

# Pediatric Anaphylaxis and its Emergency Treatment

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## DESCRIPTION

An allergic reaction known as anaphylaxis is a serious, immediate, and perhaps fatal illness. Anaphylaxis patients may have cutaneous, respiratory, cardiovascular, or gastrointestinal symptoms. The major treatment for this illness continues to be intramuscular administration of epinephrine. Inhaled beta-2 agonists, H1 and H2 receptor antagonists, and corticosteroids are examples of further second-line treatments that may be used to treat respiratory and cutaneous symptoms.

One to four patients with anaphylaxis are thought to present to Emergency Departments (EDs) every 1000 visits, or 0.1% to 0.4% of all ED visits. Only one-third of these presentations have an identified trigger for the anaphylactic reaction. The most frequent cause is food, which is closely followed by hymenoptera (bee/wasp) stings and pharmaceuticals. Peanuts, tree nuts, fish, milk, eggs, and shellfish (such as shrimp, lobster, crab, scallops, and oysters) are the food that are most frequently blamed for fatal reactions.

The majority of children (80% to 90%) with anaphylaxis experience cutaneous manifestations such as urticaria, pruritus, angioedema, and flushing. Clinical symptoms and signs can affect many organ systems. 60% to 70% of anaphylactic children appear to have respiratory involvement, making it the most worrying symptom. Less frequently, the cardiovascular system is involved; 10% to 30% of allergic children show symptoms of cardiovascular compromise, such as fainting, hypotension, and syncope.

All children who exhibit symptoms and indications that are possibly related to anaphylaxis should get an Intramuscular (IM) dose of self-injectable epinephrine before being taken to the hospital. Only two doses of self-injectable epinephrine are currently offered by two different manufacturers: 0.15 mg (EpiPen Jr) and 0.3 mg (EpiPen), or Twinject, which comes in either 0.15 mg or 0.3 mg doses and delivers two of the same dose in one device (one automatic dose and one manual dose). Children weighing 15 kg or 30 kg are the ideal patient populations for these two doses, which are based on the 0.01 mg/kg epinephrine dose that is advised.

A rapid, in-depth evaluation of the patient's airway, breathing, and circulation should be done as part of the initial therapy of a pediatric patient with suspected anaphylaxis, along with the prompt and concurrent administration of IM epinephrine. Early planning for definitive airway management is essential in patients who exhibit symptoms of upper airway blockage (stridor, swollen tongue, or uvular edoema) or severe respiratory distress. If available, further assistance from a respiratory therapy, anaesthesia, or ear, nose, and throat specialist should be obtained because intubation may be difficult with a swollen, blocked airway. Rapid sequence intubation has benefits and drawbacks that should be carefully considered by the team. It is also crucial to have the equipment on hand in case an emergency surgical airway needs to be put up.

All individuals exhibiting anaphylactic symptoms and signs should be given IM epinephrine as soon as possible. While trying to obtain Intravenous (IV) access, IM epinephrine administration shouldn't be postponed. Supplemental oxygen should be given to patients with suspected anaphylaxis, along with complete cardio-respiratory monitoring. The oxygen administration should be adjusted for those who experience respiratory symptoms in order to maximize oxygen saturation. Up to 35% of the blood volume in circulation may be lost in the first 10 minutes as a result of the increased vascular permeability brought on by anaphylaxis. Thus, all patients who are experiencing anaphylaxis should have two large-bore IV lines placed. If IV access cannot be obtained and the patient is hypotensive and inadequately perfused, an intraosseous needle should be inserted. Vigorous fluid resuscitation with 20 mL/kg boluses of normal saline is recommended for patients with cardiovascular involvement (tachycardia, hypotension, or delayed capillary refill). This should be repeated as needed to maintain cardiovascular stability. In order to maximize venous return to the heart and avoid blood pooling in the lower extremities, patients should ideally be positioned supine or in the Trendelenburg position. Throughout treatment, it will be possible to evaluate whether further fluids, inotropic support, or intubation are necessary by regularly reevaluating the patient's vital signs and condition.

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An accurate diagnosis and prompt IM epinephrine administration are essential for the successful management of the dangerous and sometimes fatal disease known as anaphylaxis. Although there are complementary therapies for the treatment of anaphylaxis, epinephrine is still the most crucial element of the acute management stage. Repeated boluses of normal saline should be given to treat hypotension aggressively; in cases where treatment is ineffective, an IV epinephrine infusion should be started. Patients who experience symptom remission while hospitalized should be watched for at

least 4 to 6 hours before being discharged to look for a biphasic reaction. Patients, who appear to have severe symptoms, require repeated epinephrine doses, or experience a biphasic reaction should be hospitalized. Parents should get thorough counseling and education regarding anaphylactic symptoms and signs, avoiding triggers, using self-injectable epinephrine and the significance of follow-up appointments with allergy or immunology specialists before being discharged from the hospital.