

OVERVIEW OF TREATMENTS AND INTERVENTIONS

(Also available directly on the [Health Office](#) page)

Ovicides kill nits (eggs) and Pediculicides kill live lice. Some preparations kill both. Information below is from the [American Academy of Pediatrics Clinical Report on Head Lice](#).

1. **Topical Agents:** shampoos, creams, lotions

- a. **Permethrin and Pyrethrin** – Pediculicidal (kills live lice) only, not ovicidal (does not kill nits)
 - i. Permethrin and Pyrethrin are neurotoxic to lice. They are not ovicidal because newly laid eggs do not have a nervous system for several days, thus 20% to 30% of eggs remain viable after treatment, which necessitates a second treatment to kill newly emerged nymphs hatched from eggs that survived the first treatment.
 - ii. Repeat the application sometime between days 7-10 after treatment if live lice are seen, new evidence based on the life cycle of lice suggests that retreatment at day 9 is optimal.
 - iii. An alternate treatment schedule on days 0,7 and 13-15 has been proposed on the basis of the longest possible life cycle of lice for this and other non-ovicidal agents.
 - iv. Although Permethrin and Pyrethrin were extremely effective when introduced, recent studies indicate that efficacy has decreased substantially because of development of resistance. The prevalence of resistance has not been systematically studied but seems to be highly variable from community to community and country to country.
 - v. Permethrin 1% (Nix) – introduced in 1986 by prescription and approved for OTC in 1990
 1. Applied to damp hair that is first shampooed with a non-conditioning shampoo and then towel dried.
 2. Left on for 10 minutes and then rinsed off.
 3. Permethrin leaves a residue on the hair that is designed to kill nymphs emerging from the 20% to 30% of eggs not killed with the first application.
 4. Conditioners and additives present in almost all currently available shampoos impair Permethrin adherence to the hair shaft and reduce its residual effect.
 5. Resistance to Permethrin has been reported but its prevalence is unknown.
 - vi. Pyrethrin Plus Piperonyl Butoxide (RID)- OTC
 1. Natural extract from chrysanthemums.
 2. Available in shampoo or mousse formulations that are applied to dry hair and left on for 10 minutes before rinsing out.
 3. No residual pediculicide activity remains after rinsing.
- b. **Malathion 0.5%** (Ovide) – available by prescription, pediculicidal and ovicidal.
 - i. Lotion applied to dry hair, left to air dry, then washed off after 8-12 hours, although some study results have suggested effectiveness when left on for as short a time as 20 minutes.

- ii. Malathion has high ovicidal activity and a single application is adequate for most but should be reapplied in 7-9 days if live lice are still seen.
 - iii. Safety and effectiveness of malathion have not been established in children younger than 6 years.
 - c. **Spinosad 0.9%** (Natroba) – available by prescription
 - i. Neurotoxic to live lice and lingers long enough to exert toxic effects on larvae after they develop nervous system.
 - ii. Applied to dry hair by saturating the scalp and working outward to the ends of the hair, then rinsed 10 minutes after application.
 - iii. A second treatment is given at 7 days if live lice are seen.
 - iv. Safety in children younger than 4 years has not been established.
 - d. **Vermeectin 0.5%** (Sklice) – available by prescription
 - i. Neurotoxic to live lice and, while not ovicidal per se, when the treated eggs hatch, the lice are not able to feed as a result of paralysis and die.
 - ii. One application is required.
 - iii. Should not be used in neonates (<6 months)
2. **Manual Removal:** Because none of the pediculicides are 100% ovicidal, nits should be removed manually after treatment with any product, especially the ones within 1 cm of the scalp. Nit removal can be difficult and tedious. Fine-toothed “nit combs” are available to make the process easier. Nit-removal combs are sold commercially. However, it appears the type of comb used is less important than that combing occurs after treatment, which may be most easily accomplished on wet hair. Studies have suggested that lice removed by combing and brushing are damaged and rarely survive.
3. **Other Remedies:**
- a. **Natural Agents:** Such as essential oils have been widely used in traditional medicine for the eradication of head lice, but because of the variability of their constitution, the effects may not be reproducible. In addition, these oils (e.g., ylang ylang oil) may be a source of contact sensitization, which limits their use. Several products have been studied (e.g., Andiroba oil, Quassia vinegar, Melaleuca oil [tea tree oil], lavender oil).
 - i. As natural products, they are not regulated by the FDA and are not required to meet FDA efficacy and safety standards for pharmaceuticals.
 - ii. Although many plants naturally produce insecticides for their own protection that may be synthesized for use by humans, such as pyrethroids, some of these insecticidal chemicals produce toxic effects as well.
 - b. **Occlusive Agents:** Such as “petrolatum shampoo”, mayonnaise, butter or margarine, herbal oils, and olive oil, applied to suffocate the lice are widely used but have not been evaluated for effectiveness in randomized controlled trials. To date, only anecdotal information is available concerning effectiveness.
 - c. **Manual Removal (exclusively):** There is little peer-reviewed information in the literature about the benefits of the manual removal of live lice and nits, the inherent safety of the manual removal relative to the minor toxicity of the pesticides is real.
4. **Highly flammable substance, such as gasoline or kerosene, or products intended for animal use, are never appropriate in treatment of head lice in humans.**
5. **Environmental Interventions**
- a. If a person is identified with head lice, all household members should be checked for head lice, and those with live lice or nits within 1 cm of the scalp should be treated.
 - b. It is prudent to treat family members who share a bed with the person infested, even if no live lice are found.

- c. Fomite transmission (inanimate object/substance) is less likely than transmission by head-to-head contact: however it is prudent to clean hair care items and bedding used by the individual infested.
- d. Only items that have been in contact with the head of the person infested in the 24-48 hours before treatment should be considered for cleaning, given the fact that louse survival off the scalp beyond 48 hours is extremely unlikely. Such items may include clothing, headgear, furniture, carpeting, and rugs. Washing, soaking, or drying items at temperatures greater than 130F will kill stray lice or nits. Furniture, carpeting, car seats, and other fabrics or fabric-covered items can be vacuumed.
- e. Viable nits are unlikely to incubate and hatch at room temperatures; if they did, the nymphs would need to find a source of blood for feeding within hours of hatching.
- f. Although it is rarely necessary, items that cannot be washed can be bagged in plastic for 2 weeks, a time when any nits that may have survived would have hatched and nymphs would die without a source for feeding.
- g. Exhaustive cleaning measures are not beneficial.

6. School Interventions

a. Screening and Education

- i. Routine classroom or school wide screening is discouraged due to lack of efficacy.
- ii. Screening for nits alone is not an accurate way of predicting which children are or will become infested, and screening for live lice has not been proven to have a significant effect on the incidence of head lice in a school community over time. In addition, such screening has not been shown to be cost-effective.
- iii. In a prospective study of 1729 school children screened for head lice, only 31% of the 91 children with nits had a concomitant live lice. Only 18% of those with nits alone converted to having an active infestation during 14 days of observation.
- iv. Although children with at least 5 nits within 1 cm of the scalp were significantly more likely to develop an infestation than were those with fewer nits, 32% vs 7%, only one-third of the children at higher risk converted to having an active infestation. School exclusion of children with nits alone would have resulted in many of these children missing school unnecessarily.

b. **Parents are encouraged to check their children's heads for lice regularly and if the child is symptomatic. School screenings do not take the place of these more careful parental checks.**

c. Criteria for Return to School

- i. A child should not be restricted from school attendance because of lice, head lice have low contagion within classrooms.
- ii. The American Academy of Pediatrics and the National Association of School Nurses discourage No-Nit policies that exclude children from school.