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## HEAD LICE REAR THEIR UGLY HEADS

HEAD LICE are a tedious challenge. While there are no surveillance data that allow comparison of year-to-year incidence rates, anecdotal reports from Oregon's public health and school nurses suggest banner crops of late. This article summarizes recommendations regarding head lice control.

The adult head louse (*Pediculus humanus* var. capitis) is a small (2-4 mm), grayish white, flattened, wingless insect with a pointed head. Each fertilized female lays 250-300 eggs over 20-30 days. The eggs, or nits, are cemented to hair shafts (see figure). About 7-10 days after deposition, small nymphs emerge that to survive must pierce the skin and take a blood meal. Meal etiquette seems to include injecting saliva into and defecating upon the hosts, triggering localized hypersensitivity responses that result in pruritus. After 2-3 weeks and 3 molts, the nymphs reach puberty.[1]

Pediculosis outbreaks are disruptive and often difficult to stop. Lousy children are often excluded from school, much to their disgust. Chagrined parents lose wages and/or sleep; they also spend money on medical treatments and laundering clothes and bedding. While head lice have never been shown to transmit infectious disease, scratching or over-aggressive treatment can lead to secondary infections and other complications. The use of folk remedies, such as disinfectants or kerosene, can be dangerous and on occasion has had tragic results.[2] Products formulated for animals are also inappropriate for use on humans.

### OPENING ARTILLERY BARRAGE

Several pediculicides are currently available (see table). The drug of choice[3,4] continues to be 1% permethrin (Nix®), available as a creme rinse. In addition to Nix, pyrethrin-based compounds are available over-the-counter (OTC). Despite advertising claims, all lice and nits are *not* killed with the initial treatment. With any of these products a second treatment is needed 7-10 days after the first treatment to kill newly hatched lice (yes, even with Nix). According to Warner Lambert, while Nix is 100% ovicidal in vitro, it kills only 70-75% of nits on human hair and scalp.[5] The effectiveness of residual product on the hair may be reduced by shampoos, vinegar (erroneously thought to release the nit glue), and nit removal or other hair care products.

Although treatment with 0.5% malathion (Ovide®) was safe and effective[6], the product was withdrawn from the U.S. market in October 1994 for marketing reasons. (It smelled awful.)

In controlled trials, lindane has been found less efficacious than permethrin[3,4,7]; nonetheless, many clinicians still prescribe 1% lindane shampoos (Kwell® and generics). Lindane has had two problems: resistance and toxicity. Although most patients are louse-free shortly after treatment, lindane does not persist on hair, and live lice often reappear 14 days after a course of "successful" treatment.[7-9] For this reason, the Health Division has discouraged its use.[10] Lindane can also cause seizures when grossly misused[11] (e.g., used over broad body surfaces or ingested), but such reactions are rare when lindane is used in children only on the head and for the short period of time required to treat head lice.[3,13] The manufacturer recommends that lindane not be used on premature infants, and that women be treated no more than twice during a pregnancy.

photo of
nit on hair shaft\nere

### GROUND TROOPS ALSO REQUIRED

Nit removal is an important adjunct to treatment with products without ovicidal and residual activity (e.g., lindane, pyrethrum, and even permethrin if the residual product is neutralized). While pediculicides can kill *most* nits, survivors can cause an apparent reinfestation if an adeqate residuum is not present. Dead nits remain attached to the hair shaft until they are combed out or the hair falls out. Since dead ones look pretty much the same as live ones, most Oregon schools have a "no nit" policy, thereby relieving school authorities of the Solomonic dilemma of distinguishing the quick and the dead. Moreover, this policy encourages parents to take an active interest in their children's tonsorial maintenance. Resist the temptation to put vinegar in the hair: it does not dissolve nit glue and when used may neutralize any residual pediculicide on the hair. Other OTC products are available (e.g., Clear® [ an enzymatic lice egg remover]) that attack the nit cement, making the difficult and tedious job of nit removal more fun. Some pediculicides are packaged with a nit comb, but some experienced nit pickers claim that pet flea combs work better.*

To prevent reinfestation, all household members should be inspected for signs of head lice and, if nits or mobile lice are found, treated. Application of pediculicides should be combined with cleaning of recently worn clothing, bedding, combs, brushes, head gear, and other fomites. Articles that cannot be washed in the laundry can be tumbled in a hot clothes dryer for 20 minutes, or sealed in a plastic bag for two weeks (by which time any viable nits will hatch and subsequently expire for

* We suggest cleaning the comb before using on your child.

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want of a blood meal). A vacuum cleaner will pick up any stray hair with nits from the floor, the sofa, car seats, or other vacuumable surfaces. Flea bombs and other environmental insecticides are not effective against head lice and may convey a false sense of achievement in the war. *P. humanus* var. capitis feed only on humans; they do not infest dogs, cats, goldfish, or other pets. Survival of adult lice away from human hosts is short—at most a few hours.

**ISSUES**

Perhaps the most vexatious head lice issue confronting parents and clinicians alike is the specter of drug resistance. Anecdotally, reports of treatment failure abound, but scientific evidence documenting this resistance is very hard to find. (A review of the medical literature was unavailing.) Treatment failure is usually attributed to improper or inadequate application of pediculicides. Reinfestation from other household members or playmates is another scapegoat. Some so-called "failures" arise from the mistaken expectation that symptoms should disappear immediately following successful treatment. This can lead to repeated applications of insecticides—some of which may be hazardous when overused. Treatment is most likely to be successful when patients and parents have realistic expectations and some understanding about the head louse's habitat, mode of spread, and response to therapy.[13]

When treatment appears to have failed, several issues should be reviewed. Was the product used correctly and repeated in the prescribed period of time? Might the patient have been reinfested from another source? While there is little if any hard evidence of drug resistance, trying a different pediculicide may be worth considering in some circumstances.

These vermin can infest almost anyone, respecting neither economic status nor educational attainment. Many adults need reassurance that infestation in their households, while perhaps not a status symbol, does not indicate a poor home environment or lack of personal hygiene. Early detection, careful treatment, and eternal vigilance remain our shields against this pest.

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## Immunization Video Conference

A NATIONWIDE interactive videoconference has been scheduled for September 19 (8:00-10:30 AM Pacific). Targeted at physicians, PA's, NP's, and other health professionals, the conference—led by Dr. William Atkinson from CDC's National Immunization Program—will provide updates about recent changes in recommended immunization schedules and information about new vaccines. The broadcast will be available at one or more sites in almost every Oregon county. CME credit is available. For more information about the conference, including registration details, contact Amanda Timmons (phone: 503/731-4564 or by e-mail: amanda.j.timmons@state.or.us).

**Pediculicides**

| *Insecticide* | *Products* | *Formulation* | *Source* | *Application* |
|---|---|---|---|---|
| Pyrethrum with piperonyl butoxide | A•200, Pronto, Rid | Gel, Shampoo | OTC | Apply for 10 minutes; shampoo; repeat in 7-10 days |
| Permethrin, 1% | Nix | Creme Rinse | OTC | Shampoo; apply for 10 minutes; rinse; repeat if live lice appear after 7 days |
| Lindane, 1% | Kwell, generics | Shampoo | Rx | Shampoo; dry hair; apply for 4 minutes; add small quantities of water until good lather forms; rinse |