

ADMINISTRATION OF MEDICATIONS



DEFINITION

- ❑ A **medication** is a substance administered for the diagnosis, cure, treatment, or relief of a symptom or for prevention of disease.
- ❑ In health care context, **medication and drug** are used interchangeably.
 - ❑ The written direction for the preparation and administration of a drug is called a **prescription**.
- ❑ **Pharmacology** – It is the branch of science which deals with study of drugs, their origin, nature, properties and effects.



DRUG NOMENCLATURE

- ′ One drug can have as many as four kinds of names: generic name, official name, chemical name, and trademark or brand name.
- ′ **Generic name** is given before a drug becomes officially an approved medication. The generic name is generally used throughout the drug's use.
- ′ The **official name** is the name under which it is listed in one of the official publications. (e.g. the United States Pharmacopeia).



DRUG NOMENCLATURE

- The **chemical name** is the name by which a chemist knows it; this name describes the constituents of the drug precisely.
- A drug's **trade name** is the name given by the drug manufacturer. The name is usually selected to be short and easy to remember. The trade name is sometimes called the brand name. Because one drug may be manufactured by several companies, it can have several trade names.
- Eg. Chemical Name – Paracetamol hydrochloride
- Trade Name – Crocin, Dolo



DRUG NOMENCLATURE

Chemical Name

Acetyl salicylic acid

Generic Name

Aspirin

Trade name

Dispirin, Aspro, Wimprin

SOURCES OF DRUGS

- **Plants** Plants and their parts are been used as medicines since prehistoric times naturally or processed synthetically. Eg. Digoxin, quinine, morphine, etc.
- **Animal products**- They are used to replace some human chemicals. Eg. Insulin, thyroid drugs, growth hormones, heparin, antitoxic sera.
- **Minerals & oils**- Minerals Eg. Aluminium, iron, fluoride, magnesium, etc their salts are used to cure many diseases. Oils like liquid paraffin are used as purgative.



SOURCES OF DRUGS

- **Microorganisms-** Many micro-organisms (bacterial and fungi) are used to prepare many drugs that are effective against some bacteria. Eg Penicillin, tetracycline's, etc.
- **Products of genetic engineering-** Many drugs are obtained from cell culture and recombinant DNA technology. Eg quinolones, sulphonamides.





PRINCIPLES OF PHARMACOLOGY



CLASSIFICATION

- By Action
- By Functional health Pattern



MECHANISM OF DRUG ACTION

- **Pharmacokinetics** – It is the effect of the body on the drug. It is the movement of drug molecules in the body in relation to the drug's absorption, distribution, metabolism and excretion.
- **Absorption** is the process by which a drug is transferred from its site of entry into the body to the bloodstream. Its is influenced by several factors such as-
 - ❑ Route of administration
 - ❑ Lipid solubility, pH
 - ❑ Blood flow, Local condition at the site of administration
 - ❑ Drug dosage, Serum drug levels



MECHANISM OF DRUG ACTION

- **Distribution-** After a drug has been absorbed into the blood stream, it is distributed throughout the body. Distribution depends on the blood flow to the tissues, the drug's ability to leave the bloodstream, and the drug's ability to enter the cells.
- **Metabolism-** is also called biotransformation or detoxification. It is a process by which a drug is converted to a less active form. Most biotransformation takes place in the liver, where many drug metabolizing enzymes in the cells detoxify the drugs. The products of this process is called metabolites



MECHANISM OF DRUG ACTION

- **Excretion-** After the drug is broken down to an inactive form, excretion of the drug occurs. Excretion is the process of removing a drug, or its metabolites, from the body. Most of the metabolites are eliminated by the kidneys in the urine; however, some are excreted in the feces, the breath, perspiration, saliva and breast milk.
- **Pharmacodynamics-** Drug act at the cellular level to achieve the desired effects. The process by which drugs alter cell physiology and affect the body is called pharmacodynamics.



EFFECTS OF DRUGS

• **Therapeutic effect-** it is referred to as the desired effect, is the primary effect intended, that is the reason the drug is prescribed.

Eg. Morphine is a narcotic agent used treat pain.

○ **Side effects** or secondary effects, of a drug is one that is unintended. Some side effects are usually predictable and may be either harmless or potentially harmful.

Eg. Morphine used for pain can cause side effect of constipation.



EFFECTS OF DRUGS

• **Toxic effects or toxicities** are specific gp. of symptoms related to drug therapy that carry risk of permanent damage or death. It results due to over dosage, ingestion of drug intended for external use and buildup of drug in the blood because of impaired metabolism or excretion.

Eg. Excess use of morphine can cause respiratory depression.

• **Allergic effect-** It is an immune system response that occurs when the body interprets the drug administered as a foreign substance and forms antibodies against the drug.



EFFECTS OF DRUGS

- **Drug tolerance** occurs when the body becomes accustomed to the effects of a particular drug over a period of time. Larger doses of the drug must be taken to produce the desired effects.
- Eg. Long term use of morphine sulphate , becomes tolerant to therapeutic effects and eventually needs higher dose to control pain.
- **Idiosyncratic effects** is an unusual or peculiar response to a drug that may manifest itself by over response, under response, or even the opposite of the expected response. They are thought to be result of genetic enzyme deficiencies that lead to an abnormal mechanism of drug breakdown.



EFFECTS OF DRUGS

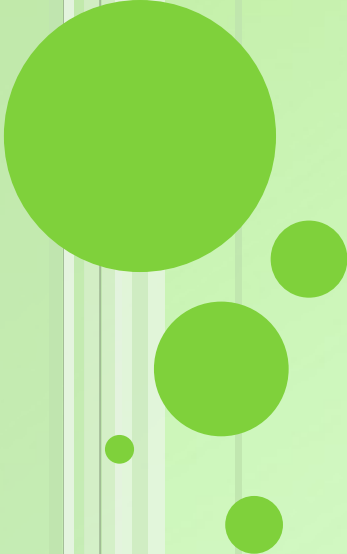
Drug interactions occurs when one drug is affected in some way by another drug, a food, or another substance that is taken at the same time. Drug interactions can be advantageous as well as harmful.




FACTORS INFLUENCING DRUG ACTION

- ′ Developmental considerations
- ′ Weight
- ′ Gender
- ′ Genetic & cultural factors
- ′ Psychological factors
- ′ Pathology
- ′ Environment
- ′ Timing of medication administration





PRINCIPLES OF MEDICATION ADMINISTRATION



RIGHTS



#1 RIGHT PATIENT

- Always check patients identification band.
- Ask patient to state their name .
 - Verify patients allergies with chart and with the patient.



#2 RIGHT MEDICATION

- Perform a triple check of the medications label.
When retrieving the medication.
When preparing the medication.
Before administering medication to the patient.
 - Always check the medication label with the physician orders.
 - Never administer medication prepared by another person
 - Never administer medication that is not labeled.



#3 RIGHT DOSE

- ✓ Check label for medication concentration.
 - ✓ Verify that dosage is within appropriate dose range for patient and medication.
 - ✓ Give special attention if the calculation indicates multiple pills/ tablets or a large quantity of a liquid medication.
 - ✓ Double check calculations that appears questionable
- ✓ Know the usual dosage range of the medications



#4 RIGHT TIME

- Give the medication at the right frequency and at the time ordered according to agency policy.
- Check last dose of medication given to the patient
 - Administer medication within 30 minutes of schedule.



#5 RIGHT ROUTE

- Verify medication route with medication order before administering.
- Medication may only be administered via route specified in order.



#6 RIGHT EDUCATION

- ′ Inform patient of medication being administered
- ′ Inform patient of desired effects of medication.
- ′ Inform patient of side effects of medication.
 - ′ Ask patient if they have any known allergies to medication.



#7 RIGHT TO REFUSE

- The nurses role is to ensure that the client is fully informed of the potential consequences of refusal and to communicate the clients refusal to the health care provider.



#8 RIGHT ASSESSMENT

- Some medications require specific assessments prior to administration of the drug. Eg. Pulse, blood pressure, lab test.
- Medication orders may include specific parameters for administration (do not give if pulse less than 60 or systolic blood pressure less than 100)



#9 RIGHT EVALUATION

- Conduct appropriate follow-up. Eg was the desired effects achieved or not? Did the client experience any side effects or adverse reactions?



#10 RIGHT DOCUMENTATION

- Document medications after giving not before.
- If the time of administration differs from the prescribed time, note the time on the record sheet and explain the reason .
 - If medication is not given, follow the agency policy for documenting the reason why.



MEDICATION ORDERS

- No medication may be given to a patient without a medication order from a licensed practitioner.
- Each health agency has a policy specifying the manner in which the practitioner writes an order. In most instances, orders are written on a form designed specifically for a physicians order, some health facilities use a computer generated pharmacy order system and can receive a medication orders by fax from a physician.
 - Each health agency will have its own policies. Nursing students need to know the agency policies about medication orders.



TYPES OF MEDICATION ORDERS

- **Stat order**- indicates that the medication is to be given immediately and only once. (eg. Inj. Demerol 100 mg IM stat)
- **Single order or one time order** is for medication to be given once at a specified time. (eg. Seconal 100 mg hs before surgery)
- **Standing order** may or may not have a termination date. A standing order may be carried out indefinitely (eg. Multiple vitamins daily) until an order is written to cancel it, or it may be carried out for a specified number of days. In some agencies, standing orders are automatically cancelled after a specified number of days and must be reordered.



TYPES OF MEDICATION ORDERS

- ' A **prn order**, or as- needed order, permits the nurse to give a medication when, in the nurse's judgment, the client requires it (eg. Amphojel 15 ml prn). The nurse must use good judgment about when the medication is needed and when it can be safely administered.



ESSENTIAL PARTS OF DRUG ORDER

- ′ Full name of the client
- ′ Date and time the order is written
- ′ Name of the drug to be administered
- ′ Dosage of the drug
- ′ Frequency of administration
- ′ Route of administration
- ′ Signature of a person writing the order.



MEDICATION ERRORS



FORMS OF MEDICATIONS

- MEDICATIONS ARE AVAILABLE IN A VARIETY OF FORMS AND PREPARATIONS.
- THE FORM OF THE MEDICATION WILL DETERMINE ITS ROUTE OF ADMINISTRATION
- COMPOSITION OF MEDICINE IS DESIGNED TO ENHANCE ITS ABSORPTION AND METABOLISM
- MANY MEDICATIONS ARE AVAILABLE IN SEVERAL FORMS such as syrups, tablets, capsules, powder, oils, tincture, mixtures, pills, injectables. Etc.



- **Aqueous solution:** One or more drugs soluble in water.
- **Aqueous suspension:** one or more drugs finely divided in a liquid such as water.
- **Capsule:** Powdered drugs or liquids within a gelatin cover.
- **Extract:** Concentrated preparation of a drug from raw material generally used to preserve a drug for use in a medication.
 - **Elixir:** Solution containing alcohol, sugar and water. May or may not have active medicines.
 - **Emulsion:** An emulsion is a mixture of two or more liquids that are normally immiscible. Eg. dispersion of fat globules in water or water globules in fat.



- **Ointment:** Semisolid preparation of a drug or drug in petrolatum (Vaseline).
- **Pill:** Single dose units made by mixing the powdered drug with a liquid such as syrup and rolling the mixture into round or oval shape. It is replaced today by tablets and capsules.
- **Powder:** A finely ground drug or drugs. Some are used internally and some are used externally.
- **Paste:** Preparations like an ointment for external use, frequently thick and stiff, penetrates the skin less than ointments.
- **Plaster:** solid preparation is used as a counter irritant or as an adhesive used externally.
- **Poultice:** Soft moist preparation that supply moist heat to the body used externally.



- **Solutions:** Liquid preparations containing one or more substances completely dissolved in a solvent.
- **Suppository:** A drug or several drugs mixed with a firm base such as glycerinated gelatin and shaped for insertion into the body cavities. The base dissolves slowly at room temperature releasing the drug.
- **Spirits:** A concentrated alcoholic solutions of a volatile substance. Also known as essences.
- **Syrup:** An aqueous solution of sugar is often used to disguise unpleasant tasting drug and soothe irritated membrane.



- **Spansule-** a drug made up in a capsule in such a way that there is slow release of its contents.
- **Tincture-** Alcoholic or hydro alcoholic solution prepared from drugs derived from plants or animals materials.
- **Tablets-** Single dose units are made by compressing powdered drugs into small hard discs. Some are readily broken along a scored line, some are enteric coated to prevent irritation to gastric mucosa or to prevent the effect of the gastric secretions upon the drug.
- **Water-** Saturated solutions of volatile oils.



- ′ **Fluid extract-** Alcoholic liquid extracts of drugs made by percolation so that 1ml of fluid extract contains 1g of drug. This is the most concentrated forms of all fluid preparations, only vegetable drug are used.
- ′ **Lotion:** Drugs in liquid suspension intended for external use.
- ′ **Liniments:** Mixture of drugs with oil, soap, water or alcohol and intended for external use.
- ′ **Lozenges:** a combination of drugs having some sugar or smoothening material which relieves the ticking sensation at the back of the throat and stops the cough.
- ′ **Mucilages:** aqueous preparations containing viscous substances such as gums and starches.



ROUTES OF DRUG ADMINISTRATION

· A ROUTE OF ADMINISTRATION IS THE PATH BY WHICH A DRUG, FLUID, POISON OR OTHER SUBSTANCE IS BROUGHT INTO CONTACT WITH THE BODY.



FACTORS GOVERNING CHOICE OF ROUTE

- **PHYSICAL & CHEMICAL PROPERTIES OF DRUG-** Solid/liquid/gas; solubility, pH, irritancy.
- **SITE OF DESIRED ACTION-** Localized and approachable or generalized and non approachable.
- **RATE & EXTENT OF ABSORPTION FROM VARIOUS ROUTES**
- **EFFECT OF DIGESTIVE JUICES & FIRST PASS EFFECT**
- **RAPIDITY OF THE DESIRED RESPONSE-** emergency/routine
- **ACCURACY OF DOSAGE**
- **CONDITION OF THE PATIENT-** unconscious, vomiting.



CLASSIFICATION

**SYSTEMIC
ROUTE**

**LOCAL/TOPICAL
ROUTE**

**ENTERAL
ROUTE**

**PARENTAL
ROUTE**

**MUCOSAL
MEMBRANE**

SKIN

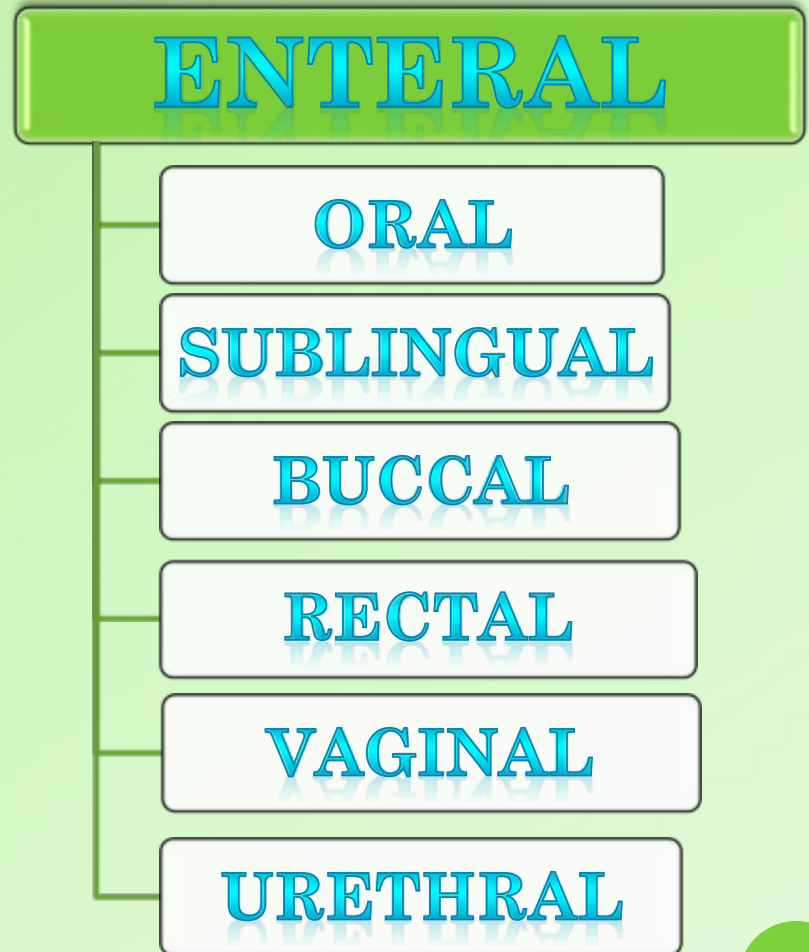


SYSTEMIC ROUTE

· IN SYSTEMIC ROUTE THE DRUG REACHES TO THE SYSTEMIC CIRCULATION (BLOOD). SO IT IS CALLED SYSTEMIC ROUTE.

· CLASSIFIED INTO TWO CLASSES-

- ❖ ENTERAL ROUTE
- ❖ PARENTRAL ROUTE



- ✓ **Oral administration-** Drugs are given by mouth in the following ways-
 1. Liquids- Oils, Water solution or suspensions, etc.
 2. Solids- Tablets, powders, capsules, pills, etc.
- **Sublingual administration-** Drugs are given sublingually by placing it under the tongue and allowed to dissolve slowly.
Eg. NTG
- **Buccal administration-** Drugs are given by placing it in between the cheeks.
- **Inhalation** Drugs may be given by inhalation for either a systemic or local effect. The patient inhales the fumes into the lungs. The systemic effect is produced immediately because of the large surface area of the lungs and the rich supply of blood vessels. Eg. Inhalation of ether, chloroform for anaesthesia.

- ✓ **Inunction** It is the application of drug to the skin usually by a friction. Eg. Ointment.
- ✓ **Instillation**- It is putting a drug in a liquid form into the body cavity such as orifice of ear or eyes.
- ✓ **Insertion**- It means introducing solid form of drugs into the body orifice. Eg. Suppositories are introduced into the vagina or rectum
- ✓ **Insufflation**- Administration of drugs in the form of powder vapour or air into the wound or a body cavity.



- http://www.slideshare.net/ankit_2408/routes-of-drug-administration-1
- <http://www.slideshare.net/vinuvarghesekiriyanthan3/routes-of-drug-administration-23349463>
- <http://www.slideshare.net/NAMDEOSHINDE15/routes-of-drug-administration-23611946>
- http://www.slideshare.net/drchandanerd/routes-of-administration-pharmacology?next_slideshow=2
- <http://www.technicaljournalonline.com/ijpsr/VOL%20I/IJPSR%20VOL%20I%20ISSUE%20I%20JULY%20SEPTEMBER%202010/IJPSR%20VOL%20I%20ISSUE%20I%20Article%208.pdf>
- http://www.slideshare.net/ankit_2408/routes-of-drug-administration-1?next_slideshow=1
- <http://www.slideshare.net/draadil/dr-adil-routes-of-drugs?related=1>
- <http://www.slideshare.net/apniid7/10-rights-of-medication-administration-17277375?related=1>



PREPARING FOR DRUG ADMINISTRATION

- ✓ CHECK THE 10 RIGHTS
 - ✓ STANDARD PRECAUTIONS: WASH YOUR HANDS
 - ✓ DOUBLE CHECK IF UNSURE ABOUT ANYTHING
- ✓ CHECK FOR DRUG ALLERGIES
- ✓ PREPARE DRUGS FOR ONE PATIENT AT A TIME
- ✓ CHECK THREE TIMES



PREPARING FOR DRUG ADMINISTRATION

- ✓ CHECK EXPIRY DATES
- ✓ CHECK THE PATIENTS IDENTIFICATION
- ✓ GIVE MEDICATION ON TIME
- ✓ EXPLAIN MEDICATIONS TO THE PATIENT
- ✓ OPEN THE MEDICATIONS AT THE BEDSIDE
- ✓ DOCUMENT THE MEDICATIONS GIVEN
BEFORE GOING TO THE NEXT PATIENT.



ORAL ROUTE

- Oral route refers to –

Two methods of administration

- Applying topically to the mouth.
 - Swallowing for absorption along the GI tract into systemic circulation.



DOSAGE FORMS

Capsules, powder

Tablets, spansules

Syrups, emulsions

Suspension, elixirs



Advantages-

- ′ Can be self administered, pain free, easy to take.
 - ′ Absorption takes place along the whole length of the GI tract.
- ′ The drugs preparation needs no sterilization.
 - ′ Both solid and liquid dosage forms can be given through this route.
 - ′ Most suitable route for GIT infections and GI parasites.
 - ′ Cheap as compared to most other parenteral routes



Disadvantages-

- ′ Sometimes inefficient- only part of the drug may be absorbed.
- ′ First pass effect- drugs absorbed orally are initially transported to the liver via the portal vein
- ′ Irritation to gastric mucosa
- ′ Effects too slow for emergencies
- ′ Destruction of drugs by gastric acid and digestive juices.
- ′ Unpleasant taste of some drugs
- ′ Unable to use in conscious patient.
- ′ Poor administration techniques may lead to intratracheal delivery and subsequent aspiratory



PARENTRAL ROUTE

- DRUGS ARE DIRECTLY DELIVERED INTO TISSUE FLUID OR BLOOD BY MEANS OF A NEEDLE OR CATHETER.
- THIS ROUTE OF ADMINISTRATION BYPASSES THE ALIMENTARY CANAL.
- IT INCLUDES INJECTIONS.
- MEDICATIONS MAY BE INJECTED TO AN ARTERY, THE PERITONEUM, HEART TISSUES, THE SPINAL CORD AND BONES.



INTRADERMAL

- INTO THE DERMAL LAYER OF THE SKIN

SUBCUTANEOUS

- INTO THE SUBCUTANEOUS LAYER OF THE SKIN

INTRA MUSCULAR

- INTO THE MUSCLE

INTRAVENOUS

- INTO THE VEIN

**INTRA
PERITONEAL**

- INTO THE PERITONEUM

INTRATHECAL

- INTO THE SUBARACHNOID SPACE (USED FOR ANESTHESIA)

INTRA-ARTICULAR

- INTO THE JOINT

INTRA-ARTERIAL

- INTO ARTERIES

INTRA-MEDULLARY

- INTO BONE MARROW

ADVANTAGES

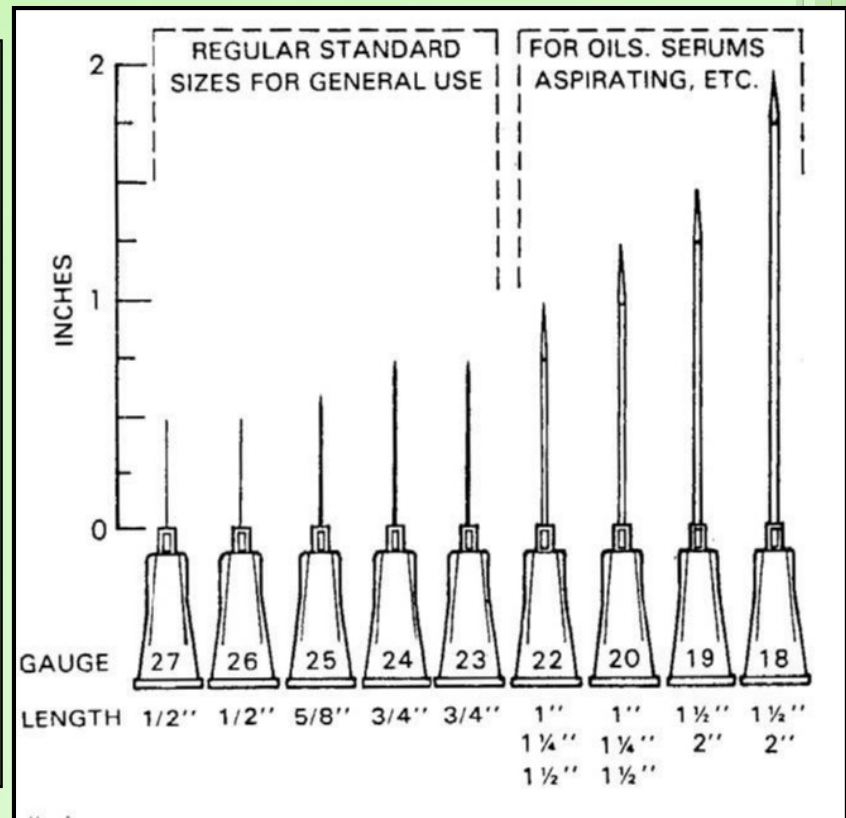
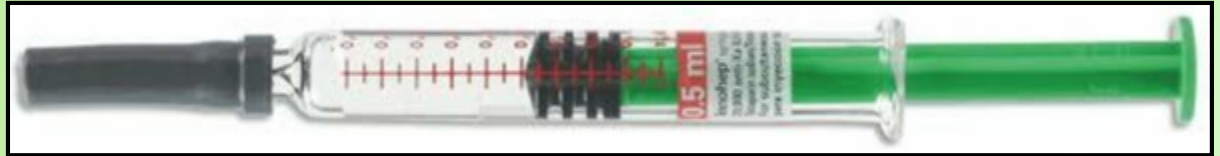
- ACTION IS RAPID, RESULTS ARE MORE PREDICTABLE.
- DOSAGES CAN BE MEASURED MORE ACCURATELY.
- ADMINISTERED EVEN IN UNCONSCIOUS PATIENTS
- GASTRIC IRRITANTS CAN BE GIVEN PARENTERALLY
- USED IN PATIENTS WHO ARE UNABLE TO SWALLOW

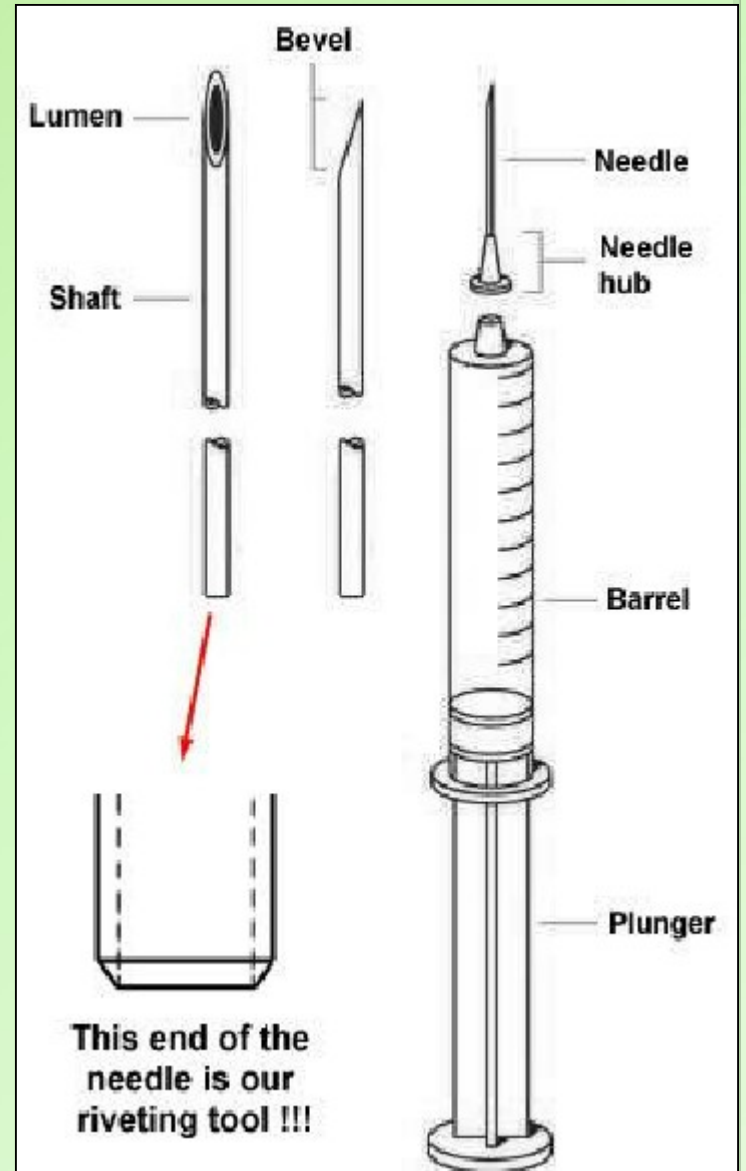


DISADVANTAGES

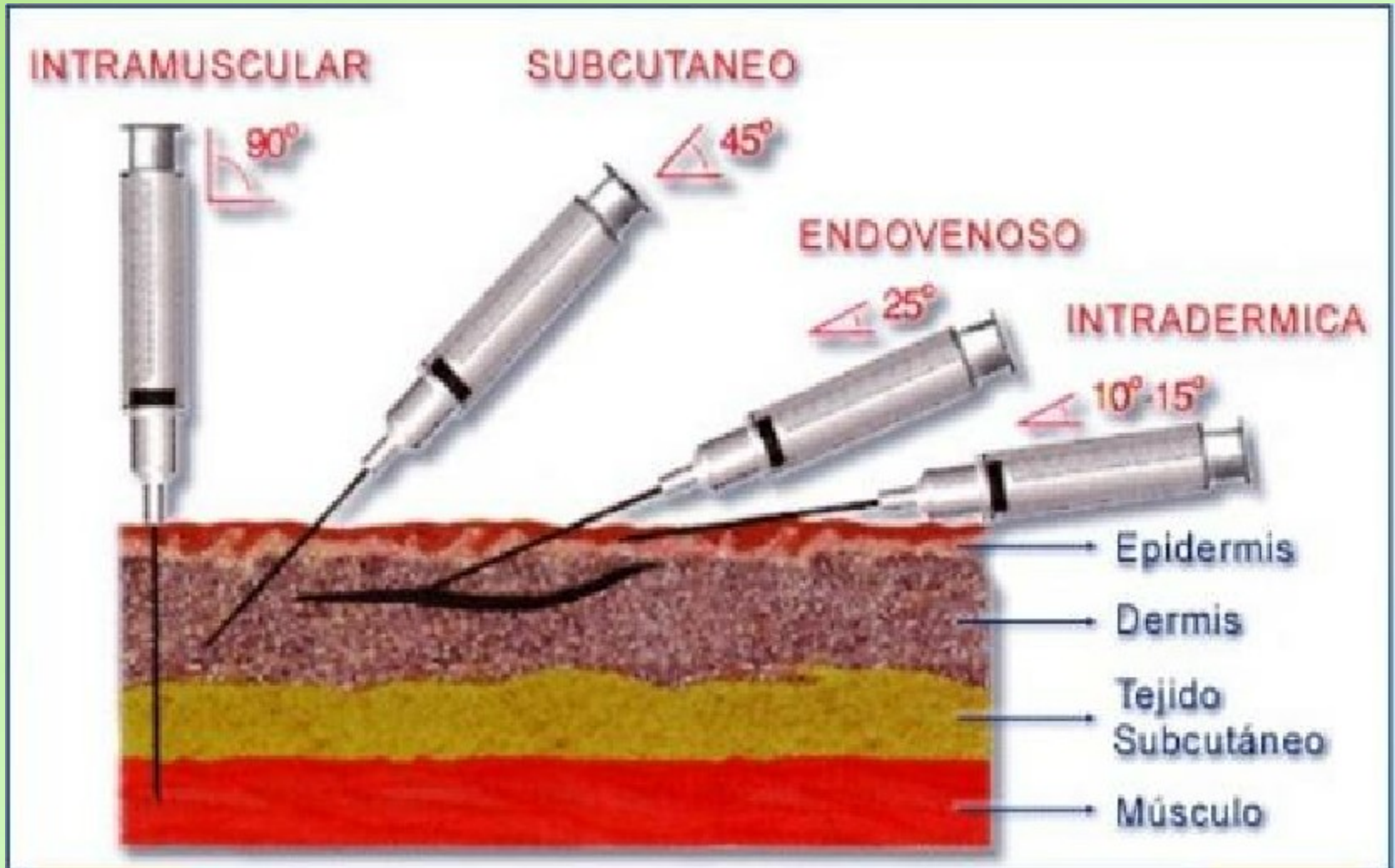
- ′ ASEPSIS MUST BE MAINTAINED
- ′ REQUIRES SKILL
- ′ MAY BE PAINFUL
 - ′ MORE EXPENSIVE, LESS SAFE AND INCONVENIENT
- ′ INJURY TO NERVE MAY OCCUR
- ′ PRODUCES ANXIETY







PARENTERAL ROUTE



PARENTRAL ROUTE- INTRADERMAL

- THE INTRADERMAL ROUTE HAS THE LONGEST ABSORPTION TIME OF ALL PARENTRAL ROUTES.
- IT IS USED FOR DIAGNOSTIC PURPOSE (E.G. TUBERCULOSIS TEST) TO TESTS TO DETERMINE SENSITIVITY TO VARIOUS SUBSTANCES. (E.G. GIVING TEST DOSE OF PENICILLIN)



PARENTRAL ROUTE- INTRADERMAL

- The site commonly used are the inner aspect of the forearm, the dorsal aspect of the upper arm and upper back.



PARENTRAL ROUTE- INTRADERMAL

- THE NEEDLE SIZE IS 25- 28 GAUGE (1/4 TO 5/8 INCH)
- DOSE SHOULD BE SMALL IN QUANTITY 0.01 TO 0.1 ML
- THE ANGLE OF INSERTION- 5 TO 15←



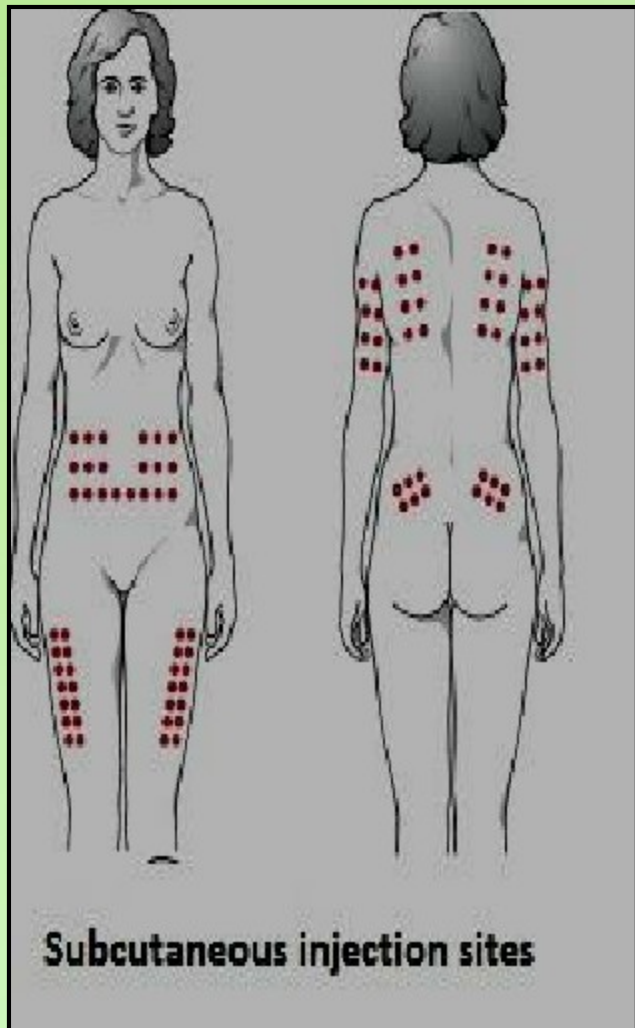
PARENTRAL ROUTE- SUBCUTANEOUS

- SUBCUTANEOUS INJECTIONS ARE GIVEN INTO THE SUBCUTANEOUS TISSUE, THE LAYER OF FAT LOCALISED BELOW THE DERMIS AND ABOVE THE MUSCLE TISSUE.
- THE DRUG ONCE REACHES TO THE SUBCUTANEOUS LAYER CROSSES THE MEMBRANE AND ABSORBS INTO THE BLOOD.
- ABSORPTION IS SLOWER THAN THROUGH THE INTRAMUSCULAR ROUTE BECAUSE S/C TISSUE DOES NOT HAVE AS RICH A BLOOD SUPPLY AS MUSCLES.



PARENTRAL ROUTE-

SUBCUTANEOUS



- SITES-OUTER ASPECT OF THE ARM, ANTERIOR ASPECT OF THE THIGH, LOWER ABDOMINAL WALL, AND SCAPULAR AREA OF THE UPPERBACK.
- ~~ARMES ON THE FASTER~~ ABSORPTION, THOSE ON THE THIGH AND UPPER BUTTOCKS, SLOWEST ABSORPTION.
- DEPOT PREPARATION CAN BE INJECTED-DEROJET, PELLETT IMPLANTATION, SIALISTIC AND BIODEGRADABLE IMPLANTS.

PARENTRAL ROUTE- SUBCUTANEOUS

- ✓ **NEEDLE SIZE**-25-27 GAUGE THAT IS LESS THAN 1 INCH LONG (USUALLY 3/8 TO 5/8 INCH)
- ✓ **DOSE**-NOT MORE THAN 1 ML
- ✓ **ANGLE OF INSERTION**-
 - ✓ FOR AN AVERAGE WEIGHT OR THIN CLIENT, INJECT AT A 45 ← ANGLE.
 - ✓ FOR OBESE CLIENT, INJECT AT A 90 ← ANGLE



PARENTRAL ROUTE- SUBCUTANEOUS

REUSING OF NEEDLES AND SYRINGES

- ❖ MANY PEOPLE (E.G THOSE WHO HAVE DIABETES) GIVE THEMSELVES REPEATED INJECTIONS, PERHAPS SEVERAL EACH DAY. SOME PEOPLE FIND IT PRACTICAL TO REUSE NEEDLES AND SYRINGES.
- ❖ TEACH THE PATIENT THE FOLLOWING-
 - CONSULT YOUR HEALTHCARE PROVIDER BEFORE BEGINNING THIS PRACTICE.
 - DISCARD THE NEEDLES WHEN THEY BECOME DULL (USUALLY THEY CANNOT BE USED MORE THAN 10 TIMES)



PARENTRAL ROUTE- SUBCUTANEOUS

- EXAMINE THE NEEDLE CAREFULLY BEFORE REUSING IT. THE NEW 30 AND 31 GAUGE NEEDLES CAN EASILY BE BENT AT THE TIP TO FORM THE HOOK, WHICH CAN LACERATE TISSUES OR BREAK OFF WITHIN THE SKIN. NEVER USE A NEEDLE THAT IS DEFORMED IN ANY WAY.
- DO NOT REUSE A NEEDLE IF IT HAS COME IN CONTACT WITH ANY THING OTHER THAN THE SKIN.



PARENTRAL ROUTE- SUBCUTANEOUS

- DO NOT USE ALCOHOL TO CLEANSE THE NEEDLE. ALCOHOL MAY REMOVE THE SILICON COATING THAT MAKES FOR LESS PAINFUL SKIN PUNCTURE
- INSPECT INJECTION SITES FOR REDNESS OR SWELLING. IF THESE SIGNS ARE PRESENT, DO NOT REUSE A NEEDLE, CONSULT YOUR HEALTHCARE PROVIDER.
- NEVER SHARE SYRINGES OR NEEDLES WITH ANOTHER PERSON. THIS POSES A RISK OF ACQUIRING A BLOODBORNE VIRAL INFECTION.



PARENTRAL ROUTE- SUBCUTANEOUS

- DISPOSE OF NEEDLES SAFELY. DO NOT BEND A NEEDLE; DOING SO INCREASES THE CHANCES OF INJURY. USE A COFFEE CAN OR OTHER PUNCTURE PROOF CONTAINER WITH LID TO DISPOSE OF NEEDLES.



PARENTRAL ROUTE- INTRAMUSCULAR

· INJECTIONS INTO THE MUSCLE TISSUE ARE ABSORBED FASTER THAN SUBCUTANEOUS MEDICATIONS BECAUSE OF THE RICH BLOOD SUPPLY IN THE MUSCLES.



PARENTRAL ROUTE- INTRAMUSCULAR

ADVANTAGES

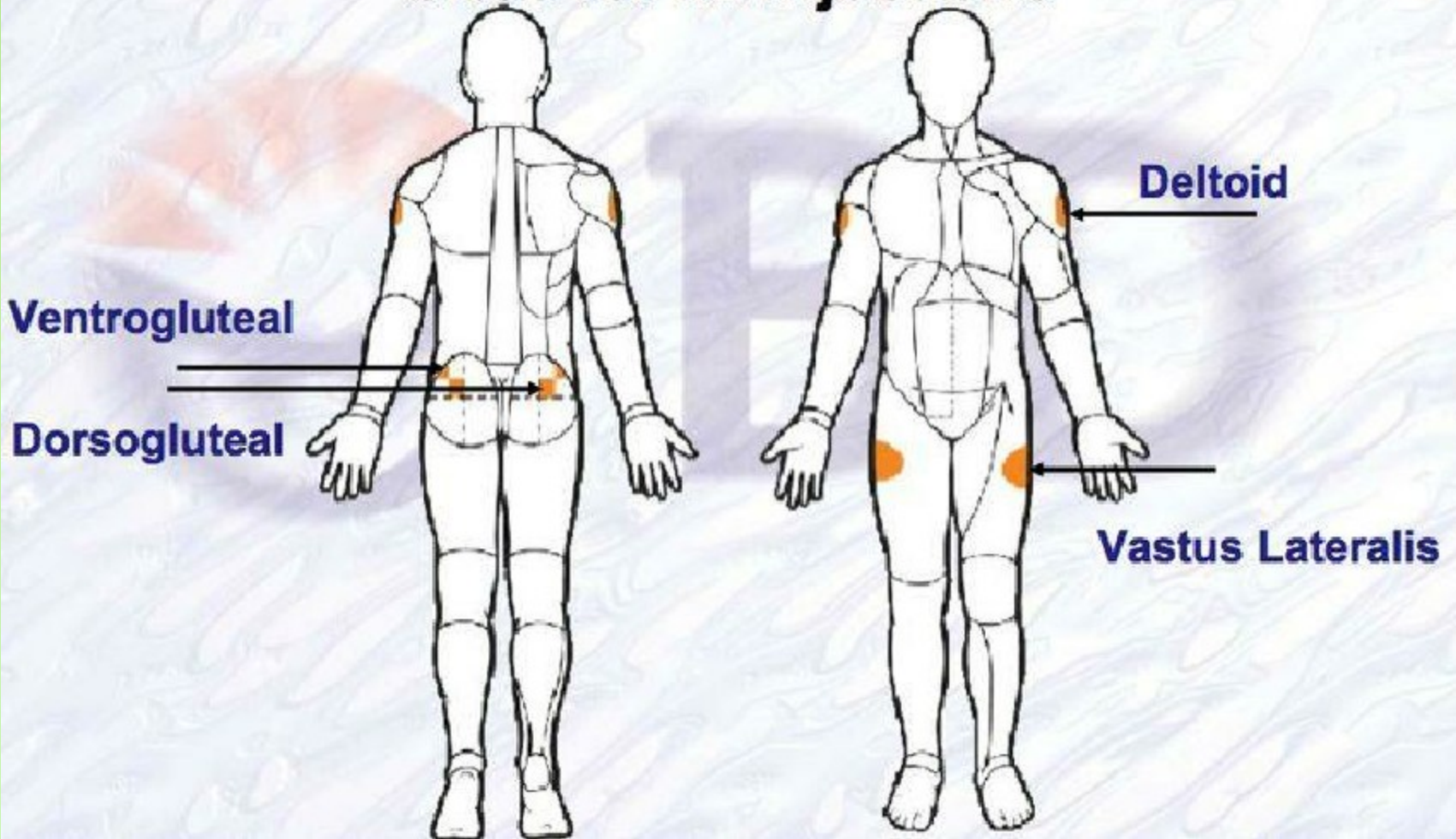
- ABSORPTION REASONABLY UNIFORM
- RAPID ONSET OF ACTION
- MILD IRRITANTS CAN BE GIVEN
- SUITABLE FOR INJECTIONS OF DRUG IN AQUEOUS SOLUTIONS (RAPID ACTION) AND DRUG IN SUSPENSION OR EMULSION (SUSTAINED RELEASE)

DISADVANTAGES

- LOCAL PAIN AND ABSCESS
- INFECTION, NERVE DAMAGE
- LOCAL HEMATOMA CAN OCCUR IN ANTICOAGULANT TREATED PATIENT

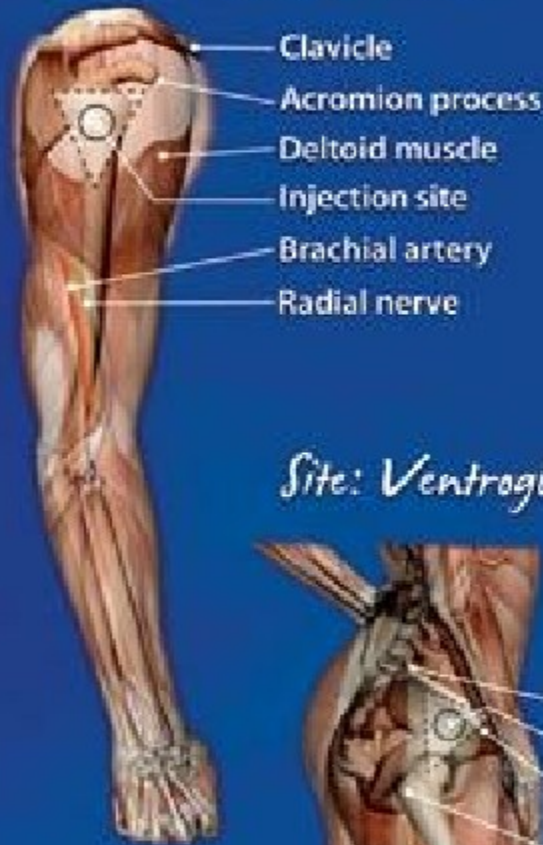


Sites for IM Injections



Intramuscular Injection Sites

Site: Deltoid Muscle



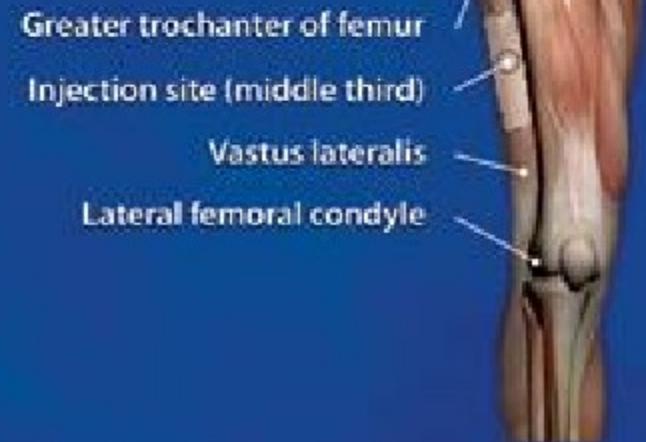
Site: Dorsogluteal Muscle

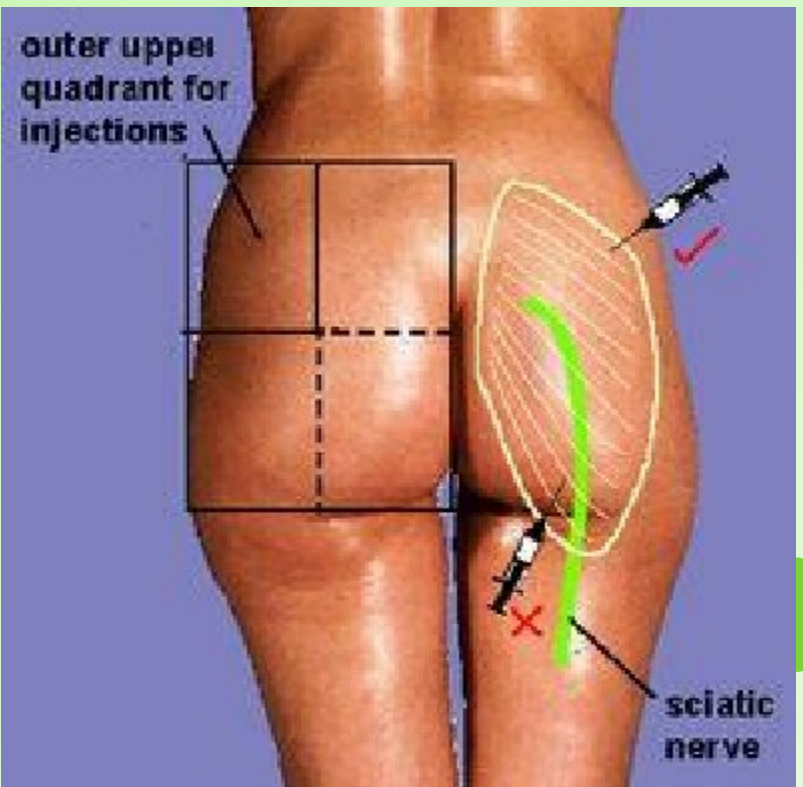


Site: Ventrogluteal Muscle



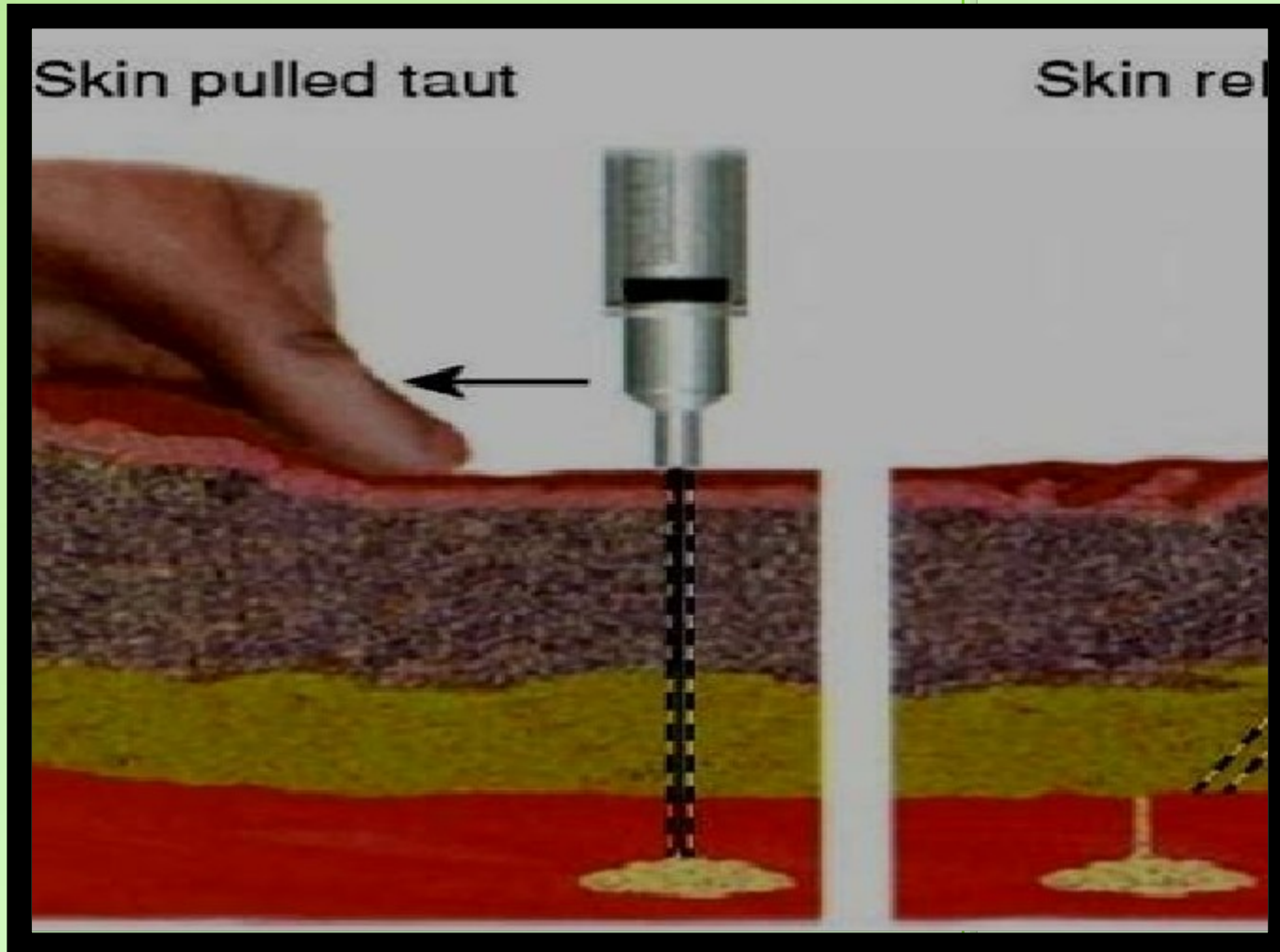
Site: Vastus Lateralis Muscle





PARENTRAL ROUTE- INTRAMUSCULAR

'Z' TRACT TECHNIQUE



PARENTRAL ROUTE- INTRAMUSCULAR

- **NEEDLE SIZE**-1 1/2 INCH IS CONSIDERED STANDARD ,ALWAYS CHOOSE A NEEDLE GUAGE AND LENGTH BASED ON THE SIZE OF THE MUSCLE, THE AMOUNT OF MEDICATION TO BE GIVEN, AND THE AMOUNT OF ADIPOSE TISSUE OVER THE MUSCLE.
- **DOSE**- 3-5ML
- **ANGLE OF INSERTION**- 90←ANGLE



PARENTRAL ROUTE- INTRAVASCULAR

- INTRAVASCULAR MEDICATIONS ARE GIVEN THROUGH A CATHETER OR CANNULA INSERTED INTO A VEIN OR AN ARTERY.
- THE ONSET OF MEDICATION ACTION TAKES PLACE WITHIN SECONDS, SO IV ADMINISTRATION IS ESPECIALLY USEFUL IN EMERGENCIES.
- IV MEDICATIONS MAY BE ADMINISTERED BY A VARIETY OF PROGRAMMABLE ELECTRONIC PUMPS AND INFUSERS.



PARENTRAL ROUTE- INTRAVASCULAR

ADVANTAGES

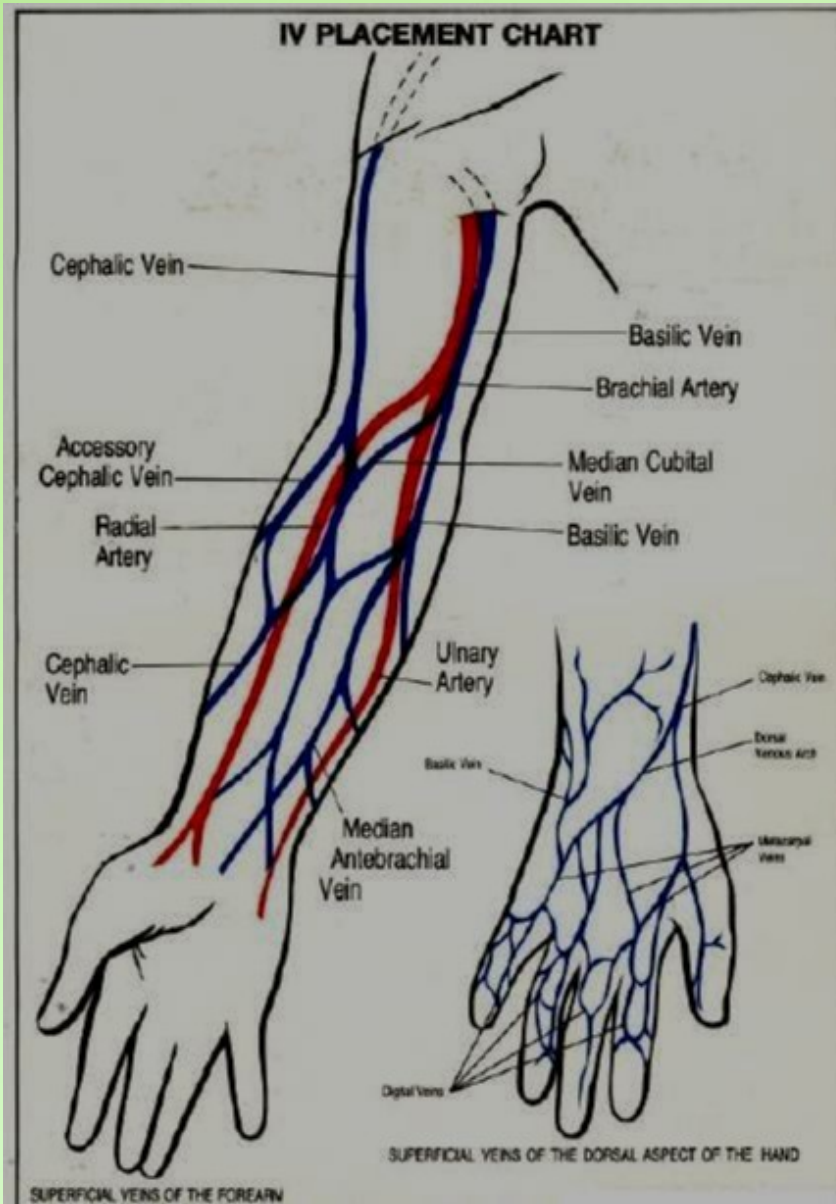
- BIOAVAILABILITY
100%
- IMMEDIATE ONSET
OF ACTION
- DESIRED BLOOD
CONCENTRATIONS
ACHIEVED.
- LARGE QUANTITIES
CAN BE GIVEN,
FAIRLY PAIN FREE
- FIRST PASS AVOIDED

DISADVANTAGES

- PAIN AT THE SITE
OF INJECTION.
- GREATER RISK OF
ADVERSE EFFECTS.
 - HIGH
CONCENTRATION
ATTAINED RAPIDLY
 - RISK OF EMBOLISM



PARENTRAL ROUTE- INTRAVASCULAR



COLOUR CODES OF INTRAVENOUS CANNULA

Gauge	Indications	Colour
18g	Blood Transfusion	Green
20g	OB /Labour	Pink
22g	Medications	Blue
24g	Infant / Child	Yellow
26g	Neonate	



PARENTRAL ROUTE- INTRAVASCULAR

- ✓ IV MEDICATIONS CAN BE ADMINSTERED IN FOLLOWING WAYS-
- ✓ ADDING MEDICATION TO THE LARGE VOLUME PRIMARY OR MAINTAINENCE FLUIDS.
- ✓ IV PUSH OR BOLUS
- ✓ INTERMITTENT NFUSION
- ✓ VOLUME CONTROL INFUSION SETS.



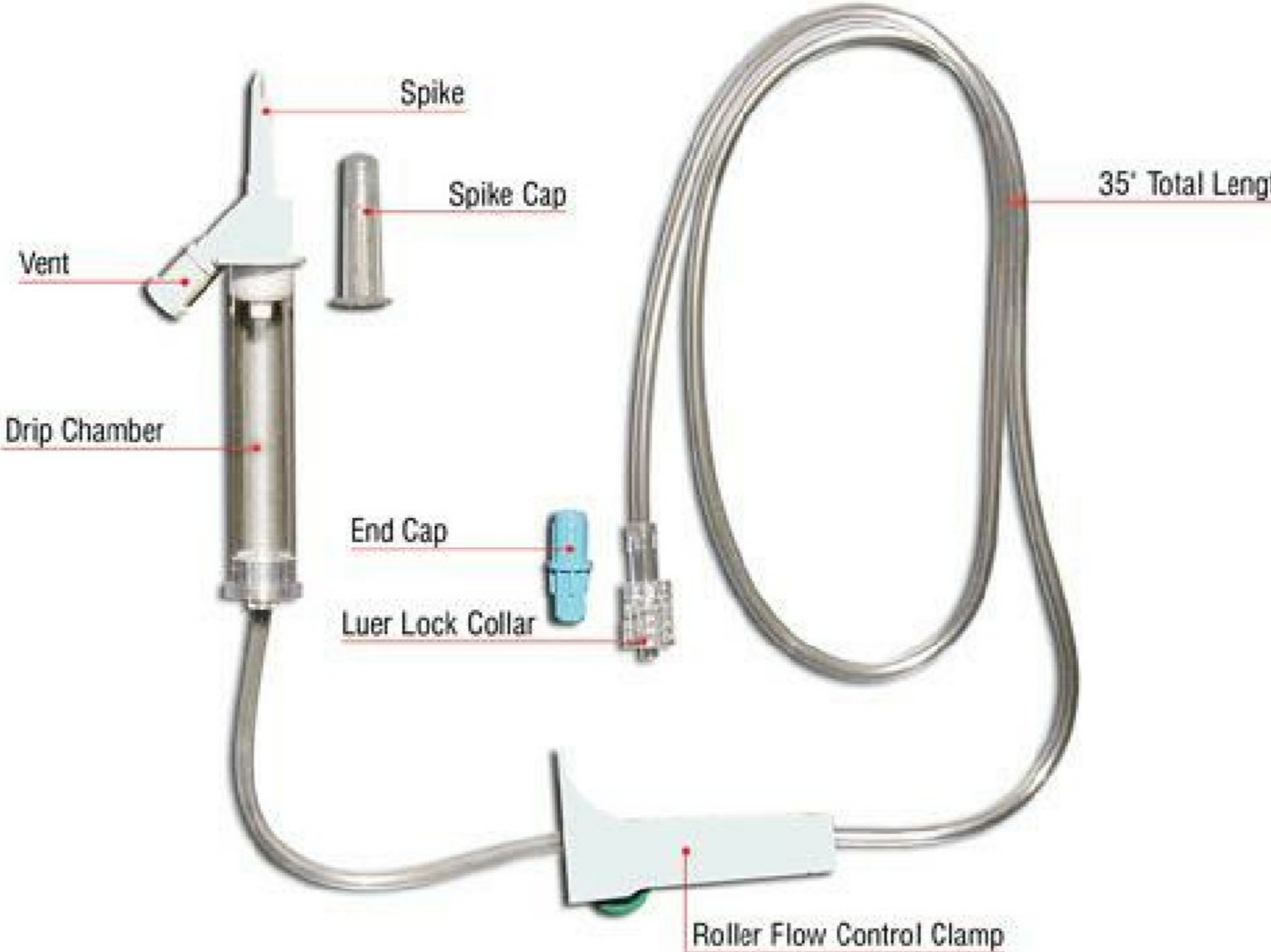
ADMINISTRATION OF IV FLUIDS

- MAINTAIN STRICT ASEPSIS
 - PORT OF IV LINE FLUSHED WITH SALINE BEFORE INFUSION
- WATCH FOR SIGNS OF EXTRAVASCATION
 - MAKE SURE THAT THERE ARE NO AIR BUBBLES
- CARRY A STERILE CONTAINER TO PLACE COMPONENTS WHILE IV CANNULISATION.



ADMINISTRATION OF IV FLUIDS





- Macro drip – 60 drops/ml
- Micro drip – 15 drops/ml



ADMINISTRATION OF IV FLUIDS

CALCULATION OF DOSAGES

$$\frac{\text{DESIRED DOSE}}{\text{HAVE IN HAND}} \times \text{QUANTITY} = \text{DOSAGE TO GIVE}$$

$$\text{Flow rate ml/hr.} = \frac{\text{Total infusion (vol. in ml.)}}{\text{Hrs. of infusion} \times 60}$$



STORAGE & MAINTENANCE

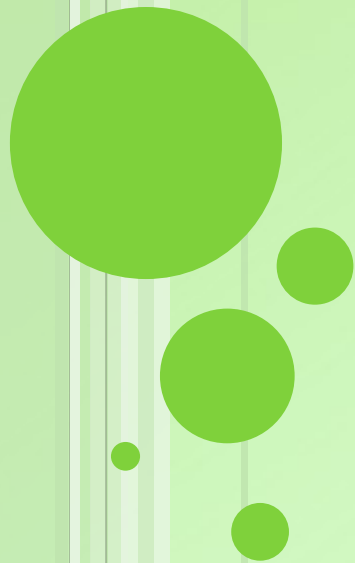
- To stock the medicines, each ward should be provided with a medicine cabinet. It should be large enough to accommodate all the drugs.
- As far as possible, the medicines cabinet should be kept in separate room. Washing sink with running water and adequate lighting should be there.
 - There should be separate compartment for different categories of drugs.
- A senior nurse should be responsible for the poisonous medicines and daily inventory should be taken.



- ′ All poisonous drugs should be marked **poison** in red ink. No drugs should be stored without labels even for a day. All medicines should be kept closed under lock and key.
- ′ Drugs which are unusual in colour, odour and consistency should be returned to the pharmacy and replaced with fresh one. Check the expiry date.
- ′ Drugs which get destroyed at room temperature such as vaccines, sera, antibiotics, etc. should be kept in refrigerator.
 - ′ When indenting for drugs, indent only the required quantity.



SYSTEMS OF MEASUREMENT



- ′ **Metric system**
- ′ **Apothecary system**
- ′ **Household system**



Formula

$$\frac{\text{Dose in hand}}{\text{Quantity on hand}} = \frac{\text{dose desired}}{\text{(quantity desired)}}$$

Erythromycin 500mg is ordered. It is supplied in liquid form containing 250 mg in 5ml. Calculate the dose to be administered.



$$\frac{\text{Dose desired}}{\text{Dose in hand}} \times \text{quantity on hand} = \text{desired quantity}$$

- Heparin is often distributed in vials in prepared dilutions of 10,000 units per milliliter. If the order calls for 5000 units. How much to administer.



CONVERTING MEASUREMENT UNITS

