

*Emergency  
Administration of  
Epinephrine for the  
EMT – Basic*

**Program of Instruction**

030512

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**The Kansas Board of EMS**

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# PREFACE

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The purpose of this curriculum is to provide the necessary information and guidelines to educate and train EMT-Basics in the specific use and administration of Epinephrine 1:1,000 solely for the emergency prehospital management of a person suffering an allergic reaction, in the absence of a physician or other authorized practitioner.

Kansas Board of Emergency Medical Services statutes define specific criteria that must be met in order for an EMT-Basic to administer Epinephrine via auto-injector. Board certified First Responders are not authorized to administer Epinephrine.

- a) The EMT-Basic must be functioning in an official capacity for a Kansas licensed ambulance service or an organized first responding organization.
- b) The EMT-Basic must be acting in compliance with medical protocols. This means that there must be appropriate medical oversight and an effective quality assurance program in place.
- c) The EMT-Basic must have successfully completed a board approved course concerning the emergency use of Epinephrine, an epi-pen auto injector, and treatment of anaphylaxis.

Reference Kansas Statute KSA 65-6121

***NOTE: The protocols contained in this program are intended as samples only. Any protocol adopted by a Licensed Ambulance Service must have the Medical Society/Director's approval.***

**EMT-Basic: Emergency Epinephrine Administration**

# KSA 65-6121 Extract

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Extract from Revised **KSA 65-6121** dealing specifically with Epinephrine

- (o) administer epinephrine auto-injectors provided that;
- (1) The emergency medical technician successfully completes a course of instruction approved by the board in the administration of epinephrine: and
  - (2) the emergency medical technician serves with an ambulance service or a first responder organization that provides emergency medical services, and;
  - (3) the emergency medical technician is acting pursuant to medical protocols
- (q) when authorized by medical protocol, assist the patient in the administration of the following medications which have been prescribed for that patient: Auto-injection epinephrine, ...

**EMT-Basic: Emergency Epinephrine Administration**

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Pre-Course Written Evaluation Key

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Post-Course Written Evaluation Tool

Post-Course Written Evaluation Key

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# SECTION I

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# LESSON PLAN



## **LESSON PLAN**

### **I. INTRODUCTION**

A. Opening Statement: Allergies are a serious medical disorder. They affect more than 1 in 5 persons in the U.S. They are the sixth leading cause of chronic disease. As a result it is imperative that once the need is identified that appropriate and expeditious interventions are implemented. This training provides the EMT-Basic the information necessary to recognize and implement that life-saving intervention.

B. Objectives:

### **OBJECTIVES LEGEND**

C=Cognitive P=Psychomotor A=Application

1 =Knowledge

2=Application

3=Problem Solving Level

### **LESSON TERMINAL INSTRUCTIONAL OBJECTIVE**

At the end of this lesson, the EMT-Basic student will be able to utilize the assessment findings to formulate a field impression and implement a treatment plan for the patient with anaphylactic emergencies resulting in anaphylaxis/allergic reaction.

### **COGNITIVE OBJECTIVES**

Upon completing this module, the EMT-Basic will be able to:

1. Review and understand the applicable Kansas statutes relative to EMT-Basic administration of Epinephrine(C-2)
2. Define antigens and antibodies. (C-1)
3. Define anaphylaxis and allergic reaction. (C-1)
4. Describe the common methods of entry of substances into the body. (C-1)
5. List common antigens most frequently associated with anaphylaxis. (C-1)
6. Review the use of equipment used during the physical examination of patients with complaints associated with anaphylaxis/allergic reaction. (C-1)
7. Describe physical signs and symptoms of anaphylaxis. (C-1)

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8. Differentiate signs and symptoms of an allergic reaction from anaphylaxis. (C-3)
9. Recognize the signs and symptoms related to anaphylaxis. (C-1)
10. Recognize the signs and symptoms of respiratory distress when associated with anaphylaxis (C-1)
11. Differentiate between the signs and symptoms of anaphylaxis from other medical conditions which may mimic anaphylaxis. (C-3)
12. Review the following concerning Epinephrine 1:1,000 administered by an auto injector as used in the management of anaphylaxis and when ALS should be contacted. (C-1)

- Use
- Classification
- Mechanisms of action.
- Indications
- Pharmacokinetics
- Side/adverse effects
- How supplied/Dosages
- Contraindications
- Special considerations
- Approved protocol

13. Recognize that Epinephrine 1:1,000 for anaphylaxis, administered by an Epinephrine auto injector may be available on an ambulance or first response vehicle and the EMT-Basic acting in an official capacity may administer the auto injector according to their local approved protocol. (C-1)
14. Recognize and differentiate between adult and pediatric doses of Epinephrine 1:1,000, for the management of anaphylaxis, when using an Epinephrine auto injector. (C-1)
15. Discuss considerations for storing Epinephrine 1:1,000. (C-1)
16. Describe on-line medical direction/control for medication administration. (C-1).
17. Describe off-line medical direction/control for medication administration. (C-1)
18. Review medical asepsis. (C-1)
19. Review universal precautions and body substance isolation procedures when administering a medication. (C-1)
20. Review disposal of contaminated items and sharps. (C-1)
21. Describe necessary elements to be documented concerning the administration of an epi-pen. (C-1)

## **EMT-Basic: Emergency Epinephrine Administration**

### **AFFECTIVE OBJECTIVES**

Upon completing this module, the EMT-Basic will be able to:

22. Understand the need for universal precautions and body substance isolation (A-1)
23. Defend the need for proper disposal of contaminated items and sharps. (A-3)
24. Recognize and value the assessment and treatment of patients with anaphylaxis/allergic reaction. (A-2)
25. Demonstrate appreciation for the critical nature of accurate field impressions of patients with anaphylaxis/allergic reaction (A-2)

### **PSYCHOMOTOR OBJECTIVES**

Upon completing this module, the EMT-Basic will be able to:

26. Demonstrate proper documentation of medication administration. (P-3)
27. Perform universal precautions and body substance isolation (BSI) procedures during medication administration. (P-1, P-2)
28. Demonstrate clean technique during medication administration. (P-3)
29. Demonstrate the proper use of the Epinephrine auto injector. (P-1, P-2, P-3)
30. Demonstrate disposal of contaminated items and sharps. (P-3)
31. Demonstrate and record pertinent assessment findings associated with anaphylaxis/allergic reaction. (P-1, P-2, P-3)
32. Competently perform the proper use of airway and ventilation devices. (P-2)
33. Conduct a simulated history and patient assessment, record the findings, and report appropriate management of patients with anaphylaxis/allergic reaction. (P-3)
34. Perform an appropriate assessment of a patient with anaphylaxis/allergic reaction. (P-2, P-3)
35. Appropriately manage a patient with anaphylaxis/allergic reaction, including the administration of Epinephrine by auto injector. (P-3)

## **EMT-Basic:** Emergency Epinephrine Administration

### C. Purpose:

1. The purpose of this curriculum is to provide the necessary information and guidelines to educate and train EMT-Basics in the specific use and administration of Epinephrine 1:1,000, solely for the emergency prehospital management of a person suffering an allergic reaction, in the absence of a physician or other authorized practitioner.
2. Kansas Board of Emergency Medical Services statutes define specific criteria that must be met in order for an EMT-Basic to administer Epinephrine via auto-injector. Board certified First Responders are not authorized to administer Epinephrine.
  - a. The EMT-Basic must be functioning in an official capacity for a Kansas licensed ambulance service or an organized first responding organization.
  - b. The EMT-Basic must be acting in compliance with medical protocols. This means that there must be appropriate medical oversight and an effective quality assurance program in place.
  - c. The EMT-Basic must have successfully completed a board approved course concerning the emergency use of Epinephrine, an epi-pen auto injector, and treatment of anaphylaxis.

## **II. Anaphylaxis**

### A. Introduction

1. Epidemiology
  - a. Incidence
  - b. Morbidity/mortality
  - c. Risk factors
  - d. Prevention
2. Physiology
  - a. Antigens - A foreign substance or toxin in the body.

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- b. Antibodies - A protein that combines with an antigen to fight infection or to neutralize toxins.
  
- c. Antibody - Antigen reactions take place constantly and are a normal part of the body's defense mechanism
  
- d. Anaphylaxis is an antibody-antigen reaction gone wrong, which is detrimental to the body, rather than helpful and protective.
  
- e. In anaphylaxis, this reaction of an antigen and an antibody causes the release of histamine, which is a chemical that causes blood vessels to dilate and capillaries to leak fluids into surrounding cells.
  
- f. With profound dilation of blood vessels, the blood pressure falls and shock results. In addition, with fluid leaking from the capillaries, profuse swelling (angioedema) of the skin, mucosa, face, tongue and airway structures occurs.
  
- g. The most common presentation of anaphylactic shock involves the skin (urticaria), respiratory, circulatory and gastrointestinal systems. This contrasts with other common allergic reactions which are much milder in symptoms such as hayfever

## **B. Pathophysiology**

1. Allergen - A substance supposed to produce symptoms of an allergy a. Allergens include various foods, feathers, dust, pollens, etc.
  
2. Routes of entry
  - a. Oral ingestion - foods, nuts, shellfish, eggs, drugs (oral antibiotics, etc.)
  
  - b. Injected/envenomation - (bees, hornets, wasps, etc.); bites (ants, etc.); drugs (anesthetics, X-ray dyes, antibiotics, etc.)
  
  - c. Inhaled - chemicals, drugs, etc.
  
  - d. Topical/absorbed - chemical, drugs, etc.

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### 3. Common Allergens

- a. Drugs
- b. Insects
- c. Foods
- d. Animals
- e. Latex
- f. Other

### 4. Allergic Response

- a. Histamine or histamine - like substance release
- b. Immunity
- c. Sensitivity
- d. Hypersensitivity

### 5. Urticaria

- a. Redness of skin

### 6. Angioneurotic

- a. Swelling / Edema of the skin

### 7. Anaphylactic Shock

- a. Cardiovascular system
- b. Respiratory system
- c. Gastrointestinal system
- d. Nervous system



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**C. Assessment of anaphylaxis/allergic reaction**

1. When paramedic service is available, EMT-Basic personnel shall contact dispatch as soon as possible and request rendezvous with paramedics.
2. Perform initial assessment
3. Perform focused history and physical exam
  - a. Not all signs and symptoms are present in every case
  - b. History -Interview individual, family or bystanders
    - (1) Previous exposure
    - (2) Previous experience to exposure -has it ever happened before
    - (3) Onset on symptoms
      - (a) When did it start?
      - (b) What happened before it began?
      - (c) Eat anything?
      - (d) Smell anything?
      - (e) Feel anything?
      - (f) Take anything?
    - (4) Have you administered your own prescription of Epinephrine?
    - (5) Do you have a history of cardiac problems?
4. See differential diagnosis below
  - a. Dyspnea
  - b. Level of consciousness (AVPU)

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c. Unable to speak

d. Restless

e. Common signs of respiratory distress for anaphylaxis - **Upper airway**

(1) Hoarseness

(2) Stridor

(3) Pharyngeal edema / spasm

(4) Patient may state he/she feels tightness in throat or chest

(5) Cough

f. Common signs of respiratory distress for anaphylaxis - **Lower Airway**

(1) Tachypnea

(2) Hypoventilation

(3) Labored-Accessory muscle use

(4) Abnormal retractions

(5) Prolonged expirations

(6) Wheezes (audible without stethoscope.)

(7) Diminished lung sounds

g. Skin

(1) Redness

(2) Rashes

(3) Edema

(4) Moisture

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(5) Itching

(6) Urticaria

(7) Pallor

(8) Cyanotic

h. Vital Signs

Cardiovascular

(1) Tachycardia

(2) Hypotension

i. Gastrointestinal

(1) Abnormal cramping

(2) Nausea/vomiting

(3) Diarrhea

j. Remember when the above signs and symptoms of allergic reaction include respiratory distress or shock, assume that it's anaphylaxis.

5. Assess baseline vital signs and SAMPLE history

6. Administer oxygen if not already done during the initial assessment

7. Differential Diagnosis of other medical conditions that mimic anaphylaxis

a. Be certain the patient is less than 30 years old, or 30 years or older and has a prescription for Epinephrine

b. Be certain the signs and symptoms are those of anaphylaxis

c. Be certain it is not only in a stage of:

(1) Heart disease, i.e., congestive heart failure

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- (2) Psychosis
- (3) Hypertension history
- (4) COPD
- (5) Glaucoma
- (6) Pulmonary edema
- (7) Hyperthyroidism
- (8) Pregnancy

D. At the time it is determined that Epinephrine is needed, any suspected complicating conditions as mentioned above must be reported to on-line medical control. In the absence of availability of on-line medical direction, protocols that have been properly approved which specifically address these conditions may be used.

E. If patient is suffering severe anaphylaxis and there is one of the conditions mentioned above, then:

1. Epinephrine would generally be indicated to reduce respiratory distress.
2. On-line medical control is required prior to administration of Epinephrine. In the absence of availability of on-line medical control, properly approved protocols that specifically address these conditions may be used.

**IMPORTANT NOTE: These patients may initially present with airway/respiratory compromise or airway/respiratory compromise may develop as the allergic reaction progresses**

F. Assessment Findings and Emergency Care

1. Anaphylaxis - Patient has come in contact with a substance that causes an allergic reaction and complains of respiratory distress or exhibits signs and symptoms of respiratory distress or shock (hypoperfusion).

G. Pharmacological interventions

1. At the time when it is determined that Epinephrine is needed, any suspected

**EMT-Basic: Emergency Epinephrine Administration**

complicating conditions, such as the following, must be reported to on-line medical control prior to the administration of Epinephrine, or when approved by the Medical Director, protocols that specifically address these conditions may be used:

- a. Heart Disease
- b. Psychosis
- c. Hypertension history
- d. Age > 30 years
- e. COPD
- f. Glaucoma
- g. Pulmonary Edema
- h. Hyperthyroidism
- i. Pregnancy

2. In situations where the patient has Anaphylaxis without the above conditions, Epinephrine may be administered with on-line or off-line medical control

a. Administer Epinephrine 1:1,000 to persons under age thirty who display signs and symptoms of anaphylaxis.

b. Administer Epinephrine 1:1,000 to those persons who are age thirty and over and:

(1) Have a prescription for Epinephrine for anaphylaxis or have their own epi-pen; and

(2) Display signs and symptoms of anaphylaxis

3. Dosage for intramuscular administration

a. Adult - one adult auto-injector (0.3 mg).

b. Infant (up to 30 kg or 66 lbs) - one pediatric auto-injector (0.15 mg).

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G. Allergic Reaction -Patient has contact with a substance that causes an allergic reaction without signs of respiratory distress or shock (hypoperfusion).

1. Continue with focused assessment
2. Patient wheezing without signs of respiratory compromise or hypotension should not receive Epinephrine
3. Contact ALS for additional resources
4. Non-Pharmacological interventions, i.e., treat for shock
5. Record assessment findings and reassess in two minutes

a. Re-assessment strategies

(1) Continue focused assessment of airway, breathing, circulatory status and level of consciousness.

(2) Patient condition continues to worsen.

(a) Decreasing mental status

(b) Increasing breathing difficulty

(c) Decreasing blood pressure

(d) Obtain medical direction/control

(i) Additional dose(s) of Epinephrine 1:1,000 by an Epinephrine auto injector

(ii) Treat for shock (hypoperfusion).

(iii) Prepare to initiate Basic Cardiac life support measures. (CPR and/or AED)

(3) Patient condition improves.

(a) Provide supportive care.

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(i) Oxygen

(ii) Treat for shock (hypoperfusion).

(iii) Psychological support

b. Transport considerations

III. Pharmacology for the administration of Epinephrine by EMT-Basics for anaphylaxis

A. The Scope of Management

1. EMT-Basics are held responsible for safe and therapeutically effective drug administration

2. EMT-Basics are personally responsible - legally, morally, and ethically, for each drug they administer

3. EMT-Basics:

a. Use correct precautions and techniques

b. Observe and document the effects of drugs

c. Perform evaluation to identify drug indications and contraindications

d. Take a drug history from their patients including:

(1) Prescribed medications (name, strength, and daily dosage).

(2) Over-the-counter medications

(3) Vitamins

(4) Drug reactions

(5) Have they administered their prescribed Epinephrine?

e. Consult with medical direction/control

f. Comply with medical direction/control

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**B. Medical Direction/Control**

1. Medication administration is bound by the EMT-Basic's on-line or off-line medical direction/control
2. Role of the medical director
  - a. On-line medical control
  - b. Local patient care protocols (off-line medical control).
  - c. Quality assurance

**C. Administration of Epinephrine 1:1000 by Intramuscular (IM) route using an Epinephrine auto-injector**

1. Medication name
  - a. Generic – Epinephrine
  - b. Trade – Adrenalin TM
2. Actions
  - a. Dilates the bronchioles.
  - b. Constricts blood vessels.
  - c. Increases heart rate
3. Indications:
  - a. Acute bronchospasm: anaphylaxis
  - b. Medical direction/control authorizes use for this patient
4. Contraindications:
  - a. Pulmonary edema, hypothermia, hypertension.
  - b. No contraindications when used in a life-threatening situation.



## **EMT-Basic:** Emergency Epinephrine Administration

c. The person is 30 years of age or over and does not have a prescription for Epinephrine.

### 5. Adverse reactions

- a. Ventricular arrhythmias
- b. Precipitation of angina or myocardial infarction
- c. Tachycardia
- d. Anxiety
- e. Hypertension
- f. Headache
- g. Pallor
- h. Dizziness
- i. Nausea
- j. Vomiting

### 6. Incompatibilities/Drug interactions

- a. Potentiates other sympathomimetics
- b. Patients taking monoamine oxidase inhibitors, antihistamines, and tricyclic antidepressants may have heightened effects.
- c. Medication form - liquid administered via a commercially pre-loaded, measured dose, injectable needle and syringe system.

### 7. Special considerations

- a. Pediatric patients.
- c. Geriatric patients

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c. Pregnant patients

### 8. Drug Storage

a. Refer to local protocol

b. Drug potency can be affected by:

(1) Temperature

(2) Light

(3) Moisture

(4) Expiration date

### 9. Dosage for intramuscular administration

a. *Adult*: - one adult auto-injector (0.3 mg).

b. *Infant and child*: (up to 30 kg or 66 Lbs) - one pediatric auto-injector (0.15 mg).

### 10. Technique of administration for Epinephrine 1:1,000, using an Epinephrine auto injector:

a. Use body substance isolation precautions

b. Identify the need for medication based on patient history and presenting signs and symptoms.

(1) Has patient administered their own prescribed Epinephrine?

c. Obtain order from medical direction/control either on-line or off-line.

d. Medication is not expired or discolored (if able to see).

e. Injections are made by penetrating a needle through the dermis and the subcutaneous tissue into the muscle layer

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f. Equipment needed for administration of Epinephrine 1:1,000 using an auto-injector:

- (1) Adult Epinephrine auto-injector
- (2) Pediatric Epinephrine auto-injector
- (3) Skin cleansing preptics
- (4) Band-Aid

g. Reassure the patient and check for allergies

h. Locate IM injection anatomical sites for adults and children

i. Expose and cleanse the area to be used for medication administration

j. Remove the cap from the injector

k. Place the tip of the auto injector against the antero-lateral aspect of the patient's thigh, midway between the waist and the knee

l. Using a quick thrusting motion, press hard against the thigh until the injector activates

m. Hold the injector in place until the medication is injected, about 5 to 10 seconds

n. Remove the injector and determine if injector has functioned properly by observing the exposed needle and if the majority of the solution has been injected

o. Massage the injection site for 10 seconds

p. Dispose of device in biohazard sharps container. DO NOT recap the needle.

q. Apply a Band-Aid to the injection site

**EMT-Basic:** Emergency Epinephrine Administration

r. Record activity and time on run report.

- (1) Date
- (2) Time
- (3) Medication name
- (4) Dose administered
- (5) Route and location (anatomical) administered.
- (6) Any patient physiological response to the medication

11. Re-assessment strategies

a. Transport (if not already initiated).

b. Continue focused assessment of airway, breathing and circulatory status.

(1) Patient condition continues to worsen.

(a) Decreasing mental status

(b) Increasing breathing difficulty

(c) Decreasing blood pressure

(d) Obtain medical direction/control

(i) Additional dose(s) of Epinephrine 1:1,000 by an Epinephrine auto injector

(ii) Treat for shock (hypoperfusion).

(iii) Prepare to initiate Basic Cardiac Life support measures. (CPR and/or AED)

(2) Patient condition improves. Provide supportive care.

(a) Oxygen

(b) Treat for shock (hypoperfusion).

## 12. Precautions

### IV. Summary

A. Review of Main Points

B. Questions from Students

C. Closing Statement: Considering the speed at which anaphylaxis can ensue, your prompt recognition and intervention can greatly affect the ultimate outcome of your patient.



## **ESTIMATED COURSE HOURS**

*This Program is Competency Based. Hours may vary.*

### **EMT Basic: Emergency Epinephrine Administration**

<b>Lesson Topic</b>	<b>Didactic</b>	<b>Practical Lab/ Evaluation</b>
Pre-Course Written evaluation		.5 hours
Section I – EMT-Basic: Emergency Epinephrine Administration	2 hours	1 hour
Post-Course Written Evaluation/Examinations		.5 hours
<b>Total estimated Didactic and Practical Lab/Evaluation Hours</b>	<b>2 hours</b>	<b>2 hours</b>

Approximately 2-4 Hours -Includes Pre-test, Didactic, Practical Evaluation,  
Post-test, and End of Course Evaluations



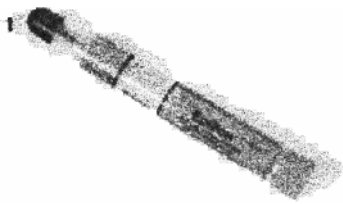


## **Technique for Administration of Epinephrine Using Auto-Injector**

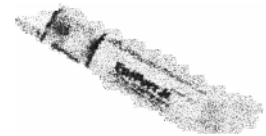
1. Receive a direct order from medical control or follow local protocols/standing orders
2. Follow BSI techniques
3. When using a patient's prescribed Epi-Pen, Do not allow person to walk -bring kit to patient
4. Check person's name against kit -Make sure the medication is not discolored or expired (see note below)
5. Check to see if there are any special physician instructions for the patient and follow these. If no special instructions, proceed with the instructions below.

**NOTE:**

If Epinephrine in auto-injector is discolored, this indicates a weakened solution. It is better to use the weakened solution than none at all.



Epi-pen – cap on and unfired



Epi-pen – cap off and fired

1. Remove the safety cap from the auto-injector and if possible, wipe the patient's thigh with alcohol or some other antiseptic. However, do not delay administration of the drug.
2. Place the tip of the auto-injector against the lateral part of the patient's thigh, midway between the waist and the knee.
3. Using a quick thrusting motion, press hard against the thigh until the injector activates, about 5 to 10 seconds. This action will help prevent the kick that the spring-loaded syringe can cause when the needle is pulled from the injection site too soon. Hold the injector in place until the medication is injected.
4. Remove the injector, massage injection site for 10 seconds
5. Dispose of injector in proper bio-hazard container



# SECTION II

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# STUDENT HANDOUTS



*Emergency  
Administration of  
Epinephrine for the  
EMT – Basic*

*Student Handouts*



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# **EMT-Basic:** Emergency Epinephrine Administration

## **OVERVIEW**

The purpose of this curriculum is to provide the necessary information and guidelines to educate and train EMT-Basics in the specific use and administration of Epinephrine 1:1,000 solely for the emergency prehospital management of a person suffering an allergic reaction, in the absence of a physician or other authorized practitioner.

Kansas Board of Emergency Medical Services statutes define specific criteria that must be met in order for an EMT-Basic to administer Epinephrine via auto-injector. Board certified First Responders are not authorized to administer Epinephrine.

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**Reference Kansas Statute KSA 65-6121**





**EMT-Basic**  
**Authorized Activities**

Extract from Revised **KSA 65-6121** dealing specifically with Epinephrine

- (o) administer epinephrine auto-injectors provided that;
- (4) The emergency medical technician successfully completes a course of instruction approved by the board in the administration of epinephrine: and
  - (5) the emergency medical technician serves with an ambulance service or a first responder organization that provides emergency medical services, and;
  - (6) the emergency medical technician is acting pursuant to medical protocols
- (q) when authorized by medical protocol, assist the patient in the administration of the following medications which have been prescribed for that patient: Auto-injection epinephrine, ...



# **OBJECTIVES**

## **LESSON TERMINAL INSTRUCTIONAL OBJECTIVE**

At the end of this lesson, the EMT-Basic student will be able to utilize the assessment findings to formulate a field impression and implement a treatment plan for the patient with anaphylactic emergencies resulting in anaphylaxis/allergic reaction.

## **COGNITIVE OBJECTIVES**

Upon completing this module, the EMT-Basic will be able to:

1. Review and understand the applicable Kansas statutes relative to EMT-Basic administration of Epinephrine.
2. Define antigens and antibodies.
3. Define anaphylaxis and allergic reaction.
4. Describe the common methods of entry of substances into the body.
5. List common antigens most frequently associated with anaphylaxis.
6. Review the use of equipment used during the physical examination of patients with complaints associated with anaphylaxis/allergic reaction.
7. Describe physical signs and symptoms of anaphylaxis.
8. Differentiate signs and symptoms of an allergic reaction from anaphylaxis.
9. Recognize the signs and symptoms related to anaphylaxis.
10. Recognize the signs and symptoms of respiratory distress when associated with anaphylaxis
11. Differentiate between the signs and symptoms of anaphylaxis from other medical conditions which may mimic anaphylaxis.
12. Review the following concerning Epinephrine 1:1,000 administered by an auto injector as used in the management of anaphylaxis and when ALS should be contacted.

Use  
Classification  
Mechanisms of action.  
Indications  
Pharmacokinetics  
Side/adverse effects  
How supplied/Dosages

## **EMT-Basic: Emergency Epinephrine Administration**

Contraindications  
Special considerations  
Approved protocol

13. Recognize that Epinephrine 1:1,000 for anaphylaxis, administered by an Epinephrine auto injector may be available on an ambulance or first response vehicle and the EMT-Basic acting in an official capacity may administer the auto injector according to their local approved protocol.
14. Recognize and differentiate between adult and pediatric doses of Epinephrine 1:1,000, for the management of anaphylaxis, when using an Epinephrine auto injector.
15. Discuss considerations for storing Epinephrine 1:1,000.
16. Describe on-line medical direction/control for medication administration.
17. Describe off-line medical direction/control for medication administration.
18. Review medical asepsis.
19. Review universal precautions and body substance isolation procedures when administering a medication.
20. Review disposal of contaminated items and sharps.
21. Describe necessary elements to be documented concerning the administration of an epi-pen.

## **AFFECTIVE OBJECTIVES**

Upon completing this module, the EMT-Basic will be able to:

22. Understand the need for universal precautions and body substance isolation.
23. Defend the need for proper disposal of contaminated items and sharps.
24. Recognize and value the assessment and treatment of patients with anaphylaxis/allergic reaction.
25. Demonstrate appreciation for the critical nature of accurate field impressions of patients with anaphylaxis/allergic reaction.

## **PSYCHOMOTOR OBJECTIVES**

Upon completing this module, the EMT-Basic will be able to:

26. Demonstrate proper documentation of medication administration.
27. Perform universal precautions and body substance isolation (BSI) procedures during medication administration.
28. Demonstrate clean technique during medication administration.

**EMT-Basic: Emergency Epinephrine Administration**

29. Demonstrate the proper use of the Epinephrine auto injector.
30. Demonstrate disposal of contaminated items and sharps.
31. Demonstrate and record pertinent assessment findings associated with anaphylaxis/allergic reaction.
32. Competently perform the proper use of airway and ventilation devices.
33. Conduct a simulated history and patient assessment, record the findings, and report appropriate management of patients with anaphylaxis/allergic reaction.
34. Perform an appropriate assessment of a patient with anaphylaxis/allergic reaction.
35. Appropriately manage a patient with anaphylaxis/allergic reaction, including the administration of Epinephrine by auto injector.



## **OXYGEN DELIVERY**

### *OXYGEN ADMINISTRATION REFERENCE CHART*

<b>Method</b>	<b>Flow Rate (in liters per minute.</b>	<b>% Oxygen Delivered</b>
<b>Room Air</b>		21
<b>Nasal Cannula (prongs)</b>	1	24
	2	28
	4	31
<b>Face Mask (simple)</b>	6	35-40
	10	40-50
<b>Nonrebreather Face Mask *(1)</b>	12	80
	15	90
<b>Face Mask with Oxygen Reservoir Bag</b>	10-12	90
<b>Pocket Mask</b>	10	50
	15	80
	30	100 *(2)
<b>Bag Valve Mask</b>	Room Air	21
	12	40-90 *(3)
<b>Positive Pressure Device (demand valve)</b>	100	100 *(4)

\*(1) Delivery system of choice for patients with inadequate breathing and patients who are cyanotic, cool, clammy, short of breath, or suffering chest pain, suffering sever injuries, or displaying an altered mental status, or being transported.

\*(2) This is accomplished by occluding breathing port with thumb.

\*(3) Depends on brand of bag-valve mask and provisions for occluding room air inlet.

\*(4) Should not be used on children under 12 years old.

**EMT-Basic: Emergency Epinephrine Administration**

**NOTES:**

1. Administration rates by nasal cannula of over 4 L/min. are uncomfortable.
2. Use humidified oxygen, when possible, on infants, children, suspected respiratory tract burns, and transports exceeding one-hour duration.
3. Bag Valve mask is not recommended for use on patients in transport situations.
4. Most hypoxic patients will feel better with an increase in delivered oxygen from 21% to 24%.
5. Pressure cycled ventilators are **NOT** acceptable alternatives to oxygen therapy.
6. Percentages of delivered oxygen listed above are based on optimal conditions. Altitude, equipment, etc. may decrease percentages of delivered oxygen.

**OXYGEN BOTTLE VOLUME AND FLOW**

<b>Bottle Size</b>	<b>Volume (Liters)</b>	<b>Time @ 5L/min.</b>	<b>Time @ 10L/min.</b>	<b>Time @ 15 L/min.</b>
D	360	1 hr. 12 min.	36 min.	24 min.
E	625	2 hrs. 5 min.	1 hr. 3 min.	42 min.
M	3,200	10 hours	5 hours	3 hrs. 20 min.
G	5,300	17 hrs. 40 min.	8 hrs. 50 min.	5 hrs. 53 min.
H	6,900	23 hours	11 hrs. 30 min.	7 hrs. 40 min.

1. The above values are based on full bottle (2,000 to 2,200 p.s.i.) @ 70 degrees F.
2. Allow for pressure drop of 5 p.s.i. for every 1 degree drop in temperature below 70 degrees F.



## ***EPINEPHRINE 1:1,000 (Administered by an Epinephrine auto injector)***

### ***Medication Name***

Generic -Epinephrine  
Trade -Adrenalin TM

### ***Actions***

Dilates the bronchioles  
Constricts blood vessels

### ***Indications***

Anaphylaxis  
Medical direction/control authorizes use for this patient

### ***Contraindications***

Pulmonary edema, hypothermia, hypertension.  
Pregnancy  
Patients with tachyarrhythmias  
**There are no contraindications when used in a life-threatening situation**

### ***Incompatibilities/Drug interactions***

Potentiates other sympathomimetics  
Patients on monoamine oxidase inhibitors, antihistamines, and tricyclic antidepressants may have heightened effects

### ***Side Effects***

Ventricular arrhythmias  
Precipitation of angina or myocardial infarction  
Tachycardia  
Anxiety  
Hypertension  
Headache  
Pallor  
Dizziness  
Nausea/vomiting

### ***Medication Form***

Liquid administered via a commercially pre-loaded, measured dose, injectable needle and syringe system

### ***Dosage***

#### **Adult:**

Intramuscular -one adult auto-injector (0.3 mg).

#### **Infant and child: (up to 30 kg or 66 lbs)**

Intramuscular -one pediatric auto-injector (0.15 mg).

### ***Route of Administration - IM***



## **ANAPHYLAXIS/ALLERGIC REACTION**

***IMPORTANT NOTE: These patients may initially present with airway/respiratory compromise or airway/respiratory compromise may develop as the allergic reaction progresses. Not all signs and symptoms are present in every case. When signs and symptoms of allergic reaction include respiratory distress or shock, assume that it is anaphylaxis.***

- I. Conduct Scene Size-Up/Scene Safety - Assure the patient, workers and bystanders are separated from the allergen
- II. Perform an Initial Patient Assessment
  - A. Initiate airway, breathing and circulation procedures as indicated
  - B. Determine patient transport priority
- III. Perform Focused History and Detailed Physical Exam
  - A. History - Previous exposure; Previous experience to exposure; Onset on symptoms; Dyspnea
  - B. Signs and Symptoms
    1. Not all signs and symptoms are present in every case
    2. Level of Consciousness -Unable to speak; Restless; Decreased level of consciousness; Unresponsive
    3. Upper Airway - Hoarseness; Stridor; Pharyngeal edema / spasm
    4. Lower Airway - Tachypnea; Hypoventilation; Labored-Accessory muscle use; Abnormal retractions; Prolonged expirations; Wheezes; Diminished lung sounds
    5. Skin - Redness; Rashes; Edema; Moisture; Itching; Urticaria; Pallor; Cyanotic
    6. Vital Signs -Tachycardia; Hypotension
    7. Gastrointestinal - Abnormal cramping; Nausea/vomiting; Diarrhea
    8. Remember when the above signs and symptoms of allergic reaction include respiratory distress or shock, assume that it's anaphylaxis
  - C. Differential Diagnosis of other medical conditions that may mimic anaphylaxis
    1. Be certain the patient is less than 30 years old, or is 30 years or older and has a prescription for Epinephrine
    2. Be certain the signs and symptoms are those of anaphylaxis
      - a. Be certain it is not only in a stage of:
        - i. Heart disease, i.e., congestive heart failure
        - ii. Psychosis
        - iii. Hypertension history

**EMT-Basic:** Emergency Epinephrine Administration

- iv. COPD
- v. Glaucoma
- vi. Pulmonary edema
- vii. Hyperthyroidism
- viii. Pregnancy

D. If the patient is suffering severe anaphylaxis and also one of the conditions mentioned above, then:

1. Epinephrine would generally be indicated to reduce respiratory distress.
2. On-line medical control is preferred prior to administration of Epinephrine.
3. Properly approved protocols that specifically address these conditions may be used in the absence of availability of on-line medical control.

III. Assessment Findings and Emergency Care

**Note:** When a paramedic system exists, EMT-Basic personnel shall arrange for ALS rendezvous as soon as possible as directed by local or regional patient care procedures or when directed by medical direction/control.

Anaphylaxis – If the patient has come in contact with a substance that causes an allergic reaction and complains of respiratory distress or exhibits signs and symptoms of respiratory distress or shock (hypoperfusion), then:

- A. Provide supplemental oxygen and/or ventilatory assistance as necessary, if not done during initial patient assessment.
- B. Maintain or provide circulation as indicated, if not done during initial patient assessment
- C. Remove offending agent (i.e. stinger)
- D. Pharmacological interventions
  1. Administer Epinephrine 1:1,000 IM via auto-injector to persons under age thirty who display signs and symptoms of anaphylaxis.
    - a. Adult dose – 0.3 mg
    - b. Pediatric dose (up to 30 kg or 66 lbs.) - 0.15 mg
      - 1.) Upon the request of the patient's parent or guardian; or
      - 2.) Upon the request of a person who presents written authorization from the patient's parent or guardian making such a request; or
      - 3.) Upon request of the patient when it is known that the patient has a history of anaphylaxis; or
      - 4.) Upon an on-line medical control order is given.

**EMT-Basic:** Emergency Epinephrine Administration

- (2) Administer 0.3 mg Epinephrine 1:1,000 IM via auto-injector to those persons who are age thirty and over **and**
  - a. Have their own Epinephrine for anaphylaxis
  - b. Display signs and symptoms of anaphylaxis

Note: At the time it is determined that Epinephrine is needed, report any suspected complicating conditions to on-line medical control prior to the administration of Epinephrine. When on-line medical control is not available, then this protocol may be used when appropriately approved by local medical control. These complicating medical conditions include:

- (1) Heart Disease
- (2) Psychosis
- (3) Hypertension history
- (4) Age > 30 years
- (5) COPD
- (6) Glaucoma
- (7) Pulmonary Edema
- (8) Hyperthyroidism
- (9) Pregnancy

In situations where the patient has signs and symptoms of anaphylaxis without the above conditions, Epinephrine may be administered with on-line medical control. In the absence of available on-line medical control, then off-line medical control via this properly approved protocol may be used.

**Allergic Reaction - Patient has contact with a substance that causes an allergic reaction without signs of respiratory distress or shock (hypoperfusion).**

1. Continue with focused assessment
  - Patient wheezing without signs of respiratory compromise or hypotension should not receive Epinephrine
2. Contact ALS for additional resources
3. Perform non-pharmacological interventions (i.e., treat for shock).
4. Record assessment findings and reassess in two minutes
  - A. Re-assessment strategies
    - (1) Continue focused assessment of airway, breathing and circulatory status.
      - a. Patient condition continues to worsen.
        - 1) Decreasing mental status
        - 2) Increasing breathing difficulty
        - 3) Decreasing blood pressure

**EMT-Basic:** Emergency Epinephrine Administration

- 4) Obtain medical direction/control
    - a) Additional dose(s) of Epinephrine 1:1,000 by an Epinephrine auto injector
    - b) Treat for shock (hypoperfusion).
    - c) Prepare to initiate Basic Cardiac Life support measures.
      - i. CPR
      - ii. AED
  - b. Patient condition improves. Provide supportive care.
    - 1) Oxygen
    - 2) Treat for shock (hypoperfusion).
- B. Psychological support
5. Transport as soon as possible
  6. Perform ongoing assessments

## **BITES AND STINGS –VENOMOUS**

***Note: When a paramedic system exists, EMT-Basic personnel shall arrange for ALS rendezvous as soon as possible as directed by local or regional patient care procedures or when directed by medical direction/control.***

I. Perform scene size-up – separate patient, workers and bystanders from the source of the poisoning.

II. Perform an initial patient assessment.

A. Intervene as indicated

III. Perform a focused history and physical exam.

A. Signs and symptoms.

1. History of bite (spider, snake) or sting (insect, scorpion or marine animal).
2. Pain
3. Redness and/or swelling
4. Weakness and/or dizziness
5. chills or fever
6. nausea and vomiting
7. Bite marks or stinger

IV. Management

A. Provide supplemental oxygen and/or ventilatory assistance as necessary, if not done during the initial patient assessment.

B. If stinger is present scrape the sting site to remove the stinger.

Note: *Do not attempt to pull the stinger.*

C. Wash area gently.

D. Remove jewelry from the affected limb before swelling begins, if possible.

E. Keep limb immobilized and below the level of the heart.

F. Keep patient at rest.

G. Do not apply cold to a snake bite.

H. Consult medical direction regarding constricting band for snakebite.

I. Observe for development of signs and symptoms of an allergic reaction; if it occurs, refer to Anaphylaxis/Allergic Reaction Protocol.

J. Transport as soon as possible.

K. Perform on-going assessments



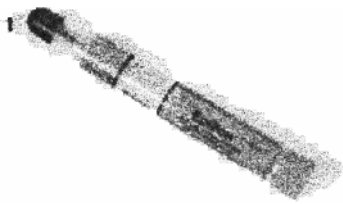


## **Technique for Administration of Epinephrine Using Auto-Injector**

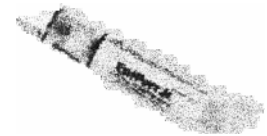
1. Receive a direct order from medical control or follow local protocols/standing orders
2. Follow BSI techniques
3. When using a patient's prescribed Epi-Pen, Do not allow person to walk -bring kit to patient
4. Check person's name against kit -Make sure the medication is not discolored or expired (see note below)
5. Check to see if there are any special physician instructions for the patient and follow these. If no special instructions, proceed with the instructions below.

**NOTE:**

If Epinephrine in auto-injector is discolored, this indicates a weakened solution. It is better to use the weakened solution than none at all.



Epi-pen – cap on and unfired



Epi-pen – cap off and fired

1. Remove the safety cap from the auto-injector and if possible, wipe the patient's thigh with alcohol or some other antiseptic. However, do not delay administration of the drug.
2. Place the tip of the auto-injector against the lateral part of the patient's thigh, midway between the waist and the knee.
3. Using a quick thrusting motion, press hard against the thigh until the injector activates, about 5 to 10 seconds. This action will help prevent the kick that the spring-loaded syringe can cause when the needle is pulled from the injection site too soon. Hold the injector in place until the medication is injected.
4. Remove the injector, massage injection site for 10 seconds
5. Dispose of injector in proper bio-hazard container



# **SECTION III**

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## **Participant**

# **Evaluation Materials**

# **Pre-course Written Evaluation**

# **EMT-Basic:** Emergency Epinephrine Administration

## Emergency Administration of Epinephrine

# Pre-Course Examination

**DO NOT OPEN UNTIL TOLD TO DO SO**

### ***INSTRUCTIONS***

1. This examination consists of 19 multiple-choice questions on material covered in the Emergency Administration of Epinephrine Curricula provided by the Kansas Board of Emergency Medical Services. This exam is used to ascertain your current understanding of Emergency Administration of Epinephrine. Your knowledge and skills proficiency on this topic will be re-evaluated upon completion of this training program.

**\* \* \* \* \* DO NOT WRITE IN THIS EXAMINATION BOOKLET \* \* \* \* \***

2. To record your choice for the correct answer, darken the letter that corresponds to the statement that best describes the answer to the question. If you change your mind about a selection make sure you erase your first selection completely.

3. If you do not know an answer, proceed to the next question and return to the answer later. Your test proctor cannot explain the question to you or the terms used within the test questions. Interpretation of the test question is part of the examination.

4. The test booklet and the answer sheet are to be returned to the examination proctor upon completion of the examination.

**\* \* \* DO NOT WRITE IN THIS EXAMINATION BOOKLET \* \* \* \***

# **EMT-Basic:** Emergency Epinephrine Administration

**Emergency Administration of Epinephrine – Pre-Course Written Evaluation**

1. Indications for use of Epinephrine include:
  - a. slow pulse
  - b. shortness of breath
  - c. anaphylaxis
  - d. all of the above
  
2. The recommended site for administration of Epi-Pen is:
  - a. upper arm
  - b. lower quadrants of the abdomen
  - c. outside of thigh midway between waist and knee
  - d. any of the above
  
3. Prior to the administration of Epinephrine for anaphylaxis, it is required to contact medical control when the patient is also experiencing which of the following conditions:
  - a. pulmonary edema
  - b. pregnancy
  - c. history of heart disease
  - d. all of the above
  
4. Side effects of Epinephrine administration include:
  - a. increased heart rate
  - b. decreased blood pressure
  - c. dilation of blood vessels
  - d. constriction of the bronchioles
  
5. The EMT-Basic is authorized by law to administer Epinephrine for treatment of:
  - a. severe anaphylactic reactions
  - b. chronic obstructive pulmonary disease
  - c. hypovolemic shock
  - d. hypertensive crisis

**EMT-Basic:** Emergency Epinephrine Administration

6. A person experiencing only itching, tearing and swelling around the eyes after exposure to a sensitive substance should be:
- administered Epinephrine by the EMT-Basic to prevent further deterioration
  - observed carefully by the EMT-Basic for further symptoms.
  - transported to the nearest emergency medical facility
  - both b and c
7. If a stinger is present at the site of a bee sting, it should be removed as soon as possible:
- True
  - False
8. After Epinephrine administration, which of the following should you do:
- continue to observe the person for increased signs of anaphylaxis
  - cover person with blanket, place alone in quiet dark room and let him/her sleep
  - administer hot stimulant drinks such as tea or coffee
  - reassure and calm victim
  - administer CPR if person stops breathing

*Select the correct answer*

- 1, 2, 4
  - 1, 3, 4
  - 1, 4, 5
  - 2, 4, 5
9. Kansas licensed ambulance and aid services are required to make Epinephrine 1:1,000 available to EMTs in their emergency care supplies.
- True
  - False
10. Kansas certified First Responders are able to administer Epinephrine to patients.
- True
  - False



**EMT-Basic:** Emergency Epinephrine Administration

11. The most significant reason for the administration of Epinephrine:
- respiratory distress
  - nausea and vomiting
  - dizziness
  - welts on the extremities
12. Which of the following is **not** a life-threatening condition of anaphylaxis?
- pharyngeal edema/spasm
  - hypotension
  - urticaria
  - labored-accessory muscle use

**The following scenario applies to questions 13 and 14.**

You are called to the scene of 10-year-old female who was stung by a wasp in the park. Assessment reveals a conscious, restless patient with a respiratory rate of 20, pulse 110, B/P of 138/78, and moist red skin. You hear wheezing without the use of your stethoscope. You note facial swelling, particularly around the eyes. She begins to scratch the palms of her hands. Her father tells you she has a history of allergies and asthma. The father also tells you that if it would help, you could give his daughter some of his Benadryl which he takes for allergies.

13. This patient is experiencing:
- an allergic reaction
  - an acute asthma attack
  - anaphylaxis
  - septic shock
14. Treatment for this patient includes:
- helping the patient take the father's Benadryl
  - administering Epinephrine
  - administering oxygen
  - apply heat to sting site

*Select the correct answer.*

- 1, 3
- 2, 3
- 2, 4
- 3, 4

**The following scenario applies to questions 15, 16 and 17.**

You are called to a restaurant where you find a 55-year-old male patient experiencing shortness of breath. Your assessment reveals a patient who is conscious and alert. His respirations are 14, pulse 110, B/P 146/80, skin red and moist. Auscultation of the chest reveals minimal wheezing. His wife tells you he has a history of congestive heart failure and allergies to seafood. She adds, "He just couldn't resist eating one of my deep fried oysters tonight." She hands you his prescribed epi-pen and tells you to go ahead give him a shot.

15. At this time, treatment for this patient includes:

1. administering oxygen
2. administering the patient's own Epinephrine
3. transporting the patient to the nearest medical facility
4. contacting on-line medical control

*Select the correct answer.*

- a. 1, 2, 3
- b. 1, 3, 4
- c. all of the above
- d. none of the above

During reassessment you find this patient's respirations are now 24, pulse 120, B/P 64 by palpation, his skin is covered in hives.

16. Of the following actions, choose the next best step.

- a. Contact medical control for permission to administer Epinephrine
- b. Immediately administer the patient's Epinephrine
- c. Transport only since he is older than 30 years old
- d. Withhold the administration of Epinephrine since patient has a history of CHF

17. Which of the following signs or symptoms might indicate the patient is progressing from an allergic reaction to anaphylaxis?

- a. Audible wheezes
- b. Nausea/Vomiting
- c. Abdominal cramping
- d. All of the above

**EMT-Basic: Emergency Epinephrine Administration**

18. Patients suffering from a severe allergic reaction may initially present in respiratory distress or the respiratory distress may develop as the allergic reaction progresses.

- a. True
- b. False

19. Congestive heart failure, glaucoma, or pulmonary edema can sometimes mimic the signs and symptoms of anaphylaxis.

- a. True
- b. False



Emergency Administration of Epinephrine  
**Pre-Course Exam Answer Sheet**

Name \_\_\_\_\_

Date \_\_\_\_\_

**Darken the letter that corresponds to the best answer.**

1. a b c d

11. a b c d

2. a b c d

12. a b c d

3. a b c d

13. a b c d

4. a b c d

14. a b c d

5. a b c d

15. a b c d

6. a b c d

16. a b c d

7. a b c d

17. a b c d

8. a b c d

18. a b c d

9. a b c d

19. a b c d

10. a b c d

20. a b c d

**EMT-Basic: Emergency Epinephrine Administration**

Emergency Administration of Epinephrine

# Pre-Course Exam Answer Sheet

## KEY

Name \_\_\_\_\_

Date \_\_\_\_\_

Darken the letter that corresponds to the best answer.

1. a b c d

11. a b c d

2. a b c d

12. a b c d

3. a b c d

13. a b c d

4. a b c d

14. a b c d

5. a b c d

15. a b c d

6. a b c d

16. a b c d

7. a b c d

17. a b c d

8. a b c d

18. a b c d

9. a b c d

19. a b c d

10. a b c d

20. a b c d

**EMT-Basic: Emergency Epinephrine Administration**



**Pre-Course Written Evaluation Key**

1. c

2. c

3. d

4. a

5. a

6. d

7. a

8. c

9. b

10. b

11. a

12. c

13. c

14. b

15. b

16. a

17. d

18. a

19. a

# **SECTION III**

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## **Participant**

### **Evaluation Materials**

#### **Post-course Written Evaluation**

**“Removed”**

# **SECTION III**

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## **Program**

# **Epinephrine Course Evaluation Forms**

**Instructor Evaluation Form**

*To be completed by the students*

Instructor or Lecturer's Name: \_\_\_\_\_

Lesson Topic: \_\_\_\_\_

Date: \_\_\_\_\_

**Directions:** Circle the number that applies. 1) Needs improvement 2) Satisfactory 3) Good 4) Excellent. If you circled number 1 for any item, include an explanation on the reverse of this form. You may add any additional comments on the reverse of this form.

DURING TODAY'S LECTURE:

- |   |   |   |   |   |
|---|---|---|---|---|
| 1. The material presented was well prepared/organized   | 1 | 2 | 3 | 4 |
| 2. The material presented was interesting   | 1 | 2 | 3 | 4 |
| 3. The material was clearly presented and easily understood   | 1 | 2 | 3 | 4 |
| 4. The lesson objectives were clearly stated at the beginning of the class  | 1 | 2 | 3 | 4 |
| 5. The lesson objectives were met during the lecture  | 1 | 2 | 3 | 4 |
| 6. Class participation/questions was encouraged   | 1 | 2 | 3 | 4 |
| 7. All your questions were answered to your satisfaction  | 1 | 2 | 3 | 4 |
| 8. Terms and concepts used were explained adequately  | 1 | 2 | 3 | 4 |
| 9. Objectives listed in the text book closely followed the objectives in the lesson presented. (Please list any differences on reverse. | 1 | 2 | 3 | 4 |
| 10. The key points of the lecture were summarized at the end of the .lecture  | 1 | 2 | 3 | 4 |



## EMS Training Program

### End of Course Evaluation

To be completed by the student

Lead Instructor's Name: \_\_\_\_\_

Name of course: \_\_\_\_\_

Date: \_\_\_\_\_

Course location: \_\_\_\_\_

Directions: Circle the number that applies. 1) Needs improvement 2) Satisfactory 3) Good 4) Excellent. If you circled number 1 for any item, include an explanation on the reverse of this form. You may add any additional comments on the reverse of this form.

#### THE COURSE:

- |  |   |   |   |   |
|--|---|---|---|---|
| 1. Provided enough time to clearly present all lesson objectives   | 1 | 2 | 3 | 4 |
| 2. Provided enough time for students to learn the lecture material or learn and practice the skill(s)  | 1 | 2 | 3 | 4 |
| 3. Contained information necessary for students to be knowledgeable in the lecture topics/practical skills presented (please explain where content was lacking or excessive. | 1 | 2 | 3 | 4 |
| 4. Was logical in it's' progression of instruction.  | 1 | 2 | 3 | 4 |
| 5. Correlated well with the text book reading assignments.   | 1 | 2 | 3 | 4 |
| 6. Correlated well to the field application of the topics.   | 1 | 2 | 3 | 4 |
| 7. Kept students interested/involved in the course.  | 1 | 2 | 3 | 4 |
| 8. Assessment-based philosophy received a positive reaction from students.   | 1 | 2 | 3 | 4 |
| 9. Assessment-based thinking helped differentiate between critical and non-critical patients   | 1 | 2 | 3 | 4 |
| 10. Assessment-based style provided a satisfactory approach to patient care.   | 1 | 2 | 3 | 4 |
| 11. Prepared the students to properly manage patients  | 1 | 2 | 3 | 4 |



# **Appendix A**

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# **MEDICATIONS**





## Medications

### ***EPINEPHRINE 1:1,000 (Administered by an Epinephrine auto injector)***

#### ***Medication Name***

Generic -Epinephrine  
Trade -Adrenalin TM

#### ***Actions***

Dilates the bronchioles  
Constricts blood vessels

#### ***Indications***

Anaphylaxis  
Medical direction/control authorizes use for this patient

#### ***Contraindications***

Pulmonary edema, hypothermia, hypertension.  
Pregnancy  
Patients with tachyarrhythmias  
**There are no contraindications when used in a life-threatening situation**

#### ***Incompatibilities/Drug interactions***

Potentiates other sympathomimetics  
Patients on monoamine oxidase inhibitors, antihistamines, and tricyclic antidepressants may have heightened effects

#### ***Side Effects***

Ventricular arrhythmias  
Precipitation of angina or myocardial infarction  
Tachycardia  
Anxiety  
Hypertension  
Headache  
Pallor  
Dizziness  
Nausea/vomiting

#### ***Medication Form***

Liquid administered via a commercially pre-loaded, measured dose, injectable needle and syringe system

#### ***Dosage***

##### **Adult:**

Intramuscular -one adult auto-injector (0.3 mg).

##### **Infant and child: (up to 30 kg or 66 lbs)**

Intramuscular -one pediatric auto-injector (0.15 mg).

#### ***Route of Administration - IM***



## **OXYGEN DELIVERY**

### OXYGEN ADMINISTRATION REFERENCE CHART

<b>Method</b>	<b>Flow Rate (in liters per minute.</b>	<b>% Oxygen Delivered</b>
<b>Room Air</b>		21
<b>Nasal Cannula (prongs)</b>	1	24
	2	28
	4	31
<b>Face Mask (simple)</b>	6	35-40
	10	40-50
<b>Nonrebreather Face Mask *(1)</b>	12	80
	15	90
<b>Face Mask with Oxygen Reservoir Bag</b>	10-12	90
<b>Pocket Mask</b>	10	50
	15	80
	30	100 *(2)
<b>Bag Valve Mask</b>	Room Air	21
	12	40-90 *(3)
<b>Positive Pressure Device (demand valve)</b>	100	100 *(4)

\*(1) Delivery system of choice for patients with inadequate breathing and patients who are cyanotic, cool, clammy, short of breath, or suffering chest pain, suffering severe injuries, or displaying an altered mental status, or being transported.

\*(2) This is accomplished by occluding breathing port with thumb.

\*(3) Depends on brand of bag-valve mask and provisions for occluding room air inlet.

\*(4) Should not be used on children under 12 years old.

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**NOTES:**

1. Administration rates by nasal cannula of over 4 L/min. are uncomfortable.
2. Use humidified oxygen, when possible, on infants, children, suspected respiratory tract  
burns, and transports exceeding one-hour duration.
3. Bag Valve mask is not recommended for use on patients in transport situations.
4. Most hypoxic patients will feel better with an increase in delivered oxygen from 21% to  
24%.
5. Pressure cycled ventilators are **NOT** acceptable alternatives to oxygen therapy.
6. Percentages of delivered oxygen listed above are based on optimal conditions. Altitude,  
equipment, etc. may decrease percentages of delivered oxygen.

**OXYGEN BOTTLE VOLUME AND FLOW**

<b>Bottle Size</b>	<b>Volume (Liters)</b>	<b>Time @ 5L/min.</b>	<b>Time @ 10L/min.</b>	<b>Time @ 15 L/min.</b>
D	360	1 hr. 12 min.	36 min.	24 min.
E	625	2 hrs. 5 min.	1 hr. 3 min.	42 min.
M	3,200	10 hours	5 hours	3 hrs. 20 min.
G	5,300	17 hrs. 40 min.	8 hrs. 50 min.	5 hrs. 53 min.
H	6,900	23 hours	11 hrs. 30 min.	7 hrs. 40 min.

1. The above values are based on full bottle (2,000 to 2,200 p.s.i.) @ 70 degrees F.
2. Allow for pressure drop of 5 p.s.i. for every 1 degree drop in temperature below 70  
degrees F.

# Appendix B

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# PROTOCOLS



## **ANAPHYLAXIS/ALLERGIC REACTION**

***IMPORTANT NOTE: These patients may initially present with airway/respiratory compromise or airway/respiratory compromise may develop as the allergic reaction progresses. Not all signs and symptoms are present in every case. When signs and symptoms of allergic reaction include respiratory distress or shock, assume that it is anaphylaxis.***

- I. Conduct Scene Size-Up/Scene Safety - Assure the patient, workers and bystanders are separated from the allergen

### II. Perform an Initial Patient Assessment

- A. Initiate airway, breathing and circulation procedures as indicated
- B. Determine patient transport priority

### III. Perform Focused History and Detailed Physical Exam

- A. History - Previous exposure; Previous experience to exposure; Onset on symptoms; Dyspnea

#### B. Signs and Symptoms

1. Not all signs and symptoms are present in every case
2. Level of Consciousness -Unable to speak; Restless; Decreased level of consciousness; Unresponsive
3. Upper Airway -Hoarseness; Stridor; Pharyngeal edema / spasm
4. Lower Airway -Tachypnea; Hypoventilation; Labored-Accessory muscle use; Abnormal retractions; Prolonged expirations; Wheezes; Diminished lung sounds
5. Skin -Redness; Rashes; Edema; Moisture; Itching; Urticaria; Pallor; Cyanotic
6. Vital Signs -Tachycardia; Hypotension



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7. Gastrointestinal -Abnormal cramping; Nausea/vomiting; Diarrhea
8. Remember when the above signs and symptoms of allergic reaction include respiratory distress or shock, assume that it's anaphylaxis

C. Differential Diagnosis of other medical conditions that may mimic anaphylaxis

1. Be certain the patient is less than 30 years old, or is 30 years or older and has a prescription for Epinephrine
2. Be certain the signs and symptoms are those of anaphylaxis
  - a. Be certain it is not only in a stage of:
    - (1) Heart disease, i.e., congestive heart failure
    - (2) Psychosis
    - (3) Hypertension history
    - (4) COPD
    - (5) Glaucoma
    - (6) Pulmonary edema
    - (7) Hyperthyroidism
    - (8) Pregnancy

If the patient is suffering severe anaphylaxis and also one of the conditions mentioned above, then:

- (1) Epinephrine would generally be indicated to reduce respiratory distress.
- (2) On-line medical control is preferred prior to administration of Epinephrine.
- (3) Properly approved protocols that specifically address these conditions may be used in the absence of availability of on-line medical control.

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IV. Assessment Findings and Emergency Care

Note: When a paramedic system exists, EMT-Basic personnel shall arrange for ALS rendezvous as soon as possible as directed by local or regional patient care procedures or when directed by medical direction/control.

**Anaphylaxis – If the patient has come in contact with a substance that causes an allergic reaction and complains of respiratory distress or exhibits signs and symptoms of respiratory distress or shock (hypoperfusion), then:**

A. Provide supplemental oxygen and/or ventilatory assistance as necessary, if not done during initial patient assessment.

B. Maintain or provide circulation as indicated, if not done during initial patient assessment

C. Remove offending agent (i.e. stinger)

D. Pharmacological interventions

(1) Administer Epinephrine 1:1,000 IM via auto-injector to persons under age thirty who display signs and symptoms of anaphylaxis.

a. Adult dose – 0.3 mg

b. Pediatric dose (up to 30 kg or 66 lbs.) - 0.15 mg

1) Upon the request of the patient's parent or guardian; or

2) Upon the request of a person who presents written authorization from the patient's parent or guardian making such a request; or

3) Upon request of the patient when it is known that the patient has a history of anaphylaxis; or

4) Upon an on-line medical control order is given.

(2) Administer 0.3 mg Epinephrine 1:1,000 IM via auto-injector to those persons who are age thirty and over **and**

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- a. Have their own Epinephrine for anaphylaxis
- b. Display signs and symptoms of anaphylaxis

**Note:** At the time it is determined that Epinephrine is needed, report any suspected complicating conditions to on-line medical control prior to the administration of Epinephrine. When on-line medical control is not available, then this protocol may be used when appropriately approved by local medical control. These complicating medical conditions include:

- (1) Heart Disease
- (2) Psychosis
- (3) Hypertension history
- (4) Age > 30 years
- (5) COPD
- (6) Glaucoma
- (7) Pulmonary Edema
- (8) Hyperthyroidism
- (9) Pregnancy

In situations where the patient has signs and symptoms of anaphylaxis without the above conditions, Epinephrine may be administered with on-line medical control. In the absence of available on-line medical control, then off-line medical control via this properly approved protocol may be used.

**Allergic Reaction - Patient has contact with a substance that causes an allergic reaction without signs of respiratory distress or shock (hypoperfusion).**

1. Continue with focused assessment  
Patient wheezing without signs of respiratory compromise or hypotension should not receive Epinephrine
2. Contact ALS for additional resources

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3. Perform non-pharmacological interventions. (i.e., treat for shock).
4. Record assessment findings and reassess in two minutes

A. Re-assessment strategies

(1) Continue focused assessment of airway, breathing and circulatory status.

a. Patient condition continues to worsen.

1) Decreasing mental status

2) Increasing breathing difficulty

3) Decreasing blood pressure

4) Obtain medical direction/control

a) Additional dose(s) of Epinephrine 1:1,000 by an Epinephrine auto injector

b) Treat for shock (hypoperfusion).

c) Prepare to initiate Basic Cardiac Life support measures.

i. CPR

ii. AED

b. Patient condition improves. Provide supportive care.

1) Oxygen

2) Treat for shock (hypoperfusion).

B. Psychological support

5. Transport as soon as possible
6. Perform ongoing assessments



## **BITES AND STINGS –VENOMOUS**

***Note: When a paramedic system exists, EMT-Basic personnel shall arrange for ALS rendezvous as soon as possible as directed by local or regional patient care procedures or when directed by medical direction/control.***

- I. Perform scene size-up – separate patient, workers and bystanders from the source of the poisoning.
- II. Perform an initial patient assessment.
  - A. Intervene as indicated
- III. Perform a focused history and physical exam.
  - A. Signs and symptoms.
    1. History of bite (spider, snake) or sting (insect, scorpion or marine animal).
    2. Pain
    3. Redness and/or swelling
    4. Weakness and/or dizziness
    5. Chills or fever
    6. Nausea and vomiting
    7. Bite marks or stinger
- IV. Management
  - A. Provide supplemental oxygen and/or ventilatory assistance as necessary, if not done during the initial patient assessment.
  - B. If stinger is present scrape the sting site to remove the stinger.

*Note: Do not attempt to pull the stinger.*

- C. Wash area gently.

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- D. Remove jewelry from the affected limb before swelling begins, if possible.
- E. Keep limb immobilized and below the level of the heart.
- F. Keep patient at rest.
- G. Do not apply cold to a snake bite.
- H. Consult medical direction regarding constricting band for snakebite.
- I. Observe for development of signs and symptoms of an allergic reaction; if it occurs, refer to Anaphylaxis/Allergic Reaction Protocol.
- J. Transport as soon as possible.
- K. Perform on-going assessments