Notice from the Wilderness Medical Associates International Medical Director, Dr. Will Smith

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Allergies and anaphylactic reactions are a serious problem for many people around the world. Prompt recognition and treatment for anaphylaxis is covered in all Wilderness Medical Associates (WMA) International courses, including emphasis on our protocol. This is a subject that has been important to us for a long time; WMA's previous Medical Director, Dr. David Johnson, contributed to the Wilderness Medical Society's Clinical Practice Guidelines for anaphylaxis. The recommendations below are influenced heavily from these, taking into consideration practical application in the field and experience of current Medical Director Dr. Will Smith. Local program authorizations may vary.

Effective Administration of Epinephrine

Epinephrine is the life-saving treatment for patients experiencing anaphylaxis. Though commonly prescribed to folks at risk for anaphylaxis, epinephrine auto-injectors don't always hit the mark of an intramuscular injection. These devices are specifically designed to be administered only in the upper, outer thigh, and it's hard to account for all body sizes and other factors (such as the force of propulsion from the autoinjector itself). Some devices may deliver the medication too shallowly, particularly with winter clothing, which results in the medication being administered subcutaneously. Some devices go too deep, particularly in younger pediatric patients, penetrating the outer layer of the bone or even into the bone. Pediatric (0.15mg) devices have a range of exposed needles (7.4-13mm), and as mentioned above, this depth doesn't add to the propulsion factor. These variables can be unsettling. It is prudent to administer auto-injectors that are the recommended size for the patient (adult versus pediatric), only into the upper, outer thigh, inject through minimal clothing layers, and to reassess frequently to assure a response to treatment. Administer a second dose of epinephrine for an ongoing reaction as needed. The WMA International protocol suggests as soon as 5 minutes after the first injection.

If your program has authorized administration of epinephrine *by syringe* (manually drawing up the medication from a vial or ampoule), below are some recommended ranges for intramuscular needle sizes:

Site for Manual Draw (syringe) Epinephrine Injection	*Infant and Toddler*	*Child 3 years-10 years*	*Adolescent to Adult*
*Vastus Lateralis- Anterior-lateral thigh (recommended site and strongly preferred due to administration safety and increased blood flow to the muscle group)**	1" (25mm) 22-25 gauge	1"-1.25" (25-32mm) 22-25 gauge	1-1.5" (25-38mm) 22-25 gauge

Source

* Note: the deltoid (lateral upper arm and shoulder) is a secondary for epinephrine in anaphylaxis for use *only* when *vastus lateralis* is not available. This site has risk of harm from injection into shoulder capsule, slower absorption than *vastus lateralis,* and the choice of needle length requires provider

clinical assessment and experience. Deltoid administration is not approved for children <3years old. Needle length for a child 3-10 years old ranges from 5/8” -1” (16-25mm) using a 22–25-gauge needle; for a child >10 through adult, needle length ranges from 1”-1.5” (25-38mm) using a 22–25-gauge needle.

Next Steps

Regardless of how the epinephrine was injected, those who administer the medication should continue to evaluate the patient for signs of improvement or ongoing reaction. Evacuation is more urgent if the patient doesn’t respond to treatment or doesn’t have full resolution of symptoms after treatment. Patients who require more than one dose of epinephrine to control a reaction merit a more urgent evacuation.

If epinephrine is given for concern for anaphylaxis, the WMA International’s protocol recommendation is to give an antihistamine and corticosteroid if they are available. Antihistamines may provide relief of symptoms associated with the anaphylactic response, including itching, nausea, and hives. WMA International preferentially indicates use of cetirizine in our current protocol. Cetirizine works like diphenhydramine but is less sedating and only requires once-daily dosing.

Administering a corticosteroid may help, particularly if evacuation is prolonged. These medications take several hours to have an effect. Dexamethasone is mentioned preferentially in the current WMA International protocols due to its longer duration of action, but prednisone is also effective. Both are anti-inflammatory steroids which may help counter the inflammatory component of the reaction. These singular doses are relatively low risk for other medication interactions, or the side effects associated with long-term use.