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Preparing and Administering Intramuscular Injections
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Preparing and Administering Intramuscular Injections

Overview:

Preparing and administering intramuscular medications requires the nurse to be knowledgeable about medication purpose, adverse effects, and patient preferences. Adherence to the five rights and three checks of safe medication administration is imperative to prevent patient injury and harm. This demonstration will present how to prepare and administer intramuscular injection medications after the medication has been obtained from the medication-dispensing device, and after the steps have been completed in performing the five rights during the third checkpoint of safe (patient bedside) medication administration. The first and second medication safety check using the associated five rights will be provided in the video titled “Safety Checks for Acquiring Medications from a Medication Dispensing Device”. The third check is demonstrated in the video “Preparing and Administering Oral and Liquid Medications”)

Prior to acquiring medications from a medication-dispensing system (MDS), the nurse must consider if the medication is appropriate given the patient’s medical conditions, medication allergies, current clinical status, and when previous doses of the medication have been administered. Intramuscular injection preparations are commonly provided in vials or ampules for withdrawal to a syringe. The nurse should determine the appropriate medication dose according to the concentration provided on the container. This demonstration will present how to prepare and administer intramuscular medications including the five rights and medication documentation in the electronic Medication Administration Record (MAR).

Procedure and representative findings

1. General medication administration considerations (review in the room, with the patient)
 - 1.1 Upon first entering the patient’s room, wash hands with soap and warm water, and vigorous friction for at least 20 seconds. Hand sanitizers may be used if the hands are not visibly soiled, but vigorous friction should also be used.
 - 1.2 At the bedside computer, log into the patient’s electronic health record and review the patient’s medical history and previous administration times. Verify with the patient any medication allergies and discuss their physical allergic responses and reactions.
 - 1.3 At the bedside computer, pull up the Medication Administration Record (MAR).

1.3.1 Review the medications that are due to be administered, and clarify with the patient if they have a preference for an intramuscular injection site and the administration process (does the patient prefer a particular site? Do they prefer you to count or to swiftly administer it?).

1.4 Leave the patient's room, wash hands as described above (1.1)

1.5 The nurse must now maintain a distraction/disruption free environment while dispensing and administering medications to prevent medication errors.

2. Go to the Medication Preparation area (this area may be in a secured room or in a secured portion of the nurses' station) and complete the first safety check using the 5 rights of medication administration. (Refer to the video "Safety Checks for Acquiring Medications from a Medication Dispensing Device")

3. In the medication preparation area, prepare the intramuscular injection according to the MAR, nurse drug guide, best practices and institutional policies/procedures.

3.1 Open the medication box and pull out the medication vial, then "pop off" the plastic cap on the top of the vial.

3.2 Remove the alcohol wipe from the package and scrub the top of the medication vial for 20 seconds with friction and intent. This should be done while looking at a clock to verify that you have scrubbed for the appropriate amount of time.

3.1 From the syringe drawer in the medication room, obtain the smallest syringe that will accommodate the volume of fluid to be aspirated from the medication vial. (Action item: comparing various sized syringes for the volume of fluid needed to withdraw from the vial).

3.2 Obtain a blunt tip needle from the needle drawer in the medication room.

3.3. Open the syringe package using aseptic technique by peeling the paper packaging at the syringe tip end until you are able to grasp the syringe outer barrel. You may then drop the packaging to the counter. Move the syringe to between your ring finger and middle finger of your dominant hand, taking special care not to contaminate the syringe tip, or the area of the plunger that extends into the barrel, by touching it to any surface or fingers.

3.4. While holding the syringe between ring finger and middle finger of your dominant hand, retrieve the needle package with your non-dominant hand. Open the needle package using aseptic technique by peeling the paper packaging at the needle hub end until you are able to grasp the outer cap. Take special care not to contaminate the needle hub by touching it to any surface or fingers. Drop the needle packaging on the counter.

3.5. Using aseptic technique, connect the needle to the syringe tip. Note: if any of the connection points are contaminated, you must obtain new supplies and start over.

3.6 Take the cap off the needle and place the cap on the counter, taking care not to contaminate the point of the needle, and hold the syringe in your dominant hand.

3.7. Secure the medication vial with your non-dominant hand, and insert the needle into the soft, rubber portion of the vial.

3.8 Holding the vial with your non-dominant hand, and the syringe and needle with your dominant hand, invert the needle and vial. Hold them at the eye-level and make sure the syringe tip is below the level of the liquid in the vial. Take special care to grasp the vial and needle in a manner that does not contaminate either the syringe tip or the needle.

3.9 Withdraw the appropriate amount of fluid from the vial, by drawing back slowly on the syringe plunger until the “right” medication volume is obtained. The volume to be withdraw is calculated based on medication dosage and the medication concentration in the vial.

3.9.1 When withdrawing medication ensure the needle tip is below the fluid level at all times.

3.10 Assess the syringe for air bubbles and appropriate amount of volume. If air bubbles are present, gently tap the syringe with your finger or a pen to release the air bubbles, and eject the air then adjust needle tip to below level of fluid and withdraw more fluid until the desired volume is reached.

3.10 Withdraw the needle from the vial, taking care not to contaminate the needle tip, and set the vial down on the counter with your non-dominant hand (while continuing to hold the needle and syringe upright, in the air, with your dominant hand).

3.11 Engage the needle safety device using the thumb of your dominant hand.

3.11.1 If a safety device is not available, leave the needle cap on the counter. Carefully place the tip of the needle in the opening of the needle cap with your dominant hand, while keeping your non-dominant hand away from the needle cap and tip. Slowly scoop the needle cap on the tip of the needle, then secure the needle cap to the syringe with your non-dominant hand.

3.12 Set the syringe with the needle and the medication down on the counter, open the drawer or cabinet containing syringe needles, and select an appropriate sized needle for the intramuscular injection site. The gauge of the needle should be between 18 and 25 gauge, and 5/8th to 1 ½ inches, with the selection dependent upon the age of the patient, administration site, volume of fluid, amount of muscle and adipose tissue, and viscosity of the solution.

3.12.1. If injecting into the deltoid of an adult, the volume of solution should not be greater than 1mL, with the average size of needle ranging from 22 gauge to 25 gauge, and 5/8th to 1 inch needles.

3.12.2 If injecting into the vastus lateralis, ventrogluteal, gluteus medius, or dorsogluteal muscles of an adult, the volume should not be greater than 3mL, and the average size of needle ranges from 18 gauge to 25 gauge, and 5/8th to 1 ½ inch needles.

3.12.3 If administering an intramuscular injection into a child under age 2, the maximum amount that should be administered is 1mL.

3.13 Open the intramuscular injection needle using aseptic technique by peeling the paper packaging at the needle hub end until you are able to grasp the outer cap. Take special care not to contaminate the needle hub by touching it to any surface or fingers. Drop the needle packaging on the counter.

3.14 Holding the syringe in your dominant hand, grasp the safety-capped needle (or capped blunt tipped needle) with your non-dominant hand's middle and ring fingers, and gently twist the syringe with your dominant hand to remove the needle from the syringe tip.

3.15 Attach the syringe tip to the subcutaneous injection needle using your non-dominant hand's thumb and pointer finger, taking care not to contaminate the syringe tip or needle syringe connection.

3.16 Dispose of the used medication withdrawal needle in the sharps container.

3.17 Using tape or a pre-printed medication label (if available), write the medication name and dosage amount on the label, and place on the syringe. Note: some institutions may require more information according to their medication labeling policy.

3.18 Dispose of all packaging materials in trash receptacle.

4. In the medication preparation area complete the second safety check using the 5 rights of medication administration. (Refer to the video "Safety Checks for Acquiring Medications from a Medication Dispensing Device")

5. Gather needed supplies, including an alcohol prep wipe, non-sterile gloves and adhesive bandage or a cotton ball and silk/paper tape and subcutaneous medication. Take the supplies into the patient's room.

Administration

6. Upon first entering the patient's room, set the medications down on the counter and wash hands as described in step 1.1.

7. In the patient's room, complete the third, and final, medication safety check adhering to the 5 rights of medication administration. (Refer to the video "Preparing and Administering Oral and Liquid Medications")

8. Prepare the patient and administer the intramuscular medication.

8.1 Select an appropriate intramuscular injection location, which is based on the type of medication, patient preference, and volume to be administered. The injection sites for intramuscular injections are the deltoid, vastus lateralis, ventrogluteal, gluteus medius, or the dorsogluteal muscle (Figure 1).

8.1.1. For infants and a child under age 2, the vastus lateralis is the only site that should be used due to decreased muscle size of the other locations.

8.1.2. It is recommended to avoid administering intramuscular injections into the dorsogluteal muscle, because this location has an increased risk of hitting a blood vessel, nerve or bone.

8.2. Access the injection site by removing bed linens and/or patient clothing/gown from the identified intramuscular medication administration injection site.

8.3. Put on clean gloves. Note: Ensure that the patient does not have a latex allergy and/or that the clean gloves are non-latex.

8.4. Variation: If the injection area is visibly dirty, clean the area with an alcohol prep pad and allow the alcohol to dry. According to the Center for Disease Control and Prevention (CDC), it is not necessary to clean the skin with an alcohol prep pad if the skin is not visibly soiled.

8.5. Hold the syringe in your dominant hand, and with your non-dominant hand, remove the needle cap.

8.6. Using the non-dominant hand, two approaches are appropriate. If the muscle is well developed, pull the skin taut between the thumb and forefinger. If the muscle is not well developed, hold the muscle between your thumb and fingers and gently press to bunch up the muscle. See figure one for more information about hand positioning.

8.7. Hold the syringe between thumb and index finger of the dominant hand like a pencil or dart, and insert the needle using a quick, purposeful motion and at a 90° angle into the skin and muscle.

8.8. Variation: When administering some IM medications (this does not include vaccinations), into the ventrogluteal, gluteus medius or the dorsogluteal muscles, it is recommended to use the z-track method and aspirate for a blood return. The z-track method prevents medication from leaking into the subcutaneous tissue. Aspiration for blood return prevents accidental administration of the medication into a blood vessel. This is not necessary for deltoid or vastus lateralis muscles because they do not contain large blood vessels.

8.8.1. For the z-track method, use the non-dominant hand, and pull the skin laterally or downward approximately 1 inch.

8.8.2 To aspirate, hold the syringe between the thumb and middle finger, and gently push up the plunger with the forefinger. If you see a blood return in the syringe, remove the needle from the site and begin the process again selecting a different IM administration site.

8.9 Using the thumb or index finger of the dominant hand, press the plunger slowly to inject the medication at a rate of 10 seconds per mL. You may stabilize the syringe into the skin with the fingers of the non-dominant hand, and using the dominant hand push down the plunger with the index finger or thumb.

8.10 Remove the needle smoothly, along the line of insertion, and immediately place the needle and syringe directly into a “sharps” container, without recapping the needle. If the needle has a safety device, once the needle is removed from the skin, use the thumb of the

dominant hand to engage the safety needle device and then place the needle and syringe directly into the “sharps” container.

8.11 If blood is present at the injection site, apply the adhesive bandage or cotton ball and silk/paper tape. Adhesive bandage may also be applied if patient prefers coverage after injection.

8.12 Cover the injection site with patient clothing/gown and replace bed linens as needed and according to patient preference.

8.13 Remove gloves and dispose of them in proper receptacle, wash hands with soap and warm water, and vigorous friction for at least 20 seconds.

9.0 Document medication administration in the electronic MAR.

9.1 In the patient’s MAR, record the date, time and location/site of the intramuscular medication administration.

9.2. Variation: Immunizations may require additional documentation depending on facility policy.

10. Prior to leaving the room, remind the patient about any side effects/adverse effects or considerations for which they should notify the nurse.

11. Leave the patient room. Upon exiting the room, wash hands as described in step 1.1.

Summary

This video demonstrates the preparation and administration of intramuscular medications. Because dosage variations in the institutional pharmacy may be limited, it is important for the nurse to verify if the correct medication dose is withdrawn from the medication vial and prepared according to the dose indicated in the patient’s medication administration record. Common errors in intramuscular medication administration include: withdrawing the incorrect amount of fluid given the medication concentration, contaminating the injection site by blowing or wiping an area after cleaning with an alcohol wipe, using a needle with an inappropriate gauge or length for the intramuscular injection site, failure to create a taut surface and hesitating with the injection resulting in needle tip contamination, and recapping a used needle potentially resulting in a nurse “needle stick” injury.

Figures & Legends

Figure 1: Intramuscular Injection Sites
Appropriate Injection Sites for Intramuscular Medication Administration

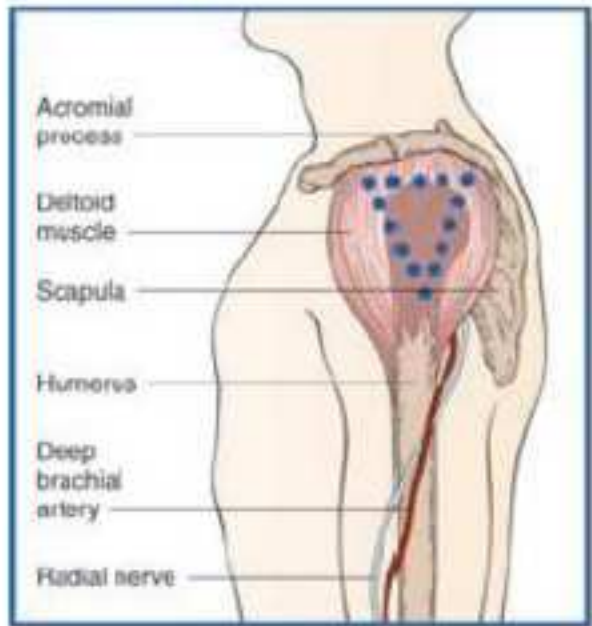
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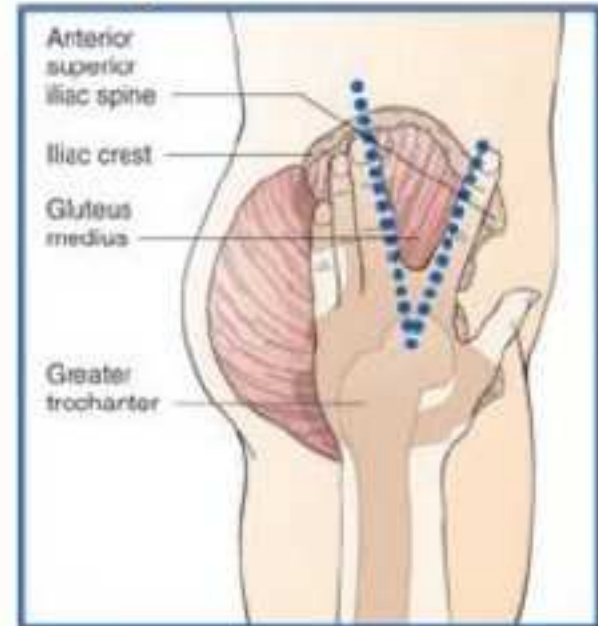
Center of Disease Control and Prevention (CDC). U.S. Department of Health & Human Services.
<http://www.cdc.gov/>

Intramuscular (IM) Injection Sites

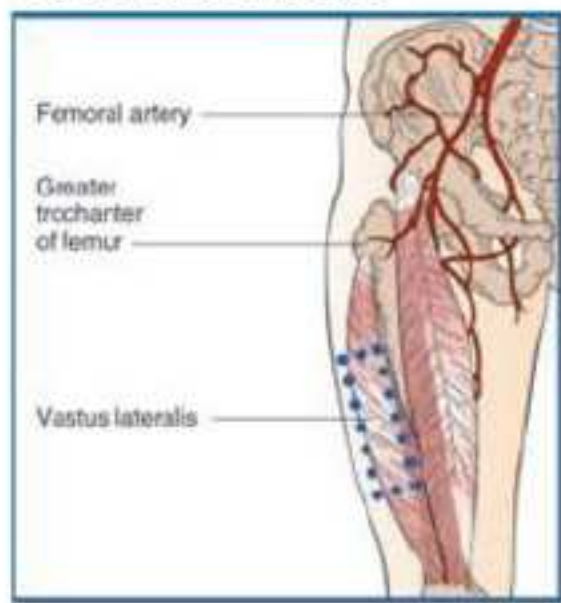
Deltoid Site



Ventrogluteal Site



Vastus Lateralis Site



Dorsogluteal Site

