



*Comment & Controversy*  
*Edited By Stephen P. Stone*

## *Optimal Treatment of Head Lice: Is a No-Nit Policy Justified?*

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To a Louse- On seeing one on a lady's bonnet at church  
Ye ugly, creepin blastit wonner, Detested, shunned by  
saunt an' sinner How daur ye set your fit upon her Sae  
fine a lady. Gae somewhere else and seek your dinner On  
some poor body

Robert Burns 1759–1796

**O**ut damned louse! Out I say," exclaims the parent, with a disturbance of mind similar to Lady Macbeth's, in an attempt to rid a child of head lice with insecticide. There is a difference, however, in that Lady Macbeth made an accomplished killer of her husband, a claim that fewer and fewer insecticides can make against the common head louse, *Pediculus humanus capitis*. Gone are the days when the omniscient doctor could say to the head lice sufferer, "I have the perfect cure." The head louse is attacking at the core of the doctor-patient relationship, a relationship based on trust and the "easy-fix" mentality. *Pediculus humanus capitis*, the head louse, differs from *Pediculus humanus corporis*, the body louse and *Phthirus pubis*, the pubic louse. *Pediculus humanus capitis* and *Pediculus humanus corporis* are almost identical morphologically, but they maintain their territorial preferences on the host.<sup>1</sup> Humans are the only known hosts of the head louse; unlike the body louse, which can transmit diseases such as trench fever, the head louse is not a vector of infectious diseases.<sup>2</sup> While lice are contagious and epidemics are common, infestation is best considered a nuisance rather than a public health issue. Nevertheless, individual reactions are commonly out of keeping with the associated morbidity and are at times phobic.

### **Symptoms and Diagnosis**

Pruritus is the characteristic symptom of head lice infestation, but many cases are asymptomatic. The lice are difficult to see; with recent infestation, nits are near the scalp, the diagnosis may be delayed or missed, facilitating person-to-person spread. Combing should be

used in suspected and affected cases, and family members can aid in scalp assessment and surveillance.

### **Treatment with Topical Insecticides**

Topical insecticides have been the mainstay of treatment of head lice in recent years. Dichloro-diphenyl trichloroethane (DDT), carbaryl, malathion, lindane (gamma-benzene hexachloride), pyrethroids, and permethrin have all been widely used. Both carbaryl and malathion have pediculocidal and ovicidal activity, as do pyrethrins.<sup>1</sup> It is important to follow the manufacturer's instructions and, in general, all family members should be simultaneously treated to minimize the possibility of reinfestation.

### **Resistance to Insecticides**

Unfortunately, head lice have proven to be resilient and adaptable.<sup>3–8</sup> Resistance was first reported to DDT and then malathion. More recently, permethrin and pyrethrins with piperonyl butoxide have been added to the list. Resistance has been confirmed clinically in children with head lice undergoing supervised applications of insecticides by medical staff in England. Head lice harvested from these children were tested in vitro to insecticides. Multiresistant lice were found showing in vitro resistance to permethrin as high as 87%, with concurrent resistance to malathion of 64%, corresponding to the clinical patterns of resistance in this patient group.<sup>7</sup> Resistance to DDT was 100% and only carbaryl was found to allow survival of fewer than 5% of tested lice in vitro. There are concerns, not only about the effectiveness of insecticides, but also about their cost and toxicity. In particular, carbaryl may be carcinogenic with long-term oral administration to rodents.<sup>1</sup>

### **Other Treatment Options**

Other pharmacological agents have been effective against head lice. Cotrimoxazole, which is thought to act on symbiotic Gram-negative bacteria in the gut of the louse, is effective only against adult and nymphal stages, but not the ova, so prolonged courses are required.<sup>9,10</sup> Ivermectin may also have a role, but there are currently concerns about side effects.<sup>11</sup> Combination of permethrin and cotrimoxazole has been suggested for

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treatment failure or suspected resistance.<sup>12</sup> Lice and their ova need hair for attachment and alternatives to insecticides include combing, shaving, and the use of petrolatum. Reports support the effectiveness of treatments such as the use of a fine-toothed metal comb with a lubricant such as a conditioner every 1–3 days.<sup>13</sup> Combing regimens are designed to remove mature lice that may otherwise lay eggs. If no adult lice are found for 2 weeks, it is likely that the cycle has been broken. Fomites are a minor problem and hot washing of clothes and bed linen is sufficient. However, effective combing is difficult and one cannot be sure that all lice will be found, especially when the hair is thick and long. Eighty percent of infestations represent a load of only 1–10 lice, so it is easy to miss the initial diagnosis or residual infestation.<sup>2</sup> The efficacy of combing needs to be further established; if confirmed, it would be a simple and acceptable treatment option that could be practiced widely.

### An Approach to Head Lice Infestation

At present, an approach to treatment could be the initial use of an insecticide, which should not be relied on totally, and its use could be combined with regular combing. Permethrin, malathion, or pyrethrins with piperonyl butoxide are the recommended pediculocides, but these may vary depending on local resistance patterns. Combing may then be used to confirm cure. If an insecticide has failed for a particular patient, the same insecticide should *not* be used repeatedly. Another treatment is to suffocate the lice with olive oil (an as yet unsung virtue of the product), petrolatum, or even mayonnaise.<sup>2</sup> These treatments could be combined with combing. Such therapies should stand the test of time, unless the louse develops “anaerobic powers” and begins to “feed off” these products. Killing the adult lice with an electric comb that discharges a small shock has been described; surprisingly, lasers have not yet found a place in this niche market. Cotrimoxazole or ivermectin are reserved for resistant cases.

### Controversy Regarding School Exclusion

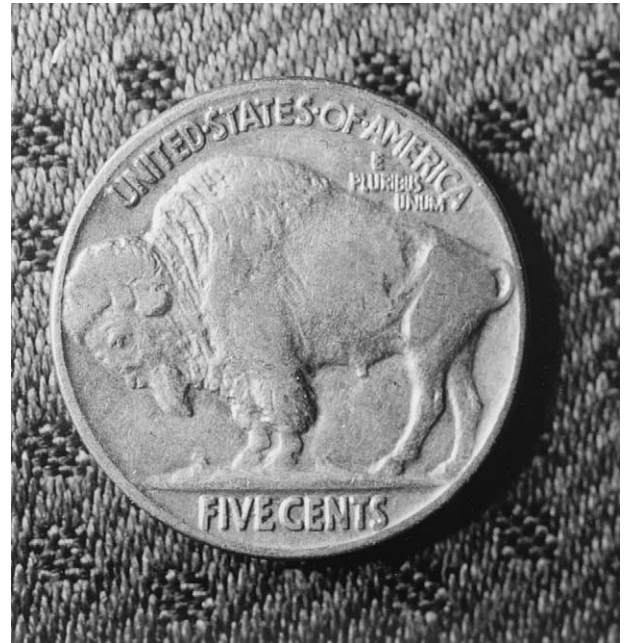
One issue not well addressed by this protocol is exclusion of infected children from schools and crèche to prevent transmission. Many schools currently have an exclusion policy for children infested with lice. For the strategy to be effective, all children in the class must be examined by a health professional after a single case is reported. All those affected must be excluded. Exclusion could be overnight during treatment or for 2 weeks, depending on whether the aim of exclusion is to ensure treatment or cure. Theoretically, the child should be reexamined by a health professional and reported to be clear before readmission. Exclusion, however, is difficult and expensive to enforce fully.

Treatment failure is likely in areas of high pharmacological resistance, when reinfestation occurs within the family or when noncompliance is an issue. There is no recent evidence that exclusion is effective in controlling head lice in school children. Overnight exclusion, particularly in areas of high resistance to insecticides, invites many children back to school the following day with active lice infestation and advocates use of insecticides, which may not be the most appropriate therapy. With effective exclusion practices, some children could continue to be excluded for prolonged periods of time, based on social factors that reduce the likelihood of successful treatment. These kinds of considerations have led to exclusion being challenged by some authorities, and in Australia the National Health and Medical Research Council's Guidelines for infectious diseases warranting school exclusion have been recently amended to exclude head lice. While the best strategy to limit spread within schools is not clear, hopefully, in Australia at least, gone are the days when a parent receives an urgent phone call from the school nurse, demanding a child be taken home from school immediately because of head lice infestation. Whatever strategy is finally chosen, members of the community should avoid ostracism of affected persons and encourage wider community acceptance of this common childhood itching skin condition.

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**T**he Buffalo nickel, minted between 1913-1938, had two very American images on the obverse and reverse of the coin. The reverse has the familiar buffalo (American Bison) which was modeled after Black Diamond, a bison that actually lived at the New York Zoological gardens. The obverse is a composite of three American Indian Chiefs. During the depression, homeless men would carve into the nickel changing the image of the bison into an elephant or a donkey, then trading the created art piece for a meal or other necessity. These altered coins were known as "hobo nickels."

From the collection of Raymond T. Kuwahara, MD, Memphis, TN.

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