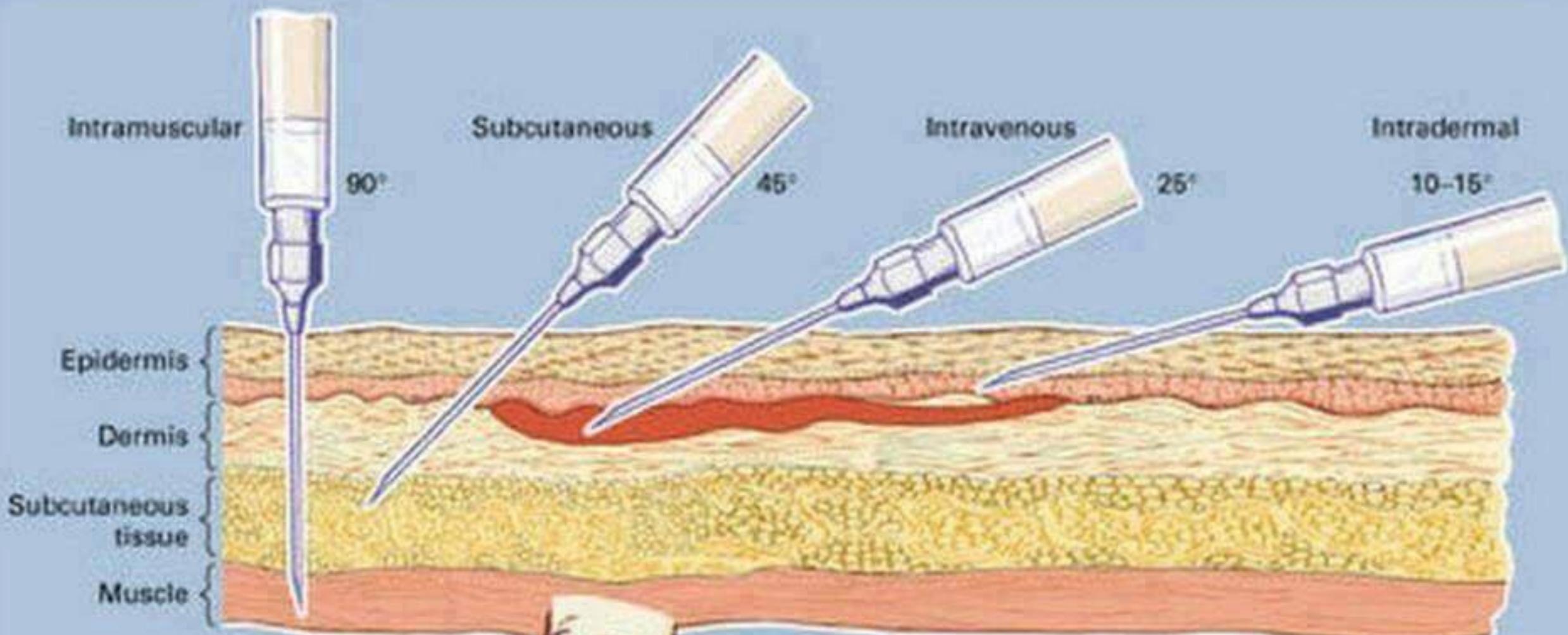
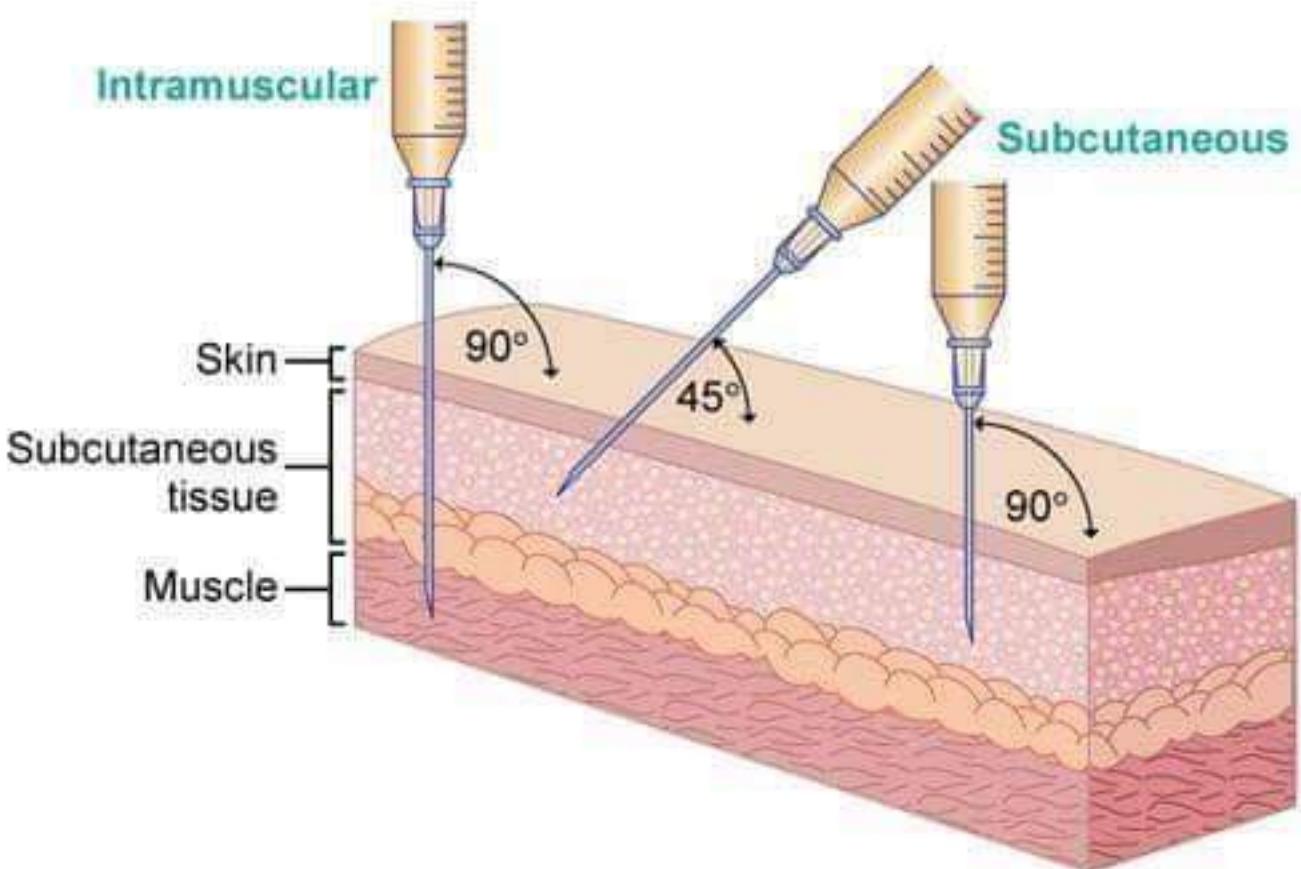
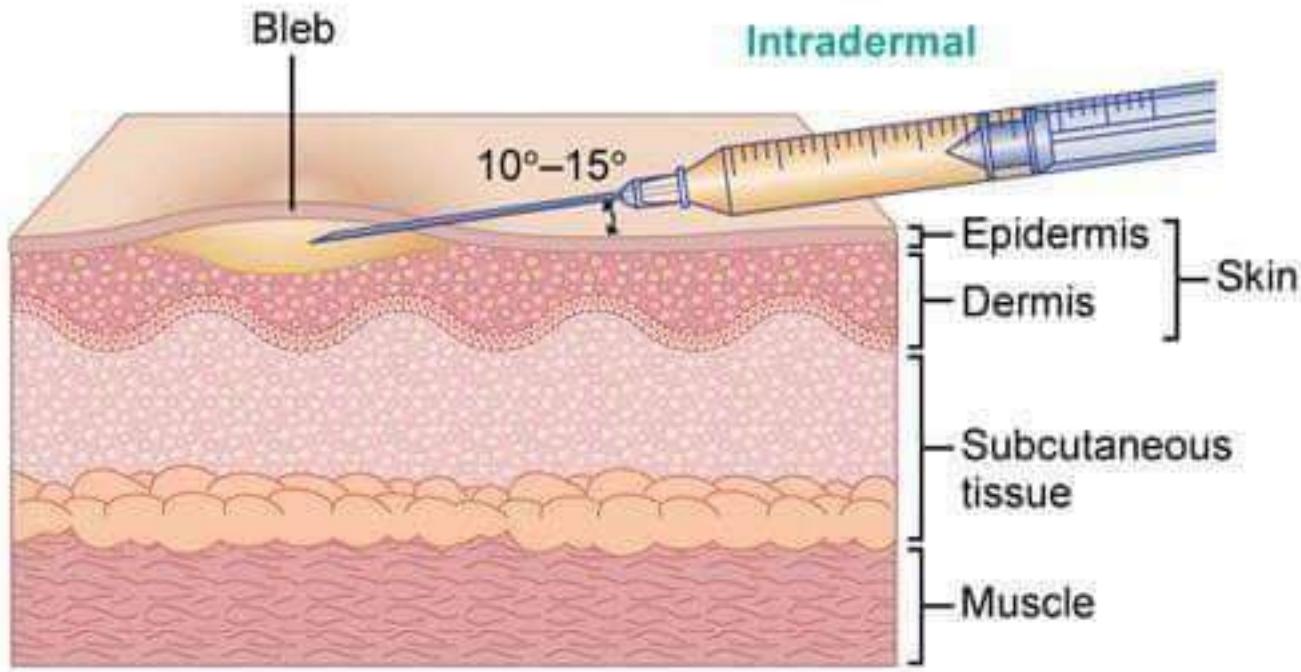


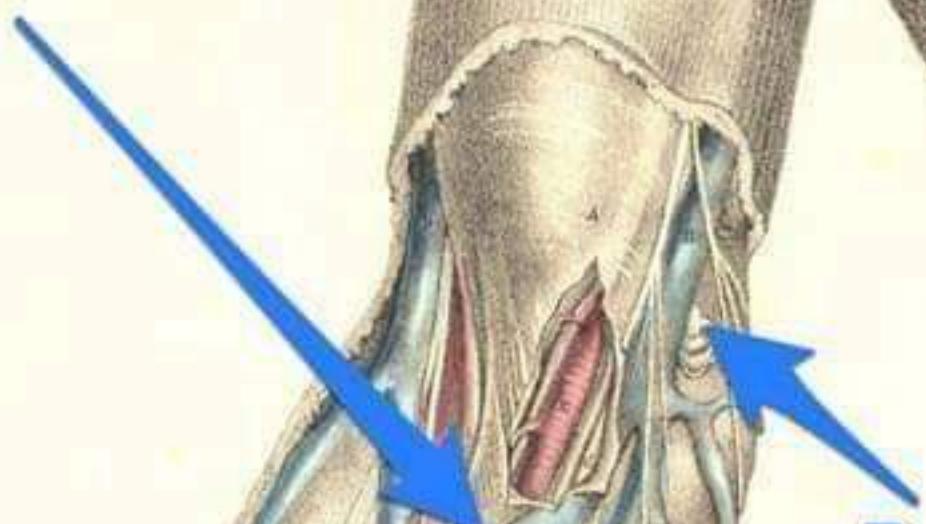
# Angles for inserting injections





# Veins of the Arm

Median Cubital



Basilic

Cephalic

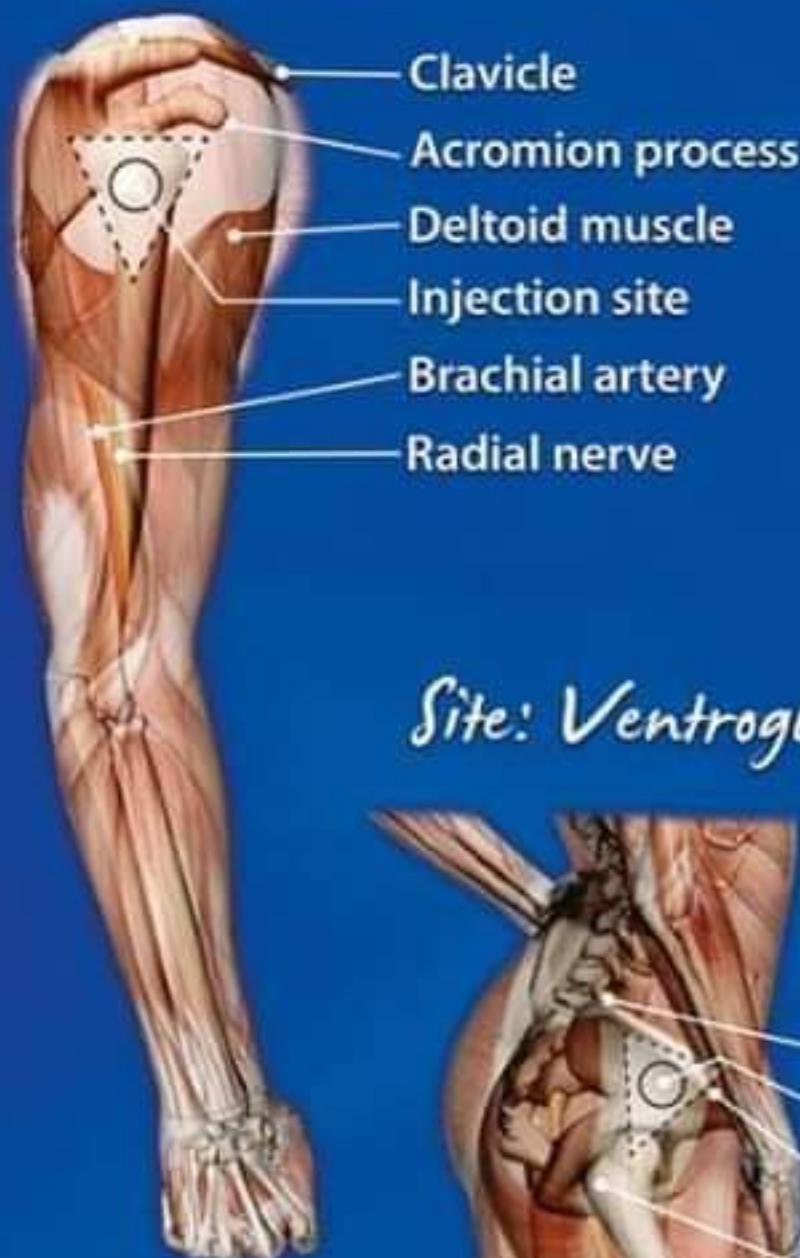


Median  
Antebrachial

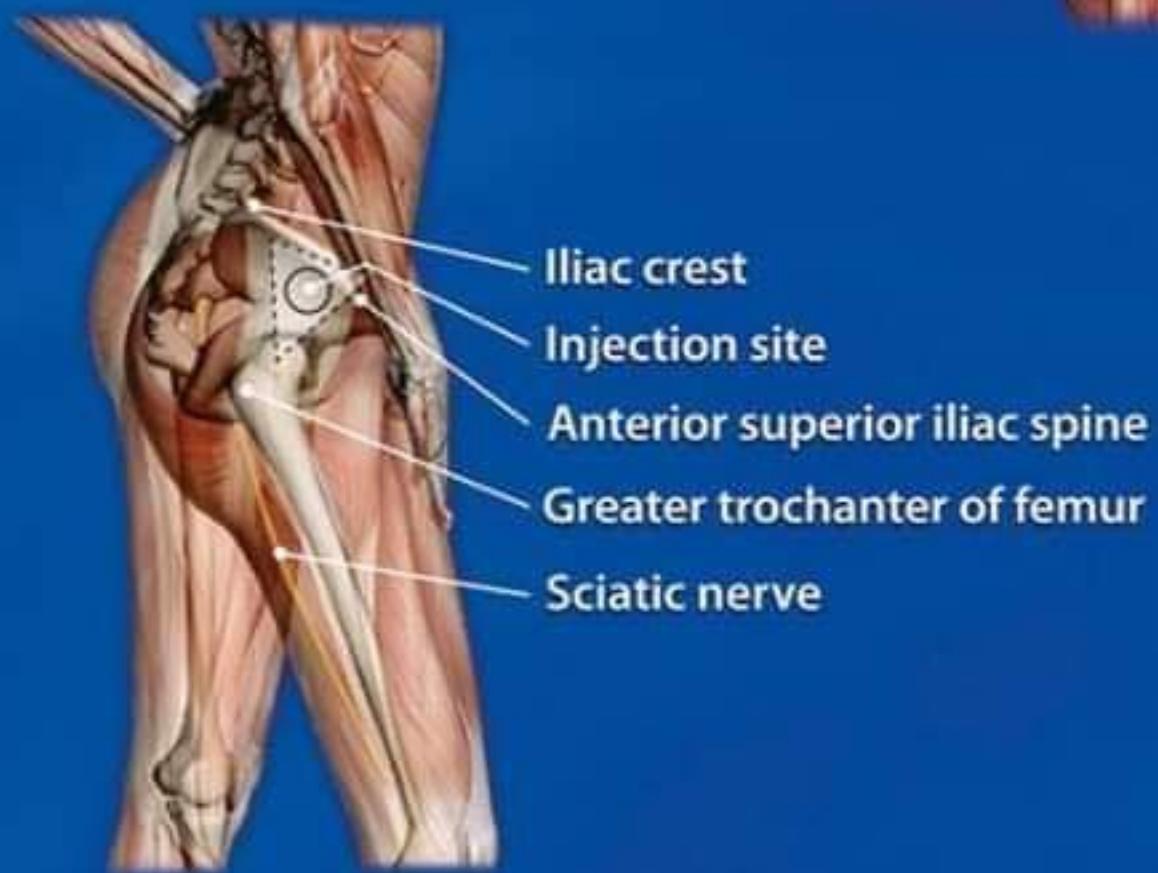
Remixed by  
[ResourceNurse.org](http://ResourceNurse.org)

# Intramuscular Injection Sites

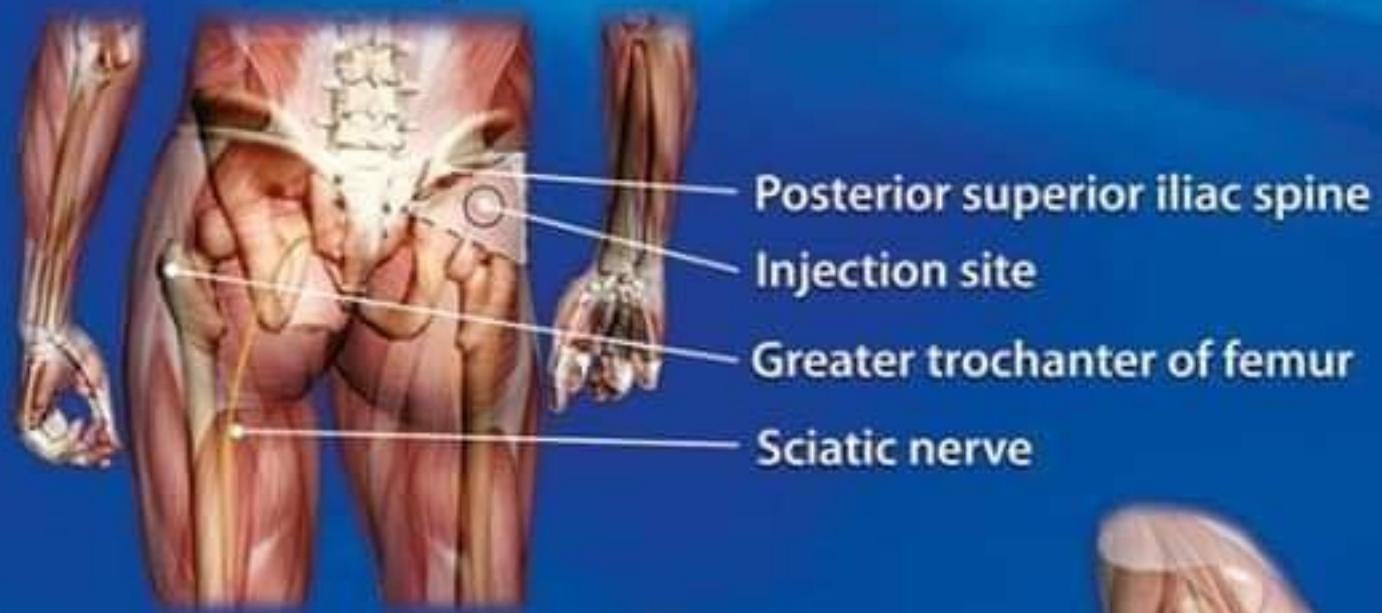
Site: Deltoid Muscle



Site: Ventrogluteal Muscle



Site: Dorsogluteal Muscle

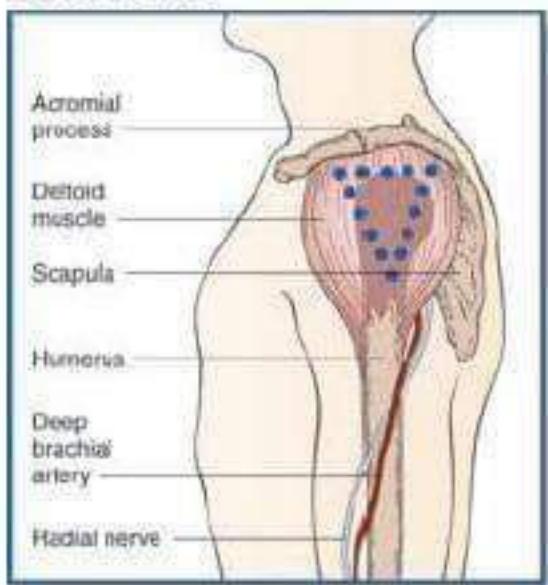


Site: Vastus Lateralis Muscle

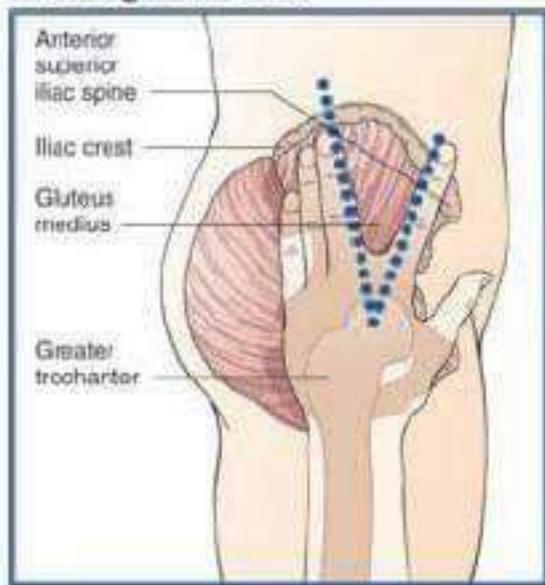


# Intramuscular (IM) Injection Sites

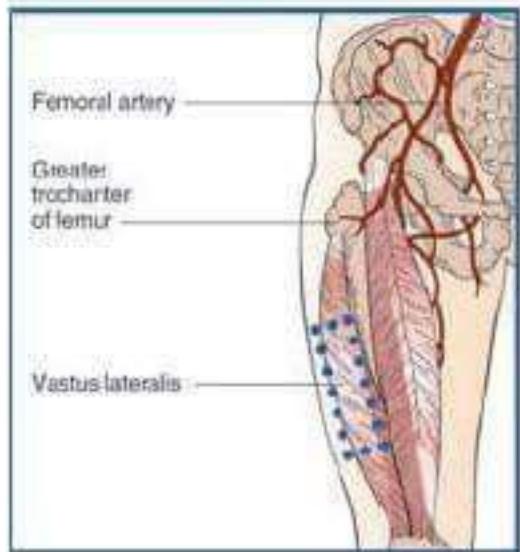
## Deltoid Site



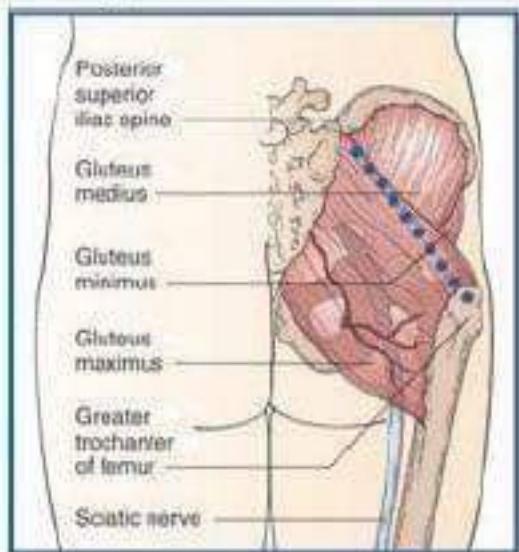
## Ventrogluteal Site

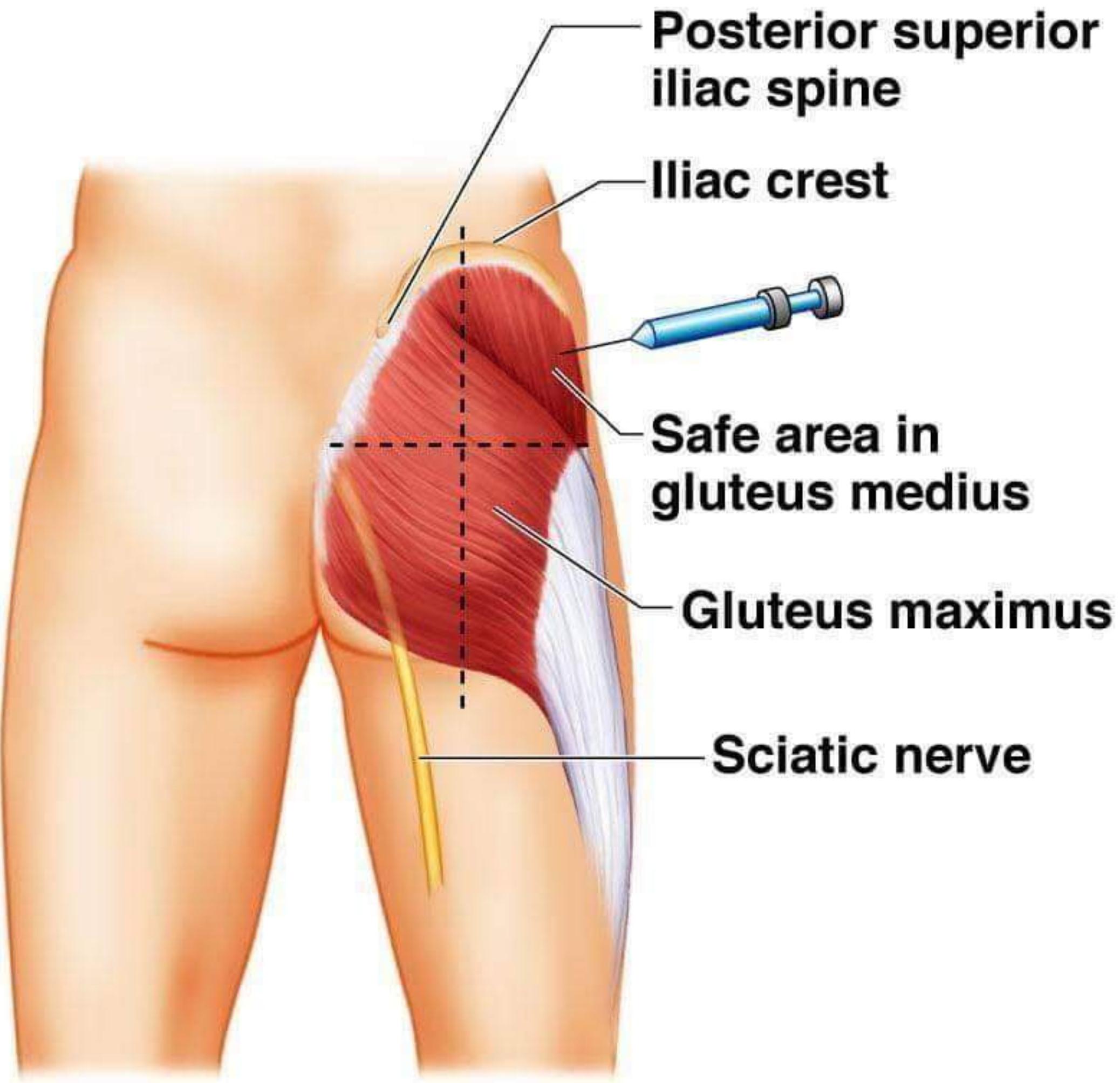


## Vastus Lateralis Site



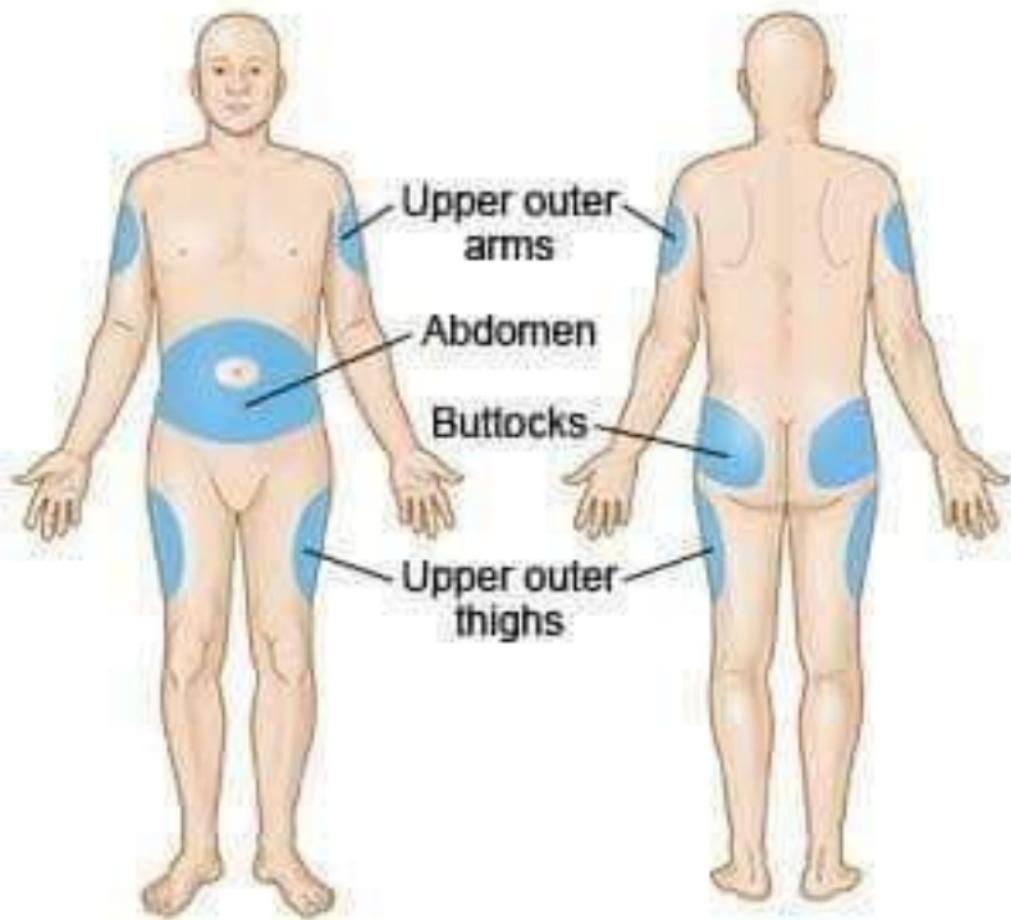
## Dorsogluteal Site





(b)

## Insulin Injection Sites



# Injections Study Guide Cheat Sheet

## Needles

	SubQ	IM	ID
Length	1/4" - 5/8"	1"-3"	1/4" -5/8"
Gauge	25-27	21-25	25 – 28
Angle	40°- 90°	90°	5° - 15°

## Landmarks

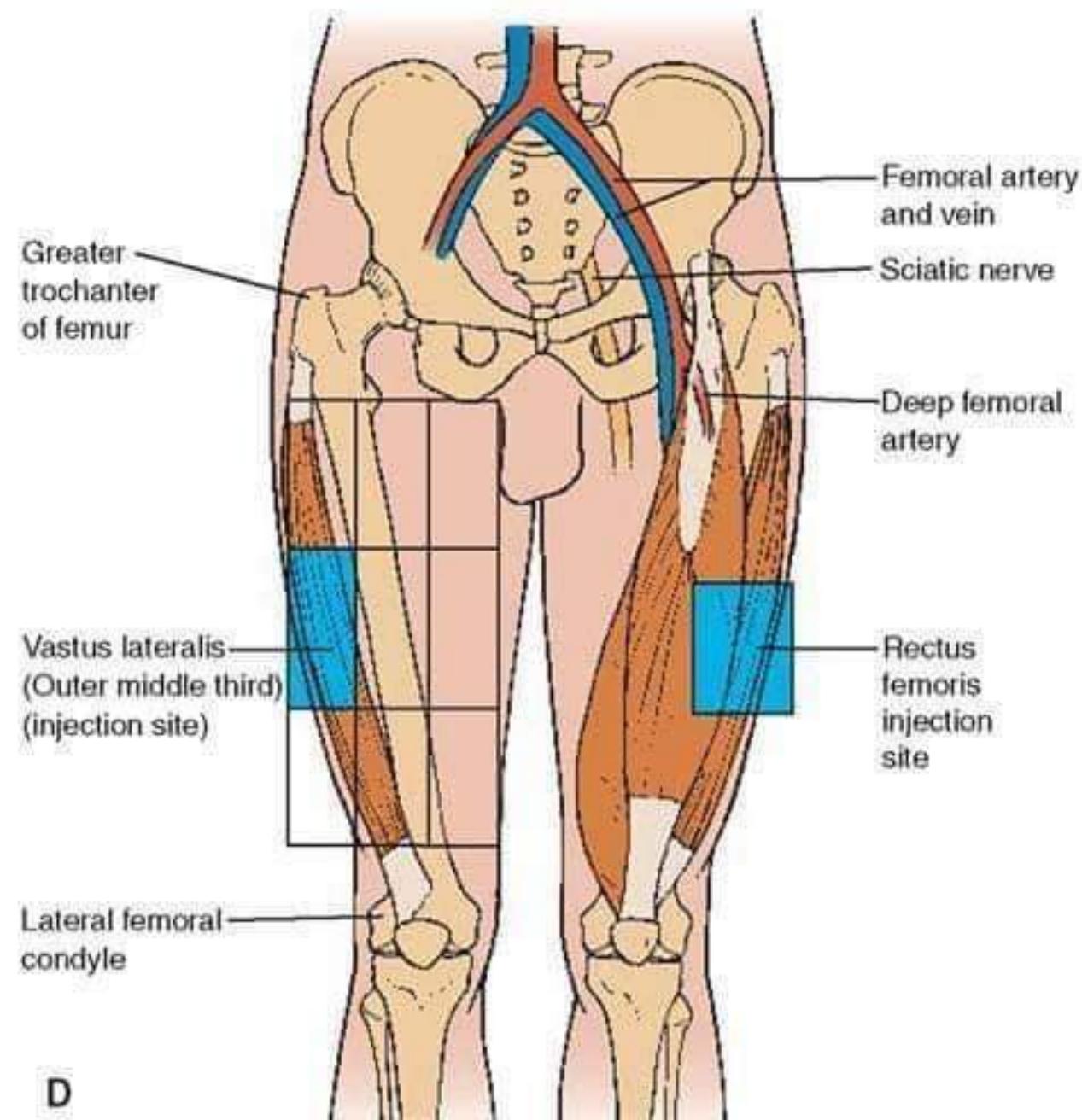
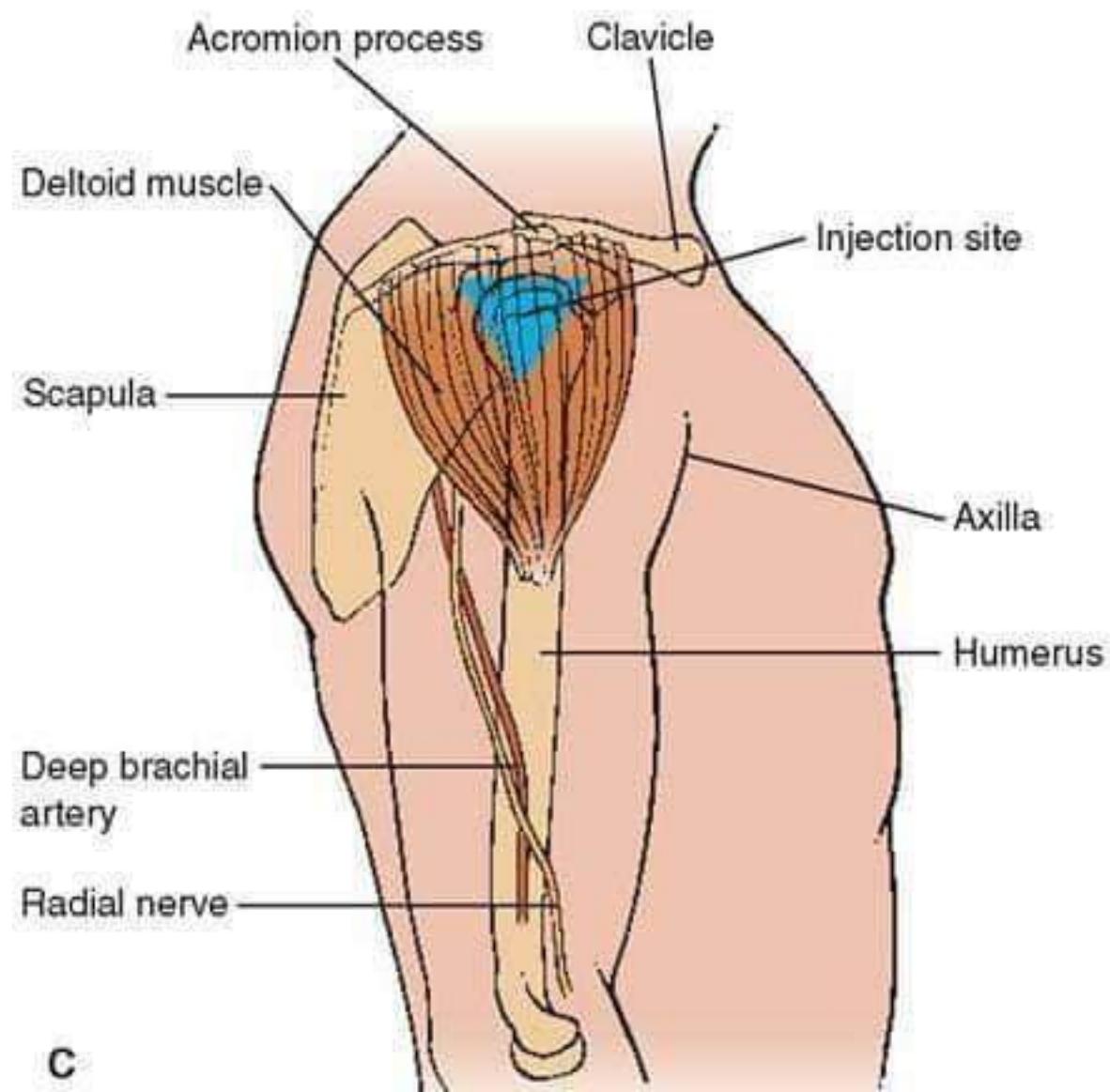
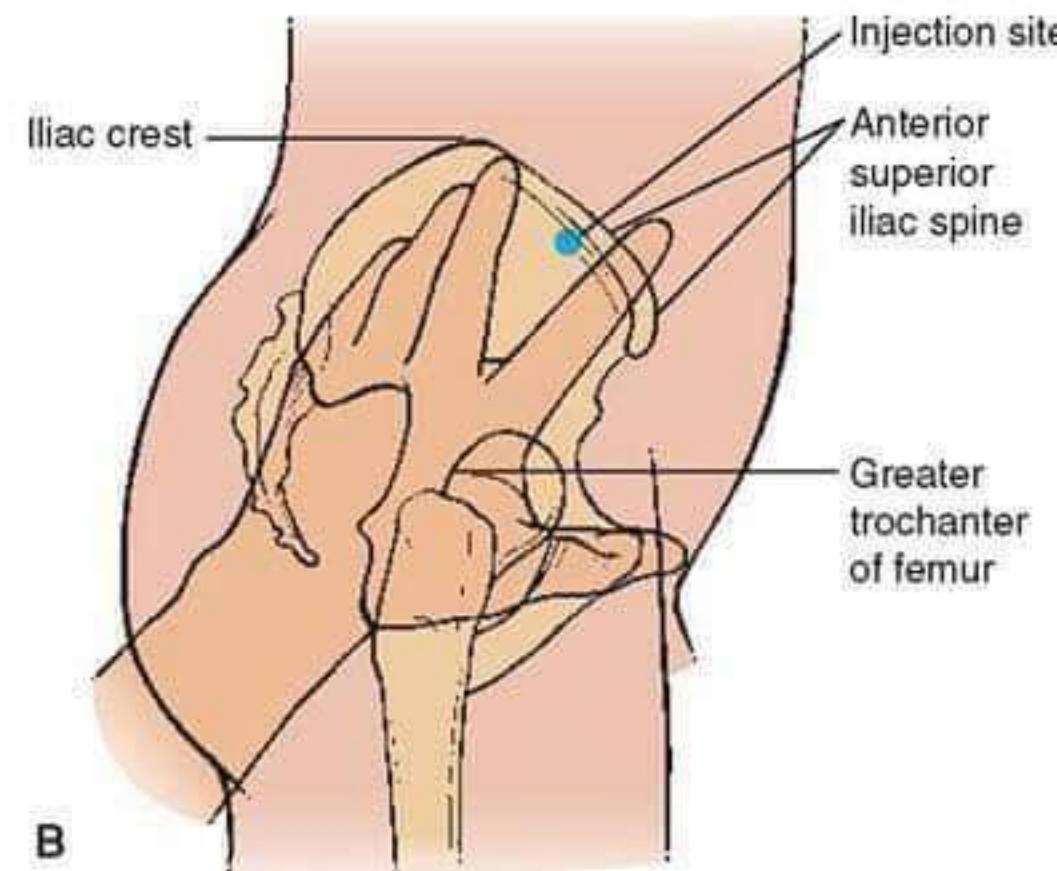
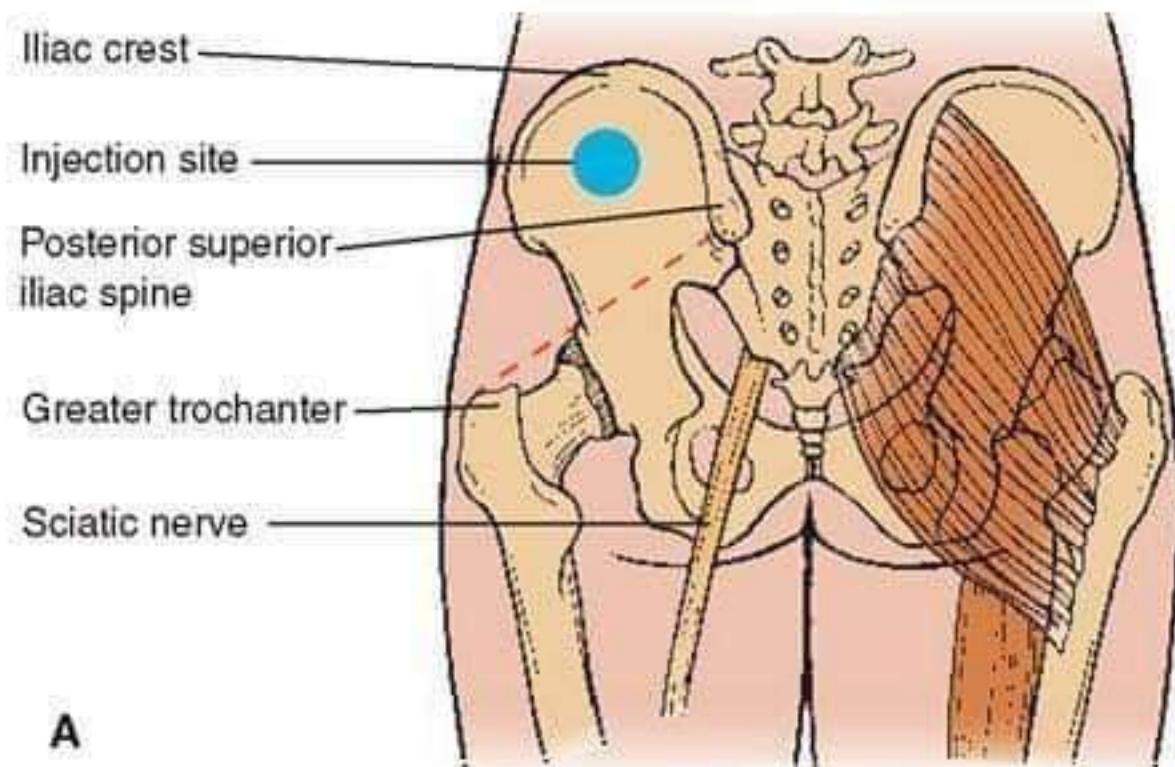
SubQ	IM	ID
Fatty Areas: 1. Abdomen, 2. back of arms, 3. Thighs	Deltoid, Ventral Gluteal, Vastus Lateralis	Lightly pigmented, lesion free, relatively hairless. Commonly ventral forearm

## Needles

SubQ	IM	ID
1 mL or less / 20-30min	Large Person:	no more than 3mL
	Small adult, older pt, children:	2 mL
	infants:	1 mL or less

## Medication Route Onsets

SubQ	IM	ID	PO
20-30 min	10-20 min	Immediate	30-40 min, may take days or weeks. Assume 60 min
		Find More @	<a href="http://www.NCLEXQuiz.com">www.NCLEXQuiz.com</a>



# The nurse's quick guide to I.V. drug calculations

## Basic dosage calculations

$$\frac{D \text{ (desired dose)}}{H \text{ (amount on hand)}} \times V \text{ (volume)} = \text{Dose}$$

I.V. drips in mcg/minute

$$\frac{\text{mg}}{\text{mL}} \times \frac{1,000 \text{ meg}}{1 \text{ mL}} \times \frac{\text{mL}}{1 \text{ hour}} \times \frac{1 \text{ hour}}{60 \text{ minute}} = \text{mcg/minute}$$

(÷ by kg to get mcg/kg/minute)

I.V. drips in unit per hour

$$\frac{D \text{ (desire)}}{H \text{ (on hand)}} \times V \text{ (volume)} = \text{units/hour} \quad (\# \text{ mL} \times \text{units/mL} = \text{dose})$$

## Dosage calculation conversions

1 mg = 1000 mcg

1 gm = 1000 mg

1 L = 1000 mL

1 mL = 1 cc

5 mL = 1 Tsp

3 Tsp = 1 Tbsp

15 mL = 1 Tbsp

30 mL = 1 oz

1 oz = 2 Tbsp

8 oz = 1 Cup

1 kg = 1000 gm (g)

1 kg = 2.2 lbs

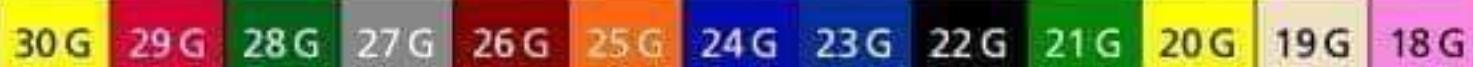
# Intramuscular Injection Guidelines

## for Needle Length and Gauge Selection\*

INTRAMUSCULAR (IM) **		Location of Injection	Needle Length	Needle Gauge	Needle Angle
<b>Pediatric</b>	Infants < 18 months	<ul style="list-style-type: none"> <li>Vastus lateralis muscle (&lt;0.5 mL vol.)</li> </ul>	7/8" - 1"	25 - 27 G	90°
	Children (>18 months and walking to 18 years)	<ul style="list-style-type: none"> <li>Deltoid muscle</li> <li>Ventrogluteal site</li> <li>Dorsogluteal site—not recommended for &lt;3 years</li> <li>Vastus lateralis muscle</li> </ul>	7/8" - 1 1/4"	22 - 25 G	90°
<b>Adult</b>	> 18 years	<ul style="list-style-type: none"> <li>Deltoid muscle, Ventrogluteal site—may be best site for cachectic adults</li> <li>Dorsogluteal site—avoid in obese adults</li> <li>Vastus lateralis muscle</li> </ul>	1" - 1 1/2" (up to 3" for large adults)	19 - 25 G	90°

\* Adapted from Fundamentals of Nursing: Human Health and Function, R. Craven, C. Hirnle, 4th ed, Lippincott Williams & Wilkins 2003.

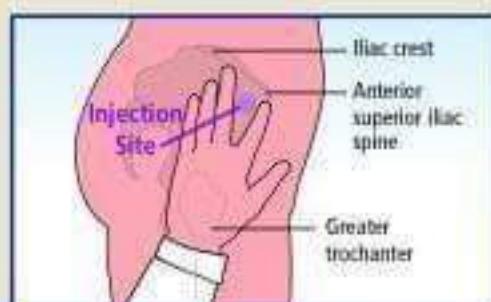
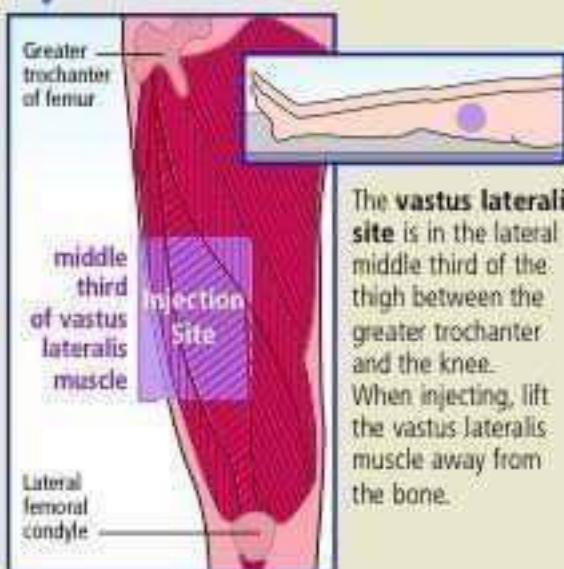
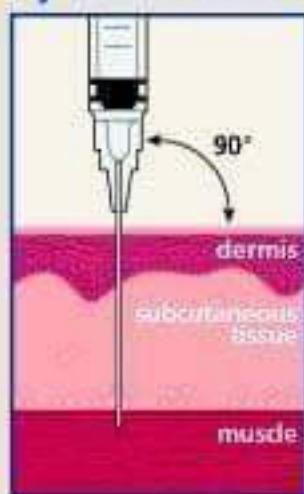
\*\* Prior to administering an IM injection, refer to your procedure manual to determine the injection site utilizing body landmarks.



ISO Hub Color Standards for safety-engineered needles

## Intramuscular (IM) Injection Guidelines:

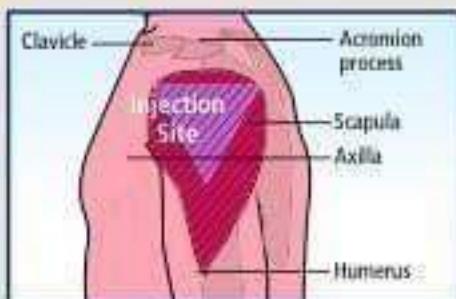
### Injection Route:



The **ventrogluteal site**: place the palm over the greater trochanter, form a 'V' with the middle finger toward the iliac crest and the index finger toward the anterior superior iliac spine. Inject within the center of the 'V' below the anterior superior iliac crest.

### Injection Procedure:

- Spread the skin taut, (except in vastus lateralis which requires lifting the muscle) and insert the needle at a 90° angle.
- Pull back plunger slightly. If blood appears, remove needle, dispose properly and prepare a new injection.
- If no blood is present, inject medication slowly.



The thickest part of the **deltoid muscle** is 2.5-5cm (1-3 finger breadths) below the lower edge of acromion process of the scapula over the midaxillary line.



The **dorsogluteal site** is above an imaginary line between the greater trochanter and the posterior superior iliac crest. The injection is administered laterally and superior to this imaginary line.



## **14 GAUGE**

COLOR: GREEN

OUTER DIAMETER: .072IN (1.83MM)

## **15 GAUGE**

COLOR: AMBER

OUTER DIAMETER: .065IN (1.65MM)

## **16 GAUGE**

COLOR: GRAY

OUTER DIAMETER: .064IN (1.63MM)

## **18 GAUGE**

COLOR: GREEN

OUTER DIAMETER: .050IN (1.27MM)

## **20 GAUGE**

COLOR: PINK

OUTER DIAMETER: .036IN (.91MM)

## **21 GAUGE**

COLOR: PURPLE

OUTER DIAMETER: .033IN (.83MM)

## **22 GAUGE**

COLOR: BLUE

OUTER DIAMETER: .027IN (.70MM)

## **23 GAUGE**

COLOR: ORANGE

OUTER DIAMETER: .025IN (.63MM)

## **25 GAUGE**

COLOR: RED

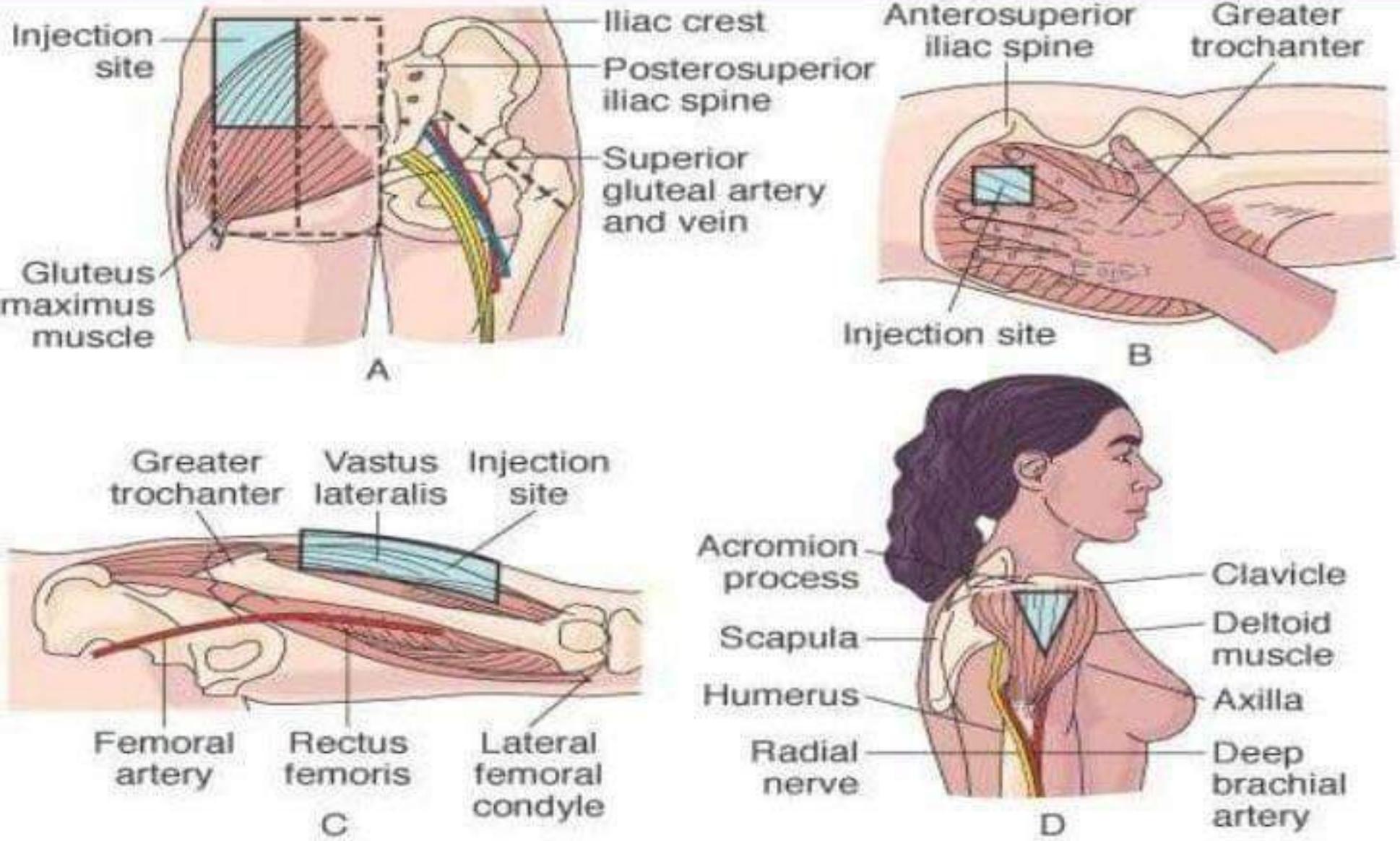
OUTER DIAMETER: .020IN (.53MM)

## **27 GAUGE**

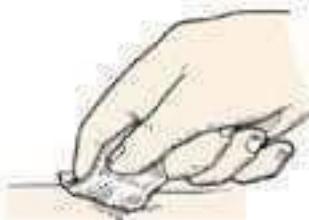
COLOR: WHITE

OUTER DIAMETER: .016IN (.42MM)

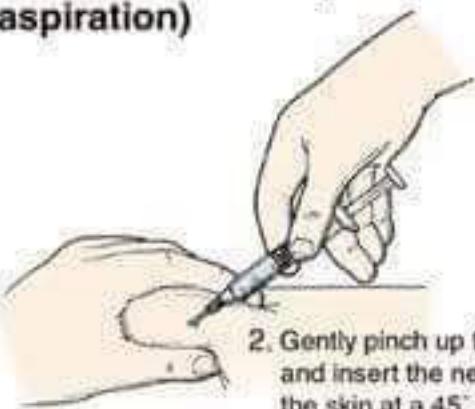
# INTRAMUSCULAR INJECTION SITES



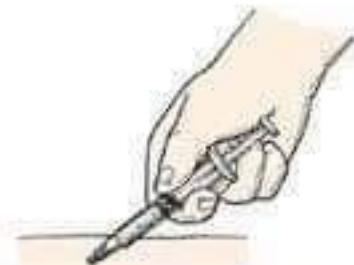
## How to Give a Subcutaneous Injection (with aspiration)



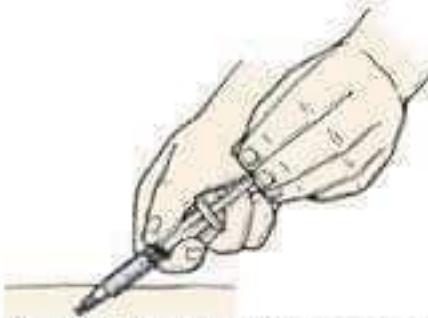
1. Use an alcohol swab to clean the skin where you will give yourself the shot.



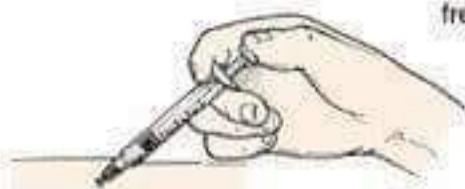
2. Gently pinch up the skin and insert the needle into the skin at a 45° angle.



3. After you insert the needle completely, release your grasp of the skin.



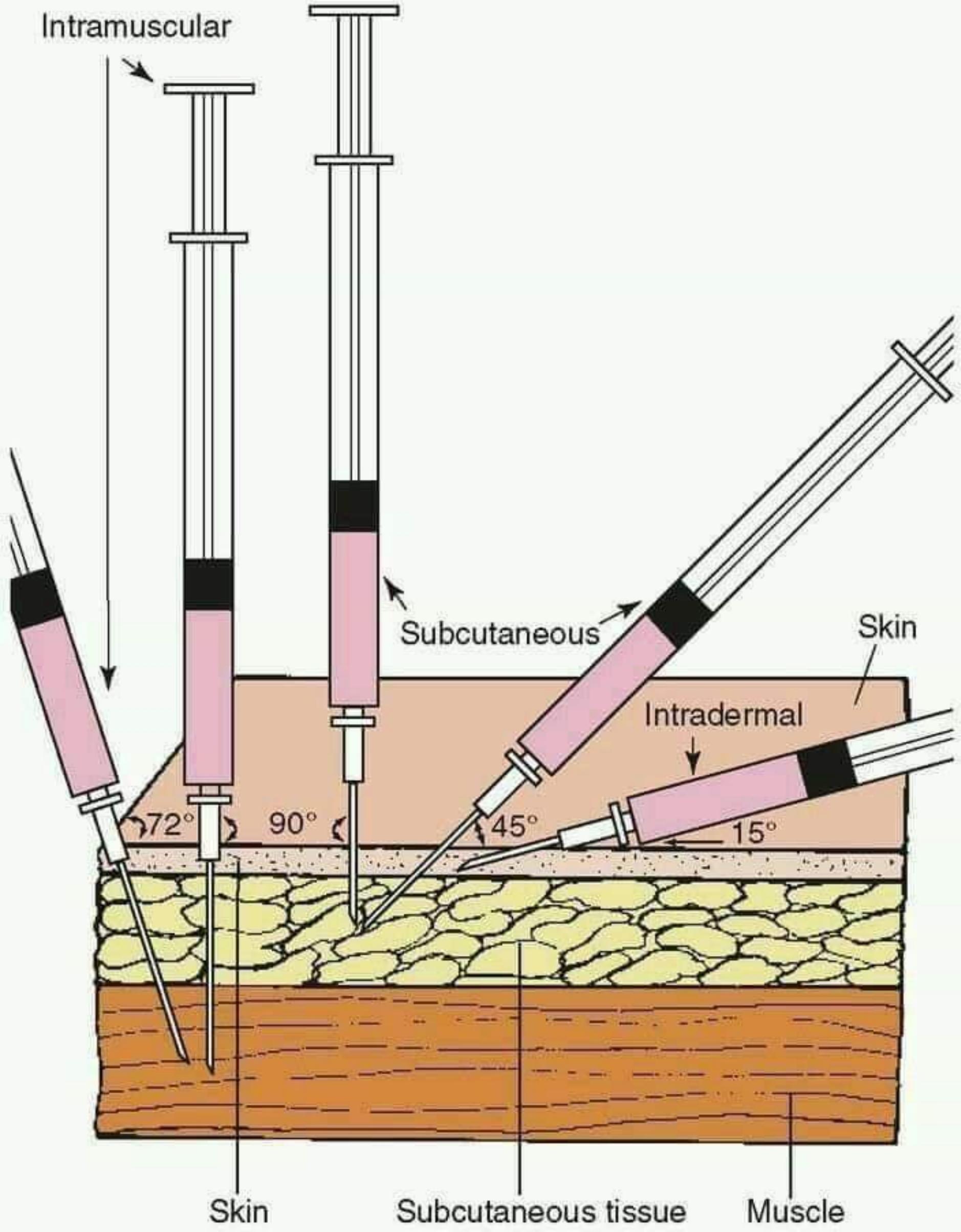
4. Gently pull back on the plunger of the syringe to check for blood. (If blood appears when you pull back on the plunger, withdraw the needle and syringe and gently press the alcohol swab on the injection site. Start over with a fresh needle.)



5. If no blood appears, inject all of the solution by gently and steadily pushing down the plunger.



6. Withdraw the needle and syringe and press an alcohol swab on the spot where the shot was given.



**Intradermal (ID) Subcutaneous (SC) Intramuscular (IM)**

ID	90°	SC	90°
ID	SC	IM	
Site Inner Forearm, chest back	Outer upper arm, anterior thigh, abdomen	Gluteus, thigh, deltoid	
Guage Length 27-30 g 1/4-3/8 "	25-28g 5/8 "	23 g 1-1 1/2	
Angle 10-15°	45°- 90°	90°	
Volume 0.1-0.2 ml	0.5-1 ml	Up to ≤ 3ml Deltoid Small Muscles ≤ 1 ml	
Insert, Aspirate, Inject, Withdraw, Massage			

Heparin & Lovenox SQ Shots 25g-26g @ 90° angle  
(45° thin patients) Do not aspirate or massage site



# Order of Draw

Tube Closure Color	Collection Tube	Mix by Inverting	Min. Clot Time	
		Blood Cultures – SPS	8 to 10 times	N/A
		Citrate Tube (Light Blue)	3 to 4 times	N/A
		Serum Separator Tubes (Gold and Tiger)	5 times	30 minutes
		Serum Tube (Red)	5 times (plastic) None (glass)	60 minutes
		Rapid Serum Tube (Orange)	5 to 6 times	5 minutes
		Plasma Separator Tube	8 to 10 times	N/A
		Heparin Tube (Green)	8 to 10 times	N/A
		EDTA Tube (Lavender)	8 to 10 times	N/A
		PPT Separator Tube (Pearl)	8 to 10 times	N/A
		Fluoride Tube (Gray)	8 to 10 times	N/A



Plain Tube



EDTA Tube



Heparin Tube



PT Tube



Serum Tube



SST Tube



ESR Tube



Glucose Tube



Multi Sample Needle



Butterfly Needle



Hypodermic Needle



Disposable Syringes



Blood Lancets



Tourniquet

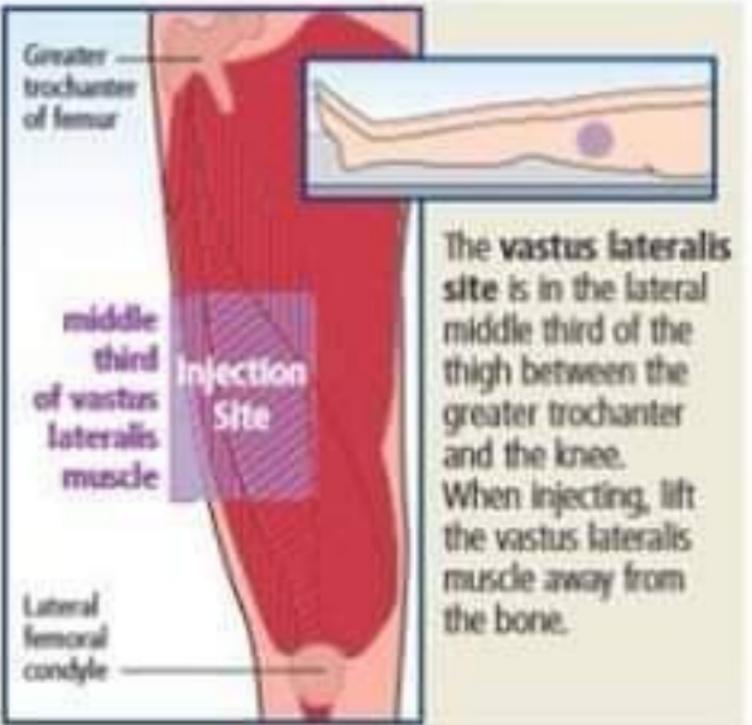


Needle Holder

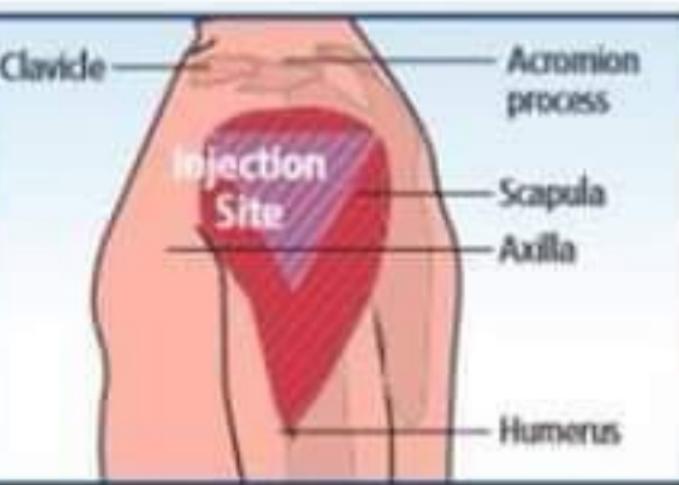


Specimen Container

# Thigh



# Arm



The thickest part of the **deltoid muscle** is 2.5-5cm (1-3 finger breadths) below the lower edge of acromion process of the scapula over the midaxillary line.

# Hip



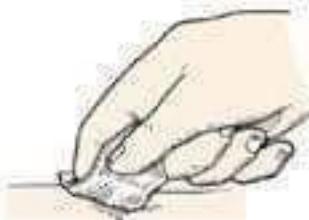
The **ventrogluteal site**: place the palm over the greater trochanter, form a 'V' with the middle finger toward the iliac crest and the index finger toward the anterior superior iliac spine. Inject within the center of the 'V' below the anterior superior iliac crest.

# Buttocks

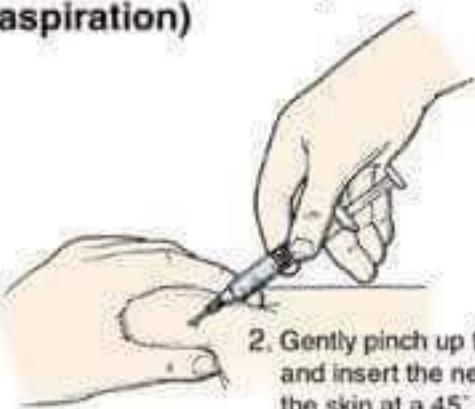


The **dorsogluteal site** is above an imaginary line between the greater trochanter and the posterior superior iliac crest. The injection is administered laterally and superior to this imaginary line.

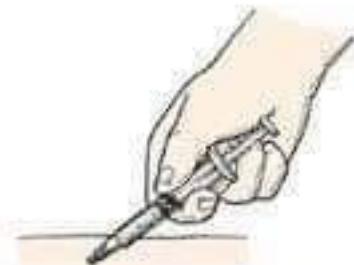
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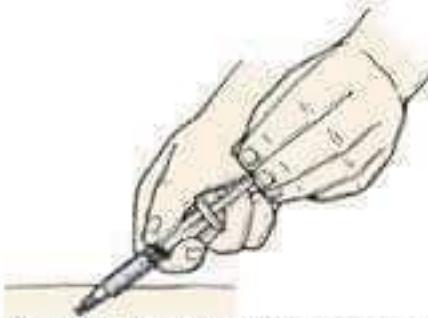
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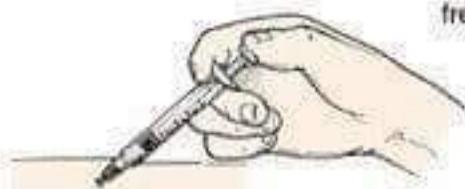
2. Gently pinch up the skin and insert the needle into the skin at a 45° angle.



3. After you insert the needle completely, release your grasp of the skin.



4. Gently pull back on the plunger of the syringe to check for blood. (If blood appears when you pull back on the plunger, withdraw the needle and syringe and gently press the alcohol swab on the injection site. Start over with a fresh needle.)



5. If no blood appears, inject all of the solution by gently and steadily pushing down the plunger.



6. Withdraw the needle and syringe and press an alcohol swab on the spot where the shot was given.

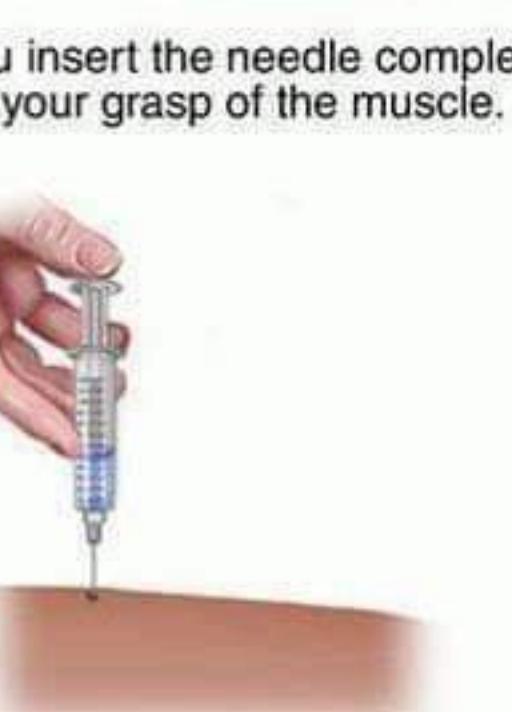
# How to Give an Intramuscular Shot



1. Use an alcohol swab to clean the skin where you will give the shot.



2. Hold the muscle firmly and insert the needle into the muscle at a 90° angle (straight up and down) with a quick firm motion.



3. After you insert the needle completely, release your grasp of the muscle.



4. Gently pull back on the plunger of the syringe to check for blood. (If blood appears when you pull back on the plunger, withdraw the needle and syringe and gently press the alcohol swab on the injection site. Start over with a fresh needle.)



5. If no blood appears, inject all of the solution by gently and steadily pushing down the plunger.

6. Withdraw the needle and syringe and press an alcohol swab gently on the spot where the shot was given.

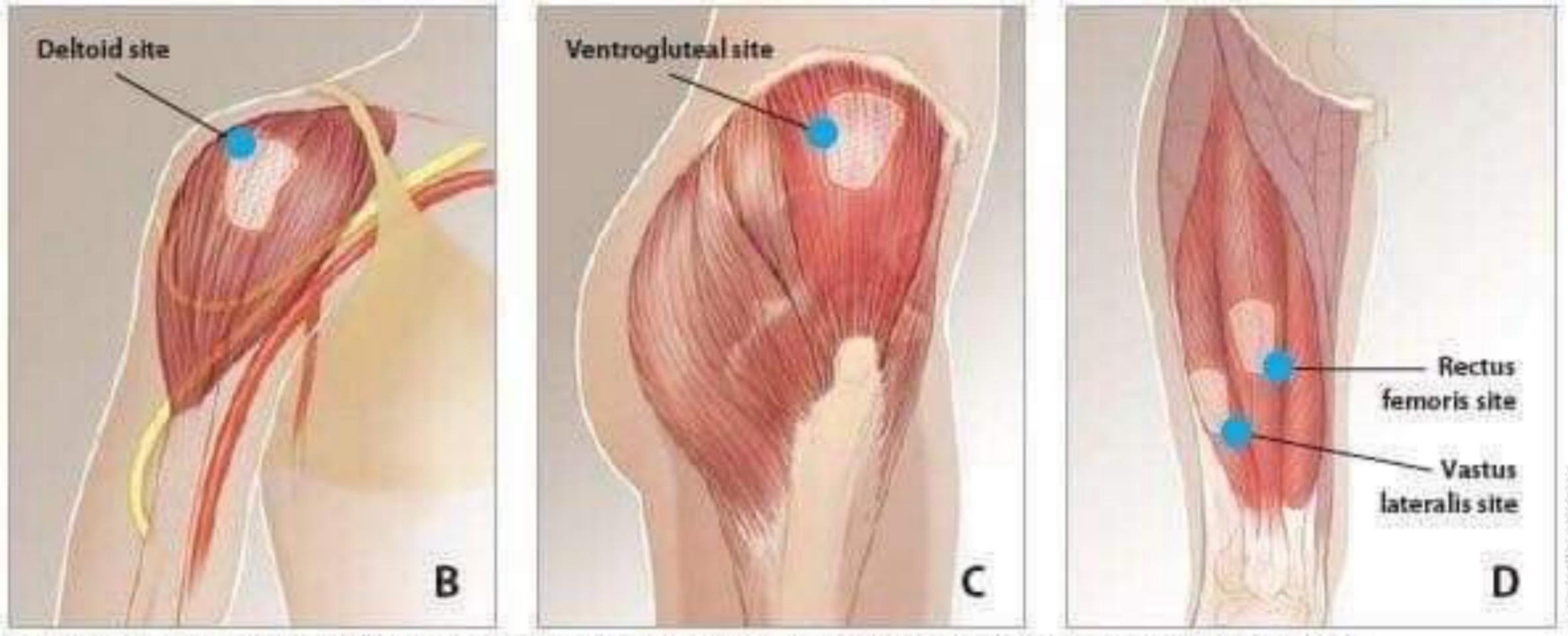


FIGURE 1B, C, D. Potential sites for intramuscular injection: Deltoid, ventrogluteal, rectus femoris, and vastus lateralis sites

- 1 Right upper arm
- 2 Left upper arm
- 3 Right abdomen
- 4 Left abdomen
- 5 Left buttock
- 6 Right buttock

- 7 Right lower thigh
- 8 Left lower thigh

