

This information is not meant to be used for self-diagnosis or as a substitute for consultation with a health care provider.

If you have any questions about the parasites described in this newsletter or think that you may have a parasitic infection, consult a health care provider.

SEALS Health News

VOLUME IV, ISSUE 7

MARCH 2020

PARASITES

Parasitic infection or infestation can occur in children of all ages. Infants, toddlers, and very young children in day care settings are at risk for the parasitic disease called giardiasis that causes diarrhea and is spread through contaminated feces. Pinworm infection (enterobiasis) also occurs among preschool and young school-age children. Both preschool and school-age children can become infested with head lice (pediculosis) or scabies, both of which are spread by close person-to-person contact as is common during childhood play. Children of all ages can develop parasitic diseases such as giar-

diasis and cryptosporidiosis from swallowing contaminated water during swimming, playing, and other activities in contaminated recreational water (e.g. pools, fountains, lakes, rivers and streams, etc.). Pets and other animals can be a potential source of parasites that can affect children. Toxoplasmosis is spread by ingesting soil or litter-box contents with infectious cat feces. Children can also be born with this infection if their mother was infected during pregnancy.

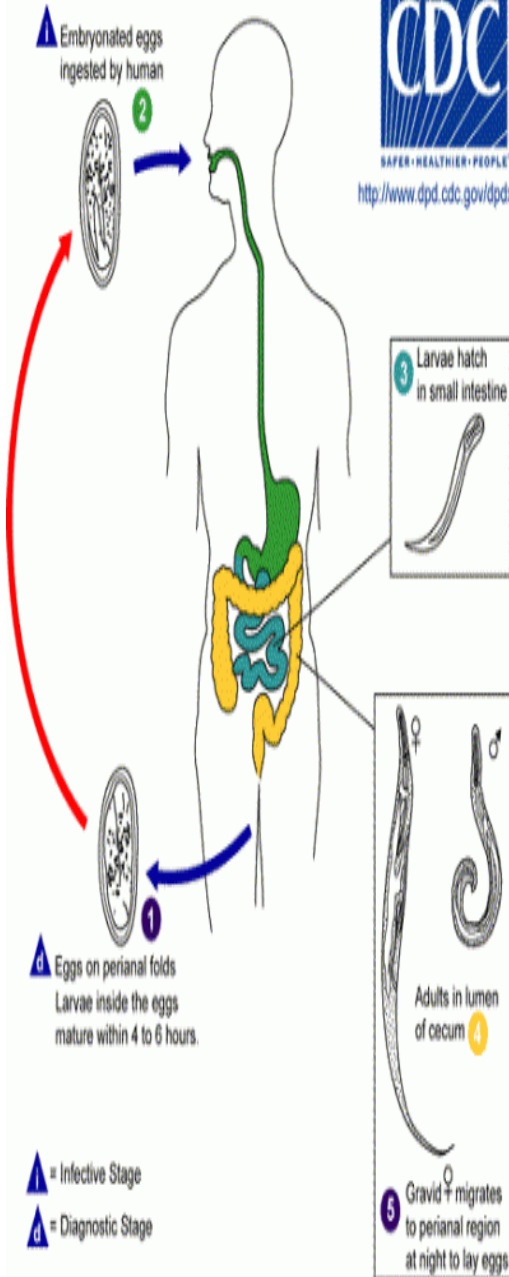
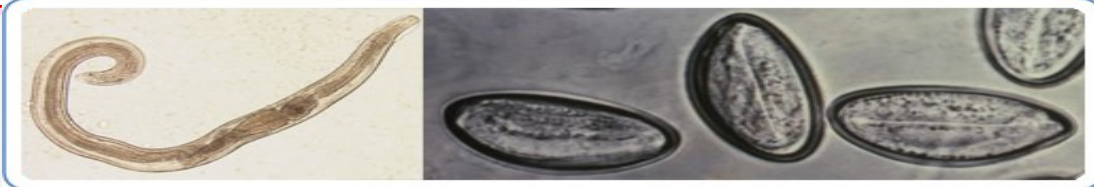


Accidentally swallowing contaminated recreational water is one way children can get cryptosporidiosis, a parasitic disease.



One of the most important ways to help prevent these parasitic diseases

is to teach children the importance of washing hands correctly with soap and running warm water, particularly after using the toilet and before eating.



What is a pinworm?

A pinworm (“threadworm”) is a small, thin, white roundworm (nematode) called *Enterobius vermicularis* that sometimes lives in the colon and rectum of humans. Pinworms are about the length of a staple. While an infected person sleeps, female pinworms leave the intestine through the anus and deposit their eggs on the surrounding skin. Symptoms include itching around the anus which can lead to difficulty sleeping and restlessness.

How is pinworm infection spread?

Pinworm infection is spread by the fecal-oral route, that is by the transfer of infective pinworm eggs from the anus to someone’s mouth, either directly by hand or indirectly through contaminated clothing, bedding, food, or other articles. Pinworm eggs become infective within a few hours

after being deposited on the skin around the anus and can survive for 2 to 3 weeks on clothing, bedding, or other objects. People become infected, usually unknowingly, by swallowing (ingesting) infective pinworm eggs that are on fingers, under fingernails, or on clothing, bedding, and other contaminated objects and surfaces. Because of their small size, pinworm eggs sometimes can become airborne and ingested while breathing.

How is pinworm infection diagnosed?

Itching during the night in a child’s perianal area strongly suggests pinworm infection. Diagnosis is made by identifying the worm or its eggs. Worms can sometimes be seen on the skin near the anus or on underclothing, pajamas, or sheets about 2 to 3 hours after falling asleep.

How is pinworm infection treated?

Pinworm can be treated with either prescription or over-the-counter medications. A health care provider should be consulted before treating a suspected case of pinworm infection. Treatment involves two doses of medication with the second dose being given 2 weeks after the first dose. All household contacts and caretakers of the infected person should be treated at the same time. Reinfection can occur easily so strict observance of good hand hygiene is essen-

tial (e.g. proper handwashing, maintaining clean short fingernails, avoiding nail biting, avoiding scratching the perianal area).

Daily morning bathing and daily changing of underwear helps remove a large proportion of eggs. Showering may be preferred to avoid possible contamination of bath water. Careful handling and frequent changing of underclothing, night clothes, towels, and bedding can help reduce infection, reinfection, and environmental contamination with pinworm eggs. These items should be laundered in hot water, especially after each treatment of the infected person and after each usage of washcloths until infection is cleared.

What should be done if the pinworm infection occurs again?

Reinfection occurs easily. Prevention always should be discussed at the time of treatment. Good hand hygiene is the most effective means of prevention. If pinworm infection occurs again, the infected person should be retreated with the same two-dose treatment. The infected person’s household contacts and caretakers also should be treated. If pinworm infection continues to occur, the source of the infection should be sought and treated. Playmates, schoolmates, close contacts outside the home, and household members should be considered possible sources of infection. Each infected person should receive the recommended two-dose treatment.





The **head louse**, or *Pediculus humanus capitis*, is a parasitic insect that can be found on the head, eyebrows, and eyelashes of people. Head lice feed on human blood several times a day and live close to the human scalp. Head lice are not known to spread disease.

Head lice are found worldwide. In the United States, infestation with head lice is most common among pre-school children attending child care, elementary schoolchildren, and the household members of infested children. Although reliable data on how many people in the United States get head lice each year are not available, an estimated 6 million to 12 million infestations occur each year in the United States among children 3 to 11 years of age. In the United States, infestation with head lice is much less common among African Americans than among persons of other races, possibly because the claws of the head louse found most frequently in the United States are better adapted for grasping the shape and width of the hair shaft of other races.

Head lice move by crawling; they cannot hop or fly. Head lice are spread by direct contact with the hair of an infested person. Anyone who comes in head-to-head contact with someone who already has head lice is at greatest risk. Spread by contact with clothing (such as hats, scarves, coats) or other personal items (such as combs, brushes, or towels) used by an infested person is uncommon. Personal hygiene or cleanliness in the home or school has nothing to do with getting head lice. Head lice have three forms: the egg (also called a nit), the nymph, and the adult.



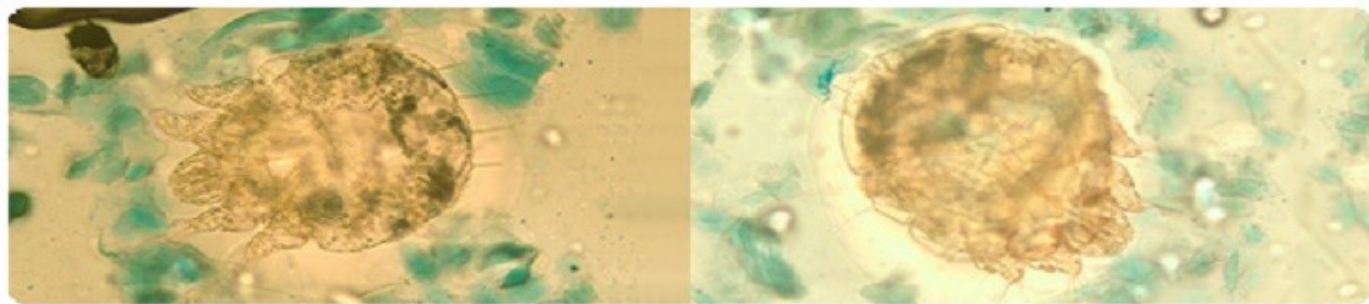
Treatment



Treatment for head lice is recommended for persons diagnosed with an active infestation. All household members and other close contacts should be checked; those persons with evidence of an active infestation should be treated. Some experts believe prophylactic treatment is prudent for persons who share the same bed with actively-infested individuals. All infested persons (household members and close contacts) and their bedmates should be treated at the same time.

When treating head lice, supplemental measures can be combined with recommended medicine (pharmacologic treatment); such additional (non-pharmacologic) measures generally are helpful. For example, hats, scarves, pillow cases, bedding, clothing, and towels worn or used by the infested person in the 2-day period just before treatment is started can be machine washed and dried using the hot water and hot air cycles because lice and eggs are killed by exposure for 5 minutes to temperatures greater than 53.5°C (128.3°F). Items that cannot be laundered may be dry-cleaned or sealed in a plastic bag for two weeks. Items such as hats, grooming aids, and towels that come in contact with the hair of an infested person should not be shared. Vacuuming furniture and floors can remove an infested person's hairs that might have viable nits attached.

Treat the infested person(s): Requires using an Over-the-counter (OTC) or prescription medication. Apply lice medicine, also called pediculicide, according to the instructions contained in the box or printed on the label. If the infested person has very long hair (longer than shoulder length), it may be necessary to use a second bottle. Pay special attention to instructions on the label or in the box regarding how long the medication should be left on the hair and how it should be washed out. Have the infested person put on clean clothing after treatment. Comb dead and any remaining live lice out of the hair using a fine-toothed nit comb.



Scabies is an infestation of the skin by the human itch mite (*Sarcoptes scabiei* var. *hominis*). The microscopic scabies mite burrows into the upper layer of the skin where it lives and lays its eggs. The most common symptoms of scabies are intense itching and a pimple-like skin rash. The scabies mite usually is spread by direct, prolonged, skin-to-skin contact with a person who has scabies.

What are the signs and symptoms of scabies?

The most common signs and symptoms of scabies are intense itching (pruritus), especially at night, and a pimple-like (papular) itchy rash. The itching and rash each may affect much of the body or be limited to common sites such as the wrist, elbow, armpit, webbing between the fingers, nipple, penis, waist, belt-line, and buttocks. The rash also can include tiny blisters (vesicles) and scales. Scratching the rash can cause skin sores; sometimes these sores become infected by bacteria.

Because mites are often few in number (only 10-15 mites per person), tiny burrows under the skin may be difficult to find. They are found most often in the webbing between the fingers, in the skin folds on the wrist, elbow, or knee, and on the penis, breast, or shoulder blades.

How are scabies spread?

Scabies usually is spread by direct, prolonged, skin-to-skin contact with a person who has scabies. Contact generally must be prolonged; a quick handshake or hug usually will not spread scabies. Scabies is spread easily to sexual partners and household members. Scabies in adults frequently is sexually acquired. Scabies sometimes is spread indirectly by sharing articles such as clothing, towels, or bedding used by an infested person; however, such indirect spread can occur much more easily when the infested person has crusted scabies.

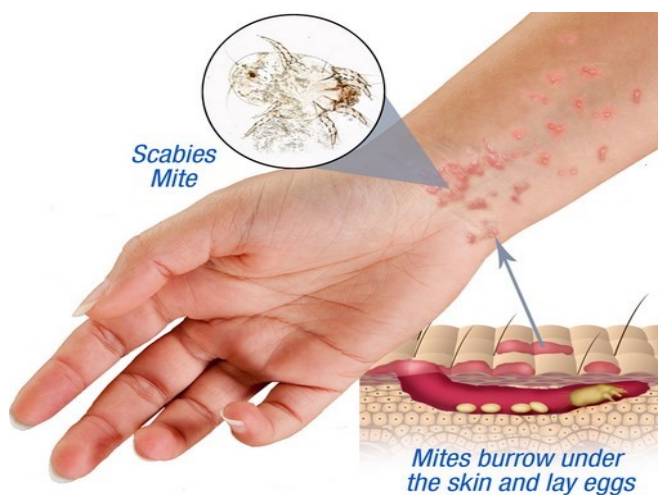
How long can scabies mites live?

On a person, scabies mites can live for as long as 1-2 months. Off a person, scabies mites usually do not survive more than 48-72 hours. Scabies mites will die if exposed to a temperature of 50°C (122°F) for 10 minutes.

Can scabies be treated?

Yes. Products used to treat scabies are called scabicides because they kill scabies mites; some also kill eggs. Scabicides to treat human scabies are available only with a doctor's prescription; no "over-the-counter" (non-prescription) products have been tested and approved for humans. Always follow carefully the instructions provided by the doctor and pharmacist, as well as those contained in the box or printed on the label. The medication should be left on the body for the recommended time before it is washed off. Clean clothes should be worn after treatment.

In addition to the infested person, treatment also is recommended for household members and sexual contacts, particularly those who have had prolonged skin-to-skin contact with the infested person. All persons should be treated at the same time in order to prevent reinfestation. Scabies mites do not survive more than 2-3 days away from human skin. Items such as bedding, clothing, and towels used by a person with scabies can be decontaminated by machine-washing in hot water and drying using the hot cycle or by dry-cleaning. Items that cannot be washed or dry-cleaned can be decontaminated by removing from any body contact for at least 72 hours. Careful vacuuming of furniture and carpets in rooms used by these persons is recommended.





What are bed bugs?

Bed bugs (*Cimex lectularius*) are small, flat, parasitic insects that feed solely on the blood of people and animals while they sleep. Bed bugs are reddish-brown in color, wingless, range from 1mm to 7mm (roughly the size of Lincoln's head on a penny), and can live several months without a blood meal.

Where are bed bugs found?

Bed bugs are found across the globe. Bed bug infestations usually occur around or near the areas where people sleep. These areas include apartments, shelters, rooming houses, hotels, cruise ships, buses, trains, and dorm rooms. They hide during the day in places such as seams of mattresses, box springs, bed frames, headboards, dresser tables, inside cracks or crevices, behind wallpaper, or any other clutter or objects around a bed. Bed bugs have been shown to be able to travel over 100 feet in a night but tend to live within 8 feet of where people sleep.

Do bed bugs spread disease?

Bed bugs are not known to spread disease. Bed bugs can be an annoyance because their presence may cause itching and loss of sleep. Sometimes the itching can lead to excessive scratching that can sometimes increase the chance of a secondary skin infection.

What are the signs and symptoms of a bed bug infestation?

One of the easiest ways to identify a bed bug infestation is by the tell-tale bite marks on the face, neck, arms, hands, or any other body parts while sleeping. However, these bite marks may take as long

as 14 days to develop in some people so it is important to look for other clues when determining if bed bugs have infested an area. These signs include:

- the bed bugs' exoskeletons after molting,
- bed bugs in the fold of mattresses and sheets,
- rusty-colored blood spots due to their blood-filled fecal material that they excrete on the mattress or nearby furniture, and
- a sweet musty odor.



How do I know if I've been bitten by a bed bug?

It is hard to tell if you've been bitten by a bed bug unless you find bed bugs or signs of infestation. The bite marks are similar to that of a mosquito or a flea — a slightly swollen and red area that may itch and be irritating. The bite marks may be random or appear in a straight line. Because bed bug bites affect everyone differently, some people may have no reaction and will not develop bite marks or any other visible signs of being bitten. Other people may be allergic to the bed bugs and can react adversely to the bites.

How did I get bed bugs?

Bed bugs are experts at hiding. Their slim flat bodies allow them to fit into the smallest of spaces and stay there for long periods of time, even without a

blood meal. Bed bugs are usually transported from place to place as people travel. The bed bugs travel in the seams and folds of luggage, overnight bags, folded clothes, bedding, furniture, and anywhere else where they can hide. Most people do not realize they are transporting stow-away bed bugs as they travel from location to location, infecting areas as they travel.

Who is at risk for getting bed bugs?

Everyone is at risk for getting bed bugs when visiting an infected area. However, anyone who travels frequently and shares living and sleeping quarters where other people have previously slept has a higher risk of being bitten and or spreading a bed bug infestation.

How are bed bugs treated and prevented?

Bed bug bites usually do not pose a serious medical threat. The best way to treat a bite is to avoid scratching the area and apply anti-septic creams or lotions and take an antihistamine. Bed bug infestations are commonly treated by insecticide spraying. If you suspect that you have an infestation, contact your landlord or professional pest control company that is experienced with treating bed bugs. The best way to prevent bed bugs is regular inspection for the signs of an infestation.



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Information brought to you by:
CDC

Giardia is a microscopic parasite that causes the diarrheal illness known as giardiasis. *Giardia* (also known as *Giardia intestinalis*, *Giardia lamblia*, or *Giardia duodenalis*) is found on surfaces or in soil, food, or water that has been contaminated with feces (poop) from infected humans or animals.

Giardia is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it tolerant to chlorine disinfection. While the parasite can be spread in different ways, water (drinking water and recreational water) is the most common mode of transmission.



What are the signs and symptoms?

Giardiasis is the most frequently diagnosed intestinal parasitic disease in the United States and among travelers with chronic diarrhea ¹. Signs and symptoms may vary and can last for 1 to 2 weeks or longer. In some cases, people infected with *Giardia* have no symptoms.

Acute symptoms include

- Diarrhea
- Gas
- Greasy stools that tend to float
- Stomach or abdominal cramps
- Upset stomach or nausea/vomiting
- Dehydration (loss of fluids)

Other, less common symptoms include itchy skin, hives, and swelling of the eye and joints. Sometimes, the symptoms of giardiasis might seem to resolve, only to come back again after several days



or weeks. Giardiasis can cause weight loss and failure to absorb fat, lactose, vitamin A and vitamin B12.

In children, severe giardiasis

might delay physical and mental growth, slow development, and cause malnutrition.

How is this treated?

Several drugs can be used to treat *Giardia* infection. Effective treatments include metronidazole, tinidazole, and nitazoxanide. Alternatives to these medications include paromomycin, quinacrine, and furazolidone. Some of these drugs may not be routinely available in the United States.

Different factors may shape how effective a drug regimen will be, including medical history, nutritional status, and condition of the immune system. Therefore, it is important to discuss treatment options with a healthcare provider.