

**State of Connecticut Education and Training Committee  
Intra-Muscular Administration of Epinephrine  
By Emergency Medical Technicians**

**Check and Inject Education Outline**

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**Instructor Stipulation**

**This educational program is to be taught by currently certified EMS-Instructors. It is critical that any EMS-Instructor that does not currently provide intramuscular injections as a component of their scope of practice (Paramedic, RN, MD, etc) needs to complete this training before providing it to other EMTs.**

**Goal**

The goal of this education program is to provide emergency medical technicians with the knowledge, skills and attitude necessary to provide timely and adequate medical care to an adult or child with signs and symptoms of anaphylaxis (severe allergic reaction).

**Objectives**

Upon completion of this education program, an emergency medical technician will:

1. List three common signs or symptoms of **minor** allergic reaction, not requiring administration of epinephrine
2. List three common signs or symptoms of **severe** allergic reaction or anaphylaxis requiring the administration of epinephrine
3. Identify the necessary equipment needed to administer epinephrine via the intramuscular route.
4. Demonstrate safe handling of, opening of and drawing from a glass medication ampule
5. Demonstrate safe handling of and drawing from a medication vial
6. Identify proper location for IM injection of epinephrine
7. Demonstrate aseptic technique in drawing and administering an intramuscular injection
8. Explain the risk of injection into a vein or artery.
9. Describe the steps necessary to measure and administer a correct dose of epinephrine based on a given patient age and weight
10. Apply the EMS protocol (#2.3A, #2.3P) in a given scenario.

**References**

**2009 National EMS Education Standards**

**Pharmacology:** The EMT will apply a fundamental knowledge of the medications that the EMT pay assist/administer the patient during an emergency.

**Emergency Medications:** The EMT will have a fundamental depth and simple understanding of knowledge, within the scope of practice of an EMT, of the names, actions, indications, contraindications, complications, routes of administration, side effects and interactions and dosages for the medications administered.

**Medication Administration:** The EMT will have a fundamental depth and foundational understanding of knowledge, within the scope of practice of an EMT, how to administer medication to a patient.

## Resources

1. Current Connecticut EMS Protocol #2.3 A and P
2. Check and Inject reference materials
3. IM injection video
4. Epinephrine injection kit
  - a. 0.5 or 1.0 mL syringe
  - b. 23 gauge needle  
(a preassembled needle and syringe are acceptable)
  - c. 1 ampule of epinephrine or a simulated ampule
  - d. 1 vial of epinephrine or a simulated vial
  - e. filter needle(s) for use with glass ampules
  - f. alcohol wipes
  - g. gauze pads
  - h. medical exam gloves
  - i. injectable surface for demonstration
    - i. fruit
    - ii. meat
    - iii. traditional IV training material
5. CT OEMS Skill Sheet
6. CT OEMS Review Quiz and Answer Key
7. Training certificates

## Education Outline

- I. Rationale for Check and Inject program.
  - a. Decreased availability of auto injectors
  - b. Rising cost of auto injectors
  - c. Success of program in other jurisdictions
    - i. King County, Washington – 100% increase in administration in appropriate cases due to reduced concern of waste of expensive injector
    - ii. New York State
    - iii. Massachusetts
- II. Signs and symptoms of minor allergic reaction
  - a. Single body system reaction
  - b. Localized itching
  - c. Runny nose
  - d. Sneezing
  - e. Watering eyes
- III. Signs and symptoms of major allergic reaction
  - a. Two or more body system reaction
  - b. Rapid onset of symptoms
  - c. Respiratory symptoms
    - i. dyspnea
    - ii. hoarse voice
    - iii. swelling of lips and tongue (angioedema)

- d. Cardiovascular system
    - i. hypotension
    - ii. tachycardia
  - e. Integumentary system
    - i. itching
    - ii. flushing of skin
    - iii. hives
    - iv. swelling
  - f. Gastrointestinal system
    - i. nausea
    - ii. vomiting
    - iii. diarrhea
- IV. Properties of epinephrine
- a. Class of medication
    - i. sympathetic agonist
    - ii. also called adrenaline
  - b. Indications
    - i. evidence of anaphylaxis or progressing severe allergic reaction
  - c. Contraindication
    - i. no absolute contraindication in anaphylaxis
  - d. Side effects
    - i. palpitations
    - ii. hypertension
    - iii. anxiety
    - iv. chest pain
    - v. tremor
    - vi. headache
  - e. Risks of over dosage
    - i. tachycardia
    - ii. myocardial ischemia
  - f. Action
    - i. vasoconstriction
    - ii. bronchodilation
- V. Review of Connecticut EMS protocol
- VI. Assessment of patient
- a. Scene safety – consider provider exposure to allergen (insects, etc)
  - b. BSI – prepare for IM injection
  - c. Primary Assessment – Early recognition of airway compromise, dyspnea, hypotension
  - d. Oxygen administration
  - e. Secondary Assessment
    - i. Rapid assessment
    - ii. Body systems (signs and symptoms above)
      - 1. Respiratory
      - 2. Cardiovascular
      - 3. Integumentary
      - 4. Gastrointestinal
- VII. Selection of injection site

- a. Lateral mid-thigh
    - i. Muscles are still adequately perfused during anaphylaxis to allow absorption of epinephrine
    - ii. Previous sub-cutaneous route may delay drug absorption due to vasoconstriction
    - iii. Risk of tissue damage if injected elsewhere
    - iv. Risk of tachycardia and cardiac compromise if injected in artery or vein
- VIII. Drug selection
- a. Right patient – ensure that the patient meets the protocol
  - b. Right medication – confirm epinephrine, 1 mg/ 1 ml
  - c. Right route – given IM at proper location
  - d. Right dose confirm 0.15 or 0.30 mg dose
  - e. Right time – given once, then reassess and call med control for 2<sup>nd</sup> dose if not better in 5 minutes.
  - f. Right documentation – 0.3mg “IM” and location/ 0.15mg “IM” and location
- IX. Aseptic technique
- a. Sterility of syringe, needle, internal surface of ampule or vial
  - b. Use of antiseptic wipe on vial surface, skin
  - c. Avoid contamination of sterile surfaces
- X. Drawing from an ampule (demonstrate)
- a. Confirm medication
  - b. Shake ampule contents to bottom
  - c. Wipe with antiseptic swab
  - d. Break neck with gauze, alcohol swab or swab wrapper
  - e. Insert filter needle and withdraw medication
  - f. Store or discard ampule safely
- XI. Drawing from a vial (demonstrate)
- a. Confirm medication
  - b. Remove lid
  - c. Wipe surface with antiseptic swab
  - d. Instill air equal to quantity equal to medication amount to be drawn
  - e. Insert needle and withdraw medication
  - f. Store or discard vial safely
- XII. Confirmation of medication
- a. Speak dose out loud
  - b. Confirm with partner
  - c. Utilize prompt materials in kit
- XIII. Prepare injection site (demonstrate)
- a. Gross decontamination – Removal of visible dirt, blood, other material
  - b. Antiseptic use – application in expanding concentric circles
  - c. Reapplication of antiseptic if contaminated or touched
  - d. Ensure removal of Filter needed for injection tip
- XIV. Administration of medication (demonstrate on manikin or fruit)
- a. Use quick dart-like action
  - b. Inject entire length of needle
  - c. Draw-back of syringe
    - i. No blood – safe to inject
    - ii. Visible blood – withdraw and select another site.
  - d. Inject medication in one fluid motion

- e. Withdraw needle, activate any safety cover
  - f. Press on injection site with gauze
  - g. Dispose of needle/syringe appropriately in sharps container
- XV. Considerations for additional doses
- a. Protocol
  - b. Online medical direction
- XVI. Proper documentation
- a. ePCR – record in medication section, not only in narrative
  - b. Initial findings
    - i. vital signs
    - ii. work of breathing
    - iii. general appearance
    - iv. lung sounds
    - v. airway patency
  - c. Document correct dosage administered (0.3 mg vs 0.03 mg, etc)
  - d. Document dosage errors accurately
  - e. Document reassessment findings
- XVII. Medication administration errors
- a. Incorrect dose given
  - b. Incorrect route of administration
  - c. Unnecessary administration
  - d. Mechanical failure

### **Skills Development and Verification**

Ample time should be provided to allow students to practice the skills required to demonstrate competency. Once they have attained a functional ability, each EMT should demonstrate the skill of IM epinephrine administration before a credentialed EMS instructor who will document the validation using the enclosed skill sheet(s). More than one attempt is permitted.

The administration of epinephrine is not a new skill for most EMTs, however the skill of utilizing a traditional syringe and vial or ampule may be new to them. Instructors should become familiar with both types of medication containers and have samples of both in the classroom. If available, utilized “training” vials and ampules which are filled only with water.

It would be valuable for an instructor to describe the following new tools to the EMT:

- Medication vials
- Medication ampules
- Syringes with attached needles
- Syringes without attached needles
- Filtered needles for drawing from glass ampules
- Blunt needles for drawing from vials

**Written Assessment**

Each EMT should complete the final written assessment, a 10-question review quiz. This may be reviewed in class and copies retained in agency training files.

**Certificate of Training**

A certificate of training completion may be awarded to the participant upon completion of the program. This certificate should not be issued if the participant was unable to complete the psychomotor or written assessments successfully. A sample certificate is included with this training package.