

Anaphylaxis

Most people go through life without ever experiencing anaphylaxis — a rare but severe allergic reaction that occurs suddenly and can be life threatening. Anaphylaxis can happen moments, or even seconds, after being exposed to a triggering substance. For example, you may experience anaphylaxis directly following an insect sting or a penicillin shot. Because an anaphylactic episode can progress quickly, it is important to know the warning signs and prepare for an emergency episode if you have had an episode in the past.

What Is anaphylaxis? Anaphylaxis, also known as anaphylactic shock, is your body's overreaction to a foreign substance. Your immune system responds by producing an abundance of antibodies, which are a type of protein created by the white blood cells, to fight the foreign substance. These antibodies, called immunoglobulin E (IgE), cause specific cells to release chemical substances that can be harmful. The release of these chemicals causes allergic symptoms. In the case of anaphylaxis, this can include drastic changes to circulation and air passages similar to those experienced when someone goes into shock.

An anaphylactoid reaction is another type of immediate reaction that mimics anaphylaxis. While symptoms and treatments are the same, the reason for the reaction is not. An anaphylactoid reaction does not involve the IgE antibodies or the immune system and is not considered a true allergic reaction. Even so, the reaction can be just as serious.

Symptoms The symptoms and course of anaphylaxis can vary. Initial signs of an anaphylactic episode can be deceptively mild, such as a runny nose, a skin rash all over the body, or a nondescript "strange feeling." These symptoms can quickly become more serious, including difficulty breathing, swelling of the throat or other parts of the body, rapid drop in blood pressure, and dizziness or unconsciousness.

Other symptoms of anaphylaxis include:

- Sense of impending doom
- Hives
- Tightness of the throat
- Hoarse voice
- Nausea
- Vomiting
- Abdominal pain
- Diarrhea
- Lightheadedness
- Cardiac effects, including a rapid drop in blood pressure and irregular heart beat

It is important to seek immediate emergency medical care if you or someone you know begins to go into anaphylactic shock. If the person loses consciousness, raise their feet while waiting for medical assistance. Keep them warm and make sure their airway remains open. If they seem to be having trouble breathing, lay them on the ground and tilt their head back. This helps get the tongue out of the way of air flow.

Emergency Treatment

In the most serious cases of anaphylaxis, your heart can stop pumping blood (a condition known as cardiovascular collapse). Cardiovascular collapse happens when there is a rapid loss of blood pressure, and your tissues and organs do not get enough fluids and oxygen. It is considered the "shock" part of anaphylactic shock. If this occurs, your doctor will administer large volumes of intravenous fluids to bring your blood pressure back to normal.

Epinephrine is the most commonly used emergency treatment for anaphylaxis. Epinephrine constricts blood vessels in the digestive tract and skin and raises blood pressure. It also widens the air passages to make breathing easier. If epinephrine doesn't ease breathing, your doctor may insert a breathing tube to keep the airway open

It is important to know that the earlier epinephrine is given, the more effective it is at stopping the reaction. Symptoms usually improve quickly after epinephrine is administered. Although epinephrine acts fast, its effects are short-lived. If you are having an anaphylactic episode, your doctor may give you second and third doses of epinephrine over several hours to control symptoms. Epinephrine is usually administered as an injection, but it can also be inhaled with a special device.

Epinephrine is sometimes given with other drugs, such as corticosteroids and antihistamines. These medications can't stop an anaphylactic episode, but they are useful in treating some of the symptoms associated with anaphylaxis, such as swelling of body parts and itching.

People on blood pressure medications, such as ACE inhibitors and beta-blockers, may not respond to epinephrine. Epinephrine constricts blood vessels, while ACE inhibitors and beta-blockers prevent blood vessel constriction. Patients on these blood pressure medications may respond better to other first-line anaphylaxis drugs. If you are on blood pressure medication or any other prescription medications, you should wear identification that indicates what drugs you are taking, such as a Medic Alert[®] bracelet.

If you visit an emergency room for anaphylaxis, you may be given a prescription for an easy-to-use, self-injectable shot of epinephrine (Epipen[®] or Epipen Jr[®]). You should carry this shot with you at all times in case of an emergency anaphylactic episode. Have someone show you how to use it correctly, and read the information on the shot insert when you get home. Injecting the epinephrine in the wrong place can have serious consequences. Always seek medical attention immediately after using a self-injectable shot of epinephrine since one shot may not be enough to stop an anaphylactic reaction and other medications may be required.

Triggers The most common anaphylactic and anaphylactoid triggers include medications, foods, insect stings and bites, and latex. Other triggers include diagnostic testing materials, exercise, progesterone (a natural hormone) and seminal fluid. In extremely rare cases, extended exposure to strong sunlight can cause anaphylactic shock.

Drug Allergies: Drug-induced anaphylaxis comes on fast — usually within minutes or even seconds after the offending medication is given. The most severe reactions usually happen when the medication is administered directly into the bloodstream — through an injection or shot — rather than when taken orally.

The most frequent cause of anaphylaxis is penicillin, a commonly used antibiotic responsible for approximately 75 percent of medicine-induced anaphylaxis deaths in the United States. A patient who has had a prior reaction to penicillin is six times more likely to experience a future reaction.

Other antibiotics, anesthetics (medications used to sedate or numb an area during surgery), protamine (medication used to counter the effects of heparin, a blood-thinning medication) and insulin also can act as anaphylactic triggers. Anaphylactoid (anaphylactic-like) reactions can occur after taking aspirin (nonsteroidal anti-inflammatory drugs, or NSAIDs) and from radiographic contrast material used for diagnostic testing.

In most cases, if you have had an anaphylactic or anaphylactoid reaction to a drug in the past, you should avoid this medication in the future, and you should get a medical bracelet

identifying your allergy. Your doctor can help determine which medications you can use as a safe alternative as well as any other medications that you should avoid.

If you develop a serious infection for which there are no alternative medications, your doctor may suggest desensitization. This process begins with a small dose of the medication to which you have had a reaction. As your body becomes tolerant, the dosage is gradually increased over time. Because there is a chance of anaphylaxis, this should only be done with appropriate monitoring by your doctor. The effects of desensitization are usually temporary. If you need the medication again in the future, the desensitization process may need to be repeated.

Food: While food allergies can develop at any age, reactions are most common in children. Even then, only 2 percent to 5 percent of children have diagnosed food allergies. Peanuts, tree nuts, fish, shellfish, milk and eggs are the most common culprits of severe reactions, although virtually any food or food component can cause anaphylaxis. It is possible for foods that have previously been eaten with no problem to trigger an anaphylactic episode.

Anaphylactic symptoms usually occur immediately after eating the problem food — although it is possible for symptoms to subside and then reappear several hours later. In extremely allergic individuals, even inhaling tiny food particles can induce a reaction.

The best way to prevent food-induced anaphylaxis is to avoid your trigger food or foods. Check ingredient labels carefully and be especially cautious when eating out. Restaurant staff often are unaware of the full list of ingredients in a dish. If your child has a severe food allergy, make sure his or her school is prepared with an emergency plan of care and a shot of epinephrine in case of an unexpected anaphylactic attack.

Insect stings and bites: While beneficial in certain situations, insects can cause considerable discomfort and sometimes even death to people who are allergic to their venom. Anaphylactic reactions to insect venom occur in 0.5 percent to 5 percent of the U.S. population and account for about 40 deaths each year.

Insects known to trigger anaphylaxis include:

- Honeybees
- Yellow jackets
- White-faced hornets
- Yellow hornets
- Wasps
- Imported Fire Ants (southern United States)

Although anaphylaxis usually occurs after multiple bites or stings, even a single sting can be life-threatening in highly allergic people. If someone has previously had an insect-sting reaction, they have a 60 percent chance of a comparable or more severe reaction if stung again.

Even if you're not allergic to insect venom, it is common to have swelling, redness and itching at the bite or sting site. These symptoms usually persist for a few days and then go away. Cleaning the area and applying ice can help reduce discomfort.

You can help reduce your chances of being stung by not wearing strong perfumes or brightly colored clothing. Long pants and sleeves can give you added protection.

Immunotherapy, or "allergy shots," is the only treatment that can reduce the possibility of future anaphylaxis caused by insect venom. Immunotherapy involves injections of venom (or fire ant whole-body extract) in gradually increasing amounts over the course of several months or sometimes years.

If you undergo immunotherapy for insect venom, your allergist-immunologist will inject tiny amounts of the venom that caused your anaphylactic episode under your skin once or twice a week. Initially, there may be a small amount of swelling and itching at the injection site. Over time, these symptoms should stop completely, indicating that you are becoming desensitized. As you are able to tolerate increasing amounts of the venom, the frequency of treatments will be decreased to once or twice a month. Eventually, the shots can be stopped altogether. Immunotherapy treatments usually continue for three to five years or longer.

After being treated with immunotherapy, you should still try to avoid stinging or biting insects. However, if you accidentally encounter an insect that stings or bites you, chances of having an anaphylactic attack will be greatly reduced.

While unlikely, immunotherapy does carry a small risk of anaphylaxis. Because of this, allergy shots should only be given under close observation of a medical professional.

Latex: Anaphylactic and allergic reactions to latex have become more common in recent decades because of an increased use of latex in medical products. Latex allergies are most commonly caused by natural latex derived from the *Hevea brasiliensis* tree, rather than from synthetic latex. Allergies to synthetic latex are very rare.

Products containing natural latex, which is most commonly the cause of allergies, include:

- Disposable gloves
- Intravenous tubes
- Airway tubes
- Syringes
- Stethoscopes
- Adhesive tapes
- Catheters

Health-care workers, children with spina bifida, people with urinary tract abnormalities, and people whose work brings them into constant contact with natural latex are at a higher risk for latex-induced allergies. People who have had prior allergic reactions to latex and people who have had unexplained anaphylactic episodes during a medical procedure also may be at higher risk for latex-induced anaphylaxis.

Before any medical procedure, it is important to inform your doctor or dentist about any allergies you may have, especially to latex. If you have spina bifida (with or without a known latex allergy) or a history of latex allergy, you should request that all dental, medical and surgical procedures be done in an environment where latex-free gloves are used and care is taken so that you do not come into contact with latex medical accessories, such as catheters or adhesives.

Exercise: Although less common, exercise can cause a physical allergy that leads to anaphylaxis. The digestion of certain foods or medications prior to exercise can be a contributing factor. Shrimp and celery, as well as aspirin and other NSAIDs, are the most common culprits.

If you have experienced exercise-induced anaphylaxis after eating or taking medication, you should avoid exercise for four to six hours after digesting the problem substance. Exercising in areas where other people are present, as well as carrying a self-injectable shot of epinephrine with you during exercise and wearing a medical bracelet that identifies your condition, are strategies that can help you to receive quick treatment in case of an emergency.

Pinpointing the Anaphylactic Trigger

Your best bet for avoiding future anaphylactic episodes is to identify and avoid your triggers. The observations of friends and family present during a past anaphylactic episode can be very helpful in

narrowing down the list of possible triggers. Any substances or foods you may have come into contact with in the hours leading up to an anaphylactic episode are suspects. In making your list, be very detailed. It's not enough to say "hot dog," for example. Contact the manufacturer and find out exactly what's in it.

If there is not an obvious culprit, an allergist-immunologist can test you for some of the more common triggers. Skin testing can be done for most foods, antibiotics (including penicillin) and insect venoms. A positive reaction results in an area of swelling, redness and itching at the site of the skin test.

If skin testing can't be done for some reason, or if the results of skin testing are inconclusive or skin testing is not available for the suspected allergen, it may be necessary to do an allergy blood test or a challenge test. Challenge tests involve introducing increasing amounts of the suspected allergen into your body through injection, inhalation or digestion. Any signs of an allergic reaction during the challenge indicate that you are allergic to the substance. If you had a negative skin test or blood test but a positive reaction to the challenge test, you are still considered sensitive to the substance - it just might take more substantial amounts of the allergen for your body to have a reaction.

Idiopathic Anaphylaxis

In about 50 percent of anaphylactic episodes, patients and doctors are unable to pinpoint the cause. When a specific trigger can't be identified, the anaphylaxis is said to be "idiopathic," which means "without known cause."

Idiopathic episodes are indistinguishable from anaphylactic episodes where a cause is eventually determined. The only difference between regular and idiopathic anaphylaxis is that people who have had idiopathic episodes are unable to avoid their triggers because they don't know what they are. These people sometimes live in fear of having another unexplained episode. Carrying self-injectable epinephrine shots and educating family and friends about what to do in case of an anaphylactic episode can help minimize this fear. In addition, keeping a diary and being very aware of events that occur before episodes may ultimately help you find a trigger.

What To Do If You Have Had an Anaphylactic Episode:

If you have had an anaphylactic reaction in the past:

- Know your triggers. Avoiding the substances to which you are allergic is the most effective way to prevent future anaphylactic episodes.
- Know what to do if you unexpectedly come into contact with your trigger. Your doctor can help you develop a detailed plan of emergency care.
- Educate family and friends on what to do if you begin to have an anaphylactic episode.
- If your doctor has prescribed a self-injectable shot of epinephrine, carry it with you at all times.
- Wear a **medical bracelet** that indicates your anaphylactic triggers. These bracelets can provide crucial information in the case of an emergency.

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Remember, these notes are intended as a guide and explanation about a complicated subject. They form the basis for a discussion with your physician; they are not a substitute for a full and informed discussion.