

# Bee Stings

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### Why do bees sting?

To protect themselves and more importantly their hive

An evolved behavior that helps to insure the survival of the bees. The attractiveness of the honey to insects and mammals required an effective means of protection which stinging provides.

### How do bees sting

The bee's abdominal muscles, legs, (2) alternating lancets ,with backward raked barbs, and a stable stylet, combine to produce a thrust that drives the penetration of the stinger.

Muscles continue to contract to ensure that the shaft of the stinger enters roughly perpendicularly into the skin so that the venom can be delivered more deeply and that the path through tough skin is the shortest

Venom is pumped from a venom sac at the top of the stylet. through a canal formed by two alternately moving lancets and a stylet, which does not move. These lancets and stylet are joined together and form what is commonly known as the stinger

Up to one milligram of venom can be injected as well as an alarm pheromone deposited on the skin to help direct other bees to the area that will also be prepared to attack or sting a perceived threat

After complete insertion of barbed lancets and stylet the bee flies away, but the stinger remains in the perceived threat. This occurs because fibrous tissue of mammals and birds holds the barbed lancets and the stylet, leaving muscle, nerve tissue and part of the digestive system. Conversely, when bees sting another insect their stingers are not torn from their bodies.

The muscles in the stinger continue to pump the venom for up to a minute after being separated from the bee. Appendages attached to the bee's stylet (a part of the stinger along with the two lancets), cause portions of the digestive system to be torn from the body and the bee dies within a few minutes

A note: only female (worker) bees have a barbed stinger, male bees (drones) do not have stingers and the queen has a stinger but it is smooth and can be used over and over.

## What happens when a bee stings?

The venom a bee continues to inject into its victim is known as an apitoxin. It is made up of several proteins, melittin, making up the largest part of the toxin or venom. These proteins bind to pain receptors in the skin causing intense pain and also begin to destroy cell walls as well as nerves at the sting site and setting off a series of chemical reactions or changes.

This series of chemical changes results in the release of histamine from its encapsulation in mast cells which are located above the capillaries supplying blood to the tissues in the skin. The histamine release causes holes in the capillaries to open to allow white blood cells to move out of the capillaries and into the fluid around the cells and engulfing the invading substances (toxins). This is what causes the redness and swelling around the bee sting

There are two types of reactions to a bee sting, localized and systemic

Localized reactions (normal) are those with symptoms occurring adjacent to the sting site. They can be mild or moderate.

Mild Reaction - sharp burning pain and a red welt at the sting site, with slight swelling that goes away in a few hours.

Moderate Reaction - Extreme redness, swelling at the site of the sting that gradually enlarges over the next day or two and largely resolves over the next 5-10 days. Heat coming through the skin, as well as itching also occur.

Systemic Reaction - A severe reaction known as anaphylaxis. If symptoms of this reaction occur, they require immediate medical attention as it can be life threatening or fatal. It is worth noting that this reaction is rare and does not occur often but the consequences are so serious that it deserves attention.

The symptoms include: Hives or rash, stomach cramps, nausea, vomiting, or diarrhea, dizziness or severe headaches, shortness of breath or difficulty swallowing, unconsciousness

Severe reaction symptoms are best recognized as occurring away from the sting site such as swelling in the foot from a bee sting on the hand or a rash on your arm from a bee sting on the leg.

The lack of a severe reaction to a bee sting does not guarantee that you will never have a severe reaction. Also, if you do have a severe reaction to a sting it does not mean that you will have a severe reaction if you are stung again, but your chances are greater for a severe reaction.

In a localized or normal reaction you are not at risk for death, unless your mouth or throat are affected and obstruct your breathing

## How do you treat a bee sting?

As soon as a bee stings you follow the steps below in order.

1. Locate the stinger and get it out as quickly as possible - the longer it stays in the more venom is pumped and the stings will result in more severe symptoms and pain. Scrape the stinger with your fingernail or credit card to avoid squeezing the venom sac and adding more venom into your system
2. Be alert to any signs of anaphylaxis mentioned above
3. If possible wash the area with soap and water to avoid infection, although few bee stings become infected as the venom is acidic and inhibits the growth of bacteria

#### 4. Apply a treatment that works best for you

According to sources such as Mayo Clinic, for a normal bee sting home remedies are all you need

An important note before discussing treatments, is that everyone's body is different and what may work for one person may not work for another. For instance honey may work as a treatment on one person but not on someone else. Also, honey may be helpful relieving symptoms on the same person for one bee sting but ineffective on the next sting. Use whatever works for you.

The following were consistently listed as helpful Home Remedies for bee sting symptoms

1. Ice and elevation - ice reduces venom absorption and reduces swelling, elevation can aid in pain relief. Apply ice with a cloth between ice source and the sting for 20 minutes then reapply as needed
2. Tooth paste - apply directly to the bee sting area - pain relief
3. Baking Soda- make a paste with water and apply to the sting area - pain relief
4. Others mentioned - meat tenderizer, honey, apple cider vinegar, activated charcoal

Natural Remedies - may be found at health food stores

1. Lavender Oil - one to two drops on the skin for itching, wait 15 minutes and if itching persists reapply
2. Peppermint Oil - avoid putting directly on the skin, talk to health store about how to apply, increases circulation and has a numbing effect
3. Witch Hazel - apply directly to bee sting, helps inflammation, itching and pain
4. Aloe Vera - break off leaf of plant and rub over sting area, soothes skin and relieves pain

Really Natural - for when you are outdoors and cannot get to any of the above suggestions

1. Plantain - found in yards and fields everywhere, google to find a picture or ask someone who knows what it looks like to show you. Pick a leaf chew it

- to release tannins and apply it to the sting. The tannins are astringent and are thought to draw out toxins and it relieves pain
2. Mud - this helps to reduce swelling and redness

Over the counter medications - found at drug stores or drug areas in most stores, can be used if pain is severe and you need some relief

1. Ibuprofen (Advil, Motrin) - itching and swelling
2. Acetaminophen (Tylenol) - for pain
3. Antihistamine (Benadryl) - to reduce swelling, Benadryl can make you drowsy. For the same effect use Claritin which is not supposed to cause drowsiness

### Severe Reactions (anaphylaxis)

1. If you exhibit two or more symptoms mentioned above seek immediate medical attention. A call to 911 will insure the fastest medical attention as the medics can apply the appropriate medication immediately
2. If you have a prescribed Epi Pen use it immediately or if someone is with you instruct them on what to do

If you are feeling confused about the symptoms related to your bee sting and are not sure what to do, before making a trip to your doctor, you can call the **Poison Control Center at 1-800-222-1222** and someone there will tell you step by step what to do and if you are feeling unstable will help you get emergency help

### How do you avoid bee stings in the future?

Avoiding stings means avoiding contact with bees. The suggestions below are intended to give ideas on things to do that may help in not attracting or interacting with bees.

1. Bees can detect and follow strong scents. Wearing perfumes, using sweet smelling soaps or shampoos will attract nectar seeking bees from a distance and once they find the source of the smell they are likely to fly or attempt to crawl around on you. Sunscreen does not seem to ha

2. Keep your outdoor wear to white, beige, khaki, or other light colors if you don't want bees to land on you.
3. Wear shoes when walking on grassy lawns or in fields
4. Bees are aggravated by sudden changes in air pressure which can occur when attempting to swat a bee or shoo it away. If a bee lands on you, you may try to gently blow it away or use an object or your finger to gently move it off of you.
5. When outdoors, wearing loose clothing allows bees to find their way up your pants leg or into your shirt, once inside they will be trapped against your skin and your first impulse will probably be to slap it or jiggle your clothing. This introduces a threat to the bee and a sting may follow.
6. Sugary foods and drinks attract bees, so if you are eating outside cover your food before and after eating.
7. Be sure to check your glass or soda can before drinking when you are outside, as bees can easily crawl into your cup or can without being noticed and when you go to drink can be stung. You might consider clear cups or containers.
8. Bees become agitated by the strong odor of sweat. So if you have been running or biking and are pretty smelly, you may want to freshen up before any planned encounters with strenuous yard work or being outdoors where you may likely encounter bees.
9. Keep windows up in your car when you are not around. Bees have an uncanny knack for getting trapped in cars.
10. Wear a hat and or tie back your hair. Furry animals steal honey and bees are at heightened state of readiness when close to hair or fur.
11. Rinse jars and cans before recycling to prevent bees from being attracted to your bin and keep the garbage cans and recycling bins tightly shut especially in the warmer months
12. If you notice a lot of bees around on side of your house or a part of your garden call your local beekeeping association. They can give you the names of beekeepers who can safely remove them.