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**EMS SKILL**

MEDICATION ADMINISTRATION

**EPINEPHRINE AUTO-INJECTOR**

**PERFORMANCE OBJECTIVES**

Demonstrate proficiency in recognizing the indications, contraindications, and criteria for administration of epinephrine to a patient with anaphylaxis or severe asthma.

**CONDITION**

Establish that a simulated patient complaining of a severe allergic reaction with respiratory distress or severe asthma meets the criteria and will assist the patient with the administration of epinephrine using an auto-injector device. Necessary equipment will be adjacent to the simulated patient.

**EQUIPMENT**

Simulated patient, oxygen tank with a flow meter, oxygen mask, blood pressure cuff, stethoscope, auto-injector trainer, biohazard container, alcohol wipes, adhesive bandage, timing device, clipboard, PCR forms, pen, goggles, masks, gown, gloves.

**PERFORMANCE CRITERIA**

• Items designated by a diamond (⧫) must be performed successfully to demonstrate skill competency.

• Items identified by double asterisks (\*\*) indicate actions that are required if indicated.

• Items identified by (§) should be practiced.

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| **PREPARATION** |
| **Skill Component** | **Key Concepts** |
| ⧫ Take body substance isolation precautions | • Mandatory personal protective equipment - gloves• Situational - long sleeves, goggles, masks, gown |
| ⧫ Complete a primary assessment • General impression• Life-threatening condition• Assess mental status/stimulus response (AVPU)• Assess/Manage airway• Assess/Manage breathing***\*\* Administer high flow oxygen – if indicated******\*\* If the patient has a prescribed inhaler, encourage the patient to use it - if the patient is able to follow directions*** | * Patients in a moderate or severe level of distress should be placed on high flow oxygen.
* **Do not delay the use of a physician prescribed multi-dose inhaler. EMT may assist with the use of the inhaler prior to administration of epinephrine**
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| ⧫ Complete a secondary assessment* SAMPLE history
* Vital Signs
* Obtain an oxygen saturation (SpO2) reading – if available
 | * Obtaining and documenting a baseline set of vital signs assists with determining if the patient is improving or deteriorating after medication delivery
* Document the SpO2 reading on the provider report or ePCR.
* A goal of oxygen administration is to deliver the minimum amount of oxygen to meet the needs of the patient and to maintain an oxygen saturation level at or above 94%.
* When available, use pulse oximetry to guide oxygen delivery. The desired SpO2 for most non-critical patients is 94-98%.
* **SPECIAL CONSIDERATION:** For chronic obstructive pulmonary disease (COPD), the goal is to titrate oxygen to keep the SpO2 at 88-92%.
* A pertinent piece of information that must be determined for patients with asthma and allergic reaction is to ask “have you ever been intubated for your asthma/allergic reaction?” This provides you with information that may indicate the potential rapid deterioration.
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| **Skill Component** | **Key Concepts** |
| ⧫ State the criteria for assisting patients with their own medications: • Medication is prescribed by a physician• Meets indication for administration• No contraindications are present * An ALS unit must have been requested
 | • An EMT may assist a patient in the prehospital setting with a patient’s own prescribed medications. An adult patient **may not** use their child’s medication for themselves and vice versa.* EMTs may *only* assist with administration of epinephrine using an auto-injector device as per Reference 802 - Emergency Medical Technician Scope of Practice.
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| ⧫ State when an EMT may carry an EpiPen on the ambulance and administer it to a patient with S/S of anaphylaxis or severe asthma* Must be on duty and working for a provider agency that has been approved by the EMS Agency Medical Director to carry Epinephrine on the ambulance.
 | * EMTs may carry an EpiPen on the ambulance ONLY if they are on duty and working for a provider agency that has been approved by the Local EMS Agency (LEMSA) Medical Director.
* If an EMT does not work for a provider agency that has been approved by the EMS Agency Medical Director to carry Epinephrine, they may only assist the patient with their own prescribed EpiPen.
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|  ⧫ State the mechanism of actions for epinephrine:* Bronchial dilation
* Blood vessel constriction
* Increases blood pressure
* Increases the pulse rate
 | * Epinephrine is a naturally occurring hormone in the body that controls the body’s fight or flight reactions. It is secreted by the Adrenal glands.
* Epinephrine is classified as a sympathomimetic, which increases the blood pressure and heart rate, and causes bronchial dilation to bring in more oxygen to the tissues. (Fight response)
 |
| ⧫ Verbalize the adverse (side) effects associated with administration of epinephrine:* Cardiovascular:
	+ Tachycardia
	+ Hypertension
	+ Chest pain
	+ Arrhythmias
	+ Increased oxygen demand
* Neurological:
* Seizures
* Cerebral hemorrhage
* Tremors
* Dizziness
* Anxiety
* Gastrointestinal:
	+ Nausea/vomiting
* Respiratory:
	+ Difficulty breathing

  | * While epinephrine has significant side effects associated with its use, it is considered a life-saving medication when indications for use are met.
* If anaphylaxis and severe asthma are not treated, the patient is likely to deteriorate and ultimately go into cardiac arrest. When this occurs, epinephrine is the first-line medication administered by Advanced Life Support (ALS) personnel to patients in cardiac arrest.
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| ⧫ Verbalize the indications for assisting or administering epinephrine (EpiPen) auto-injector to a patient* Suspected anaphylaxis and/or severe asthma
* Signs and Symptoms of **ANAPHYLAXIS** include:
	+ Airway swelling
	+ Stridor
	+ Hypotension
	+ Itching
	+ Hypotension
	+ Accessory muscle use
	+ Wheezing
* Signs and symptoms of **SEVERE ASTHMA** include:

Continued…* + Tripod positioning
	+ Wheezing
	+ Diaphoresis
	+ Cyanosis
	+ Using all accessory muscles to breathe
	+ Decreased oxygen saturation levels < 94% in a patient without COPD
	+ Decreased oxygen saturation levels < 88 to 92% in a patient with COPD
 | * If a patient has his/her own EpiPen, he/she may administer his or her own medication with lesser signs/symptoms. EMTs may assist the patient with a patient’s physician prescribed Epinephrine.
* EMTs may administer epinephrine to a patient ***ONLY*** if there are signs/symptoms of anaphylaxis or severe asthma, which includes signs and symptoms of shock and/or airway compromise.

• Symptoms of severe asthma may include tightness of throat, wheezing, difficulty speaking, shortness of breath, use of accessory muscles etc.A pertinent piece of information that must be determined for patients with asthma and allergic reaction is to ask “have you ever been intubated for your asthma/allergic reaction?”Continued…* This provides you with information that may indicate the potential rapid deterioration.
* Patients with anaphylaxis may deteriorate rapidly. Therefore, be prepared to administer positive pressure ventilation using a bag-mask device.
* The **onset of action** of epinephrine for anaphylaxis and severe asthma is 5 -10 minutes with peak effects occurring within 20 minutes.
* The **duration** of action is 4 - 6 hours.
* In severe asthma and anaphylaxis, bronchial constriction may be so severe that it is difficult to auscultate wheezing.
* Administration of epinephrine causes the bronchial dilation, so wheezing may become more pronounced. ***This means the***

***patient is improving instead of deteriorating.**** After administration of epinephrine, the signs and symptoms of anaphylaxis are reversed.
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| **Skill Component** | **Key Concepts** |
| ⧫ Contraindications:* There are no absolute contraindications to the use of epinephrine if the patient is experiencing life threatening anaphylaxis and asthma.
 | * There are no absolute contraindications for the use of epinephrine in a life-threatening situation.
* Signs and symptoms of severe asthma/ respiratory distress include:
	+ Tripod position
	+ Tachypnea
	+ Speaks 2-3 word sentences
	+ Cool, clammy (diaphoretic) skin signs
	+ Accessory muscle use
* Epinephrine is NOT indicated for patients without signs and symptoms of respiratory distress
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|  **PROCEDURE** |
| **Skill Component** | **Key Concepts** |
| ⧫ Check medication for (DICCE):• Drug name• Integrity of container/medication• Concentration/Dose• Clarity• Expiration date | • Drug name - Trade names include: Adrenalin EpiPen, EpiPen Jr., AnaPen, Ana-Guard, Sus-Phrine Injection, Twinject, Ana-Kit, etc. • Integrity of container/medication - Make sure container is NOT broken • Concentration/Dose – the concentration only refers to liquid form of any medication. The dose is the amount of medication prescribed by the physician. • Clarity - if container is transparent, the liquid should be clear• Expiration date - not to be administered after this date |
| ⧫ Verbalize the proper adult and pediatric dosage of Epinephrine:* Adults - 0.3mg IM auto-injector/EpiPen
* Pediatrics < 3 years of age or weighs < 15kg –

 0.15mg IM auto-injector  | * An adult EpiPen contains 0.3mg/0.3mL;
* The pediatric EpiPen delivers 0.15mg/0.3mL
* If a pediatric patient is >3 years of age or weighs > 15kg, the adult dose is administered.
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| ⧫ Calls for an Advanced Life Support Unit | * If the administration of epinephrine is required, an ALS Unit must be contacted and be enroute. However, if the ETA for the responding ALS unit exceeds the ETA to the most appropriate emergency department, the EMT should consider transporting the patient.
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|  Identify location of injection site:• Remove clothing from thigh area• Locate site - upper-outer thigh | • Patients may have been instructed that they can use EpiPen through clothing. **This is not recommended for healthcare providers.**• Theupper-outer thigh is best explained as midway between the groin and the knee. Injection in the deltoid muscle is NOT recommended in Los Angeles County.• DO NOT inject into buttocks, hands, feet, or intravenously (IV). Injection into the buttocks, hands, or feet may result in loss of blood flow to these areas and result in delayed absorption and tissue necrosis. IV injection may cause an acute myocardial infarction or cerebral hemorrhage. |
| **Skill Component** | **Key Concepts** |
| ⧫ Cleanse injection site with alcohol wipe§ Allow the area to air dry if time permits | * Cleanse the injection site with an alcohol wipe, in a circular motion, from inner to outer.
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| ⧫ Remove the safety cap from auto-injector | • DO NOT cover this end of the safety cap with fingers since the pressure may activate the injector device and inadvertently inject self. |
| ⧫ Place the tip of the auto-injector at a 90° angle to the thigh  | • The auto-injector must be placed at a right-angle to the thigh for IM injection. |
| ⧫ Push tip of auto-injector forcefully against injection site | • Pressure on the tip of the injector is required to activate the spring-loaded needle. |
| ⧫ Continue to hold the injector in place for 3 seconds until the medication is injected | • It may take up to 3 seconds for the medication to be injected. |
| ⧫ Remove the injector and place in biohazard container | • Caution must be taken with auto-injectors, the needle does not retract. |
| ⧫ Apply adhesive bandage - if bleeding | * Band-Aids must be latex free.
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|  ⧫ Evaluate response to epinephrine administration:• Respiratory status- rate, tidal volume, lung sounds• Cardiovascular status- pulse, blood pressure, skin vitals• Mental status***\*\* Treat for shock - if indicated******\*\* Initiate BLS Procedures (CPR, AED) - if indicated*** | * The **onset of action** of epinephrine for anaphylaxis and severe asthma is 5 -10 minutes with peak effects occurring within 20 minutes.
* The **duration** of action is 4 - 6 hours.

• If the administration of epinephrine is required, an ALS Unit must be contacted and be enroute. However, If the ETA for the responding ALS unit exceeds the ETA to the most appropriate emergency department, the EMT should consider transporting the patient. * EMTs may administer a second dose of epinephrine to an adult or pediatric patient in 10 minutes if ALS is delayed greater than 10 minutes or if the ETA to the most accessible emergency department that best meets the need of the patient exceeds 10 minutes.
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| **REASSESSMENT/PATIENT REPORT/DOCUMENTATION****(Ongoing Assessment)** |
| **Skill Component** | **Key Concepts** |
| § Reassess the patient every **5 minutes**:• Primary assessment• Relevant portion of the secondary assessment• Vital signs***\*\*Manage patient’s condition as indicated.***§ Administer a repeat dose of Epinephrine in 10 minutes – *if indicated:* | • Patients with severe asthma and/or anaphylaxis are priority patients.• A patient is considered a priority patient if the assessment reveals an immediate threat to life i.e. vital signs that are grossly abnormal and S/S of shock.* EMTs may administer a second dose of epinephrine to an adult or pediatric patient in 10 minutes if ALS is delayed greater than 10 minutes or if the ETA to the most accessible emergency department that best meets the need of the patient exceeds 10 minutes.
* Evaluating and comparing the results from a prior assessment assists in recognizing that the patient is improving, responding to treatment or condition is deteriorating.
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| § Verbalize/Document • Assessment findings before and after administration • Drug* + name
	+ dose
	+ route
	+ site
	+ time
	+ who administered medication

 • Patient’s response to medication • Respiratory/Cardiovascular status • Mental status • Vital signs | • Documentation of medication administration must be on either the Provider’s form, or an ePCR.• Documenting reassessment information provides a comprehensive picture of patient’s response to treatment.• Last reassessment information (before patient care is transferred) should be documented in the appropriate section of the EMS Report. |

Developed: 1/02 Revised 3/2018



MEDICATION ADMINISTRATION

**EPINEPHRINE AUTO-INJECTOR**

**Supplemental Information**

**DEFINITION/:**

• Anaphylaxis – A severe allergic reaction that comes on suddenly and rapidly progress to an exaggerated, life threatening reaction that may lead to cardiovascular collapse and respiratory arrest.

• Patients with a history of anaphylaxis or severe asthma may have their own EpiPen. Patients who have a history of a prior hospitalization and intubation for severe asthma have a high potential for rapid deterioration. If the patient has their own medication, they may administer it to themselves, if able. If their level of distress is too severe and they cannot administer it to themselves, the EMT may administer the medication for the patient, using the patient’s own prescribed EpiPen or the EMT’s EpiPen **if they are on duty and working for a Provider Agency that has been approved by the EMS Agency Medical Director.**

**ASSESSMENT: ALLERGIC REACTION / ANAPHYLAXIS / ENVIRONMENTAL EMERGENCY:**

• *Onset* - history of allergy

• *Substance* - type of substance

• *Exposure* - ingestion, inhalation, absorption, envenomation

• *Time* - duration

• *Effect* - respiratory problems, general vs. local rash, hives, nausea, vomiting, itching etc.

• *Progression* - initial symptom to current condition

• *Relief* – decrease of symptoms with treatment rendered prior to EMS

**ASSESSMENT: RESPIRATORY DISTRESS FROM ACUTE ASTHMA:**

• ***O****nset* - gradual vs. sudden and when it began

• ***P****rovokes* - causative event (e.g. allergy, exertion, drugs, etc.)

• ***Q****uality* - effective ventilations, tidal volume, and difficulty getting air in or out

• ***R****ate -* fast, slow, normal, and respiratory pattern

• ***R****ecurrence* - initial vs. repeated episodes and time of last episode

• ***R****elief -* constant vs. intermittent and what makes it better or worse

• ***S****everity* - mild, moderate, severe (used to rate initial event or compare to previous episode or ongoing assessment)

 accessory muscle use, stridor, position, etc.

• ***T****ime* – duration of current episode

 **Level of distress for chief complaint of shortness of breath (SOB)**

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| **SHORTNESS OF BREATH SEVERITY SCALE** |
| **S/S** | **Mild** | **Moderate** | **Severe** |
| Dyspnea | When walking  | When talking | At rest,  |
| Ability to speak | Full sentences | Phrases or partial sentences | Single words |
| Heart Rate | Borderline Tachycardia | 100-120bpm | >120bpm |
| Respiratory Rate | Tachypnea | Tachypnea | >30/min |
| Breath Sounds | Mild wheezes at the end expiration | Throughout expiration | Inspiration and expiration |
| Accessory Muscle use | None | Common | All |
| Mental Status | Anxious | Agitation | Drowsy to agitated |
| Body Position | Normal posture | Sits upright | Tripod position |
| Skin Signs | Normal – warm, normal color, dry | Cool, pale,dry,  | Cool, pale, moist (diaphoretic) |

**NOTES:**

• EMTs may carry epinephrine on the ambulance if it they are employed by, and are on duty for, a Provider Agency that has been approved by the Los Angeles County EMS Medical Director.

• In life-threatening situations, an ALS Unit must be enroute or BLS should consider transport if ALS arrival is longer than transport time.

• Anaphylaxis may be caused by insect stings or bites, foods, drugs, other allergens, exercise, or may be spontaneous.

• **Signs/symptoms of anaphylaxis that meet the indications for administration of Epinephrine include: wheezing, stridor, difficulty breathing, flushed skin, nervousness, syncope, tachycardia, thready or unobtainable pulse, and hypotension.** Additional supportive findings may include: seizures, vomiting, diarrhea, abdominal cramps, urinary incontinence, itching, rash,

 hives, and generalized edema. **NOTE: These supportive findings do not meet the indications for administration of Epinephrine. However, they must be closely monitored as patients exhibiting these signs and symptoms are likely to deteriorate.**

• Patients may have been instructed that they can use an epinephrine Auto-Injector through clothing. This is not recommended for healthcare providers.

• **DO NOT** inject epinephrine into buttocks, hands, feet, or intravenously (IV). Injection into the buttocks, hands, or feet may result in loss of blood flow to these areas and result in delayed absorption and tissue necrosis.

• An Epinephrine Auto-Injector contains 2mL (2mg) of epinephrine. The auto-injector delivers 0.3mL (0.3mg). Approximately 1.7mL remains in the pen after activation. However, this depends on the device used and if it can be activated a 2nd time.

* EMTs may administer a second dose of epinephrine to an adult or pediatric patient in 10 minutes if ALS is delayed greater than 10 minutes or if the ETA to the most accessible emergency department that best meets the need of the patient exceeds 10 minutes.

**EPINEPHRINE AUTO-INJECTOR**

**EPINEPHRINE HYDROCHLORIDE**

**Adrenalin®, EpiPen, EpiPen Jr®, AnaPen®, Ana-Guard®, Ana-Kit,Sus-Phrine Injection®,Twinject®**

**Classification:** Sympathomimetic agent (catecholamine)

**Actions:** Dilates bronchioles

 Constricts blood vessels

**Indications:** Anaphylaxis and severe asthma with either shock and/or respiratory distress

**Contraindications:** There are no absolute contraindications to the use of epinephrine in a life-threatening situation.

 Patient does not meet indication or criteria for administration

**Adverse effects:** ***Cardiovascular*** ***Neurological*** ***Gastrointestinal***

Tachycardia Seizures Nausea/vomiting

Hypertension Cerebral hemorrhage

Chest pain Headache ***Respiratory***

Ventricular fibrillation Tremor Difficulty breathing

 Dizziness

Anxiety

**Administration:** **Epinephrine** Auto-Injector (0.3mg) IM in the upper-outer thigh. No repeat.

**Pediatric:** **Epinephrine** Auto-Injector (0.15mg) IM in the upper-outer thigh. No repeat.

**Onset:** 5-10 minutes

**Duration:** 20 minutes

**Precautions**:

The epinephrine auto-injector is for **EMERGENCY SUPPORTIVE THERAPY ONLY** and is not a substitute for immediate medical care. An ALS unit must be enroute or the patient must be transported immediately to the nearest emergency department if ALS response is not available.

**DO NOT INJECT INTO BUTTOCKS, HANDS, FEET, OR ADMINISTER INTRAVENOUSLY**. Injection into buttocks, hands, or feet may result in loss of blood flow to the affected area and result in delayed absorption and tissue necrosis. Intravenous injection may result in an acute myocardial infarction or cerebral hemorrhage.

**Note:**

The adult auto-Injector delivers 0.3mL (0.3mg) and the pediatric auto-Injector delivers 0.3mL (0.15mg)

Anaphylaxis may be caused by insect stings or bites, foods, drugs, other allergens, exercise, or may be spontaneous.

**Signs/symptoms of anaphylaxis**: flushed skin, nervousness, syncope, tachycardia, diaphoresis, thready or unobtainable pulse, hypotension, convulsions, vomiting, diarrhea, abdominal cramps, urinary incontinence, wheezing, stridor, difficulty breathing, itching, rash, hives, and generalized edema.