

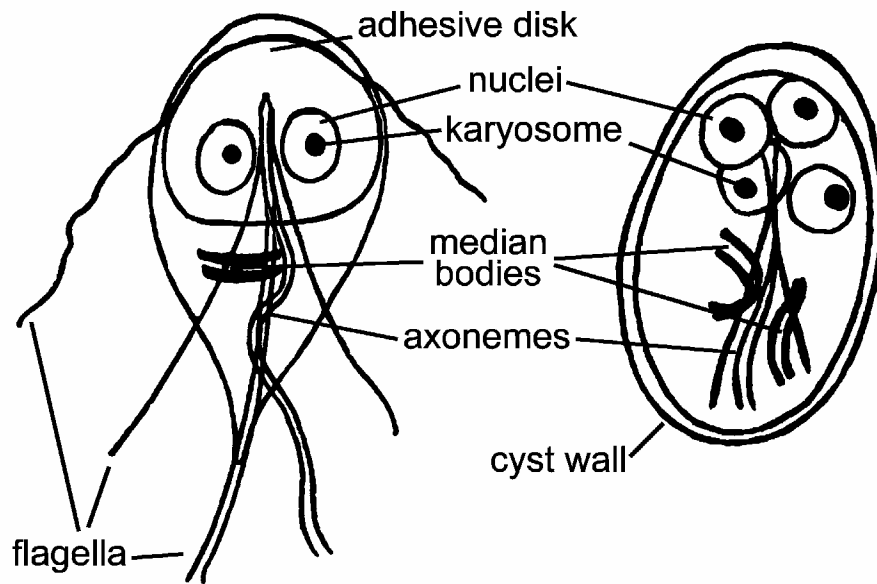
Handout for Giardia and Trichomonas

Giardia lamblia

- worldwide distribution
 - higher prevalence in tropical or developing countries (20%)
 - 1-6% in temperate countries
- most common protozoa in stools
 - ~200 million cases/yr
- giardiasis
 - often asymptomatic
 - acute or chronic diarrhea

Fecal-Oral Transmission Factors

- poor personal hygiene
 - children (eg, day care centers)
 - food handlers
- developing countries
 - poor sanitation
 - endemic
 - travelers diarrhea
- water-borne epidemics
- male homosexuality
 - oral-anal contact
- zoonosis?
 - *Entamoeba* =no
 - *Cryptosporidium* =yes
 - *Giardia* =controversial



TROPHOZOITE

CYST

Encystation

- exposure to pH 7, no bile
- exposure to pH 7.8, high bile
- cyst wall secretion (appearance of vesicles)
- loss of disk and flagella
- nuclear division

Excystation

- brief exposure to acidic pH (~2)
- flagellar activity within 5-10 min after return to neutral pH
- breakdown of cyst wall (proteases)
- trophozoite emerges from cyst
- cytokinesis within 30 min

Adhesive Disk Components

- 3 distinct cytoskeletal elements
 - microtubules/tubulin
 - microribbons/giardins
 - actin-myosin (lateral crest)
- suggests that contractile forces involved in adhesion

Acute Symptoms

- 1-2 week incubation
- sudden explosive, watery diarrhea
 - bulky, frothy, greasy, foul-smelling stools
 - no blood or mucus
- upper gastro-intestinal uneasiness, bloating, flatulence, belching, cramps, nausea, vomiting, anorexia
- usually clears spontaneously (undiagnosed), but can persist or become chronic

Subacute/Chronic

- recurrent diarrheal episodes
- cramps uncommon
- sulfuric belching, anorexia, nausea frequent
- can lead to weight loss and failure to thrive

Pathogenesis

- epithelial damage
 - villus blunting
 - crypt cell hypertrophy
 - cellular infiltration
- malabsorption
 - enzyme deficiencies
 - lactase (lactose intolerance)

Diagnosis

- suspect: acute or chronic symptoms
- confirmed: detection of parasite in feces or duodenal aspirate or biopsy
- parasite easy to identify
- parasite can be difficult to detect
- inconsistent excretion in feces
- patchy loci of infection

Parasite Detection

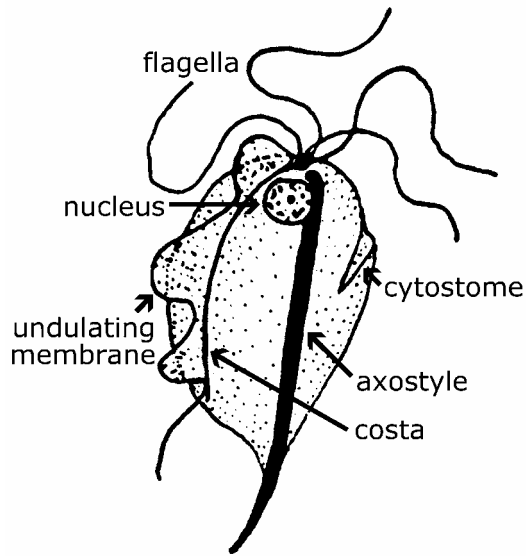
- Stools
 - 3 non-consecutive days
 - wet mounts or stained
 - IFA, copro-antigens
- Aspirate or Biopsy
- Enterotest (or string test)

Treatment

- Drug of Choice
 - metronidazole (Flagyl)
- Alternatives
 - tinidazole (single dose)
 - paromomycin (pregnancy)
 - quinacrine
 - furazolidone

Control

- avoid fecal-oral transmission
- improve personal hygiene
 - especially institutions
- treat asymptomatic carriers
 - eg, family members
- health education
 - hand-washing
 - sanitation
 - food handling
- protect water supply
- treat water if questionable
 - boiling
 - iodine
 - not chlorine



Human *Trichomonas* Species

<i>T. tenax</i>	oral cavity
<i>T. hominis</i> *	intestine
<i>T. vaginalis</i>	uro-genital

*aka: *Pentatrichomonas*

Trichomonas vaginalis

- trophozoite stage transmitted during sexual intercourse
 - non-sexual contact possible
- common STD
 - co-infection w/other STDs
 - more prevalent in at risk groups
- associated with epithelium of uro-genital tract
 - females: vagina
 - males: urethra, prostate, epididymis
- both sexes equally susceptible
- symptoms more common in females

Trichomoniasis

- 4-20 day incubation

females

- acute or chronic vaginitis
- urethritis
- pruritus
- abnormal discharge (frothy, creamy or yellowish)

males

- often asymptomatic
- mild dysuria or pruritus
- minor urethral discharge

Control and Treatment

- limiting # of sexual partners
- condoms
- metronidazole
 - single 2 g dose
 - 250 mg (3/d) x 7 days
- simultaneous treatment of partner! (cure 85-95%)

Demonstration of Parasite

- direct observation or in vitro culture
 - vaginal discharge
 - prostatic secretion
 - urine sediment

Non-Pathogenic Intestinal Flagellates	
<i>Chilomastix mesnili</i>	<i>Trichomonas hominis</i>
<ul style="list-style-type: none">• 10-20 μm trophozoite• 6-20 μm cyst• single nucleus• cytostome	<ul style="list-style-type: none">• 7-15 μm trophozoite• no cyst• single nucleus• axostyle, undulating membrane, costa