



Nitpicking the Details About Lice

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Very few things will give people a peculiar itchy feeling more than the mentioning of lice. Pediculosis is a common infestation, particularly in the pediatric population. The three species of lice (*i.e.*, *Pediculus humanus corporis*, *Pediculus humanus capitis* and *Phthirus pubis*) account for most of the cases seen in practice; therefore, they are this month's **Bug of the Month**.

What is pediculosis?

Pediculosis refers to an infestation with one of three species of lice (*i.e.*, *P. humanus corporis*, *P. humanus capitis* and *P. pubis*). Each has a predilection for specific areas of the body and causes variable amounts of pruritis and rash as a result of injection of saliva and a secondary hypersensitivity reaction to louse antigens. Typically, this will occur anytime two weeks after an infestation has been established.

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All three species of lice are small, flattened and wingless arthropods of the Order Anoplura. Of the more than 200 species in this Order, only these three are human pathogens. As its name would imply, *P. capitis* likes to infest the hair of the head while *P. corporis* can be found in the seams

of clothing and infesting other parts of the body. *P. pubis*, which does resemble a crab, prefers the coarse hair typical of the groin region but can be found in other locales, such as body or axillary hair or even on the eyebrows and eyelashes.

What is the life cycle of lice?

Female lice lay eggs either at the base of the hair (nits) or within the seams of clothing. After seven to 10 days, the eggs hatch releasing the nymphal stage. The nymph must have its first blood meal within 24 hours or perish. Following three molts and two to three weeks, the nymph becomes a mature louse, mates and the fertilized female proceeds to lay up to 300 eggs over its life of 20 to 30 days. Survival off of the human host is limited to 15 to 20 hours. Nits are a different matter and can remain viable upwards of a month.

Who gets lice?

Lice can be transmitted to anyone. *P. capitis* is more common among children of school age due to their close proximity and tendency to share things from hats to

combs to hair elastics. Girls and those of European ancestry are more likely to be infested.

P. corporis is seen in situations of poor sanitation, overcrowding and in the homeless. Outbreaks are typically seen in times of war and decreased personal hygiene and are spread by those with endemic lice or "lousy" people.

P. pubis requires intimate contact to be spread and could even be considered a sexually transmitted infection (STI). In fact, one-third of people with crab lice will have an additional STI.

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What can lice spread?

Aside from the association of *P. pubis* with STIs, lice, specifically *P. corporis*, can also spread the following uncommon infections:

- epidemic typhus (*Rickettsia prowazekii*),
- trench fever (*Bartonella quintana*) and
- relapsing fever (*Borrelia recurrentis*).

What are the symptoms of pediculosis?

The main symptoms associated with pediculosis are related to the hypersensitivity reaction to antigens in the lice saliva. Pruritis is the most common finding. Erythematous papules and macules are also common, as are excoriations from scratching. The distribution of the rash and pruritis is directly related to where the lice live. In the case of *P. capitis*, it is typically on the scalp, as well as the temporal and occipital regions of the skull. For *P. corporis*, expect the rash to be on the trunk region. Finally, for *P. pubis* expect the main symptoms to be in the groin region.

What are the complications of pediculosis?

By far, the most common complication is a secondary skin infection. Skin organisms, particularly *Staphylococcus aureus*, like to take up residence in excoriated skin. Occasionally, with cases of pediculosis due to *P. corporis*, the skin may become hyperpigmented and markedly thickened. Together, these findings are called Vagabond's disease.

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How is pediculosis diagnosed?

Direct examination of the hair, body and clothes of a suspected host for evidence of infestation is the key to diagnosis. Using a fine-toothed or lice comb can increase the diagnostic yield as can a meticulous search with good lighting and a magnifying instrument. Though finding the louse itself is diagnostic, it is more likely that nits will be discovered, usually at the base of the hair shaft. Finding either a single louse or nit confirms the diagnosis.

How is pediculosis treated?

The goals of treatment are to prevent reinfection and transmission and to treat the symptoms of the infestation. Antihistamines are useful to treat the pruritis as are topical corticosteroids.

Elimination of the lice is achieved by a variety of agents including 1% lindane creams, 1% permethrin and malathion lotions. The treatment of choice is pyrethrum agents, an extract of the chrysanthemum. Malathion and permethrin are both "Pregnancy Category B" drugs, meaning that although good studies are absent to confirm safety in humans, the agents are presumed safe due to an absence of reported adverse effects despite wide scale use in pregnancy. Breastfeeding safety is unknown. Lindane is often avoided in pregnancy due to its potential neurotoxicity. A brief 10 minute application to affected areas of permethrin is adequate to kill 70% to 80% of the nymphs and adult lice; however, this agent is not ovicidal so a repeat is necessary in one week time. Nits

are effectively removed with a comb and a one-to-one ratio vinegar water solution.

Unlike the others, pediculosis secondary to *P. corporis* does not require treatment. Instead, clothes and bedding must be washed in hot water or an insecticidal agent can be used if the item is too delicate. Careful ironing of seams afterwards is important to eradicate any residual organisms. Secondary skin infections are best treated with an oral anti-staphylococcal antibiotic.

What if initial treatment fails?

Initial failures can usually be treated with a course of malathion ointment, which is ovicidal, or by adding either ivermectin or trimethoprim-sulfamethoxazole to a second round of permethrin. This will increase the treatment efficacy to 95%. Less popular alternatives include head shaving, shower caps and petroleum jelly and manual removal.

How do you prevent the spread of lice?

Improved living conditions and personal sanitation are both helpful as is the avoidance of sharing of fomites, such as combs and brushes. The "no nit" policies of many schools have not proven efficacious for the prevention of spread, thus children should not miss school on account of louse eggs.

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