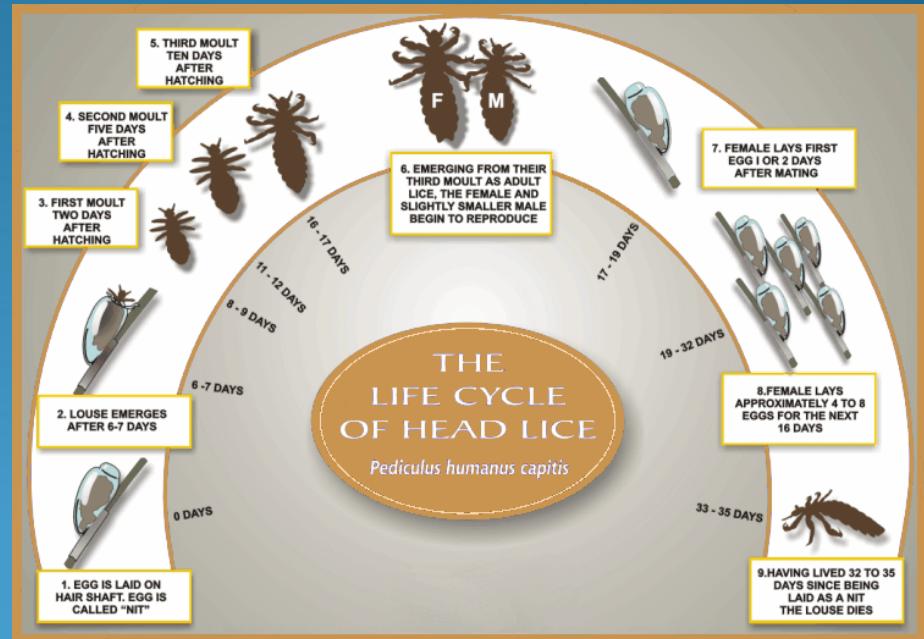


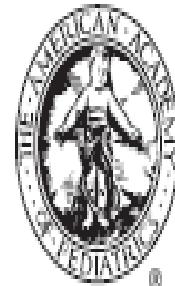
Guidelines for the Pharmacologic Management of Head Lice



CLINICAL REPORT

Guidance for the Clinician in Rendering Pediatric Care

American Academy
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

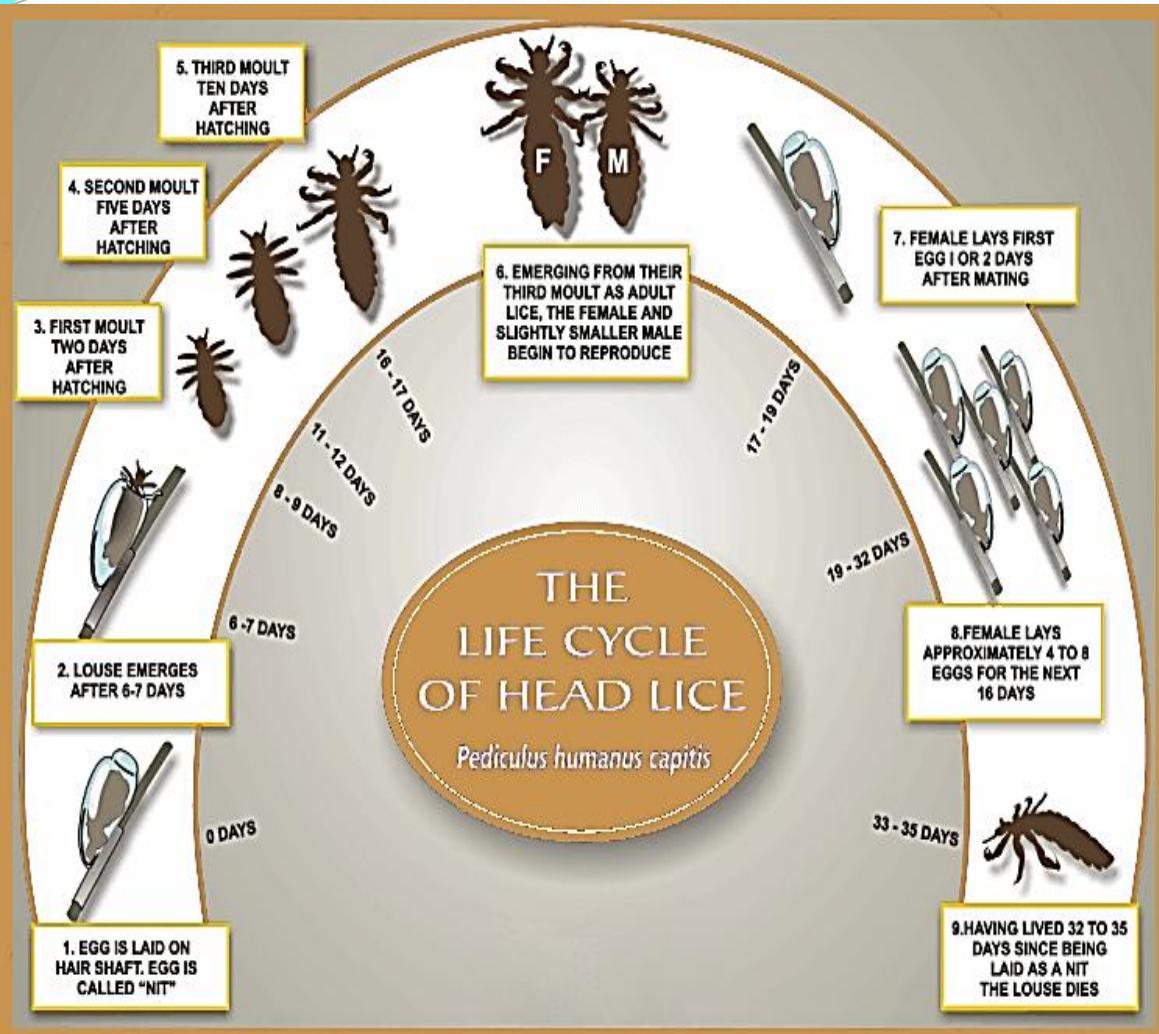
Head Lice

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- Head lice (pediculosis capitis) have been companions of the human species since antiquity. In the United States, **head lice infestation is common among children 3 to 12 years of age.**
- Before the development of modern insecticides, various botanical treatments, inorganic poisons, and petroleum products were used to treat head lice infestation.
- Shaving heads was also quite effective.
- The development of dichlorodiphenyltrichloroethane (DDT) after World War II offered a significant advancement in treatment and continues to be used in some developing countries.
- Because of environmental concerns regarding DDT, other pharmaceutical agents, including ***lindane, pyrethrin, permethrin, and malathion, were developed to replace DDT.***
- Resistance to each of these pediculicides has developed. Inadequate treatment can sometimes be mistaken for drug resistance, and careful scrutiny is needed in making that determination.

ETIOLOGIC AGENT

The adult head louse is 2 to 3 mm long (the size of a sesame seed), has 6 legs, and is usually tan to grayish-white in color. The female lives up to 3 to 4 weeks and, once mature, can lay up to 10 eggs per day. These tiny eggs are firmly attached to the base of the hair shaft within approximately 4 mm of the scalp with a glue-like substance produced by the louse. Viable eggs camouflaged with pigment to match the hair color of the infested person often are seen more easily at the posterior hairline. Empty egg casings (nits) are easier to see because they appear white against darker hair. (Note that some experts refer to "eggs" as containing the developing nymph and use "nits" to refer to empty egg casings; others use the term "nits" to refer to both eggs and the empty casings.) The eggs are incubated by body heat and typically hatch in 8 to 9 days, but hatching can vary from 7 to 12 days depending on whether the ambient climate is hot or cold. Once it hatches, a nymph leaves the shell casing and passes through a total of 3 nymph stages (instars) during the next 9 to 12 days and then reaches the adult stage.



TRANSMISSION

Lice cannot hop or fly; they crawl. However, there are reports that combing dry hair can build up enough static electricity to physically eject an adult louse from an infested scalp more than 1 m.³ Transmission in most cases occurs by direct contact with the head of an infested individual.¹⁶ Indirect spread through contact with personal belongings of an infested individual (combs, brushes, hats) is much less likely but may occur rarely.¹⁷ Lice found on combs are likely to be injured or dead,¹⁸ and a healthy louse is not likely to leave a healthy head unless there is a heavy infestation.¹⁹ This is further illustrated by 2 studies from Australia. In 1 study, examination of carpets on 118 classroom floors found no lice despite more than 14 000 live lice found on the heads of 466 children using these classrooms.²⁰ In a second study, live lice were found on only 4% of pillowcases used by infested volunteers.²¹ Thus, the major focus of control activities should be to reduce the number of lice on the head and to lessen the risks of head-to-head contact.



Mortality/Morbidity

- Body lice can be vectors for disease such as epidemic typhus and relapsing fever.
- Violation of the integrity of the skin from a bite can lead to bacterial infection, including methicillin-resistant *Staphylococcus aureus*(MRSA).
- More commonly, infestation with lice produces social embarrassment and isolation rather than medical disease.

CLINICAL DISEASE

Head lice, unlike body lice, do not transmit any disease agent.^{4,10} Itching can develop in a sensitized individual. Rarely, scratching may cause impetigo or other skin infection, which can lead to local adenopathy.



Physical

- Pruritus may lead to secondary excoriations that predispose to secondary skin infection and regional lymph node enlargement. However, these are nonspecific findings.



- Pediculosis capitis*
 - Although head lice are found on any part of the scalp, they are **most commonly found in the postauricular and occipital areas.**
 - Eggs depend on body warmth to incubate; a sticky substance attaches nits to the hair shafts within 3-4 mm of the scalp. Because hair grows approximately 10 mm per month, the distance of nits from the scalp can be used to estimate the duration of infestation.
 - Wet combing is an accurate method to diagnose active lice infestation.**
- Pediculosis corporis*
 - Bites from body lice can be found in any area of the body.
 - Because nits are laid in the host's clothing (especially along inner seams of clothing), nits are not found on the hair as with head lice and pubic lice.
- Pediculosis pubis:* Pubic lice can be found in hairy areas throughout the body, but they prefer the perineum and pubic areas.
- Occasionally, the infestation may be present in the eyebrows and eyelashes.

Treatment



Content Source: Division of Parasitic Diseases (DPD)
National Center for Zoonotic, Vector-Borne, and Enteric Diseases (ZVED)
Page Located on the Web at <http://www.cdc.gov/lice/head/treatment.html>

- 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.**
- *Retreatment of head lice usually is recommended because no approved pediculicide is completely ovicidal.*
- ***To be most effective, retreatment should occur after all eggs have hatched but before new eggs are produced.***
- The retreatment schedule can vary depending on the pediculicide used.

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 off.

WARNING: Do not use a creme rinse, 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 lice medicine (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 generally is recommended for most prescription and non-prescription (over-the-counter) drugs after 9-10 days in order to kill any surviving hatched lice before they produce new eggs. However, if using the prescription drug malathion, retreatment is recommended after 7-9 days ONLY if crawling bugs are found.

Prevent Reinfestation:

- Avoid head-to-head (hair-to-hair) contact during play and other activities at home, school, and elsewhere (sports activities, playground, slumber parties, camp). Lice are spread most commonly by direct head-to-head (hair-to-hair) contact and much less frequently by sharing clothing or belongings onto which lice or nits may have crawled or fallen.
- Do not share clothing such as hats, scarves, coats, sports uniforms, hair ribbons, or barrettes.
- Do not share infested combs, brushes, or towels.
- Do not lie on beds, couches, pillows, rugs, carpets, or stuffed animals that have recently been in contact with an infested person.
- 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.



Lice Comb

There are battery-powered “electronic” louse combs with oscillating teeth (Quantum MagiComb) that claim to remove live lice and nits as well as combs that resemble small “bug zappers” (LiceGuard Robi-Comb [ARR Health Technologies, Needham, MA]) that claim to kill live lice.⁷⁸ No randomized, case-controlled studies have been performed with either type of comb. Their instructions warn not to use on people with a seizure disorder or a pacemaker.

Over-the-counter Medications

1. Pyrethrins (pie-WREATH-rins) combined with piperonyl butoxide (pie-PER-a-nil beu-TOX-side);
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 in 9-10 days to kill any newly hatched lice before they can produce new eggs. Treatment failures can be common depending on whether lice are resistant to pyrethrins in the patient's geographic location. Pyrethrins generally should not be used by persons who are allergic to chrysanthemums or ragweed.



- After using pyrethrin shampoo, sanitize all the clothing, underwear, pajamas, hats, sheets, pillowcases, and towels you have used recently.
- These items should be washed in very hot water or dry-cleaned. You should also wash combs, brushes, hairs clips and other personal care items in hot water.

To use the shampoo, follow these steps:

- Shake the shampoo well right before use to mix the medication evenly.
- Use a **towel to cover your face and eyes**. Be sure to keep your eyes closed during this treatment. You may need to have an adult help you apply the shampoo.
- Apply pyrethrin shampoo to your dry hair and scalp area or skin. If you have head lice, **begin to apply the shampoo behind your ears and at the back of your neck and then cover all of the hair on your head and scalp**.
- **Keep the shampoo on for 10 minutes**, but no longer. You should use a timer or clock to track the time.
- After 10 minutes, **use a small amount of warm water to form a lather and shampoo as usual**. Rinse your hair and scalp or skin thoroughly with warm water.
- If you have head lice, dry your hair with a towel and comb out tangles.
- A **lice comb may also be used to remove the dead lice and nits** (empty egg shells) after this treatment. You may also need to have an adult help you to do this.
- You will need to **repeat this entire process in 7-10 days to kill the lice that hatch from eggs**.

Permethrin

- Permethrin has been the **most studied pediculicide** in the United States and is **the least toxic to humans**.
- Permethrin is less allergenic than pyrethrins and does not cause allergic reactions in individuals with **plant allergies**. The product is applied to damp 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**.
- 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.

Permethrin

- However, conditioners and silicone-based additives present in almost all currently available shampoos impair permethrin adherence to the hair shaft and reduce its residual effect.
- Although many **repeat the application sometime between day 7 to 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.**
- An alternate treatment schedule on days 0, 7, and 13 to 15 has been proposed on the basis of the longest possible life cycle of lice for this and other nonovicidal agents (eg, pyrethrins plus piperonyl butoxide)

How to use permethrin lotion

- Wash your hair with shampoo and rinse with water. Do not use a conditioner or a shampoo that contains a conditioner because your treatment will not work as well.
- Dry your hair with a towel until just damp.
- Shake permethrin lotion well right before use to mix the medication evenly.
- Use a towel to cover your face and eyes. Be sure to keep your eyes closed during this treatment. You may need to have an adult help you apply the lotion.
- Apply permethrin lotion to your hair and scalp area. *Begin to apply the lotion behind your ears and at the back of your neck and then cover all of the hair on your head and scalp.*
- **Keep the lotion on your hair and scalp for 10 minutes** after you finish applying permethrin lotion. You should use a timer or clock to track the time.
- Rinse your hair and scalp with warm water in a sink. You should not use a shower or bathtub to rinse the lotion away because you do not want to get the lotion over the rest of your body.
- Dry your hair with a towel and comb out tangles.
- **You and anyone who helped you apply the lotion should wash your hands carefully after the application and rinsing steps.**
- A lice comb may also be used to remove the dead lice and nits (empty egg shells) after this treatment. You may also need to have an adult help you to do this.
- If you see live lice on your head 7 days or more after treatment, repeat this entire process.

| اسم الدواء | التركيز | التعبئة | بلد الشركة الصانعة | بلد المالكة | سعر الجمهور بدون الضريبة | سعر الجمهور مع الضريبة |
|------------------|-------------------------------------|--------------|--------------------|-------------|--------------------------|------------------------|
| Para Plus Spray | 1 g, 4 g, 0.5 g, 94.5 g, :HFA 134 a | 125ml (116g) | فرنسا فرنسا | فرنسا | 3.84 | 3.99 |
| Prescab 5% Cream | 50 mg/g | 60 g | الأردن الأردن | الأردن | 3.29 | 3.42 |
| Prescab Cream | 2 % | 60 g | الأردن الأردن | الأردن | 2.39 | 2.49 |



اسم الدواء : Para Plus Spray
 لعائدة الدوائية : Propulseur
 التركيز : 1 g, 4 g, 0.5 g, 94.5 g, :HFA 134 a
 التعبئة : 125ml (116g)
 DoseageForm : SPRA:

Prescription Medications

1. Malathion lotion 0.5%; Brand name product: Ovide*

Malathion is an organophosphate. Malathion lotion 0.5% is approved by the FDA for the treatment of head lice. 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 and scalp; contact with the eyes should be avoided. 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.



How to use malathion

- Be sure to keep your eyes closed during this treatment. You may need to have an adult help you apply the lotion.
- **Apply malathion lotion to dry hair and scalp area paying special attention to area behind your ears and at the back of your neck.** Be sure to use enough lotion to cover the entire scalp area and hair thoroughly.
- **Allow hair to air dry and to remain uncovered.**
- **Malathion lotion is flammable.** The ***lotion and wet hair should not be exposed to open flames or electric heat sources, including hair dryers or curlers. Do not smoke while applying lotion or while hair is wet.***
- ***Leave the lotion on your hair and scalp for 8 to 12 hours.***
- After 8 to 12 hours have passed, ***shampoo your hair and scalp with warm water in a sink. You should not use a shower or bathtub to rinse the lotion away because you do not want to get the lotion over the rest of your body.***
- You and anyone who helped you apply the lotion should ***wash your hands carefully after the application and rinsing steps.***
- Use a lice comb to remove the dead lice and nits (empty egg shells) after this treatment. You may also need to have an adult help you to do this.
- ***If you see live lice on your head 7 to 9 days after treatment, repeat this entire process.***

The current US formulation of malathion (Ovide lotion, 0.5%) differs from the malathion products available in Europe in that it contains terpineol, dipentene, and pine needle oil, which themselves have pediculicidal properties and may delay development of resistance.

Malathion has high ovicidal activity, and a single application is adequate for most patients. However, the product should be reapplied in 7 to 9 days if live lice are still seen.

A concern is the high alcohol content of the product (78% isopropyl alcohol), which makes it highly flammable. Patients and their parents, therefore, should be instructed to allow the hair to dry naturally; not to use a hair dryer, curling iron, or flat iron while the hair is wet; and not to smoke near a child receiving treatment.

Safety and effectiveness of malathion lotion have not been established in children younger than 6 years, and the product is contraindicated in children younger than 24 months. Because malathion is a cholinesterase inhibitor, there is a theoretical risk of respiratory depression if accidentally ingested, although no such cases have been reported.

Benzyl alcohol lotion

Benzyl alcohol inhibits lice from closing their respiratory spiracles, allowing the lotion to obstruct the spiracles, which ultimately results in asphyxiation. Does not elicit ovicidal activity. Contains 5% benzyl alcohol.

Dosing

Adult

Apply lotion to dry hair, using enough to completely saturate scalp and hair; rinse off with water after 10 min; repeat treatment in 1 wk

Application: same as pyrethrin use

Pediatric

<6 months: Do not use

≥6 months: Apply as in adults

Interactions

None reported

Contraindications

Documented hypersensitivity

Benzyl alcohol lotion

- Was FDA-approved in April 2009 for treatment of head lice in children older than 6 months.
- **The product is not neurotoxic and kills head lice by asphyxiation.** Two studies demonstrated that more than 75% of the subjects treated were free of lice 14 days after initial treatment.
- The most common adverse reactions after treatment included pruritus, erythema, pyoderma, and ocular irritation.
- Benzyl alcohol is available by prescription and is not ovicidal: package instructions state that it is to be applied topically for 10 minutes and repeated in 7 days, although as with other nonovicidal products, consideration should be given to retreating in 9 days or using 3 treatment cycles (days 0, 7, and 13–15).



Spinosad

- Spinosad (Natroba; ParaPRO LLC, Carmel, IN) was approved by the FDA for topical use in children 6 months of age and older. It is contraindicated for children younger than 6 months because it also contains benzyl alcohol.
- Spinosad has a broad spectrum of activity against insects, including many species of lice. **Activity appears to be both ovicidal and pediculicidal** by disrupting neuronal activity and lingering long enough to exert its effect on the developing larvae until they form an intact nervous

Spinosad

- Superiority of spinosad over permethrin has been demonstrated with treatment success rates of 84% to 87% as compared with 43% to 45%.
- Spinosad is available by prescription and should be applied to dry hair by saturating the scalp and working outward to the ends of the hair, which may require a whole bottle. **Spinosad should be rinsed 10 minutes after application.**
- A second treatment is given at 7 days if live lice are seen. Safety in children younger than 4 years has not been established.



Crotamiton (10%)

This product is available by prescription only as a lotion (Eurax), usually used to treat scabies. One study showed it to be effective against head lice when applied to the scalp and left on for 24 hours before rinsing out. Other reports have suggested that 2 consecutive nighttime applications safely eradicate lice from adults.

Safety and absorption in children, adults, and pregnant women have not been evaluated. Crotamiton is not currently approved by the FDA for use as a pediculicide.

| اسم الدواء | التركيز | التعينة | بلد الشركة الصانعة | بلد الشركة المالكة | سعر الجمهورية بدون الضريبة | سعر الجمهورية مع الضريبة |
|--------------|---------|---------|--------------------|--------------------|----------------------------|--------------------------|
| EURAX CREAM | 10 % | 20 g | سويسرا | سويسرا | 1.0 | 1.04 |
| EURAX LOTION | 10 % | 50ml | سويسرا | سويسرا | 3.07 | 3.19 |



Ivermectin

- Ivermectin (Sklice; Sanofi Pasteur, Swiftwater, PA), a widely used anthelmintic agent, was approved in a lotion form by the FDA in 2012 for children 6 months or older for head lice.
- This medication increases the chloride ion permeability of muscle cells, resulting in hyperpolarization, paralysis, and death of the lice.

Ivermectin

- Combined data comparing a single application of 0.5% ivermectin lotion with a vehicle control found that significantly more patients receiving ivermectin were louse free on day 2 as compared with the control (94.9% vs 31.1%), day 8 (85.2% vs 20.8%), and day 15 (73.8% vs 17.6%; P < .001 for each comparison).
- Topical ivermectin lotion is available by prescription, is applied to dry hair and scalp, and is rinsed after 10 minutes.
- *Only 1 application is required, because when the treated eggs hatch, the lice are not able to feed as a result of pharyngeal muscle paralysis and, therefore, are not viable.*

Lindane

- Lindane is no longer recommended by the American Academy of Pediatrics or the Medical Letter for use as treatment of pediculosis capitis.

Oral Agents Used Off-Label for Lice

Ivermectin

This product (Stromectol; Merck & Co, Whitehouse Station, NJ) is an anthelmintic agent structurally similar to macrolide antibiotic agents, but without antibacterial activity. A single oral dose of 200 µg/kg, repeated in 10 days, has been shown to be effective against head lice.^{47,48} Most recently, a single oral dose of 400 µg/kg repeated in 7 days, has been shown to be more effective than 0.5% malathion lotion.⁴⁹ Ivermectin may cross the blood/brain barrier and block essential neural transmission; young children may be at higher risk of this adverse drug reaction. Therefore, oral ivermectin should not be used for children who weigh less than 15 kg.^{50,51}

Oral agents used for lice offlabeled : Sulfamethoxazole-Trimethoprim.

- The oral antibiotic agent sulfamethoxazole trimethoprim (Septrin) has been cited as effective against head lice.
- It is postulated that this *antibiotic agent kills the symbiotic bacteria in the gut of the louse or perhaps has a direct toxic effect on the louse.*
- The results of 1 study indicated increased effectiveness when *sulfamethoxazole-trimethoprim was given in combination with permethrin 1% when compared with permethrin 1% or sulfamethoxazole-trimethoprim alone; however, the treatment groups were small.*
- Rare severe allergic reactions (Stevens-Johnson syndrome) to this medication make it a potentially undesirable therapy if alternative treatments exist.
- *It is not currently approved by the FDA for use as a pediculicide.*

Occlusive Agents

- 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

- **What about hair dryer use to kill lice and their eggs???**
- **What about kerosene use ??**

Summary of key points

1. No healthy child should be excluded from school or allowed to miss school time because of head lice or nits. Pediatricians may educate school communities that no-nit policies for return to school should be abandoned.
2. It is useful for pediatricians to be knowledgeable about head lice infestations and treatments (pediculicide and alternative therapies); they may take an active role as information resources for families, schools, and other community agencies.
3. Unless resistance to these products has been proven in the community, 1% permethrin or pyrethrins are a reasonable first choice for primary treatment of active infestations if pediculicide therapy is required.
4. Carefully communicated instructions on the proper use of products are important. Because current products are not completely ovicidal, applying the product at least twice, at proper intervals, is indicated if permethrin or pyrethrin products are used or if live lice are seen after prescription therapy per manufacturer's guidelines. Manual removal of nits immediately after treatment with a pediculicide is not necessary to prevent spread. In the school setting, nit removal may be considered to decrease diagnostic confusion and social stigmatization.

Summary of key points

6. Benzyl alcohol 5% can be used for children older than 6 months, or malathion 0.5% can be used for children 2 years or older in areas where resistance to permethrin or pyrethrins has been demonstrated or for a patient with a documented infestation that has failed to respond to appropriately administered therapy with permethrin or pyrethrins. Spinosad and topical ivermectin are newer preparations that might prove helpful in difficult cases, but the cost of these preparations should be taken into account by the prescriber (Table 1).
7. New products should be evaluated for safety and effectiveness.
8. School personnel involved in detection of head lice infestation should be appropriately trained. The importance and difficulty of correctly diagnosing an active head lice infestation should be emphasized.
9. Head lice screening programs have not been proven to have a significant effect over time on the incidence of head lice in the school setting and are not cost-effective. Parent education programs may be helpful in the management of head lice in the school setting.

Which medicine is best?

If you aren't sure which medicine to use or how to use a particular medicine, always ask your physician, pharmacist, or other health care provider. CDC does not make recommendations about specific products. When using a medicine, always carefully follow the instructions contained in the package or written on the label, unless the physician and pharmacist direct otherwise.

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. 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.
3. Do not use different head lice drugs at the same time unless instructed to do so by your physician and pharmacist.

Treating Head Lice

What are head lice?

Head lice are tiny bugs the size of a sesame seed. Young lice, or nymphs, are clear, but as they feed on blood they become a reddish-brown to black color. Usually head lice do not cause health problems, but they can be annoying. Getting head lice does not mean a person is dirty, but rather that they have been near someone with head lice.

How do you get head lice?

While head lice do not fly or jump, they can move quickly. Head lice travel from person to person after close contact. Sharing of hats, brushes, combs, or pillows can easily spread head lice from one person to the next. Close head-to-head contact, such as when children are playing together, can also spread head lice.

How do I know if my child has head lice?

Children with head lice may complain of their head itching. Some children may also have red bumps on their scalp. If you look closely you may see the live lice, but not always. Seeing nits, or lice eggs, is often the only way to tell your child has lice. The tiny yellowish-white oval nits are attached to the hair shaft and may be confused with dandruff. Unlike dandruff, nits are not flaky or easily removed from the hair. Nits may be found throughout the hair, but are most often seen at the back of the head, just above the neck, or behind the ears.

How do you treat head lice?

Once you know your child has head lice, you should begin treatment. Use of over-the-counter (OTC) lice products containing permethrin 1% (*Nix*) or pyrethrins (*RID*, *A-200*, others) is the first step. When using these products the directions should be carefully followed. In addition to use of these OTC lice products, you may also want to remove the nits. The hair should be checked in one inch sections. A fine-tooth lice comb can be used to comb out remaining live lice and nits. Not doing proper nit removal can cause OTC lice products not to work as well.

Experts also recommend a second treatment with OTC lice products nine days after the first treatment, to kill remaining lice or lice that have just hatched. If after two treatments you still see live lice, you should call your child's prescriber. There are prescription lice treatments your child's prescriber may want you to try.

Don't use unproven remedies like mayonnaise, petrolatum jelly (*Vaseline*), olive oil, butter, *Cetaphil* (*Nuvo* lotion), or tea tree oil. Also, don't use dangerous chemicals such as rubbing alcohol, kerosene, gasoline, or paint thinners.

Once I've treated my child, how do I keep them lice free?

Be sure to machine wash clothes, bedding, and towels used by your child within the previous two days. Use hot water (130 degrees F) and/or dry them in a hot dryer (for at least 20 minutes). Items that can't be washed or placed in the dryer can be vacuumed or put in a sealed plastic bag for two weeks. Soak combs and brushes in hot water (at least 130 degrees F for 5 to 10 minutes). Going overboard with house cleaning is not necessary. Also, the use of lice sprays on furniture is not recommended. Carefully check your child's hair (and their brothers' and sisters' hair too!) for several weeks after treatment. Then continue to check their hair every now and again. The sooner you know your child has lice, the easier it is to treat it and keep it from spreading.

[August 2011]

TABLE 1 Topical Pediculicides for the Treatment of Head Lice in the United States

| Product | Availability | Cost Estimate |
|--|--------------|---------------|
| Permethrin 1% lotion (Nix) | OTC | \$ |
| Pyrethrins + piperonyl butoxide (Rid) | OTC | \$ |
| Malathion 0.5% (Ovide) | Prescription | \$\$\$\$ |
| Benzyl alcohol 5% (Ulesfia) ^a | Prescription | \$\$-\$\$\$\$ |
| Spinosad 0.9% suspension (Natroba) | Prescription | \$\$\$\$ |
| Ivermectin 0.5% lotion (Sklice) | Prescription | \$\$\$\$ |

Adapted from refs 18, 40.

\$, <\$25; \$\$, \$26–\$99; \$\$\$, \$100–\$199; \$\$\$\$, \$200–\$299.

^a Cost varies based on the length of the hair and the number of bottles of medication required.