

Organism:	<i>Entamoeba histolytica</i>
Disease:	Amebiasis, Amebic Dysentery
Clinical:	Diarrhea, Bloody Mucous Diarrhea, Tenesmus Invasive Disease - Liver Tenderness
Distribution/↑ Risk:	Worldwide, Areas of Poor Sanitation/Travelers
Transmission:	Fecal-Oral route
Parasite:	Trophozoite in Colon (Large Intestine) Cyst in Feces (round >10 μm, 4 nuclei)
Diagnosis:	O&P Test for Cysts and Trophozoites -Distinguish from <i>E. dispar</i> & Commensals Serology, Rectal/Liver Biopsy, Hepatic Imaging
Pathology:	Colonic Ulcer (Ameboma), Liver Abscess, Brain Abscess
Control & Treatment:	

Organism: *Giardia lamblia*

Disease: Giardiasis

Clinical: Diarrhea, Flatulence

Distribution/↑ Risk: Worldwide, Areas of Poor Sanitation/
Sierra Stream Water, Pre-School Daycare

Transmission: Fecal-Oral route

Parasite: Trophozoite in Duodenum (Proximal Small Int
Cyst in Feces (oval, 4 nuclei)

Diagnosis: O&P Test for Cysts and Trophozoites
String Test for Trophozoites

Pathology: Malabsorption, "Failure to Thrive"- Infants,
(Lactose Intolerance)

Control & Treatment:

Organism: *Cryptosporidium parvum*

Disease: Cryptosporidiosis

Clinical: Watery Diarrhea

Distribution/↑ Risk: Worldwide, Areas of Poor Sanitation / AIDS

Transmission: Fecal-Oral route

Parasite: Intracellular “Trophozoite” in Intestine

Cysts in Feces (4-8µm, Acid Fast staining)

Diagnosis: Fecal Exam for Cysts

Duodenal/Rectal Biopsy

Pathology: Dehydration can lead to Death

Control & Treatment:

Organism:	<i>Cyclospora cayatenensis</i> (CLB, Cyanobacteria-Like Bodies)
Disease:	Cyclosporiasis
Clinical:	Diarrhea
Distribution/↑ Risk:	Worldwide, Areas of Poor Sanitation
Transmission:	Fecal-Oral route
Parasite:	Cysts in Feces (8-10µm, Acid Fast Variable, Blue fluorescence in UV light)
Diagnosis:	Fecal Exam
Pathology:	
Control & Treatment:	

Organism:	<i>Trichomonas vaginalis</i>
Disease:	Trichomoniasis, Vaginitis
Clinical:	Vaginal Discharge, Itching
Distribution:	Worldwide
Transmission:	STD
Parasite:	Trophozoite
Diagnosis:	Vaginal Smear & Culture
Pathology:	Contact-dependent Inflammation of Epithelium
Control & Treatment:	Metranidazole

Organism:	<i>Toxoplasma gondii</i>
Disease:	Toxoplasmosis
Clinical:	Flu-like Symptoms, Infect. Mono. syndrome
Distribution / ↑ Risk:	Worldwide / AIDS, transplants, cancer, Pregnant Women
Transmission:	Ingestion of Cysts (Pseudocyst) in Raw Meat Ingestion of Cysts (Oocyst) in Cat Feces
Parasite:	Intracellular Tachyzoite Bradyzoites in Pseudocyst
Diagnosis:	Serology, White Cell smear?
Pathology:	1st Trimester - Abortion, 2nd/ 3rd Trimester- Chorioretinitis, Hydrocephalus
Control & Treatment:	

Organism:	<i>Plasmodium falciparum</i>
Disease:	Malaria (Malignant Tertian)
Clinical:	Fever, Sweats, Chills (48 hour cycle) Recrudescence (low level infected RBCs)
Distribution / ↑ Risk:	Tropics (Mosquito Distribution)
Transmission:	Mosquito bite
Parasite:	Sporozoite infects Liver Merozoite infects RBC Intracellular in RBC (Trophozoite, Schizont) Gametocytes (infective to mosquito)
Diagnosis:	Blood Smear (multiple rings, NO trophozoites, crescent gametocytes)
Pathology:	Anemia, Hepatomegaly & Splenomegaly Cerebral Malaria (blockage of capillaries by infected RBCs & Hemozoin)

Organism:	<i>Plasmodium vivax</i>
Disease:	Malaria (Benign Tertian)
Clinical:	Fever, Sweats, Chills (48 hour cycle) Relapsing disease (dormant stage in liver)
Distribution / ↑ Risk:	Tropics
Transmission:	Mosquito
Parasite:	Sporozoite infects Liver Hypnozoite dormant in Liver Merozoite infects RBC Intracellular in RBC (Trophozoite, Schizont)
Diagnosis:	Blood Smear (single rings, enlarged RBCs, Schuffner's dots on RBCs)
Pathology:	Hepatomegaly & Splenomegaly
Control & Treatment:	

Organism:	<i>Plasmodium malariae</i>
Disease:	Malaria (Benign Quartan)
Clinical:	Fever, Sweats, Chills (72 hour cycle)
Distribution / ↑ Risk:	Tropics
Transmission:	Mosquito
Parasite:	Intracellular in RBC (Trophozoite, Schizont)
Diagnosis:	Blood Smear (band-form Trophozoite)
Pathology:	Hepatomegaly & Splenomegaly
Control & Treatment:	

Organism:	<i>Leishmania spp.</i>
Disease:	Cutaneous Leishmaniasis
Clinical:	Dry/wet lesions
Distribution / ↑ Risk:	Travelers, military
Transmission:	Sandfly
Parasite:	Intracellular amastigotes in dermal macrophages
Diagnosis:	Smear from lesion
Pathology:	Tissue destruction from dead macrophage <u>Mucocutaneous</u> disease with <i>L. braziliensis</i>
Control & Treatment:	

Organism:	<i>Leishmania donovani</i>
Disease:	Visceral Leishmaniasis
Clinical:	Diurnal fevers, coughs
Distribution / ↑ Risk:	
Transmission:	
Parasite:	Intracellular amastigotes in dermal macrophages
Diagnosis:	Smear/culture from WBC/bone marrow
Pathology:	Hepatosplenomegaly, pancytopenia, gammaglobulinemia, immunosuppression
Control & Treatment:	

Organism: *Trypanosoma brucei gambiense*
Trypanosoma brucei rhodesiense
Disease: African Sleeping Sickness

Clinical: relapsing fever, lethargy, insomnia

Distribution/↑ Risk:

Transmission: Tsetse fly

Parasite: Trypomastigote in blood

Diagnosis: Blood smear

Pathology:

Control & Treatment:

Organism:	<i>Trypanosoma cruzi</i>
Disease:	Chagas disease
Clinical:	Acute- fever, flu-like malaise, 2-10% death Chronic- cardiac, intestinal problems
Distribution / ↑ Risk:	Poor housing in South America
Transmission:	Reduviid bug feces, blood transfusion ingestion
Parasite:	Trypomastigote in blood Amastigote in muscle
Diagnosis:	Blood smear, serology, xenodiagnosis
Pathology:	Cardiomyopathy, Heart/intestinal enlargement
Control & Treatment:	

Organism: *Enterobius vermicularis*

Disease: Enterobiasis, Pinworms

Clinical: Anal pruritis

Distribution / ↑ Risk: School-age children

Transmission: Ingestion (& inhalation) of eggs

Parasite: Adults (1 cm) in colon, appendix
Eggs deposited on Perianal area

Diagnosis: “Scotch” Tape Test

Pathology:

Control & Treatment: Re-infection common

Organism: *Ascaris lumbricoides*

Disease: Ascariasis

Clinical: Gastrointestinal complaints
- pain, diarrhea

Distribution / ↑ Risk: Worldwide/poor sanitation

Transmission: Ingestion of embryonated egg

Parasite: Adult (25-30 cm) in small intestine

Diagnosis: Ova in feces by O&P Test

Pathology: Intestinal obstruction

Control & Treatment:

Organism:	<i>Ancylostoma duodenale</i> & <i>Necator americanensis</i>
Disease:	Hookworm disease/anemia
Clinical:	Epigastric pain, eosinophilia
Distribution / ↑ Risk:	Humid areas with poor sanitation
Transmission:	Larvae penetrate unbroken skin
Parasite:	Adults (1 cm) eating mucosa of duodenum & proximal small intestine; ova in feces
Diagnosis:	Ova by O&P Test
Pathology:	Anemia in heavy infections (Fe-deficient diet)
Control & Treatment:	

Organism:	<i>Strongyloides stercoralis</i>
Disease:	Strongyloidiasis
Clinical:	Erythema at site of penetration, coughing & wheezing, pulmonary infiltrates & high eosinophilia
Distribution / ↑ Risk:	Humid areas/poor sanitation
Transmission:	Larval penetration of unbroken skin, AUTOINFECTION-internal & external
Parasite:	Adult (2-3 mm) in mucosa of duodenum
Diagnosis:	“String” Test for adult, concn. & plate tests for larvae in feces
Pathology:	Hyperinfection & DISSEMINATED disease in immunosuppressed (not AIDS)
Control & Treatment:	

Organism: *Schistosoma spp.*

Disease: Schistosomiasis

Clinical:

Distribution / ↑ Risk: Tropics

Transmission: Larva penetrate skin (aquatic snails)

Parasite: Adults in portal veins, Superior mesenteric
(*S. japonicum*) & Inferior mesenteric (*S. mansoni*)

Diagnosis: Eggs in feces (*S. mansoni*) or urine (*S. hematobium*)

Pathology: Granulomas - Immune reaction to eggs in
liver, intestine & bladder

Control & Treatment:

Organism: *Taenia saginata*

Disease: Beef Tapeworm

Clinical:

Distribution / ↑ Risk:

Transmission: raw/undercooked beef

Parasite: Adult in small intestine

Diagnosis: Proglotids (>12 branches)
& Ova in feces

Pathology:

Control & Treatment:

Organism:	<i>Taenia solium</i>
Disease:	Pork Tapeworm
Clinical:	<u>Cysticercosis</u> possible
Distribution / ↑ Risk:	
Transmission:	raw/undercooked pork (adult) ingestion of eggs (larval stage)
Parasite:	Adult in small intestine
Diagnosis:	Proglotids (<12 branches) & Ova in feces
Pathology:	Cysticercus in organs
Control & Treatment:	

Sample Question

A camper returns from the High Sierras with a persistent, mild diarrhea. She admits to having drunk stream water during her two-week camping trip. Which of the following parasites is most likely responsible for the infection:

- A) *Cryptosporidium parvum*
- B) *Giardia lamblia*
- C) *Taenia saginata*
- D) *Entamoeba hartmanni*