

## Parenteral Injections

Intramuscular  
Intradermal  
Subcutaneous

### Principles of Giving Injections

- Use a draw up non coring needle or Admin Spike.
- When injecting use a 25-27 gauge needle
- Length of the needle is dependent on injection procedure
- Always clean the injection site
- Always aspirate to ensure the needle is not in a vessel.
- **MAXIMUM** volume per injection site is **3 ml**

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### Principles of Giving Injections

- Always let patient lie down if they have a history of fainting.
- Relax muscle
- Make sure patient is breathing properly
- Can use a distractor or "shot blocker"
- Insert quickly in a darting method and inject slowly

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### Needle Size

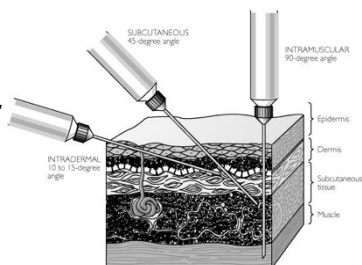
Patient	Location	Length	Gauge
Infant	Thigh	5/8 "	25-27
Children	Deltoid	5/8 "	25-27
	Gluteal	1-1 1/4 "	22-27
Adults	Deltoid	5/8 - 1 1/4 "	23-27
	Gluteal	1 - 1 1/2 "	23-27
All	Intradermal/Subcutaneous	5/8 - 3/4 "	25-30

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### Injection Type

- Intradermal
- Subcutaneous
- Intramuscular



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### Intradermal Injection

- Placed in the epidermis
- Usually for allergy testing, tuberculosis testing, scar treatment
- 1/10 cc usually used
- If TB it is checked at 48-72 hours

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### Intradermal Injection

1. Intradermal injections are best administered with a tuberculin syringe or a 1 ml syringe with a 27 gauge needle.
2. Aseptically draw up 0.1 ml of the antigen or test solution to be administered and express all air bubbles. Recap the needle by sliding the needle into the cap lying on a clean surface
3. Explain what is being injected and its expected benefits
4. Provide privacy when injection site is other than the arm
5. Wash your hands and put on examination gloves
6. Select the site of injection where the skin is not damaged or discolored and is free of obvious surface veins
7. Cleanse the area with alcohol wipe, using circular motion and cleansing from inside outward. Allow to dry
8. Holding the syringe, remove the needle guard

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### Intradermal Injection

9. Gently pull the skin taut over the injection site
10. Insert the needle at 10-15 degree angle with the bevel of the needle facing up. Do not aspirate.
11. Inject the medication slowly observing the site for signs of wheal formation and skin blanching
12. Withdraw the needle slowly and blot area lightly with clean 2X2 gauze
13. Do not massage as this will express the antigen out of the skin, perhaps negating the skin test
14. Discard the intact needle syringe assembly directly into an approved sharps container
15. Put on an adhesive dressing if needed
16. Allow the patient to get comfortable and observe for 5-15 minutes for any signs of drug reaction
17. Document the medication given and the site used

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### Subcutaneous Injection

- Placed in between the dermis and muscle
- More prone to problems than intramuscular. Necrotizing lesions have a greater tendency to spread in fat than in muscle.
- 1/10 cc -1 cc
- Medication delivery or hydrodissection with perineural injection technique. (Treat nerve inflammation)

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### Subcutaneous Injection

1. Explain what is being injected and its expected benefits
2. Provide privacy when injection site is other than the arm
3. Wash your hands and put on examination gloves
4. Select site by according to anatomical landmarks
5. Cleanse the area with alcohol wipe, using circular motion and cleansing from inside outward. Allow to dry
6. Holding the syringe, remove the needle guard, and make sure there are no air bubbles
7. Gently pinch the tissue together to form a cushion of subcutaneous tissue.
8. Insert the needle at a 45 or 90 degree angle depending on depth of fat pad

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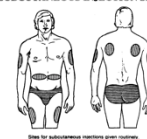
### Subcutaneous Injection

10. Pull back on the plunger to insure that the needle is not in a blood vessel
11. Inject the medication slowly
12. Withdraw the needle quickly and massage the area with alcohol wipe to aid absorption
13. Discard the intact needle syringe assembly directly into an approved sharps container
14. Put on an adhesive dressing if needed
15. Allow the patient to get comfortable and observe for 5-15 minutes for any signs of drug reaction
16. Document the medication given and the site used

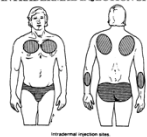
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#### SUBCUTANEOUS INJECTION SITES



#### INTRADERMAL INJECTION SITES



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## Intramuscular Injection

- Provide immediate and prolonged effect
- Remember the muscle is well vascularized and deposition of medication will slowly absorb into circulation.
- Common injection sites:
  - Deltoid
  - Gluteus medius
  - Vastus lateralis (lateral thigh)

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## Intramuscular Injection

1. Explain what is being injected and its expected benefits
2. Provide privacy when injection site is other than the arm
3. Wash your hands and put on examination gloves
4. Select site by according to anatomical landmarks
5. Cleanse the area with alcohol wipe, using circular motion and cleansing from inside outward. Allow to dry
6. Holding the syringe, remove the needle guard, and make sure there are no air bubbles
7. Stabilize the tissue over the muscle being injected by gently spreading it between finger and thumb of non-dominant hand

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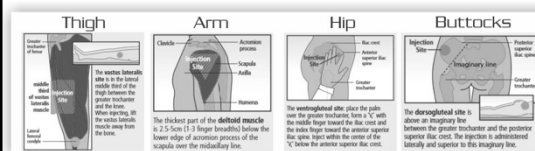
## Intramuscular Injection continued....

8. Insert the needle at a 90 degree angle
9. Pull back on the plunger to insure that the needle is not in a blood vessel
10. Inject the medication slowly
11. Withdraw the needle quickly and massage the area with alcohol wipe to aid absorption
12. Discard the intact needle syringe assembly directly into an approved sharps container
13. Put on an adhesive dressing if needed
14. Allow the patient to get comfortable and observe for 5-15 minutes for any signs of drug reaction

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## Site Selection

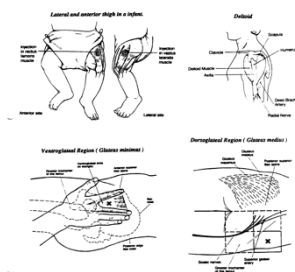


Source: [http://www.bd.com/hypodermic/pdf/Intramuscular\\_Injection\\_Guidelines.pdf](http://www.bd.com/hypodermic/pdf/Intramuscular_Injection_Guidelines.pdf)

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## IM INJECTION SITES



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## Infants

- **Lateral and anterior thigh** - Vastus lateralis and Rectus femoris

The gluteal muscles are not developed enough until the child has been walking for a year or more. To inject into the lateral or anterior thigh, hold the child securely, and using a needle 1 inch or less in length, inject into the upper outer quadrant of the thigh at a 45 degree angle and pointing toward the knee.

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## Children

- **Ventrogluteal – Gluteus minimus**

With the child supine place the index finger on the anterior superior iliac spine. Move the middle finger dorsally, finding the iliac crest and drop the finger below the crest. The triangle formed by the iliac crest, index finger and middle finger is the injections site.

- **Dorsogluteal – Gluteus medius**

The area is above and outside a diagonal line drawn from the greater trochanter of the femur to the posterior superior iliac spine. This site avoids the area near the sciatic nerve and the superior gluteal artery.

- **Deltoid**

The area is bounded on the top by the acromion and on the bottom by the axilla. The two side boundaries are lines parallel to the arm, one third and two thirds of the way from the outer aspect of the arm. Thus the middle third of the arm is the area

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## Adults

Generally, injection sites for adults are similar as for children except adults have greater tissue mass. The same anatomical landmarks are used to identify injection areas. In the dorsogluteal regions, adults and older children will have a more developed gluteus maximus.

- **Lateral site – Vastus lateralis:** See last slide

- **Anterior site – Rectus femoris:** See last slide

- **Ventrogluteal region – Gluteus minimus:** See last slide

- **Dorsogluteal region – Gluteus medius and maximus:** As above with the noted exception of more gluteal tissue

- **Deltoid:** See last slide

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## Intramuscular Z-Track

### REQUIRED FOR IRON INJECTIONS

1. Draw up the correct dose of injectable iron into a sterile syringe. Remove the needle used to draw up the solution and replace it with a 21-22 gauge X 2-3 inch needle to penetrate deep into the muscle.
2. Draw an additional 0.3-0.5 ml of air into the syringe
3. Explain what is being injected and its expected benefits
4. Wash your hands and put on examination gloves
5. Place the patient in a prone position on an examination table
6. Z-Track injections of iron are ONLY injected into the upper outer quadrant of the buttocks
7. Cleanse the area with alcohol wipe, using circular motion and cleansing from inside outward. Allow to dry
8. Loosen the needle guard, so that the needle may be picked up for injection with one hand, place on a clean surface within reach

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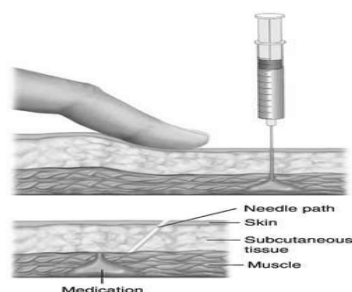
## Intramuscular Z-Track

9. Pull the skin laterally away from the injection site and hold
10. Insert the needle at a 90 degree angle
11. Pull back on the plunger to insure that the needle is not in a blood vessel
12. Inject the medication slowly (while maintaining the lateral skin pull), including the air bubble which will clear the needle of any remaining iron solution that could stain the puncture wound
13. Withdraw the needle quickly and then release the skin
14. Do not massage the site
15. Apply a dressing if required
16. Allow the patient to get comfortable
17. Observe for 10 to 20 minutes for any signs of an acute drug reaction
18. Document the medication given and the site

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## Z-Track



Source: <http://medical-dictionary.thefreedictionary.com/Z-track+injection>

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## Injectables

- **NEVER INJECT Chlorides (ex. Calcium Chloride).** They can necrosis of the tissue.
- **Fats (Vitamin A, D etc.) must be done as DEEP IM**
- **Any IM injection can falsely elevate AST, ALT levels.**

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## Injectables

- **Vitamin A:** May falsely increase serum cholesterol readings. May also falsely elevate bilirubin.
- **Vitamin D:** May falsely increase serum cholesterol
- **Vitamin E:** None
- **Vitamin K:** May falsely elevate urine steroid levels.
- **Vitamin C:** False negative glucose testing when giving greater than 500 mg. False negative on occult blood if within 48-72 hours.
- **Biotin:** None
- **Cyanocobalamin, Hydroxocobalamin, Methylcobalamin:** May cause false positive for intrinsic factor antibodies. Methotrexate, pyrimethamine and most anti-infectives invalidate blood assay for B12.
- **Folinic or 5MTHF:** Can precipitate when mixed

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## Injectables

- **Niacin:** May alter fluorometric test for urine catecholamines and alter results of urine glucose test.
- **Dexpantenol:** None
- **Pyridoxine:** Can give false positive results of urobilinogen spot testing
- **Riboflavin:** Fluorescent urine and falsely elevated catecholamines and urobilinogen.
- **Calcium Gluconate:** Can cause transient elevation of 11-hydroxycorticosteroids.
- **Iron:** Iron dextran can cause false elevations of serum bilirubin and false reductions in serum calcium. Can cause dense areas of activity on bone scans for 1-6 days after injection.
- **Magnesium Sulfate:** None. Burns give with procaine or lidocaine.
- **CoQ10:** None

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## Injectables

- **B-Complex:** See individual B vitamins.
- **MIC:** None. Burns give with procaine or lidocaine
- **Biotin:** None
- **Chromium:** None
- **Carnitine:** None. Burns give with procaine or lidocaine
- **Taurine:** None
- **Glycine:** None
- **Glutathione:** None. Burns give with procaine or lidocaine.

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