trophozoites.

In addition, *E. histolytica* trophozoites can also be identified in aspirates or biopsy samples obtained during colonoscopy or surgery.

Diagnostic findings:

- Microscopy
- Immunodiagnosis
- Molecular methods for discriminating between *E. histolytica* and *E. dispar*
- Morphologic comparison with other intestinal parasites
- Bench aid for *E. histolytica*

Treatment:

For asymptomatic infections, iodoquinol, paromomycin, or diloxanide furoate (not commercially available in the U.S.) are the drugs of choice. For symptomatic intestinal disease, or extraintestinal infections (e.g., hepatic abscess), the drugs of choice are metronidazole or tinidazole, immediately followed by treatment with iodoquinol, paromomycin, or diloxanide furoate.