



University
of Glasgow

School of Medicine, Dentistry & Nursing

Injection Techniques

Clinical Skills Guidance



Injection Techniques

Injections are the art of giving medications through the use of a needle and syringe. There are several different routes for giving an injection and are often subject to the desired therapeutic effect and the patient's safety and comfort

Injections are usually used when a rapid action is required, if the drug is altered by intestinal sections or cannot be absorbed by the alimentary tract, when the patient is unable to take the medication orally or the drug is not available in an oral form.

Equipment Required:

- Drug to be administered
- Clean tray
- Needles and syringe

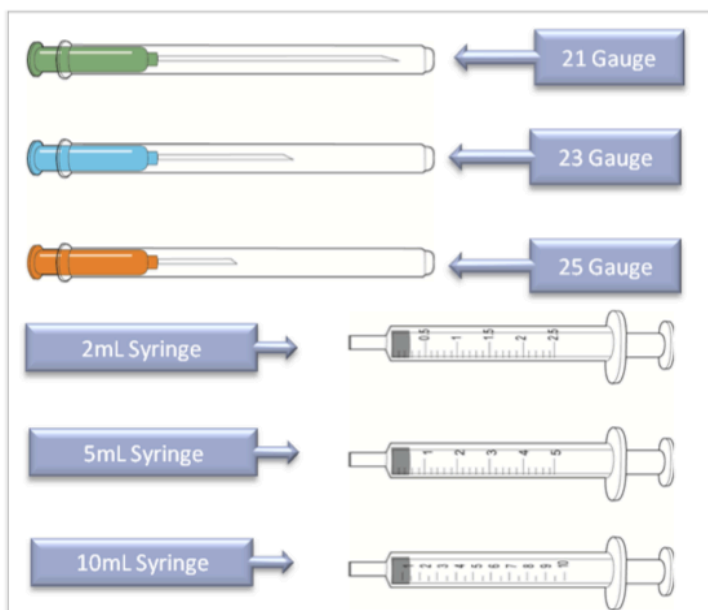
Needles & Syringes

Subcutaneous

Only 1-2ml is injected via the subcutaneous route, so using a 5ml syringe is usual. Needle choice is an orange (25 gauge). This is short, and unlikely to penetrate the muscle layer. For insulin administration, a special low dose, 1ml syringe is used for accurate drug measurement.

Intramuscular

Needles should be long enough to penetrate the muscle but still allow a quarter of the needle to remain external to the skin. In an adult, needle choice is usually a green (21 gauge) or blue (23 gauge). For children a blue is the obvious choice.



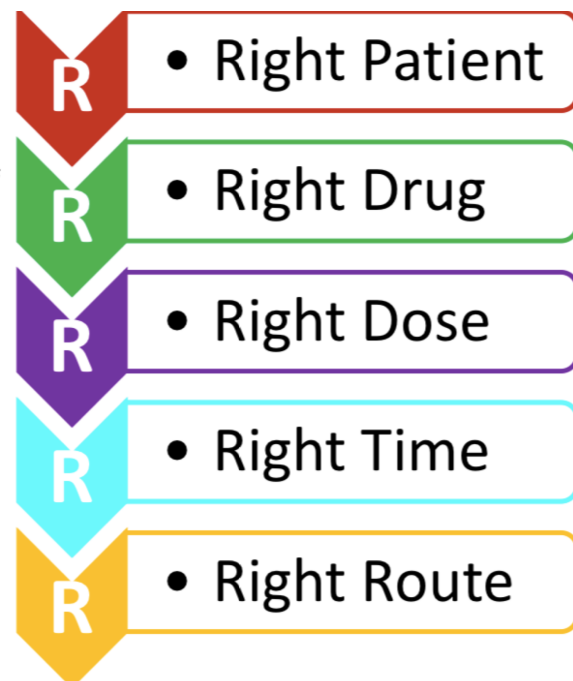
- Alcohol wipe
- Prescription and recording chart
- Gloves or protective clothing as per hospital policy
- Sharps bin

Procedure:

- Collect all equipment and medication required
- Check that the packaging is intact and the equipment is sterile
- Wash hands
- Prepare the equipment
 - Draw up the medication using aseptic technique
 - Some SC injection come in prefilled syringes – they do not need the air expelled prior to injection as the air bubble prevents the drug tracking back to the surface
- Check the prescription chart to confirm
 - Drug
 - Dose
 - Date and time of administration
 - Route and method of administration
 - Diluent as appropriate
 - Validity of prescription
 - Signature of prescriber

Safe Injection Administration

- Preparation – Checking details
- It is vitally important that you carry out a number of checks before you start preparing the drug prescribed for a patient. Do not assume that the prescription has been written up correctly.
- Ask the patient details of their name and if they have any allergies. Check against the prescription chart. Check the details about the indication for the drug, dose, route, and contraindications with the BNF.
- Make sure the date and time are correct.



- Check the patient's identity
- Ensure patient's privacy and dignity, assist the patient into an appropriate and comfortable position close the curtains
- Explain the procedure to the patient and obtain consent
- Prepare the skin if appropriate (visibly contaminated skin should be cleansed)

Skin cleansing - to swab or not to swab



Cleansing a site with an alcohol impregnated swab and allowing it to dry is known to reduce the incidence of bacteria before giving an injection. However, inconsistencies exist in current research and in practice. Skin swabbing repeatedly before a SC injection can pre-dispose the skin to hardening by the alcohol. It is therefore not recommended for SC injections.

The World Health Organization (WHO) Best Practice Guidance for Injections (2010) recommends:

For IM **immunizations** : suggests soap and water is sufficient

For IM **therapeutic drugs**: an alcohol swab should be used.

If skin disinfecting is practiced, the skin should be cleansed with an alcohol swab for 30 seconds, and allowed to dry for 30 seconds. It is otherwise ineffective.



- Inject the medication as per prescription
- Discard the sharps in the sharps bin and waste into the clinical waste bin
- Wash hands
- Document the procedure
- Note any abnormalities or side effects and inform medical staff

Key Checks before and after injecting



Prior to administering a drug by SC or IM route, there are common steps to observe.

- ✓ Check prescription including allergies.
- ✓ Prepare medication as per prescription.
- ✓ Ensure you have the right patient, right time, right dose.
- ✓ Obtain consent.
- ✓ Ensure the patient is comfortable.
- ✓ Select site.
- ✓ Following injection, observe site for at least 15 minutes, checking for swelling, discomfort or pain.

Potential complications include:

- Infection
- Incorrect location of injection (study in 1982 found only 5% of women and 15% men received IM injections the rest went into subcutaneous tissue – think patient size)
- Pain. Factors include:
 - The needle
 - The chemical composition of the drugs/ solution
 - The technique
 - The speed of the injection
 - The volume of the drug
- Anaphylaxis
- Long and short term nerve damage
- Intramuscular haemorrhage
- Hitting a blood vessel
- Sterile abscess
- Lipodystrophy
- Build up of drug if areas not rotated

The Subcutaneous Route:

The subcutaneous (SC) route is used for a slow sustained absorption of medication, up to 1 - 2 ml being injected into the subcutaneous tissue. Amongst the drugs that may be injected using this route are insulin or anticoagulants, which require a slow steady release. The technique is relatively pain free, and sites are often suitable for frequent injections.

Site for subcutaneous route:

Subcutaneous

- Outer area of the arm
- The abdomen (except a 2 inch area around the navel)
- Lateral aspects of thigh
- The principle to remember is that the drug should be administered into the fat or connective tissue underlying the dermis and not the muscle
- If the area is inflamed or oedematous or sites that contain moles/ scar tissue or other lesions should not be used.



Sites on the Body Where
a Subcutaneous Injection
Can Be Given



The Correct Angle and
Way to Hold the Syringe

Procedure for subcutaneous injection:

1. Lift up a roll of skin
 2. Insert needle at 90 degree angle. Do not full insert the needle
 3. Inject the medication with a slow steady pressure
 4. Withdraw needle quickly whilst placing a gauze swab over the site
 5. Dispose of the sharps immediately
 6. Document procedure
- Don't administer irritant injections
 - Don't aspirate the needle
 - Don't massage the site

The Intramuscular Route:

Intramuscular injections deliver medication into well perfused muscle, providing rapid systemic action and absorbing fairly large doses, these being from 1 ml in a deltoid, to 5 ml in the ventrogluteal site (half these doses in children).

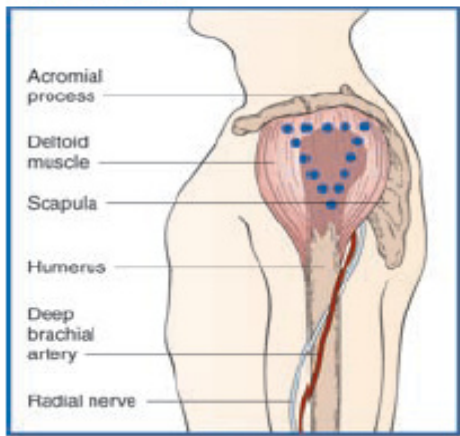
The choice of site should take in to account the general physical condition of the patient, age, and the amount of drug being delivered. The chosen site should be inspected for contraindications of inflammation, infection, or swelling. If the patient is elderly frail with reduced muscle mass, ensure you 'bunch up' the muscle to ensure adequate bulk before injecting.

Sites for intramuscular procedure:

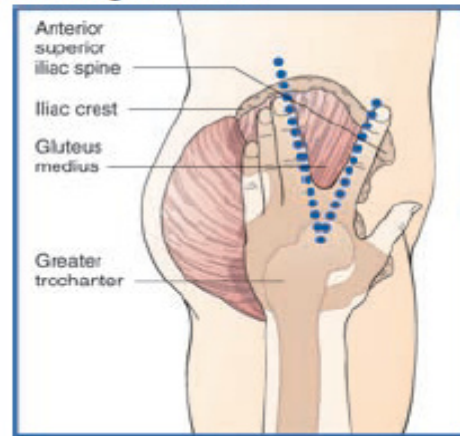
- **Deltoid muscle** of the upper arm – preferred site for vaccinations in adult
- **Dorsogluteal** – performed by entering the gluteus maximus muscle. Care should be given to avoid damage to the sciatic nerve and vessels surrounding this area
- **Ventrogluteal** – Safer option which accesses the gluteus medius muscle. (Primary location for IM as it avoids all major nerves and blood vessels)
- **Vastus lateralis** – A quadriceps muscle situated on the outside femur and is used as a primary site for children. It does have risks associated to it due to overuse.

Intramuscular (IM) Injection Sites

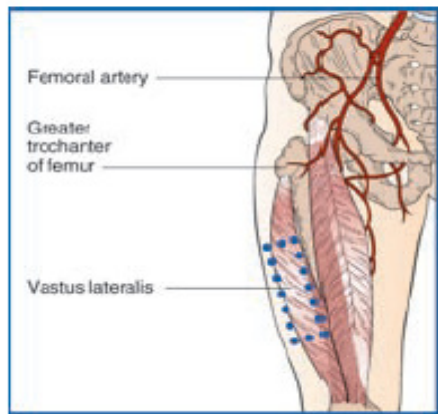
Deltoid Site



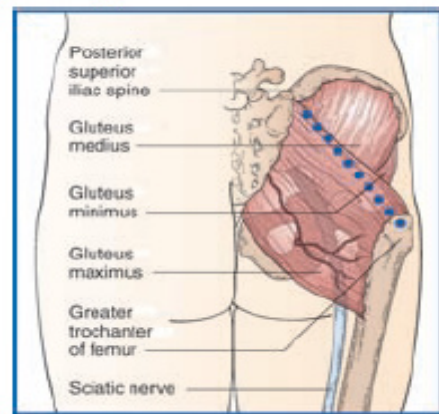
Ventrogluteal Site



Vastus Lateralis Site



Dorsogluteal Site



Procedure for intramuscular procedure (Z Tracking)

1. Stretch the skin
 2. Angle the needle at 90 degrees
 3. Leave 1/3 of the needle exposed
 4. For deep IM injection aspirate, if blood appears withdraw needle, replace and start again
 5. Depress plunger slowly (1ml - 10 seconds)
 6. Dispose of sharps in an appropriate container
 7. Document procedure
- Do not aspirate if giving a preloaded vaccine

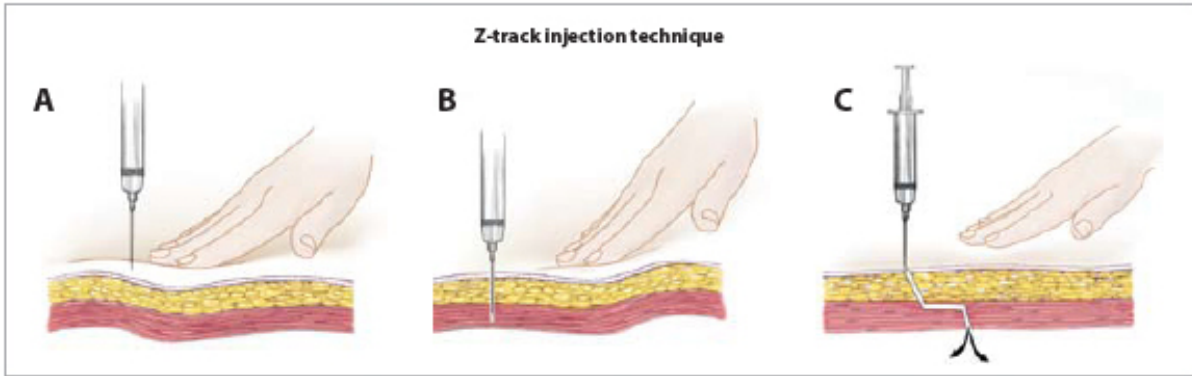


FIGURE 2. Z-track injection technique prevents leakage into subcutaneous tissue and decreases the chance of local irritation. (A) Pull or push the skin 2 to 3 cm away from the injection site with the nondominant hand. (B) Pierce the skin at 90° and depress the plunger slowly. If resistance occurs, pause then resume depressing the plunger. (C) Withdraw the needle, then release the skin.

Reference:

- <https://www.nursingtimes.net/clinical-archive/critical-care/skills-intramuscular-injections/205349.article>