

## What are head lice?

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.



## Who is at risk for getting head lice?

Head lice are found worldwide. In the United States, infestation with head lice is most common among pre-school children attending child care, elementary school children, 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 can also happen. Personal hygiene or cleanliness in the home or school has nothing to do with getting head lice.

## What do head lice look like?

Head lice have three forms: the egg (also called nit), the nymph, and the adult.



Actual size of the three lice forms compared to a penny. (CDC Photo)



Illustration of egg on a hair shaft. (CDC Photo)

**Egg/Nit:** Nits are lice eggs laid by the adult female head louse at the base of the hair shaft nearest the scalp. Nits are firmly attached to the hair shaft and are oval-shaped and very small (about the size of a knot in thread) and hard to see. Nits often appear yellow or white although live nits sometimes appear to be the same color as the hair of the infested person. Head lice nits usually take about 8–9 days to hatch.



Nymph form. (CDC Photo)

**Nymph:** A nymph is an immature louse that hatches from the nit. A nymph looks like an adult head louse, but is smaller. To live, a nymph must feed on blood. Nymphs mature into adults about 9–12 days after hatching from the nit.



Adult louse. (CDC Photo)

**Adult:** The fully grown and developed adult louse is about the size of a sesame seed, has six legs, and is tan to grayish-white in color. Adult head lice may look darker in persons with dark hair than in persons with light hair. To survive, adult head lice must feed on blood. An adult head louse can live about 30 days on a person's head but will die within one or two days if it falls off a person. Adult female head lice are usually larger than males and can lay about six eggs each day.

### **Where are head lice most commonly found?**

Head lice and head lice nits are found almost exclusively on the scalp, particularly around and behind the ears and near the neckline at the back of the head. Head lice or head lice nits sometimes are found on the eyelashes or eyebrows but this is uncommon. Head lice hold tightly to hair with hook-like claws at the end of each of their six legs. Head lice nits are

cemented firmly to the hair shaft and can be difficult to remove even after the nymphs hatch and empty casings remain.

### **What are the signs and symptoms of head lice infestation?**

Tickling feeling of something moving in the hair.

Itching, caused by an allergic reaction to the bites of the head louse.

Irritability and difficulty sleeping; head lice are most active in the dark.

Sores on the head caused by scratching. These sores can sometimes become infected with bacteria found on the person's skin.

### **How did my child get head lice?**

Head-to-head contact with an already infested person is the most common way to get head lice. Head-to-head contact is common during play at school, at home, and elsewhere (sports activities, playground, slumber parties, camp).

Although uncommon, head lice can be spread by sharing clothing or belongings. This happens when lice crawl, or nits attached to shed hair hatch, and get on the shared clothing or belongings.

#### **Examples include:**

Sharing clothing (hats, scarves, coats, sports uniforms) or articles (hair ribbons, barrettes, combs, brushes, towels, stuffed animals) recently worn or used by an infested person; or lying on a bed, couch, pillow, or carpet that has recently been in contact with an infested person.

Dogs, cats, and other pets do not play a role in the spread of head lice.

### **Can head lice be spread by sharing sports helmets or headphones?**

Head lice are spread most commonly by direct contact with the hair of an infested person. Spread by contact with inanimate objects and personal belongings may occur but is very uncommon. Head lice feet are specially adapted for holding onto human hair. Head lice would have difficulty attaching firmly to smooth or slippery surfaces like plastic, metal, polished synthetic leathers, and other similar materials.

### **Head lice treatments: The FCDC has determined that regardless of the labeling there is no lice treatment that kills all the nits.**

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); however, such additional (non-pharmacologic) measures generally are not required to eliminate a head lice infestation. 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. Follow these treatment steps:

1. Before applying treatment, it may be helpful to remove clothing that can become wet or stained during treatment.
2. 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.

**WARNING:**

Do not use a combination shampoo/conditioner, or conditioner before using lice medicine. Do not re-wash the hair for 1–2 days after the lice medicine is removed.

3. Have the infested person put on clean clothing after treatment.
4. If a few live lice are still found 8–12 hours after treatment, but are moving more slowly than before, do not retreat. The medicine may take longer to kill all the lice. Comb dead and any remaining live lice out of the hair using a fine-toothed nit comb.
5. If, after 8–12 hours of treatment, no dead lice are found and lice seem as active as before, the medicine may not be working. Do not retreat until speaking with your health care provider; a different pediculicide may be necessary. If your health care provider recommends a different pediculicide, carefully follow the treatment instructions contained in the box or printed on the label.
6. Nit(head lice egg) combs, often found in lice medicine packages, should be used to comb nits and lice from the hair shaft. Many flea combs made for cats and dogs are also effective.
7. After each treatment, checking the hair and combing with a nit comb to remove nits and lice every 2–3 days may decrease the chance of self-reinfestation. Continue to check for 2–3 weeks to be sure all lice and nits are gone.

8. Retreatment is meant to kill any surviving hatched lice before they produce new eggs. For some drugs, retreatment is recommended routinely about a week after the first treatment (7–9 days, depending on the drug) and for others only if crawling lice are seen during this period. Retreatment with lindane shampoo is not recommended.

**Supplemental Measures:** Head lice do not survive long if they fall off a person and cannot feed. You don't need to spend a lot of time or money on housecleaning activities. Follow these steps to help avoid re-infestation by lice that have recently fallen off the hair or crawled onto clothing or furniture.

1. Machine wash and dry clothing, bed linens, and other items that the infested person wore or used during the 2 days before treatment using the hot water (130°F) laundry cycle and the high heat drying cycle. Clothing and items that are not washable can be dry-cleaned OR sealed in a plastic bag and stored for 2 weeks.
2. Soak combs and brushes in hot water (at least 130°F) for 5–10 minutes.
3. Vacuum the floor and furniture, particularly where the infested person sat or lay. However, the risk of getting infested by a louse that has fallen onto a rug or carpet or furniture is very small. Head lice survive less than 1–2 days if they fall off a person and cannot feed; nits cannot hatch and usually die within a week if they are not kept at the same temperature as that found close to the human scalp. Spending much time and money on house cleaning activities is not necessary to avoid reinfestation by lice or nits that may have fallen off the head or crawled on to furniture or clothing.
4. Do not use fumigant sprays; they can be toxic if inhaled or absorbed through the skin.

### **Over-the-counter Medications**

Many head lice medications are available "Over-the-counter" without a prescription at a local drug store or pharmacy. Each Over-the-counter product approved by the FDA for the treatment of head lice contains one of the following active ingredients. If crawling lice are still seen after a full course of treatment contact your health care provider.

1. **Pyrethrins** combined with piperonyl butoxide;  
Brand name products: A-200\*, Pronto\*, R&C\*, Rid\*, Triple X\*.

Pyrethrins are naturally occurring pyrethroid extracts from the chrysanthemum flower. Pyrethrins are safe and effective when used as directed. Pyrethrins can only kill live lice, not unhatched eggs (nits). A second treatment is recommended 9 to 10 days after the first treatment to kill any newly hatched lice before they can produce new eggs. Pyrethrins generally should not be used by persons who are allergic to chrysanthemums or ragweed. Pyrethrin is approved for use on children 2 years of age and older.

2. **Permethrin lotion, 1%**;  
Brand name product: Nix\*.

Permethrin is a synthetic pyrethroid similar to naturally occurring pyrethrins. Permethrin lotion 1% is approved by the FDA for the treatment of head lice. Permethrin is safe and effective when used as directed. Permethrin kills live lice but not unhatched eggs. Permethrin may continue to kill newly hatched lice for several days after treatment. A second treatment often is necessary on day 9 to kill any newly hatched lice before they can produce new eggs. Permethrin is approved for use on children 2 months of age and older.

## Prescription Medications

The following medications, in alphabetical order, approved by the U.S. Food and Drug Administration (FDA) for the treatment of head lice are available only by prescription. If crawling lice are still seen after a full course of treatment, contact your health care provider.

- **Benzylalcohol lotion, 5%;**  
Brand name product: Ulesfia lotion\*

Benzyl alcohol is an aromatic alcohol. Benzyl alcohol lotion, 5% has been approved by the FDA for the treatment of head lice and is considered safe and effective when used as directed. It kills lice but it is not ovicidal. A second treatment is needed 7 days after the first treatment to kill any newly hatched lice before they can produce new eggs. Benzyl alcohol lotion is intended for use on persons who are 6 months of age and older and its safety in persons aged more 60 years has not been established. It can be irritating to the skin.

- **Ivermectinlotion, 0.5%;**  
Brand name product: Sklice\*

Given as a tablet in mass drug administrations, ivermectin has been used extensively and safely for over two decades in many countries to treat filarial worm infections. Ivermectinlotion, 0.5% was approved by the FDA in 2012 for treatment of head lice in persons 6 months of age and older. It is not ovicidal, but appears to prevent nymphs (newly hatched lice) from surviving. It is effective in most patients when given as a single application on dry hair without nit combing. It should not be used for retreatment without talking to a healthcare provider.

- **Malathionlotion, 0.5%;**  
Brand name product: Ovide\*

Malathion is an organophosphate. The formulation of malathion approved in the United States for the treatment of head lice is a lotion that is safe and effective when used as directed. Malathion is pediculicidal (kills live lice) and partially ovicidal (kills some lice eggs). A second treatment is recommended if live lice still are present 7–9 days after treatment. Malathion is intended for use on persons 6 years of age and older. Malathion can be irritating to the skin. Malathion lotion is flammable; do not smoke or use

electrical heat sources, including hair dryers, curlers, and curling or flat irons, when applying malathion lotion and while the hair is wet.

- **Spinosad 0.9% topical suspension;**  
Brand name product: Natroba\*

Spinosad is derived from soil bacteria. Spinosad topical suspension, 0.9%, was approved by the FDA in 2011. Since it kills live lice as well as unhatched eggs, retreatment is usually not needed. Nit combing is not required. Spinosad topical suspension is approved for the treatment of children 4 years of age and older. It is safe and effective when used as directed. Repeat treatment should be given only if live (crawling) lice are seen 7 days after the first treatment.

### **When treating head lice**

1. Do not use extra amounts of any lice medication unless instructed to do so by your physician and pharmacist. The drugs used to treat lice are insecticides and can be dangerous if they are misused or overused.
2. All the medications listed above should be kept out of the eyes. If they get into the eyes, they should be immediately flushed away.
3. Do not treat an infested person more than 2–3 times with the same medication if it does not seem to be working. This may be caused by using the medicine incorrectly or by resistance to the medicine. Always seek the advice of your health care provider if this should happen. He/she may recommend an alternative medication.
4. Do not use different head lice drugs at the same time unless instructed to do so by your physician and pharmacist.

### **Alternative LICE Treatment**

Over-the-counter pediculicidal products are potentially dangerous, particularly with repeated use. The Public Health Department suggests the following alternative:

1. **Recommended Natural Remedies:** Treat with food-grade oils (Olive oil, mayonnaise, miracle whip) or hair gels (Vaseline).
  - The theory is lice and nits are suffocated by the coating of the oil or gel.
  - The infested head should be covered liberally in the oil or gel and kept on the hair for the night or an 3-4 hour period. You can cover the hair with a plastic bag to aid in this.
  - Comb out the hair before you remove the oil or gel. The hair can then be rinsed with food grade vinegar to help remove the oil or gel from the hair and loosen the glue that holds the nits (eggs) to the hair shaft.
  - Recommended treatment days have been carefully timed to coincide with the life cycle of the louse. **This treatment should be done on days 1, 2, 5, 9, 13, 17 & 21.**

- The only adverse effect of this remedy is that the oils and gels can be difficult to completely wash out of the hair.
2. **Nit Removal:** Manual nit removal is a safe alternative to the use of lice-killing pesticides and a necessary component to any head lice treatment program. Removal of all nits assures total lice treatment.
- Work under a good light (magnifying glass is helpful). Black lights have also been found to be effective.
  - Separate hairs into sections and remove all attached nits with a lice comb first then your fingernails. Soaking the hair with a mixture of ½ vinegar and ½ water may help loosen nits for easier removal. Use a paper towel to remove any lice, nits or debris from the comb between combings. Be sure to dispose of the paper towel carefully in a plastic bag.
3. **Environmental Clean-Up:** Cold, heat and isolation kill lice.
- Every surface in the home and car that has touched a head (or touched an object that has touched a head) must be cleaned.
  - Wash clothing and bedding (including bedspreads, pillows and mattress covers) in hot water, tumble in the dryer on a hot cycle.
  - Clothing, bedding, and soft toys that cannot be safely washed in hot water should be double-bagged in plastic bags, sealed tightly, and put away for at least two weeks. After at least two weeks follow normal washing instructions.
  - Soak all combs, brushes, and hair accessories in scalding hot water for 10 minutes
  - Vacuum all furniture, carpets, mattresses, and the car. Remove the vacuum bag after use; enclose the bag in a plastic bag.
  - Lice insecticide sprays and powders for carpets, furniture and floors are not recommended by the Federal Centers for Disease Control.
4. **Prevention: Re-Check For Nits On A Daily Basis:** Routine screening and early detection is the best and only prevention. Parental screening for head lice should be a regular part of personal hygiene, done routinely just like brushing teeth. Being consistent and diligent about screening and manual removal will go a long way toward controlling the problem.

The following recipe has been used by several of our families and they have found it to work very well:

- 2 ounces Vegetable oil
- 20 drops Tea Tree Essential oil(Melaleuca)
- 10 drops Rosemary Essential oil
- 10 drops Lavender Essential oil
- 10 drops Lemon Essential oil



To use, combine the ingredients and perform a skin test. If no sensitivity is experienced, apply the mixture to dry hair. Cover hair with a shower cap or plastic bag. Leave the mixture on for 1-2 hours. Shampoo the hair 2-3 times to remove the oil.

To prevent the return use 1-2 drops on the scalp daily.

**It is very important to remember....**

- All lice-killing products or pediculicidal products are pesticides. Follow directions carefully and use with caution.
- Overuse of anti-lice pesticides has caused insect resistance similar to the current situation with some bacteria and antibiotics.
- **More is not better-more is potentially dangerous.**

**The Federal Center for Disease Control has determined:**

- **Regardless what the claims on the pesticides may say they do not completely kill the nits (eggs).**
- **The only way to get rid of the nits is to remove them all by hand. If any nits are left they will hatch.**