CONDITION

Bee, wasp, hornet, or yellow jacket sting

Learn how to recognize and treat bee, wasp, hornet, and yellow jacket stings, including local reactions, anaphylaxis, and signs that need urgent care.

WHAT IT IS
Venom reaction from a stinging insect

BODY SYSTEM
Skin and immune system

MAIN SYMPTOMS
Pain, redness, itching, swelling

WHAT CAUSES IT
Injected venom and immune allergy

HOW IT IS DIAGNOSED
Clinical assessment, skin or venom-specific IgE tests

MAIN TREATMENT
Home care and emergency allergy treatment

CAN IT BE CURED?
Yes, most reactions resolve with care

IS IT AN EMERGENCY?
Sometimes, trouble breathing or throat swelling

LONG-TERM OUTLOOK
Most improve, but severe reactions can recur

Overview

Bees, wasps, hornets, and yellow jackets inject venom through a stinger. Most stings cause brief pain, redness, itching, and swelling near the sting. These reactions are uncomfortable but usually improve with basic home care.

Some people develop a large local reaction, with swelling that spreads well beyond the sting site. A smaller number have a systemic allergic reaction, meaning symptoms occur in parts of the body away from the sting. The most serious form is anaphylaxis , a rapid allergic reaction that can affect breathing, blood pressure, or several body systems at once.

The type of insect can affect what happens after a sting. Honeybees often leave a barbed stinger and attached venom sac in the skin. Wasps, hornets, and yellow jackets usually do not leave a stinger and may sting more than once.

Quickly recognizing anaphylaxis matters because epinephrine is the first-line treatment. Multiple stings can also be dangerous because a large amount of venom may cause illness even in someone who is not allergic.

Symptoms

A typical local reaction begins soon after the sting. Symptoms are limited to the area around it and may include:

These symptoms often begin improving within hours, although tenderness or itching may last longer.

A large local reaction causes swelling that extends well beyond the sting. For example, a sting on a finger may lead to swelling of much of the hand or forearm. Swelling may increase for a day or two and can take several days to settle. A large local reaction is not the same as anaphylaxis, but a clinician may need to assess severe or persistent swelling.

An allergic reaction can cause symptoms away from the sting site. Warning signs include widespread hives, flushing, swelling of the lips or tongue, throat tightness, a hoarse voice, wheezing, coughing, or trouble breathing. Nausea, vomiting, abdominal cramps, diarrhea, dizziness, confusion, fainting, or a sudden feeling of weakness can also occur.

Anaphylaxis may involve breathing problems, reduced blood pressure, or symptoms from more than one body system. Skin symptoms are common but are not always present.

Call emergency services immediately if someone has trouble breathing, throat or tongue swelling, fainting, confusion, collapse, or a rapidly worsening reaction. Use prescribed epinephrine without delay when the person's emergency plan or device instructions call for it.

Stings inside the mouth or throat need urgent evaluation because local swelling can affect the airway. A sting to the eye or eyelid also needs prompt medical care.

- Sharp or burning pain
- A red or discolored raised spot
- Mild swelling
- Itching or warmth
- A visible stinger after a honeybee sting

Causes and risk factors

Venom contains proteins and other substances that cause pain and inflammation. This local effect is expected and does not necessarily mean the person has a venom allergy.

An allergic reaction happens when the immune system mistakenly treats venom proteins as a major threat. A previous sting may have sensitized the immune system, but reactions are not always predictable. A person can react differently to separate stings.

Factors that may increase the chance of being stung include outdoor work, gardening, handling food or sweet drinks outside, walking barefoot, and being near nests. Yellow jackets may gather around open rubbish bins, food, and drink containers. Bees are often found near flowering plants.

The likelihood of a serious future reaction is more concerning after a previous systemic reaction than after an ordinary local reaction. Certain mast cell disorders may also increase the risk of severe anaphylaxis. Mast cells are immune cells that release chemicals involved in allergic reactions.

Some heart or blood pressure medicines can affect anaphylaxis treatment decisions. They should not be stopped without medical advice. A clinician or allergist can review the benefits and risks based on the person's health and reaction history.

Ways to reduce exposure include wearing closed shoes outdoors, covering food and drinks, checking open cans or bottles before drinking, and avoiding perfumes or brightly scented products around stinging insects. Do not swat at an insect. Move away calmly. Professional pest control is safer than trying to remove an active nest without proper training.

Diagnosis

Most uncomplicated stings do not require testing. A clinician usually identifies the type of reaction by asking what happened, how quickly symptoms began, where they appeared, and how long they lasted. Photos of swelling or hives can be helpful if the symptoms have resolved before the appointment.

Identifying the exact insect is not always possible. Details such as a stinger left in the skin, the insect's appearance, the location, and whether there were repeated stings may provide clues. Treatment of an acute allergic reaction should not be delayed while trying to identify the insect.

Large local swelling can resemble a skin infection. Venom-related swelling usually begins soon after the sting and may be itchy. Infection is less common and is more likely when pain, warmth, or redness continues to worsen after an initial period of improvement, especially if there is pus, fever, or red streaking.

After a systemic allergic reaction, an allergist may recommend skin testing or a blood test for venom-specific immunoglobulin E, often called venom-specific IgE. These tests look for allergic sensitization. A positive result does not by itself show how severe a future reaction would be; it must be interpreted with the person's history.

A clinician may also check a baseline serum tryptase level after a serious reaction. Tryptase is a substance released by mast cells. A persistently elevated level can lead to further evaluation for an underlying mast cell condition.

Treatment and management

For a honeybee sting, remove the stinger as quickly as possible. Scraping it out and pulling it out are both reasonable; speed matters more than the method. Do not keep squeezing the attached venom sac. Wasps, hornets, and yellow jackets usually do not leave a stinger.

Wash the area with soap and water. Apply a cold pack wrapped in cloth for short periods to reduce pain and swelling. Elevating a stung arm or leg may help. Remove rings, watches, or tight clothing before swelling increases.

An over-the-counter oral antihistamine may reduce itching. A topical hydrocortisone product or calamine lotion may also help some people. Nonprescription pain medicine can be considered when it is safe for the person and used according to the label. A pharmacist or clinician can help if there are questions about other medicines, pregnancy, kidney or liver disease, or treatment for a child.

Do not scratch or break blisters. Antibiotics like amoxicillin or doxycycline do not treat the venom reaction and are not routinely needed unless a clinician finds evidence of infection.

For a very large local reaction, a clinician may recommend additional treatment based on the location and severity. Swelling around the face, mouth, or neck deserves particular attention because of the structures nearby.

Anaphylaxis requires immediate treatment with epinephrine. If a prescribed auto-injector is available, use it promptly in the outer thigh according to the device instructions and the person's emergency plan. Antihistamines like cetirizine or loratadine may help itching or hives, but they do not reverse airway swelling or low blood pressure and must not replace epinephrine.

After using epinephrine, call emergency services. Keep the person lying down with legs raised if possible. If breathing is difficult, a more upright position may be easier, but the person should not suddenly stand or walk. Turn an unconscious person who is breathing onto their side. A second auto-injector may be needed if symptoms continue or return, following the emergency

plan and instructions from emergency personnel.

Someone with numerous stings should receive urgent medical advice, even without allergy symptoms. A large venom exposure can damage muscles, kidneys, blood cells, or other organs.

People with a confirmed systemic venom allergy may be offered venom immunotherapy . This treatment gives carefully controlled amounts of the relevant venom to reduce the risk of a serious reaction from a future sting. It is provided and monitored by an allergy specialist. The treatment schedule and duration depend on the person's reaction, test results, exposure risk, and other medical factors.

Complications

The main immediate complication is anaphylaxis. Symptoms can progress quickly, so treatment should not wait for every possible sign to appear.

Some people experience a biphasic reaction , in which symptoms return after initially improving. Emergency clinicians may monitor a person after anaphylaxis based on the severity of the reaction, the treatment required, and other risk factors.

A large local reaction can temporarily limit movement, especially when swelling affects a hand, foot, or joint. Swelling near the mouth or throat can interfere with breathing even when the reaction is limited to the sting area.

Many stings can produce a toxic venom reaction rather than an allergy. Possible complications include muscle breakdown, kidney injury, blood-clotting problems, or damage to blood cells. These effects require hospital assessment.

Secondary bacterial infection is possible but uncommon. Increasing pain, pus, fever, or redness that spreads after the reaction should have started improving may suggest infection and warrants medical review.

Follow up

Routine follow-up is usually unnecessary when mild pain and swelling steadily improve. Seek medical advice if local symptoms are severe, continue to worsen, interfere with movement, or do not begin resolving as expected.

Contact a clinician promptly for possible infection, especially if there is fever, pus, increasing tenderness, or red streaking. A sting to the eye, inside the mouth, or near the throat also needs prompt assessment.

After any reaction involving widespread hives, breathing symptoms, dizziness, fainting, or symptoms away from the sting site, arrange follow-up with a clinician or allergist. This visit may include allergy testing, an epinephrine prescription, training on auto-injector use, and discussion of venom immunotherapy.

Emergency care is needed for breathing difficulty, throat or tongue swelling, collapse, confusion, a rapidly worsening reaction, or symptoms involving several body systems. Multiple stings may also require emergency assessment.

People prescribed epinephrine should check expiration dates, store the device as directed, carry it as advised, and make sure family members or close contacts know where it is and how to use it.

Sources

- Golden DBK, Demain J, Freeman T, et al. Stinging insect hypersensitivity: A practice parameter update 2016 . Annals of Allergy, Asthma & Immunology . 2017;118(1):28-54.
- Shaker MS, Wallace DV, Golden DBK, et al. Anaphylaxis: A 2023 practice parameter update . Annals of Allergy, Asthma & Immunology . 2024;132(2):124-176.
- American Academy of Allergy, Asthma & Immunology. Stinging Insect Allergy . Patient education resource.
- Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. Protecting Yourself from Stinging Insects . DHHS (NIOSH) Publication No. 2010-117.
- Resuscitation Council UK. Emergency Treatment of Anaphylaxis: Guidelines for Healthcare Providers . May 2021.