

## Allergies to Insect Venom Bee, Wasp, Ant Sting Allergies

### Facts About Allergies

The tendency to develop allergies may be inherited. If you have allergic tendencies and are exposed to certain things in your environment (allergens), you may develop allergies to some of those things. Examples of allergy symptoms include itchy eyes, runny nose, asthma symptoms, eczema (atopic dermatitis) and hives (urticaria). The timing of the allergic response may be immediate or delayed. Allergy testing may be recommended to help identify your allergies.



Unfortunately, pollens aren't the only allergens in the air. There is another potential bunch of allergens being flown around inside a special injection device that, when encountered, may threaten the lives of those who are sensitive to it...insect venom! Most people think of bees or wasps when talking about stinging insects. Ants, hornets and yellow jackets are insects that also sting. These insects actually inject venom into your body, and an insect sting allergy is an allergy to that venom. Although less common than pollen allergy, insect venom allergy is anything but trivial.

### Which Insects Are to Blame?

The primary offenders are most often insects that sting rather than those that bite. These insects are members of the order of Hymenoptera of the class Insecta.

Stinging insects of concern are found in three families:

- Wasps and Hornets (Vespidae): Yellow jackets (which are wasps), yellow hornets, white-faced hornets and paper wasps all sting.
- Bees (Apidae): Honeybees are the most frequent stinging insect. Bumblebees cause significantly fewer reactions, but both types of bee's sting.
- Ants (Formicidae): Fire ants, harvester ants, bulldog ants and jack jumper ants are all stinging insects. Harvester ant stings are painful, but are a less common cause of a severe reactions, called anaphylaxis. Stings from red imported fire ants (RIFA) are known to cause severe allergic reactions in their habitat in the southeastern U.S. and along the Gulf Coast. They characteristically bite to attach themselves to their victim and then sting multiple times in a semicircular pattern, with a sterile pustule forming at each sting site after several hours.

There have been isolated case reports of systemic allergic reactions to bites from deer flies, kissing bugs, bed bugs, and mosquitoes, but such reactions are rare. More common are large local reactions to these bites that,

although unpleasant, are not life threatening.

## What Are The Different Types of Reactions To Insect Stings?

Reactions to bee stings, wasp stings and ant bites can be **immediate** or **delayed** and they can be **allergic or toxic**. A toxic reaction is due to poisons in the venom itself acting on cells and tissues of the body. Whereas, a true allergic response is a result of the immune system making specific allergic antibodies (IgE) to compounds of the insect venom, leading with exposure to the generation and release of a variety of chemicals such as histamine that act on surrounding tissue to cause the symptoms associated with allergic reactions.

### Immediate Reactions

Immediate reactions occur within four hours of a bee or other insect sting and can be further divided into local, large local, anaphylactic and toxic reactions.

Immediate local reactions are often considered the "normal reaction". Signs and symptoms of immediate localized reactions are limited to the area of the sting site. Local reactions can occur in individuals who are not insect allergic.

Signs and symptoms of an immediate reaction may include:

- pain
- redness
- swelling
- mild itching that lasts for several hours

### Delayed Reactions

Reactions occurring more than 4 hours after a bee or other insect sting are delayed reactions. There have been isolated reports of serum sickness-like syndromes occurring about a week after a sting. Other unusual reactions that have been reported in association with insect stings include Guillain-Barre syndrome, glomerulonephritis, myocarditis, vasculitis and encephalitis.

Signs and symptoms of delayed allergic reactions may include:

- hives
- fever
- general discomfort
- joint pain
- pain or partial paralysis of extremities (hands, arms, feet, and legs)
- kidney pain
- chest pain (angina)
- swelling
- headache, dizziness, loss of consciousness

These people are at risk for anaphylaxis to subsequent stings and are candidates for venom immunotherapy (allergy shots). If anaphylaxis is suspected, call 911, or seek professional medical help immediately.

### Allergic Reactions

A true allergic response to a bee or other insect sting happens when the immune system overreacts. It makes specific allergic antibodies to fight the insect venom. Chemicals such as histamine are released that cause the tissue around the bite or sting to swell, turn red, itch and be painful.

### Large Local Allergic Reactions

Large local reactions are characterized by redness and swelling that extends from the sting site over a large surrounding area. These reactions often peak within 48 to 72 hours and last up to 10 days. They may be accompanied by fatigue, low-grade fever, mild nausea and discomfort and are often misdiagnosed as cellulitis.

## Anaphylaxis

Anaphylaxis is the most severe insect sting reaction. This is an allergic reaction, involving multiple organ systems at the same time, most often begins within minutes of the sting although it can occasionally begin an hour or so later. If an anaphylactic reaction is suspected, give injectable epinephrine and an antihistamine (if available) and call 911 immediately.

Signs and symptoms of anaphylaxis may include:

- flushing, itching
- hives
- sneezing, runny nose
- nausea, vomiting, diarrhea
- abdominal cramping
- heart irregularities
- swelling in the throat
- severe trouble breathing
- loss of blood pressure (hypotension)
- loss of consciousness
- shock

## Toxic Reactions

In the event of a sting from a poisonous spider or insect; or multiple, simultaneous stings from otherwise non-poisonous insects (when a nest is disturbed or when Africanized honeybees are involved); a toxic reaction may result.

Toxic reactions are not caused by an allergic response, but by poisons in the venom that acts as a poison.

Local and toxic reactions can be seen in individuals who are not insect sting allergic. Some people who experience toxic reactions can become allergic to insect venom later. Symptoms of a toxic reaction vary depending on the toxicity of the venom of the insect or spider, the individual's tolerance for that particular venom and the amount of venom injected.

Signs and symptoms of toxic reactions may include:

- rapid swelling at the site of the sting
- headache
- weakness
- lightheadedness
- drowsiness
- fever
- diarrhea
- muscle spasms
- fainting (syncope)
- seizures

Usually, symptoms lessen or go away within 48 hours.

Hives and shortness of breath may occur in an allergic reaction, but not in a toxic reaction. It is possible to have both a toxic reaction and an allergic reaction at the same time, but this rarely occurs. A toxic reaction can be life-threatening and may lead to heart problems, shock, and death. If a toxic reaction is suspected, call 911, or

seek professional medical attention immediately.

## How is the Diagnosis Made?

Making a correct diagnosis of allergy to bee, wasp or insect sting (insect venom) is important. The first step in making the diagnosis of wasp sting or other insect venom allergy is a careful history of the types of insects and the reactions you have to their stings.

### Identify the Insect

If you didn't see the insect that stung you, take a look around where you were stung. Do you see honeybees flying around? Is there a yellow jacket nest nearby? Are you standing on an anthill?

Nesting and behavior patterns and a description of the insect and the sting may aid identification. For example, honeybees, because their stinger is barbed, usually lose their stinging apparatus, leaving it stuck in the victim at the site of the sting. Thus, stinging is often a fatal event for a honeybee. However, this alone is not diagnostic of a honeybee sting, because vespids (types of wasps) can also sometimes lose their stingers.

Unfortunately, accurate identification of the insect based on the history alone is not always possible. People with histories suggestive of significant sting allergy should be referred to an allergist. The usual procedure is to complete skin tests with the five commercially available insect venoms. These include honeybee, paper wasp, yellow jacket, yellow hornet and white-faced hornet. When appropriate, whole-body extracts for imported fire ant, harvester ant and several biting insects are also available for testing. If the history is very suggestive of a generalized reaction and skin tests are negative, they should be repeated as well as obtaining blood tests for specific insect venoms (RAST).

## How Can I Manage Allergic Reactions to Insect Stings?

It is important to know how to reduce the risk of bee, wasp and insect stings if you or a family member has a bee sting, wasp sting or insect venom allergy. Teach your child's caregivers how to respond when avoidance strategies fail and a sting occurs.

This means being prepared to treat insect sting reactions in a variety of settings including the home and at school, day care, friend's houses and any other sites where the child spends time.

### Prevent bee stings, wasp stings, ant bites and other insect stings:

- Wear protective clothing while outside to decrease exposed skin.
- Wear long pants when hiking or mowing the grass and wear gloves while gardening.
- Wear white or light colored clothing. Dark clothing and clothing with flowery designs is more likely to attract insects.
- Wear shoes rather than running around in bare feet or sandals while playing outside.
- Use unscented deodorant and rinse off perspiration after vigorous exercise. Insects are attracted to the scent of deodorants and perspiration.
- Avoid the use of strong smelling perfume, cologne, hair oil, hair spray or lotions as insects may be attracted by their fragrance.
- Cover food and drinks at outdoor events as much as possible.
- Keep outside garbage covered. The smell of food attracts these insects.
- Use insect repellents and keep insecticide available.

In addition to preventing exposure, it is important to be prepared to treat insect sting reactions in a variety of settings, including at home, school, day care, friend's houses and all other sites where your child spends time. This is called an Insect Sting Action Plan.

### Treatment tips:

There are different treatments for bee stings, wasp stings and other insect bites based on the type of reaction you have.

#### Local Reaction without a history of sting allergy

- Take aspirin for pain, and use ice to reduce swelling.

#### History of large local reactions

- Take an oral antihistamine (preferably one that is non-sedating).
- If your doctor suggests, take a single dose of oral steroids soon after the sting.
- Wear a medical alert bracelet or necklace stating that you (or your child) are allergic to bee stings, wasp stings or other insect stings.
- Learn and teach your family the potential symptoms of allergic reactions to insect stings.
- Ask your healthcare provider to give you a written action plan.
- If an epinephrine injection device is prescribed, learn how to give it and when it should be used. Make sure that all caretakers understand the action plan and how to give the epinephrine and any other medication prescribed for the treatment of reactions.
- Carry an emergency pack at all times. Keep the emergency pack stocked with an antihistamine (liquid or chewable tablet) and an epinephrine injection device (if prescribed), a rescue inhaler if you have asthma; and an action plan card that describes the treatment steps to take and the importance of calling 911 or going to the closest medical facility once the medication is given.
- Take allergy shots to prevent future insect sting reactions. After reaching maintenance doses of immunotherapy, 95 percent of insect venom-treated people are able to tolerate single stings, and sting reactions that occur are generally milder. Adults who have a positive venom skin test generally are considered candidates for specific-venom allergy shots (immunotherapy). Children with skin symptoms alone have only a 10 percent risk of systemic allergic reactions and aren't considered candidates for skin testing or immunotherapy. Nonetheless, children with more severe or life-threatening reactions are candidates for venom immunotherapy.

These measures are part of an Insect Sting Action Plan to prevent exposure to insects and treat an insect sting once it occurs.

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