

PROTOZOAN INFECTIONS

DISEASE: Amebiasis

AGENT: *Entamoeba* spp. (*E. histolytica*, *E. polecki*)

RECOGNITION

Syndrome: Human: Most infections are asymptomatic. Clinical manifestations vary from intermittent periods of mucoid or bloody diarrhea to severe dysentery accompanied by pyrexia. With hepatic invasion, hepatomegaly, and abdominal pain.

Animal: Usually subclinical, but colitis and diarrhea can occur, particularly in nonhuman primates.

Incubation period: 2-4 weeks, but infections may be subclinical for several months before signs appear.

Case fatality rate: In severe cases, and with hepatic abscessation-up to **100%** without treatment.

Confirmatory tests: Microscopic examination of fresh feces from diarrheic patients for trophozoites or cysts in feces of asymptomatic individuals. Treatment with an amebicide is diagnostic when clinical signs are reduced. Radiology and/or test serum by hemagglutination for evidence of extraintestinal infection.

Occurrence: Worldwide but most common in tropical areas with poor sanitation. Common in nonhuman primates, especially in Asia and Africa. *E. polecki* is a parasite of swine.

Transmission: Ingestion of food or water contaminated with cysts from asymptomatic individuals. (Trophozoites, passed by acute cases, are too fragile to survive outside the host.)

CONTROL AND PREVENTION

Individual/herd: Treat infected individuals with metronidazole. Personal hygiene should include thorough cooking of food and treatment of water with iodine to destroy cysts.

Local/community: Water purification. Proper fecal waste disposal. Education regarding method of transmission, particularly for food handlers.

National/international: None.

DISEASE: Balantidiasis

AGENT

Balantidium coli

RECOGNITION

Syndrome: Human: Colic, tenesmus, nausea, vomiting, diarrhea. In severe cases-anorexia, bloody dysentery, and weakness. Infection **is** often asymptomatic.

Animal: Usually subclinical.

Incubation period: Unknown. Probably **3-4** days.

Case fatality rate: Low. Humans are usually quite resistant to infection unless debilitated, in which case disease may be fatal.

Confirmatory tests: Microscopic examination of fresh feces from diarrheic patients for trophozoites or cysts in feces of asymptomatic individuals. Trophozoites may be found in material obtained by sigmoidoscopy.

Occurrence: Worldwide. Swine, as well as rats, dogs, and nonhuman primates serve as major sources of infection for humans.

Transmission: Consumption of water or vegetables contaminated with feces from infected animals. Direct fecal-oral transmission of cysts from asymptomatic **humans**.

CONTROL AND PREVENTION

Individual/herd: Treat with metronidazole. Personal hygiene should include thorough **cooking** of food and boiling of water possibly contaminated with pig feces.

Local/community: Treat infected humans with metronidazole. Filter drinking water through diatomaceous earth to remove cysts. Chlorine is ineffective in killing cysts, therefore, if filtration of potentially contaminated water **is** impossible, drinking water should be treated with iodine or boiled.

National/international None.

DISEASE: Cryptosporidiosis

AGENT

***Cryptosporidium* spp. (*C. parvum*, possibly others)**

RECOGNITION

Syndrome: Human: Abdominal pain, nausea, watery diarrhea lasting 3-4 days. In immunodeficient or immunosuppressed people, the disease is severe, with persistent diarrhea (6-25 evacuations per day) and malabsorption of nutrients.

Animal: Normally a clinical disease only among young. Gastroenteritis and diarrhea in ruminants. A respiratory syndrome among chicken and turkey poults.

Incubation period: 3-7 days.

Case fatality rate: In normal persons the disease is self-limiting. In immunocompromised individuals, disease is severe and case fatality rate may be high.

Confirmatory tests: Microscopic examination of fresh feces for the identification of oocysts.

Occurrence: Worldwide. Common in domestic livestock and birds.
Found in **1%-5%** of gastroenteritis patients.

Transmission: Oocysts are infective when passed in feces. Not species specific (strain from one animal can infect many other species).
Fecal-oral transmission from infected animals or humans.

CONTROL AND PREVENTION

Individual/herd At present there is no effective treatment. Good personal hygiene. Immunocompromised individuals should avoid contact with diarrheic animals or people.

Local/community: Proper fecal waste disposal. Education of public, particularly the immunocompromised, regarding the method of transmission and potential danger associated with infection.

National/international None.

DISEASE: Giardiasis

AGENT

Giardia lamblia (intestinalis)

RECOGNITION

Syndrome: Human: Usually subclinical. Abdominal pain, bloating, diarrhea, steatorrhea, fatigue, weight loss. Sometimes nausea and vomiting will o m .

Animal: Same as human.

Incubation period 1-4 weeks.

Case fatality rate: None.

Confirmatory tests: Microscopic examination of feces for presence of cysts or trophozoites of ***G. lamblia***. False-negative results are common, therefore repeat 3 times before accepting negative results.

Occurrence: Worldwide. The most common intestinal parasitic infection in the developed world. Prevalence very high in areas with poor sanitation and in institutions. Human infections usually originate from other humans but may result from contact with dogs, cats, rodents, beavers, or nonhuman primates.

Transmission: Ingestion of cysts (trophozoites are too fragile to survive outside host) on food, or by direct fecal-oral transfer. Commonly waterborne, including municipal outbreaks.

CONTROL **AND** PREVENTION

Individual/herd: Treat with quinacrine or metranidazole. Practice good personal hygiene. Cook food thoroughly. Boil water. Chlorine treatment of water will not **kill** cysts; iodine will.

Local/community: Sanitary disposal of fecal waste. Filter municipal drinking water.

National/international None.

DISEASE: Leishmaniasis

AGENT

Leishmania spp.; ***L. mexicana***, ***L. braziliensis***, cutaneous (New World);
L. tropica, ***L. major***, ***L. aethiopica***, ***L. donovani***, cutaneous (Old World);
L. donovani, visceral

RECOGNITION

Syndrome: Human: Cutaneous-erythematous papule on exposed portions of body which develops into a slowly healing ulcer.

Visceral-Progressive weakness, intermittent fever, splenomegaly, anorexia, weight loss, hair loss, bleeding from **gums** and mucous membranes.

Animal: frequently subclinical. Skin lesions have been observed on dogs and horses.

Incubation period: Cutaneous-Usually **2-6** weeks but may extend to 10 years. Visceral-2-4 months but may extend to several years.

Case fatality rate: Old World type usually not fatal but New World type may result in face lesions involving mucocutaneous junction with secondary bacterial infection resulting in death.

Visceral: if untreated is usually fatal.

Confirmatory tests: Cutaneous: biopsy of ulcer edge to examine microscopically for the organism. Visceral: microscopic examination of blood or bone marrow aspirate for organism or culture to reveal Leishman-Donovan bodies, ELISA test of paired sera.

Occurrence: Cutaneous: Old World: Africa, Asia, southern Europe. New World: Latin America, southern United States.

Visceral: Asia, Africa, Europe, Latin America.

Transmission: Phlebotomine (sand) flies transmit from reservoir hosts, which are primarily humans or dogs and other canids for the visceral type and wild rodents for the cutaneous type.

CONTROL **AND** PREVENTION

Individual/herd: Treat with pentavalent antimony compounds. Use of repellents and screening.

Local/community: Vector control. Elimination of infected dogs (treatment usually ineffective).

National/international: None.