

# Medication

**A Drug is**

**Any substance that alters physiologic function, with the potential of affecting health.**

**A Medication is**

**A substance used in the diagnosis, treatment, cure, relief, or prevention of health alteration.**



# Indications

Drugs can be administered for these purposes:



- Diagnostic purposes. e.g. assessment of liver function or diagnosis of myasthenia gravis.
- Prophylaxis .e.g. heparin to prevent thrombosis or antibiotics to prevent infection.
- Therapeutic purposes. e.g. replacement of fluids or vitamins, supportive purposes (to enable other treatments, such as anesthesia), palliation of pain and cure (as in the case of antibiotics).

## Mild allergic reactions

- Skin rash: Small, raised vesicles that are usually reddened; often distributed over entire body.
- Pruritus: itching of the skin with or without rash.
- Angioedema: edema due to increased the permeability of the blood capillaries.
- Rhinitis: Inflammation of mucous membranes lining nose; causes swelling and clear, watery discharge.

# Routes of administration

## **Topical administration:**

Medications applied to the skin and mucous membranes generally have local effects.

- Applied to skin.
- Rectal.
- Otic.
- Optic.
- Nasal.



# Continue

## Routes of administration

- **Oral route.**
- **Sublingual route**
- **Parenteral route**
- **Intravenous route, IV**
- **Intramuscular, IM**
- **Intradermal, ID**
- **Subcutaneous, SQ**



Employee Infection  
Control

# Assessment For Reactions

Assessment needs vary and depend on route and medication. Always assess pt after giving drugs that affect RR, HR, BP, LOC, blood sugar and pain. These approximate time table will help guide you in your assessment.

Approximate Onset	
IV	3 – 5 min
IM	3 – 20 min
SC	3 – 20 min
PO	30 – 45 min

# Essential Parts of a Drug Order

- Full name of the patient and file number
- Date and time of the order is written
- Legible writing
- Name of the drug to be administered
- Dosage of the drug
- Frequency of the drug to administered
- Method of administration
- Signature and stamp of the physician



# Medication Rights

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1. Right Drug/Medication
2. Right Client/Patient
3. Right Route
4. Right Dose
5. Right Frequency/Time
6. Right Assessment
7. Right Approach
8. Right Education
9. Right Evaluation
10. Right Documentation
11. Right to Refuse
12. Right Principle of Care
13. Right Prescription
14. Right Nurse Clinician





## Basic Guidelines

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Assess the patient's history for allergies, drug-drug or drug-food interactions, and drug contraindications, and notify the physician if any exists.

Follow Infection Control Policy during the entire process of Medication Administration.

# Drug-drug interactions ..

Drug-drug interactions (DDIs) are one of the commonest causes of ADRs and these manifestations are common in the elderly due to poly-therapy. In fact, poly-therapy increases the complexity of therapeutic management and thereby the risk of clinically relevant drug interaction. ☐ Poly-therapy may determine the “prescribing cascade,” which occurs when an ADR is misunderstood and new potentially unnecessary drugs are administered; therefore the patient is at risk to develop further ADRs.

# **BASIC GUIDELINES/GENERAL INSTRUCTION**

## **A.BEFORE ADMINISTRATION (DURING PREPARATION OF DRUG)**

- Patient must be correct identified by using 2 identifiers ;complete name and file number checked against the ID .do not identify patient using room or bed number .**
- To the maximum extent possible ,only administer medications you have personally prepared .**
- Gather or review assessment data that may influence drug administration .this may include vital signs,lab data ,drug serum etc.**
- Do not administer medication from containers that are unmarked or illegible .do not give medications that have changed color .appearance ,or from which the container is broken or crusted.**

# Cont

- Check the label of the containers thrice before preparing the drug .
  - before the medication container is taken from the shelf.
  - before pouring the drug
  - before replacing the container in shelf .
  - check the expiry date of the drug.
- Always use a calibrated measures while preparing the drug .
- Shake the liquid medication before pouring it into the ounce glass ;pour it away from the label.

# Cont

- Wipe the mouth of the bottle ,close it tightly and replace it at the proper place .
- When taking tablets or capsule do not touch them with hands ,drop them from the container to its lid and then to the medication cup .
- Do not put back the medicine once it is taken out of the container .
- Prepare the drug just before the time of administration and do not leave the drug in the medicine tray without proper identification .

# Cont

## B.DURING ADMINISTRATION

- Observe 14 right of administration of drugs .

## C.AFTER ADMINISTRATION :

- Record only the medicine ,which you have administered .
- Record the date ,time ,name and dose of the drug administered.
- Never record a medicine before it is given
- Record the effect observed –the local or systematic effect ,its side –effect or toxicity ,any complication.

# Policy on Medication Administration



Nurses cannot administer medication until certified in Medication Administration

- Attends GNO
- Pass the Medication Examination
- Completes the competency





Always check medication expiration dates.





Tablets and capsules should be maintained in their wrappers and opened at the bedside immediately prior to use.

With each drug, inform the patient of the drug's name, purpose, action, and potential side effects



**The medication order shall be written in the physician order sheet and transcribe in the Medication Sheet.**

**Medications shall be double checked by a witness during preparation and administration**



The nurse and the witness sign the medication sheet after administration.

Any order that is incomplete, illegible, or of any concern should be clarified prior to administration




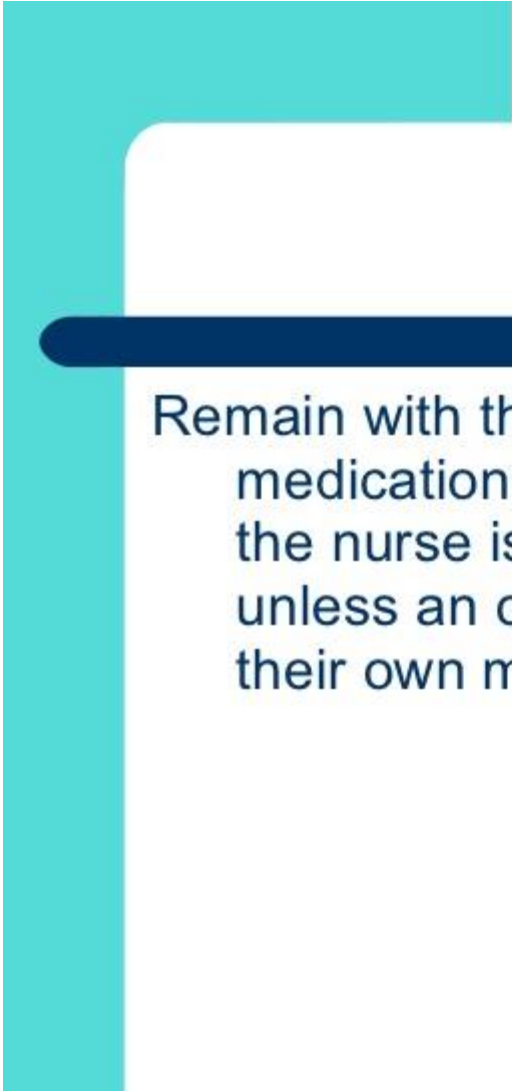
In situations such as

- Not given-
- Not tolerated-
- Refused-

Notify the physician and justify the reason in the Interdisciplinary Progress Notes.



Do not leave medications unattended and accessible to patients, family or visitors



Remain with the patient while they take medications. Inhalers are to be used while the nurse is observing for proper technique, unless an order exists for patient to take their own medication.

## Always Check for



1. The indication of the drug before administering (refer to Saudi Drug Formulary Hand Book).
2. The medication sheet is up to date.
3. For allergies and assess for reactions to drugs not previously taken by the pt.

# Triple Checking



- Check label when obtaining medication from storage.
- do side-by-side comparison of the medication with the written order and the medication sheet.
- Recheck one last time after preparation with a witness, just before administration.



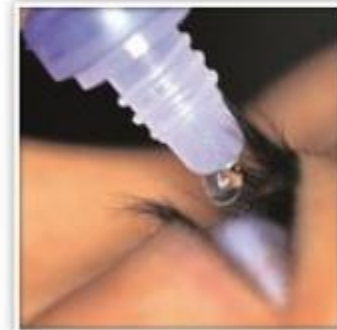
# ADMINISTERING OPHTHALMIC MEDICATIONS

## Definition:

Medications are instilled in mucous membranes of eye for various therapeutic effects.

## Purpose:

- To treat infection.
- To relieve inflammation.
- To treat eye disorders such as glaucoma.
- To diagnose such as foreign bodies and corneal abrasions.



# Preparation Of OPHTHALMIC MEDICATIONS

## 1 Gather Equipments

- Medication bottle with sterile dropper or ointment tube.
  - Small guze squares or cotton balls.
  - Eye patch and tape (optional).
  - Disposable gloves.
2. Explain the need and reason for instilling drops or ointment.

## Continue Preparation Of OPHTHALMIC MEDICATIONS

3. Allow the pt to sit with head tilted backward or to lie in a supine position.
4. Ask client to look up and explain steps to client.



## Instill eye drops

1. Identify pt. Compare name on medication sheet with pt ID band . Ask pt to state name.
2. Check prescribed medication order for number of drops (if a liquid) and eye

Rt. = O.D.

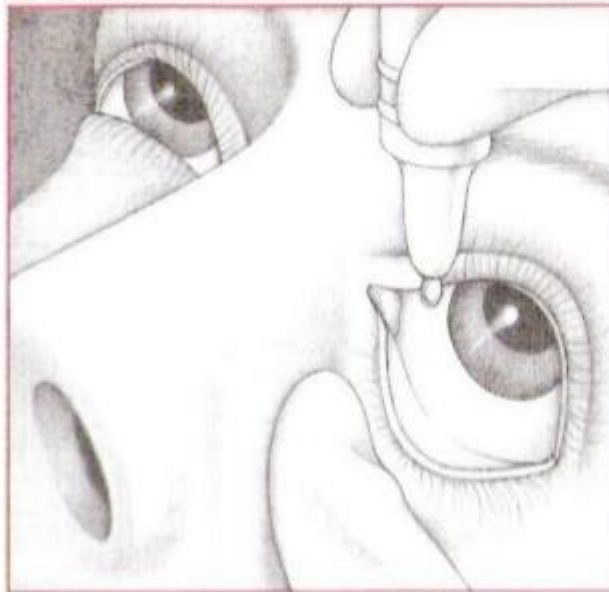
Lt. = O.S.

both = O.U.

# Instill eye drops continue

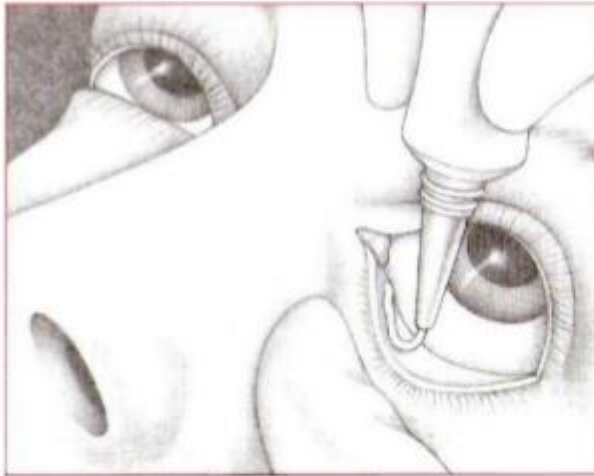
1. Wash Hands
2. With dominant hand resting on client's forehead, hold filled medication eye dropper or ophthalmic solution approximately 1-2 cm (1/2-3/4 in) above conjunctival sac

## Instill eye drops continue



5. pull the lower lid down to expose the conjunctival sac. have the pt look up and away, then squeeze the prescribed numbers of drops into the sac. Release the patient's eyelid, and have him/ her to blink to distribute the medication.
6. **If drops land on outer lid margins, repeat procedure**

# Instilling Eye Ointment



- Gently lay a thin strip of the medication along the conjunctival sac from the inner canthus to the outer canthus. avoid touching the tip of the tube to the patient's eye. then release the eye lid and have the patient roll his eye behind closed lids to distribute the medication.

# Administration of oral medication

## Definition:

Drugs given by the oral or gastric route are absorbed into the bloodstream through the gastric or intestinal mucosa. Usually the patient swallows the drug.

## Forms of oral medications:

- Tablets.
- Capsules.
- Liquid drugs like syrup
- Also available as powder, granules or oil.



**Figure 34-1** Forms of oral medications. Top row: Diamond-shaped tablet, capsule, scored tablet. Bottom row: Gelatin-coated liquid, extended-release capsule, enteric-coated tablet.



# Continue Administration of oral medication

## Purpose:

- Uses basic safety factors of drug administration in preparing and administering medications.
- Avoids client injury due to drug errors.
- Delivers medication for absorption through alimentary tract for oral medication.



# Preparation of Oral Medication

- Wash hands
- Gather equipment:
  - a. Medication Sheet
  - b. Medication tray
  - c. Glass of water or preferred liquid
  - d. Drinking straw
  - e. Pill Crusher device



# Oral Drug Administration

- Unlock the medication cart or drawer.
- Prepare one client's medication at a time.
- Calculate correct drug dose. Take time. Double check calculation.
- If the client has difficulty in swallowing, grind tablets in a pill crusher until smooth. Mix it with drinks or soft food.



# Continue Oral Drug Medication



- Measure liquid medication by holding the medication cup at eye level. Pour away from the label and wipe the neck.
- Re-check each medication with the MAR and physician order.
- Don't use liquid medication that are cloudy or have changed in color.

# Continue Oral Drug Medication



- Ask the patient his or her name with a staff witness.
- Assist the patient to a comfortable position.
- Administer the medication
- Remain with the client until he or she has taken all medication
- Wash hands

# Continue Oral Drug Medication



Documenting administration of medication.  
(Photos © B. Proud)

- Record medication administration.
  - Sign after giving the medication
  - Counter sign with another nurse for high risk medication.
  - If client refuses the medication, record according to the hospital policy.
  - check the client after 30 minutes

# Giving Medication Through an NG Tube



- Holding the nasogastric (NG) tube at a level some what above the patient's nose, pour up to 30 ml of the diluted medication into the syringe barrel. Hold the at a slight angle and add more medication before the syringe empties. rise the tube slightly higher to increase the flow rate.

## Continue Giving Medication Through an NG Tube



- After you've delivered the whole dose, position the patient on her/ his side, head slightly elevated.



# EAR (OTIC) INSTILLATION

## **Definition:**

Instill liquid medication into external auditory canal for such therapeutic effects.

## **Purpose:**

- To treat infection and inflammation.
- To soften cerumen for removal.
- To produce local anesthesia.
- To aid in removal of foreign body trapped in the ear.

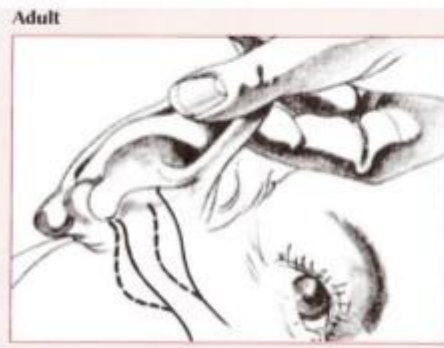
# Preparation for EAR (OTIC) INSTILLATION

- Wash hands

Gather Equipment:

- 2 or 3 cotton balls or tissue.
- Disposable gloves.
- Medication record or card.
- Medication to be administered.

# Positioning The Client For Eardrop Instillation



Before instilling eardrops, have the client lie on his or her side. Then straighten the ear canal to help the medication reach the eardrum. For adult, gently pull the auricle up and back. For young child and infant, gently pull down and back

# The Transdermal Patch

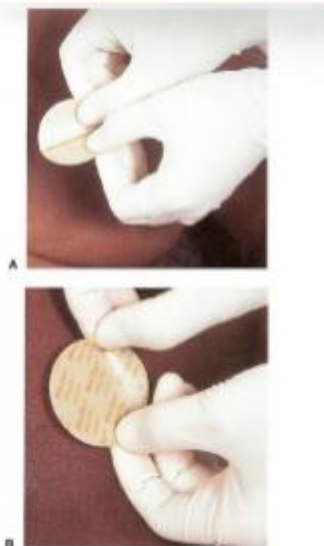
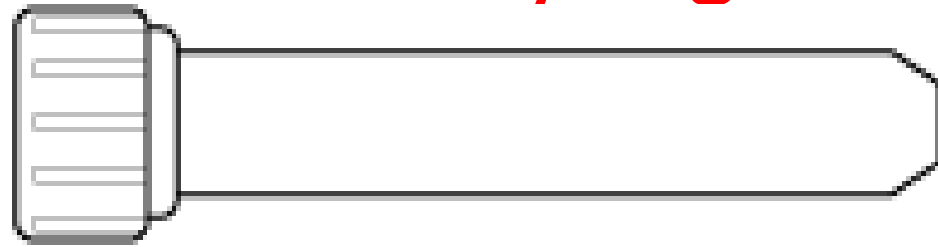


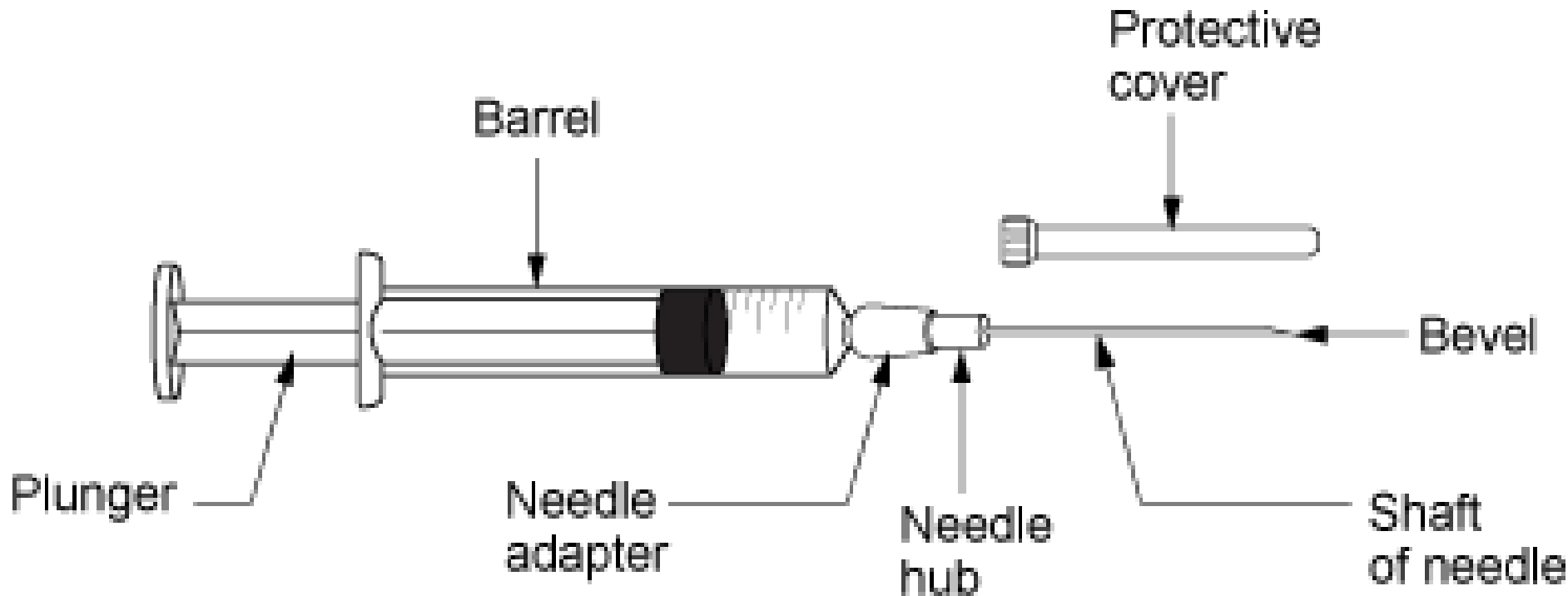
FIGURE 43-2. The transdermal patch. (A) First, bend the patch to break the seal. (B) Remove protective covering and apply to skin.

- (B) First bend the patch to break the seal
- (D) Remove protective covering and apply to the skin

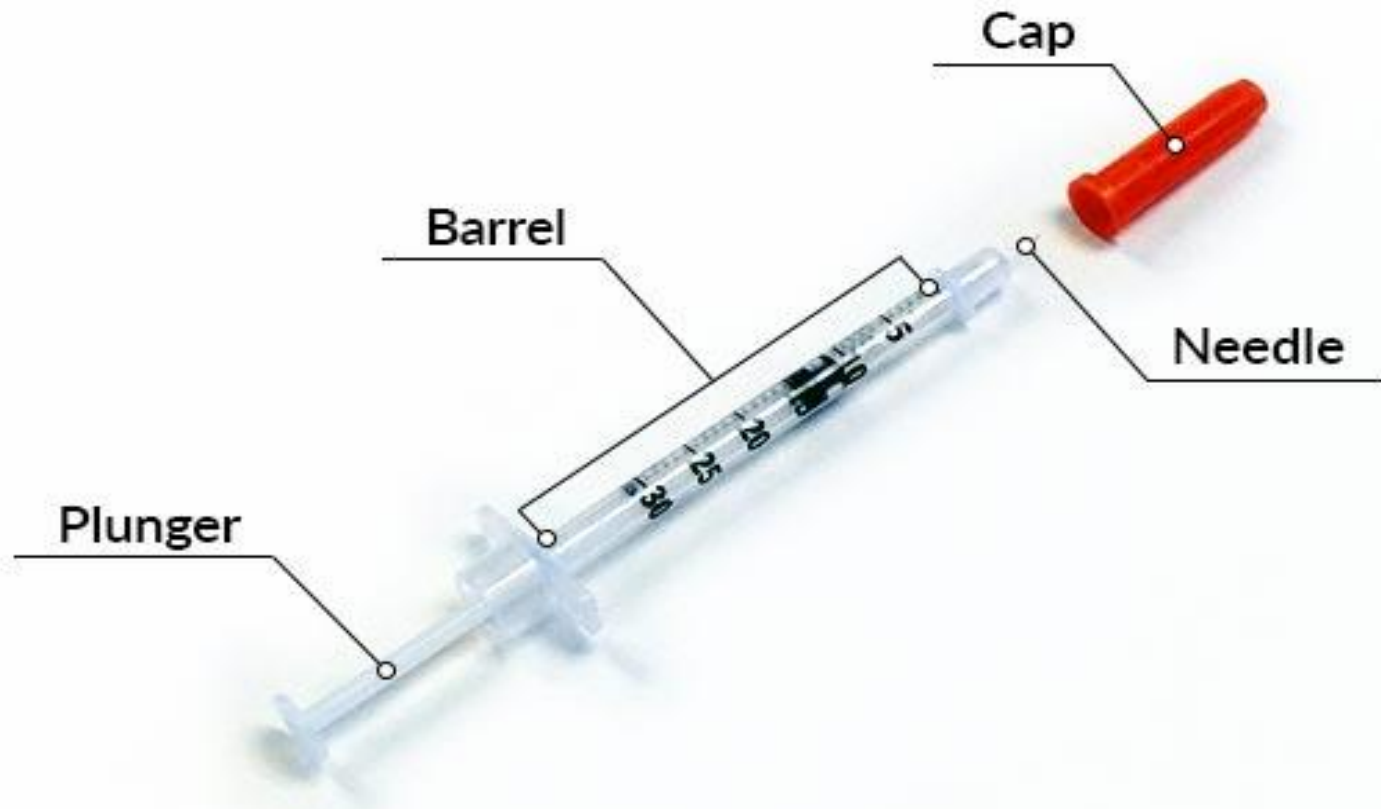
# Parts of syringe



Disposable syringe and needle (parts labelled)



# Parts of an Insulin Syringe



# IV Medication



Ampules



Vials

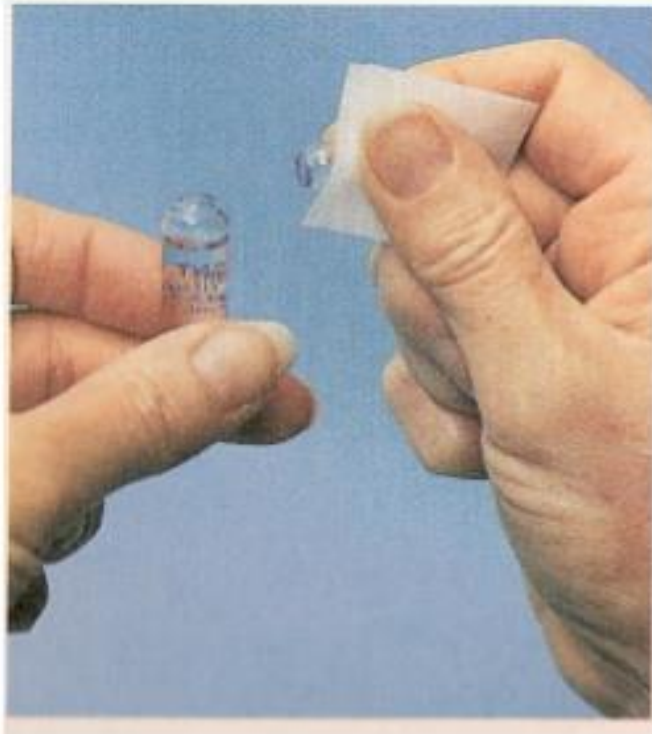
# Drawing Up Medication From an Ampules



- Wash hands and gather equipment.
- Grasp the stem with an alcohol swab



# Continue Drawing Up Medication From an Ampules



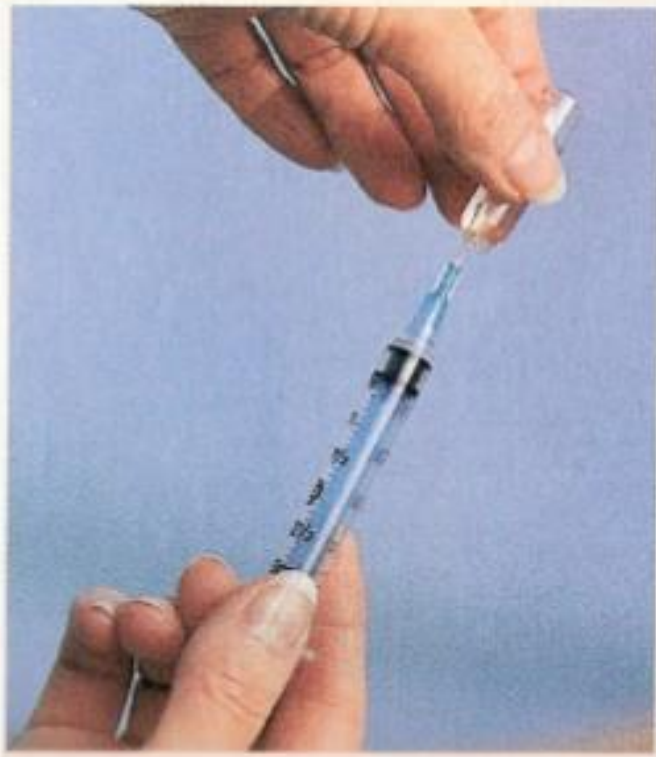
- Snap off the ampoule's neck away from the hands and face

# Continue Drawing Up Medication From an Ampules



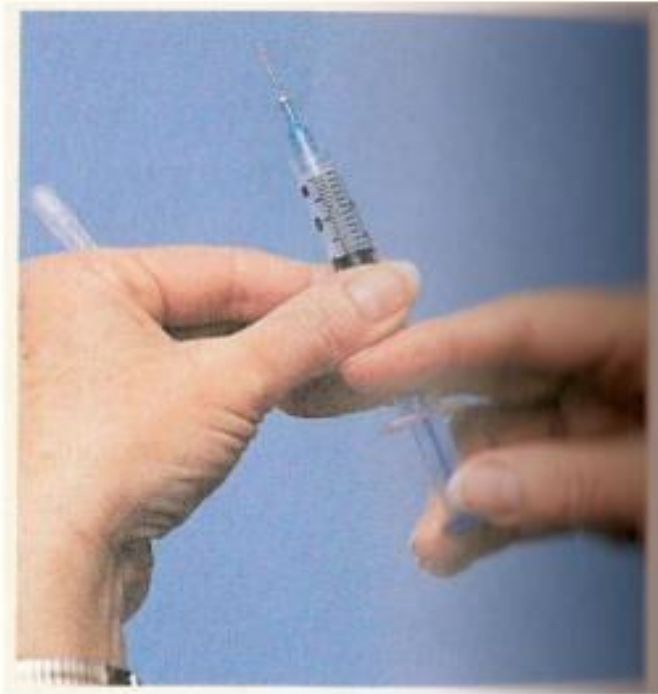
- Uncap the needle and insert the needle into the ampule. Avoid touching the rim with the needle.

# Continue Drawing Up Medication From an Ampules



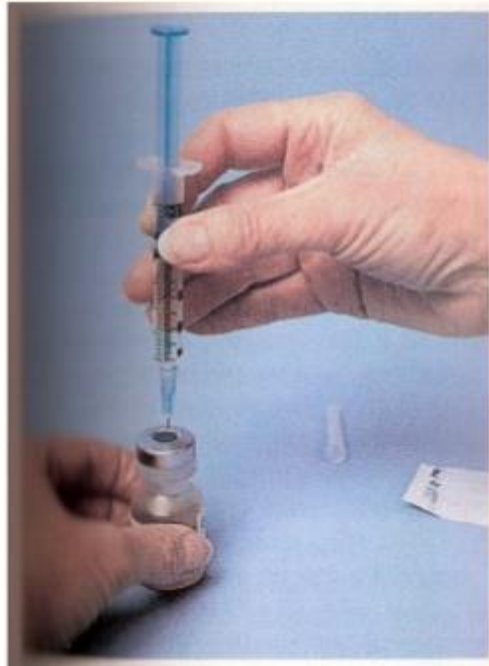
- Invert the ampule, insert the needle into the solution and aspirate.

# Continue Drawing Up Medication From an Ampules



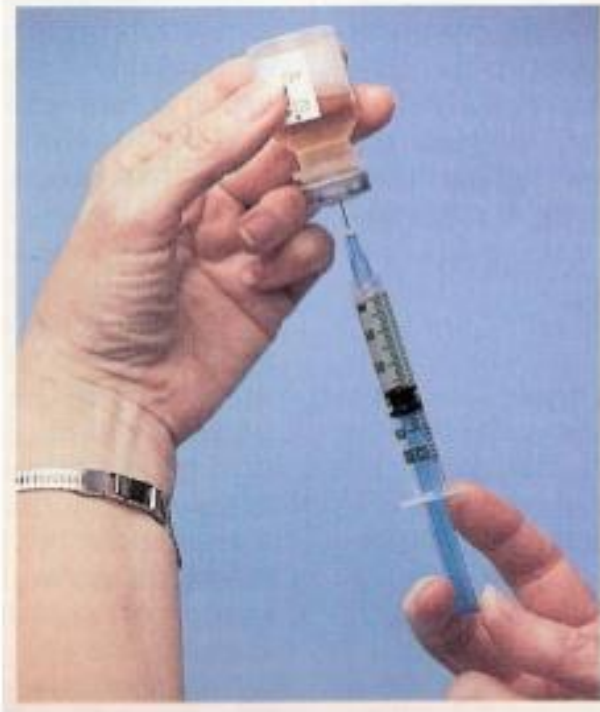
- Remove the needle cap and draw an amount of air into the syringe that is equal to the amount of medication that will be withdrawn from the vial

## Drawing Up Medication From a Vial



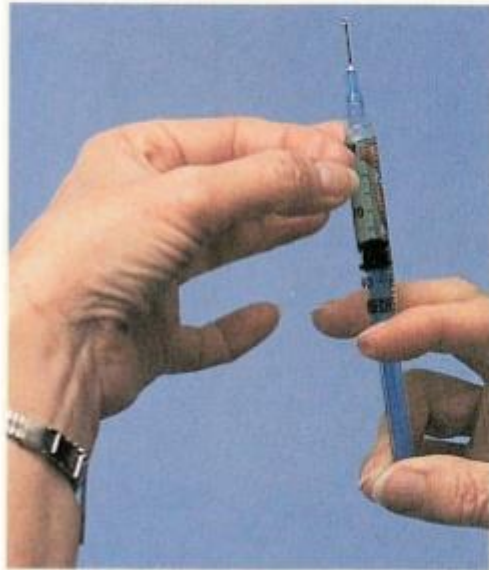
- Insert the needle keeping it above the solution

# Continue Drawing Up Medication From a Vial



- Invert the vial at eye level

# Continue Drawing Up Medication From a Vial



- Hold the needle upright and re-check the syringe's contents for presence of air

# subcutaneous injection

1. A **subcutaneous injection** is a method of **administering** medication. ... In this type of **injection**, a short needle is used to **inject** a drug into the tissue layer between the skin and the muscle. Medication given this way is usually absorbed more slowly than if **injected** into a vein, sometimes over a period of 24 hours.
2. A subcutaneous injection is a method of administering medication. Subcutaneous means under the skin



# Location of injection

- The location of injection is important for subcutaneous injections. The drug needs to be injected into the fatty tissue just below the skin. Some areas of the body have a more easily accessible layer of tissue, where a needle injected under the skin will not hit muscle, bone, or blood vessels.
- The most common injection sites are:
- Abdomen: at or under the level of the belly button, about two inches away from the navel
- Arm: back or side of the upper arm
- Thigh: front of the thigh

# Cont...

- **Medication:** Vials of liquid medication can be single-use or multiuse. Vials can also be filled with a powder to which liquid needs to be added.
- **Syringes:** The needles are short, at 5/8 inches long. The thickness of the needle is usually 25 or 27 gauge. There may be other options for doses more than 1 mL or for children or people with visual impairments.
- **Auto-injector pen:** Some medications are available in a “pen” with a short single-use needle screwed onto the end of a pen-shaped, multiuse vial. The amount of medication needed is then dialed in at the end. As mentioned earlier, emergency medications like epinephrine can also come in this form

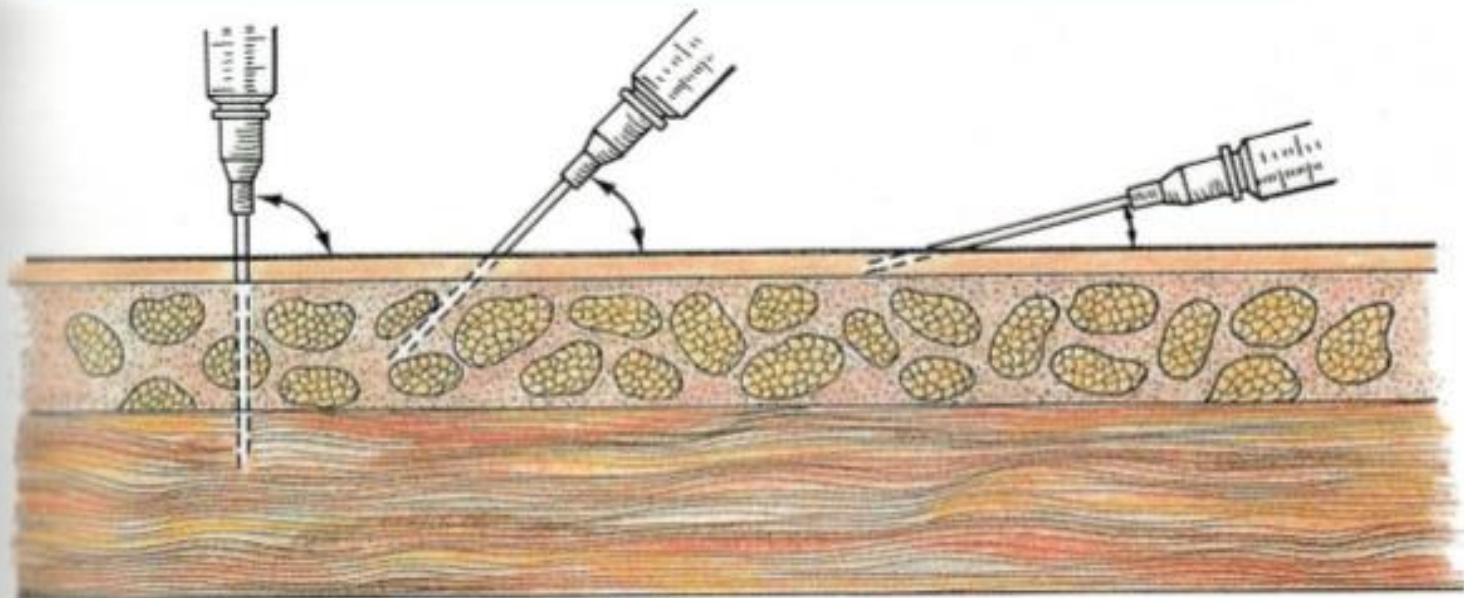


Fig. 35-18 Comparison of the angles of insertion of IM (90 degrees), SQ (45 degrees), and ID (15 degrees) injections.

# complication

- As with any injection procedure, infection at the site of injection is a possibility. Signs of infection at the injection site include:
  - severe pain
  - redness
  - swelling
  - warmth or drainage

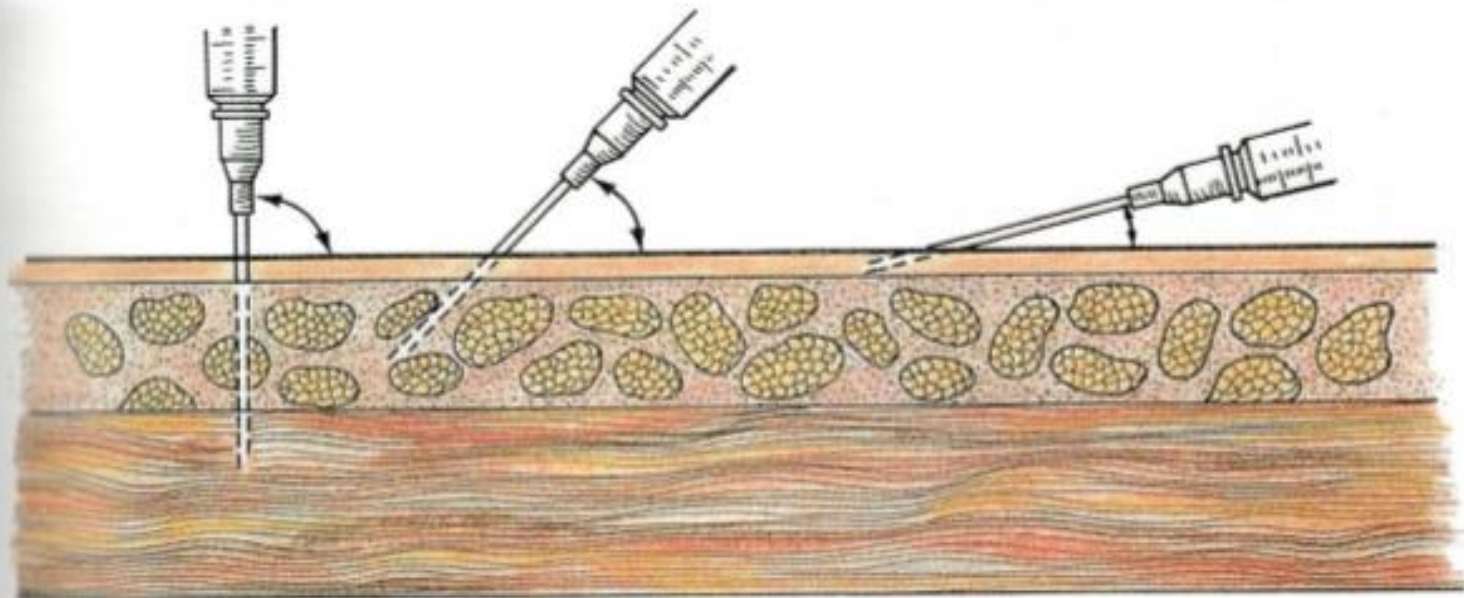
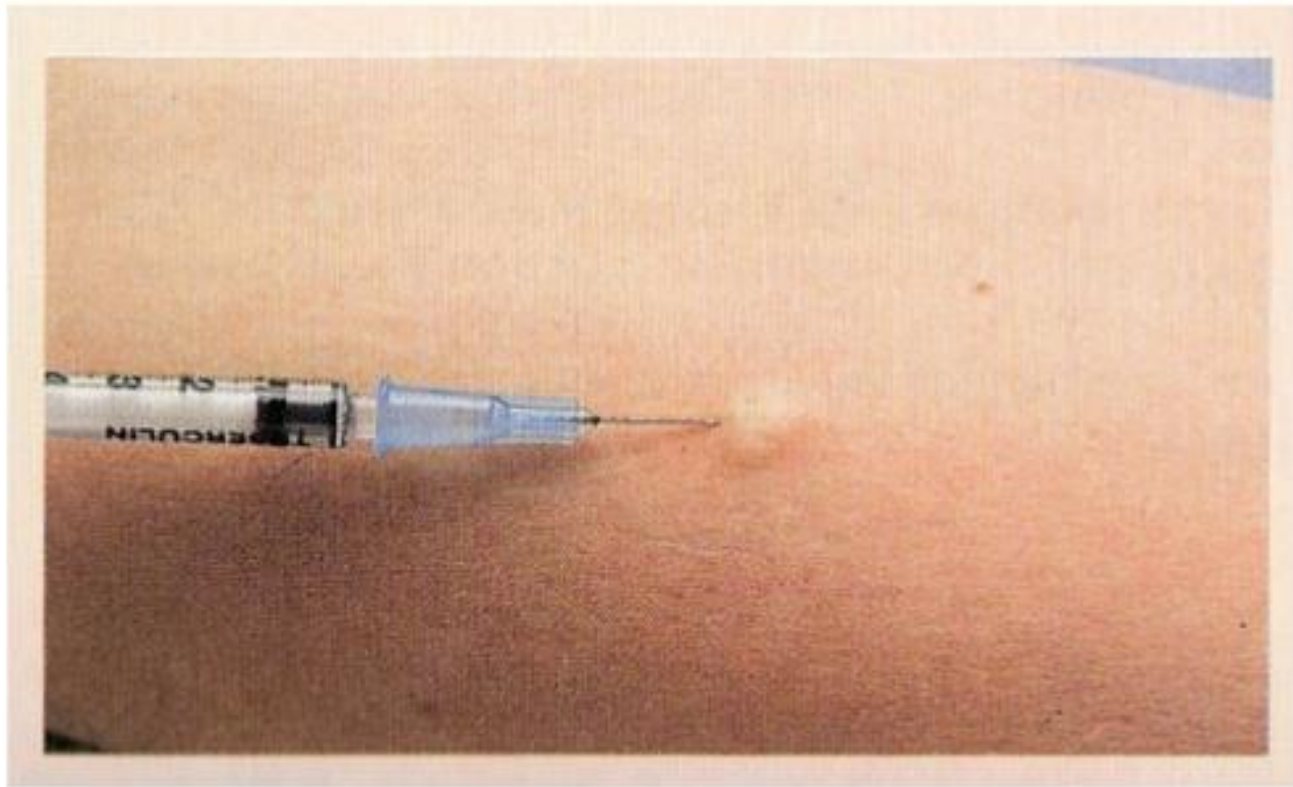


Fig. 35-18 Comparison of the angles of insertion of IM (90 degrees), SQ (45 degrees), and ID (15 degrees) injections.

# Intradermal Injection



# IM INJECTION

- An **intramuscular**, or **IM, injection** is a procedure used to insert medications into the muscle tissue. Some medication cannot be taken by mouth because digestive juices can alter their effects. Others can be very irritating when they go into fatty tissues or veins. IM injections insert medication deep into the muscle, where there is an adequate supply of blood. This facilitates fast absorption and leads to better effects and outcomes.

# SITES OF IM INJECTION

- The **dorsogluteal** injection site is in the upper outer quadrant of the buttock. Be careful to identify the correct location because permanent damage to the body can occur if the injection reaches the sciatic nerve that is close by.
- The **ventrogluteal** injection site is located in the upper side of the hip. It is the preferred site for most IM injections given to adults.



# CONT..

- The **deltoid** injection site is one to two inches below the shoulder region. Many adult vaccinations are administered at this site.
- There are two IM injection sites located in the leg. The **vastus lateralis** is located mid-thigh on the outer side of the leg. The **rectus femoris** is also located mid-thigh, but on the anterior that is 1 and a 1/2 inches or longer is appropriate for someone who has a large body mass, while a needle that is 1/2 - to 1-inch long is appropriate for someone with a smaller body mass

## Dorsogluteal

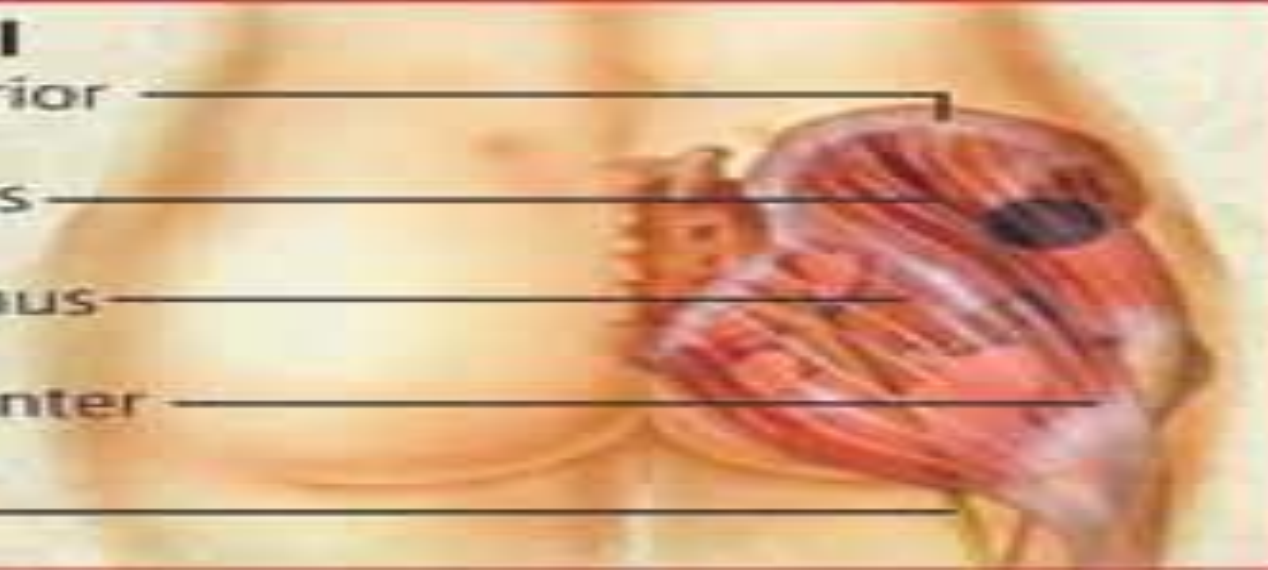
Posterior superior iliac spine

Gluteus medius

Gluteus maximus

Greater trochanter of femur

Sciatic nerve



## Ventrogluteal

Iliac crest

Anterior superior iliac spine

Gluteus medius

Greater trochanter of femur



## Deltoid

Acromial process

Deltoid muscle

Scapula

Deep brachial artery

Radial nerve

Humerus



# ADVANTAGES

- **Intramuscular injections** have other **advantages** too. The muscles have a plentiful supply of blood, which helps ensure that the body absorbs the medication quickly. The tissue in the muscles can also hold more medication than fatty tissue. Doctors administer most injectable vaccines into the muscles

# CONT..

- **1. Simple and Accessible**

The method is simple and very accessible. When injections cannot be administered by doctors or no one trained is around, it is difficult to administer intravenous or even the subcutaneous injections. Intramuscular injections are much easier to administer. Most people can easily access their thigh muscles. One can even access the deltoid or the gluteus muscle.

- **2. Unaided Administering**

There are medical devices available that make administering intramuscular injections easier but one doesn't have to use them. With some intravenous injections and subcutaneous injections, you would depend on some medical devices. You don't need to find a vein or the exact depth of the fat inside the skin.

- **3. Imperative for Many**

Intramuscular injections are necessary to administer some vaccines and many drugs including immunoglobulins. You cannot administer these as subcutaneous or intravenous injections. Intramuscular injections can supply a larger volume of the drug or fluid. The intake is much more since muscles have a larger capacity than the veins. Since the medicine is not directly getting into the bloodstream, there is a sustained release which can have a desired effect in certain cases. Not everyone or every condition benefits from an instant release of a medicine into the bloodstream.

# DISADVANTAGES

- **1. Can be Ineffective**

Intramuscular injections can be futile if the exact site where it is administered is not conducive to the ready absorption of the drug. Absorption is anyway poor with intramuscular injections, especially when compare with intravenous injections, so wrong choice of site can easily lead to wastage.

- **2. Side Effects**

Intramuscular injections have quite a few side effects. General discomfort is quite common. One may also experience severe pain where injected, numbness and tingling are common too, swelling and redness would certainly occur if the administration was not gentle, there can be drainage at the site, bleeding is possible and there can be allergies depending on the drug as well as the person's vulnerability to various allergens.

# COMPLIICATION

- **Complications** with **IM** include muscle atrophy, injury to bone, cellulitis, sterile abscesses, pain, and nerve injury .

## When to Aspirate (IM & SC injection)

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The reason for aspiration before injection a medication is to ensure that the needle is not in a blood vessel. If blood appears in the syringe, withdraw the needle, discard the syringe, and prepare a new injection.

## When Not To Aspirate

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When administering SC heparin/ insulin, it is recommended that you do NOT aspirate. Because of the anticoagulant properties of heparin, aspiration could damage surrounding tissue and cause bleeding and bursting.



# Subcutaneous Injection Sites



Injecting subcutaneous heparin in the abdomen.

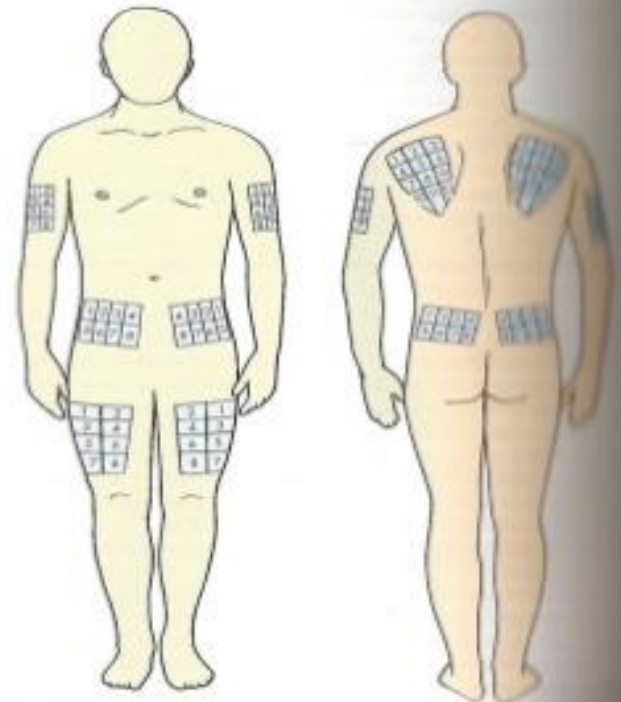
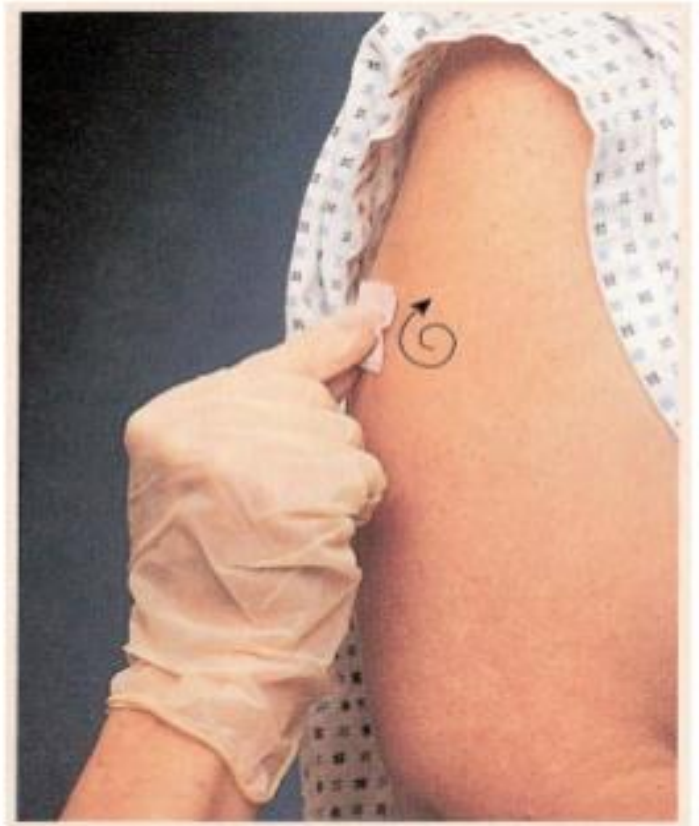


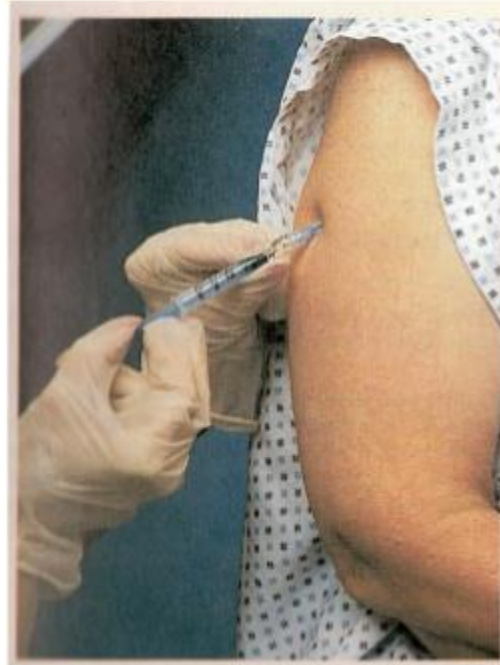
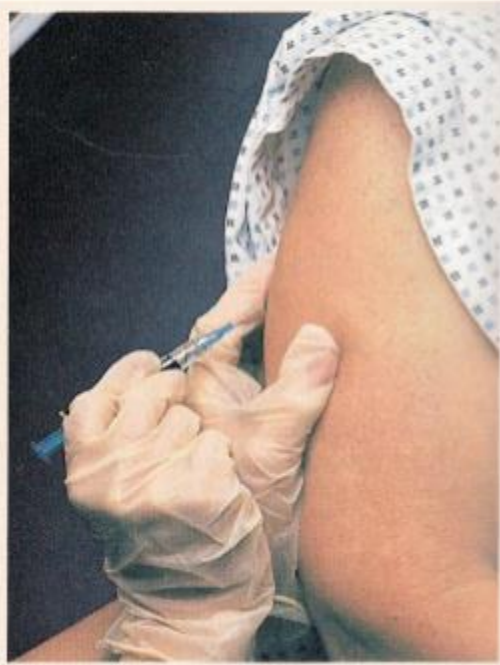
Fig. 35-17 Common site for subcutaneous injections. How sites may be rotated.

# Subcutaneous Injection

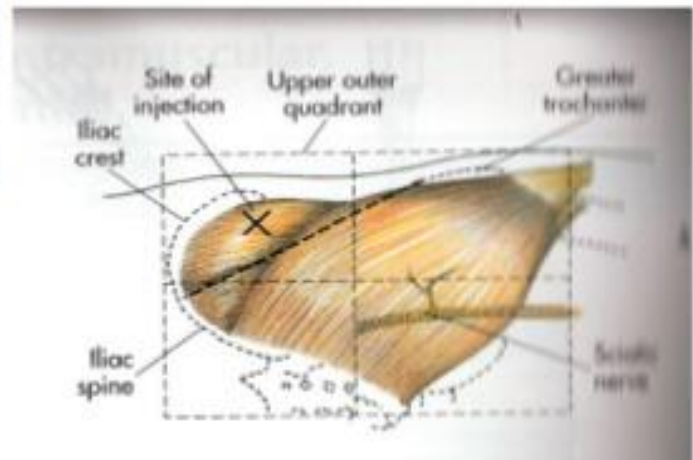
- Assist client to comfortable position
- Apply alcohol swab and rotate outward in circular direction



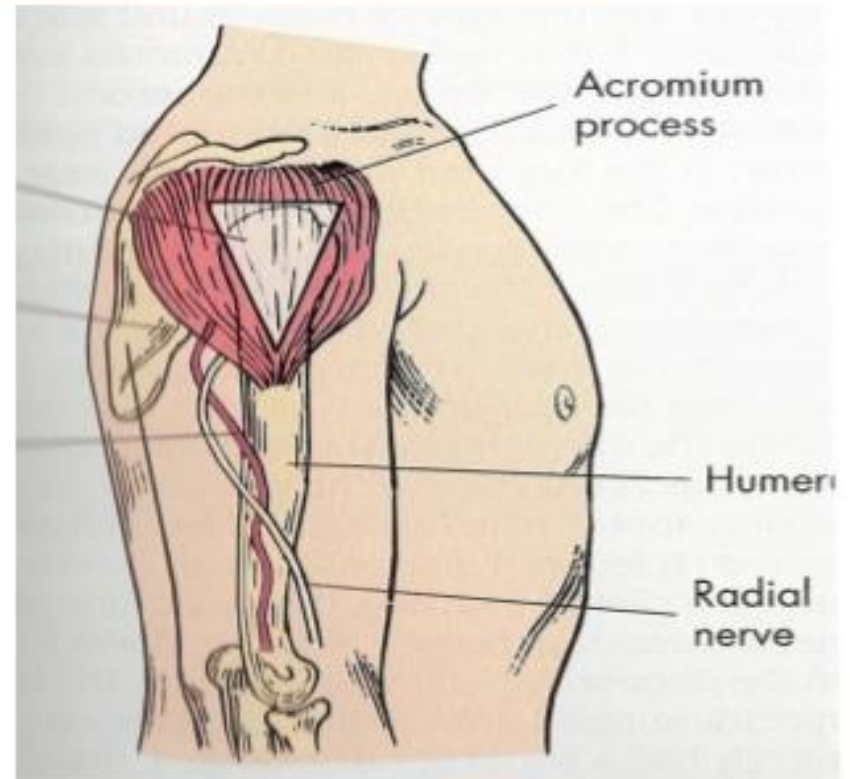
# Subcutaneous Injection



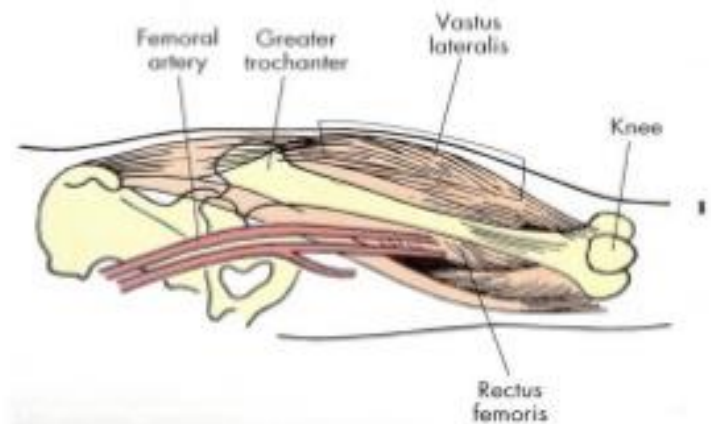
# Intramuscular Injection



# Intramuscular Injection



# Intramuscular Injection



# Intradermal Administration

- Used for allergy and tuberculin skin testing
- Site: inner forearm (may use back and upper chest)
- Volume: 0.01-0.05 ml
- Equipment: gloves, TB syringe (1ml, 25-27g,  $\frac{5}{8}$  or  $\frac{1}{2}$  inch needle), alcohol swab.
- Administration angle: 10-15°

# Intradermal Administration



- ✓ Prepare medication
- ✓ Gather supplies
- ✓ Identify site
- ✓ Don gloves
- ✓ Cleanse site with alcohol
- ✓ Pull skin taut
- ✓ Insert needle with bevel up at 10-15 degree angle  $\frac{1}{8}$  inch.
- ✓ Needle should be visible under skin



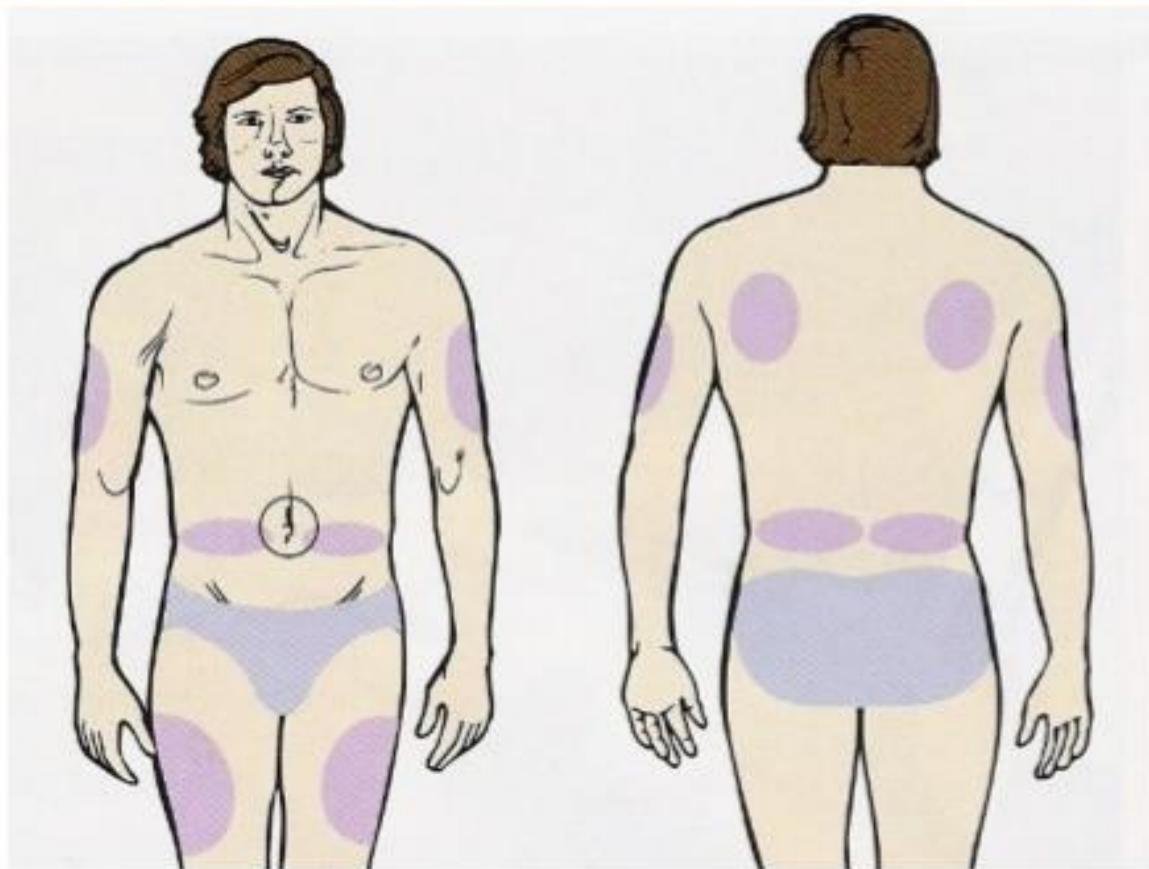
# Intradermal Administration

- ✓ Push plunger to instill medication creating a wheal under skin
- ✓ Withdraw needle at same angle inserted.
- ✓ Cover site with gauze for bleeding. DO NOT massage.
- ✓ DO NOT RECAP. Activate safety feature. Place needle in sharps container uncapped.

# Subcutaneous Administration

- Administered into subcutaneous tissue that lies between the skin and the muscle.
- Common subcutaneous injections are **heparin, lovenox and insulin**
- Onset: within a half hour
- Volume: up to 1ml
- Equipment: TB or Insulin syringe (25-27g, ½ to ⅝ inch needle), gloves, alcohol swab.
- Administration Angle: 45° or 90 °

# Subcutaneous Administration



# Subcutaneous Administration

- ✓ Prepare medication
- ✓ Gather supplies
- ✓ Identify site
- ✓ Don gloves
- ✓ Cleanse site with alcohol
- ✓ Bunch the skin
- ✓ Hold needle like “dart”



# Subcutaneous Administration

- ✓ Pierce skin with quick motion at 45-90 degree angle.
- ✓ DO NOT ASPIRATE.
- ✓ Inject medication slowly
- ✓ Quickly remove needle
- ✓ DO NOT RECAP. Activate safety feature. Place needle in sharps container uncapped.

# Intramuscular Administration

- Administered into a muscle or muscle group
- Onset: variable
- Volume: up to 4ml
- Equipment: gloves, 1-5 ml syringe, needle (18-23 g,  $\frac{5}{8}$  to 3 inch needle), alcohol swab
- **RN is responsible to chose needle size and gauge.**
- Administration angle: 90°

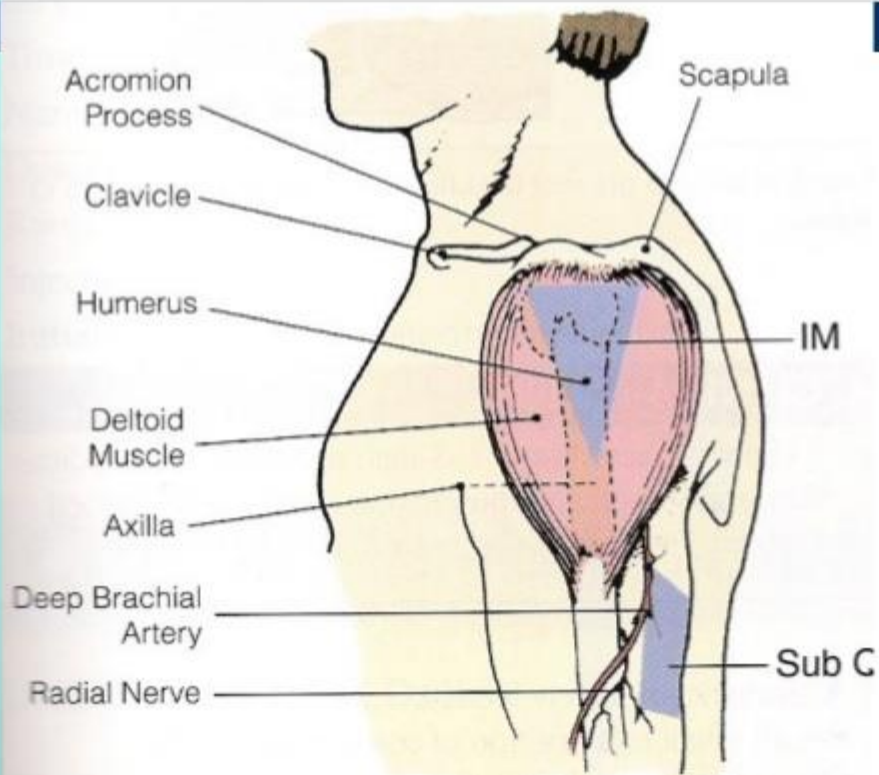


# Intramuscular Administration Deltoid

- Palpate lower edge of acromion process.
- Place 4 fingers across the deltoid muscle with the top finger along the acromion process. This forms the base of a triangle.
- Draw an imaginary line at the axilla. This forms the apex of the triangle.
- **Injection site is the center of the triangle, 3 finger widths (1-2 inches) below the acromion process.**



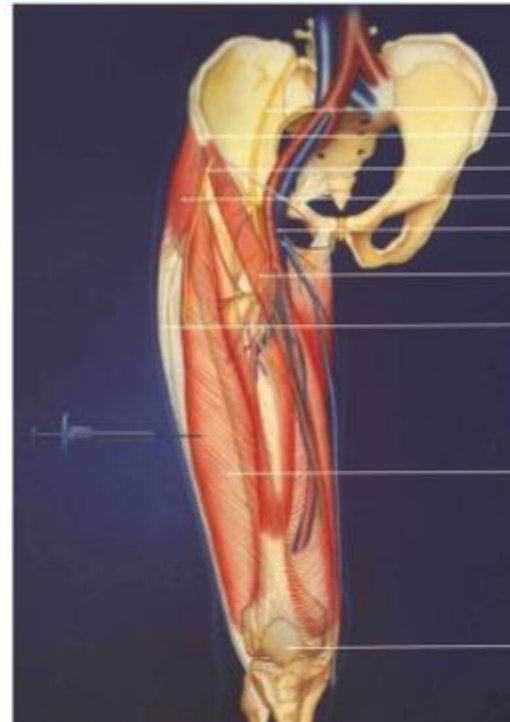
# Deltoid Injection Site





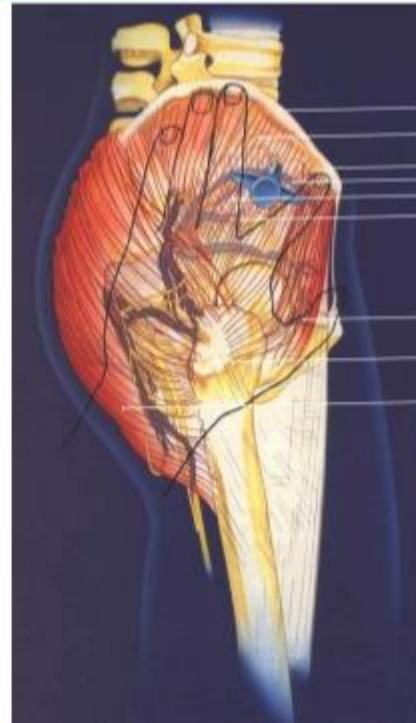
# Intramuscular Administration Vastus Lateralis

- One hand above the knee.
- One hand below the greater trochanter.
- Locate midline of anterior thigh and midline of lateral thigh.
- **Injection site is the lateral area of the thigh**



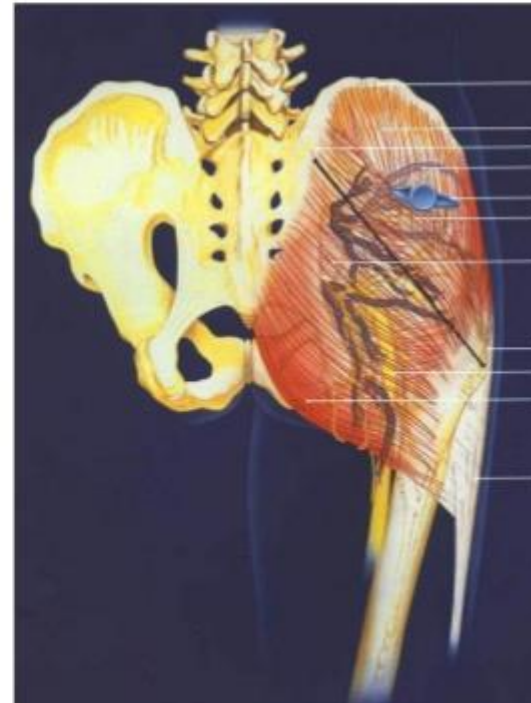
# Intramuscular Administration Ventral Gluteal

- Palm of hand on greater trochanter of femur.
- Index finger on anterior superior iliac spine (hip bone).
- Middle finger extended toward iliac tubercle.
- **Injection site lies within the triangle formed by the index and middle fingers**



# Intramuscular Administration Dorsal Gluteal

- Locate the posterior iliac spine.
- Locate the greater trochanter.
- Draw an imaginary line between these two landmarks.
- **Injection site is above and lateral to the line.**
- **Most dangerous site because of sciatic nerve location**



# Procedure

## Intramuscular Administration

- ✓ Prepare medication
- ✓ Gather supplies
- ✓ Identify site
- ✓ Don gloves
- ✓ Cleanse site with alcohol
- ✓ Pull skin taut
- ✓ Hold needle like “dart”
- ✓ Insert quickly at a 90° angle

# Intramuscular Administration

- ✓ Stabilize needle
- ✓ **Aspirate for blood**
- ✓ If no blood, instill medication slow and steady
- ✓ Quickly remove needle.
- ✓ **DO NOT RECAP.** Activate safety feature.  
Place needle in sharps container uncapped.
- ✓ Massage site with alcohol swab
- ✓ Remove gloves

# Z-track method

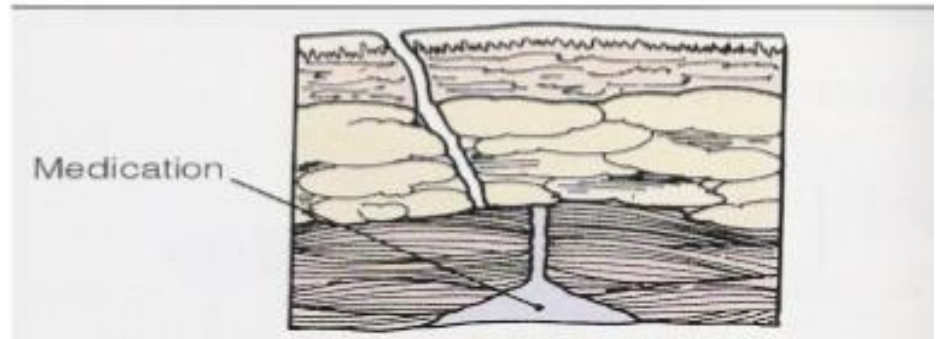
- The **Z-track** method is a type of IM injection technique used to prevent **tracking** (leakage) of the **medication** into the subcutaneous tissue (underneath the skin). ...

This zigzag **track** line is what

Prevents **medication** from leaking from the muscle into surrounding tissue.

# Z-track IM Administration

- Method used with irritating medications
  - Vistaril
  - Iron
- Used to “trap” medication in muscle and prevent “tracking” of solution through tissues.



# Z-track IM Administration

- ✓ Prepare medication
  - ✓ Change needle after drawing up medication
- ✓ Gather supplies
- ✓ Identify site
- ✓ Don gloves
- ✓ Cleanse site with alcohol
- ✓ Displace skin laterally 1-1 ½ inches from injection site
- ✓ While holding skin, insert needle with a darting motion, at a 90° angle.





# Z-track IM Administration

- ✓ Stabilize needle with thumb and forefinger.
- ✓ **Aspirate.**
- ✓ If no blood, then inject medication slowly and steady
- ✓ Wait 10 seconds
- ✓ Quickly withdrawal needle
- ✓ Then release skin
- ✓ Cover site with swab and DO NOT MASSAGE
- ✓ DO NOT RECAP. Activate safety feature. Place needle in sharps container uncapped
- ✓ Remove gloves

# Special consideration during parental injection

[special consideration parental injection.docx](#)

# IV INJECTION

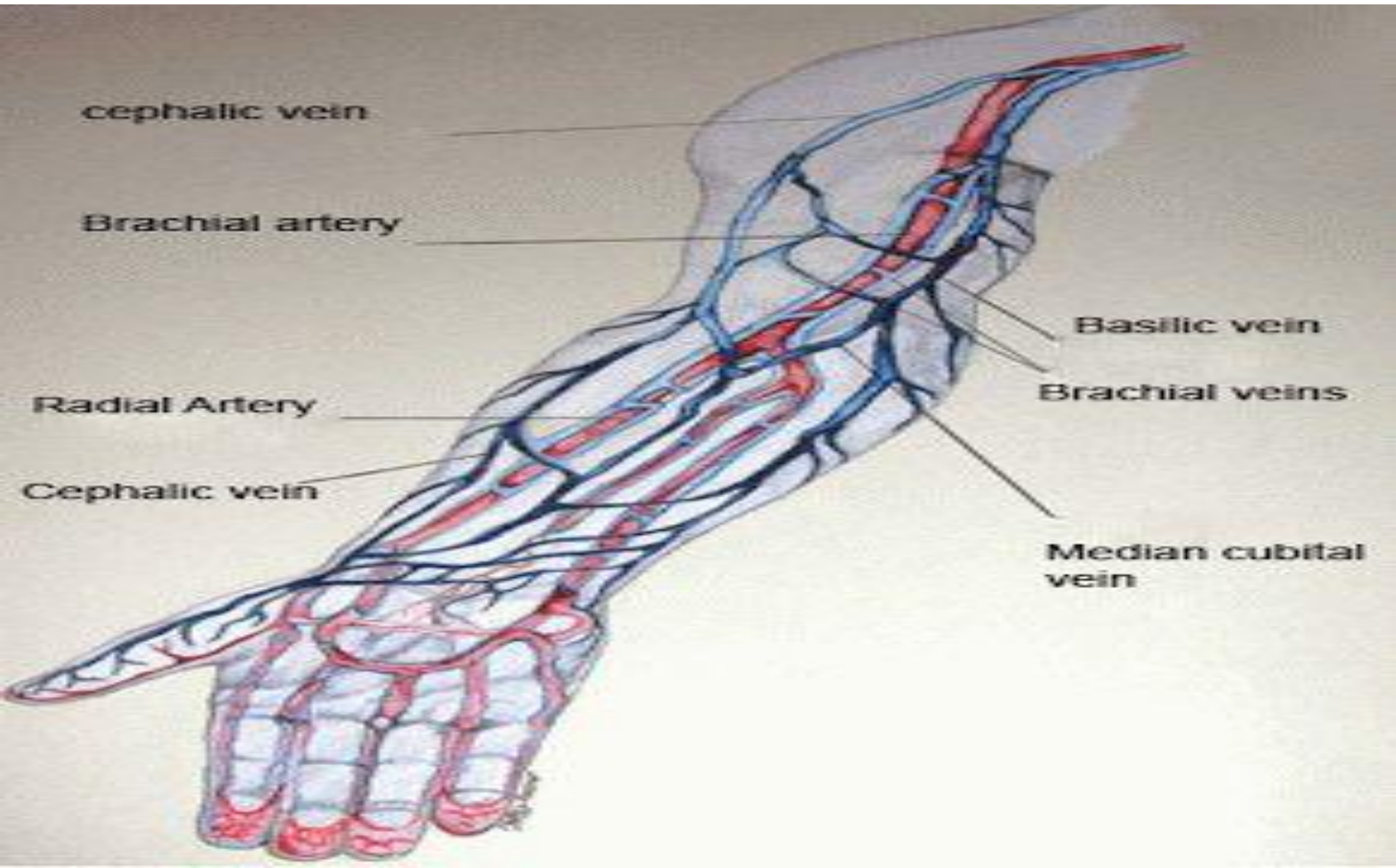
- Intravenous fluid regulation is the control of the amount of fluid receive intravenously, or through bloodstream. The fluid is given from a bag connected to an intravenous line. This is a thin tube, often called an IV, that's inserted into one of veins.
- **intravenous injection** an injection made into a vein. Intravenous injections are used when rapid absorption is called for, when fluid cannot be taken by mouth, or when the substance to be administered is too irritating to be injected into the skin or muscles. In certain diagnostic tests and x-ray examinations a drug or dye may be administered intravenously.

# PURPOSE

There are several reasons why you might need to have fluids administered intravenously. For instance, some treatments rely on IV delivery. These include:

- **rehydration after becoming dehydrated from illness or excessive activity**
- **treatment of an infection using antibiotics**
- **cancer treatment through chemotherapy drugs**
- **management of pain using certain medications**
- **Fluids for such treatments consist of water with electrolytes, sugar, or medications added in concentrations that depend on need.**
- **The rate and quantity of intravenous fluid given depends on medical condition, body size, and age. Regulation ensures the correct amount of fluid drips from a bag down the IV into vein at the correct rate. Complications can result from receiving too much too quickly, or not enough too slowly.**

# SITE OF IV INJECTION



# Types of intravenous fluid regulation

There are two ways to regulate the amount and rate of fluids given during intravenous therapy:

1. Manually and
2. Using an electric pump

## *The equipment:*

- **Infusion set.**
- **Container of solution**
- **IV stand.**
- **Adhesive tape.**
- **Clean gloves.**
- **Tourniquet**
- **Antiseptic swabs**
- **Intravenous catheter.**
- **Sterile gauze.**
- **Towel or pad**
- **Electronic infusion device or pump.**



# Cont





# INTRAVENOUS CANNULATION

# Cannulation

“The aim of intravenous management is safe, effective delivery of treatment without discomfort or tissue damage and without compromising venous access, especially if long term therapy is proposed”

# Cannulation

3

## **Indications:**

- Fluid and electrolyte replacement
- Administration of medicines
- Administration of blood/blood products
- Administration of Total Parenteral Nutrition
- Haemodynamic monitoring
- Blood sampling

# Cannulation

1

## **Advantages**

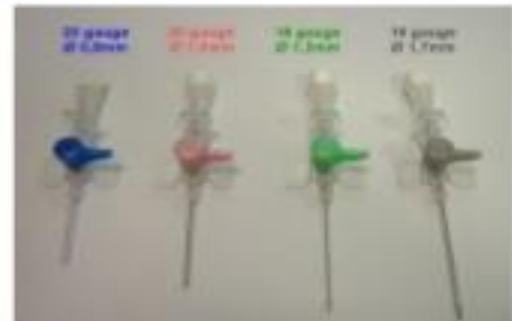
- Immediate effect
- Control over the rate of administration
- Patient cannot tolerate drugs / fluids orally
- Some drugs cannot be absorbed by any other route
- Pain and irritation is avoided compared to some substances when given SC/IM

# Cannulation

5

## **What equipment do you need?**

- Dressing Tray - ANTT
- Non Sterile Gloves / Apron
- Cleaning Wipes
- Gauze swab
- IV cannula (separate slide)
- Tourniquet
- Dressing to secure cannula
- Alcohol wipes
- Saline flush and sterile syringe or fluid to be administered
- Sharps bin



# Cannulation

## **Preparation:**

- Consult with patient
- Give explanation
- Gain consent
- Position the patient appropriately and identify the non-dominant hand / arm
- Support arm on pillow or in other suitable manner.
- Check for any contra-indications e.g. infection, damaged tissue, AV fistula etc.

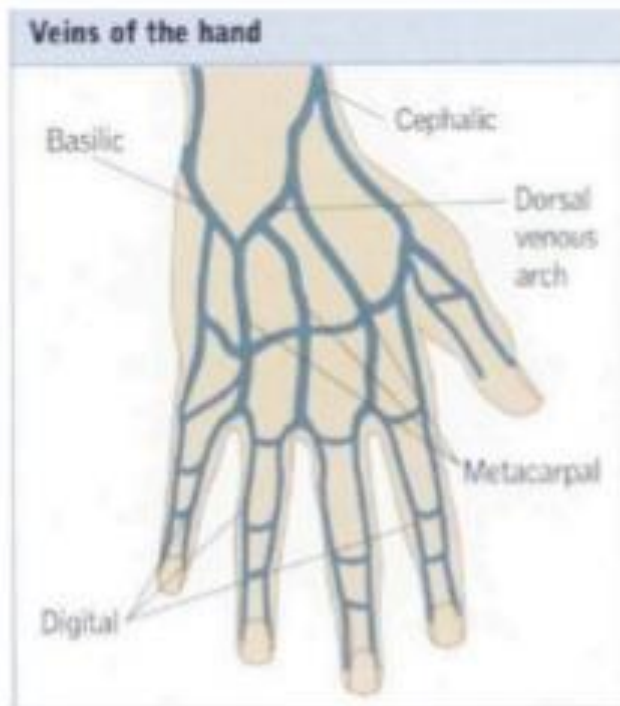
# Cannulation

## **Encourage venous filling by:**

- Correctly applying a tourniquet (A tourniquet should be applied to the patient's upper arm. The tourniquet should be applied at a pressure which is high enough to impede venous distension but not to restrict arterial flow)
- Opening & closing the fist
- Lowering the limb below the heart

# Site Choice

- Identify a suitable vein





# Cannulation

- What are the signs of a good vein ?
  - Bouncy
  - Soft
  - Above previous sites
  - Refills when depressed
  - Visible
  - Has a large lumen
  - Well supported
  - Straight
  - Easily palpable

# Cannulation

- What veins should you avoid ?
  - Thrombosed / sclerosed / fibrosed
  - Inflamed / bruised
  - Thin / Fragile
  - Mobile
  - Near bony prominences
  - Areas or sites of infection, oedema or phlebitis
  - Have undergone multiple previous punctures
  - Do not use if patient has IV fluid in situ

# Cannulation



## **Procedure**

- Wash hands prepare equipment ANTT
- Remove the cannula from the packaging and check all parts are operational
- Loosen the white cap and gently replace it
- Apply tourniquet
- Identify vein
- Clean the site over the vein with alcohol wipe, allow to dry

# Cannulation

- Remove tourniquet if not able to proceed
- Put on non-sterile gloves
- Re-apply the tourniquet, 7-10 cm above site
- Remove the protective sleeve from the needle taking care not to touch it at any time
- Hold the cannula in your dominant hand, stretch the skin over the vein to anchor the vein with your non-dominant hand (Do not re palpate the vein)

# Cannulation

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- Insert the needle (**bevel side up**) at an angle of 10-30° to the skin (this will depend on vein depth.)
- Observe for blood in the flashback chamber



# Cannulation

- Lower the cannula slightly to ensure it enters the lumen and does not puncture exterior wall of the vessel
- Gently advance the cannula over the needle whilst withdrawing the guide, noting secondary flashback along the cannula
- Release the tourniquet

# Cannulation

15

- Apply gentle pressure over the vein (beyond the cannula tip) remove the white cap from the needle



# Cannulation

- Remove the needle from the cannula and dispose of it into a sharps container
- Attach the white lock cap
- Secure the cannula with an appropriate dressing



# Cannulation

17

- Flush the cannula with 2-5 mls 0.9% Sodium Chloride or attach an IV giving set and fluid



# Cannulation

18

## **Finally**

- Document the procedure including
  - Date & time
  - Site and size of cannula
  - Any problems encountered
  - Review date (cannula should be in situ no longer than 72 hours without appropriate risk assessment.)
  - Note: some hospitals have pre-printed forms to record cannula events
  
- Thank the patient
  
- Clean up, dispose of rubbish

# Cannulation

- **Possible Complications:**
- The intravenous (IV) cannula offers direct access to a patient's vascular system and provides a potential route for entry of micro organisms into that system. These organisms can cause serious infection if they are allowed to enter and proliferate in the IV cannula, insertion site, or IV fluid.

# Cannulation

- **IV-Site Infection:** Does not produce much (if any) pus or inflammation at the IV site. This is the most common cannula-related infection, may be the most difficult to identify



# Cannulation

21

- **Cellulites:** Warm, red and often tender skin surrounding the site of cannula insertion; pus is rarely detectable.



# Cannulation

- **Infiltration** or tissuing occurs when the infusion (fluid) leaks into the surrounding tissue. It is important to detect early as tissue necrosis could occur – re-site cannula immediately



# Cannulation

- **Thrombolism /thrombophlebitis** occur when a small clot becomes detached from the sheath of the cannula or the vessel wall – prevention is the greatest form of defence. Flush cannula regularly and consider re-siting the cannula if in prolonged use.



# Cannulation

21

- **Extravasation** is the accidental administration of IV drugs into the surrounding tissue, because the needle has punctured the vein and the infusion goes directly into the arm tissue. The leakage of high osmolarity solutions or chemotherapy agents can result in significant tissue damage and other complications





# Cannulation

- **Bruising** commonly results from failed IV placement - particularly in the elderly and those on anticoagulant therapy.



# Cannulation

- **Air embolism** occurs when air enters the infusion line, although this is very rare it is best if we consider the preventive measures –  
Make sure all lines are well primed prior to use and connections are secure

# Cannulation

- **Haematoma** occurs when blood leaks out of the infusion site. The common cause of this is using cannula that are not tapered at the distal end. It will also occur if on insertion the cannula has penetrated through the other side of the vessel wall – apply pressure to the site for approximately 4 minutes



# Cannulation

- **Phlebitis** is common in IV therapy and can be caused in many ways. It is inflammation of a vein (redness and pain at the infusion site) – prevention can be using aseptic insertion techniques, choosing the smallest gauge cannula possible for the prescribed treatment, securing the cannula properly to prevent movement and carrying out regular checks of the infusion site.

# SPECIAL CONSIDERATION FOR IM INJECTION

- Ensure the patient's position for injection is not contraindicated by a medical condition (e.g., circulatory shock, surgery).
- Always wear gloves to administer injections. Although policy may vary from place to place, the CDC recommends wearing gloves if there is potential for contact with blood and body fluid.
- **If required by agency policy, aspirate for blood prior to administering an IM medication.**
- Upon injection, if a patient complains of radiating pain or a burning or a tingling sensation, remove the needle and discard.
- Take all necessary steps to avoid interruptions and distractions when preparing and administering medications.
- If a patient expresses concern or questions the medication, always stop and explore the patient's concerns by verifying the order.
- NEVER recap needles after giving an injection. Apply the safety shield and dispose in the closest sharps container.

# CONT.

- Ensure the patient's position for injection is not contraindicated by a medical condition (e.g., circulatory shock, surgery).
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# SPECIAL CONSIDERATION FOR IV INJECTION

- **From TNI BOOK**

# Cont...

- [CLINICAL PROCEDURES FOR SAFER PATIENT CARE.docx](#)



## **Parenteral administration of medicine**

- Parenteral therapy means giving of therapeutic agent including food outside the alimentary tract.
- Types of parenteral routes: Intra dermal, subcutaneous, Intra Muscular, Intravenous, etc)

### **Purposes:**

- To get rapid and systemic effect of the drug
- To provide needed effect when the patient unconscious, unable to swallow due to neurological or surgical alterations.
- To give nourishment when it cannot taken by mouth

## **Nurses responsibility in administration of parenteral medications**

- **Check the physician's orders for the type of injections , dosage, and the route of administration**
- **Check the diagnosis and age of the patients**
- **Check the purpose of injections**
- **Check the necessity for giving test dose.**
- **Check the form of the medication available and the correct method of administration.**
- **The nurse must have the knowledge of anatomy and physiology of the body is essential and safe administration of medication parenteral route.**

# Ethical and legal aspects in drug administration.

- A moral as well as legal dimension is involved in the administration of medications.
- “Nurses are responsible for their actions”
- Under the law nurses are responsible for their own actions regardless of a written order. It is expected to know all nurses the minimum and the maximum dose of every medicine that she administer. If a nurse gives an Inj.pethadine 500mg to a patient instead 50mg , the nurse is responsible for the harm, she cannot justify her deed spite of a written order for the same dosage.
- The nurses responsibility includes to monitor medication errors by observing seven rights of giving medication.
- The nurse must follow the own institutional policy(leaving medicine in the bedside strictly prohibited)

# CLIENT'S RIGHT RELATED TO MEDICATION ADMINISTRATION ,CONT

- The patient has the right to considerate and respectful care, and the right to refuse the medication,
- To be informed of the medication's name, purpose, action, and potential undesired effects,
- To refuse a medication regardless of the consequences
- To have a qualified nurses or physicians assess medication history, including allergies
- To be properly advised of the experimental nature of medication therapy and to give written consent for its use
- To receive appropriate supportive therapy in relation to medication therapy
- To not receive unnecessary medications.

# Medication safety guidelines

- Medications are not given without physician's written orders.
- Do not administer a drug about which any doubt exists, check further with the physician.
- Labels must be clear if not return to pharmacy.
- A nurse not to pour medication to one bottle to another, not to put a medicine back into bottle, Nurses are not authorized to re-label medication bottles, Medication which loses its label or which lacks a legible label shall be return to the pharmacy

# CONT.

- Nurse who administer the medications are responsible for their own action. Question any order that you considered incorrect (may be unclear or inappropriate)
- Be knowledgeable about the medication that you administer
- Keep the Narcotics in locked place.
- Use only medications that are in clearly labeled containers.
- Return liquid that are cloudy in colour to the pharmacy
- Before administering medication, identify the client correctly
- The nurse who prepares the drug administers it.. Only the nurse prepares the drug knows what the drug is.
- If the client vomits after taking the medication, report this to the nurse in-charge or physician.

# CONT.

- Preoperative medications are usually discontinued during the postoperative period unless ordered to be continued.
- When a medication is omitted for any reason, record the fact together with the reason.
- When the medication error is made, report it immediately to the nurse in-charge or physician. To implement necessary measures immediately. This may prevent any adverse effects of the drug.
- Each nurse should know the common dose, maximum dose, how to compute dosage if necessary.
- Do not leave the medication at the bedside. Stay with the client until he takes the medications.
- Prepare medications for one patient at a time.
- Do not label the medicine by patient room number or bed number .

# CONT.

- **Know and follow institutional policy and procedures**
- Look up what you do not know
- Chart carefully
- Listen to the patient “I never took that before” and the like
- Check ,Double – check when a dose seems high.
- Narcotics are to be checked by every shift, and the narcotic cabinet must be locked
- Follow the universal safeguards in administration of medications.
- Always check patient ID before administering medications.
- Chart the medication after administration, if it is not charted , it is not done.
- Chart if any nursing action done before administering( apical heart rate, B.P, )
- Check for the expected effect(therapeutic) of the drug. Did side effects or adverse effects occur perform indicated nursing actions . Record observations.



# Patient & Family Education

- Name dose and action of the drug.
- Time of administration
- Special storage and preparation of the drug
- Specific OTC drugs and alternate
- Special comfort and safety reasons
- Specific points about drug toxicity
- Specific warning about drug discontinuation.

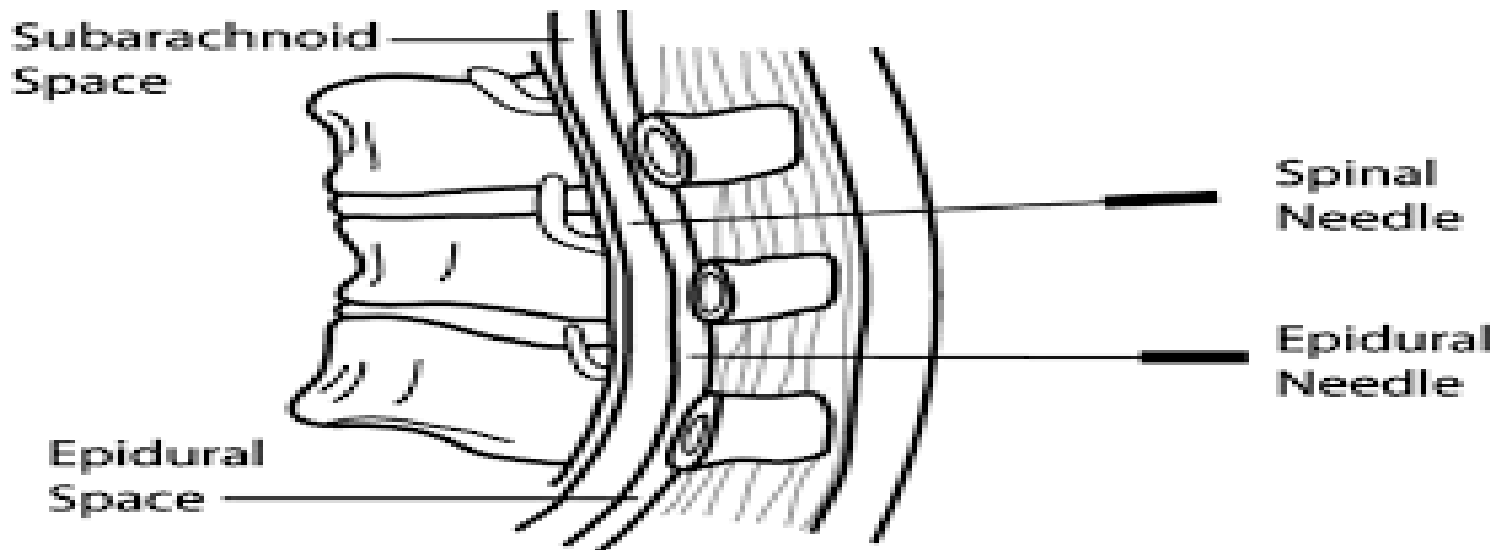


- **ADVANCED TECHNIQUES INJECTION**

**Modern injection** systems reach very high **injection** pressures, and utilize sophisticated electronic control methods.

# Epidural

- **definition of epidural** : an **injection** of a local anesthetic into the space outside the dura mater of the spinal cord in the lower back region to produce loss of sensation especially in the abdomen or pelvic region.



# EPIDURAL

## 1. Patient preparation

- Nurse Prehydration
- Non-particulate antacid Monitors Position Preparation Emergency equipment, O2

## 2. Procedure

1. Informed consent

2. Monitoring during analgesia induction :

B P/1–2 m for 15 m

verbal communication

Maternal HR.

FHR

3. Hydration: 500 to 1000 mL of L R

4. Position: lateral decubitus or sitting

5. The epidural space: identified with a loss-of- resistance

6. E catheter is threaded 3–5 cm into the E space.

7. Test dose: 3 mL of 1.5% lidocaine with 1:200,000 epinephrine is injected after careful aspiration & after uterine contraction {minimizes the chance of confusing tachycardia that results from labor pain with tachycardia from IV injection of the test dose}.

8. If the test dose is negative: one or two 5-mL doses of 0.25% bupivacaine are injected to achieve a cephalad sensory T10 level.

## Cont..

Assess the block: After 15–20 m loss of sensation to cold or pinprick.

- No block : Catheter is replaced.
- Block is asymmetrical: Catheter is withdrawn 0.5–1.0 cm Additional 3–5 mL of 0.25% bupivacaine is injected.
- Block inadequate: Catheter is replaced.

**Position:** lateral or semilateral position {avoid aortocaval compression}.

Observation

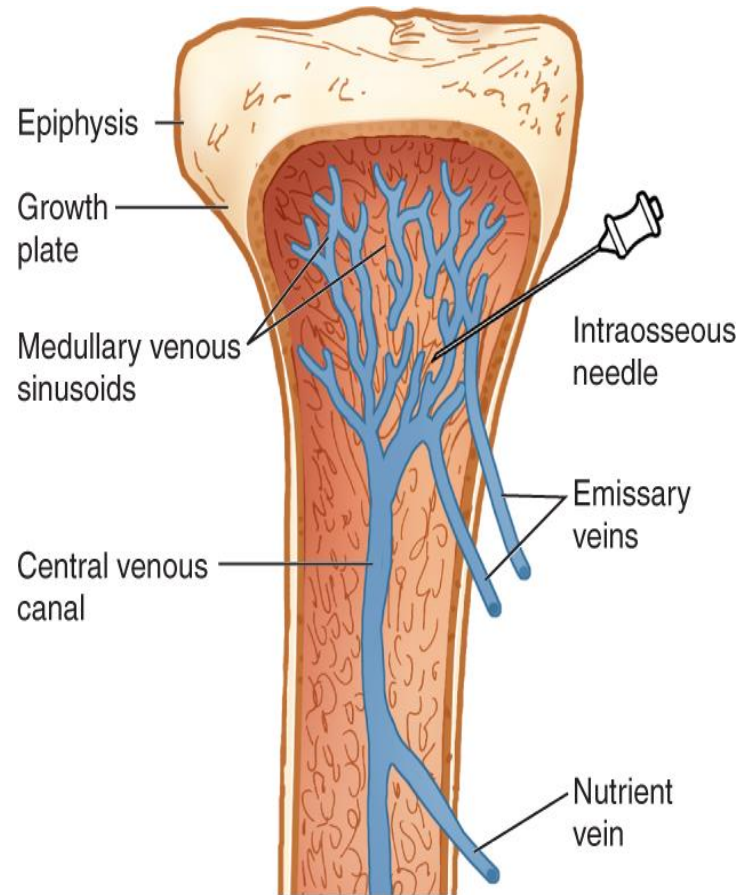
- Maternal BP: /5–15 min.
- FHR: continuously.
- Level of analgesia & intensity of motor block: hourly.

## Cont..

- **Intrathecal administration** is a route of administration for drugs via an **injection** into the spinal canal, or into the subarachnoid space so that it reaches the cerebrospinal fluid (CSF) and is useful in spinal anaesthesia, chemotherapy, or pain management applications.

# CONT..

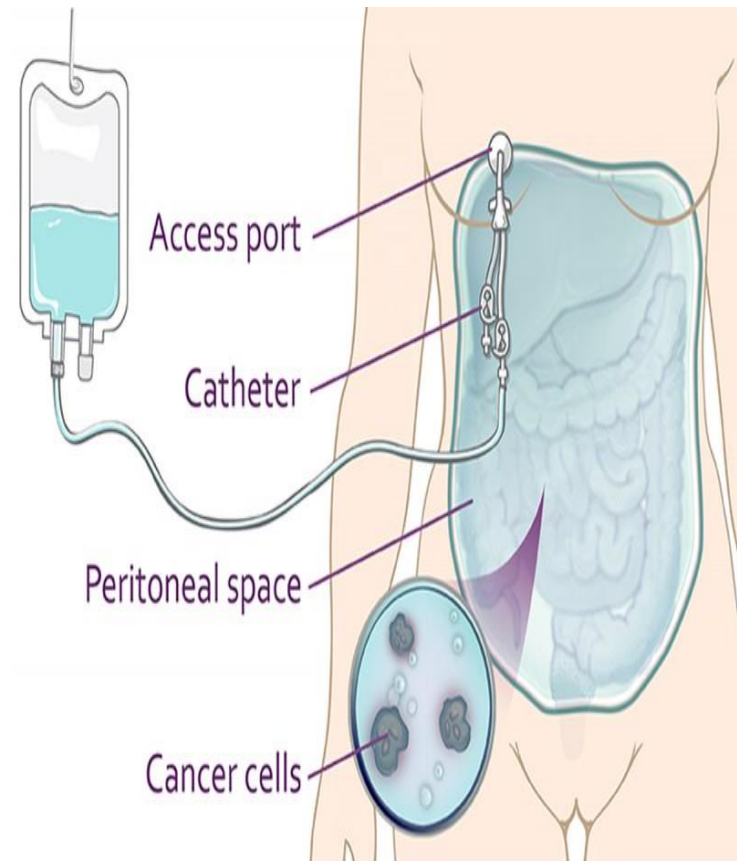
- **Intraosseous infusion (IO)** is the process of injecting directly into the marrow of a bone. This provides a non-collapsible entry point into the systemic venous system. This technique is used to provide fluids and medication when intravenous access is not available or not feasible.



Source: Reichman EF: *Emergency Medicine Procedures*,  
Second Edition: [www.accessemergencymedicine.com](http://www.accessemergencymedicine.com)  
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# CONT.

- **Intraperitoneal injection** or **IP injection** is the **injection** of a substance into the **peritoneum** (body cavity). It is more often applied to animals than to humans.





## Patient & Family Education

- Name dose and action of the drug.
- Time of administration
- Special storage and preparation of the drug
- Specific OTC drugs and alternate
- Special comfort and safety reasons
- Specific points about drug toxicity
- Specific warning about drug discontinuation.





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*Thank You*