Allergy & Asthma Center
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STINGING INSECT PRECAUTIONS

The major season for stinging insects are the warm months from April to October. During this period, if you are highly allergic to bees, keep your 2 Epi-Pens and Benadryl with you at all times when you are outdoors and/or in the car. If you are stung, take 50 mg of Benadryl and if severe symptoms (hives, asthma, throat tightening, light headedness, feelings of marked illness) then take your first dose of epinephrine immediately. Immediately go to the **nearest emergency room or call 911 if you have a severe reaction**. If you start to have more symptoms or if your initial symptoms fail to respond to the epinephrine, you can take the second dose in 5-10 minutes while continuing to the emergency room.

Allergy shots are the key reliable intervention to prevent life threatening bee sting anaphylaxis. Both during build-up of shot doses and on maintenance it is also important to use common sense bee sting avoidance measures.

Prevent being stung by making yourself unattractive to insects. Wear white or khaki clothes. Do not wear black or brightly colored clothing. Do not use perfumed substances – hair spray, perfume, deodorant, scented soap, or sun tan lotion etc. Use insect repellant, but do not rely on it entirely. Try to avoid fast, jerky movements which may provoke insects to sting.

Wear closed shoes when outdoors. Sandals are not adequate even with socks (insects can sting through socks). The most common way to get stung is to step on a hive/nest resulting in stings to the lowest unprotected part of the body.

Avoid areas where stinging insects are common – near flowers, outdoor cooking, food, garbage, wet areas of gardens or walkways.

Be careful gardening – it is very common to accidentally hit a hidden yellow jacket nest, resulting in multiple stings.

If necessary have a professional exterminator look for and remove any hives or nests around your home. Keep screens in your home in good repair and keep them closed at all times. While driving, keep windows closed.

Again if severe allergies obtain a Medic Alert bracelet and wear it at all times. (Medic Alert Foundation, Turlock, California 95380; 1-800-432-5378)

Injection therapy with venom is generally highly effective in preventing allergic reactions to stings. Injection therapy should be offered to everybody who has had a generalized ("systemic") reaction to a sting. Even while receiving injection therapy, epinephrine and Benadryl and if needed Epinephrine must be carried on person and taken immediately after a sting.

PLEASE DON'T HESITATE TO ASK IF YOU HAVE ANY QUESTIONS!!!

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HYMENOPTERA STINGS: Insects that sting to defend their colonies or subdue their prey belong to the order Hymenoptera, which includes apids (bees and bumblebees), vespids (wasps, hornets, and yellow jackets), and ants. Their venoms contain a wide array of amines, peptides, and enzymes that are responsible for local and systemic reactions. Although the toxic effect of multiple stings can be **fatal, nearly all of the 50 or more deaths due to hymenopteran stings in the United States each year are the result of allergic reactions.**

Bee and Wasp Stings: Bees lose their venom apparatus in the act of stinging and subsequently die, while vespids can sting numerous time in succession. The familiar honeybees (Apis mellifera) and bumblebees (Bombus and other genera) attack when a colony is disturbed, but the extremely aggressive Africanized honeybees respond to minimal intrusions rapidly and in large numbers. Since their introduction into Brazil in 1957, these "killer bees" have spread through South and Central America to the southern and western United States.

The common vespids in the United States include the yellow jacket, notable for the yellow and black bands on its abdomen; the bald-faced hornet, with a black body and a white face; the brown hornet, measuring 2.5 to 3.5 cm in length; and the paper wasps, which have variously colored elongate bodies. Vespids sting in defense of their nests, which they often build near human dwellings and suspend from eaves or shrubbery, plaster on to walls, or burrow into wood or soil. Yellow jackets feed on sugary substances and decaying meat and are annoyingly abundant at recreation sites and around garbage cans, particularly in the late summer and fall.

Venom is produced in glands at the posterior end of the abdomen and is rapidly expelled by contraction of the muscles of the venom sac, which has a capacity of up to 0.1 ml in large insects. The venoms of different species of hymenopterans are biochemically and immunologically distinct. Direct toxic effects are mediated by mixtures of low-molecular-weight compounds such as serotonin, histamine, and acetylcholine and several kinins. Polypeptide toxins in honeybee venom include mellitin, which damages cell membranes; mast cell-degranulating protein, which causes histamine release; apamin, a neurotoxin; and adolapin, which has anti-inflammatory action. Enxymes in venom include hyaluronidase, which allows the spread of other venom components,m and phospholipases, which may be among the major venom allergens. There appears to be little cross-sensitization between honeybee and wasp venoms.

Uncomplicated stings cause immediate pain, a wheal-and-flare reaction, and local edema and swelling that subside in a few hours. Stings from accidently swallowed insects may induce life-threatening edema of the upper airways. Multiple stings can lead to vomiting, diarrhea, generalized edema, dyspnea, hypo-tension, and collapse. Rhabdomyolysis and intravascular hemolysis may cause renal failure. Death from the direct effects of venom has followed 300 to 500 honeybee stings.

Large local reactions that spread $\geq$ 10 cm around the sting site over 24 to 48 hours are hot uncommon. These reactions may resemble cellulitis but are caused by hypersensitivity rather than secondary infection.

Such reactions tend to recur on subsequent exposure but are seldom accompanied by anaphylaxis and are not prevented by venom immunotherapy.

An estimated 0.4 to 4.0% of the U.S. population exhibits clinical immediate-type hypersensitivity to insect stings, and 15% may have asymptomatic sensitization manifested by positive skin tests. Persons who experience severe allergic reactions are likely to have similar reactions after subsequent stings; occasionally, adults who have had mild reactions later experience serious reactions. Mild anaphylactic reactions from insect stings, as from other causes, consist of nausea, abdominal cramping, generalized urticaria, flushing, and angioedema. Serious reactions, including upper airway edema, bronchospasm, jypotension, and shock, may be rapidly fatal. Severe reactions usually begin within 10 min. of the sting and only rarely develop after 5 h. Usual complications, including serum sickness, vasculitis, neuritis, and encephalites, develop several days or weeks after a sting.

R_X TREATMENT Stingers embedded in the skin should be scraped or brushed off with a blade or a fingernail but not removed with forceps, which may squeeze mor venom out of the venom sac. The site should be cleansed and disinfected and ice packs used to slow the spread of venom. Elevation of the affected site and administration of analgesics, oral antihistamines, and topical calamine lotion relieve symptoms; application of meat tenderizer containing papain is of no proven value. Large local reactions may require a short course of oral therapy with glucocorticoids. Patients with numerous stings should be monitored for 24 h for evidence of renal failure or coagulopathy.

Anaphylaxis is treated with subcutaneous injection of 0.3 to 0.5 ml of epinephrine hydrochloride in a 1:1000 dilution; treatment is repeated every 20 to 30 min if necessary. Intravenous epinephrine (2 to 5 ml of a 1:10,000 solution administered by slow push) is indicated for profound shock. A tourniquet may slow the spread of venom. Parenteral antihistamines, fluid resusciation, bronchodilators, oxygen, intubation, and vasopressors may be required. Patients should be observed for 24 h for recurrent anaphylaxis.

✱**Prevention** Persons with a history of allergy to insect stings should carry a sting kit with a pre-loaded syringe containing epinephrine for self-administration in case of a sting. These patients should seek medical attention immediately after using the kit. To avoid stings when outdoors, individuals can wear shoes and protective clothing and avoid attracting insects with sweet foods, bright-colored clothes, perfumes, or cosmetics.

✱**Venom Immunotherapy** Repeated injections of purified venom produce a blocking IgG antibody response to venom and reduce the incidence of recurrent anaphylaxis from 50-60% to <5%. Honeybee, wasp, yellow jacket, and mixed vespid venoms are commercially available for desensitization and for skin testing. Adults with a history of anaphylaxis should undergo desensitization. Results of skin tests and venom-specific radioallergosorbent test aid in the selection of patients for immunotherapy and guide the design of such treatment. The risk of a systemic reaction to a sting is ~5 to 10% after discontinuation of a $\geq$5 year course of immunotherapy