Epinephrine and Glucagon by Intramuscular Injection

2011 SPEMS Protocols
- Requires administration of epinephrine by _______________________ rather than SC
  - Severe allergic reaction with BP < 90
- All EMTs and EMT-Is must be trained and tested OR Epi Auto Injectors must be carried

2008 thru Current SPEMS Protocols
- Allows EMTs to administer _______________________ by IM injection on hypoglycemic patients that cannot take oral glucose
  - Depressed LOC where:
    - Unable to hold head upright, or
    - No gag reflex
- Glucagon is _______________________
- All EMTs and EMT-Is must be trained and tested if Glucagon is carried

2008 thru Current SPEMS Protocols
- Allows EMT-Is and EMT-Ps to administer Glucagon to _______________________ patients if IV is unobtainable
- EZ IO should be attempted PRIOR to administering Glucagon if Bgl is <50mg/dL and patient is unstable (ALS personnel)
- _______________________ is ALWAYS the drug of choice (ALS)

Six Rights of Drug Administration
- Right _______________________
- Right drug
- Right _______________________
- Right time
- Right route
- Right _______________________

Pounds vs. Kilograms
- 1 kilogram (kg) = __________ pounds (lb)
- To convert pounds into kilograms:
  - Divide pounds by 2.2, or
  - Divide pounds by 2 and subtract ___________%
- Example: 40lbs
  - 40 divided by 2 = 20
  - 20 minus 10% = 20 - 2 = ____________kg

Always take appropriate body substance isolation measures to reduce your risk of ________________ during medication administration.

Needle Handling Precautions
- Minimize the tasks performed in a ________________ ambulance.
- Immediately dispose of used sharps in a ________________ container.
  - Do no hand off needles
• Do not _______________________ contaminated needles

9 Kinds of Parenteral (Non GI) Drug Containers
• Glass _______________________
• Single and multidose vials
• Nonconstituted _______________________
• Prefilled syringes
• Intravenous medication fluids

10 Checking the Drug
• Check for correct medication by reading _______________________
• Check expiration date
• Check for _______________________ to the drug
• Check for cloudiness or _______________________

11 Obtaining Medication From a Vial
• Confirm label and expiration date
• Attach needle to a syringe
• Remove plastic cap and _______________________ rubber top
• Insert the hypodermic needle into the rubber top and inject the _______________________ from the syringe into the vial.
  • Amount of air is the same as the amount of fluid you want to draw up

12 Non-Constituted Vials
• The nonconstituted drug vial actually consists of _______________________ vials, one containing a powdered medication and one containing a liquid mixing solution.

13 Obtaining Medication From a Non-Constituted Vial (Glucagon)
• Confirm labels and expiration dates
• Remove all solution from the vial containing the mixing solution as described earlier
  • Inject ________cc of air and draw out the _________cc of sterile water
• Cleanse the top of the vial containing the powdered drug and _______________________ the solution (1cc)

14 Obtaining Medication From a Non-Constituted Vial (Glucagon)
• Agitate or _______________________ the vial to ensure complete mixture
• Prepare a _______________________ syringe and hypodermic needle
• Inject air (1cc) into the constituted drug and withdraw the drug

15 Drawing Medications From an Ampule (Epi) (1 of 2)
• Check for _______________________ and contraindications
• Check for allergies
• Gather equipment
• Inspect for _______________________ date
• Check for cloudiness or contamination
• _______________________ ampule to get medication out of neck
• Use gauze pad for personal protection

16 Drawing Medications From an Ampule (Epi) (2 of 2)
• Grasp ampule and ________________ off top
  • Perform away from yourself and patient
• Withdraw correct ________________ of medication
  • Should draw the entire volume
  • May expel excess medication
• Advance plunger to ________________ air

17 Intramuscular Injections

18 Intramuscular Injection Sites
• ________________
  • 3–4 finger widths below the acromial process (bony bump on shoulder)
  • Can administer up to 2cc
  • Predominant EMS site for Epi and Glucagon
• ________________ gluteal
  • Buttock
  • Upper, outer quadrant of buttock
  • Can administer 5cc or more

19 Intramuscular Injection Sites
• Vastus lateralis
  • ________________ muscle
  • Anteriolateral part of muscle
  • Commonly used in pediatrics
  • Can administer 5cc or more
• Rectus ________________
  • Thigh Muscle
  • Center of muscle midshaft of femur
  • Can administer ____________cc or more

20 Intramuscular Injection Sites

21 IM Injections
• BSI
• Prepare equipment
  • Drug
  • Alcohol prep
  • ________________
• Needle
  • ___________-___________ga, __________” to 1” long
  • Dependant on muscle size
• Gauze pad or Bandaid
• Check and reconfirm medication label
22 IM Injections
- Inquire about allergies if possible
- Draw up medication as previously described
- Select and prepare site
  - Cleanse with alcohol in a circular motion beginning in center and working
    _______________________
  - Hold skin taught
  - Insert needle at a __________° angle
    - Use ______________________ action

23 IM Injections
- Aspirate for blood return. If blood is seen:
  - Do _______________________ inject medication
    - Withdraw, replace needle and start over
- Slowly inject medication
- Remove needle and dispose properly
- Use bandaid or gauze pad over site and massage
- _________________________ patient

24 Safety
- Always wear _______________________
- Handle sharps carefully
  - Do NOT _______________________ off sharps
- Dispose of contaminated materials and sharps into proper sharps container
- NEVER _______________________ needles

25 Glucagon
26 Glucagon
- Polypeptide _______________________ identical to human glucagon
- Increases blood glucose and relaxes smooth muscles of the GI tract
- Acts only on _______________________ glycogen, converting it to glucose
- Indications: _______________________ where patient cannot take oral glucose and
  an IV is unobtainable

27 Glucagon
- Contraindications: _______________________
- SPEMS Protocol dosage is:
  - Adult ___________mg IM
  - Pediatric ___________mg IM
- Short half life if given IV (8-13 minutes)
- Takes approximately 10-20 minutes to reach full effects given IM
- Side Effects: N/V

28 Glucagon
- Repeat X ___________ if patient does not regain consciousness
• However repeat doses are not normally needed since glucose can then be given and the repeat dosage may not work if liver glycogen is depleted

29  **Glucagon**

• Special Notes:
  • After patient responds, watch
  • EMTs may then administer oral glucose if conscious
• Supplemental required after Glucagon to restore liver glycogen
• Comes in a dry powder and must be
• Does not contraindicate D50W
• Establish an IV if ALS is available
• D50W is ALWAYS the drug of choice

30  **Epinephrine**

31  **Anaphylactic Shock Review**

• Shock due to reaction
• A true life threat
• S/S
  • Swelling of dyspnea with stridor and wheezing
  • Falling BP
  • Edema/swelling
  • Slowing pulse rate
  • ...

32  **Treatment of Anaphylactic Shock**

• High Con Oxygen
• 1-2 IVs of NS wide open to maintain BP (EMT-I and EMT-P)
• Maintain Body Temp
• Feet
• Rapid Transport
• (Auto-injector or IM)

33  **Epinephrine**

• Classified as a Catecholamine
• Stimulates Alpha and Beta 1 receptors as well as Beta 2 receptors
  • peripheral blood vessels and mucosa
  • the bronchial passageways
• Concentrations of Epinephrine
  • 1:10,000: used for cardiac arrest (EMT-P Only)
  • 1: : used for anaphylactic, asthma, and cardiac arrest in pediatrics

34  **Indications/Contraindications of Epinephrine**

• Indication
• Anaphylactic shock when BP < __________ systolic
• Contraindications
  • ________________ shock
  • Coronary insufficiency
  • Allergic to Epi

35 Dosages of Epinephrine
• Adult dosage: __________ mg (0.3cc) intramuscular (IM)
  • Paramedic dose is 0.5mg IM
• Pediatric Dosage: __________ mg/kg up to __________ mg (0.15cc)
  • 11lbs (5kg): 0.05mg (0.05cc)
  • 22lbs (10kg): 0.1mg (0.1cc)
  • 33lbs (15kg) or larger: 0.15mg (0.15cc)

36 Signs/Symptoms Following Epi Administration
• ________________
  • Tachypnea
  • Flushed Skin
  • Restlessness
  • Anxiousness
  • Vomiting

37 Keys
• Epi and Glucagon can be the difference between living and dying for the patient
• Pediatric dosing is critical: Do the ________________ !
• Verify need for drug first
  • ________________ for Glucagon
  • Allergic reaction with SBP < 90 for Epinephrine
• Monitor and ________________ after administration