
SECTION 1

OVERVIEW OF ALLERGIES AND ANAPHYLAXIS

ALLERGY

Several million Americans suffer from allergies. According to the American Academy of Allergy Asthma and Immunology (AAAAI), approximately 50 million Americans have some form of allergic disease and note that the incidence is rising. Allergy is an immune response that causes antibodies (Immunoglobulin E or IgE) to respond to allergens. Allergens are substances that trigger an allergic response such as dust mites, animal dander, pollens, and mold.¹

ANAPHYLAXIS

Some allergens such as food, medication, insect stings, and latex can trigger a severe, systemic allergic reaction called anaphylaxis. Anaphylaxis is a life-threatening allergic reaction that may involve systems of the entire body. Anaphylaxis is a medical emergency requiring immediate medical treatment and follow up care by an allergist/immunologist. **Deaths have occurred in schools because of delays in recognizing and responding to symptoms with immediate treatment and further medical interventions.**

FOOD ALLERGY

Food allergy is a growing concern in the United States and creates a significant challenge for children in school. Increasing numbers of children are diagnosed with life-threatening food allergies (6–8 percent) that may result in a potentially life-threatening condition (anaphylaxis). Currently, there is no cure for life-threatening food allergies. The only way to prevent life-threatening food allergies from occurring is strict avoidance of the identified food allergen. Critical to saving lives are plans that include life-threatening food allergy education and awareness, avoidance of allergens, and immediate treatment of anaphylaxis.

Food allergies are a group of disorders distinguished by the way the body's immune system responds to specific food proteins. In a true food allergy, the immune system will develop an allergic antibody called Immunoglobulin E (IgE), sensitive to a specific food protein. Children with moderate to life-threatening eczema have about a 35 percent chance of having food protein specific IgE. Manifestations of food allergies range from mild skin reactions to life-threatening reactions.² Children with allergies to environmental agents such as pollens and dust mites are more likely to develop food allergies; and those with asthma and food allergies are at the highest risk of death from food allergies.

Ingestion of the food allergen is the principal route of exposure leading to allergic reactions. Even very minute amounts of food particles (for example, a piece of a peanut) can, in some instances, quickly lead to fatal reactions unless prompt treatment is provided. Research indicates exposure to food allergens by touch or inhalation is extremely unlikely to cause a life-threatening reaction. However, if children with life-threatening food allergies touch the allergen and then place their fingers in their mouth, eye, or nose, the exposure becomes ingestion and could lead to anaphylaxis. The amount of allergen capable of triggering a life-threatening reaction is dependent upon the sensitivity level of each individual child.

The top eight most common food allergens are: milk, eggs, peanuts, tree nuts (such as pecans and walnuts), shellfish, fish, wheat, and soy; although an individual can have an allergy to any food. The most prevalent food allergens for children are milk, eggs, and peanuts; while for adults the most prevalent allergens are shellfish and peanuts. Children will frequently outgrow an allergy to eggs, milk, and soy. However allergies to peanuts, tree nuts, fish, and shellfish usually continue into adulthood. **Not eating the foods the child is sensitive to is the only proven therapy at this time.**

INSECT ALLERGY

Insect allergy is an underreported event that occurs every year to many adults and children. Approximately 3 percent of adults and 1–2 percent of children may be at risk for anaphylaxis from insect stings. Stinging insects commonly include bees, hornets, yellow jackets, paper wasps, and fire ants. For most, complications include pain and redness at the bite site. However, some people have a true allergy to insect stings that can lead to life-threatening systemic reactions (anaphylaxis). In these cases, prompt management of the reaction is needed. Immunotherapy (allergy shots) is available for some types of stinging insects. Allergy shots reduce the risk of severe reactions.

LATEX ALLERGY

Latex products such as balloons, gloves, and gym equipment are a common cause of allergic-type reactions. Two common types of reactions include contact dermatitis and immediate allergic reactions. Contact dermatitis, a type of localized allergic reaction to the skin, can occur on any part of the body that has contact with latex products, usually after 12–36 hours. Immediate allergic reactions however, are potentially the most serious form of allergic reactions to latex products. Exposure can lead to anaphylaxis depending on the amount of allergen exposure and the degree of sensitivity. Students with latex allergies may also need to avoid certain foods including many fruits such as bananas, kiwi, and papaya. Latex should be avoided by students and staff at risk for anaphylaxis. Since the reactions caused by latex vary, each student at risk should be evaluated by a trained medical provider.

OTHER CAUSES OF ANAPHYLAXIS

Other causes of anaphylaxis may include: medications (such as penicillin, aspirin, and muscle relaxants), exercise, temperature extremes, certain medical procedures, and psychological as well as other unknown causes.

SYMPTOMS OF ANAPHYLAXIS

In some individuals, symptoms may appear in only one body system such as the skin or lungs, while in others, symptoms appear in several body systems. The symptoms range from mild to life-threatening and may quickly become life-threatening depending upon the sensitivity of the individual and the amount of allergen exposure. Prior reactions are the best predictor of the severity of future reactions; but no one can predict with certainty how a reaction will occur or progress.

Life-threatening anaphylaxis symptoms usually happen within the first 20 minutes of exposure. Sometimes, however, the symptoms subside, then return hours later. In some cases, serious reactions might take hours to become evident. **Food is the leading cause of anaphylaxis in children. Children who have asthma and food allergies are at a greater risk for anaphylaxis and may often react more quickly requiring aggressive and prompt treatment.**

Signs and symptoms of harmful reactions may include any or several of the following and may require immediate emergency treatment:

Skin

- Hives, skin rashes, or flushing.
- Itching/tingling/swelling of the lips, mouth, tongue, throat.
- Nasal congestion or itchiness, runny nose, sneezing.
- Itchy, teary, puffy eyes.

Respiratory

- Chest tightness, shortness of breath, wheezing, or whistling sound.
- Hoarseness or choking.

Gastro-Intestinal

- Nausea, vomiting, dry heaves.
- Abdominal cramps or diarrhea.

Cardiovascular

- Dizziness, fainting, loss of consciousness.
- Flushed or pale skin.
- Cyanosis (bluish circle around lips and mouth).

Mental/Psychological

- Changes in the level of awareness.
- A sense of impending doom, crying, anxiety.
- Denial of symptoms or severity.

More subtle symptoms of a severe reaction may include:

- Exhibit screaming or crying.
- Very young children will put their hands in their mouth or pull at their tongues.

Or will say:

- This food's too spicy. It burns my mouth or lips.
- There's something stuck in my throat.
- My tongue and throat feel thick.
- My mouth feels funny. I feel funny or sick.³

TREATMENT

Anaphylaxis is a potentially life-threatening condition, requiring immediate medical attention. **Most fatalities occur due to delay and delivery of the needed medication.** Although many medications may be used for treating anaphylaxis, **epinephrine is the life-saving medication that must be given immediately to avoid death.**

“Epinephrine has long been regarded as the treatment of choice for acute anaphylaxis. This is true despite the recognition of its potential hazards. Alternative treatments - such as antihistamines, sublingual isoproterenol, inhaled epinephrine, and corticosteroids without epinephrine - have failed to prevent or relieve severe anaphylactic reactions. It is therefore inappropriate to use them for the first-line treatment or prevention of anaphylaxis.”⁴

Epinephrine, also known as adrenaline, is a natural occurring hormone in the body. It is released in the body in stressful situations known as the “fight or flight syndrome.” It increases the heart rate, diverts blood to muscles, constricts blood vessels, and opens the airways. Administering epinephrine by injection (such as an EpiPen® auto-injector) quickly supplies individuals with a large and fast dose of the hormone. An injection of epinephrine will assist the student temporarily. Sometimes, a second dose is needed to prevent further anaphylaxis before the student is transported to a medical facility for further emergency care. **If a child is exhibiting signs of a life-threatening allergic reaction, epinephrine must be given immediately and the Emergency Medical Services (EMS) 911 called for transport. There should be no delay in the administration of epinephrine.** Section 4 covers additional information regarding epinephrine training.

All students will require the help of others, regardless of whether they are capable of epinephrine self-administration. The severity of the reaction may hamper their attempt to self-inject. **Adult supervision is mandatory.**

The American Academy of Allergy Asthma and Immunology (AAAAI) notes, *“all individuals entrusted with the care of children need to have familiarity with basic first-aid and resuscitative techniques. This should include additional formal training on how to use epinephrine devices...”⁵*