



FIGURE 475-1 Deer ticks (*Ixodes scapularis*, black-legged ticks) on a U.S. penny: larva (below ear), nymph (right), adult male (above), and adult female (left).

removed from a person succumb to desiccation and starvation within ~1 day. Head lice are not known to serve as a natural vector for any pathogens.

Body lice remain on clothing except when feeding and generally succumb in ≤ 2 days if separated from their host. In most Western countries, body lice are generally found on a small proportion of indigent persons but may become increasingly prevalent after upheaval associated with natural or human-caused disasters, when homeless victims are in close contact with infested individuals with whom they share accommodations. Body lice are acquired by direct contact or by sharing of infested clothing and bedding. These lice are vectors for the agents of louse-borne (epidemic) typhus (Chap. 211), louse-borne relapsing fever (Chap. 209), and trench fever (Chap. 197). Pruritic lesions from their bites are particularly common around the neckline. Chronic infestations result in a postinflammatory hyperpigmentation and thickening of skin known as *vagabond's disease*.

The crab or pubic louse is transmitted mainly by sexual contact. These lice occur predominantly on pubic hair and less frequently on axillary or facial hair, including the eyelashes. Children and adults may acquire pubic lice by sexual or close nonsexual contact. Intensely pruritic, bluish macules ~3 mm in diameter (*maculae ceruleae*) develop at the site of bites. Blepharitis commonly accompanies infestations of the eyelashes.

Pediculiasis is often suspected upon the detection of nits firmly cemented to hairs or in clothing. Many bona fide nits, however, are dead or hatched relics of prior infestation, and pseudo-nits are frequently misconstrued to be signs of a louse infestation. Confirmation of a louse infestation, therefore, best relies on the discovery of a live louse.

TREATMENT LOUSE INFESTATION

Generally, treatment is warranted only if live lice are discovered. The presence of nits alone is evidence of a former—not necessarily current—infestation. Mechanical removal of lice and their eggs with a fine-toothed louse or nit comb (Fig. 475-2) often fails to eliminate infestations. Treatment of newly identified active infestations generally relies on a 10-min topical application of ~1% permethrin or pyrethrins, with a second application ~10 days later. Lice persisting after this treatment may be resistant to pyrethroids. Chronic infestations may be treated for ≤ 12 h with 0.5% malathion. Lindane is applied for just 4 min but seems less effective and may pose a greater risk of adverse reactions, particularly when misused. Resistance of head lice to permethrin, malathion, and lindane has been reported. Newer FDA-approved topical pediculicides contain benzyl alcohol, dimethicone, spinosad, and ivermectin. Although children infested by head lice—or those who simply have remnant nits from a prior infestation—are frequently isolated or excluded



FIGURE 475-2 Adult female human head louse (*Pediculus capitis*) on a nit (louse-egg) comb.

from school, this practice increasingly is seen as unjustified and ineffective.

Body lice usually are eliminated by bathing and by changing to laundered clothes. Application of topical pediculicides from head to foot may be necessary for hirsute patients. Clothes and bedding are effectively deloused by heating in a clothes dryer at $\geq 55^\circ\text{C}$ ($\geq 131^\circ\text{F}$) for 30 min or by heat-pressing. Emergency mass delousing of persons and clothing may be warranted during periods of civil strife and after natural disasters to reduce the risk of pathogen transmission by body lice.

Pubic louse infestations are treated with topical pediculicides, except for eyelid infestations (*pthiriasis palpebrum*), which generally respond to a coating of petrolatum applied for 3–4 days.

MYIASIS (FLY INFESTATION)

Myiasis refers to infestations by several kinds of fly larvae (maggots) that invade living or necrotic tissues or body cavities and produce different clinical syndromes, depending on the species of fly.

In forested parts of Central and South America, larvae of the human botfly (*Dermatobia hominis*) produce furuncular (boil-like) papules or subcutaneous nodules ≤ 3 cm in diameter. A gravid adult female botfly captures a mosquito or another bloodsucking insect and deposits her eggs on its abdomen. When the carrier insect attacks a human or bovine host several days later, the warmth and moisture of the host's skin stimulate the eggs to hatch. The emerging larvae promptly penetrate intact skin. After 6–12 weeks of development, mature larvae emerge from the skin and drop to the ground to pupate and then become adults.

The African tumbu fly (*Cordylobia anthropophaga*) deposits its eggs on damp sand or leaf litter or on drying laundry, particularly that contaminated by urine or sweat. Larvae hatch from eggs upon contact with a host's body and penetrate the skin, producing boil-like lesions from which mature larvae emerge ~9 days later. Furuncular myiasis is suggested by uncomfortable lesions with a central breathing pore that emits bubbles when submerged in water. A sensation of movement under the patient's skin may cause severe emotional distress.

Larvae that cause furuncular myiasis may be induced to emerge if the air pore is coated with petrolatum or another occlusive substance. Removal may be facilitated by injection of a local anesthetic into the surrounding tissue, but surgical excision is sometimes necessary because upward-pointing spines of some species hold the larvae firmly in place.

Other fly larvae cause nonfuruncular myiasis. For example, larvae of the horse botfly (*Gasterophilus intestinalis*) emerge from eggs deposited on the horse's flanks and may come into contact with and infest human beings. After penetrating human skin, these larvae rarely mature but instead may migrate for weeks in the dermis. The resulting pruritic and serpiginous eruption resembles cutaneous larva migrans caused by canine or feline hookworms (Chap. 256). Larvae of rabbit and rodent botflies (*Cuterebra* species) occasionally cause dermal or tracheopulmonary myiasis.