



Medical Direction and Practices Board

WHITE PAPER

Anaphylaxis

BACKGROUND

Anaphylaxis is a life-threatening allergic reaction. It can occur at any age and anytime. Anaphylaxis should be suspected when there is an acute onset of illness after a probable exposure to a known or potential allergen. The most common allergens are insect stings, nuts and medications.

DEFINITION

The Second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network Symposium defines an anaphylactic reaction as follows¹:

Must fulfill **one** of the following criteria (occurring within minutes to hours of exposure):

1. Acute onset of an illness with involvement of the skin, mucosal tissue, or both **AND AT LEAST ONE OF THE FOLLOWING**:
 - a. Respiratory compromise
 - b. Reduced BP or associated symptoms of end-organ dysfunction
2. Two or more of the following that occur rapidly after exposure to a likely allergen for that patient:
 - a. Involvement of the skin or mucosal tissue (may be absent in 20% of children with food or insect sting allergy)
 - b. Respiratory compromise
 - c. Reduced BP or associated symptoms
 - d. Persistent GI tract symptoms
3. Reduced BP after exposure to known allergen for that patient:
 - a. Infants and children: low systolic BP or greater than 30% decrease in SBP
 - b. Adults: systolic BP less than 90 mmHg or greater than 30% decrease from that person's baseline.
 - c.

The MDPB simplified this in the protocols by only including the first definition, which captures 80% of the cases of anaphylaxis. It is important that providers are aware that other systems, such as the GI tract (vomiting/diarrhea) can be involved and not necessarily the skin or mucosa – these patients will often self-identify.

EARLY ADMINISTRATION OF EPINEPHRINE

All guidelines recommend epinephrine as the first-line agent and that it needs to be given early in patient treatment². There are no absolute contraindications to epinephrine administration to a patient in anaphylaxis. Hence, the focus of treatment for anaphylaxis should be the *early administration of IM epinephrine*. The MDPB emphasizes this by moving it up in the protocols. The timeliness of epinephrine administration is associated with the best outcomes for the patients and it may play a role in decreasing the chance of what is called a biphasic reaction³. A biphasic reaction is defined as a recurrence of symptoms requiring treatment following complete resolution of the initial episode. This recurrence can occur in up to 20% of patients, usually occurs within 4 hours but can be delayed as long as 72 hours⁴.

The Pediatric Evidence Based Guidelines: Assessment of EMS System Utilization in States (PEGASUS) study recommends that epinephrine auto-injectors be used according to the patient's body weight as follows: 0.15mg (i.e. EpiPen[®] Junior) for less than 25 kg and 0.3 mg (i.e. EpiPen[®]) for those greater or equal to 25 kg. The Maine EMS protocols will reflect this in the July 2015 updates.

All patients who receive epinephrine in the prehospital setting for an anaphylactic reaction should be transported to the hospital.

HIGH RISK PATIENTS

There are several categories of patients who are at high risk for having severe allergic reactions that may require multiple doses of IM epinephrine. These patients are those with **asthma**, prior history of severe anaphylaxis and those on beta-blockers (will blunt the effect of the epinephrine).

Be aware that anaphylaxis can also be difficult to recognize in the very young and the very old.

REPEATING DOSES OF EPINEPHRINE

Because epinephrine is the treatment of choice for anaphylaxis, if symptoms do not improve, providers may be required to give additional dose(s) to achieve symptoms improvement. If the patient is in profound shock, an epinephrine drip, given IV may be needed. Advanced EMTs and Paramedics should contact OLMC to consider repeating IM Epinephrine every 5-15 minutes. Paramedics must contact OLMC to start an epinephrine drip for patients with cardiovascular compromise.

WHY WERE STEROIDS REMOVED FROM THE PROTOCOL?

Glucocorticoids have never been shown in placebo-controlled randomized trials to affect the course of anaphylaxis⁵. The PEGASUS group concluded that due to poor evidence to support the routine use of glucocorticoids in the treatment of anaphylaxis, these are not included in the PEGASUS protocol. Hence, steroids have been removed from both the adult and pediatric Maine EMS protocols for anaphylaxis.

Works cited

1. Sampson HA et al. Second symposium on the definition and management of anaphylaxis: summary report – Second National Institute of Allergy and Infectious Disease/Food Allergy and Anaphylaxis Network Symposium. *J Allergy Clin Immunol* 2006;117:391-7.

2. Sheikh A et al. Adrenaline (epinephrine) for the treatment of anaphylaxis with and without shock. (Review) *The Cochrane Library*. 2012(4)
3. Tole JW and Lieberman P. Biphasic anaphylaxis: Review of incidence, clinical predictors, and observation recommendations. *Immunology and Allergy Clinics of North America*. 2007; 27:309-326
4. Tse Y et al. Emergency management of anaphylaxis in children and young people: New guidance from the Resuscitation Council (UK). *Arch Dis Child Educ Pract Ed* 2009;94:97-101
5. Choo KJL et al. Glucocorticoids for the treatment of anaphylaxis. *The Cochrane Collaboration*. 2012(3).