Glucagon

Optional (EMT); Optional (AEMT)

Cognitive Objectives

- 2.1 Recognize the need for medical direction of protocols to assist in the emergency medical care of the patient with altered mental status and hypoglycemia.
- 2.2 List the class, mechanism of action, indications, contraindications, side effects, dosage and administration, duration of action and special considerations of glucagon.
- 2.3 Differentiate among the chemical, generic, and trade names of glucagon.
- 2.4 Describe the reassessment strategy for the patient with altered mental status and hypoglycemia following glucagon administration.

Objectives

Psychomotor

- 2.5 Demonstrate proper documentation required for completing a patient care report for a patient experiencing altered mental status and hypoglycemia.
- 2.6 Demonstrate the assessment and emergency medical care of a patient experiencing altered mental status and hypoglycemia.
- 2.7 Perform the steps in facilitating the use of glucagon for altered mental status and hypoglycemia.

Affective

2.8 Explain the importance of good patient care report (PCR) form documentation practices

General Pharmacology

- You will be responsible for administering certain drugs.
- EMT-A and EMT-B (with standing orders and medical director approval) will now be able to administer glucagon that you carry to a patient who meets criteria.
- Not understanding how medications work, places you and the patient in danger.

EMT-Advanced

- EMT-Advanced can administer glucagon if:
  1. Medical Director has approved
  2. Proper training has occurred (this is it!)
  3. Standing orders/protocols allow EMT-A administration
  4. Patient meets criteria

EMT-Basics

- EMT-Basics can only administer glucagon if:
  1. Medical Director has approved
  2. Proper training has occurred (this is it!)
  3. Standing orders/protocols allow EMT-B administration
  4. Patient meets criteria

Pharmacology Definitions (1 of 2)

- **Pharmacology**
  - The science of drugs, including their ingredients, preparation, uses and actions on the body
- **Dose**
  - Amount of medication given
- **Action**
  - Therapeutic effects expected on the body

Pharmacology Definitions (2 of 2)

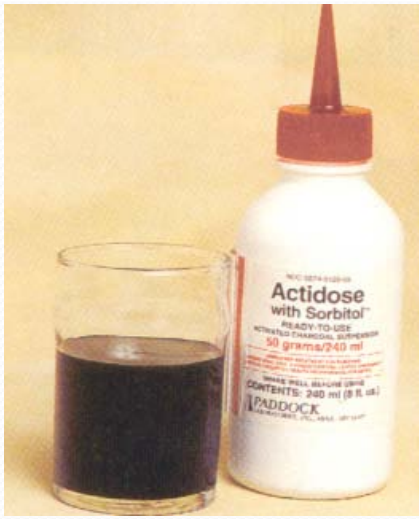
- **Indications**
  - Therapeutic uses for a particular drug
- **Contraindications**
  - Conditions in which a medication should **not** be given
- **Side effects**
  - Actions of a drug other than the desired ones

Medication Names

- Trade name-GlucaGen
  - Brand name given by manufacturer
- Generic name-glucagon
  - Original chemical name

Medications Carried on EMS Unit

- Oxygen
- Activated Charcoal
- Oral Glucose
- In Idaho-Epinephrine Auto-Injectors-with proper training
- Glucagon



Medications Carried on EMS Unit

- In Idaho-Glucagon can be carried on EMS unit and EMT-A may administer following standing orders/protocols following proper training

Medications Carried on EMS Unit

- In Idaho-Glucagon can be carried on EMS unit and EMT-B may administer with medical director approval and following standing orders/protocols after proper training of this optional EMT-Basic curriculum

Glucagon-What is it???

- **Class:** Hyperglycemic agent, insulin antagonist
- **Mechanism of action:** induces liver breakdown of glycogen, releasing glucose from the liver. Blood glucose rises within 10 minutes. Liver stores of glycogen are necessary for glucagon to produce a rise in glucose

Glucagon-What is it???

- **Indications:** Altered LOC when hypoglycemia is suspected
- **Contraindications:** Hyperglycemia or hypersensitivity to the medication

Glucagon-What is it???

- **Adverse Reactions:** nausea and vomiting occur occasionally especially with doses above 1 mg or with rapid injection of less than 1 minute; tachycardia and hypertension.

Glucagon-What is it???

- **Dosage:**
  - For **adults** weighing over 55 lb: 1mg via intramuscular injection may re-administer in 5-20 min if ineffective
  - For **pediatrics** weighing less than 55 lb: 0.5 mg via intramuscular injection

Glucagon-What is it???

- **Time of MAXIMAL glucose concentration:**
  - Intramuscular: 30 minutes
  - You should see a rise in glucose concentrations within 10 minutes of IM administration
- **Duration of action:**
  - 60-90 minutes

Glucagon

- Adequate amounts of glycogen must be stored in the liver. If a patient has conditions such as prolonged fasting, starvation, adrenal insufficiency or chronic hypoglycemia releasable glucose may be inadequate

Glucagon

- Stability and storage: the glucagon package may be stored up to 24 months at controlled room temp prior to reconstitution. Avoid freezing and protect from light. Do not use after expiration. After reconstitution, the glucagon should be used immediately. Discard any unused portion

Glucagon-Supplied

- 1 vial containing 1 mg glucagon
- 1 vial containing 1 ml sterile water for reconstitution

General Steps to Administer Medications (1 of 2)

- Obtain orders from medical control.
- Verify proper medication and prescription.
- Verify form, dose, and route of the medication.
- Verify if any medications have been administered already
- Check expiration date and condition of the medication.

General Steps to Administer Medications (2 of 2)

- Obtain blood glucose measurement.
- Reassess vital signs, especially heart rate, blood pressure, and blood glucose at least every 5 minutes or as the patient's condition changes.
- Advise patient to eat a carbohydrate meal to maintain glucose levels, transport if indicated.

General Steps to Administer Medications (2 of 2)

- Document
- May repeat dose with medical control permission up to a max dose

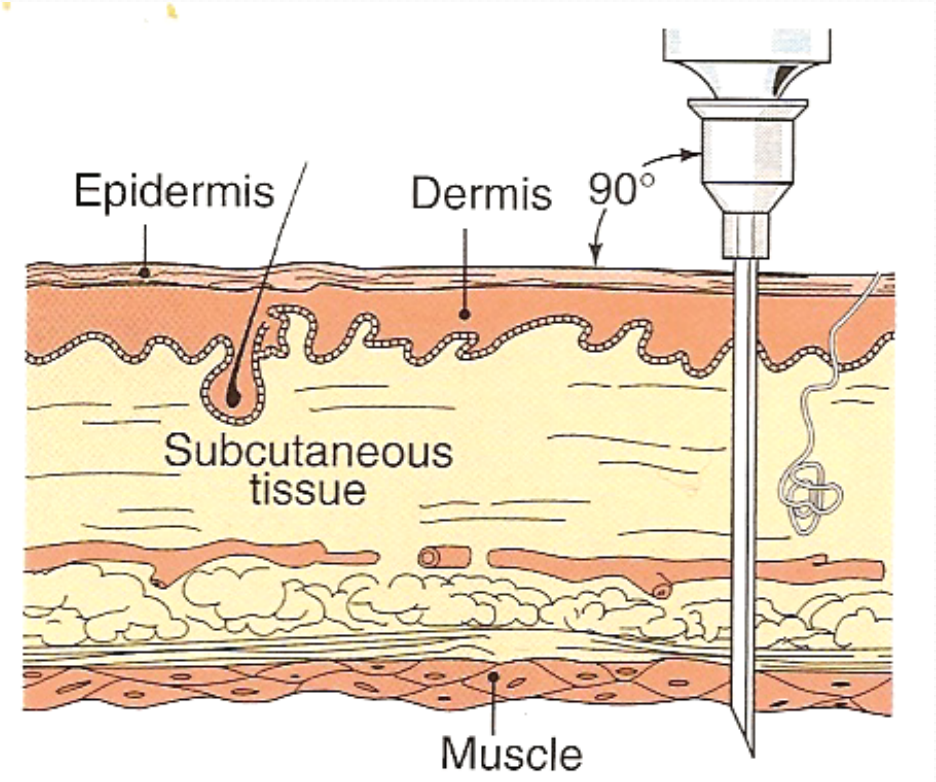
General Medication Procedures

- Right:
  - Route
  - Medicine
  - Patient
  - Dose
  - Time
  - Expiration Date

General Intramuscular Injection Procedures

- Prepare the equipment
- Check the medication
- Draw up the medication
- Prepare the site
- Insert the needle at a 90 degree angle for IM injection
- Remove the needle and cover the puncture site
- Monitor patient and document

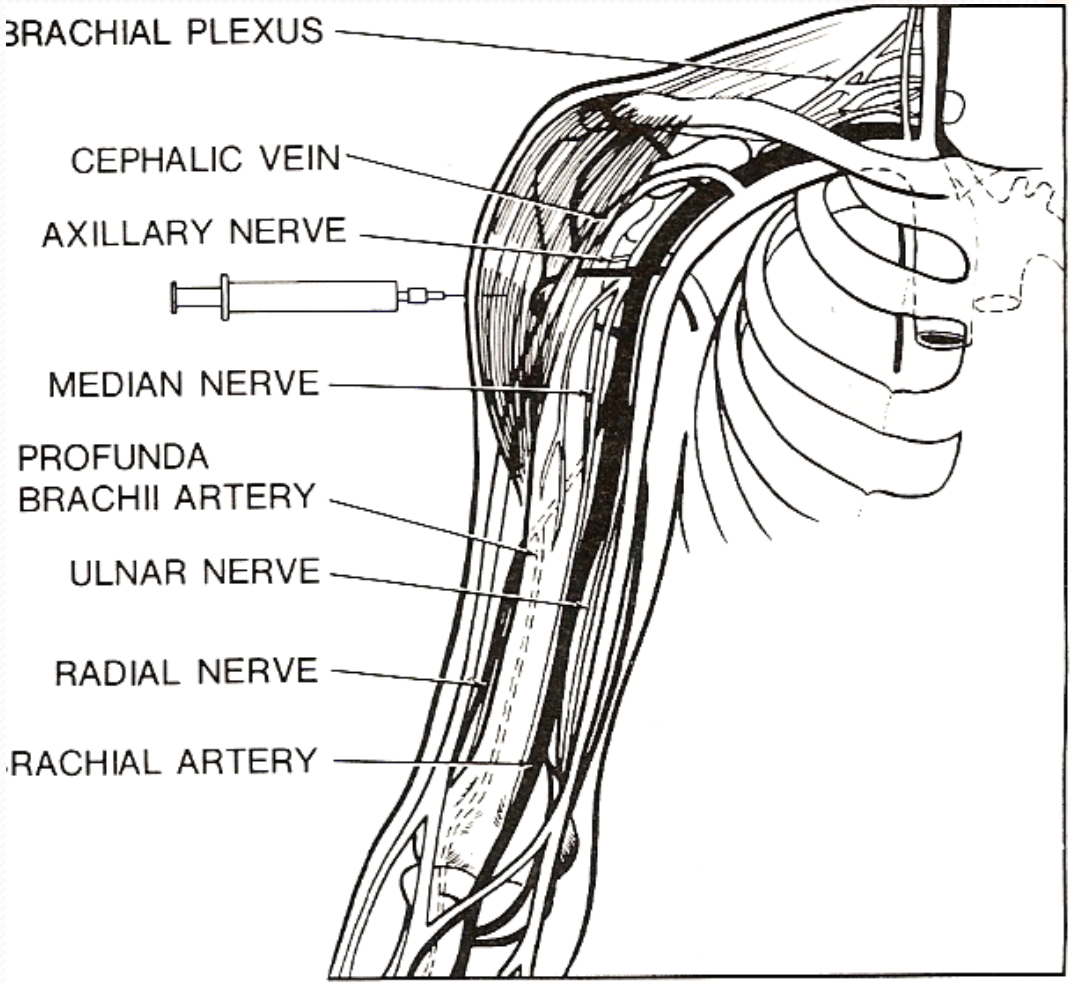
General Intramuscular Injection Procedures

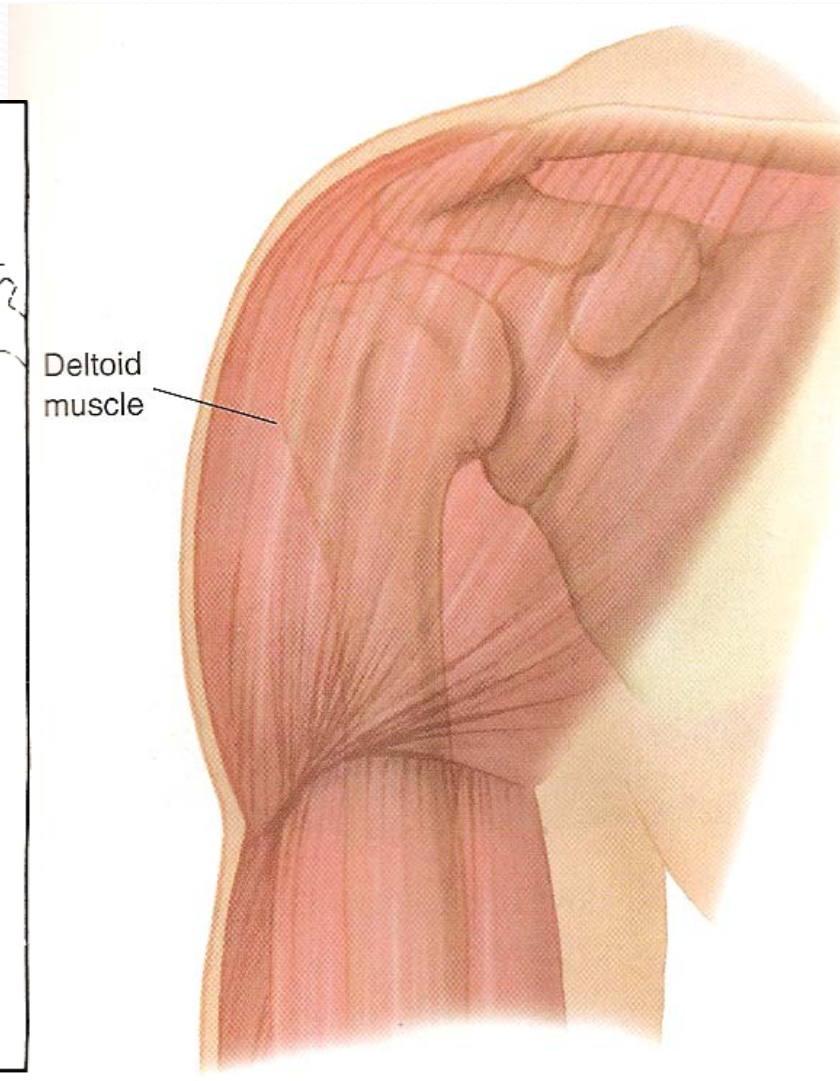


Sites for Intramuscular Injection

- **Deltoid:** 3 to 4 finger-breadths below the acromial process (the bony bump on the shoulder)
- You can deliver up to 2.0 mL into the muscle
- Preferred site due to location and ease of use

Deltoid


BRACHIAL PLEXUS
CEPHALIC VEIN
AXILLARY NERVE
MEDIAN NERVE
PROFUNDA BRACHII ARTERY
ULNAR NERVE
RADIAL NERVE
RACHIAL ARTERY


Deltoid muscle

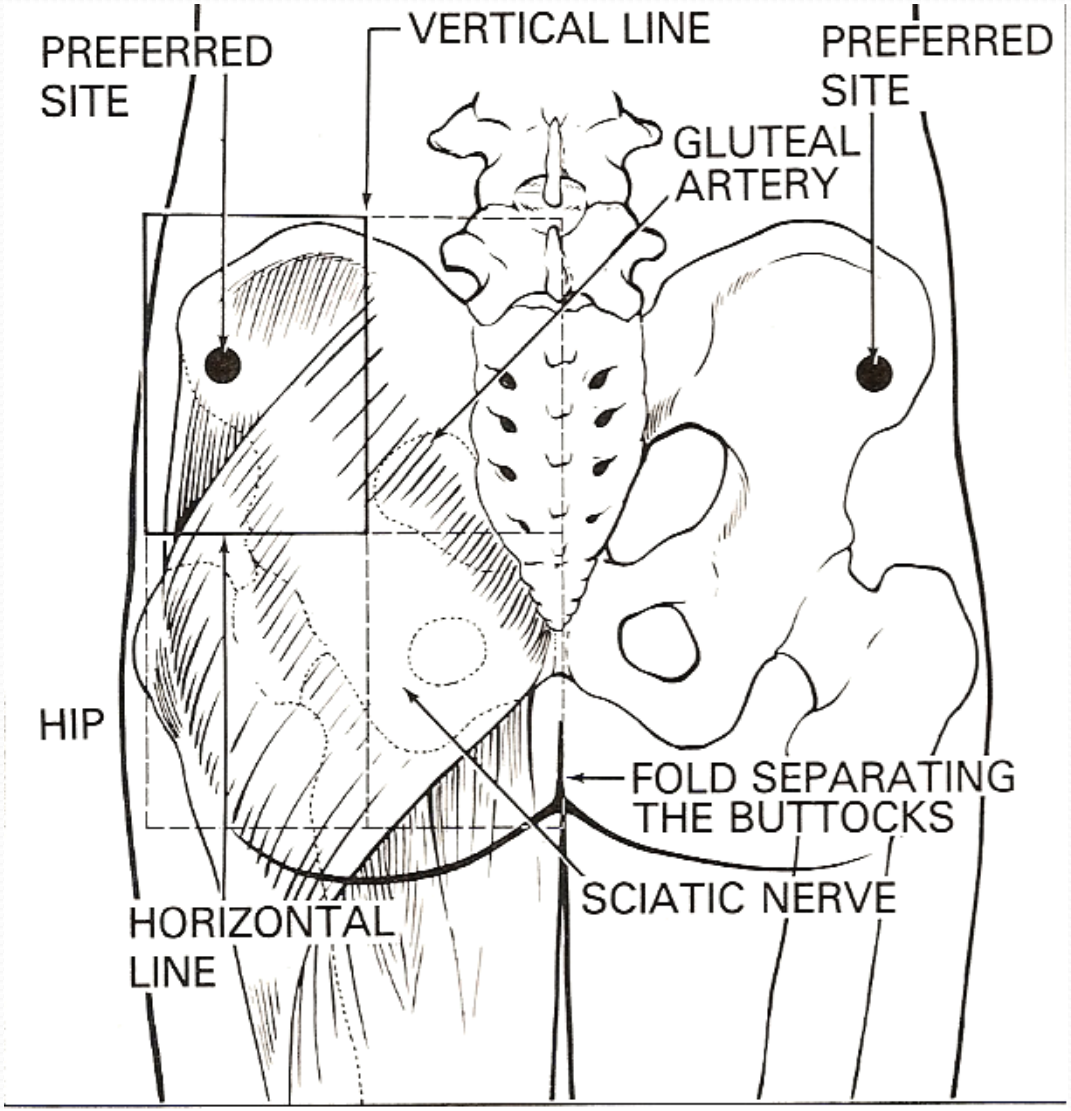
Deltoid

- 3-4 finger widths below the acromian process
- ALWAYS aspirate after you insert the needle into the muscle and check for blood return in the syringe
- If you have blood return, take out the needle and attempt at a different site

Sites for Intramuscular Injection

- **Dorsal Gluteal**: Upper and outer portion of the buttock
- You can deliver up to 5.0 mL into the muscle
- Damage to sciatic nerve may cause decreased mobility or total paralysis of the leg-always use upper or outer portion of buttock

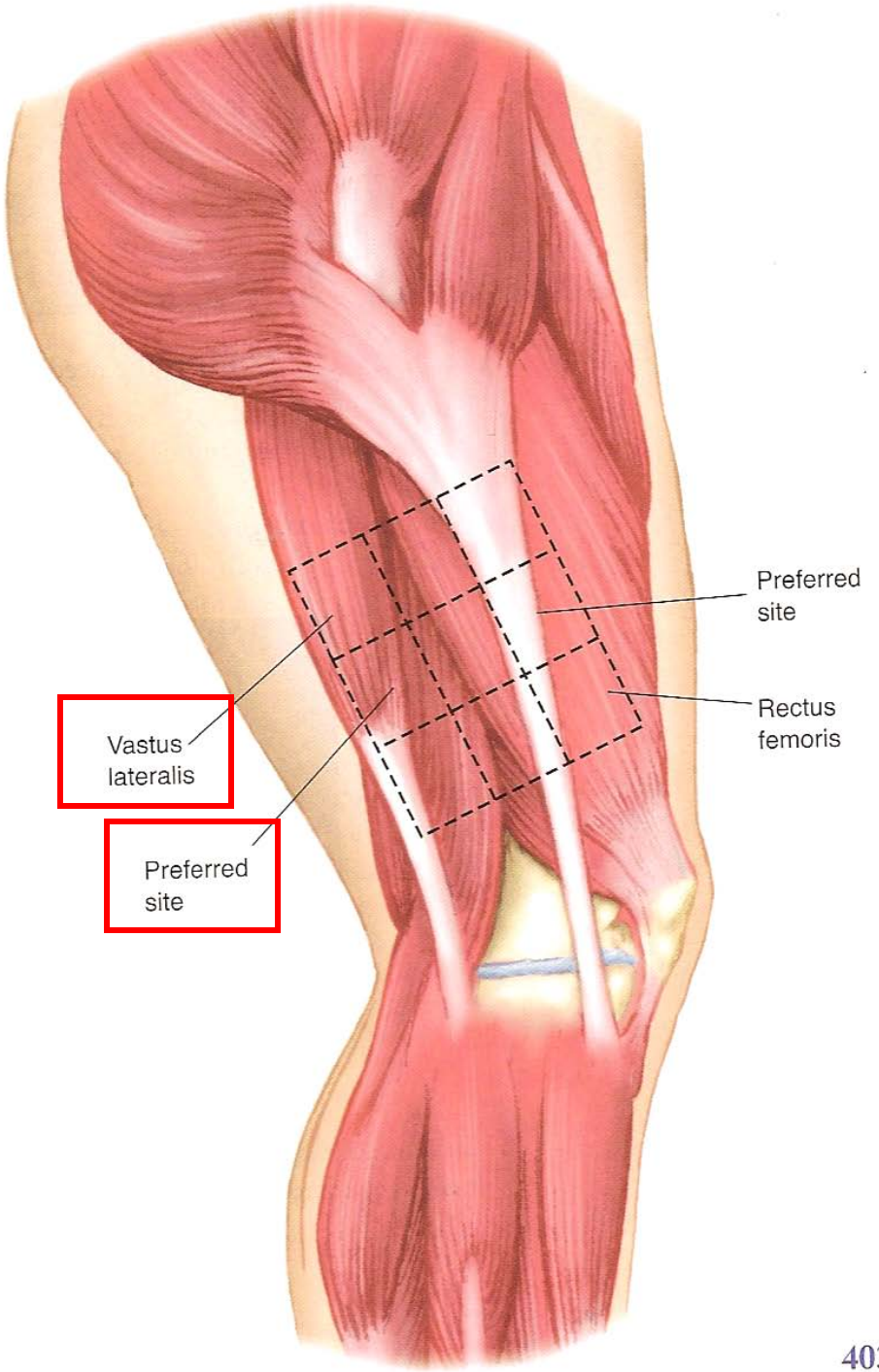
Dorsal Gluteal



Sites for Intramuscular Injection

- **Vastus Lateralis**: Thigh muscle used especially in pediatric patients
- You can deliver up to 5.0 mL into the muscle
- Imagine a grid of nine boxes, administer in the middle or outer box or the anterolateral part of the muscle

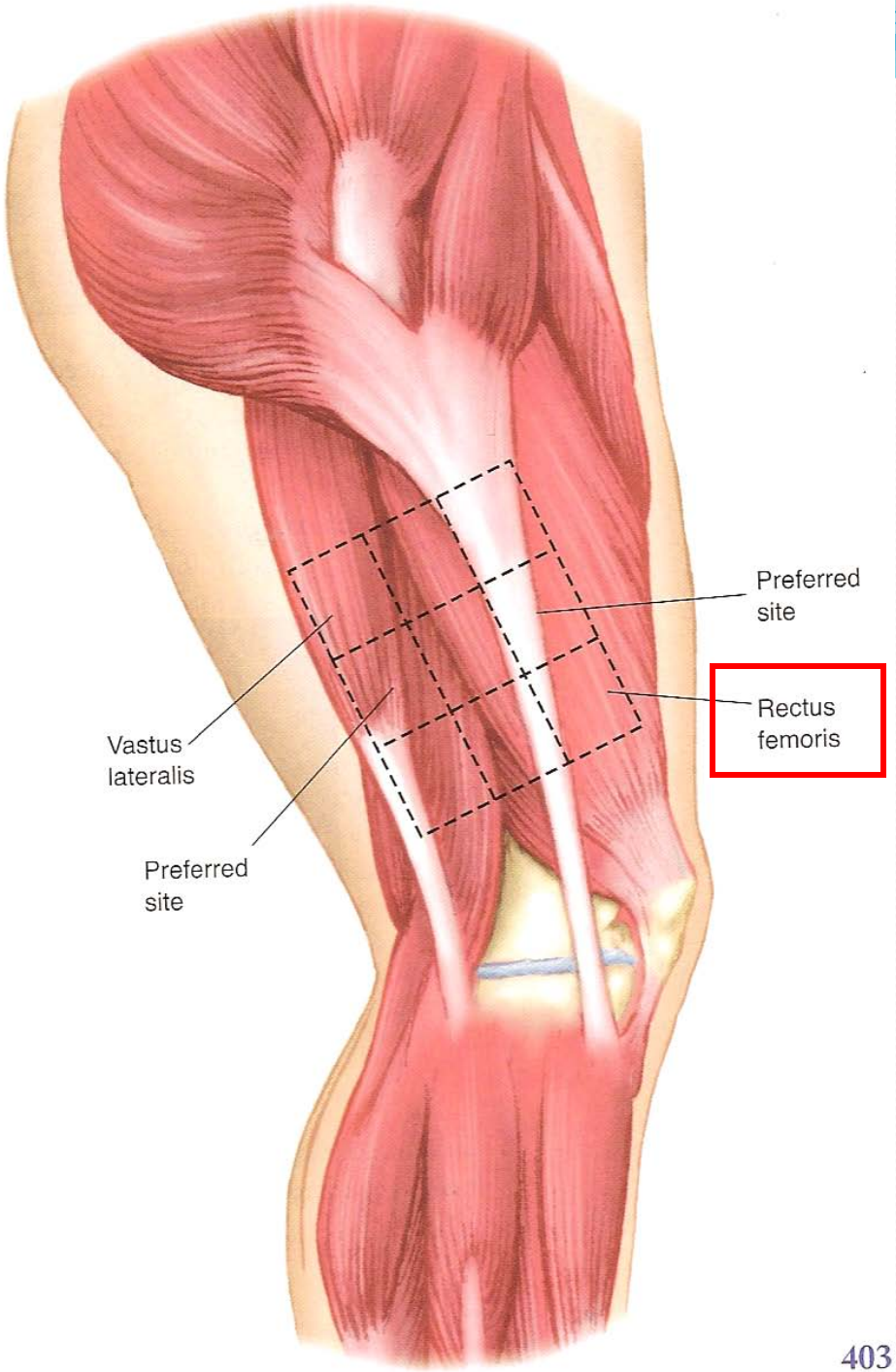
Vastus Lateral



Sites for Intramuscular Injection

- **Rectus Femoris**: lies over the femur, inject the medication into the center of the muscle at approximately midshaft of the femur
- You can deliver up to 5.0 mL into the muscle
- Also used in pediatric patients

Rectus Femor



General Intramuscular Injection Procedures

1. Take BSI precautions.
2. Assemble equipment. The medication should be already drawn up and ready.
3. Assures medication is indicated for patient.
4. Determine if patient has taken any doses.

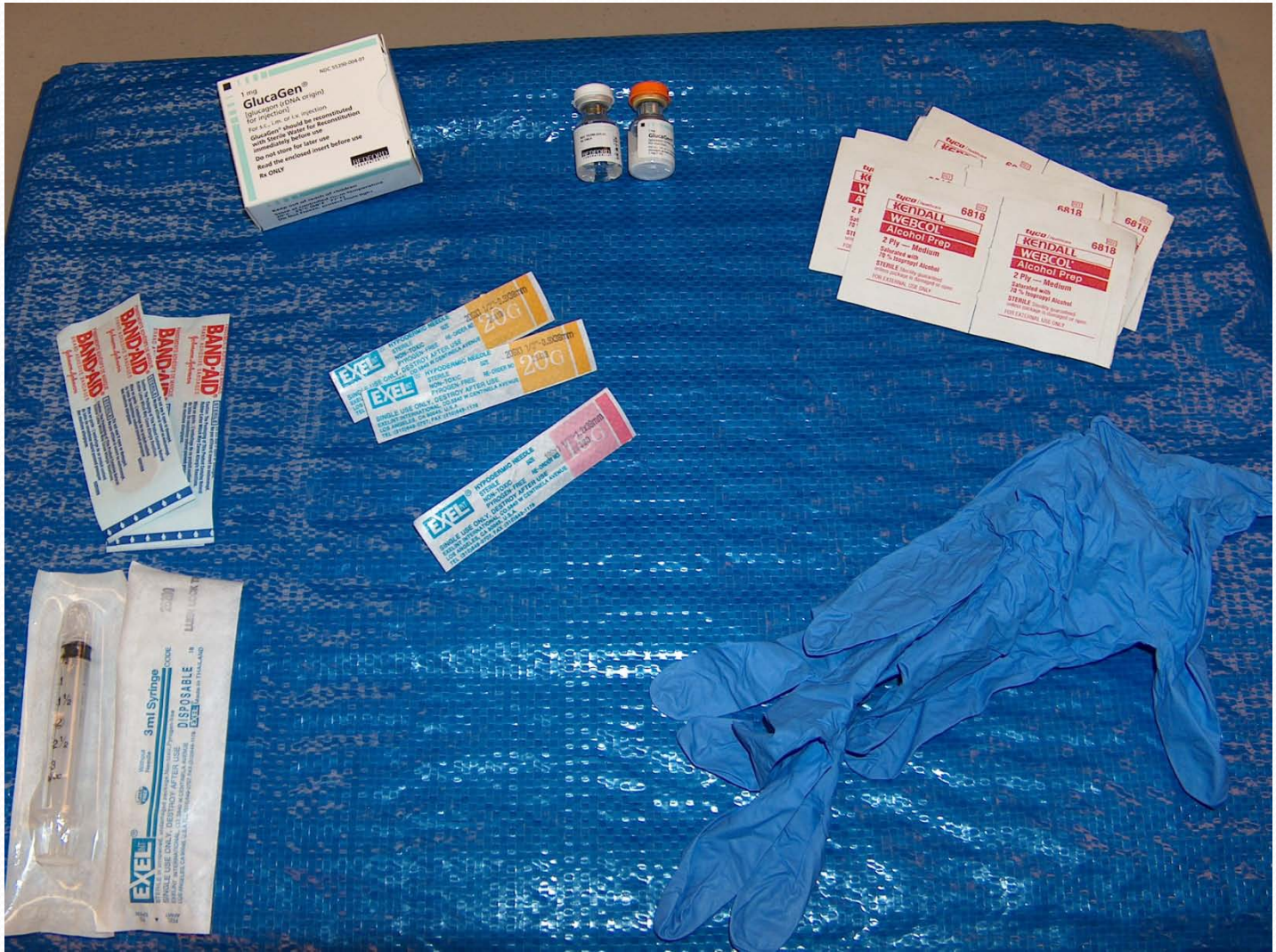
General Intramuscular Injection Procedures

5) Assures proper dosage: Adults weighing over 55 lbs 1 mg; pediatrics weighing less than 55 lbs 0.5 mg.
6) Selects appropriate site. Prepare with alcohol wipe.
7) Stretch the skin taut and insert the needle at a 90 degree angle.

General Intramuscular Injection Procedures

8) Pull back on the plunger to aspirate tissue fluid, if blood appears, remove needle and start over at a new injection site. If no blood appears, continue
9) Slowly inject the medication.
10) Remove the needle and dispose of in sharps
11) Use gauze for hemorrhage control, bandage
12) Reassess patient and monitor.

Gather Equipment



Select Site

Cleanse Site

Puncture Skin and Aspirate

90 degree angle

Inject Medication Slowly

Remove and Dispose

Glucagon-Reconstitution

- Administer as per protocols
  1 mg for adults, ½ mg for pediatrics.

- Reconstituted glucagon should be used immediately after reconstitution and any unused portion should be discarded

Reconstitution of Glucagon

1. Confirm both labels of the medication (sterile water and the glucagon powder).
2. Checks expiration date.
3. Pop the top off both vials and cleanse with an alcohol wipe.

Reconstitution of Glucagon

4. Pull plunger back and fill the syringe with 1 cc of air.
5. Insert needle into the center of the rubber stopper of the vial with sterile water and inject the 1 cc of air.
6. Withdraw 1 cc of sterile water into the syringe and withdraws needle from stopper.

Reconstitution of Glucagon

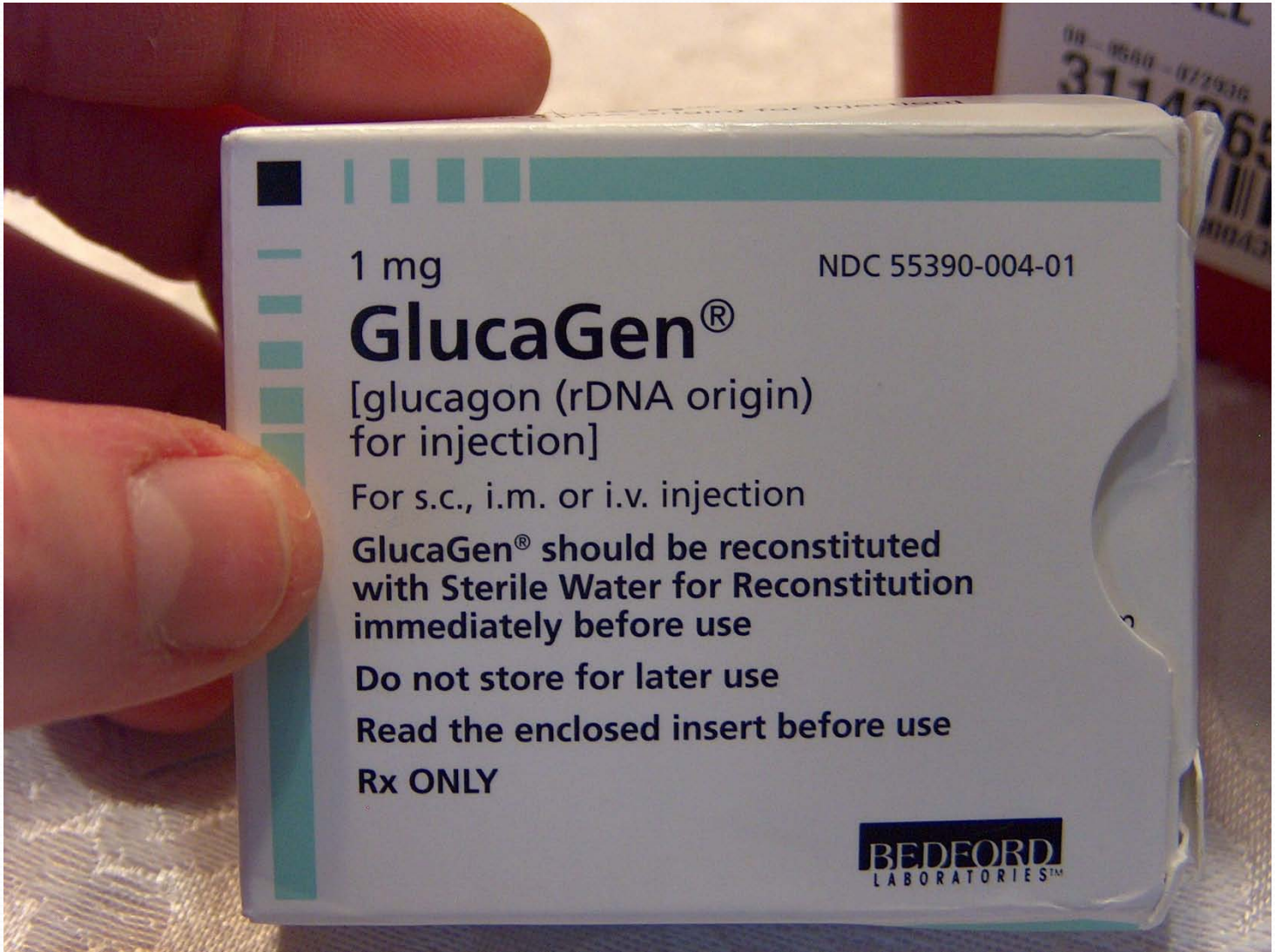
7. Insert the needle of the sterile water into the center of the rubber stopper of the vial with the powdered glucagon and slowly inject the 1cc of sterile water into the vial.
8. Discard needle into sharps container.

Reconstitution of Glucagon

9. Roll the vial gently between your hands until the powder is completely dissolved and no particles remain in the fluid. The reconstituted fluid should be clear and of water-like consistency.
10. Using the syringe and needle to be used for the patient, draw up appropriate dose of reconstituted medication.

Gather Equipment

Gather Equipment



Cleanse Top of Vials

1 cc of air injected into water

Withdraw 1 cc of water

Inject Sterile Water into GlucaGen Vial

Gently Mixing the GlucaGen

1cc of Glucagen