

Administration of Medication by Injection

Things to consider:

- An injection is sometimes described as a “shot” using a syringe and needle to deliver medication into the body through the skin. It can be given in several different areas of the body, depending on the type of medication being given and several other factors. Your school nurse or other licensed health care professional must review the procedure with you before you are able to begin administering a medication by injection to ensure that you have the knowledge and skills to perform administration competently.
- Because different medications may be mixed or injected differently, and even given in different areas of the body, it’s critical to give the medication exactly as ordered.
- Remember to document the site of injection so that proper rotation of injection sites is accomplished, and use different injection sites if giving more than one injection at a time.
- In this video, several different medications will be reviewed, as well as several different techniques for injection. You will follow your school nurse or licensed health care professional’s instructions when preparing for a specific student’s medication order and health plan.

Needed supplies:

- Syringe
- Needle
- Gloves
- Alcohol swab
- Cotton ball/gauze
- Adhesive bandage

Procedure for medication administration:

1. Injectable Medication Packaging
 - a. There are several different types of packaging injectable medications can come in.
 - b. Vials
 - i. Single-Dose—only enough medication for one injection.
 - ii. Multi-Dose—several doses of medication for multiple injections.
 - iii. Act-O-Vial—separated parts of a medication in one vial that need to be mixed together before being given.
 - c. Ampoules—a small glass container filled with the medication. These would rarely be seen in the school setting.
 - d. Prefilled syringes—the medication is already in the syringe and ready for injecting.

- e. Auto-Injectors—auto-injectors come pre-filled with a quick and easy way of dispensing the medication injection.
 - i. Epinephrine (Epipen®, Adrenaclick®)
 - ii. Imitrex (IMITREX STATdose Pen®)

2. Intramuscular Injections

- a. An intramuscular injection, or IM injection, is a shot given into a large muscle. It allows for rapid systemic action and for absorbing larger doses of medication.
- b. There are multiple sites for injections; however the two sites that will be reviewed are deltoid and vastus lateralis.
 - i. The deltoid is the upper third of the muscle on the arm, 2 finger widths below the bony aspect of the shoulder. This site is preferred for older school-age children and adolescents, but can be used to administer an IM shot to toddlers, preschool-aged children, and younger school-aged children.
 - ii. The vastus lateralis is a quadriceps muscle located on the outer aspect of the middle third of the thigh. This site is preferred for small children, and younger school-age children; however it can also be used for adolescents and adults as well.
- c. The angle of injection should be at a 90-degree angle.
- d. Needle sizes and lengths depend on the age of the child and the muscle mass of the child.
- e. How much medication is given is dependent on the injection site and age of the child.
- f. It is no longer recommended to aspirate or pull the plunger back, once in the muscle, to check for blood.
- g. Procedure for IM Injections
 - i. Assemble the needed supplies and place on a clean surface.
 - ii. Wash your hands and put on gloves.
 - iii. Review the medication administration log, the medical provider order form, and the parent-guardian consent form.
 - iv. Check the medication and the student's medical order to ensure that it is
 - 1. For the right child
 - 2. The right medication
 - 3. The right dose
 - 4. Being given at the right time and
 - 5. Being given by the right route.
 - 6. Also, check to ensure the medication has not expired.

- v. Remove the cap, if present, and clean the top of the medication vial with an alcohol pad and let it dry.
- vi. Place the needle on the syringe if not already attached, and remove the needle cap.
- vii. Pull air into the syringe equal to the amount of medication needed.
- viii. Insert the needle into the top of the medication vial and push in the air.
- ix. Turn the bottle upside down. While keeping the tip of the needle inside the liquid, pull back on the plunger to the amount of medication needed. If there are air bubbles, pull back a little more medication. Tap the side of the syringe so that air goes to the top and push the air out.
- x. Check to make sure there is the correct dose inside the syringe. If not, repeat the procedure.
- xi. Pull the needle out of the medication vial and carefully replace the cap on the needle without touching anything or anyone.
- xii. Determine where the injection will be given on the student, with the student's assistance as appropriate. Position student as needed.
- xiii. Clean the skin site with an alcohol pad. Let the alcohol dry.
- xiv. Hold the muscle firmly between your thumb and index finger.
- xv. Holding the syringe like a dart, insert the needle at a 90-degree angle with a quick firm motion.
- xvi. Proceed to push all the medication into the tissue slowly. Count to 5 then remove the needle.
- xvii. Activate the safety device on the needle if you are using a safety capped needle. Dispose of the used syringe in the sharps container.
- xviii. Apply gentle pressure on the site until bleeding stops and place a bandage on the site.
- xix. Remove gloves and wash your hands.
- xx. Document the medication given, the dose, the time given, the route, and the site where the injection was given. Sign your name after the documentation.

3. Subcutaneous Injections

- a. A subcutaneous injection is a shot given through the skin into the subcutaneous tissue, also known as the fat layer. It allows for a slow and sustained absorption of medication.
- b. Sites of Injection for Subcutaneous Injections
 - i. Subcutaneous injections are given at sites with at least a half inch of fat under the skin.

- ii. Common sites are the stomach, buttocks, top outer thigh, and the back of the upper arm. If you are giving the injection into the stomach, choose a site at least two inches away from the belly button.
 - iii. Remember to rotate sites and use different sites if giving more than one injection at a time.
- c. The injection should be given at a 45-degree angle for children with little fat and a 90-degree angle for children with increased fatty tissue.
- d. Needle sizes and lengths depend on the age of the child.
- e. How much medication is given is dependent on the injection site and age of the child.
- f. Procedure for Subcutaneous Injections
 - i. Assemble the needed supplies and place on a clean surface.
 - ii. Wash your hands and put on gloves.
 - iii. Review the medication administration log, the medical provider order form, and the parent-guardian consent form.
 - iv. Check the medication and the student's medical order to ensure that it is
 - 1. For the right child
 - 2. The right medication
 - 3. The right dose
 - 4. Being given at the right time and
 - 5. Being given by the right route.
 - 6. Also, check to ensure the medication has not expired.
 - v. Remove the cap, if present, and clean the top of the medication vial with an alcohol pad and let it dry.
 - vi. Place the needle on the syringe if not already attached and remove the needle cap.
 - vii. Pull air into the syringe equal to the amount of medication needed.
 - viii. Insert the needle into the top of the medication vial and push in the air.
 - ix. Turn the bottle upside down. While keeping the tip of the needle inside the liquid, pull back on the plunger to the amount of medication needed. If there are air bubbles, pull back a little more medication. Tap the side of the syringe so that air goes to the top and push the air out.
 - x. Check to make sure there is the correct dose inside the syringe. If not, repeat the procedure.

- x. Pull the needle out of the medication vial and carefully replace the cap on the needle without touching anything or anyone.
 - xii. Determine where the injection will be given on the student, with the student's assistance as appropriate. Position student as needed.
 - xiii. Clean the site with an alcohol pad. Let the alcohol dry.
 - xiv. Using your thumb and index finger, pinch a small area of skin with fat.
 - xv. Holding the syringe like a dart, insert the needle at a 45 to 90-degree angle depending on the amount of fatty tissue.
 - xvi. Slowly push all the medication into the tissue.
 - xvii. Remove the needle from the skin; activate the safety device on the needle if you are using a safety capped needle. Dispose of the used syringe in the sharps container.
 - xviii. Apply gentle pressure on the site until bleeding stops and place a bandage on the site.
 - xix. Remove gloves and wash your hands.
 - xx. Document the medication given, the dose, the time given, the route, and the site where the injection was given. Sign your name after the documentation.
4. Mixing Medications—certain medications must have ingredients mixed before injecting. If you will be using a mixed medication, your school nurse or health professional will need to train you on the specific medication. Here are several examples:
- a. Act-o-Vial (Solu-Cortef)
 - i. Remove the Act-O-Vial from the packaging.
 - ii. Press the cap down, so that the liquid can mix with the powder.
 - iii. Mix the contents gently, making a semi-circular movement with your wrist until the powder is completely dissolved. Do not shake the vial. The powder is completely dissolved once the solution is clear.
 - iv. The medication is ready to be withdrawn from the vial.
 - b. Glucagon
 - i. Remove the glucagon vial and syringe containing the liquid or diluent from the case.
 - ii. Remove the gray cap from the vial.
 - iii. Remove the cap from the syringe.
 - iv. Place the needle tip in the center top of the vial and slowly push the diluent from the syringe into the vial.
 - v. Gently swirl the vial with the syringe still in the vial until the solution is clear (this takes about 10-15 seconds).

- vi. Turn the vial upside down, being sure that the needle does not fall out of the vial.
 - vii. Pull the solution into the syringe, by pulling back on the plunger, as you withdraw the ordered amount of glucagon solution.
 - viii. If present, remove air bubbles by tapping on the outside of the syringe and expelling the air or by pushing the dose back into the vial and pulling back on the plunger again.
2. Final Comments
- i. Be prepared to give injections. Review this video again, if needed, and review any procedural documents you have been given. You will need to demonstrate to your school nurse or other licensed health care professional that you are competent to administer medication by this route.

References:

- Children's Healthcare of Atlanta & Georgia Association of School Nurses (2016). Chapter 3: Administration of Medications. In *Georgia School Health Resource Manual* (pp. 31-36). Retrieved from <http://www.choa.org/~media/CHOA/Documents/Health-Professionals/2013-School-Health-Manual/Manual-Chapters/Ch-3-Administration-of-Medications.pdf>
- Van Schaik, P. (2013). Emergency injection with corticosteroids Solu-Cortef. Retrieved from <http://www.addisoncrisis.info/emergency-injection/emergency-injection-cortico-steroids-solu-cortef-act-o-vial-two-chamber-ampul/>
- Workman, B. (1999). Safe Injection Techniques. *Nursing Standard*, 13(39), 47-53.