



## Human lice

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### What You Should Know

- 6-12 million people in the United States get infested with head lice every year.
- Although lice cannot jump or fly, they are very contagious and are spread by close human contact.
- Infestations can be controlled with diligent sanitation and various over-the-counter cleansing products.

Lice infestations on humans, called pediculosis, is very common worldwide. Lice can transmit disease and are parasitic insects on humans, pets and livestock. Lice belong to the order Phthiraptera and are generally divided into two groups based on mouthparts and feeding preferences. Chewing lice (Mallophaga) have well developed mandibles and eat skin, feathers, and fur from birds and mammals (Fig. 1). There are 2,650 species of chewing lice in the world. Chewing lice have broad heads and appear to have cheeks wider than the shoulders. Sucking lice (Anoplura) look similar to chewing lice except they have narrow heads (Figs. 1-2). Sucking lice feed on the blood of mammals. There are about 550 species of sucking lice in the world. There are three types of human lice: head, body and pubic.



Fig. 1. Chewing louse<sup>1</sup> (left) and sucking louse.<sup>2</sup>

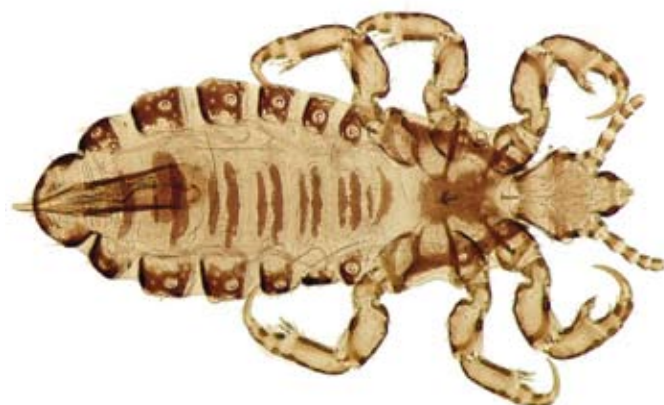


Fig. 2. Adult human sucking louse. Note specialized claws for clinging onto hair.<sup>3</sup>

### Description and Life Cycle

Sucking lice are obligate ectoparasites, meaning they feed on other animals and remain on the host even when not feeding. Each leg has a specialized claw for clinging onto hair (Fig. 2). Similar to other blood-feeding insects, lice have piercing-sucking mouthparts with recurved teeth that attach to skin during feeding. At rest, the stylet is withdrawn into the body. Lice are very host specific, and typically feed on one kind of mammal or bird. Lice go through simple metamorphosis (egg, nymph, adult), and reproduce 10-12 generations per year. Lice are flattened top-to-bottom, and can be distinguished from fleas that are flattened side-to-side.

Male and female adult lice are small (0.4-10 mm long), and wingless. Adults range in color from white to brown to dark grey, and can be covered with coarse setae. In medically important species, the adults have well-developed eyes and antennae. Mated females lay 4-5 eggs, or nits, per day for about 30-35 days. Eggs are white and oval, and individually glued near the base of the hair (Figs. 4-5). Eggs are incubated by human body heat and hatch in 4-15 days depending on temperature. Nymphs will take a blood meal within 24 hours of hatching and remaining close to the scalp to feed. Nymphs look similar to the adults, gradually becoming covered with setae as they develop. Nymphs go through three instars before becoming adults in 10-12 days.

## Types of Human Lice

**Head lice** (*Pediculus humanus capitis*) are the most common type of lice in the U.S., and are normally found on the head. About 6-12 million cases of head lice occur in the U.S. every year. Adults are generally smaller than body lice, and range from 2.1-3.3 mm long.

**Body lice** (*P. h. humanus*) are nearly identical to head lice except they do not typically live on the head. Adults range from 2.3-3.6 mm long. Although once common parasites of humans throughout the world, body lice are rare except in developing nations or in poor living conditions without access to clean clothing. Over a prolonged infestation period, people will get desensitized to the biting. Body lice can be found within clothing seams near the body.

**Pubic lice** (*Phthirus pubis*) are sometimes called crab lice, and are also known as "cooties" by the British or the "butterflies of love" in France. Pubic lice are common throughout the world. The adults are more stout, range from 1.1-1.8 mm in length, and have robust claws needed to cling on to coarse body hair (Fig. 3). Pubic lice can also infest armpits, eyebrows, eyelashes, armpits, and other facial hair. Infestations cause intense itching and purple lesions can develop on the skin.

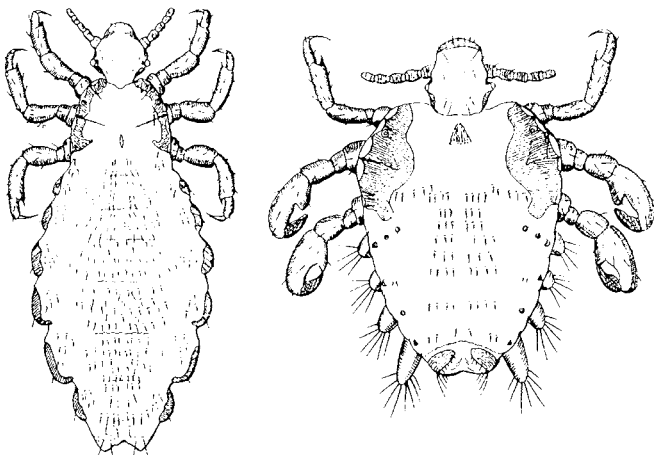


Fig. 3. Head/body louse (left) and pubic louse.<sup>4</sup>



Fig. 4. Many lice eggs near the scalp.<sup>3</sup>

## Myths and Realities of Lice

**MYTH: Only dirty people can get lice.**

Anyone can get lice if they are in close contact with an infested person. Human lice will lay eggs on hair regardless of cleanliness. Coarse hair is less desired, but still acceptable to head lice. Poor sanitary and crowded conditions are more conducive to body lice infestations. Sexual contact with an infested person increases the chance of getting pubic lice.

**MYTH: People with long hair get lice more easily.**

All life stages of lice live near the skin and rarely are located at the end of hair. So regardless of hair length, any close contact can pass on adults and nymphs. Lice are most commonly found at the nape of the neck and near the ears.

**MYTH: Only kids get lice.**

Although anybody can get lice, children are more likely to get infested because of frequent close contact (e.g. sharing lockers, sports, etc.).

**MYTH: The entire house must be treated to kill lice.**

Lice do not survive well away from human contact. Washing and drying clothing, bedding, fabrics in recent contact (3-4 days) with an infested person should eliminate most of the active lice. Use hot water (>130°F) and high heat dryers. If someone in the family is infested with lice, everyone should be examined to avoid continuous reinfestations.

**MYTH: Pets commonly transmit lice to humans.**

Human lice are very host specific, and do not live on pets or other animals. Rarely would human lice be transmitted from pets; however, fleas can be passed on to humans and cause skin dermatitis.

**MYTH: Using a lice shampoo will immediately kill lice.**



Fig. 5. Louse egg, or nit, glued to a hair.<sup>2</sup>

Some medicated shampoos will not kill eggs (nits), but will effectively control most adults and nymphs within 24 hours. A second application may be needed two weeks later to kill any lice that have hatched since the first shampoo. Lice not controlled with two treatments may be resistant and require a prescription to resolve the problem.

## How to Detect a Lice Infestation

- Wet hair to temporarily immobilize adults and nymphs.
- Take a small section of hair and examine for eggs, nymphs and adults near the scalp and base of hair. Using a fine-tooth comb to run through hair will help identify lice from hair. Eggs can look like dandruff, but are not easily removed from the hair.
- Look for empty egg cases, dried blood or cast skins near the scalp and at the base of the hair shaft.
- Work through small sections of hair at a time, especially concentrating on the nape of the neck and around the ears.
- Continue to inspect all family members once a week.

## Medical Importance

Human lice can transmit several diseases while feeding on blood. Epidemic typhus, trench fever and relapsing fever are the most serious diseases vectored by lice. In most cases, lice are more of an embarrassment and a nuisance, especially to children. Lice inject saliva with anticoagulants which can be highly irritating under the skin. If lice are not detected in the early stages, continuous blood feeding can lead to bite sensitivity. Most people will itch the bite area, eventually causing dermatitis and red, swollen skin. In some cases long term exposure to lice can lead to secondary infections such as impetigo, blood poisoning and pyoderma. A scabby crust may also form on the scalp from a head lice infestation. People with chronic body lice infestations often develop skin discoloration and thickening, swollen lymph nodes, headache, or joint and muscle pain. Consider going to a doctor if over-the-counter (OTC) medicated shampoos are not effective or secondary infections develop.

## Management Options

### *Medication lice shampoos*

The most common treatment for head lice in people over the age of 2 is OTC medicated shampoos. Most products contain low doses of insecticides to kill the nymphs and adults. Common products include permethrin (Nix®) or pyrethrins with piperonyl butoxide (A200®, Rid®, and Pronto® Plus). Some doctors will prescribe shampoo, such as Ovide®, if OTC products are not effective. To minimize insecticide exposure, wear gloves and wash the infested person's hair in a sink so residues do not wash over the rest of the body. Avoid applying shampoo people with open cuts or inflammations. A second application, 7-10 days later, may be necessary if lice are still active.

### *Lice combs*

In addition to lice shampoo, removing lice with a special fine-tooth comb, such as LiceMeister®, is a necessary part of complete control. Comb through the hair completely every other day for up to 14 days, or until eggs are no longer found. Continuously dip the comb into hot, soapy water to kill lice and remove eggs.

### *Non-medicated shampoos*

For people with sensitive skin or are adverse to OTC insecticides, try using shampoo with coconut or olive oil. Wash hair every day for 10-14 days to kill adults and hatching nymphs. Alternatives to traditional lice shampoos include TLC lice shampoo™ and LiceKiller™.

### *Drying and combing*

For those who want to avoid insecticides or oily shampoos, consider diligent grooming to control lice. Blow drying wet or dry hair can damage all life stages. Blow drying wet or dry hair can damage all life stages. Try using a gentle cleanser, like Cetaphil®, and blow dry hair for 15-20 minutes. Repeat every 7 days for 3 weeks. The use of a hair dryer on high heat can destroy eggs and nymphs (be careful not to burn the scalp!). Egg removal with a lice comb on "hot" hair can be easier.

<sup>1</sup> Image courtesy of Jack Weckstein ([http://fm1.fieldmuseum.org/aa/staff\\_page.cgi?staff=jweckstein](http://fm1.fieldmuseum.org/aa/staff_page.cgi?staff=jweckstein)).

<sup>2</sup> Images courtesy Minnesota Department of Health ([www.health.state.mn.us/divs/idepc/diseases/headlice/treatment.html](http://www.health.state.mn.us/divs/idepc/diseases/headlice/treatment.html)).

<sup>3</sup> Images courtesy of Vincent S. Smith, University of Glasgow ([www.eurekalert.org/pub\\_releases/2004-10/uou-ola092704.php](http://www.eurekalert.org/pub_releases/2004-10/uou-ola092704.php)).

<sup>4</sup> Image courtesy of H. D. Pratt and K. S. Littig. 1977. Lice of Public Health Importance and Their Control, Center for Disease Control Publication 77-8265.

<sup>5</sup> Image courtesy Clay Scherer, University of Florida ([http://creatures.ifas.ufl.edu/urban/human\\_lice.htm](http://creatures.ifas.ufl.edu/urban/human_lice.htm)).

**Precautionary Statement:** All pesticides have benefits and risks, however following the label will maximize the benefits and reduce risks. Pay attention to the directions for use and follow precautionary statements. Pesticide labels are considered legal documents containing instructions and limitations. Inconsistent use of the product or disregarding the label is a violation of both federal and state laws. The pesticide applicator is legally responsible for proper use.

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