

Human Lice



Introduction: These human-infesting lice receive their common names from the areas of the human body that they typically infest. It must be realized that an infestation of any of these is a medical problem, not a pest control problem. Only the body louse is a vector of human diseases, namely typhus, relapsing fever, and trench fever. These lice are found worldwide and throughout the U.S.

Recognition: Lice are tiny and measure 1/16 to 1/8 inch long. Lice are flat (top to bottom), wingless and yellowish white to grayish black in color.

1. The Head louse, *Pediculus humanus capitatus* measures 1/8 inch long and has a flat elongate body. It occurs almost exclusively on the head and attaches its eggs (nits) to hairs.
2. The Body louse, *Pediculus humanus humanus* also measures 1/8 inch long, and has an elongate flattened body. It occurs primarily in clothing and moves to adjacent body areas to feed and glues its eggs (nits) primarily to clothing fibers.
3. The Crab/pubic louse, *Pthirus pubis* is 1/16 inch long with a crablike body that is flattened but broadly oval in form. It occurs primarily where flat hairs are present (pubic region, arm pits, eyebrows, beards), and attaches its eggs (nits) to body hairs.

Signs of Infestation and Incidence:

1. Head louse. The presence of eggs/nits is the most important indication of a problem because they are more numerous than lice, not active, and not easily removed. Scratching of the back of the scalp or the nape of the neck is cause to suspect lice. Scratching associated with lice is likely to lead to secondary infections, which are more likely to cause itching than the bites themselves. The socioeconomic status or income level of the person or family has little to do with who gets infested. Infestations are particularly common among younger school children. Girls are more likely to be infested than boys, up to 5% more likely. Cutting or wearing shorter hair does not prevent or eliminate an infestation.
2. Body louse. Other than observing lice on the outside of clothing, profiling conducive living habits or conditions is the key. Infestations tend to occur when people are forced to constantly wear several layers of clothing due to inadequate heat. This includes war areas, disaster areas, and homeless people. Today they are most commonly encountered in accommodations sheltering the homeless, hospital emergency rooms, jails that hold vagrants, and in morgues.
3. Crab / pubic louse. The presence of eggs/nits is the most important indication of a problem because they are easier to see and inactive whereas the lice are near the skin feeding. Another indication is general discomfort and irritation, usually causing scratching. Also, small blue dots (1/64 to 1/8 inch in diameter) develop at the feeding sites, which are often accompanied by swelling and tenderness.

About 3% of the public is infested. Clinics dealing with sexually transmitted diseases (STDs) see far more infestations than do general physicians or dermatologists.

Biology:

1. Head lice live continuously on the host. Each female lays 50 to 100 oval eggs, which are pearly white and 1/32 inch long. Each egg is individually securely cemented to a head hair near the scalp and is commonly called a nit. Eggs require high relative humidity and warmth in order to develop and hatch. Eggs hatch in 5 to 10 days and there are 3 nymphal instars. The life cycle (egg to egg) requires about 3 weeks. Adults live for about 23 days. Head lice can survive no more than 48 hours off the host.
2. Body lice occur primarily in the clothing, especially clothing in contact with the body. They move to adjacent body areas to feed. The female lays about 200 oval eggs, which are pearly white and 1/32 inch long. Females lay 5 to 8 eggs per day, usually during periods of host inactivity. Each egg/nit is individually securely cemented to a clothing fiber and only occasionally to body hair. Eggs tend to be laid in large numbers along the seams of underwear and in places where clothing is in contact with the body such as the neck, shoulder, armpit, waist, and the crotch of trousers.

Because eggs are removed with the clothing, development and hatch times are dependent on room temperature and occur between 75 and 99° F, taking 17 to 21 and 6 to 7 days respectively. There are 3 nymphal instars. The life cycle (egg to egg) requires 8 to 9 days if clothing is not removed nightly to 2 to 4 weeks if clothing is removed at night. They feed only when the infested person is resting. If clothing is not worn for several days, the lice usually die. Adults live up to 29 days. Body lice serve as vectors of typhus, relapsing fever, and trench fever.

3. Crab/public lice live continuously on the host. The female lays 2 to 3 whitish eggs per day, for a lifetime total of 15 to 50 eggs. Each egg is firmly cemented to a coarse hair near the skin. Eggs hatch in 7 to 8 days with feeding beginning in 1 to 2 hours. The first instar nymph feeds off and on for 5 to 6 days and then molts; the second instar requires 9 to 10 days, and the third instar 13 to 17 days. The life cycle (egg to egg) requires about 5 to 6 weeks. Adults live for about 15 to 25 days. Crab lice can survive no more than 24 hours off the host.

Habits:

1. Head louse. For all practical purposes, head lice occur only on the head. They are most commonly found above the ears and on the back of the scalp, less often on the entire scalp; rarely are they found on other body hairs such as in the eyelashes. Head lice live continuously on the head area unless dislodged by scratching, hats, comb, brush, towel, etc. They are commonly transmitted by the direct contact of 2 heads, or by combs, hairbrushes, or hats being shared, or by hats being temporarily stored in contact with other hats.
2. Body louse. Females usually occur along clothing seams where they lay eggs. Males tend to be generally distributed over the inside of the clothing but further away from the body skin. Adults migrate further from the body than nymphs. The infestation must be severe before lice can be seen on the outside of clothing. Body lice prefer wool clothing. When feeding, they usually retain their hold on the adjacent clothing and only occasionally will they crawl on the body. Body lice are commonly transmitted by the sharing of infested clothing and/or bedding.
3. Crab / pubic louse. These lice live continuously on the host. Once a louse settles it does not move much. They feed off and on for several hours at a time and defecate frequently both blood and body wastes while feeding. Crab lice are transmitted by intimate or sexual body contact. They are found primarily in the public and perianal areas. Prior to puberty, children are usually not infested but if

crab lice are present, they are usually in the eyelashes. If infants are infested, the mother should be examined.

Solutions:

What you can do: Control on the human host consists of the following 6 steps:

1. Prescribed shampoo (head) or lotion (body and crab/pubic) treatments or over-the-counter preparations containing insecticides are typical therapy.
2. Follow the instructions on the product label.
3. For head and crab/pubic lice, 2 or more treatments are required because not all eggs/nits are killed with the first application. The timing of the second treatment allows for the hatching of any viable eggs.
4. Because of secondary infections of the skin caused by scratching, an antibiotic therapy may also be required.
5. Non-infested family or non-family members, who have shared a bed, bedding, or clothing, or sexual partner in the case of crab/public lice, should be examined for lice, but preventative treatments are not recommended. Note the nits located more than 1 1/2 inch from the skin or hair are most likely either dead or have hatched.
6. Required sanitation. Hot cycle washing and drying (minimum of 20 minutes) of clothing, bedding, and towels used by infested individuals. For infestations of head and body lice, this procedure should also be done for individuals who sleep or have slept in the same bed with an infested person. Non-infested people should not share towels, combs, hairbrushes, hats, clothing, and similar items with infested people. Note that if hot cycle washing is not available, boil clothing and bedding for at least 10 to 15 minutes.

Special requirements which are typically unknown by school personnel and the public but essential for a successful head louse control program include the following:

1. Children have significantly higher rates of infestation in schools where school lockers are shared as opposed to schools where individual lockers are the norm.
2. Children in schools with assigned wall hooks for their clothing have significantly lower head lice problems than in schools where hooks are unassigned.
3. It is almost a certainty that head lice will not survive in an empty school building from the close of classes on Friday until they reconvene on Monday morning.
4. A sanitation strategy is required for the short-term storage of hats, scarfs, and coats to reduce the transfer of head lice. As examples, the following are suggested:
 - a. Children should not share combs, hairbrushes, hats, or clothing.
 - b. Children's hats should be tucked into coat sleeves, with coats stored individually.
 - c. Children's sleeping mats and/or towels should be stored individually and sent home for regular washings.
 - d. School-provided napping mats, gym mats, or headgear should be disinfected, wiped clean or vacuumed after each use.

5. The National Pediculosis Association recommends:
 - a. That children infested with head lice should be sent home until they have been successfully treated with a pediculicide (louse killer) and all lice, live eggs/nits, and hatched eggs have been removed from the head.
 - b. That parents should be educated as to their responsibilities in eliminating head lice. Note: The National Pediculosis Foundation can be contacted by writing to P. O. Box 149, Newton, MA 02161 or calling (617) 449-6487.
 - c. Verification of infestation.
 - d. Any suspect insects and/or nits should be collected into and preserved in a jar/vial containing 70% rubbing (isopropyl) alcohol.
 - e. They can then be taken to an entomologist for verification of their identity.

Professional Solution: The control of head, body, and crab/pubic lice is a medical problem, period! This is because these lice spend essentially all of their time on the host (head and crab/pubic) or host's clothes (body) and can only survive for a short time off the host (48 hours for head louse; 24 hours for crab/pubic louse) or host's clothing (body louse: a few days). Lice, which are easily dislodged or drop from their host, are frail and unlikely to infest a new host. Therefore, residual pesticide treatments are unlikely to be of any control value. There are few pesticides labeled for application to humans or their clothing; a few are labeled for bedding for the control of bed bugs. A pest management professional should not be called upon to apply insecticides to control lice indoors or treat infested persons. Quik-Kill's pest management specialists do provide practical information to those requesting it.



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