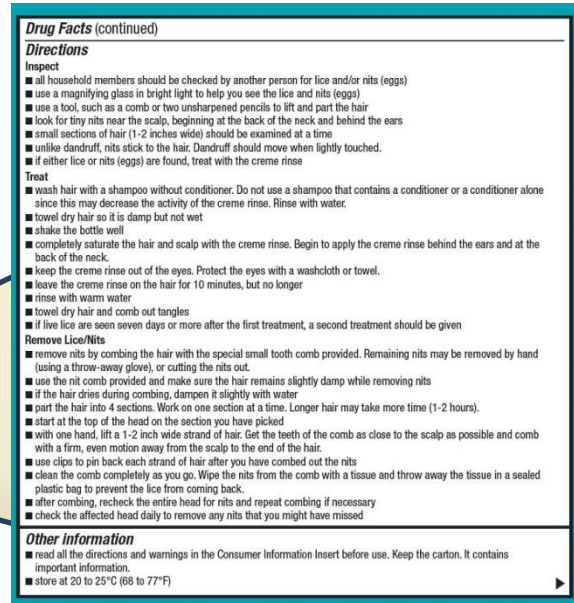


Treatment With Pediculicides

Pediculicides

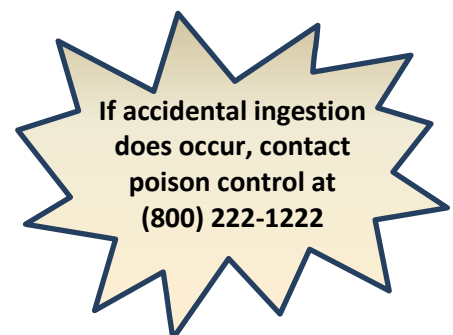
Pediculicides are substances or agents used to kill head lice. There are many medicated products available for treatment of head lice, and they normally come in the form of shampoos. Most are available over the counter, but some are by prescription only and may be reimbursable through insurance.

All products must be used strictly in accordance with label directions to ensure effectiveness and prevent adverse reactions from overuse or misuse. When used properly, their effectiveness has been reported to be 80-95 percent. Repeat treatment with the pediculicide in 7 to 10 days may be needed if indicated on the product label. (See “Safety and Precautions”)



Important Things to Know About Pediculicides

- Never treat unless there is definite evidence of head lice. Pediculicides are to be used for the treatment of head lice only when there are active lice or viable nits present in the hair, or when individuals share the same bed with someone who has live lice or viable nits.
 - **They should not be used as routine shampoo or conditioner.**
- These products **do not prevent** someone from getting head lice.
- No product is 100 percent effective at getting rid of lice and their eggs
 - Head lice infestations will be resolved more quickly by manually removing or combing nits within one quarter inch of the scalp after treatment. This will prevent eggs not killed during treatment from hatching. Nits further than one quarter inch from the scalp have likely hatched or are not viable.
 - A second treatment may be required as recommended on the product label.
- Non-prescription pediculicidal products generally are effective and safe if used according to the manufacturers' directions. **To ensure proper treatment, follow all recommendations and directions on the label.** All safety precautions listed on the product label should be observed.
- **Pediculicidal products are for external use only, and should only be applied to the scalp.** These products are harmful if swallowed or inhaled.



Treatment With Pediculicides

The following will describe active ingredients, brief instructions, and precautions for over-the-counter pediculicides and prescription pediculicides:

OVER THE COUNTER (OTC) PEDICULICIDES

Permethrin (1%) – Nix

- Manufactured as a synthetic pyrethroid, permethrin 1% is currently the recommended treatment of choice by the American Academy of Pediatrics (AAP) for head lice in newly diagnosed cases.
- It is indicated in treatment of head lice for those individuals' ages two months and older.
- Permethrin has low toxicity and does not cause allergic reactions in individuals with plant allergies.
- The product is a cream rinse applied to hair that is first shampooed with a non-conditioning shampoo and then towel dried. It is left on for 10 minutes and then rinsed off. It leaves a residue on the hair that is designed to kill nymphs emerging from the 20-30 percent of eggs not killed with the application. In order not to remove the residue, the hair should be rinsed with plain water after application in a sink rather than the bathtub to limit exposure and with cool rather than hot water to minimize chemical absorption through the scalp.
- It is suggested that the application be repeated if live lice are seen 7 to 10 days later. Many experts recommend routine re-treatment (preferably on day 9).

Pyrethrins plus Piperonyl Butoxide – RID, A-200, R&C. Pronto. Clear Lice System



- Manufactured from natural extracts from the chrysanthemum, pyrethrins plus piperonyl butoxide has low toxicity for people, but is neurotoxic to lice.
- It is indicated in treatment of head lice for those individuals aged two years and older.
- Pyrethrins should be avoided in persons allergic to chrysanthemums or who suffer from asthma.
- The labels warn against possible allergic reaction in patients who are sensitive to ragweed, but modern extraction techniques minimize the chance of product contamination, and reports of true allergic reactions are rare.
- These products are mostly shampoos that are applied to dry hair and left on for 10 minutes before rinsing. All topical pediculicides should be rinsed from the hair over a sink rather than in the shower or bathtub to limit exposure. Rinsing should be done with cool rather than hot water to minimize chemical absorption through the scalp.
- None of these natural pyrethrins are totally ovicidal (have the ability to kill a louse through the egg before hatching), as newly laid eggs do not have a nervous system for several days; 20-30 percent of the eggs may remain viable after treatment.
- A second treatment is necessary 7 to 10 days after first treatment to kill newly emerged nymphs hatched from eggs that survived the first treatment.



Treatment With Pediculicides

PRESCRIPTION PEDICULICIDES

Malathion (0.5%) – Ovide

- The organophosphate (Cholinesterase inhibitor) 0.5% malathion was reintroduced to the U.S. market as a head lice treatment in 1999.
- It is indicated in treatment of head lice for those individuals aged six years and older.
- Available as a lotion that is applied to the hair, left to air dry, then washed off after 8 to 12 hours (although some studies suggest effectiveness when left on for as short a time as 20 minutes).
- Malathion has high ovicidal activity and a single application is adequate for most individuals, but the product should be reapplied if live lice are still seen in 7 to 9 days.
- **A concern about this product is its high alcohol content (78% isopropyl alcohol), making it potentially flammable. Users should be instructed not to use hair dryers, curling irons or flat irons while the hair is wet, and not to smoke near a person receiving treatment.**
- There is a risk of severe respiratory depression if accidentally ingested, although no such cases have been reported.



Benzyl Alcohol Lotion (5%) – Ulesfia

- Approved in 2009, this product kills head lice by asphyxiation.
- It is indicated in treatment of head lice for those individuals aged six months and older.
- The product is to be applied topically to the scalp for 10 minutes and repeated in 7 days (retreating in 9 days is optimal).
- The most common adverse effects include pruritis, erythema, pyoderma, and ocular irritation.
- Benzyl alcohol is not ovicidal (have the ability to kill a louse through the egg before hatching).

Ivermectin Lotion (0.5%) – Sklice

- Applied as a topical lotion, this product affects the nerve cells of lice, causing paralysis and death of lice.
- It is indicated in treatment of head lice for those individuals aged six months and older.
- Applied to dry hair in an amount sufficient (up to one tube) to thoroughly coat the hair and scalp for 10 minutes and then rinsed with plain water.
- Ivermectin is both pediculicidal and partially ovicida.
 - Sklice may be a one-time treatment – retreatment may not be necessary. In a study, 73.8 percent of individuals who received one treatment remained lice free after 15 days.
- Common side effects include eye redness or irritation, dandruff, dry skin, or burning sensation of the skin.



Spinosad Suspension (0.9%) - Natroba

- Topical suspension with active ingredient of spinosad which causes neuronal excitement leading to paralysis and death of lice.
- It is indicated in treatment of head lice for those individuals aged four years and older.

Treatment With Pediculicides

- Product is applied to dry hair and scalp. Once washed off, a fine-toothed comb may be used to remove treated lice and nits from the hair and scalp.
- Use product in one or two treatments that are one week apart. If live lice are seen one week (7 days) after first use, re-treat.
- Contains benzyl alcohol. Common side effects include eye and scalp redness and irritation.

TOPICAL REACTIONS TO PEDICULICIDE TREATMENT

Itching or mild burning of the scalp caused by inflammation of the skin in response to topical therapeutic agents can persist for many days after lice are killed and are not a reason for re-treatment. Topical corticosteroids (i.e., hydrocortisone creams) and oral antihistamines (i.e., Benadryl®) may be beneficial for relief of these symptoms. ***Please consult with the child's health care provider or pharmacist before starting any topical therapies.***

TREATMENT FAILURE

None of the current pediculicides are 100 percent ovicidal (effective at killing nits), and resistance has been reported with pyrethrins and permethrin* products. This is not unusual, as insects can develop resistance to products over time. Resistance will vary from one community to another.

When faced with a persistent case of head lice, consider several possible explanations, including:

- Misdiagnosis (no active infestation or misidentification)
- Noncompliance (not following treatment protocol or directions per manufacturer's label)
- Re-infestation (lice reacquired after treatment)
- Failure to treat all affected family members or close contacts at the same time
- Resistance of lice to the pediculicide

Many cases of suspected resistance represent either misdiagnosis of old nits as active cases or a re-infestation. Individuals who are chronically infested and have been treated multiple times with pyrethroid shampoos are more likely to have resistant cases.

Although Permethrin 5% lotion has been tried for suspected resistant cases, it is unlikely that an increased concentration or prolonged application time would be effective in cases of true resistance to Permethrin 1%. Studies have shown that resistance to Permethrin is not dose-dependent.*

NIT REMOVAL AFTER TREATMENT WITH A PEDICULICIDE



Nit on hair strand magnified x70.

Because none of the pediculicides are 100 percent ovicidal, manual removal of nits after treatment should be done to reduce worries of another lice infestation or for cosmetic reasons.

Adult female lice lay their eggs (nits) close to the scalp so the new louse can eat as soon as it hatches (otherwise it dies quickly). Nits are attached to the hair shaft with a glue-like substance, making them very difficult to remove.

*Durand et al. (20122). Insecticide resistance in head lice: clinical, parasitological and genetic aspects. Clin Microbiol Infect., (4):338-344.

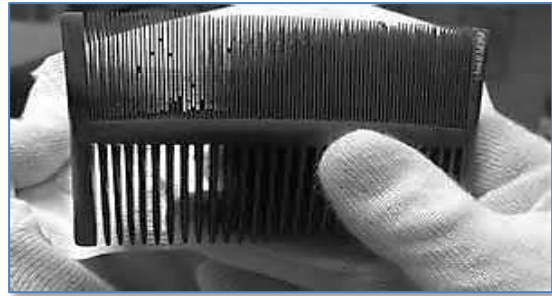
Treatment With Pediculicides

To remove nits after a treatment is done, use a lice comb, combing small sections of wet hair at a time. Combing the hair when wet with the lice comb is a good way to find evidence of lice and remove nits.

(See *“Manual Removal of Lice and Nits”*)



If nits are found within one quarter inch of the scalp, they should be removed as they are potentially viable eggs that were not killed during treatment.



Quick Facts

While the comb is a good tool to use, it is important to know that the nits may need to be removed by manually pulling them off the hair shaft, particularly if nits are found one quarter inch from the scalp