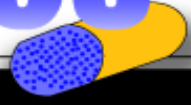




DUR Capsules



News and Information for West Virginia Providers from the West Virginia Bureau for Medical Services (WVBS)

Pediculosis Capitus Treatment Review for Clinicians March, 2014 Larry Dent, PharmD, BCPS

Introduction

Lice are ectoparasites that live on the body and feed on human blood. Different species of lice prefer to feed on certain locations on the body of the host. Species include *Pediculosis capitis* (head lice), *Pediculosis corporis* (body lice), and *Pediculosis pubis* or *Pthirus pubis* (pubic lice).¹ *Pediculosis capitis* or head lice are the most common cause of lice infestation and will be the focus of this article.

Head lice affect 6 to 12 million Americans annually, with most cases involving children 3 to 11 years of age.² Head lice are usually spread from one person to another through close personal contact or less commonly by sharing personal items such as hats, hairbrushes, combs, linens, clothes, and other fomites.^{1,2,3,4} Outbreaks are common in places, such as schools and day care centers. In one study, approximately one of every four elementary-level students in the United States had head lice.² All socioeconomic groups are affected. Males are affected less frequently than females and African-American children are affected much less frequently than whites probably due to the unique oval structure of their hair shafts that make it more difficult for lice to attach to the hair.² Head lice create problems such as pruritus, but do not contribute to the spread of other diseases in the United States.⁴

Although head lice can be unpleasant, there are effective treatment options available. It is important to find and treat lice quickly and effectively, to avoid infesting others.²

Head Lice Description

The head louse is a tiny, grayish-white insect. Female head lice typically live for about one month and lay seven to ten eggs per day. The lice egg or nit is about one mm in diameter and is yellowish or grayish-white. The eggs are attached to the base of a hair, near the scalp. The eggs hatch after about eight to nine days. Once hatched, the nymph must begin feeding within 24 hours or it dies. A nymph looks like an adult, but is much smaller. Nymphs mature into adults about nine to twelve days after hatching from the nit. Without treatment this cycle may repeat every three weeks.^{2,3}

After the eggs hatch, the egg cases become easier to see. Since the eggs are firmly attached to the hair, they move away from the scalp as the hair grows. Head lice do not jump or fly, and they cannot spread from person to person by attaching to pets.^{2,3}

Symptoms

Most people with head lice do not have any symptoms. Some people feel itching or skin irritation of the scalp, neck, and ears. This is caused by a reaction to lice saliva, which the lice inject into the skin during feeding. Itching and subsequent scratching may result in secondary infection.³

Diagnosis

Head lice are diagnosed by examination of the scalp and hair. Special fine-toothed nit combs can be used to assist with the diagnosis. The comb is placed at the top of the head touching the scalp and pulled through the hair from roots to ends. After each stroke, the comb should be carefully examined for lice or nits. This can be done while the hair is wet or dry. If the hair is wet, apply hair conditioner to make the hair easier to comb.³

Finding nits without lice does not necessarily mean that there is an active infestation; nits can be found for months after lice are treated. Because lice lay eggs at the base of the hair shaft, the identification of nits within ¼ inch of the scalp suggests an active infestation.^{2,3}

Lice can be more difficult to see than nits since they can move and hide from view. An examination using an ultraviolet (UV) lamp can aid in finding lice. UV light makes adult lice fluoresce yellow-green and nits glow opalescent white.³

General Treatment Guidelines

Treatment for head lice is recommended for persons diagnosed with an active infestation. All household members and other close contacts should be checked and treated if an active infestation is present. Some experts believe prophylactic treatment is warranted for persons who share the same bed with actively-infested individuals.² Over-the-counter (OTC) topical pediculocides are preferred as first-line therapy because of safety.⁴

A topical **pediculocide** is a substance, usually a lotion or gel that is applied to the scalp to kill lice. Additionally, for **pediculocides** that are non-ovicidal or weakly ovicidal, routine retreatment is recommended to kill newly hatched nymphs. For **pediculocides** that are more strongly ovicidal, retreatment is recommended only if live lice are still present several days after treatment. Pediculocides continue to kill newly hatched lice for several days after treatment, so it is important not to re-wash the hair for several days after the product is removed. To be most effective, retreatment should occur after all eggs have hatched, but before new eggs are produced, so timing of treatment is important. Educating the patient regarding the life cycle of lice and limitations of the pediculocide is recommended to ensure compliance with the re-treatment step.²

Patients should follow the manufacturer's instructions for applying the **pediculicide** carefully. Specifically, patients should first wash their hair with shampoo, rinse it, and towel-dry it, then apply the **pediculicide** shampoo or lotion liberally to the scalp and leave on for ten minutes before rinsing with water. Malathion (Ovide) should be left on the scalp for eight to twelve hours or overnight. If the infested person has longer than shoulder length hair, it may be necessary to use a second bottle.²

Nit combs, often found in lice medicine packages, should be used to comb nits and lice from the hair shaft after treatment. Using a nit comb to remove nits and lice every two to three days for two to three weeks may decrease the chance of self-reinfestation. Nit removal is not needed when treating with spinosad topical suspension.²

Instruct patients to follow directions carefully to ensure that the treatment is effective. Poor follow through with instructions is the most common cause of treatment failure. Spending time with patients providing detailed instructions regarding the application and timing of medications used in the treatment of lice is important for the successful treatment of head lice.²

Pharmacologic Therapy

OTC remedies include pyrethrins with piperonyl butoxide and permethrin lotions. Prescription remedies include benzyl alcohol, ivermectin, malathion, and spinosad lotions.² OTC products should be chosen over

prescription remedies for initial therapy. **Pediculocide** resistance should be confirmed before using a prescription product.⁴

Table 1 provides a list of prescription and OTC remedies for treatment of head lice.

- Pyrethrins are naturally occurring pyrethroid extracts from the chrysanthemum flower. Pyrethrins are pediculocidal, but not ovicidal. A second treatment is recommended nine to ten 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 two years of age and older.²
- Permethrin is a synthetic pyrethroid similar to naturally occurring pyrethrins. Permethrin is pediculocidal, but not ovicidal. A second treatment often is necessary on day nine to kill any newly hatched lice before they can produce new eggs. Permethrin is approved for use on children two months of age and older.²
- Benzyl alcohol is an aromatic alcohol. It is pediculocidal, but not ovicidal. A second treatment is needed seven 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 six months of age and older and its safety in persons aged more than 60 years has not been established. It can be irritating to the skin.²
- Ivermectin was approved by the FDA for treatment of head lice in 2012. It is not ovicidal, but appears to prevent nymphs 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 further evaluation. Ivermectin is approved for use on children six months of age and older.² Oral ivermectin may be an option for individuals whose lice are resistant to topical pediculocide treatment.³
- Malathion is an organophosphate. Malathion is pediculicidal and about 98% ovicidal. A second treatment is recommended if live lice still are present seven to nine days after treatment. Malathion is intended for use on persons six years of age and older. Malathion can be irritating to the skin. Malathion has a bad smell, which can be hard for some people to tolerate. Malathion is flammable; advise patients not to 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.²
- Spinosad is derived from soil bacteria. Spinosad was approved by the FDA for treatment of head lice in 2011. Since it **is** pediculocidal and ovicidal, retreatment is usually not needed. Nit combing is not required. Spinosad is approved for the treatment of children four years of age and older. Repeat treatment should be given only if live lice are seen seven days after the first treatment.²
- Lindane is an organochloride. The American Academy of Pediatrics (AAP) no longer recommends it as a pediculocide. Although lindane shampoo 1% is approved by the FDA for the treatment of head lice, it is not recommended as a first-line treatment due to neurotoxicity. It should be restricted to patients for whom prior treatments have failed or who cannot tolerate other medications that pose less risk. Lindane should not be used to treat premature infants, persons with HIV, a seizure disorder, women who are pregnant or breast-feeding, persons who have very irritated skin or sores where the lindane will be applied, infants, children, the elderly, and persons who weigh less than 110 pounds. Retreatment should be avoided.²

Table 1. Prescription and Non-prescription Remedies for Head Lice

Treatment	Active Ingredient	Usage	Cautions/Warnings
Over-the-Counter			
Nix	Permethrin lotion 1%	For use in children over 2 months of age. Non-ovicidal; repeat treatments are required or recommended by the manufacturer.	Most studied and least toxic to humans. Generally effective and safe if used according to the manufacturer's directions. May cause pruritus, erythema, and edema.
A-200, Pronto, R&C, Rid, Triple X	Piperonyl butoxide lotion 4% Pyrethrum extract (equivalent to 0.33% pyrethrins)	For use in children over 2 years of age. Non-ovicidal; repeat treatments are required or recommended by the manufacturer.	Generally effective and safe if used according to the manufacturer's directions. Avoid if allergic to ragweed or chrysanthemums.
Prescription			
Ovide	Malathion lotion 0.5%	For use in children over 6 years of age. Partially- ovicidal; single application may be adequate for most patients. Repeat if necessary.	Has a bad odor Potentially flammable; use with caution. May cause skin irritation or stinging sensation.
Ulesfia	Benzyl alcohol lotion 5%	For use in children over 6 months of age. Non-ovicidal; repeat treatments are required or recommended by the manufacturer.	May cause eye and scalp redness and irritation. Kills lice by asphyxiation; non-neurotoxic
Sklice	Ivermectin lotion 0.5%	For use in children over 6 months of age. Pediculocidal and Ovicidal; consult with healthcare provider before repeating.	May cause eye redness or irritation, dandruff, dry skin, or burning sensation of the skin.
Natroba	Spinosad lotion 0.9%	For use in children over 4 years of age. Non-ovicidal; repeat treatments may be required or recommended by the manufacturer.	May cause eye and scalp redness and irritation.

Complimentary Therapies

Products containing ingredients such as olive oil, eucalyptus oil, rosemary oil, and pennyroyal oil are being used as pesticide-free alternatives to traditional lice treatments with anecdotal reports of success.⁵ Other oil-based products such as petroleum jelly and mayonnaise are also being used based on the theory that they impair lice respiration; however, these products are not very effective and most likely only slow the movement of lice. Tea tree oil, another alternative treatment, should be used with caution because of potential for contact dermatitis.⁶

Lice treatments that use gasoline or kerosene are dangerous alternatives and should be avoided because of flammability and potential for toxicity.⁷

Nonpharmacologic Therapy

Wet-combing is a way to remove lice from the hair with careful and repeated combing. This may be an option for treating very young children to avoid use of pediculocides. However, it is time consuming and requires multiple repeat treatments over a period of a few weeks. Typically, the hair is wetted and lubricated with a conditioner or cream rinse, vinegar, or olive oil before combing. The combing session may take 15 to 30 minutes to complete, depending on the length and thickness of the hair. The hair should be combed every three to four days for two weeks after finding an adult louse. Shaving of hair is effective, but may not be socially acceptable.³

Preventative Guidelines

Head lice are spread most commonly by direct head-to-head or more specifically by hair-to-hair contact. Less frequently, they are spread by sharing personal items infested with nits or lice from attached hair. The risk of lice infestation from exposure to carpet or furniture is very small. Head lice survive less than one to two days off a human host. Moreover, nits cannot hatch and usually die within a week if they are not kept at the same temperature as the scalp. Spending an inordinate amount of time and money on housecleaning activities is not necessary to avoid reinfestation by lice or nits from furniture or clothing. Fumigant sprays are not recommended due to toxicity.²

Recommendations to avoid lice reinfestation from the environment are as follows:²

- Patients should avoid sharing hats, scarves, pillow cases, bedding, clothing, grooming aids, and towels worn or used by the infested person.
- Clothing, bedding, and towels used within 48 hours before treatment should be washed in hot water (at least 130°F) and dried in an electric dryer on the hot setting. Dry cleaning is also effective. Combs and brushes can be soaked in hot water for 5–10 minutes to kill lice.
- Vacuuming furniture and floors can remove infested hairs that might have viable nits. Items that cannot be washed or vacuumed can be sealed inside a plastic bag for two weeks.

To help control a head lice outbreak in a community, school, or camp, children can be taught to avoid activities that may spread head lice. Children with longer hair should wear it pulled back in a ponytail or braid. In cases of school-wide infestations, the social stigma associated with infestation should be addressed. Poor hygiene is not a risk factor in acquiring head lice. Most experts believe that children with head lice do not need to be removed from school, which has not been shown to reduce the number of infestations.³

Resistance

Resistance has been reported with all topical **pediculosides**, except malathion, limiting treatment options. Factors that may lead to resistance include misdiagnosis and improper use of pediculocides. If a child is misdiagnosed, a **pediculocide** may be unnecessarily used becoming less effective if an infestation does occur. Resistance from improper use occurs from excessive dilution due to excessive water in the hair when the product is applied. Diluted products are ineffective in killing lice and allow the parasite to develop resistance over time from repeated exposure to sublethal doses. Similarly excessive or prophylactic use overexposes the product, making it less effective over time. Clinicians should evaluate appropriate follow through on instructions when evaluating intractable infestations to determine if appropriate treatment, retreatments, and preventative measures have been followed. Reinfestation does not preclude use of products that have failed for a first attempt as future treatment options.⁴

Conclusion

Follow-up evaluation of lice infestations should occur within 10 days. The medical provider should advise the patient to seek medical attention if signs of lice infestation persist after completion of steps for treatment

of the initial infestation. Overuse of these products should be discouraged and nonpharmacologic control measures emphasized.⁴

West Virginia Medicaid preferred and non-preferred agents and prior authorization criteria are listed in **Table 1**.

Table 2

Therapeutic Drug Class	Preferred Agents	Non-Preferred Agents	PA Criteria
Antiparasitics, Topical^{AP}			
	Permethrin (OTC) Pyrethrins-piperonyl butoxide OTC Sklice (ivermectin) Ulesfia (benzyl alcohol)	Euarax (crotamiton) Lice Egg remover OTC (benzalkonium Chloride) lindane malathion Natroba (spinosad) Ovide (malathion) spinosad	Trials of the preferred agents (which are age and weight appropriate) are required before non-preferred agents will be authorized unless one (1) of the exceptions on the PA form is present

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¹ The DUR Capsules is a quarterly newsletter published for West Virginia Medicaid Providers. Information concerning West Virginia Medicaid can be accessed online at <http://www.dhhr.wv.gov/bms/>

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