

2750 of fly, risks include transmission of diverse pathogens and secondary infection of the lesion.

TREATMENT FLY AND MOSQUITO BITES

Treatment of fly bites is symptom based. Topical application of antipruritic agents, glucocorticoids, or antiseptic lotions may relieve itching and pain. Allergic reactions may require oral antihistamines. Antibiotics may be necessary for the treatment of large bite wounds that become secondarily infected.

FLEA BITES

Common human-biting fleas include the dog and cat fleas (*Ctenocephalides* species) and the rat flea (*Xenopsylla cheopis*), which infest their respective hosts and the hosts' nests and resting sites. Sensitized persons develop erythematous pruritic papules (*papular urticaria*) and occasionally vesicles and bacterial superinfection at the site of the bite. Symptom-based treatment consists of antihistamines, topical glucocorticoids, and topical antipruritic agents.

Flea infestations are eliminated by removal and treatment of animal nests, frequent cleaning of pet bedding, and application of contact and systemic insecticides to pets and the dwelling. Flea infestations in the home may be abated or prevented if pets are regularly treated with veterinary antiparasitic agents and insect growth regulators.

Tunga penetrans, like other fleas, is a wingless, laterally flattened insect that feeds on blood. Also known as the chigoe flea, sand flea, or jigger (not to be confused with the chigger), it occurs in tropical regions of Africa and the Americas. Adult female chigoes live in sandy soil and burrow under the skin, usually between toes, under nails, or on the soles of bare feet. Gravid chigoes engorge on the host's blood and grow from pinpoint to pea size during a 2-week interval. They produce lesions that resemble a white pustule with a central black depression and that may be pruritic or painful. Occasional complications include tetanus, bacterial infections, and autoamputation of toes (*ainhum*). Tungiasis is treated by removal of the intact flea with a sterile needle or scalpel, tetanus vaccination, and topical application of antibiotics.

HEMIPTERAN (TRUE BUG) BITES

Several true bugs of the family Reduviidae inflict bites that produce allergic reactions and are sometimes painful. The cone-nose bugs, so called because of their elongated heads, include the assassin and wheel bugs, which feed on other insects and bite vertebrates only in self-defense, and the kissing bugs, which routinely feed on vertebrate blood. The bites of the night-feeding kissing bugs are painless. Reactions to such bites depend on prior sensitization and include tender and pruritic papules, vesicular or bullous lesions, extensive urticaria, fever, lymphadenopathy, and (rarely) anaphylaxis. Bug bites are treated with topical antipruritics or oral antihistamines. Persons with anaphylactic reactions to reduviid bites should keep an epinephrine kit available. Some reduviids transmit *Trypanosoma cruzi*, the agent of New World trypanosomiasis (also called *Chagas disease*) (Chap. 252).

The cosmopolitan bedbugs (*Cimex* species) hide in crevices of mattresses, bed frames and other furniture, walls, and picture frames and under loose wallpaper. Bedbug populations have resurged, recently attaining levels and spreading to an extent not encountered since the mid-twentieth century. These bugs are now a common pest in homes, dormitories, and hotels; on cruise ships; and even in medical facilities. Generally, the bugs hide during the day and take blood meals at night. Their bite is painless, but minutes to days later, sensitized persons develop erythema, itching, and wheals around a central hemorrhagic punctum. Bedbugs are not known to transmit pathogens.

CENTIPEDE BITES AND MILLIPEDE DERMATITIS

The fangs of centipedes of the genus *Scolopendra* can penetrate human skin and deliver a venom that produces intense burning pain, swelling, erythema, and sterile lymphangitis. Dizziness, nausea, and anxiety are described occasionally, and rhabdomyolysis and renal failure have

been reported. Treatment includes washing of the site, application of cold dressings, oral analgesic administration or local lidocaine infiltration, and tetanus prophylaxis.

Millipedes are docile and do not bite, but some secrete defensive fluids that may burn and discolor human skin. Affected skin turns brown overnight and may blister and exfoliate. Secretions in the eye cause intense pain and inflammation that can result in corneal ulcers and even blindness. Management includes irrigation with copious amounts of water or saline, use of analgesics, and local care of denuded skin.

CATERPILLAR STINGS AND DERMATITIS

Caterpillars of several moth species are covered with hairs or spines that produce mechanical irritation and may contain or be coated with venom. Contact with these caterpillars or their hairs may lead to lepidopterism or caterpillar envenomation. The response typically consists of an immediate burning sensation followed by local swelling and erythema and occasionally by regional lymphadenopathy, nausea, vomiting, and headache. A rare reaction to a South American caterpillar, *Lonomia obliqua*, can cause disseminated coagulopathy and fatal hemorrhagic shock. In the United States, dermatitis is most often associated with caterpillars of the io, puss, saddleback, and brown-tail moths. Even contact with detached hairs of other caterpillars, such as gypsy moth larvae, can later produce a pruritic urticarial or papular rash called *erucism*. Spines may be deposited on tree trunks or drying laundry or may be airborne and cause irritation of the eyes and upper airways. Treatment of caterpillar stings consists of repeated application of adhesive or cellophane tape to remove the hairs, which can then be identified microscopically. Local ice packs, topical glucocorticoids, and oral antihistamines relieve symptoms.

BEETLE VESICATION AND DERMITIS

Several families of beetles have independently developed the ability to produce chemically unrelated vesicating toxins. When disturbed, blister beetles (family Meloidae) extrude cantharidin, a low-molecular-weight toxin that produces thin-walled blisters (≤ 5 cm in diameter) 2–5 h after contact. The blisters are not painful or pruritic unless broken and resolve without treatment in ≤ 10 days. Nephritis may follow unusually heavy cantharidin exposure. Contact occurs when individuals sit on the ground, work in the garden, or deliberately handle the beetles. The hemolymph of certain rove beetles (Staphylinidae) contains pederin, a potent vesicant. When these beetles are crushed or brushed against the skin, the released fluid causes painful, red, flaccid bullae. These beetles occur worldwide but are most numerous and problematic in parts of Africa (where they are called "Nairobi fly") and southwestern Asia. Ocular lesions may develop after impact with flying beetles at night or unintentional transfer of the vesicant on the fingers. Treatment is rarely necessary, although ruptured blisters should be kept clean and bandaged.

Larvae of common carpet beetles are adorned with dense arrays of ornate hairs called *hastisetae*. Contact with these larvae or their setae results in delayed dermal reactions in sensitized individuals. The lesions are commonly mistaken as bites of bedbugs.

DELUSIONAL INFESTATIONS

The groundless conviction that one is infested with arthropods or other parasites (Ekbohm's syndrome, delusory parasitosis, delusions of parasitosis, and perhaps Morgellons syndrome) is extremely difficult to treat and, unfortunately, is not uncommon. Patients describe uncomfortable sensations of something moving in or on their skin. Excoriations and self-induced ulcerations typically accompany the pruritus, dysesthesias, and imaginary insect bites. Patients often believe that some invisible or as yet undescribed creatures are infesting their skin, clothing, homes, or environment in general. Frequently, patients submit as evidence of infestation specimens that consist of plant-feeding and nonbiting peridomestic arthropods, pieces of skin, vegetable matter, lint, and other inanimate detritus. When evaluating a patient with possible delusional parasitosis, it is imperative to rule out true infestations and bites by arthropods, endocrinopathies, sensory disorders due to neuropathies, opiate and other drug use, environmental irritants