

Waterborne Diseases

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- Waterborne diseases are pathogenic micro-organisms which are directly transmitted when contaminated drinking water is consumed.
- Contaminated drinking water used in the preparation of food can be the source of food borne disease through consumption of the same micro-organisms.
- According to the World Health Organization, diarrheal disease accounts for an estimated 4.1 % of the total daily global burden of disease and is responsible for the deaths of 1.8 million people every year.
- It was estimated that 88% of that burden is attributable to unsafe water supply, sanitation and hygiene and is mostly concentrated on children in developing countries.
- Waterborne disease can be caused by protozoa, viruses, bacteria, and intestinal parasites.

Protozoal infections

Disease and Transmission	Microbial Agent	Sources of Agent in Water Supply	General Symptoms
Amebiasis (hand-to-mouth)	Protozoan (<i>Entamoeba histolytic</i>) (Cyst-like appearance)	Sewage, non-treated drinking water, flies in water supply	Abdominal discomfort, fatigue, weight loss, diarrhea, gas pains Fever, abdominal pain, diarrhea
Cryptosporidiosis (oral)	Protozoan (<i>Cryptosporidium parvum</i>)	Collects on water filters and membranes that cannot be disinfected, animal manure, seasonal runoff of water.	Flu-like symptoms, watery diarrhea, loss of appetite, substantial loss of weight, bloating, increased gas, stomach
Cyclosporiasis	Protozoan parasite (<i>Cyclospora cayetanensis</i>)	Sewage, non-treated drinking water	cramps, nausea, vomiting, muscle aches, low-grade fever, and fatigue
Giardiasis (oral-fecal) (hand-to-mouth)	Protozoan (<i>Giardia lamblia</i>) Most common intestinal parasite	Untreated water, poor disinfection, pipe breaks, leaks, groundwater contamination, campgrounds where humans and wildlife use same source of water. Beavers and muskrats act as a reservoir for Giardia.	Diarrhea, abdominal discomfort, bloating, gas and gas pains

Parasitic Infections

Disease and Transmission	Microbial Agent	Sources of Agent in Water Supply	General Symptoms
Schistosomiasis (immersion)	Schistosoma	Contaminated fresh water with certain types of snails that carry schistosomes	Rash or itchy skin. Fever, chills, cough, and muscle aches
dracunculiasis	dracanculus medinensis	drinking water containing infective cyclops	allergic reaction,urticarial rash, nausea, vomitting, diarrhoea, asthmatic attack.
taeniasis solium	taenia solium	contaminate drinking water with eggs	intestinal disturbances, neurologic manifestations, loss of weight, cysticercosis
fascioliasis	fasciola	contaminated drinking water with encysted metacercaria	GIT disturbance, diarrhea, liver enlargement, cholangitis, cholecystitis, obstructive jaundice.
hymenolepiasis nana	hymenolepis nana	contaminated drinking water with eggs	mild GIT symptoms, nervous manifestation
hyatidosis	echinococcus granulosus	contaminated drinking water with eggs	hyatid cyst press on bile ductand blood vessels, if it ruptured cause anaphylactic shock.
coenurosis	multiceps multiceps	contaminated drinking water with eggs	increases intacranial tension
ascraiasis	ascaris lumbricoides	contaminated drinking water with eggs	loefflers syndrome in lung, nausea ,vomitting, diarrhea, malnutrition, underdevelopment,
enterobiasis	entrobilus vermicularis	contaminated drinking water with eggs	peri-anal itch, nervous irritability, hyperactivity and insomnia

Bacterial infections

- **Cholera** - Vibrio cholerae bacteria - gastro-intestinal often waterborne
- **Botulism** - Clostridium botulinum bacteria - gastro-intestinal food/water borne; can grow in food
- **Typhoid** - Salmonella typhi bacteria - gastro-intestinal water/food borne
- **Dysentery** - Shigella/Salmonella bacteria - gastro-intestinal food/water
- **Legionellosis**-
- **Leptospirosis**-

Viral Infections

- **Hepatitis A - Hepatitis A virus - gastro-intestinal water/food borne**
- **Polio - polioviruses - gastro-intestinal exposure to untreated**
- **Caliciviruses-**
- **Astroviruses-**
- **Small Round Structured Virus**
- **Enteric Adenoviruses-**