



Definition

Anaphylaxis is defined as a serious allergic reaction that is rapid in onset and may cause death.¹

The acute onset of a reaction (minutes to hours) with involvement of the skin, mucosal tissue or both and at least one of the following: a) respiratory compromise or b) reduction in systemic blood pressure or signs/symptoms of end-organ dysfunction.² The prevalence of anaphylaxis is estimated to be as high as 2%, and appears to be rising, particularly in the younger age group.¹

Clinical Presentation

Anaphylaxis has many different signs and symptoms and can present differently among patients. The most common manifestation of anaphylaxis is cutaneous, including urticaria and angioedema, and can occur up to 90% of the time. However, the absence of cutaneous signs does not rule out anaphylaxis.³ The respiratory system is the second most common system affected, including dyspnea, bronchospasm, and wheezing. The gastrointestinal and cardiovascular systems can be affected as well causing nausea, vomiting, diarrhea, abdominal pain, hypotension.⁴ Other less common manifestations can occur such as headache.

Signs and symptoms of anaphylaxis can appear within minutes of exposure to an allergen. Be aware that some reactions can appear greater than 30 minutes after exposure. Anaphylaxis can be biphasic meaning that symptoms can recur hours after resolution of the initial phase secondary to treatment. When this occurs, most of the time it is within 10 hours. Patients should be monitored for at least several hours after initial resolution of symptoms with consideration for overnight observation after more severe episodes (the optimal duration of the observation period has not been established in the literature).⁵

When discharged, patients must be counseled of these facts and strong consideration should be made to provide auto-injectable epinephrine along with instructions for use.^{2,3}

Management of Anaphylaxis— Immediate Intervention³

To successfully manage anaphylaxis, clinicians should not confuse anaphylaxis with vasovagal reactions, asthma, panic attack, or other entities. Clinicians must be aware that initial mild symptoms may progress rapidly into a life-threatening situation unless identified and treated promptly. Epinephrine is the only first-line treatment and any delay in administration can lead to serious consequences, including death. Treatment recommendations and decisions to transfer patients to a different care setting are made on an individual basis by the physician. Please note that the following recommendations do not have to be followed in the stepwise order presented and many of these interventions should happen simultaneously.

- 1 Assess airway, breathing, and circulation. Monitor vital signs.
- 2 Administer epinephrine
Aqueous epinephrine 1:1000 dilution (1 mg/ml): 0.2-0.5 ml IM in lateral thigh or subcutaneously every 5 min as necessary to control symptoms. In children, 0.01 mg/kg, max 0.3 mg dosage.
- 3 Call 911.
- 4 Place patient in supine position with lower extremities elevated.
- 5 Administer oxygen.
- 6 Obtain IV access and administer rapid IV fluid replacement.

1 Kim H, Fischer D. Anaphylaxis. All Asth Clin Immun 7, S6 (2011) doi:10.1186/1710-1492-7-S1-S6.

2 Tang A. A Practical Guide to Anaphylaxis. Am Fam Physician 2003; 68:1325-32

3 Lieberman P. The risk and management of anaphylaxis in the setting of immunotherapy. Am J Rhinol Allergy 26, 469-474, 2012.

4 Hurst DS, Gordon BR, et al. Safety of Home Based and Office Allergy Immunotherapy: a multicenter prospective study. Otolaryngol Head and Neck Surg 1999; 121:553-561

5 Lieberman P. Recognition and First-line Treatment of Anaphylaxis. Am J Med. 2014 Jan; 127(1 Suppl):S6-11.

Note: American Academy of Otolaryngic Allergy's (AAOA) Clinical Care Statements attempt to assist otolaryngic allergists by sharing summaries of recommended therapies and practices from current medical literature. They do not attempt to define a quality of care for legal malpractice proceedings. They should not be taken as recommending for or against a particular company's products. The Statements are not meant for patients to use in treating themselves or making decisions about their care. Advances constantly occur in medicine, and some advances will doubtless occur faster than these Statements can be updated. Otolaryngic allergists will want to keep abreast of the most recent medical literature in deciding the best course for treating their patients.

- 7 Place tourniquet above injection site.
- 8 Consider diphenhydramine 1-2 mg/kg or 25-50 mg/dose parenterally.
NOTE: H1 antihistamines are second-line and should not be administered instead of epinephrine in the treatment of anaphylaxis.
- 9 Consider H2 blockers as a second-line treatment that should not be administered instead of epinephrine.
- 10 Consider inhaled beta-agonist (MDI or nebulized) for bronchospasm.
- 11 Consider IV/IM steroids. NOTE: steroids do not work acutely and should not be used in place of epinephrine.
- 12 Consider advanced cardiac life support measures for cardiopulmonary arrest during anaphylaxis.
- 13 Endotracheal intubation or a surgical airway may be needed if respiratory distress persists or worsens after initial treatment.
- 14 Consider glucagon in patients taking beta-blockers with refractory symptoms. The recommended dose is 1-5 mg administered IV over 5 minutes followed by a 5-15 ug/min infusion that can be titrated. In children, the dose is 20-30 ug/kg with a maximum dose of 1 mg.

Prevention

Clinicians should recognize that there are certain factors that could potentially put patients at increased risk of anaphylaxis. These include active asthma, immunotherapy escalation, vial prepared in another office, errors in dosing, injection of wrong patient serum, immunotherapy injections during peak allergy season, first injection from a new vial, and history of anaphylaxis.⁶

It remains controversial if preceding large local reactions predict systemic reactions.⁵

Underlying medical conditions must be taken into consideration if treatment of anaphylaxis may pose a significant health risk (e.g. administration of epinephrine in patients with cardiovascular disease).

Medications prescribed for common medical conditions can also place patients at increased risk. Beta-blocker therapy may render a patient more refractory to management with epinephrine. ACE inhibitors have been shown to increase risk of anaphylaxis in those undergoing venom immunotherapy.⁶

Patient Education

Patients undergoing immunotherapy and those with a history of anaphylaxis should be instructed on how to recognize signs and symptoms of anaphylaxis. They should also be instructed on how to properly administer auto-injectable epinephrine. Family members (particularly of children) should be educated on recognition and initial treatment of anaphylaxis with epinephrine. Education specifically on use of auto-injectable epinephrine is recommended.

Preparation

Offices and facilities administering immunotherapy should be prepared to treat anaphylaxis. Physicians and office staff should have an established protocol in place, which can be reinforced with rehearsal drills.^{6,7}

Anaphylaxis treatment medications should be immediately available and replaced if used or expired. Health providers administering injections should be trained in the recognition and management of anaphylaxis. It is recommended to continually review medications, which patients take, prior to administration of immunotherapy to avoid placing patients at higher risk of a systemic reaction.

6 Simons, F.E.R., Ebisawa, M., Sanchez-Borges, M. et al. 2015 update of the evidence base: World Allergy Organization anaphylaxis guidelines. *World Allergy Organ J* 8, 1-16 (2015). <http://www.worldallergy.org/anaphylaxis>

7 Leatherman BD. Anaphylaxis in the allergy practice. *Int Forum Allergy Rhinol.* 2014;4:S60-S65.