

HIGH-YIELD Q&A: GASTROINTESTINAL PARASITOLOGY 1

1. INTESTINAL PARASITES – GENERAL CONCEPTS

QUESTION	ANSWER
1. What are intestinal parasites?	• Human parasites that inhabit the gastrointestinal tract and cause disease or are asymptomatic.
2. Main groups of intestinal parasites?	• Protozoa (unicellular eukaryotes) • Helminths (multicellular worms)
3. Why are parasitic diseases a major public health problem?	Strongly associated with poverty, poor sanitation, limited access to clean water, and inadequate health care. [4]
4. Examples of important intestinal parasites?	• Protozoa: <i>Giardia</i> , <i>Entamoeba</i> , <i>Cryptosporidium</i> , <i>Cyclospora</i> • Helminths: Nematodes, Trematodes, Cestodes [4]

2. CLASSIFICATION OF INTESTINAL PROTOZOA

GROUP	LOCOMOTION / FEATURE	EXAMPLES & KEY POINTS
Flagellates	One or more flagella	<i>Giardia lamblia</i> Only common intestinal pathogenic flagellate [5]
Amebae	Pseudopodia	<i>Entamoeba histolytica</i> Causes amebiasis [5]
Sporozoa	No locomotion; sexual & asexual phases	<i>Cryptosporidium parvum</i> , <i>Cyclospora cayentanensis</i> Cause self-limited or chronic diarrhea [5]
Ciliates	Cilia in rows or patches	<i>Balantidium coli</i> Giant ciliate; humans & pigs [5]
Microsporidia (Fungi)	Intracellular spore-forming	<i>Encephalitozoon spp.</i> , <i>Enterocytozoon bienersi</i> Affect immunocompromised [5]

3. CLASSIFICATION OF INTESTINAL HELMINTHS

• Human helminths are mainly nematodes and platyhelminths (flatworms). [6]

A. NEMATODES (Roundworms)

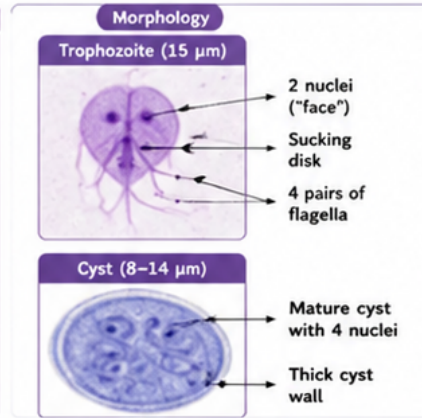
- Elongated, tapered at both ends, round in cross-section, unsegmented.
- Infection by ingestion of eggs/larvae or skin penetration. [6]

B. PLATYHELMINTHS (Flatworms)

TREMATODES (Flukes)	CESTODES (Tapeworms)
<ul style="list-style-type: none"> • Leaf-shaped, flattened. • Usually acquired by ingestion of metacercariae • Schistosome cercariae penetrate skin. 	<ul style="list-style-type: none"> • Flat, ribbon-like; divided into proglottids. • Scolex (head) attaches to intestinal wall. • No mouth or gut; absorb nutrients from host. [6]

4. GIARDIA LAMBLIA

QUESTION	ANSWER
1. What is the causative agent of giardiasis?	• <i>G. lamblia</i> (also called <i>Giardia duodenalis</i> or <i>Giardia intestinalis</i>). [8]
2. Where in the intestine does it reside?	• Duodenum and jejunum. [8]
3. What are the two forms?	• Trophozoite (active form) • Cyst (infective & diagnostic form) [8]
4. Mode of transmission?	• Ingestion of cysts in contaminated water, food, or by person-to-person fecal contamination. [11]
5. Epidemiology?	• Worldwide; common in areas with poor sanitation and crowded living conditions. • Cysts can survive in water for up to 3 months. [11]



5. PATHOGENESIS & CLINICAL DISEASE (GIARDIA)

- Usually weakly pathogenic; many infected individuals are asymptomatic. [10]
- Trophozoites attach to intestinal villi via ventral sucking disk → cause irritation and low-grade inflammation.
- Histologic changes: crypt hypertrophy, villous atrophy or flattening, epithelial cell damage. [10]
- Clinical manifestations:
 - Acute or chronic diarrhea
 - Steatorrhea (greasy, foul-smelling stools)
 - Abdominal cramps, bloating, flatulence
 - Weight loss, weakness, malabsorption (states). [11]

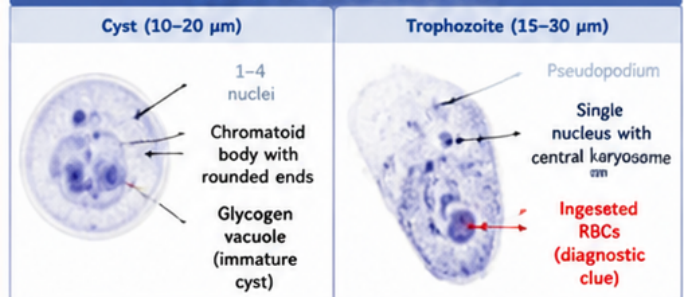
6. DIAGNOSIS OF GIARDIA

- Specimen: Stool (collect 3 samples on separate days). [11]
- Microscopy: Identify cysts in formed stool or trophozoites in loose stool.
- Concentration methods increase sensitivity: formalin-ether concentration, zinc sulfate flotation.
- Antigen detection tests (EIA, DFA) – high sensitivity & specificity.
- PCR is highly sensitive but not routinely needed.
- Serology: Not useful (local IgA, not systemic response). [11]

7. ENTAMOEBIA HISTOLYTICA – OVERVIEW

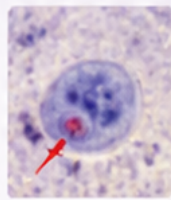
QUESTION	ANSWER
1. Causative agent of amebiasis?	<i>Entamoeba histolytica</i> [12]
2. Important forms?	Trophozoite (in tissues & loose stool) Cyst (in formed stool) [12]
3. Disease caused?	Amebiasis (can be intestinal or extraintestinal) [12]
4. Reservoir?	Humans only. [12]
5. Mode of transmission?	Fecal-oral via contaminated food, water, or hands. [12]

8. MORPHOLOGY OF E. HISTOLYTICA



9. TROPHOZITE & DIAGNOSTIC CLUE (E. HISTOLYTICA)

- Cytoplasm has two zones: outer clear (ectoplasm) and inner granular (endoplasm).
- Actively motile with finger-like pseudopodia.
- May contain ingested RBCs → diagnostic of *E. histolytica* (never seen in nonpathogenic *Entamoeba* spp.).
- Trophozoites survive only in loose stool or tissues (die quickly outside body). [14]



10. CLINICAL MANIFESTATIONS (AMEBIASIS)

- Intestinal Amebiasis:**
- Dysentery: blood & mucus in stool, abdominal pain, tenesmus.
 - Chronic colitis: mild, intermittent symptoms.
- Extraintestinal Amebiasis (via portal circulation):**
- Liver abscess (most common)
 - Lung, brain, skin involvement (rare). [12]

11. DIAGNOSIS OF E. HISTOLYTICA

- Specimen: Stool (fresh, not preserved in formalin). [12]
- Microscopy: Identify cysts in formed stool or trophozoites in loose stool.
- Antigen detection (EIA) – more sensitive than microscopy.
- Serology: Useful for extraintestinal disease (liver abscess).
- PCR: Highly sensitive & specific.
- Endoscopy/biopsy if diagnosis uncertain (presence of trophozoites in mucosa). [12]



HIGH-YIELD TAKEAWAYS

- *Giardia*: "Heart-shaped trophozoite with face" & "Cysts in formed stool."
Rx: Metronidazole, Tinidazole, or Nitazoxanide.

- *Entamoeba histolytica*: Look for ingested RBCs in trophozoite (diagnostic clue).
Rx: Metronidazole/Tinidazole + luminal agent (Paromomycin).

- *Cryptosporidium* & *Cyclospora*: Causes self-limited watery diarrhea; acid-fast oocysts on stool stain.

- Prevention: Safe water, sanitation, hand hygiene, cook food well, control of fecal contamination.

1. What are the main protozoan parasites affecting the gastrointestinal tract?

Answer:

- * Giardia lamblia
 - * Entamoeba histolytica
 - * Cryptosporidium spp.
 - * Cyclospora cayentanensis
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2. How is Giardia lamblia transmitted?

Answer:

- * Fecal-oral route via contaminated water or food
 - * Direct person-to-person contact (especially in daycares)
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3. What are the common symptoms of giardiasis?

Answer:

- * Diarrhea (often greasy and foul-smelling)
 - * Abdominal cramps and bloating
 - * Malabsorption and weight loss
 - * Sometimes asymptomatic
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4. What is the diagnostic method for Giardia lamblia?

Answer:

- * Stool microscopy (trophozoites or cysts)
 - * Antigen detection in stool (ELISA)
 - * PCR (for difficult cases)
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5. How is Entamoeba histolytica distinguished from non-pathogenic E. dispar?

Answer:

- * Only E. histolytica causes invasive disease
 - * Detection of Gal/GalNAc lectin antigen or PCR can distinguish pathogenic species
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6. What is the treatment for Giardia and Entamoeba infections?

Answer:

- * Giardia lamblia: Tinidazole or Metronidazole
 - * Entamoeba histolytica: Metronidazole followed by Paromomycin (luminal agent)
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7. How is Cryptosporidium infection diagnosed?

Answer:

- * Modified acid-fast staining of stool
 - * Antigen detection assays
 - * PCR in severe or immunocompromised cases
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8. What populations are most at risk for severe cryptosporidiosis?

Answer:

- * HIV/AIDS patients
 - * Immunocompromised individuals
 - * Young children in developing countries
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9. How is Cyclospora cayentanensis transmitted and detected?

Answer:

- * Transmission via contaminated fresh produce or water
 - * Stool microscopy using modified acid-fast stain
 - * PCR for confirmation
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10. What are the preventive measures for gastrointestinal protozoal infections?

Answer:

- * Boil or filter drinking water
- * Wash fruits and vegetables thoroughly
- * Good hand hygiene
- * Avoid swimming in contaminated water