

People who live and work overseas often forget the dangers associated with parasitic infections. It is important to review this information about parasites and assess what is being done to protect against becoming infected.

A parasite is an organism that lives in another organism, called *the host*, and often harms it. A parasite is dependent on its host for survival - it has to be in or on the host to live, grow and multiply. A parasite cannot live independently. Parasites can cause disease in humans. Some parasitic diseases are easily treated, and some are not. The burden of these diseases often rests on communities in the tropics and subtropics, but parasitic infections also affect people in developed countries.

Fast Facts About Parasites

Here are some key points about parasites.

- Parasites live within other organisms and thrive to the detriment of their host
- There are at least 1,000 species of parasite capable of living in or on humans
- Parasites are an incredibly varied group of organisms. Around 70% of parasites are microscopic; however, some worm parasites can reach over 30 m in length.
- There are three main classes of parasites that can cause disease in humans: protozoa, helminths, and ectoparasites.
- Malaria is a parasitic disease and causes the most human deaths globally.
- The Neglected Tropical Diseases (NTDs), which have suffered from a lack of attention by the public health community, include parasitic diseases such as lymphatic filariasis, onchocerciasis, and Guinea worm disease. The NTDs affect more than 1 billion people—one-sixth of the world's population—largely in rural areas of low-income countries.
- Doctors diagnose the infection by taking samples of blood, stool, urine, phlegm, or other infected tissue and examining or sending them to a laboratory for analysis.

<http://www.cdc.gov/parasites>

Three Main Classes of Parasites

1. Protozoa

Protozoa are microscopic, one-celled organisms that can be free-living or parasitic in nature. They are able to multiply in humans, which contributes to their survival and also permits serious infections to develop from just a single organism. Transmission of protozoa that live in a human's intestine to another human typically occurs through a fecal-oral route (for example, contaminated food or water or person-to-person contact). Protozoa that live in the blood or tissue of humans are transmitted to other humans by an arthropod vector (for example, through the bite of a mosquito or sand fly).

2. Helminths

Helminths are large, multicellular organisms that are generally visible to the naked eye in their adult stages. Like protozoa, helminths can be either free-living or parasitic in nature. In their adult form, helminths cannot multiply in humans. There are three main groups of helminths (derived from the Greek word for worms) that are human parasites:

- Flatworms (platyhelminths) – these include the trematodes (flukes) and cestodes (tapeworms).

- Thorny-headed worms (acanthocephalins) – the adult forms of these worms reside in the gastrointestinal tract. The acanthocephala are thought to be intermediate between the cestodes and nematodes.
- Roundworms (nematodes) – the adult forms of these worms can reside in the gastrointestinal tract, blood, lymphatic system or subcutaneous tissues. Alternatively, the immature (larval) states can cause disease through their infection of various body tissues. Some consider the helminths to also include the segmented worms (annelids)—the only ones important medically are the leeches.

3. *Ectoparasites*

Although the term ectoparasites can broadly include blood-sucking arthropods such as mosquitoes (because they are dependent on a blood meal from a human host for their survival), this term is generally used more narrowly to refer to organisms such as ticks, fleas, lice, and mites that attach or burrow into the skin and remain there for relatively long periods of time (e.g., weeks to months). Arthropods are important in causing diseases in their own right, but are even more important as vectors, or transmitters, of many different pathogens that in turn cause tremendous morbidity and mortality from the diseases they cause.



Tick



Head louse



Mite - Scabies

Some Ways People Can Acquire Parasites

Human parasites just about everywhere in our environment, so it is easy to become infected. Routes of transmission include:

- insect bites
- animal feces
- walking barefoot
- handling raw meat and fish
- eating raw or undercooked pork, beef or fish
- handling soiled litter pans (cats)
- eating contaminated raw fruits and vegetables
- eating meals prepared by infected food handlers
- drinking contaminated water
- having contact with infected persons (including sexual contact, kissing, and shaking hands)
- inhaling contaminated dust (parasitic eggs or cysts)

Some of the Parasitic Illnesses That Can Be Acquired During International Travel (This is not a comprehensive list)
Contaminated Food and Water
giardiasis amebiasis ascariasis trichinosis <i>Taenia</i> infection Various food-borne bacterial infections
Vector-borne Transmission
malaria Chagas disease lymphatic filariasis African sleeping sickness Onchocerciasis

Symptoms of Parasitic Diseases

Because there are so many species of parasite there is a wide array of potential symptoms. Sometimes the symptoms may appear similar to hormone deficiency, pneumonia or food poisoning. These are some of the potential symptoms that might occur:

- Weight loss and/or increased appetite
- Abdominal pain
- Diarrhea and vomiting
- Itchy anus or vagina
- Sleeping problems
- Anemia
- Aches and pains
- General malaise
- Allergies
- Anxiety

Prevention

Since many parasites are transmitted from person-to-person, the most effective way to prevent infection is to thoroughly wash the hands with soap and water.

1. *Handwashing is important in the following situations:*

- After using the toilet
- After changing a child's diapers or cleaning a child who has used the toilet
- Before, during, and after preparing food
- Before eating food
- Before and after caring for a person who is sick
- Before and after treating a cut or wound
- After touching an animal or animal waste

2. *Food, drink, and water may be contaminated with parasites.* Be very cautious especially when traveling.
 - Avoid drinking tap water. Water filters are essential.
 - Remember: “Cook it, boil it, peel it, or forget it!”
3. Since malaria is a parasitic disease and causes the most human deaths globally, people visiting or living in areas where it is prevalent need to know the -ABCD- of malaria protection:
 - Be **Aware** of the risk, the incubation period, the possibility of delayed onset, and the main symptoms.
 - Avoid being **Bitten** by mosquitoes, especially between dusk and dawn which is the time of day when mosquitoes that transmit malaria are biting humans (and also animals).
 - Take antimalarial medications (**Chemoprophylaxis**) or other prescribed drug, when appropriate, to prevent infection from developing into clinical disease.
 - Immediately seek **Diagnosis** and treatment if a fever develops 1 week or more after entering an area where there is malaria risk, and up to 3 months (or, rarely, later) after departure from a risk area.

Diagnosis

1. Fecal testing (examination of your stool) can identify both helminths and protozoa. Stool samples must be collected before you take any anti-diarrhea drugs or antibiotics, or before x-rays with barium are taken. Several stool samples may be needed to find the parasite.
2. The "Scotch tape" test identifies pinworms by touching tape to the anus several times, then looking at the tape under a microscope for eggs.
3. Your doctor may use x-rays with barium to diagnose more serious problems caused by parasites, although this test is usually not required.

Treatment

Drug resistance to anthelmintics (anti-parasite drugs) is becoming more common. Unfortunately these drugs are unable to completely eliminate an entire population of parasites. The few that remain are resistant to the drug and with time reproduce creating a new population that is also resistant. Resistance is encouraged with indiscriminate use of anthelmintics. Anthelmintics should complement but not replace good management and sanitation practices.

If you have any questions about this topic, please reach out to CompassionLink at info@compassionlink.org. We will be happy to answer your questions.

Sources:

<http://www.cdc.gov/parasites>

<http://www.medicalnewstoday.com>

<http://www.webmd.com/skin-problems-and-treatments/ss/slideshow-pictures-of-parasites>

<http://www.who.int/ith/diseases/malaria>