

SAEMS
ALLERGIC REACTION STANDING ORDER
Self-Learning Module

Dawn Daniels
Tucson Medical Center
August 2010

PURPOSE

This SAEMS Standing Order Training Module has been developed to serve as a template for EMS provider training. The intent is to provide consistent and concise information to all providers practicing within the SAEMS Region. The content of the Training Module has been reviewed by the Protocol Development and Review Sub-Committee, and includes the specific standing order, resource and reference material, and instructions for completing the Training Module to obtain continuing education credit. One hour of SAEMS continuing education may be issued following successful completion of the module.

OBJECTIVES

1. List three benefits of the Allergic Reaction Standing Order (SO)
2. Outline inclusion and exclusion criteria for this Standing Order
3. List medications used to treat an allergic reaction
4. Define anaphylaxis
5. List common methods of entry of allergens into the body

INSTRUCTIONS

1. Read the accompanying information, standing order and any additional reference material as necessary.
2. Complete the attached post test and return to your Base Hospital Manager/Coordinator.
3. A SAEMS CE Form will be issued to providers scoring greater than ___% on the pretest.
4. Please contact your Prehospital Manager/Coordinator for questions, suggestions or concerns.

TABLE OF CONTENTS

1. Purpose	2
2. Objectives	2
3. Instructions	2
4. Table of Contents	2
5. History	3-8
6. Standing Order	9
7. Drug Profiles	10-22
8. Reference	23
9. Post Test	24
11. Evaluation	27

Anaphylaxis

Anaphylaxis is a life threatening, often unexpected, allergic reaction that affects many parts of the body at once. The ability to recognize and manage a severe allergic reaction (anaphylaxis) is possibly the only thing standing between a patient and imminent death. Anaphylaxis is the body's overreaction to a foreign substance that ordinarily is harmless.

Background

Anaphylaxis refers to a severe allergic reaction in which prominent dermal and systemic signs and symptoms manifest. The full-blown syndrome includes urticaria (hives) and/or angioedema with hypotension and bronchospasm. The classic form, described in 1902, involves prior sensitization to an allergen with later re-exposure, producing symptoms via an immunologic mechanism.

Pathophysiology

Rapid onset of increased secretion from mucous membranes, increased bronchial smooth muscle tone, decreased vascular smooth muscle tone, and increased capillary permeability occur after exposure to an inciting substance. These effects are produced by the release of mediators, which include histamine, leukotriene C4, prostaglandin D2, and tryptase.

In the classic form, mediator release occurs when the antigen (allergen) binds to antigen-specific immunoglobulin E (IgE) attached to previously sensitized white blood cells. The mediators are released almost immediately when the antigen binds. In an anaphylactoid reaction, exposure to an inciting substance causes direct release of mediators, a process that is not mediated by IgE. Increased mucous secretion and increased bronchial smooth muscle tone, as well as airway edema, contribute to the respiratory symptoms observed in anaphylaxis. Cardiovascular effects result from decreased vascular tone and capillary leakage. Histamine release in skin causes urticarial skin lesions.

The most common inciting agents in anaphylaxis are parenteral antibiotics (especially penicillin's), IV contrast materials, hymenoptera stings, and certain foods (most notably, peanuts). Oral medications and many other types of exposures also have been implicated, such as latex. Anaphylaxis may also be idiopathic. Some sources state 66% of cases have an unknown cause.

Frequency

- **In the US:** The true incidence of anaphylaxis is unknown, partly because of the lack of a precise definition of the syndrome. Some clinicians reserve the term for the full-blown syndrome, while others use it to describe milder cases. Fatal anaphylaxis is relatively rare; milder forms occur much more frequently. Some authors consider up to 15% of the US population "at risk" for anaphylaxis. The frequency of anaphylaxis is increasing and this has been attributed to the increased number of potential

allergens to which people are exposed. Up to 500-1,000 fatal cases of anaphylaxis per year are estimated to occur in the US.

- **Internationally:** Reactions to insects and other venomous plants and animals are more prevalent in tropical areas because of the greater biodiversity in these areas.

Mortality/Morbidity

Approximately 1 in 5000 exposures to a parenteral dose of a penicillin or cephalosporin antibiotic causes anaphylaxis. More than 100 deaths per year are reported in the United States. Fewer than 100 fatal reactions to hymenoptera stings are reported each year in the United States but this is considered to be an underestimate. One to 2% of people receiving IV radiocontrast experience some sort of reaction. The majority of these reactions are minor, and fatalities are rare.

Race

Well-described racial differences in the incidence or severity of anaphylaxis do not exist. Cultural and socioeconomic differences may influence exposure rates.

Sex

No major differences have been reported in the incidence and prevalence of anaphylactic reactions between men and women.

Age

Anaphylaxis occurs in all age groups. While prior exposure is essential for the development of true anaphylaxis, reactions occur even when no documented prior exposure exists. Thus, patients may react to a first exposure to an antibiotic or insect sting. Adults are exposed to more potential allergens than are pediatric patients. The elderly have the greatest risk of mortality from anaphylaxis due to the presence of preexisting disease.

Common Methods of Entry of Substances into the Body

An anaphylactic reaction is usually triggered by a limited number of allergic exposures. These include injection, swallowing, inhaling or skin contact with an allergen. Examples of injected allergens are bee, hornet, wasp, and yellow jacket stings; certain vaccines that have been prepared on an egg medium; and allergen extracts used for diagnosis and treatment of allergic conditions. Antibiotics such as penicillin can trigger a reaction by injection or ingestion (swallowing).

Typically, a severe reaction caused by a food allergy occurs after eating that particular food, even a small bite. Skin contact with the food rarely causes anaphylaxis. Foods most commonly associated with anaphylaxis are peanuts, seafood, nuts and, in children particularly, eggs and cow's milk.

An anaphylactic reaction from an inhaled allergen is rare. An increasingly recognizable example is when an allergic individual inhales particles from rubber gloves or other latex products.

For some people, two or more factors may be needed to cause anaphylaxis. Recently, it has been recognized that some persons have experienced an anaphylactic reaction if they eat a certain food, and then exercise. Neither the food alone nor exercise alone causes any problem for these individuals. Some people have an anaphylactic reaction with no identifiable cause.

Physical Assessment

- General
 - Physical examination of patients with anaphylaxis depends on affected organ systems and severity of attack. Vital signs may be normal or significantly disordered with tachypnea, tachycardia, and/or hypotension.
 - Place emphasis on determining the patient's respiratory and cardiovascular status.
 - Frank cardiovascular collapse or respiratory arrest may occur in severe cases. Anxiety is common unless hypotension or hypoxia causes obtundation. Shock may occur without prominent skin manifestations or history of exposure; therefore, anaphylaxis is part of the differential diagnosis for patients who present with shock and no obvious cause.
 - General appearance and vital signs vary according to severity of attack and affected organ system(s). Patients commonly are restless due to severe pruritus from urticaria. Anxiety, tremor, and a sensation of cold may result from compensatory endogenous catecholamine release. Severe air hunger may occur when the respiratory tract is involved. If hypoperfusion or hypoxia occurs, the patient may exhibit a depressed level of consciousness or may be agitated and/or combative. Tachycardia usually is present, but bradycardia may occur in very severe reactions.
- Skin
 - The classic skin manifestation is urticaria (i.e., hives). Lesions are red and raised, and they sometimes have central blanching. Intense pruritus occurs with the lesions. Lesion borders usually are irregular and sizes vary markedly. Only a few small or large lesions may become confluent, forming giant urticaria. At times, the entire dermis is involved with diffuse erythema and edema. Hives can occur anywhere on the skin.
 - In a local reaction, lesions occur near the site of cutaneous exposure (e.g. insect bite). The involved area is erythematous, edematous, and pruritic. If only local skin reaction (as opposed to generalized urticaria) is present, systemic manifestations (e.g., respiratory distress) are less likely. Local reactions, even if severe, are not predictive of systemic anaphylaxis on re-exposure.

- Lesions typical of angioedema also many manifest in anaphylaxis. The lesions involve mucosal surfaces and deeper skin layers. Angioedema usually is nonpruritic and associated lesions are non-pitting. Lesions most often appear on the lips, palms, soles, and genitalia.
- Pulmonary
 - Upper airway compromise may occur when the tongue or oropharynx is involved. When the upper airway is involved, stridor may be noted. The patient may have a hoarse or quiet voice and may lose speaking ability as the edema progresses. Complete airway obstruction is the most common cause of death in anaphylaxis.
 - Wheezing is common when patients have lower airway compromise due to bronchospasm or mucosal edema.
 - In angioedema, due to ACE inhibitors, marked edema of the tongue and lips may obstruct the airway.
- Cardiovascular
 - Cardiovascular examination is normal in mild cases. In more severe cases, compensatory tachycardia occurs due to loss of vascular tone.
 - Intravascular volume depletion may take place as a consequence of capillary leakage. These mechanisms also lead to development hypotension.
 - Relative bradycardia has been reported.

Syncope and Anaphylaxis: clues which may help you tell the difference		
	Anaphylaxis	Unexplained Syncope
Color	Pink, typically	Pale, typically
Pulse	Fast, usually	Slow, usually
Blood Pressure	Can remain low lying down	Normal when lying down
Other features which may be present	Urticaria (hives) Swelling Difficulty breathing Abdominal pain or diarrhea	The person has probably fainted before

Emergency Medical Care: A typical scenario is a patient who has come in contact with a substance that has caused a past allergic reaction and is now complaining of *respiratory distress*, or is exhibiting signs and symptoms of *shock* (Hypoperfusion).

- Conduct a thorough scene survey (identify clues and assure crew safety)
- Administer high flow oxygen
- Perform initial assessment

- Perform focused history and physical exam
 1. History of allergies
 2. What was patient exposed to?
 3. How were they exposed?
 4. What effects is the exposure having on the patient?
 5. How have the effects progressed?
 6. What interventions have been taken (has patient administered their own epinephrine auto-injector?)
 7. Response to interventions
- Vital signs
- Administer epinephrine auto-injector if indicated
- Document procedure
- Remove stinger and clean wound
- Apply ice or cold packs to stings
- Elevate affected area
- Reassess and record findings

Administration of the Epinephrine Auto-injector

Medical asepsis and the use of standard precautions and body substance isolation procedures should be used when administering a medication by injection. “Standard precautions” means the use of barriers by an individual to prevent parenteral, mucous membrane, and non-intact skin exposure to body fluids and secretions other than sweat. “Isolation” is defined as separation, during the communicable period, of an infected individual or animal from others to limit the transmission of infectious agents.

The steps for using an auto-injector are as follows:

1. Get the prescribed pen (correct dose, current expiration date, not discolored)
2. In the pediatric patient > 30 kg, one adult auto-injector 0.3 mg
3. Remove the safety cap being careful not to touch the tip of the pen
4. Hold the injector in your fist without touching either end (the needle comes out of one end). Press the open tip of the pen hard against the patient’s thigh, about midway between the hip and knee, through clothing if necessary. Hold the pen in place for several seconds
5. Dispose of the used injector in an appropriate biohazard container
6. Document

Documentation

- Patient assessment findings
- Dose administered
- Time administered
- Location of auto-injection
- Changes in clinical condition or status

- Presence of side-effects: tachycardia, pallor, dizziness, chest pain, headache, nausea, vomiting, anxiety
- Transport and transfer of care

Medical Direction Considerations

The use of the epinephrine auto-injector is a life-saving intervention that should be administered prior to making medical direction authority contact. Medical direction authority contact should be made as soon as is possible following the initial emergency medical care, and again should the patient experience no improvement or a worsening of symptoms:

- Decreasing mental status
- Increasing breathing difficulty
- Decreasing blood pressure

Be prepared to administer an additional dose of epinephrine. Treat the patient for shock and prepare to initiate Basic Cardiac Life Support measures. If patient condition improves, provide supportive care.

ALLERGIC REACTION

Initiate Immediate Supportive Care:

- Keep O2 sat > 90%
- Cardiac Monitor

**I
N
C
L
U
S
I
O
N**

Stable Allergic Reaction

- Urticaria (Hives)
- Sense of Dyspnea
- Sense of Oropharyngeal Swelling
- Sense of Throat Tightness

**I
N
C
L
U
S
I
O
N**

Unstable Allergic Reaction

- Signs of Shock
- Objective Signs of **severe** Respiratory Distress
- Objective signs of Airway Compromise

**O
R
D
E
R
S**

STABLE ALLERGIC REACTION

- Establish IV NS TKO
- Administer Diphenhydramine IVP 1mg/kg up to 25 mg

**O
R
D
E
R
S**

UNSTABLE ALLERGIC REACTION

- Manage Airway
- Administer Epinephrine:

BLS	ALS
<ul style="list-style-type: none"> • Administer Epi pen (pediatric auto-injector if \leq 30 kg) 	<ul style="list-style-type: none"> • 1:10,000 IV/IO 0.5 mg repeat every 2-5 minutes for patients in extremis OR • 1:1,000 IM (ant thigh preferred) 0.01mg/kg up to 0.5 mg total \pm

- If wheezing, give Albuterol one unit dose with Ipratropium one unit dose via SVN
- Initiate IV NS to keep SBP > 90
- Administer Diphenhydramine IVP 1mg/kg up to 25 mg total
- Administer Methylprednisolone 2 mg/kg IVP up to 125 mg
- If Methylprednisolone unavailable administer Dexamethasone 0.5mg/kg IVP up to 20mg

If patient has mixed symptoms or wishes to refuse contact medical direction.

MEDS Notification to receiving facility: Advise if patient is Stable or Unstable

Approved 6-2005; revised 6-15-10

DIPHENHYDRAMINE HCl

112.10

BRAND NAME: Benadryl

CLASS: antihistamine; anticholinergic

Mechanism of Action:

Blocks cellular histamine receptors, but does not prevent histamine release; results in decreased capillary permeability and decreased vasodilation, as well as prevention of bronchospasm.

Has some anticholinergic effects.

Indications and Field Use:

Anaphylaxis (2nd line)

Phenothiazine reactions (extrapyramidal symptoms)

Antiemetic

Contraindications:

Known hypersensitivity to diphenhydramine or drugs of similar chemical structure.

Newborn or premature infants; nursing mothers.

Considerable caution in patients with glaucoma, acute narrow angle; stenosing or obstructive diseases of the GI tract; bronchial asthma; hyperthyroidism; cardiovascular disease or hypertension; age greater than 60 years (all relative benefit vs risk).

Adverse Reactions:

CV: Hypotension; palpitations; arrhythmias; hemolytic anemia.

Resp: Anaphylaxis; thickening of bronchial secretions, tightness in chest; wheezing; nasal stuffiness.

CNS: Sedation; visual disturbances; seizures.

GU/GI: Urinary frequency or retention; vomiting.

Children: In children, may cause paradoxical CNS excitation, seizures, palpitations, thickening of bronchial secretions.

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Additive effects with alcohol and other CNS depressants (hypnotics, sedatives, tranquilizers, etc.).

MAO inhibitors prolong and intensify anticholinergic (drying) effects.

Adult Dosage:

Anaphylaxis: 25-50 mg slow IV push or deep IM.

Extrapyramidal symptoms and antiemetic: 10-50 mg IV or deep IM, dose should be individualized according to the needs and patient response.

Pediatric Dosage:

1.0 -1.25 mg/kg slow IV push

May also be given deep IM

Routes of Administration:

IV, Deep IM

Onset of Action:

IV 5 - 10 minutes

Peak Effects:

1 hour

Duration of Action:

3-6 hours

Dosage Forms/Packaging:

50 mg/1 ml syringes and vials

Arizona Drug Box Supply Range:

PARAMEDIC: 1 - 2 units

INTERMEDIATE: 1 - 2 units

Special Notes:

- > Not used in newborn or premature infants; used in pregnancy only if clearly needed.
- > In anaphylaxis, used as a 2nd line treatment after epinephrine and steroids.

GENERIC NAME: EPINEPHRINE AUTO-INJECTOR

CLASS: sympathomimetic

Mechanism of Action:

Vasoconstrictor: Acts on alpha adrenergic receptors to counter vasodilation and increased vascular permeability that can lead to loss of intravascular fluid volume and hypotension during anaphylactic reaction.

Bronchodilator: Acts on beta receptors on bronchial smooth muscle to cause bronchial smooth muscle relaxation, which alleviates wheezing and dyspnea.

Alleviates pruritis, urticaria, and angioedema and may be effective in relieving gastrointestinal and genitourinary symptoms associated with anaphylaxis.

Indications and Field Use:

Indicated in the emergency treatment of anaphylaxis.

Contraindications:

There are no absolute contraindications in a life-threatening situation.

Adverse Reactions:

Side effects may include:

- Ventricular arrhythmia
- Precipitation of angina or myocardial infarction
- Tachycardia
- Anxiety and nervousness
- Hypertension
- Headache
- Pallor
- Sweating
- Dizziness
- Weakness
- Tremor
- Nausea and vomiting

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Potentiates other sympathomimetics.

Adult Dosage:

Intramuscular: 0.3 mg (one adult auto-injector)

Pediatric Dosage:

Intramuscular: 0.15 mg (one pediatric auto-injector), for patients ≤ 30 kg (66 lbs) body weight

Intramuscular: 0.3 mg (one adult auto-injector) for patients >30 kg (66 lbs) body weight

Route of Administration:

IM, only into the anterolateral aspect of the thigh (through clothing if necessary)

Onset of Action:

Seconds

Peak Effects:

Minutes

Duration of Action:

Several minutes

Dosage Forms/Packaging:

Adult auto-injector, 1:1000 solution, 0.3mL (0.3 mg)

Pediatric auto-injector, 1:2000 solution, 0.3mL (0.15 mg)

Recommended Arizona Drug Box Minimum Supply:

Minimum of 2 adult auto-injectors

Minimum of 2 pediatric auto-injectors

Special Notes:

Overdosage or inadvertent intravascular injection may cause cerebral hemorrhage resulting from a sharp rise in blood pressure. Fatalities may also result from pulmonary edema because of peripheral vascular constriction together with cardiac stimulation.

GENERIC NAME: EPINEPHRINE HCL

112.12

CLASS: sympathomimetic

Mechanism of Action:

Pharmacological Effects: Direct acting α and β agonist; α -bronchial, cutaneous, renal, and visceral arterial constriction (increased systemic vascular resistance); β_1 -positive inotropic and chronotropic actions (increases myocardial workload and oxygen requirements), increases automaticity and irritability; β_2 bronchial smooth muscle relaxation and dilation of skeletal vasculature. Other: blocks histamine release

Clinical Effects: Cardiac Arrest-increases cerebral and myocardial perfusion pressure; increases systolic and diastolic blood pressures; increases electrical activity in the myocardium; can stimulate spontaneous contractions in asystole. Bradycardia-increases heart rate, increases BP; Bronchospasm/Anaphylaxis-reverse signs/symptoms

Indications and Field Use:

Cardiac arrest - VF/Pulseless VT; asystole; PEA (First line pharmacologic agent for any pulseless dysrhythmia in cardiopulmonary arrest).

Severe bronchospasm, i.e., bronchiolitis, asthma.

Anaphylaxis.

Bradycardia, refractory with profound hypotension, monitored patient only.

Hypotension unresponsive to other therapy, monitored patient only.

Croup

Contraindications:

None known for cardiac arrest

Hypothermia, relative contraindication

Adverse Reactions:

CV: Hypertension, ventricular dysrhythmias; tachycardia; angina

CNS: Anxiety, agitation

GI: Nausea/vomiting

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Potentiates other sympathomimetics.

Reacts with alkaline solutions, such as sodium bicarbonate, should not be mixed with alkaline agents.

Adult Dosage:

Pulseless Arrest –

IV/IO: 1 mg of 1:10,000 solution repeat every 3 - 5 minutes or,

ET: Give 2 - 2.5 mg via the ET tube.

May use 1:10,000 or dilute 1:1000 to equal 10 mL via ET tube for adult. (i.e., 2 mg of 1:1,000 epinephrine diluted with 8 mL NS in a 10 mL syringe)

Continuous Infusion for Hypotension or Symptomatic Bradycardia: 1 mg added to 500 mL of NS administered at 1 mcg/min titrated to desired hemodynamic response (range 2-10 mcg/min); not first-line therapy.

Anaphylaxis and asthma: Give 0.3 - 0.5 mg of 1:1,000 solution IM (preferred), SC, or inject SL, may repeat every 15 to 20 minutes; or in extreme cases only, may be asked to use 1:10,000 solution and give 0.1 mg every 5 minutes IV/IO or continuous IV/IO infusion of 1 - 4 mcg/min to prevent need for multiple injections.

Pediatric Dosage:

Pulseless Arrest or Refractory Bradycardia:

IV/IO: 0.01 mg/kg of 1:10,000 repeat every 3 - 5 minutes, maximum single dose 1 mg.

ET: 0.1 mg/kg of 1:1,000; diluted with NS to a volume of 3 - 5 mL prior to instillation or followed with flush of 3 - 5 mL of NS after instillation repeat every 3 - 5 minutes, maximum single dose 10 mg.

Asthma/anaphylaxis: Use 1:1,000 solution; give 0.01 mg/kg IM (preferred), SC (maximum single dose of 0.5 mg/dose).

IV Infusion: 0.1 – 1 mcg/kg/min; to prepare for small children $0.6 \times \text{body wt. in kg} = \text{mg}$ added to NS to make 100 mL. With this mixture, 1 mL/hr delivers 0.1 mcg/kg/min.

Croup: 3 mg 1:1,000 mixed in 3 mL NS via SVN.

Neonatal Dose for First 12 hours of life:

IV/IO Initial and Repeat Dose for Cardiac Arrest or Refractory Bradycardia: 0.01-0.03 mg/kg of 1:10,000 every 3-5 minutes

ET: 0.1 mg/kg of 1:10,000 every 3 – 5 minutes if neonate has no vascular access, fails to respond to positive pressure ventilation with 100% O₂.

Routes of Administration:

Cardiac: IV push, IV infusion, ET, or IO

Asthma/anaphylaxis/bronchiolitis: IM, SC, SL injection, IV, ET, IO
Infusion pump required for IV infusions in interfacility transfers

Onset of Action:

Seconds

Peak Effects:

Minutes

Duration of Action:

Several minutes

Dosage Forms/Packaging:

1:10,000 solution 1 mg/10 ml prefilled syringes

1:1,000 solution 1 mg/1 ml ampule or prefilled syringes; 30 mg/30 ml vial

Arizona Drug Box Minimum Supply:

PARAMEDIC and IEMT/99: 1:10,000 prefilled syringes – 5 mg

1:1,000 - 2 mg

1:1,000 multidose vial- 30 mg

INTERMEDIATE 1:1,000 - 2 mg

Special Notes:

- > Total dose for an adult ET (drug plus diluting solution) should equal at least 10 ml to ensure that the drug reaches lung tissue rather than remaining in the tube. Pediatric patient should equal 3 - 5 ml.
- > Multi-dose Vial: 1 mg/ml (1:1,000) in 30 ml bottle. May be used for administering the ACLS doses of epinephrine down the endotracheal tube (2-2.5 times the peripheral route dose, diluted with 8 ml NS to make a 1:10,000 solution) or for mixing an epinephrine infusions such as 1 mg in 500 mL NS
- > Infusions: An infusion pump is required for interfacility transports. A minimum of microdrip tubing is required for field use.

GENERIC NAME: ALBUTEROL SULFATE

112.03

BRAND NAME: Proventil, Ventolin

CLASS: sympathomimetic, bronchodilator

Mechanism of Action:

β agonist (primarily β_2); relaxes bronchial smooth muscle, resulting in bronchodilation; also relaxes vascular and uterine smooth muscle; decreases airway resistance

Indications and Field Use:

Treatment of bronchospasm

Contraindications:

Synergistic with other sympathomimetics
Use caution in patients with diabetes, hyperthyroidism, and cerebrovascular disease

Adverse Reactions:

CV: Dysrhythmias, tachycardia (with excessive use), peripheral vasodilation
Resp: Bronchospasm (rare paradoxical with excessive use)
CNS: Tremors, nervousness
GI: Nausea, vomiting
Endocrine: Hyperglycemia

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Tricyclic antidepressants (TCA's) and monoamine oxidase (MAO) inhibitors
Other sympathomimetics (relative)

Adult Dosage:

Give 2.5 mg of premixed solution for inhalation (0.083%) via SVN with a mouth piece, or in-line with a ventilatory device. Repeated according to medical control preference

Pediatric Dosage: (children <40 lbs)

For children < 40 lbs., administer half of 0.083% premixed solution; add 1-1.5 ml NS to make 2.5-3 cc inhalation treatment administered via SVN with a mouth piece, O₂ mask or in-line with a ventilatory device. May be repeated according to medical control preference

Routes of Administration:

Nebulized, mouth piece or in-line via mask
Inhaler, patients own
ET/NT in-line

Onset of Action:

5-15 minutes

Peak Effects:

30 minutes - 2 hours

Duration of Action:

3-4 hours

Dosage Forms/Packaging:

2.5 mg albuterol premixed in 3 ml normal saline (independent dose) sulfite-free

Arizona Drug Box Supply Range:

PARAMEDIC: 2 - 6 independent doses
INTERMEDIATE: 2 - 6 independent doses

Special Notes:

> Must be sulfite-free

GD-046-PHS-EMS: Drug Profile for Methylprednisolone Sodium Succinate

GENERIC NAME: **METHYLPREDNISOLONE SODIUM SUCCINATE**

112.18

BRAND NAME: Solu-Medrol

CLASS: corticosteroid, glucocorticoid, steroid, anti-inflammatory

Mechanism of Action:

Enters target cells and causes many complex reactions that are responsible for its anti-inflammatory and immunosuppressive effects; thought to stabilize cellular and intracellular membranes.

Indications and Field Use:

Reactive airway disease: Acute exacerbation of emphysema, chronic bronchitis, asthma
Anaphylaxis

Burns potentially involving the airway

** Acute spinal cord trauma (large loading and maintenance doses)

Contraindications:

Preterm infants

Adverse Reactions:

None from single dose

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

None

Adult Dosage:

Reactive Airway Disease, Anaphylaxis, Burns Potentially Involving the Airway

Usual dose 125 mg slow IV bolus (much larger doses can be used).

** **Acute Spinal Cord Trauma:** Should be within 6 hours of insult and patient meeting criteria, initial bolus dose of 30 mg/kg IV administered over 15 minutes; bolus followed by a 45 minute rest period, then a 23-hour continuous infusion of 5.4 mg/kg/hr. See: Special Notes.

Pediatric Dosage:

Reactive Airway Disease, Anaphylaxis, Burns Potentially Involving the Airway

2-4 mg/kg slow IV bolus

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

Routes of Administration:

IV bolus

Onset of Action:

1 - 6 hours; dogmatic 6 hour time to onset of benefit has decreased markedly during the last few years

Peak Effects:

8 hours

Duration of Action:

18-36 hours

Dosage Forms/Packaging:

125 mg/1 ml, 500 mg/4 ml, 1 Gm/8 ml mix-a-vial
2 Gm vial with diluent

Arizona Drug Box Supply Range:

**	PARAMEDIC:	1 - 2	125 mg/2 ml mix-a-vial	Optional: additional training requirement for Spinal Cord Trauma (2 Gm x 1, 1 Gm x 1, 500 mg x 1, 125 mg x 1)
**	INTERMEDIATE:	1 - 2	125 mg/2 ml mix-a-vial	Optional: additional training requirement for Spinal Cord Trauma (2 Gm x 1, 1 Gm x 1, 500 mg x 1, 125 mg x 1)

Special Notes:

- > Use for spinal cord trauma is limited to prehospital providers that have completed a special training curriculum in accordance with their medical control authorities. *Proper administration of methylprednisolone for spinal cord trauma is imperative.*
- > Infusions: An infusion pump is required for continuous infusions of corticosteroids during interfacility transports; a minimum of microdrip tubing is required for field use if administering loading dose therapy for spinal cord trauma.

** Indicates special training requirement

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

GENERIC NAME: DEXAMETHASONE SODIUM PHOSPHATE

BRAND NAME: Decadron

CLASS: synthetic adrenocorticoid/glucocorticoid with a predominance of glucocorticoid action, anti-inflammatory

Mechanism of Action:

Improves lung function and myocardial performance: stabilization of lysosomal and cell membranes, inhibition of compliment-induced granulocyte aggregation, rightward shift in oxygen-hemoglobin dissociation curve, inhibition of prostaglandin and leukotriene production, increase in surfactant production, decrease in pulmonary edema, relaxation of bronchospasm.

Indications and Field Use:

Reactive airway disease: Acute exacerbation of bronchial asthma
Anaphylaxis
Cerebral edema (non-traumatic)

Contraindications:

Systemic fungal infections
Hypersensitivity to any component of dexamethasone, including sulfites
Preterm infants

Adverse Reactions:

Sodium retention, fluid retention, potassium loss, hypokalemic alkalosis, hypertension, convulsions, hyperglycemia, myocardial rupture following recent myocardial infarction

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Dexamethasone is not compatible with benadryl or versed in IV tubing.

Adult Dosage:

Reactive Airway Disease, Anaphylaxis
8-24 mg

Cerebral Edema
1-5 mg/kg

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

Pediatric Dosage:

Reactive Airway Disease, Anaphylaxis

0.25-0.5 mg/kg

Cerebral Edema

0.5-1.5 mg/kg

Routes of Administration:

IV bolus, IM

Onset of Action:

4-8 hours

Peak Effects:

6-12 hours

Duration of Action:

24-72 hours

Dosage Forms/Packaging:

20 mg/5 mL, 100 mg/25 mL, 120 mg/5 mL

Arizona Drug Box Supply Range:

PARAMEDIC: 2-4 120 mg/5 mL and 2-4 20 mg/5 mL

INTERMEDIATE: 2-4 120 mg/5 mL and 2-4 20 mg/5 mL

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

References

http://www.azdhs.gov/diro/admin_rules/guidance_PHS.htm#Drug%20Profiles

American Heart Association Heartsaver First Aid, 2002

Anne S. Reisman RE: Risk of administering cephalosporin antibiotics to patients with histories of penicillin allergy. *Ann Allergy Asthma Immunol* 1995 Feb; 74(2): 167-70 [[Medline](#)].

Atkinson TP, Kaliner MA: Anaphylaxis. *Med Clin North Am* 1992 Jul; 76 (4) 841-55 [[Medline](#)].

Barach EM, Nowak RM, Lee TG, et al; Epinephrine for treatment of anaphylactic shock, *JAMA* 1984 Apr 27; 251(16) 2118-22 [[Medline](#)].

Bochner BS, Lichtenstein LM: Anaphylaxis. *N Engl J Med* 1991 Jun 20; 324(25): 1785-90 [[Medline](#)].

Caplan EL, Ford JL, Young PF, Own by DR: Fire ants represent an important risk for anaphylaxis among residents of an endemic region. *J Allergy Clin Immunol* 2003 Jun; 111(6): 1274-7 [[Medline](#)].

Greenberger PA: Contrast media reactions. *J Allergy Clin Immunol* 1984 Oct; 74(4 Pt 2): 6000-5 [[Medline](#)].

Kelkar PS: Cephalosporin Allergy. *New England Journal of Medicine* 2001; 345(11): 804-9 [[Medline](#)].

Reisman RE: Insect stings. *N Engl J Med* 1994 Aug 25; 331(8): 523-7 [[Medline](#)].

Sheffer AL: Anaphylaxis. *J Allergy Clin Immunol* 1988 May; 81(5 Pt 2): 1048-50 [[Medline](#)].

Sheffer AL: Anaphylaxis. *J Allergy Clin Immunol* 1985 Feb; 75(2): 227-33 [[Medline](#)].

Stark BJ, Sullivan TJ: Biphasic and protracted anaphylaxis. *J Allergy Clin Immunol* 1986 Jul; 78 (1 Pt 1): 76-83 [[Medline](#)].

Terr AI: Anaphylaxis. *Clin Rev Allergy* 1985 Feb; 3(1): 3-23 [[Medline](#)].

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

TRAINING MODULE FOR STANDING ORDER ALLERGIC REACTION POST TEST

NAME: _____ AGENCY: _____ DATE: _____

- 1) Epinephrine is classified as an:
 - a) Hymenoptera
 - b) Sympathomimetic
 - c) Anticholinergic
 - d) ACE Inhibitor

- 2) Indications for the use of the Epinephrine Auto-Injector include:
 - a) Overdose and poisoning
 - b) Chest pain
 - c) Anaphylaxis
 - d) All of the above

- 3) The recommended site for administration of the Epinephrine Auto-Injector is:
 - a) Outside of the thigh midway between hip and knee
 - b) Lower quadrants of the abdomen
 - c) Upper outer arm
 - d) Any of the above

- 4) Side effects of epinephrine administration may include:
 - a) Angina and myocardial infarction
 - b) Nausea, vomiting and weakness
 - c) Hypertension, headache and anxiety
 - d) All of the above

- 5) After epinephrine administration, which of the following should you do:
 - a) Continue to observe the patient for increased signs of anaphylaxis
 - b) Cover the patient with a blanket, place alone in a quite dark room to rest
 - c) Administer a stimulant drink such as tea or coffee
 - d) Reassure and calm victim
 - e) Administer CPR if person stops breathing

Select the correct answer:

- a. a, b, d
- b. a, c, d
- c. a, d, e
- d. b, d, e

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

- 6) Which of the following is **not** a life threatening condition of anaphylaxis:
- a) Pharyngeal edema/spasm
 - b) Hypotension
 - c) Urticaria
 - d) Labored breathing with accessory muscle use
- 7) Which of the following signs or symptoms might indicate the patient is progressing from an allergic reaction to anaphylaxis:
- a) Audible wheezes or stridor
 - b) Nausea/vomiting
 - c) Signs of shock
 - d) All of the above
- 8) The most common cause of death in anaphylaxis is the result of:
- a) Hypovolemic shock
 - b) Complete airway obstruction
 - c) Myocardial infarction and sudden death
 - d) Uncontrolled urticaria and pruritus
- 9) The onset of action of the Epinephrine Auto-Injector is:
- a) Seconds
 - b) Minutes
 - c) Several minutes
 - d) Dependant on the site of administration
- 10) The usual intramuscular dosage of the Epinephrine Auto-Injector for the treatment of anaphylaxis is:
- a) In the adult patient, 0.3 to 0.5 mg
 - b) In the pediatric patient < 30 kg, 0.01 mg
 - c) Dependant on the site of administration
 - d) In the pediatric patient > 30 kg, one adult auto-injector 0.3 mg
- 11) Shock may occur without prominent skin manifestations or history of exposure; therefore, anaphylaxis is part of the differential diagnosis for patients who present with shock and no obvious cause.
- a) True
 - b) False
- 12) During anaphylaxis, mediator release occurs when the antigen binds to antigenspecific E (IgE) attached to previously sensitized white blood cells. The mediators are released slowly over time when the antigen binds.
- a) True
 - b) False

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

- 13) Four (4) common methods of entry of substances into the body are inhaling, swallowing, skin contact and sneezing.
- a) True
 - b) False
- 14) For some people, two or more factors may be needed to cause anaphylaxis.
- a) True
 - b) False
- 15) The use of the Epinephrine Auto-Injector is not a life-saving intervention and you have time to call for medical direction when unsure of the patients' condition.
- a) True
 - b) False

SAEMS ALLERGIC REACTION STANDING ORDER TRAINING MODULE

SAEMS EVALUATION FORM

EVALUATION

Please answer the following questions by marking the appropriate response:

	Lowest Worst Least				Highest Best Most
1. To what extent did this module meet your needs?	1	2	3	4	5
2. There was a balance between theoretical and practical information.	1	2	3	4	5
3. The time required was appropriate to content.	1	2	3	4	5
4. The module increased my knowledge and understanding of the topic.	1	2	3	4	5
5. References or audiovisuals were adequate.	1	2	3	4	5
6. Overall, this program was worthwhile.	1	2	3	4	5
7. Additional comments:					
