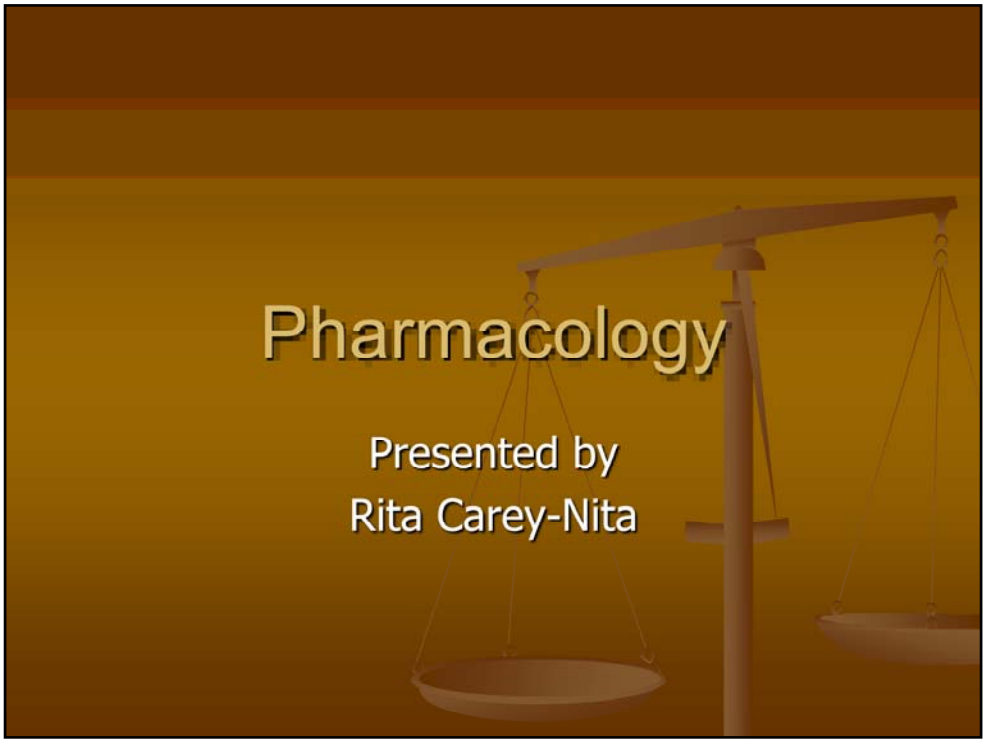
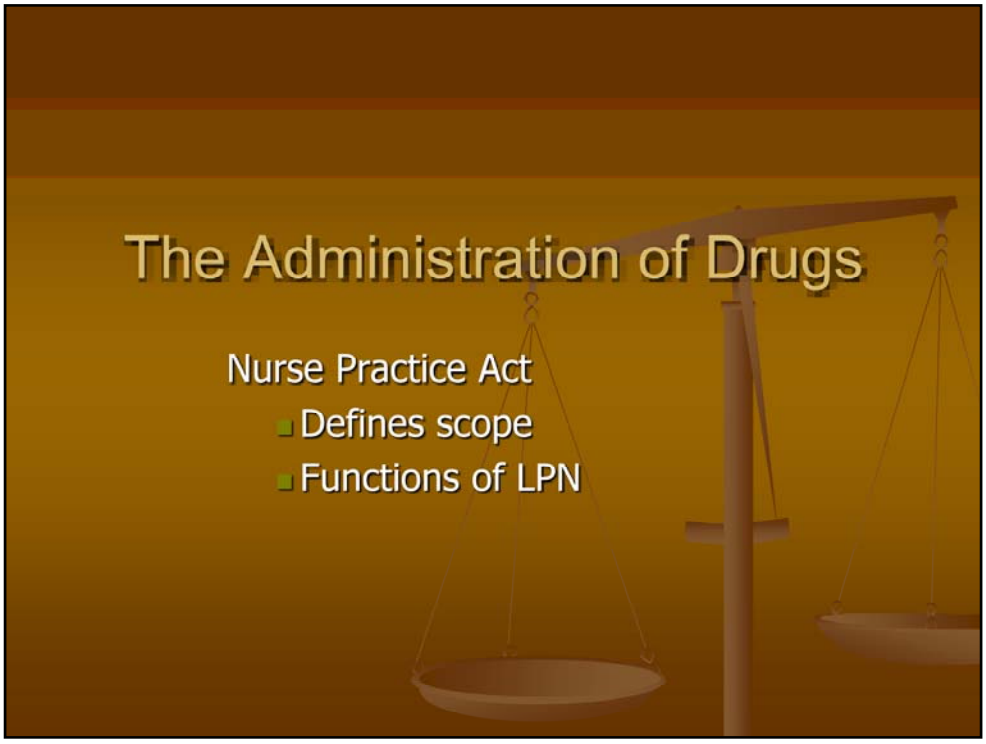
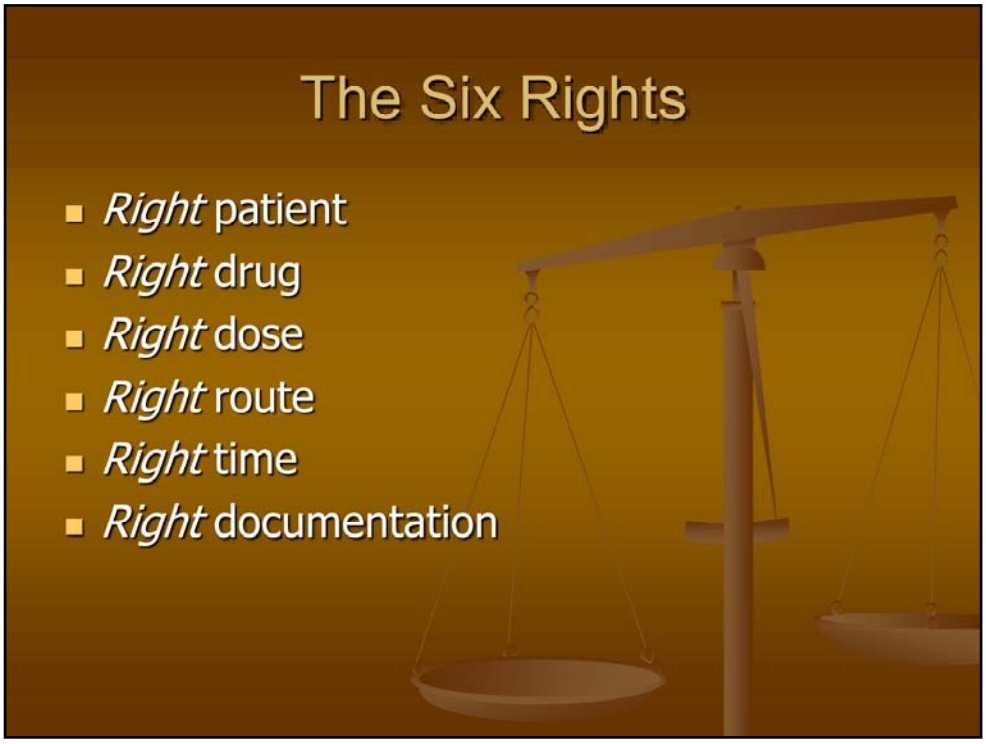

Pharmacology
Presented by
Rita Carey-Nita



Fundamental response of the nurse.

The Pennsylvania Code determines what medications and what route of administration the LPN is allowed to provide.

See Code & review with students



Right Patient

This is accomplished by checking the patient's wristband containing the patient's name If there is no written identification verifying the patient's name, the nurse obtains a wristband or other form of identification before administering the drug. In some instances the nurse may ask the patient to identify himself.

Be aware some patients may have dementia or impairment

The nurse should not ask, "Are you Mr. Jones?" Some patients, particularly those who are confused or have difficulty hearing, may respond by answering yes even though that is not their name.

Right Drug

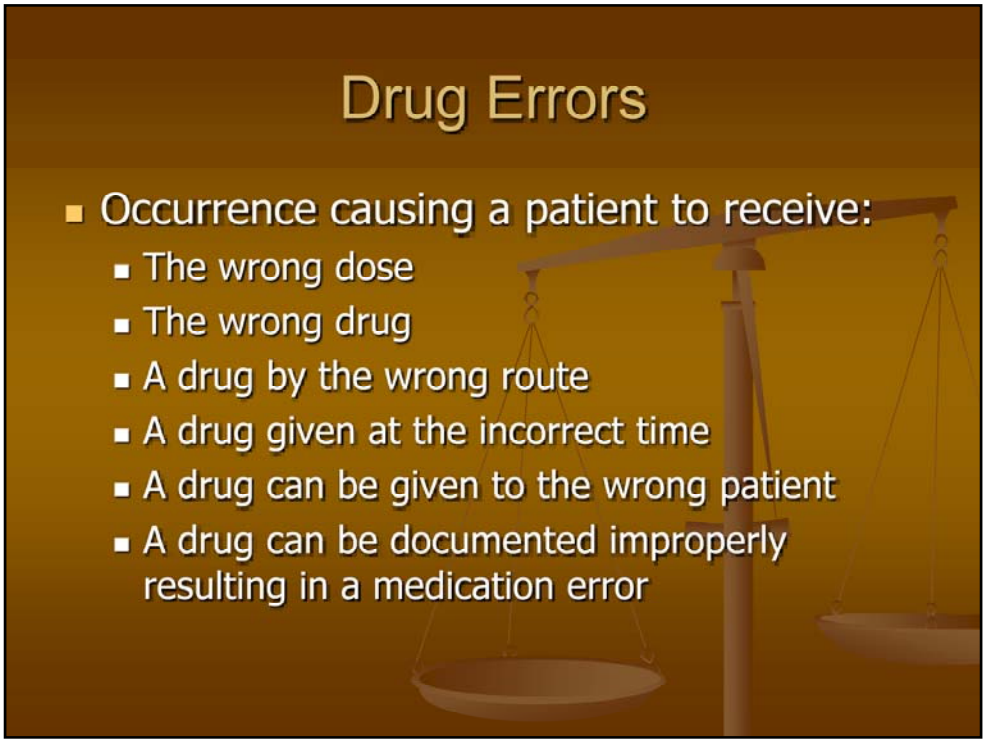
Drug names are often confused, especially when the names sound similar or the spellings are similar. Table 2-1 Lilley p. 60 identifies examples of drugs that can easily be confused. The nurse should compare medication, container label, and medication record.

Right Dose, Route, and Time

The nurse should obtain a primary care provider's written order for the administration of all drugs. The primary care provider's order must include the patient's name, the drug name, the dosage form and route, the dosage to be administered, and the frequency of administration. The primary care provider's signature must follow the drug order. In an emergency, the nurse may administer a drug with a verbal order from the primary care provider. However, the primary care provider must write and sign the order as soon as the emergency is over.

Right Documentation

After the administration of any drug, the nurse records the process immediately (see Fig. 2-3). Immediate documentation is particularly important when drugs are given on an as-needed basis (PRN drugs). For example, most analgesics require 20 to 30 minutes before the drug begins to relieve pain. A patient may forget that he or she received a drug for pain.



Errors may occur in transcribing drug orders, when the drug is dispensed, or in administration of the drug. Nurses serve as the **last defense** against detecting drug errors. Reported immediately so that any necessary steps to counteract the action of the drug or any observation can be made as soon as possible. In most institutions, the nurse must complete an incident report and notify the primary care provider. It is important to report errors even if the patient suffers no harm. Drug errors occur when one or more of the six "rights" has not been followed.

The nurse should adhere to the following precautions to help prevent drug errors:

•Clarify any questionable orders.

• When calculations are necessary, verify them with another nurse.

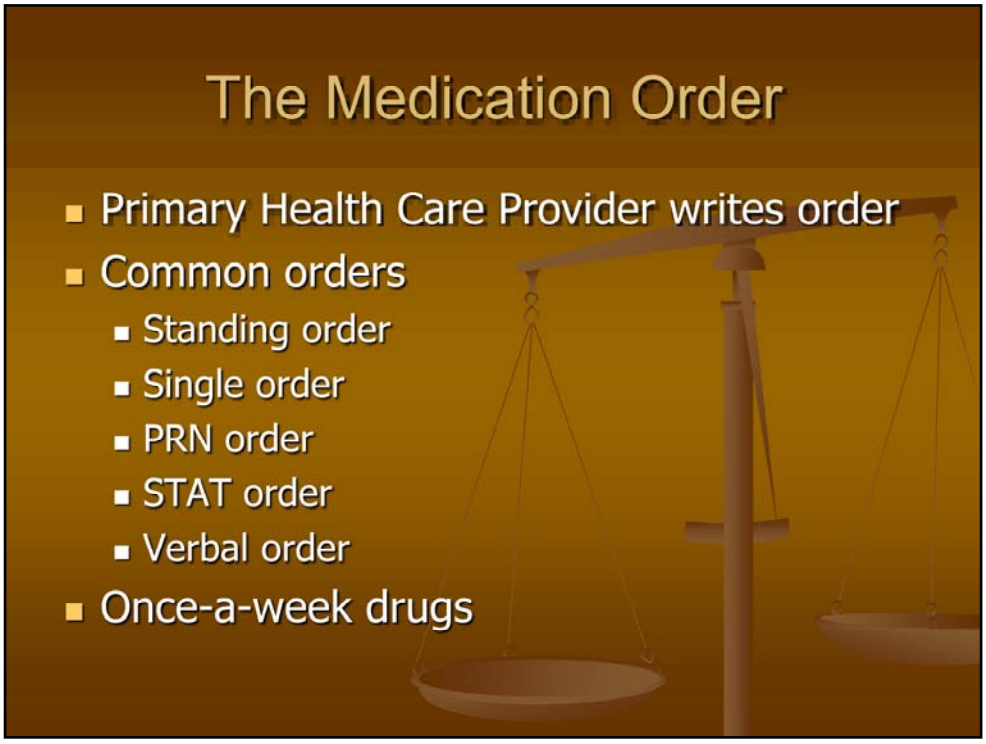
• Listen to the patient when he or she questions a drug, the dosage, or the drug regimen. Never administer the drug until the patient's questions have been adequately researched. If a patient question the med or tells you they had the medication already, Listen to that patient

• Concentrate on only one task at a time. Focus on prepartion & adminstration medication only

The United States Pharmacopeia (USP) in cooperation with the Institute of Safe Medication Practices instituted

a program called Medication Errors Reporting Program. This program is designed to identify the number and type of drug errors occurring around the country. The goal of this voluntary reporting system is to collect data and disseminate information that will prevent such errors in the future. A copy of the report form is included in Appendix C. Nurses are urged to participate in this important program as a means of protecting the public by

identifying ways to make drug administration safer.



Standing Order: This type of order is given when the patient is to receive the drug as prescribed on a regular basis. The drug is administered until the physician discontinues the drug's use. Occasionally a drug may be ordered for a specified number of days, or in some cases a drug can only be given for a specified number of days before the order needs to be renewed.

Example: Lanoxin 0.25 mg PO QD.

Single order: An order to administer the drug one time only.

Example: Valium 10 mg IVP @ 10:00 AM.

PRN order: An order to administer the drug as needed.

Example: Demerol 100 mg IM q4h PRN for pain.

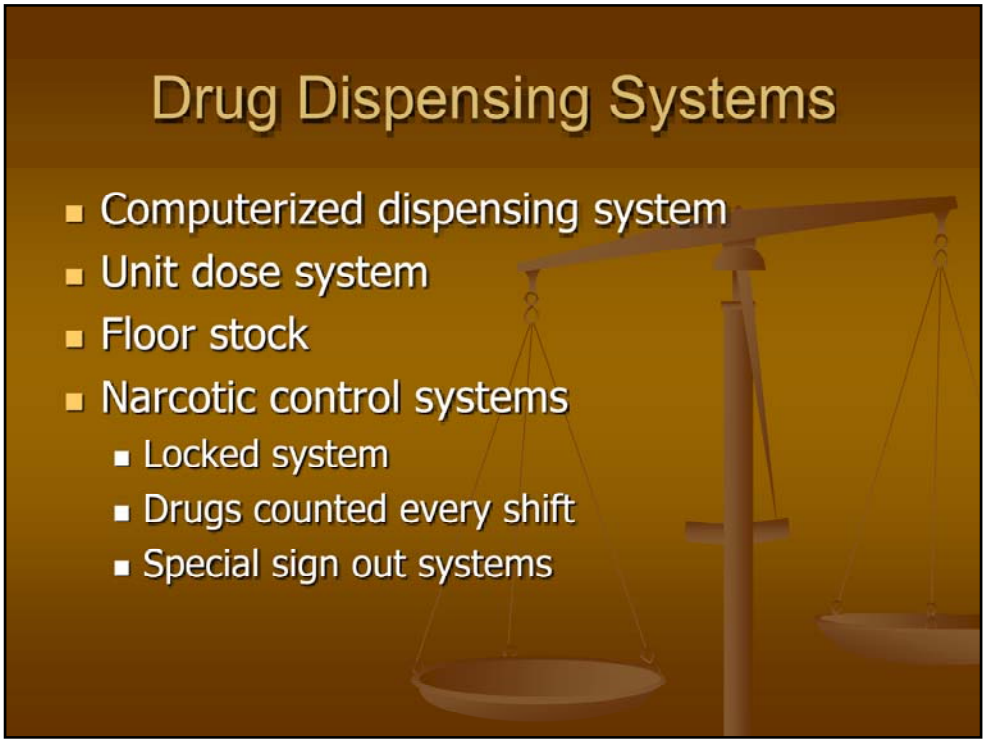
STAT order: A one-time order given as soon as possible.

Example: Morphine 10 mg IV STAT.

Once-a-Week Drugs

Soon many drugs will be available for once-a-week, or even twice-a-month, administration. The doses are

designed to replace daily doses of drugs. One of the first is alendronate (Fosamax), a drug used to treat osteoporosis (see Chapter 21).



Computerized Dispensing System

Each floor or unit has a medication cart in which medications are placed for individual patients. Medication orders are filled in the hospital pharmacy and are placed in the drug dispensing cart. When orders are filled, the cart is delivered to the unit. To administer the drugs, nurses enter the patient's name and the drug to be administered. The drug is dispensed and automatically recorded into the computerized system. After drugs are dispensed and the cart is almost empty, it goes back to the pharmacy to be refilled and for new drug orders to be placed.

Unit Dose System

The **unit dose** system is a shown on the next slide.

Floor Stock

Some agencies, such as nursing homes or small hospitals, use a floor stock method to dispense drugs. Some special units in hospitals, such as the emergency department, may use this method. In this situation, drugs most frequently prescribed are kept on the unit in containers in a designated medication room or at the nurses' station. The nurse takes the medication from the appropriate container and administers the drug to the patient and records the drug in the patient's administration record.

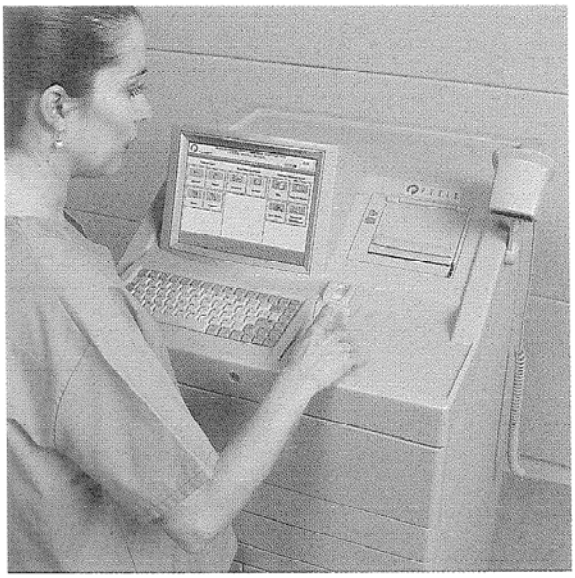
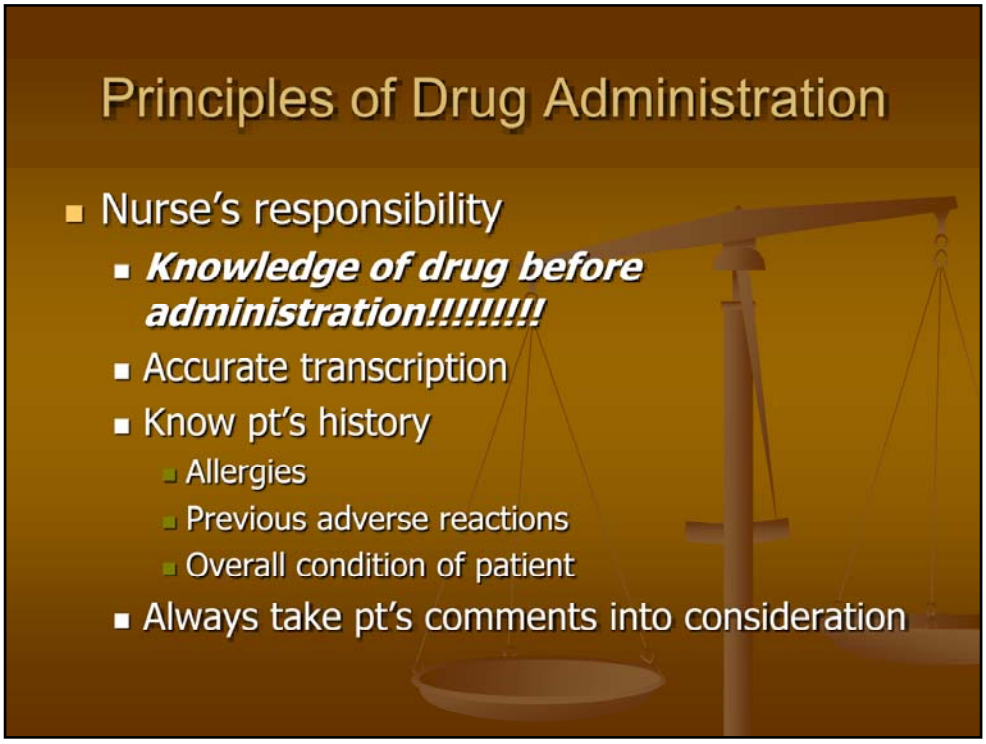


FIGURE 2-4. An automated medication system.

Unit Dose System or automated medication system.

The **unit dose** system is a method of dispensing medications in which drug orders are filled and medications dispensed to fill each patient's medication order(s) for a 24-hour period. The pharmacist dispenses each dose (unit) in a package that is labeled with the drug name and dosage. Some hospitals are using a bar code scanner in the administration of unit dose drugs. To use this system, a bar code is placed on the patient's hospital identification band when the patient is admitted to the hospital. The bar codes, along with bar codes on the drug unit dose packages, are used to identify the patient and to record and charge routine and PRN drugs. The scanner also keeps an ongoing inventory of controlled substances, which eliminates the need for narcotic counts at the end of each shift.

May here it called a pyxis; name of brand of machine



Responsibilities include:

Knowledge of medication being administered

Proper technique while adminstering

Monitoring therapeutic (desired) response

Report adverse reactions.

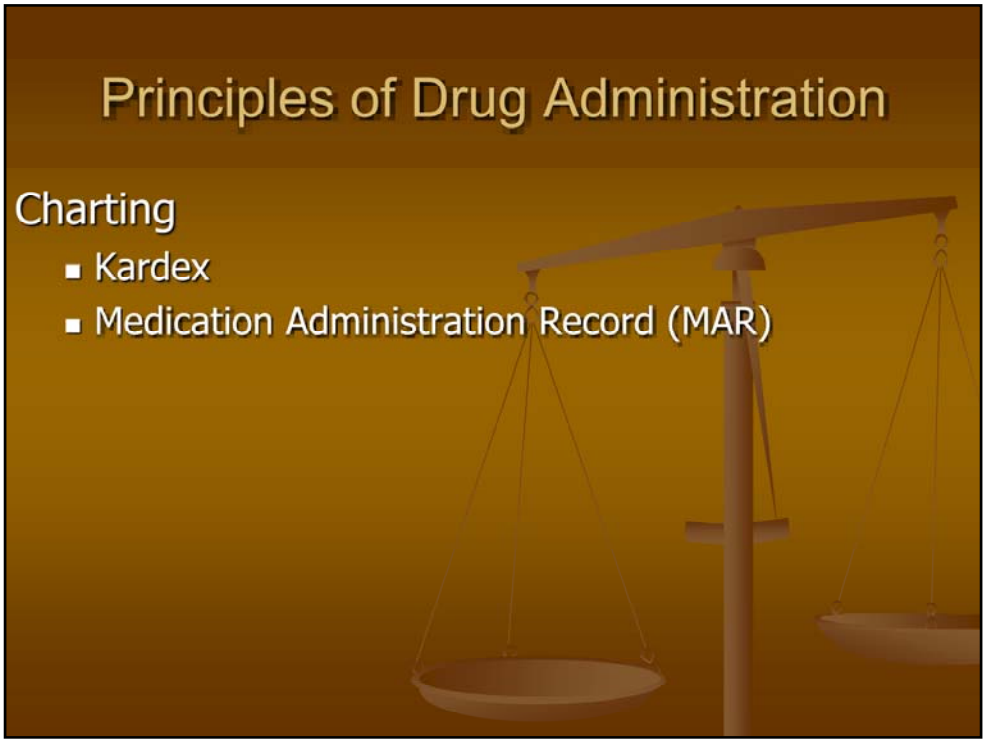
Teaching the pt and family.

Examples of situations that require consideration before a drug is given include:

• Problems that may be associated with the drug, such as nausea, dizziness, ringing in the ears, and difficulty walking. Any comments made by the patient may indicate the occurrence of an adverse reaction. The nurse should withhold the drug until references are consulted and the primary caregiver contacted. The decision to withhold the drug must have a sound rationale and must be based on knowledge of pharmacology.

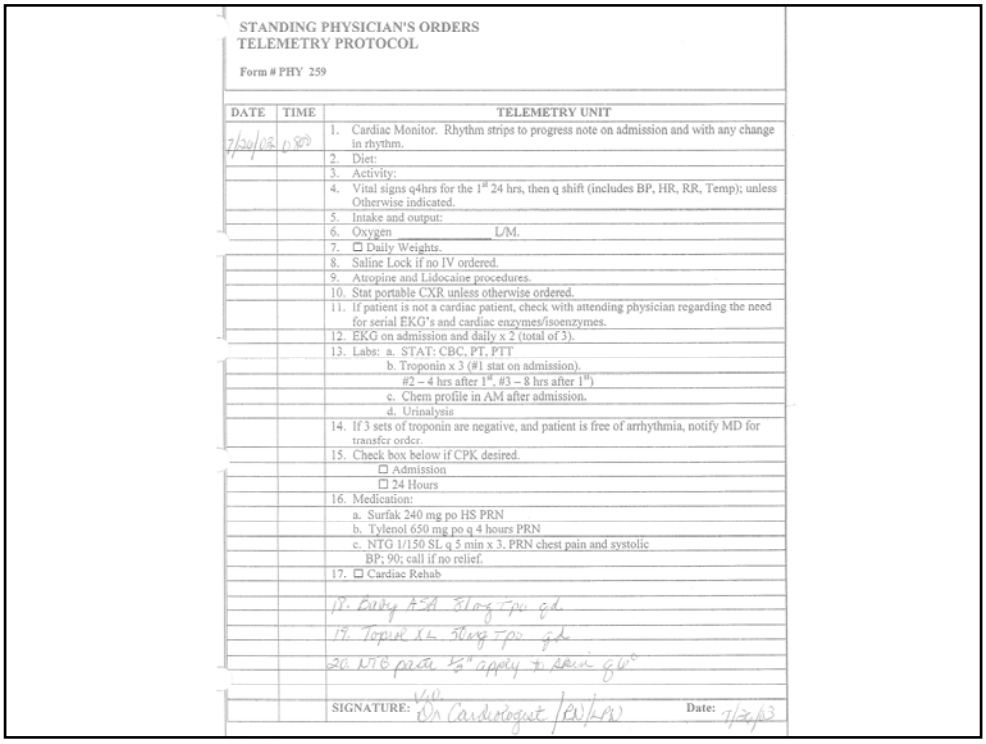
• Comments stating that the drug looks different from the one previously received, that the drug was just given by another nurse, or that the patient thought the primary care provider discontinued the drug therapy.

• A change in the patient's condition, a change in one or more vital signs, or the appearance of new symptoms. Depending on the drug being administered and the patient's diagnosis, these changes may indicate that the drug should be withheld and the primary care provider contacted.



HAND OUT COPY OF WBGH MED KARDEX AND REVIEW. ALSO HAVE A COPY OF A DOCTORS ORDER AND HAVE STUDENTS TRANSCRIBE ORDERS AS ASSIGNMENT.

Copies of Kardex and MD orders are shown on the next slides

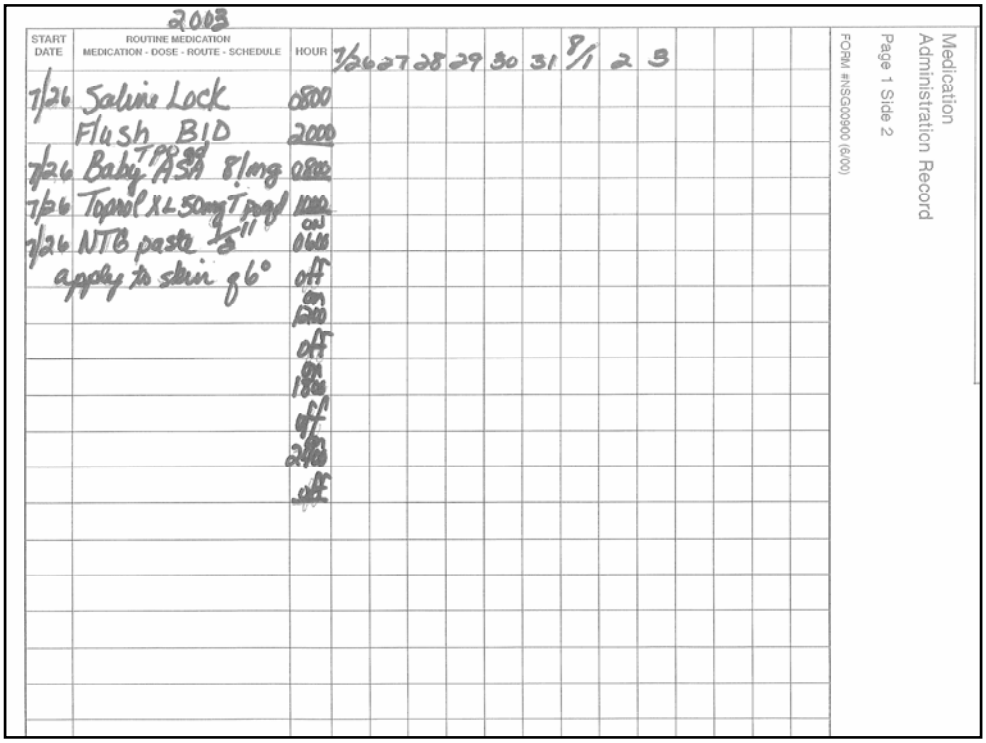


STANDING PHYSICIAN'S ORDERS
TELEMETRY PROTOCOL

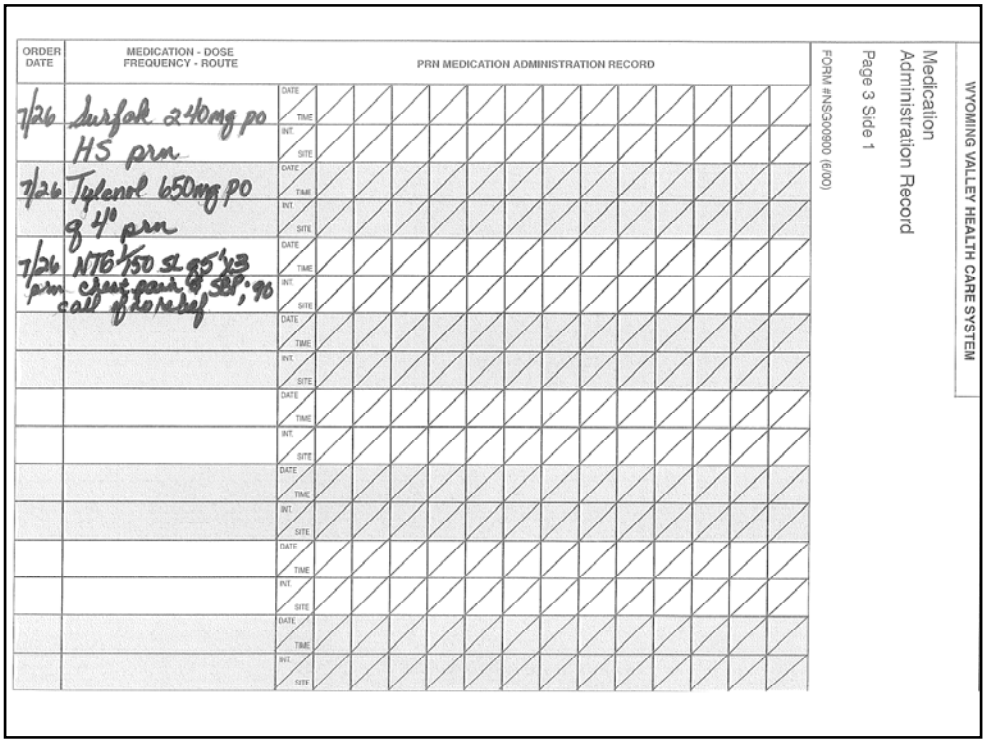
Form # PHY 259

DATE	TIME	TELEMETRY UNIT
7/26/03	0800	1. Cardiac Monitor. Rhythm strips to progress note on admission and with any change in rhythm.
		2. Diet:
		3. Activity:
		4. Vital signs q4hrs for the 1st 24 hrs, then q shift (includes BP, HR, RR, Temp); unless Otherwise indicated.
		5. Intake and output:
		6. Oxygen _____ L/M.
		7. ☐ Daily Weights.
		8. Saline Lock if no IV ordered.
		9. Atropine and Lidocaine procedures.
		10. Stat portable CXR unless otherwise ordered.
		11. If patient is not a cardiac patient, check with attending physician regarding the need for serial EKG's and cardiac enzymes/isoenzymes.
		12. EKG on admission and daily x 2 (total of 3).
		13. Labs: a. STAT: CBC, PT, PTT
		b. Troponin x 3 (#1 stat on admission).
		#2 – 4 hrs after 1st, #3 – 8 hrs after 1st)
		c. Chem profile in AM after admission.
		d. Urinalysis
		14. If 3 sets of troponin are negative, and patient is free of arrhythmia, notify MD for transfer order.
		15. Check box below if CPK desired.
		☐ Admission
		☐ 24 Hours
		16. Medication:
		a. Surfak 240 mg po HS PRN
		b. Tylenol 650 mg po q 4 hours PRN
		c. NTG 1/150 SL q 5 min x 3. PRN chest pain and systolic BP; 90; call if no relief.
		17. ☐ Cardiac Rehab
		18. Baby ASA 81mg Tpo qd.
		19. Toprol XL 50mg Tpo qd.
		20. NTG paste ½" apply to chest q6°
		SIGNATURE: VVP Dr Cardiologist PN/LPN Date: 7/26/03

The MD orders is what dictates the care the pt will be given. Medications are written for daily and prn administration.



This slide shows the MAR for daily drug administration. The pts identifying information would be either hand written or stamped in the area provided. The nurse will sign initials only in the box that corresponds to the medication and time. If the pt refused the medication the initials are generally circled and then the reason is charted in the pts record along with notification of the health care provider that ordered the medication.



This slide shows prn drug administration records. The date, time, nurse's initials and site are recorded in the area provided. Prn medications are also charted in the pts record. The nurse charts what was given, why and the pt's response.

Most MARs also have places to put one-time orders or single dose orders. Usually on the front of the kardex. There is also a signature page – the nurse signs his/her full name, credentials and initials on this page so they can only sign their initials in the med space provided – it saves room.

1.TRADE NAME – usually capitalized and written in bold print. They are the first name written on the label. The trade name is always followed by the ® registration symbol. Different manufacturers market the same medication under different trade names.

2.GENERIC NAME – is the official name of the drug. Each drug ahs only *one* generic name. This name appears directly under the trade name, usually in smaller or different type letters. Physicians may order a pt's medication by generic or trade name. nurses need to be familiar with both names and cross-check references as needed. Occasionally, only the generic name will appear on the label.

3.DOSAGE STRENGHT – indicates the amount or weight of the med that is ordered.

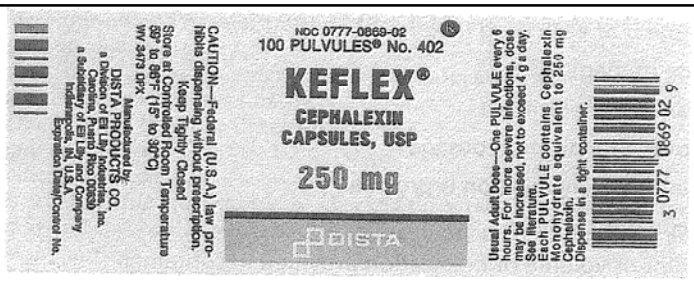
4.FORM - indicates how the drug is supplies. Examples of various forms are tablets, capsules, liquids, suppositories or ointments.

5.ROTUE - indicate how the drug is to be administered. The route can be oral, topical, injection or intravenous.

6.AMOUNT – the total amount of volume of the med may be indicated. Some examples are 250 mL of oral suspension, or a bottle that contains 50 capsules.

7.DIRECTIONS – some medications must be mixed before use. The amounts and types of diluents required will be listed along with the resulting strengths of the medications.

Other information may be found on drug labels: the name of the manufacturer, expiration date, special instructions for storage, and an NDC (National Drug Code) number.



1. Trade name.....Keflex
2. Generic name.....cephalexin
3. Dosage strength.....250 mg
4. Form.....capsules
5. Amount.....100
6. Directions.....Keep tightly closed. Store at controlled room temperature 59° to 86° F (15° to 30° C).
7. NDC number.....0777-0869-02
8. Manufacturer.....DISTA

1.TRADE NAME – usually capitalized and written in bold print. They are the first name written on the label. The trade name is always followed by the ® registration symbol. Different manufacturers market the same medication under different trade names.

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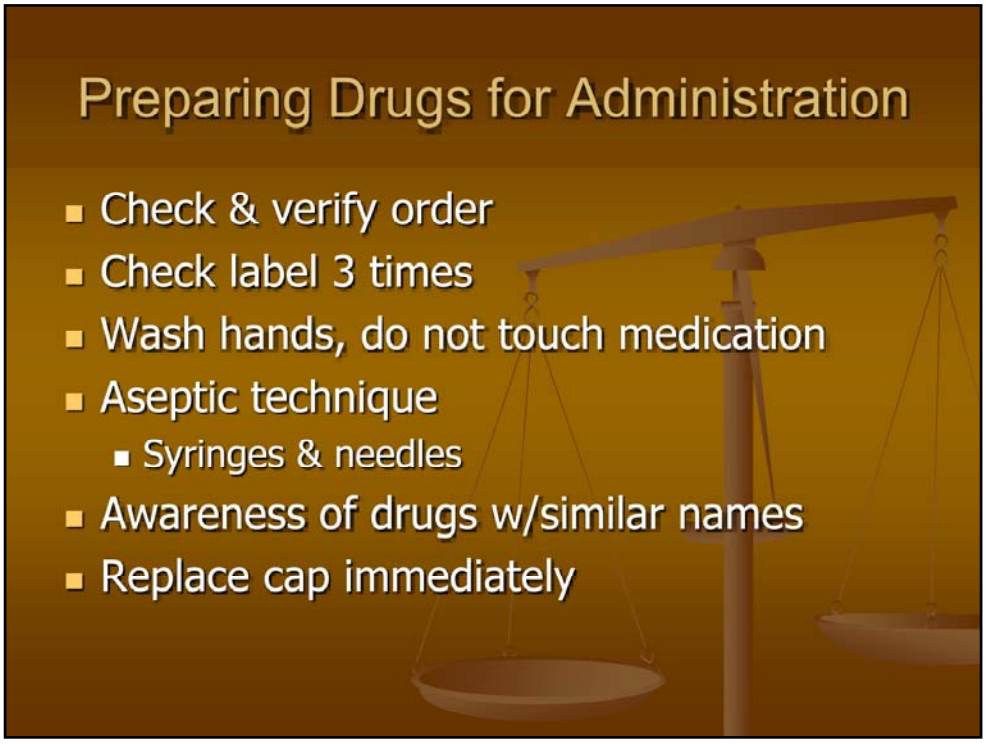
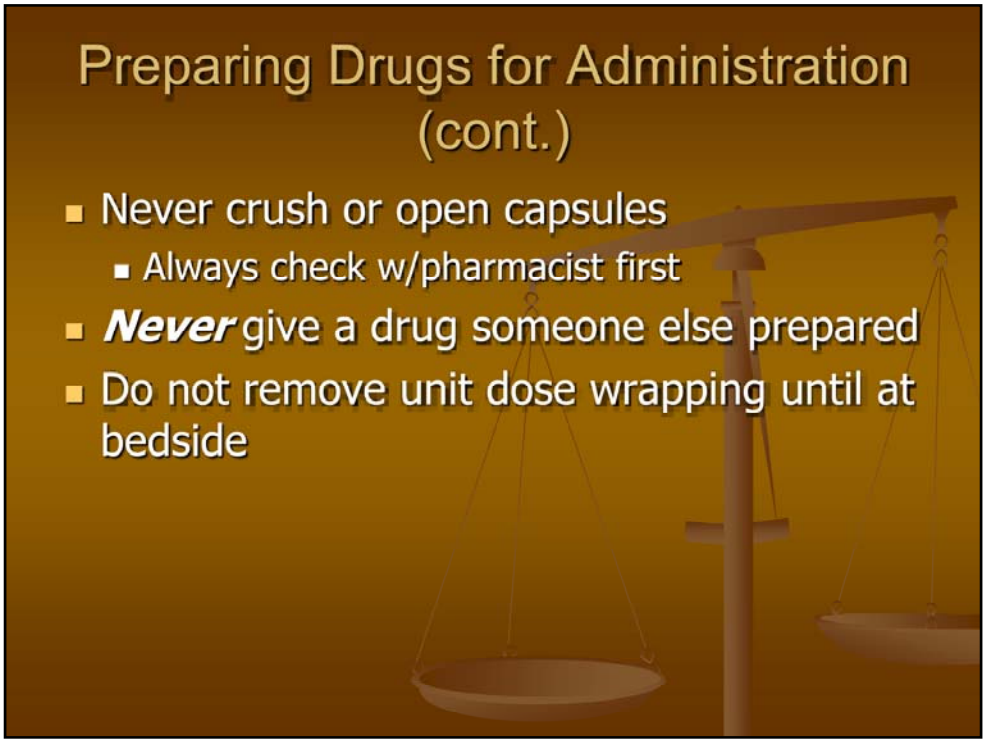


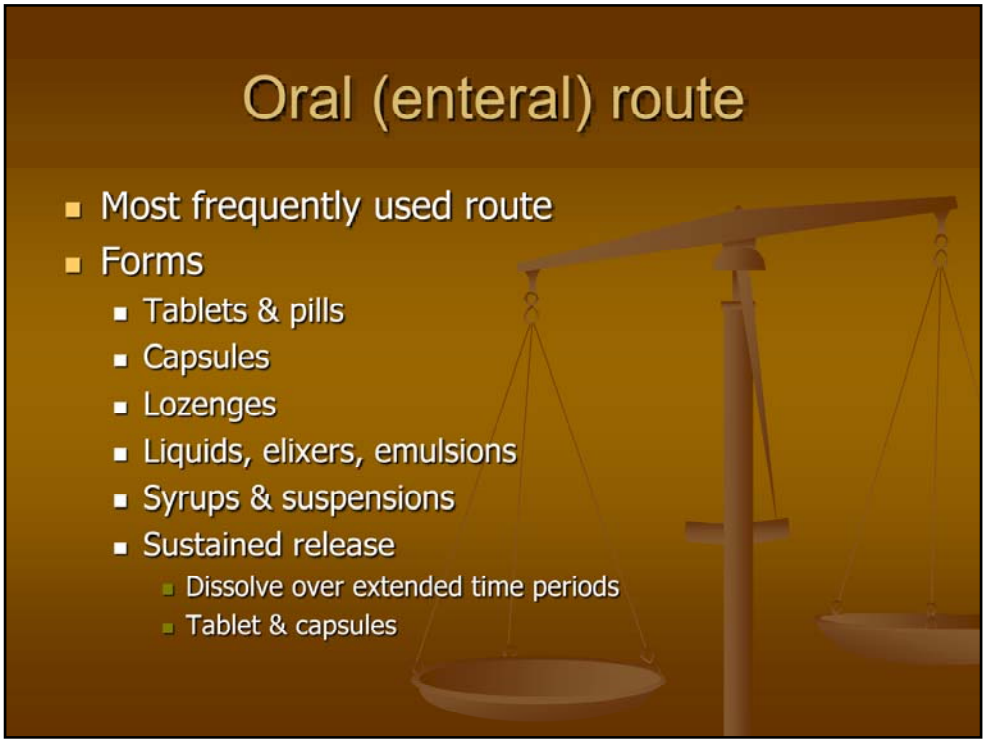
• Prepare drugs for administration in a quiet, well-lit area.

• Never remove a drug from an unlabeled container or from a container whose label is illegible.

If medication is in multi-dose vail, Do three checks before entering patients room



•Some tablets can be crushed or capsules can be opened and the contents added to water or a tube feeding when the patient cannot swallow a whole tablet or capsule. Some tablets have a special coating that delays the absorption of the drug. Crushing the tablet may destroy this drug property and result in problems such as improper absorption of the drug or gastric irritation. Capsules are gelatin and dissolve on contact with a liquid. The contents of some capsules do not mix well with water and therefore are best left in the capsule. If the patient cannot take an oral tablet or capsule, consult the primary care provider because the drug may be available in liquid form.



HAND OUT ORAL CUPS – PAPER AND MEASURING

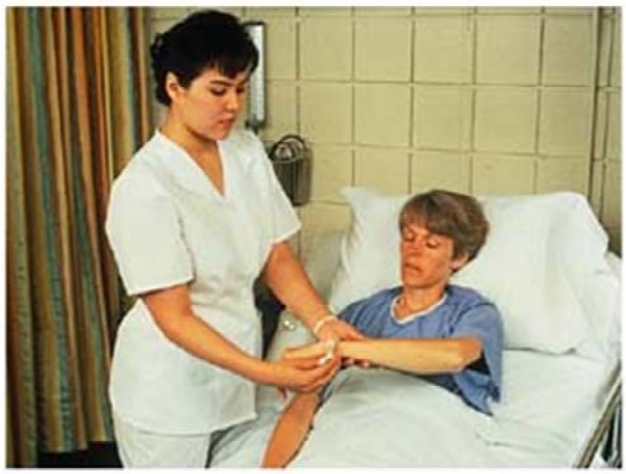
Elixers are sweetened liquids. Emulsions are mixtures of 2 liquids not mutually soluble (ability to dissolve). A suspension – state of a solid when its particles are mixed with, but not dissolved in a fluid or another solid.

ly

FIGURE 2-2. Prior to administering the medication, the nurse compares the medication, the container, and the medication to ensure that the patient received the "Right Drug" and the "Right Dosage." (Photograph © B. Proud.)

This slide shows the nurse pouring medication from a multi dose vial. Again make sure correct med, dose and route are given.

Be sure to do three checks before you enter the room



Always check the pts name before giving drug.

Promptly chart the drug given.

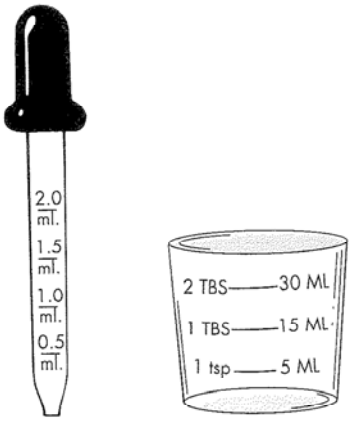


FIGURE 16-4 Scaled dropper and cup to measure oral liquids. (From Clayton BD, Stock YN: *Basic pharmacology for nurses*, ed 11, St. Louis, 1997, Mosby.)

This picture shows a dropper and a measuring cup to measure and administer liquid medications. It is graduated in both cc's and tsps.

Other oral administration equipment include unit dose packing, soufflé cup (paper cup), teaspoons and oral syringes.

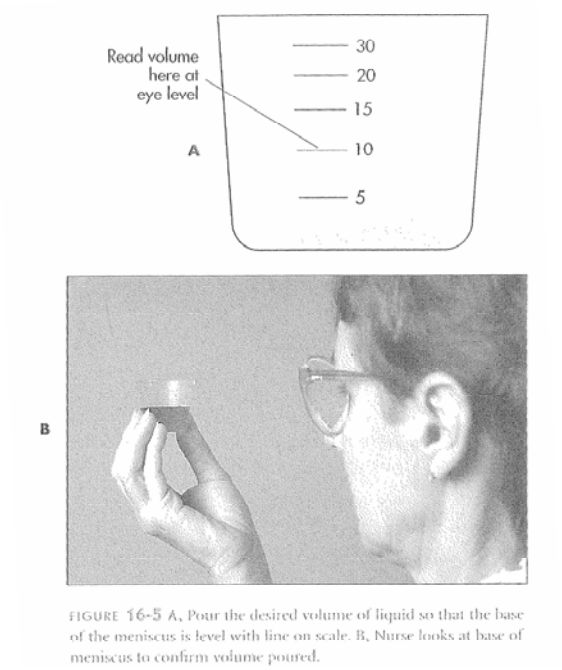
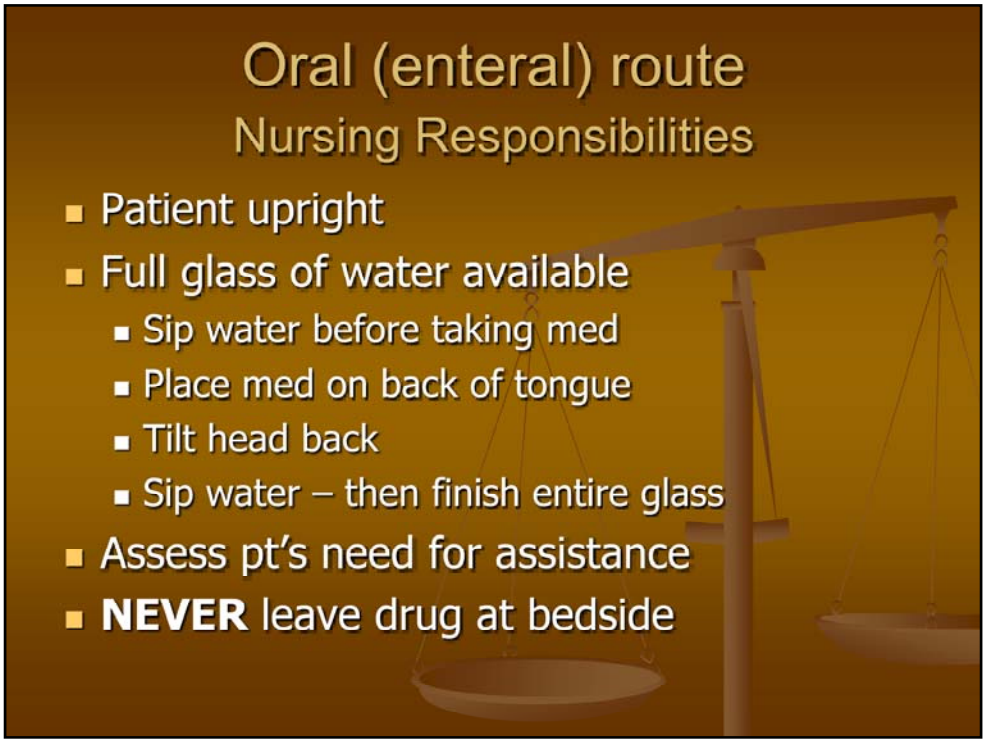


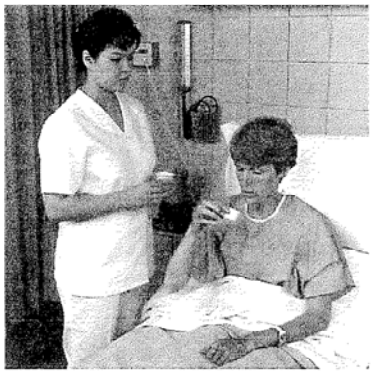
FIGURE 16-5 A, Pour the desired volume of liquid so that the base of the meniscus is level with line on scale. B, Nurse looks at base of meniscus to confirm volume poured.

Key principles for when using measuring receptacles:

1. Drugs poured into medication cups should e done at eye level. This allows the nurse to accurately see the desired amt. the amount of poured liquid should be even with the base of the meniscus.
2. Pour liquid medications away form a label to ensure that liquid will not run down a label, making it difficult to read.
3. Drugs drawn into syringes should be drawn slowly to prevent air bubbles from entering the syringe. Air displaces medications and may lead to inaccurate measurement of doses.



Sometimes drugs like NTG or antacids are left at the bedside only if there is an order!

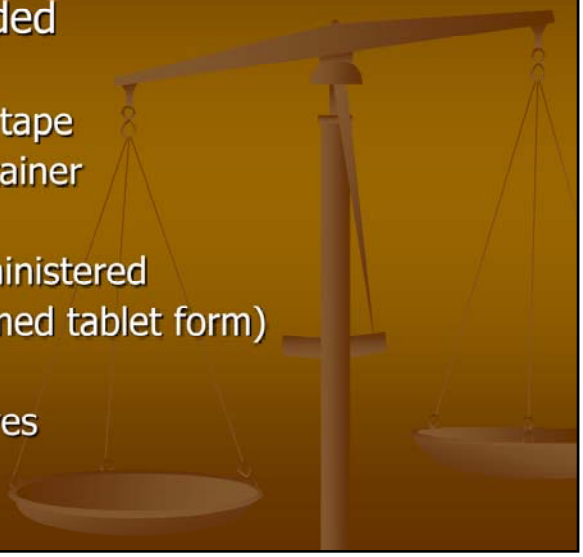


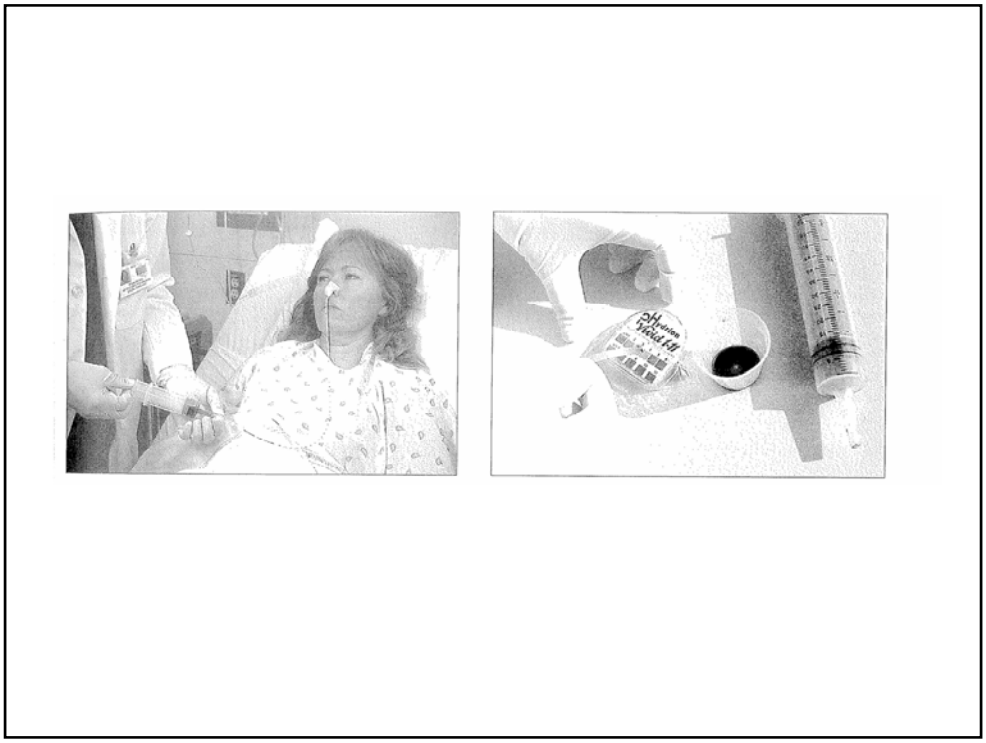
Step 14. Administering the medication

REVIEW NEXT 3 PAGES WHILE THIS SLIDE IS BEING VIEWED.

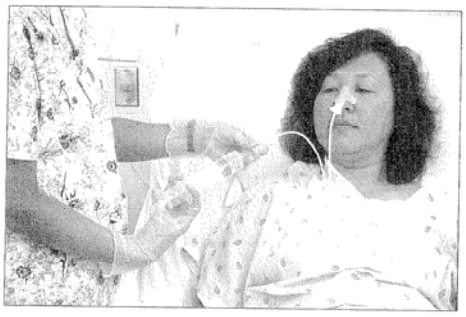
Oral (enteral) route
Drugs through NG tube

- Equipment needed
  - 60 mL syringe
  - Gastric pH test tape
  - Graduated container
  - Water
  - Drug to be administered
  - Pill crusher (if med tablet form)
  - MAR
  - Disposable gloves





This slide shows the nurse checking for placement before drug administration to ensure the tube is in the correct location. First the nurse aspirates contents and checks with pH test tape. Gastric fluid is in the 1 – 4 range. Fluid from the nasointestinal tube of a fasting pt usually has a pH > 6. Pts with continuous tube feeding may have a pH of > or = to 5 because the feeding contains solutions that are basic. Pleural fluid form the tracheobronchial tree is generally > 6 (it may be difficult to differentiate between intestinal placement)

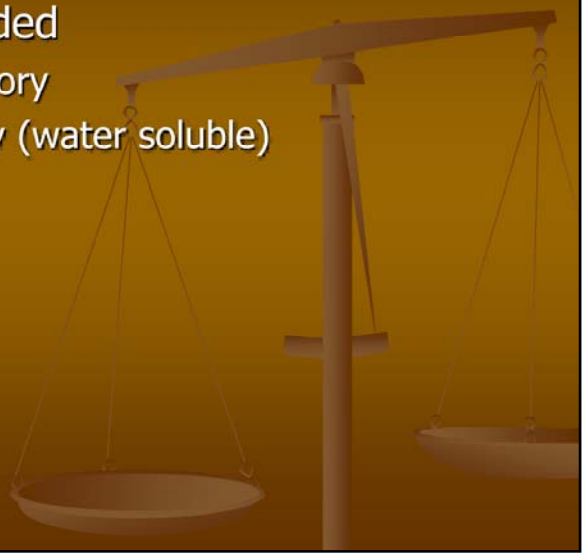


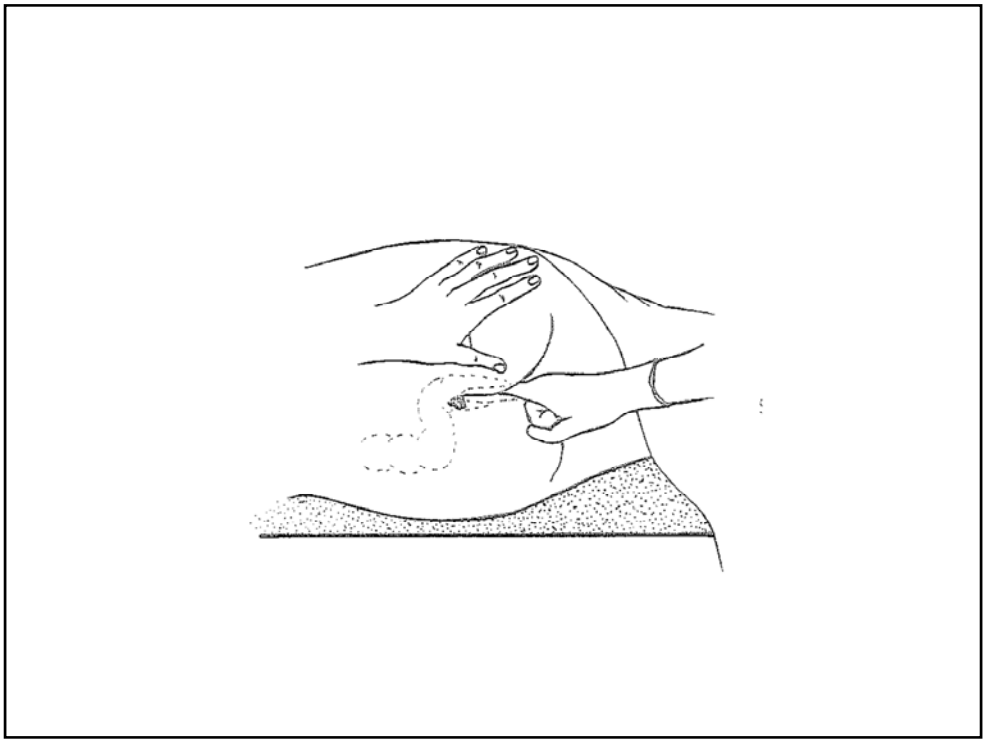
READ NEXT PAGES WHILE THIS SLIDE IS BEING VIEWED.

Enteral Route (cont.)

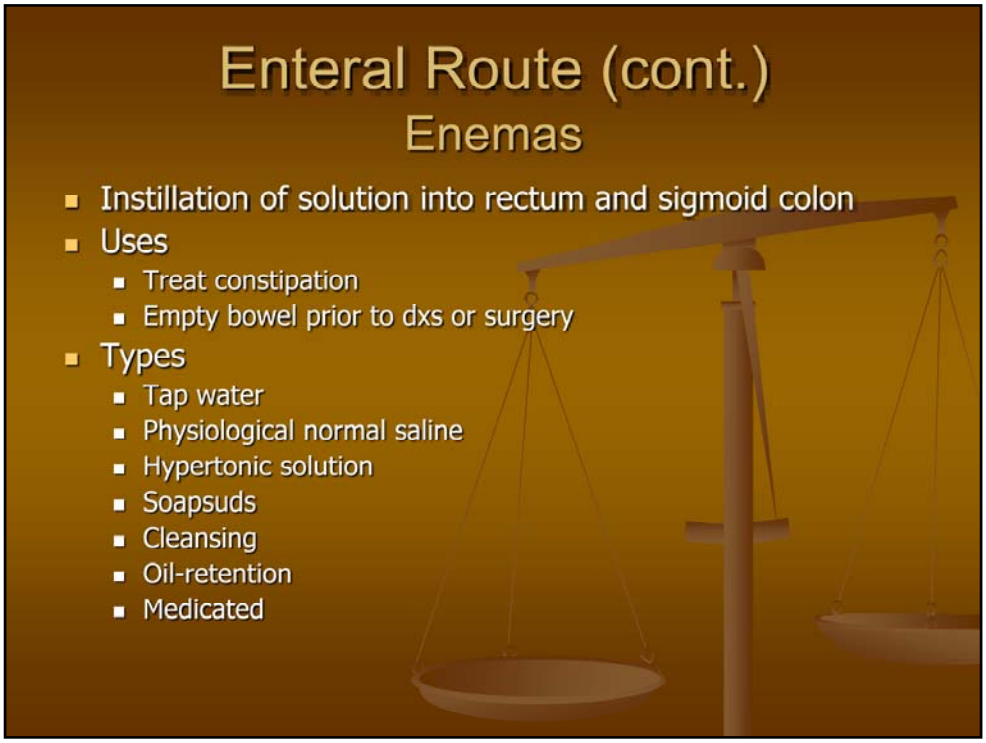
Rectal Suppositories

- Equipment needed
  - Rectal suppository
  - Lubricating jelly (water soluble)
  - Clean gloves
  - Tissue
  - Drape
  - MAR

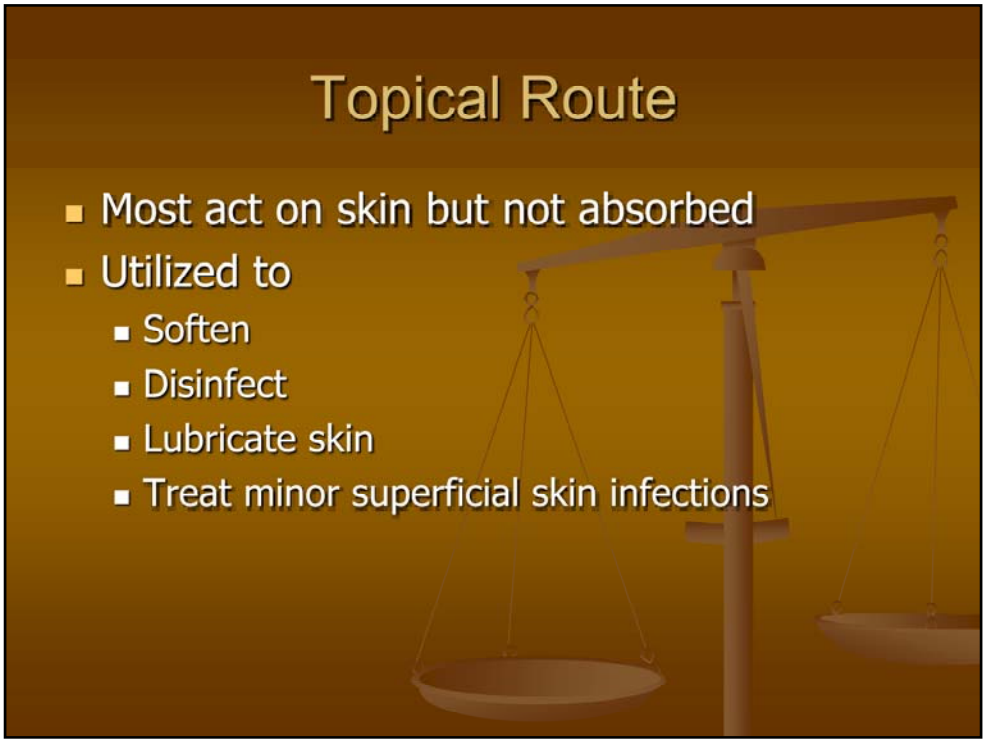




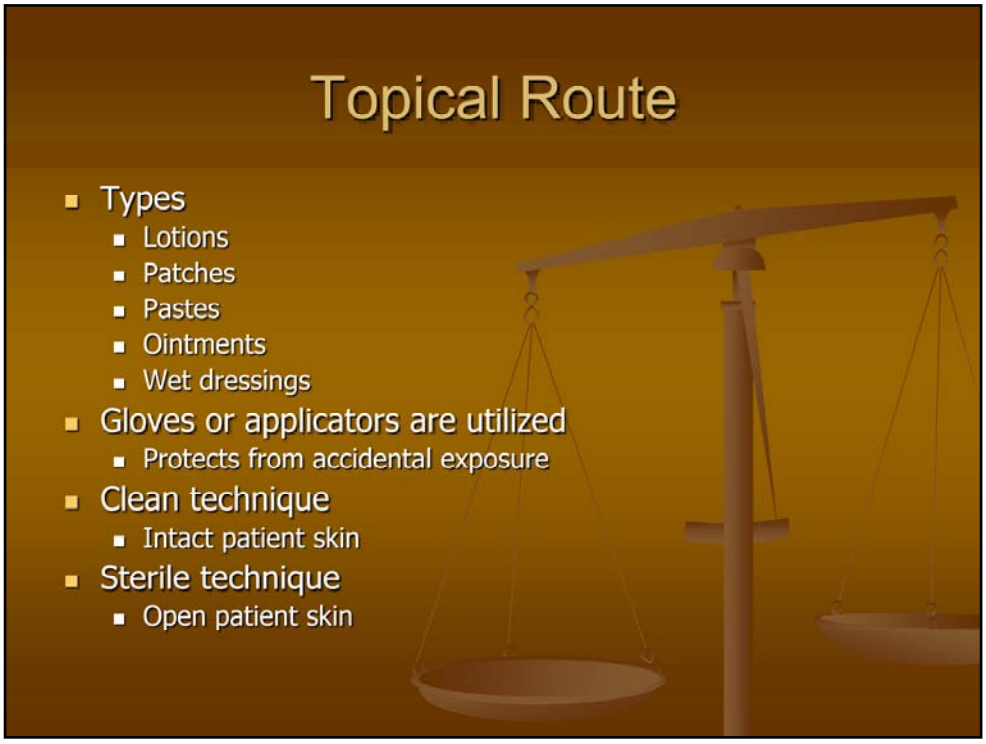
READ NEXT PAGES WHILE THIS SLIDE IS BEING VIEWED



1. Types
    1. Tap water – should not be repeated after first installation because can cause water toxicity or circulatory overload can develop
    2. Physiological normal saline – is safest. Infants and children can tolerate only this type because of their predisposition to fluid imbalance. If prepared at home – mix 500 mL(1 pint) of tap water with 1 tsp salt
    3. Hypertonic solution – useful for clients who cannot tolerate large volumes of fluid. Only 120 – 180 ml is usually effective (i.e., Fleet enema)
    4. Soapsuds – is pure soap added to either tap water or NSS, depending on pt;s condition and frequency of administration. Use only castile soap . Recommended ratio of pure soap to solution is 5 ml to 1000 ml warm water or saline. Soap should be added to enema bag after water is in place
    5. Cleansing – promote complete evacuation of feces from the colon. They act by stimulating peristalsis through infusion of large volumes of solution.
    6. Oil-retention – act by lubrication the rectum and colon. Feces absorb oil and become softer and easier to pass.
    7. Medicated – contain pharmacological therapeutic agents and may be prescribed to reduce dangerously high serum potassium levels, as with use of a sodium polystyrene sulfonate (*Kayexalate)* enema, or to reduce bacteria in the colon before bowel surgery, as with use

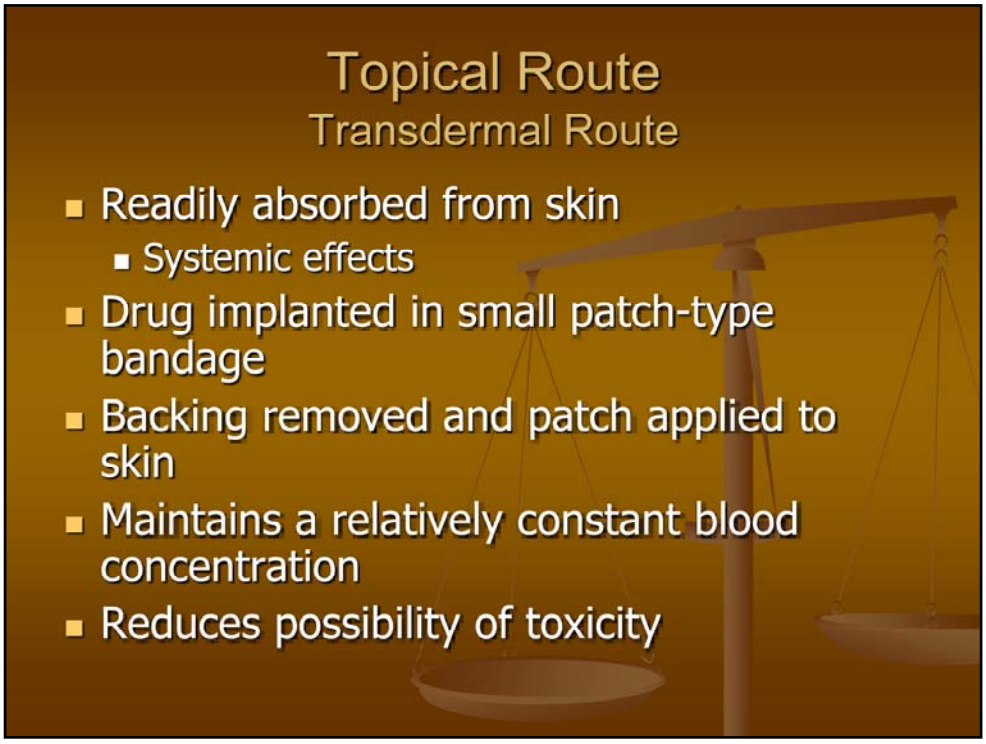


A few topical drugs are enzymes that have the ability to remove the superficial debris, such as the dead skin and purulent matter present in skin ulcers.



Can create systemic and local effects if absorbed through the skin (depending on the drug).

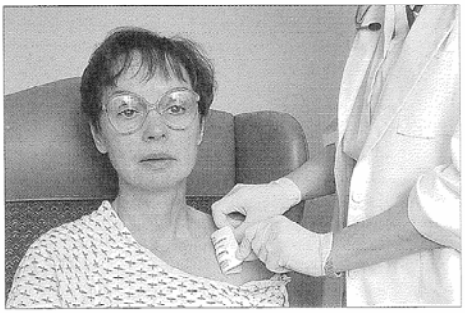
Skin encrustations and dead tissue harbor microorganisms and block contact of medications with the tissues to be treated. Simply applying new medications over previously applied drugs does little to prevent infection or offer therapeutic benefit. The nurse cleans the skin thoroughly before applying medications by washing the area gently with soap and water, soaking an involved site, or locally debriding tissue.



Can be ointment or commercially made patch

Transdermal Route

STEP 3b(1) Ointment spread in inches over measuring guide.



STEP 3b(5) Nurse applies wrapper with medication on client's skin.

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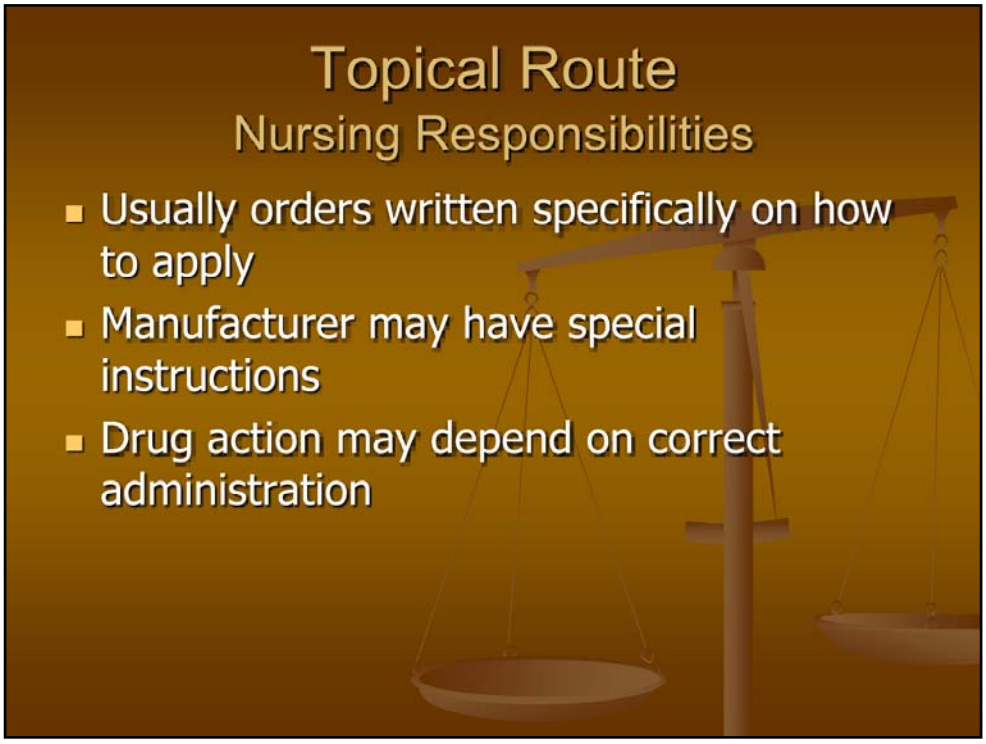
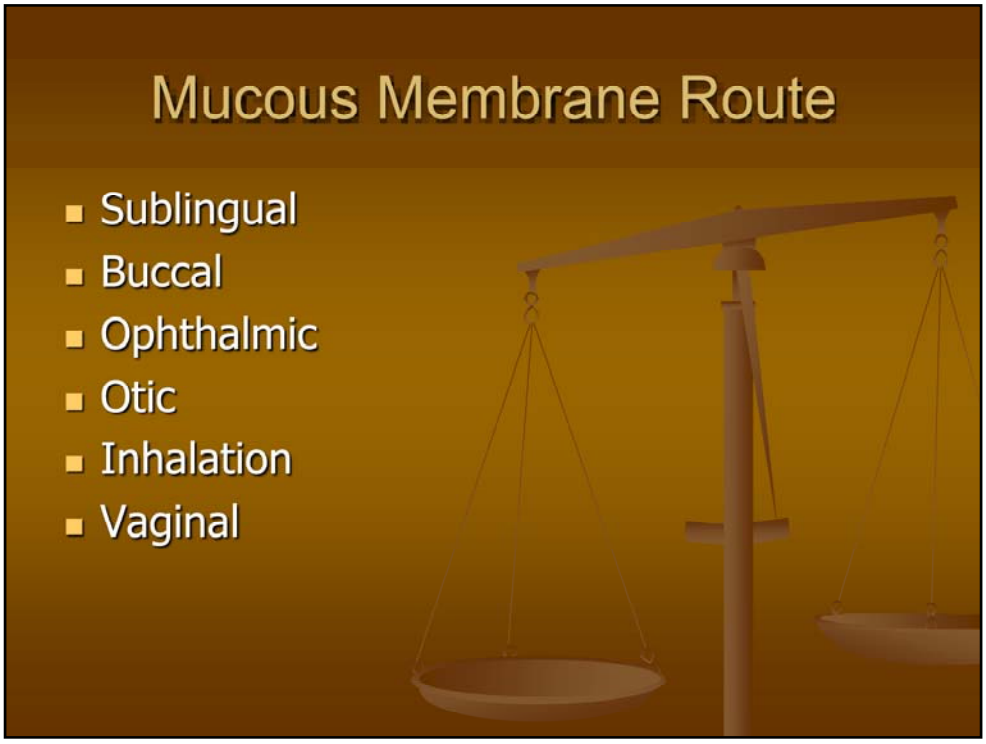
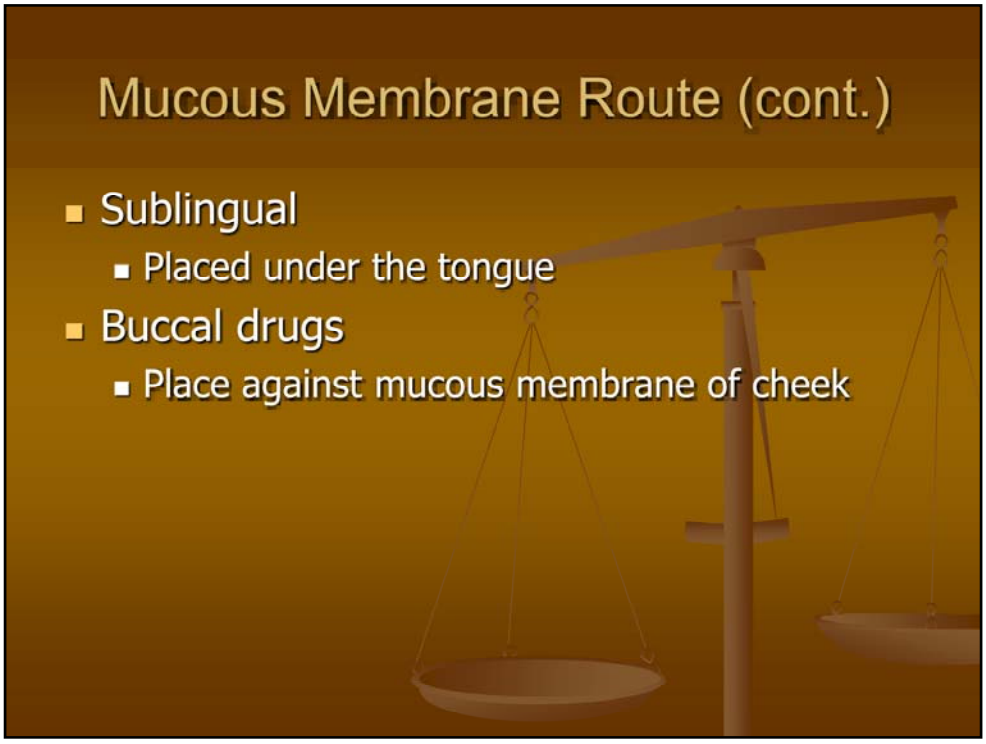


Each type of medication, whether an ointment, lotion, powder or patch should be applied in a specific way to ensure proper penetration and absorption. For example, the nurse applies lotions and creams by spreading them lightly onto the skin's surface, whereas powders are dusted lightly over affected areas.

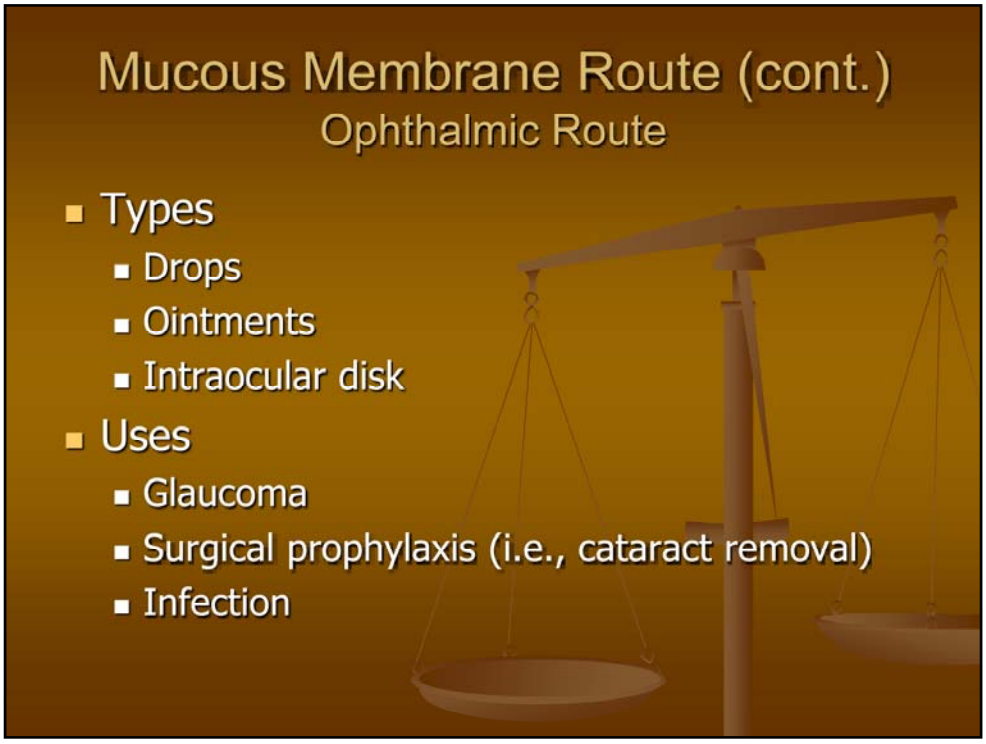
An excessive amount of topical agent can cause chemical irritation of skin, negate drug's effectiveness, and/or cause adverse systemic effects, such as decreased white cell counts.



I will review each of these separately.



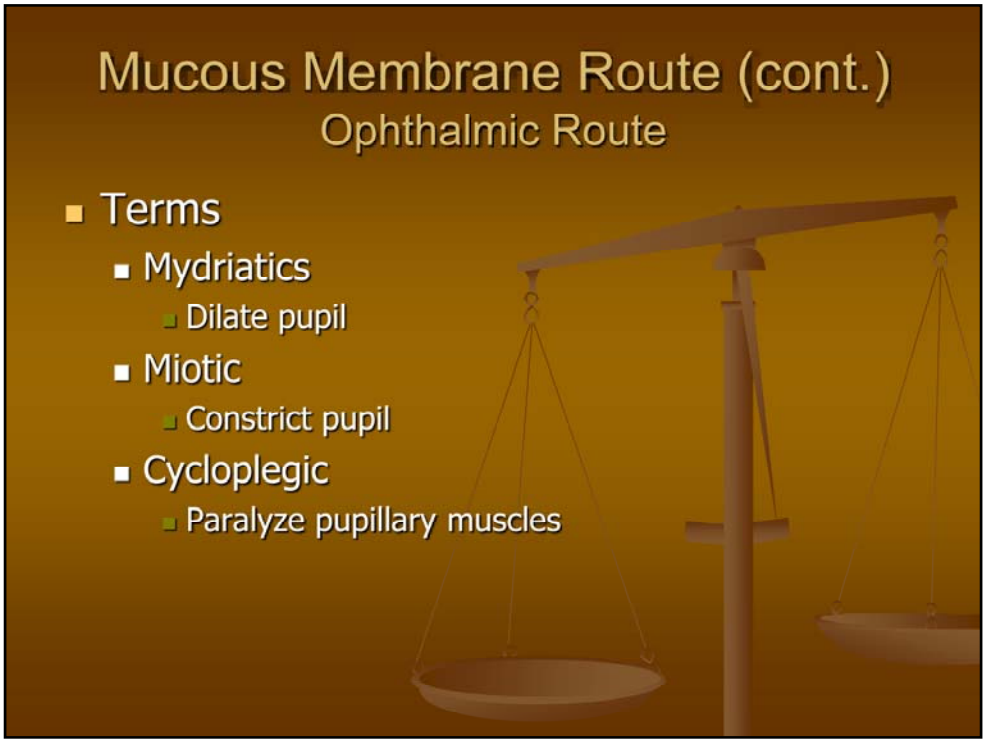
- **Sublingual drugs**
  - Have pt place medication under tongue and allow it to dissolve completely. Do not allow pt to swallow. The drug is absorbed through blood vessels of undersurface of tongue. If swallowed, drug is destroyed by gastric juices or so rapidly detoxified by liver that therapeutic blood levels are not attained
  - Must not be swallowed or chewed and must be dissolved completely before the patient eats or drinks. Nitroglycerin is commonly given sublingually.
- **Buccal drugs**
  - Are given for a local, rather than systemic, effect. They are absorbed slowly from the mucous membranes of the mouth. Examples of drugs given buccally are lozenges and troches.



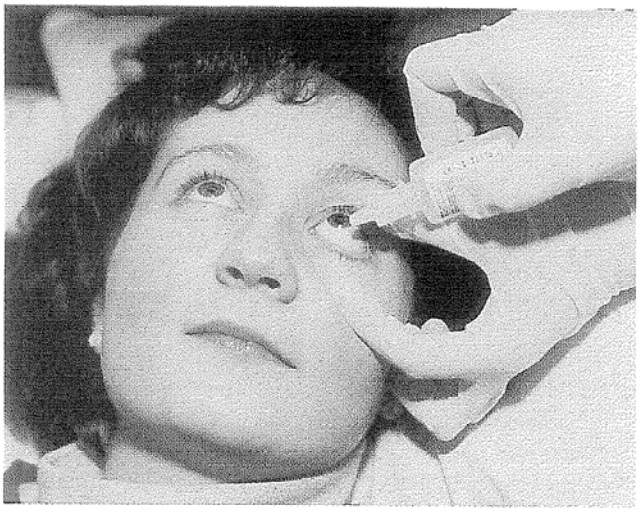
Many OTC preparations such as artificial tears and vasoconstrictors (ie, Visine and Murine).

Medications delivered through an intraocular disk resemble a contact lens. The disk is placed into the conjunctival sac, where it remains in place for up to one week.

The eye is the most sensitive organ to which the nurse applies medications. The cornea is richly supplied with sensitive nerve fibers. Care must be taken to prevent instilling medication directly onto the cornea. The conjunctival sac is much less sensitive and thus a more appropriate site for medication instillation.



Eye medications come in a variety of concentrations. Instilling the wrong concentrations may cause local irritation of eyes, as well as systemic effects. Some meds (above) can temporarily blur vision. Use of the wrong dose or concentration can prolong these effects.



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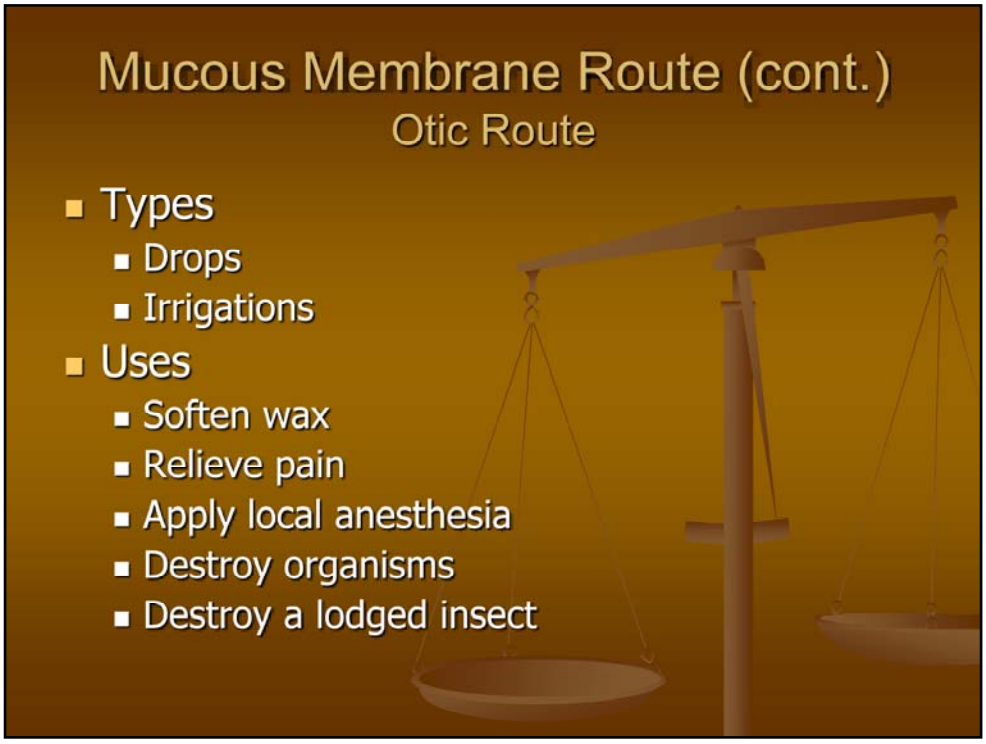
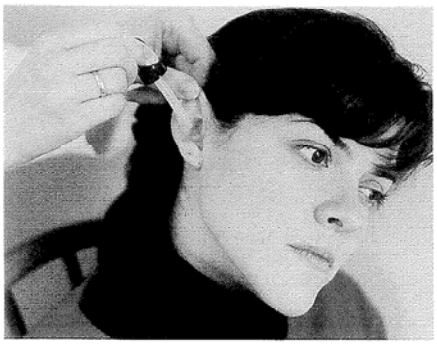


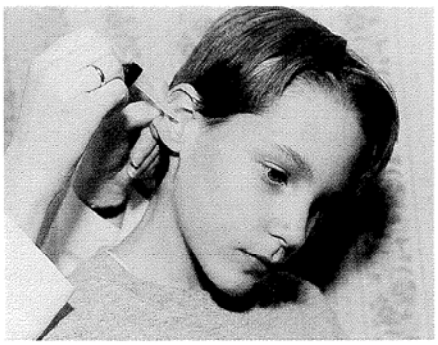
1. Drops – I will review next
2. Irrigations – ordinarily done for cleaning purposes or for applying heat to the area. Typically, NSS is used, although an antiseptic solution may be indicated for local action. An irrigation syringe is used in most instances. An irrigating container with tubing and an ear tip may also be used, especially if the purpose of the irrigation is to apply heat to the area.

Always take care that the TM is not ruptured before instilling medication or irrigations. Outer ear material can be forced into the middle or inner ear. Sterile procedure is used to prevent infection.

Instilling Ear Drops



Adult



School-aged child

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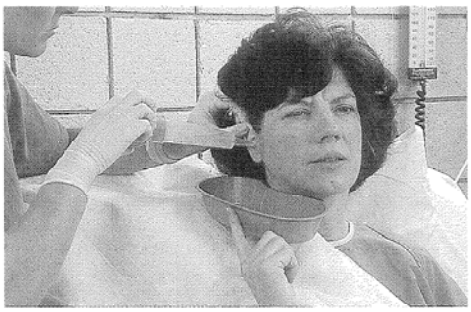
Administering Ear Irrigation

Action 7: Straightening the auditory canal.



Action 8: Instilling irrigation fluid. (PHOTOS © KEN KASPER.)

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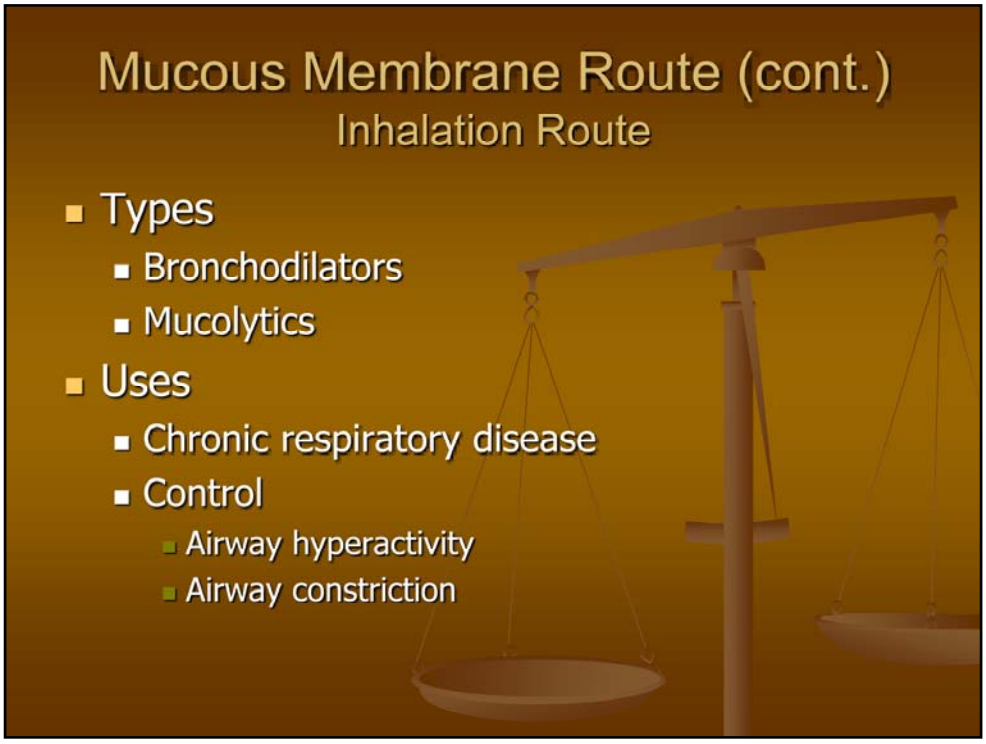


These medications are rapidly absorbed through the pulmonary system so they have potential for producing systemic side effects. (i.e., epinephrine dilates bronchioles but can cause tachycardia)

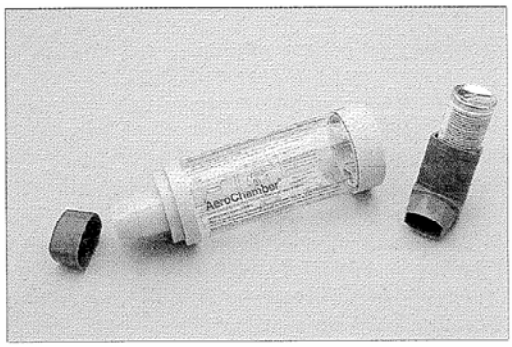


FIGURE 17-1 Example of a metered-dose inhaler (MDI) with spacer.

•Metered-dose inhalers (MDI's) are handheld devices that disperse medications through an aerosol spray, mist, or fine powder to penetrate lung airways.

•The deeper passages of the resp tract provide a large surface area for drug absorption. The aveoli-capillary network absorbs medication rapidly.

•Drugs can be administer by MDIs in high concentrations with **few** side effects.

•Delivers a measured dose of the drug with each push of the canister

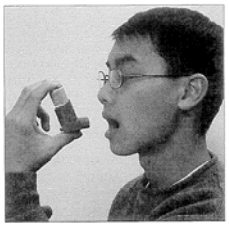
•Requires coordination during breathing cycle (many pts may spray the back of their throats and fail to receive a full dose)

•Must be depressed just as the pt inhales – ensures medication reaches lower airways

•Poor coordination can be solved by using a spacer device (as shown above), i.e., Aerochamber

Using a MDI

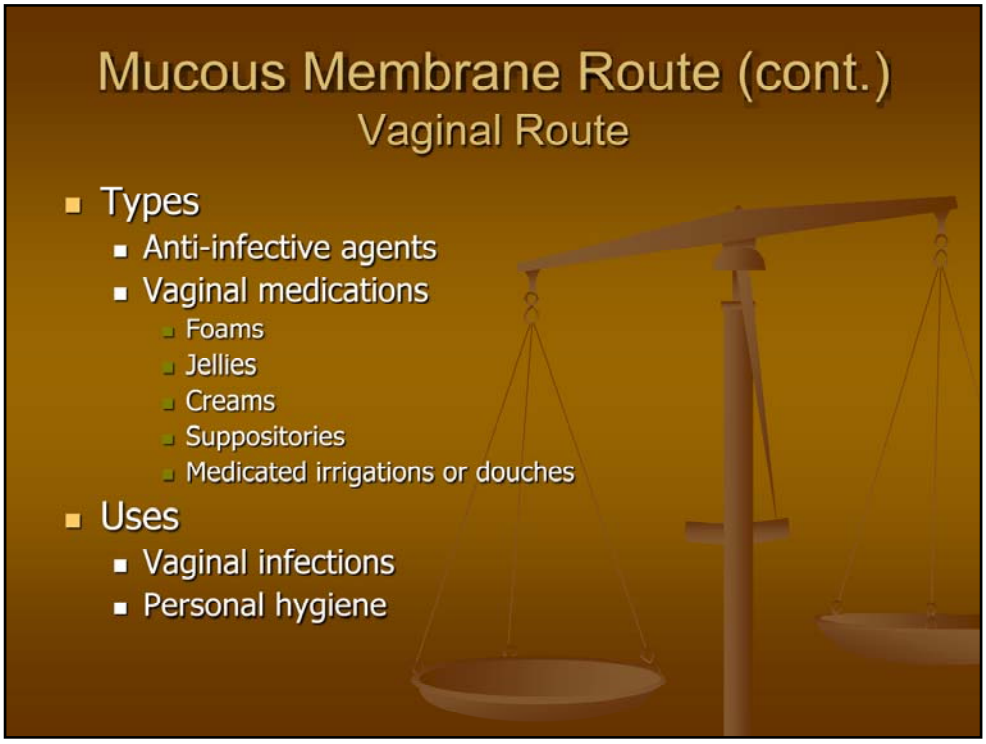
STEP 4d(1) One technique for use of the inhaler. The client opens lips and places inhaler in mouth with opening toward back of throat.



STEP 4d(2) One technique for use of the inhaler. The client tions the mouthpiece 1 to 2 inches from the mouth. This is c ered the best way to deliver the medication.

Using a MDI with a Aerochamber

Read next 3 pages while viewing this slide.



•Vaginal suppositories are oval shaped and come in individually packaged in foil wrappers.

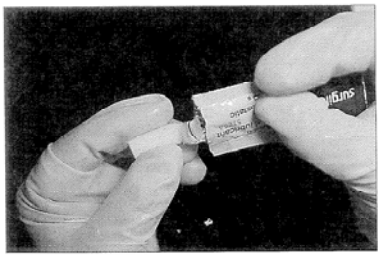
•They are larger and more oval than rectal supps.

•Store in refrigerator to prevent from melting

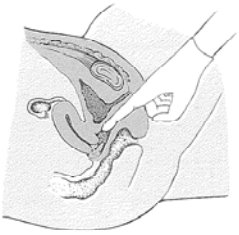
•Inserted with an applicator or gloved hand

•Body temp causes supp to melt and then distributed

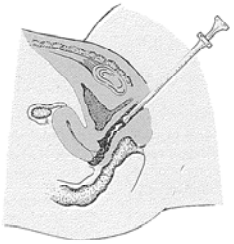
•Pts usually prefer to wear a perineal pad after insertion to collect excess d/c



STEP 7a Lubricate tip of suppository.

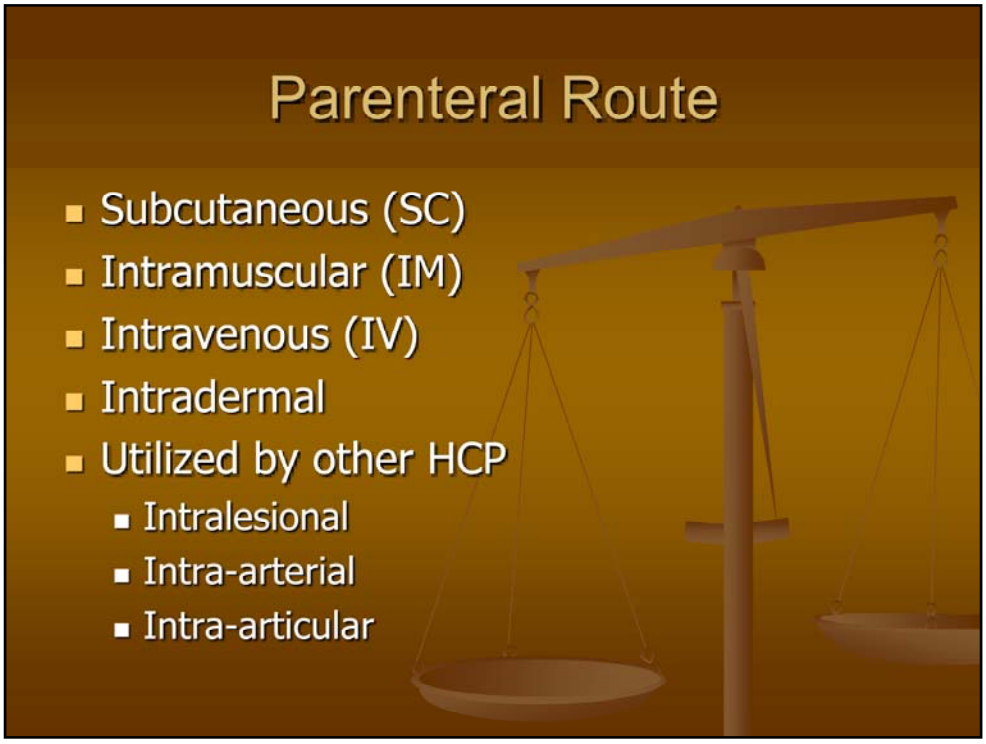


STEP 7c Angle of suppository insertion.

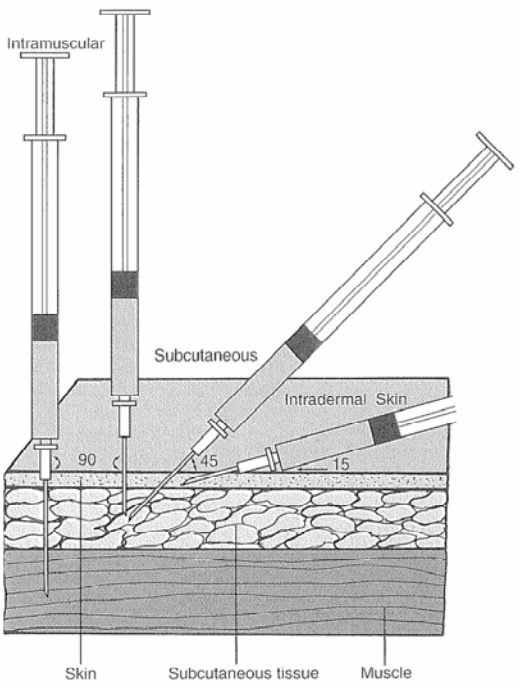


STEP 8c Applicator inserted into vaginal canal. Plunger pushed to instill medication.

View this slide while reviewing next 3 pages



In some instances, intra-arterial drugs are administered by a nurse. However, administration is not by direct arterial injection but by means of a catheter that has been placed in an artery.



This slide compares the angles of insertion for intramuscular, subcutaneous, and intradermal injections.

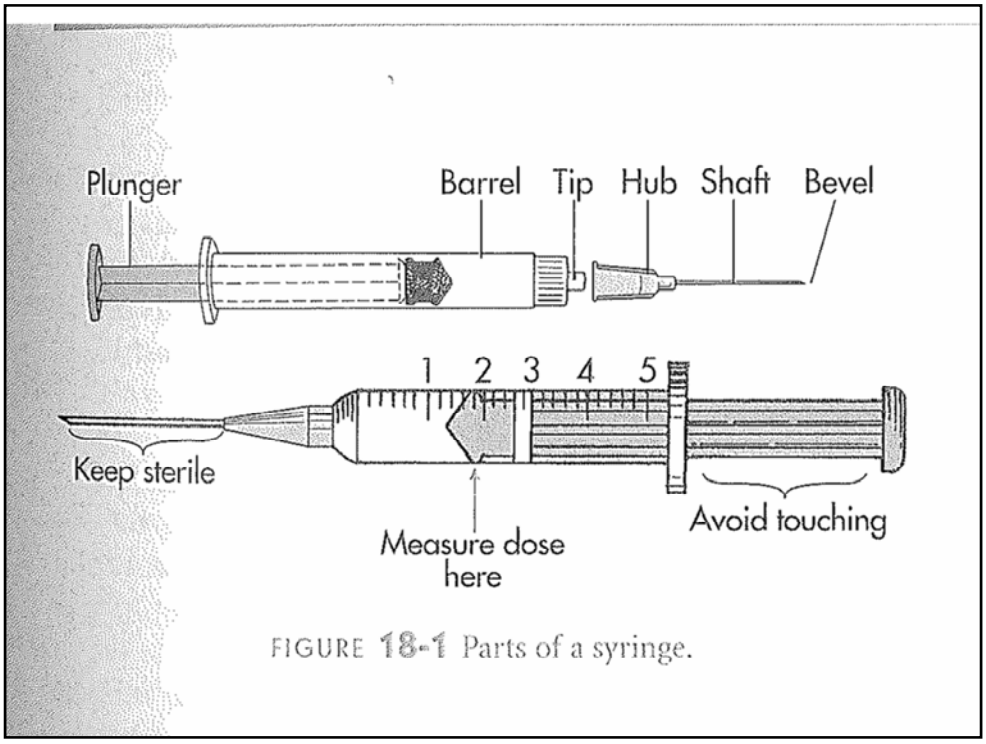


FIGURE 18-1 Parts of a syringe.

REVIEW ALL THE PARTS OF THE SYRINGE AS SHOWN IN THE SLIDE

•A syringe consists of a cylindrical barrel, a tip designed to fit the hub or a hypodermic needle, and a close-fitting plunger. They are single-use and disposable.

•Packaged with or without a needle. Can be **Luer-lok or non Luer-lok.**

•Various sizes – from 1 to 60 mL. The LPN uses her/his judgment in deciding what size to utilize.

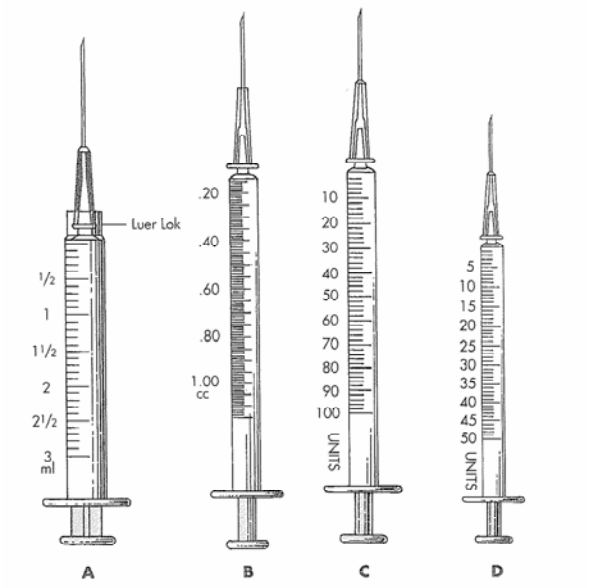
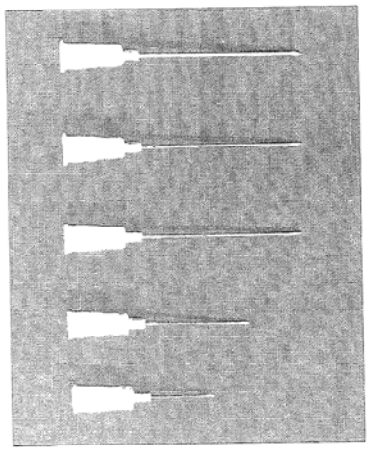


FIGURE 18-2 Types of syringes. A, Syringe with 3-ml capacity is marked in 0.1 (tenths). B, Tuberculin syringe is marked in 0.01 (hundredths) for doses of less than 1 ml. Insulin syringes marked in units in two sizes: C, 100 U; or D, 50 U (low-dose).

Syringes are normally calibrated in:

1. Minim = 15 mL
2. Milliliter – marked in tenths. Tb syringes are marked in hundredths.
3. Units – insulin syringes

Some syringes have two scales along the barrel – one divided into minims and the other into tenths of a mL.

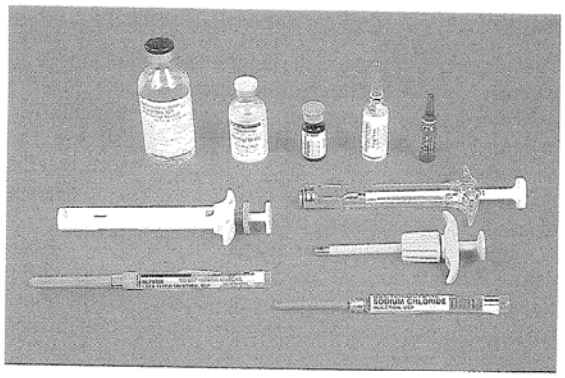


Needles are measured in gauge. As the needle gauge gets smaller, the needle diameter becomes larger.

Top to bottom: 19 gauge, 20 gauge, 23 gauge, and 25 gauge

The tip of a needle or the **bevel** is always slanted. The bevel creates a narrow slit into the tissue and quickly closes when the needle is removed to prevent leakage of the drug , blood or serum.

Needle vary in length from ¼ inch to 3 inches. The nurse again uses her judgment when selecting gauge and needle size. It usually depends on what is to be administered. Larger gauges for thicker fluid and longer needles for muscular or obese pts.



- Drugs for administration by injection are packaged several ways. Those that deteriorate in solution are usually dispensed as powders and are reconstituted immediately before injection. If drugs remain stable in solution, they are usually dispensed in ampoules, bottle, or vials in an aqueous (watery) or oily solution or suspension.
- Drugs may be dispensed in single-dose glass ampoules, single-dose rubber-capped vials, multidose rubber-capped vials, and prefilled cartridges.

Ampules:

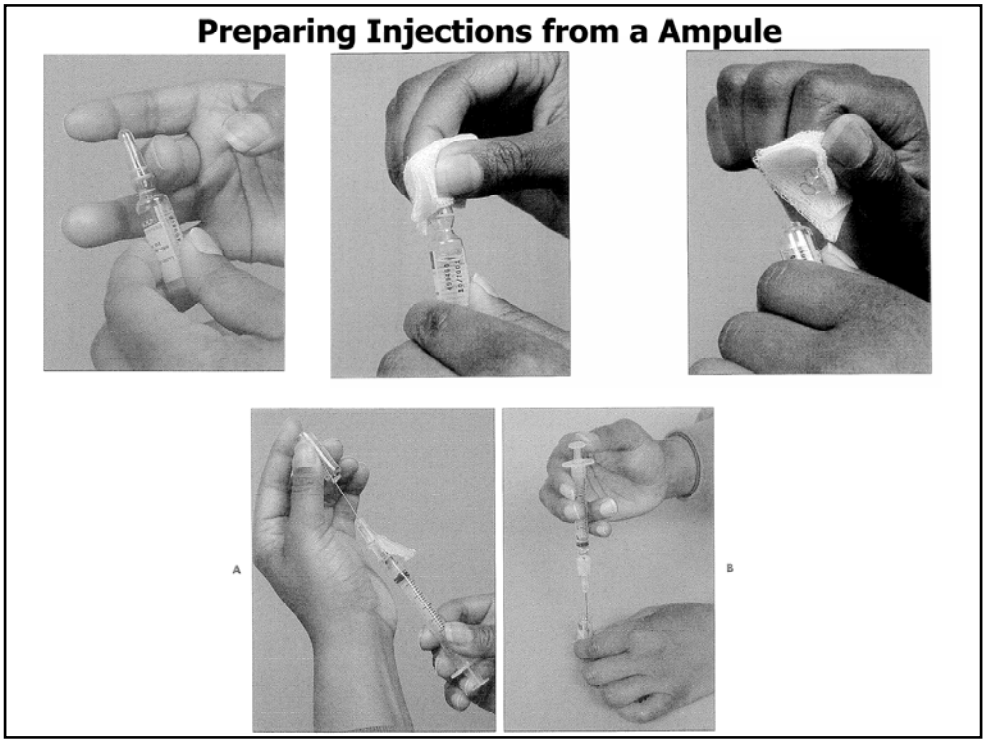
1. Glass flask
2. Contains single dose of drug
3. Discard any med not used – cannot prevent contamination after opened
4. Thin neck broken before drug drawn up – can be inverted or placed on flat surface
5. Care must be taken not to contaminate needle by touching rim of ampule

Vials

1. Glass bottle w/ a self-sealing stopper through which medication is removed
2. Usually covered with a soft metal cap that easily removed for transporting and storing
3. Can be several dose vial
4. Air must be injected first in an amount equal to the drug being removed.

Prefilled cartridges

1. Provide a single dose of drug
2. The cartridge is inserted into a reusable holder
3. Before giving the injection, the LPN checks the dosage in the cartridge and clears it of excess air
4. Most are overfilled – so eject any excess
5. Tubex and Carpuject are tow types of prefilled cartridges



Picture:

1. Shows tapping moves fluid down neck
2. Gauze pad placed around neck of ampule
3. Neck snapped away from hands
4. Medication aspirated with vial inverted OR
5. Medication aspirated with vial on flat surface

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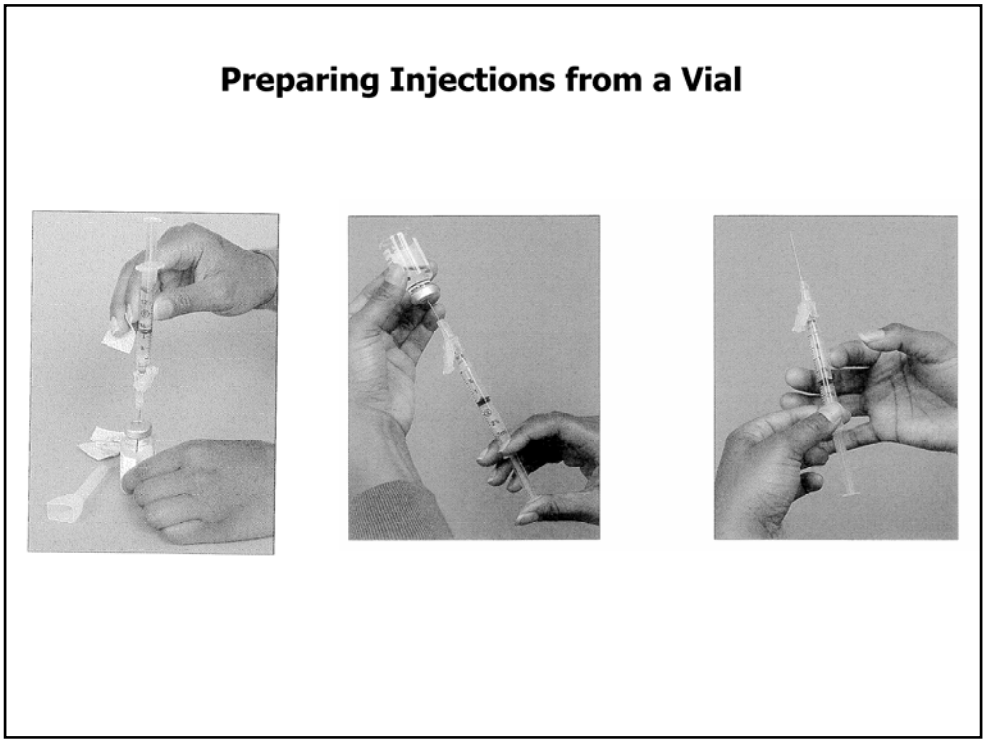

Picture:

1. Insert adapter through center of vial diaphragm
2. Withdraw fluid with vial inverted
3. Hold syringe; tap barrel to dislodge air bubbles

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Mixing Medications from Vials

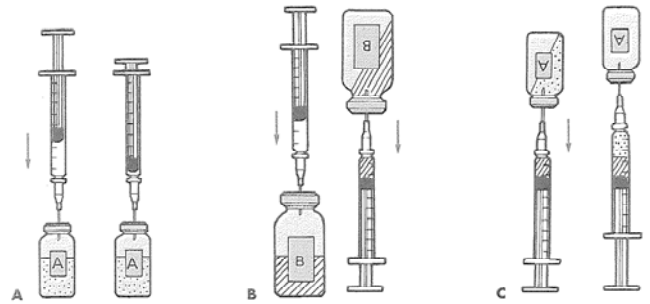

FIGURE 18-9 **A,** Injecting air into vial A. **B,** Injecting air into vial B and withdrawing dose. **C,** Withdrawing medication from vial A; medications are now mixed.

Most commonly done with Insulin

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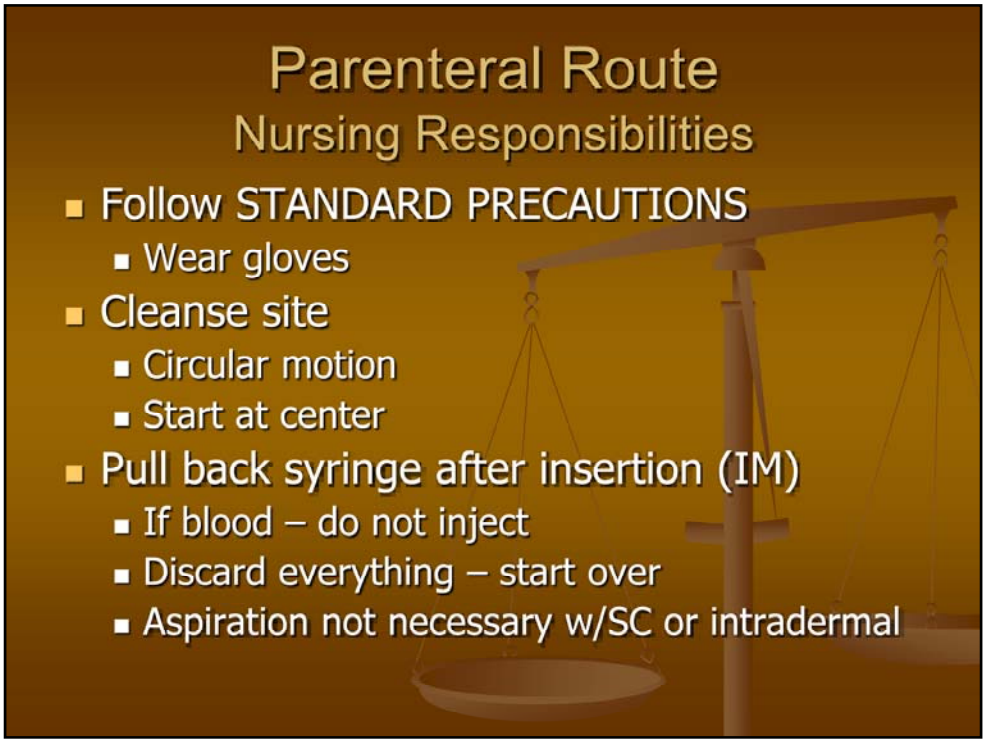
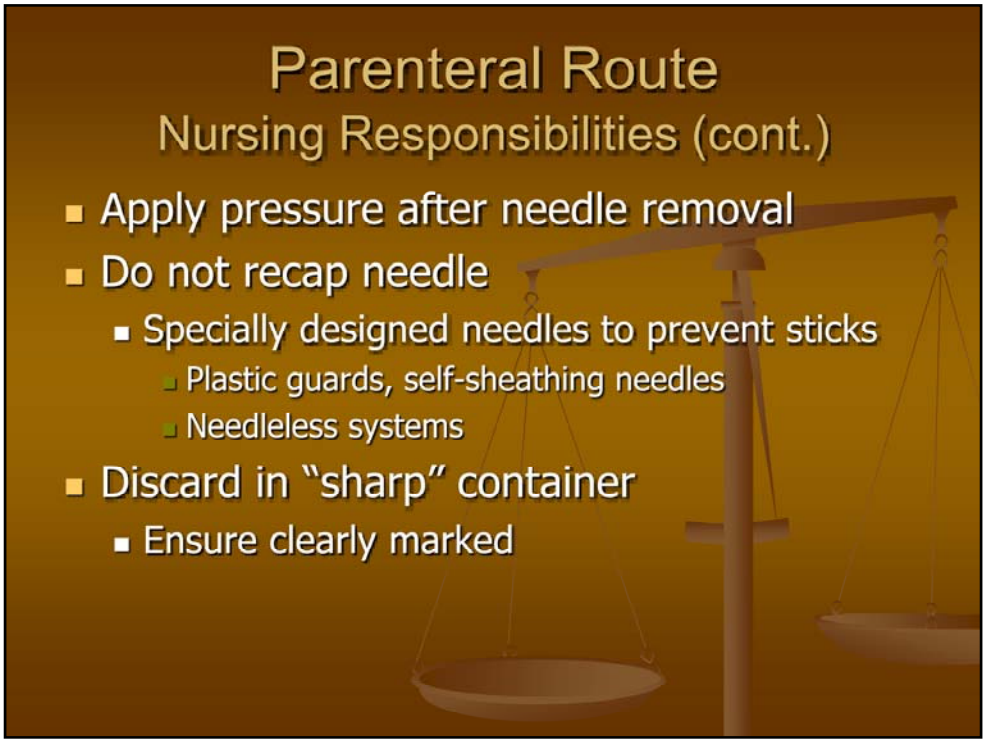


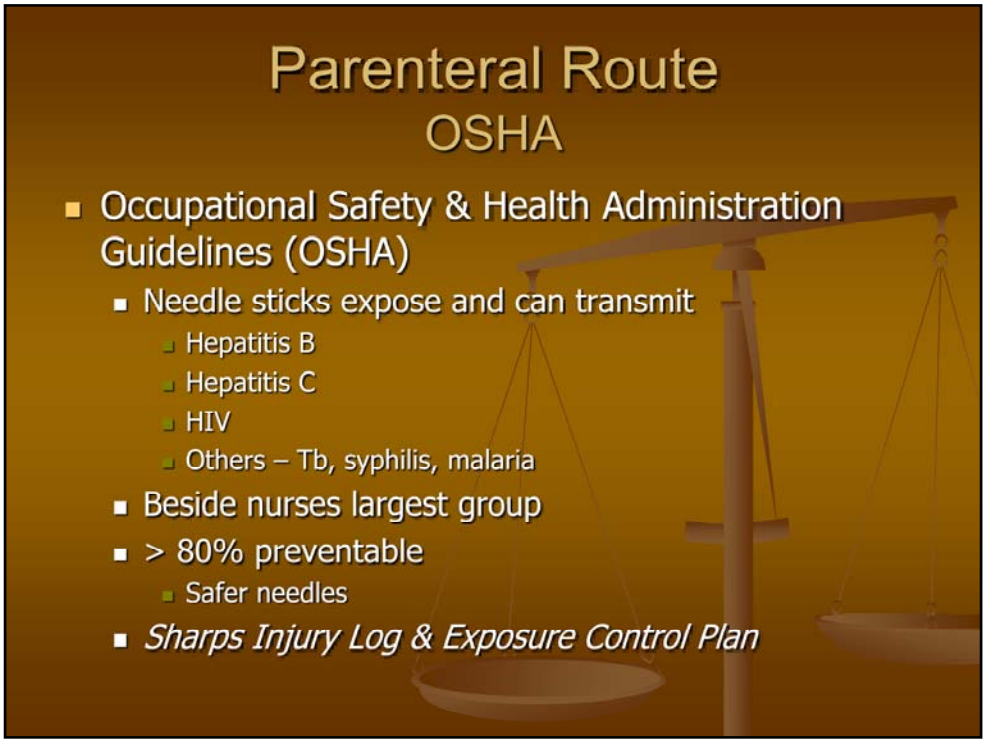
STANDARD PRECAUTIONS

The CDC recommends that gloves be worn when touching blood or body fluids, mm, or any broken skin area

Parenteral Route
Nursing Responsibilities (cont.)

- Apply pressure after needle removal
- Do not recap needle
  - Specially designed needles to prevent sticks
    - Plastic guards, self-sheathing needles
    - Needleless systems
- Discard in "sharp" container
  - Ensure clearly marked





Each year - ~ 600,000 to 1 million health care workers experience sticks from needles or sharps.

In April 2001, OSHA made revisions to the Bloodborn Pathogen Standard. It is based on prevention. Employees need to select safer needles and become involved in choosing devices utilized in workplace.

Also employers with > 11 employees need to maintain a ***Sharps Injury Log*** to include minimum of the following components:

•Type and brand of device involved in incident (if known)

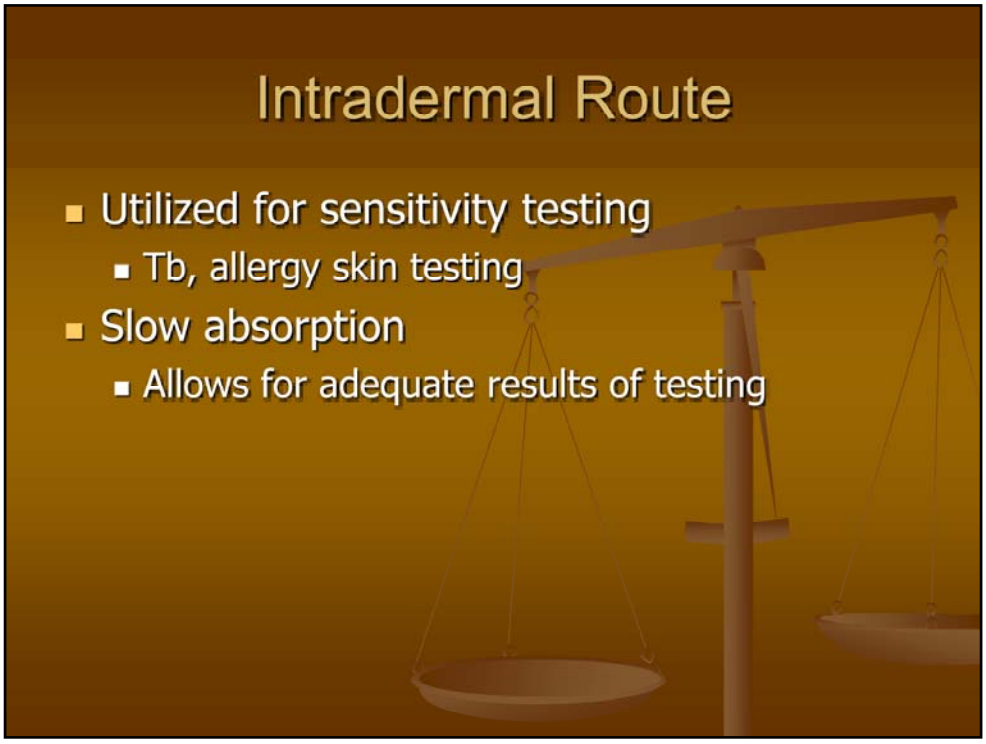
•Location of incident

•Description of incident

This system tracks all needle sticks to help identify problem areas. Confidentiality must be kept.

Exposure Control Plan

Written plan that is updated annually

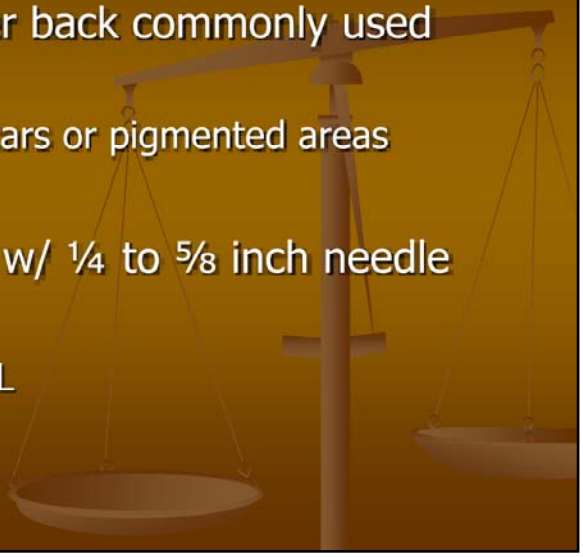


This route is also utilized for anesthetic injection before suturing.

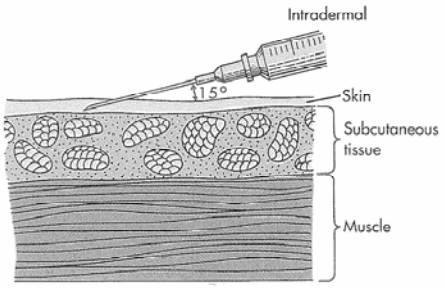
Intradermal Route (cont.)

Nursing Responsibilities

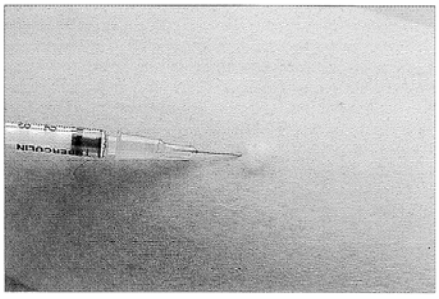
- Inner arm/upper back commonly used
  - Hairless
  - Avoid moles, scars or pigmented areas
- 1 ml syringe
- 25 to 27 gauge w/ ¼ to ⅝ inch needle
- Small volumes
  - Usually < 0.1mL



If a wheal does not appear on the outer surface of the skin – the drug probably entered the SC tissue and any results would be inaccurate.



STEP 10 Intradermal needle tip inserted into dermis.



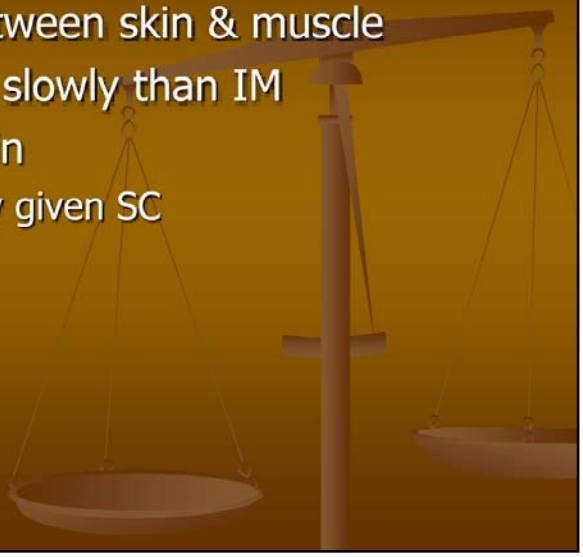
STEP 12 Injection creates small bleb.

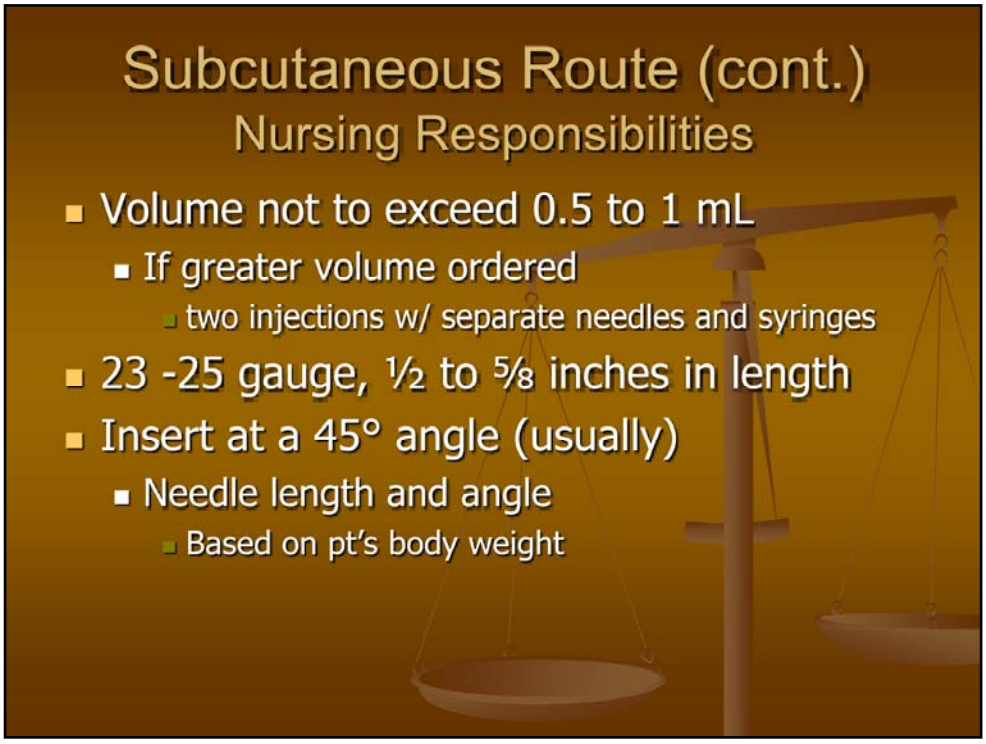
REVIEW NEXT 2 PAGES WHILE VIEWING THIS SLIDE

1. Insert the needle almost level with the skin
2. Observe for a wheal injecting medication

Subcutaneous Route

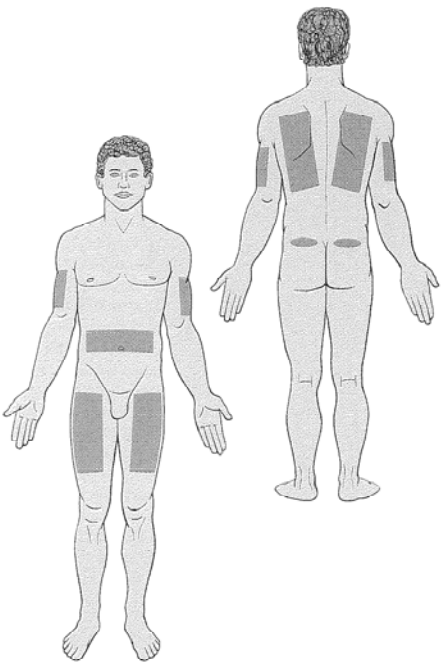
- Drug placed between skin & muscle
- Absorbed more slowly than IM
- Heparin & insulin
  - Most commonly given SC



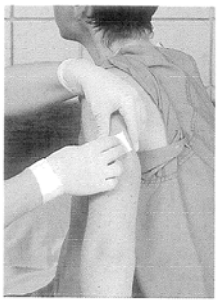


Obese pts have a lot of SC tissue and you may have to insert the needle at a 90 degree angle.

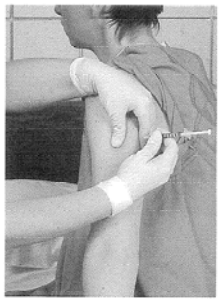
Thin pt's – less SC tissue – upper abd best site



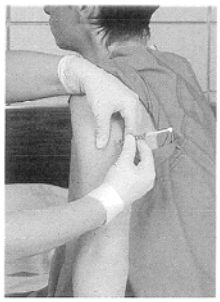
Sites on the body where subcutaneous injections can be given.



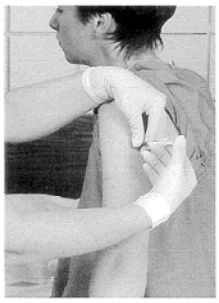
Action 8: Cleaning injection site.



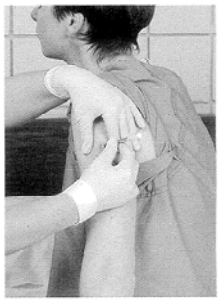
Action 10: Bunching tissue around injection site.



Action 11: Inserting needle.

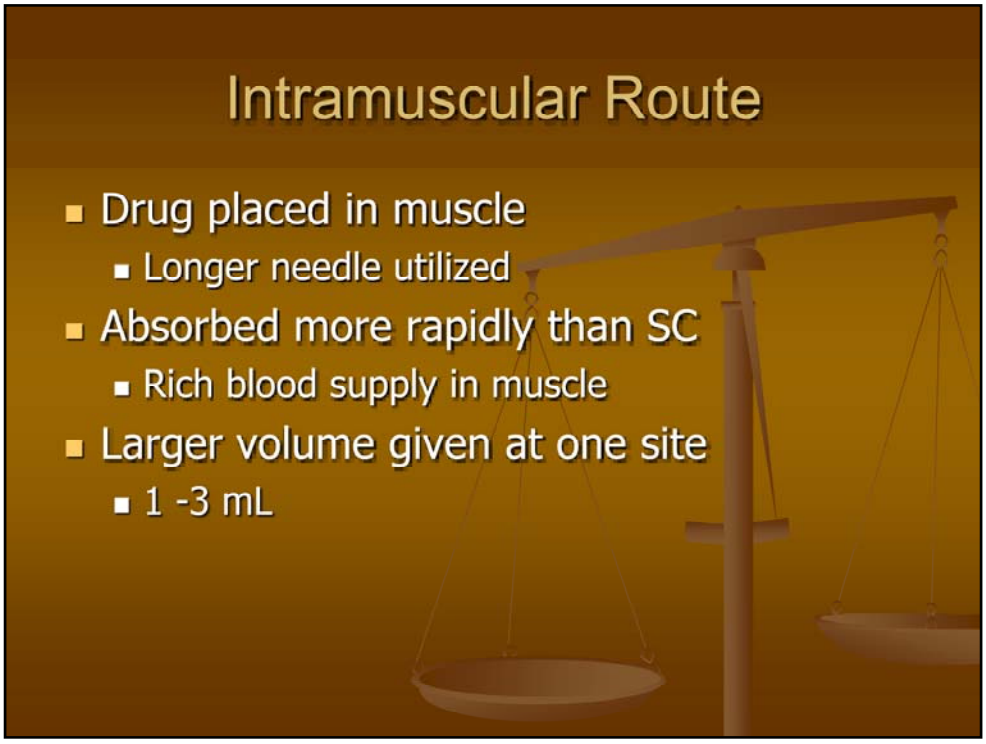


Action 14: Injecting medication.

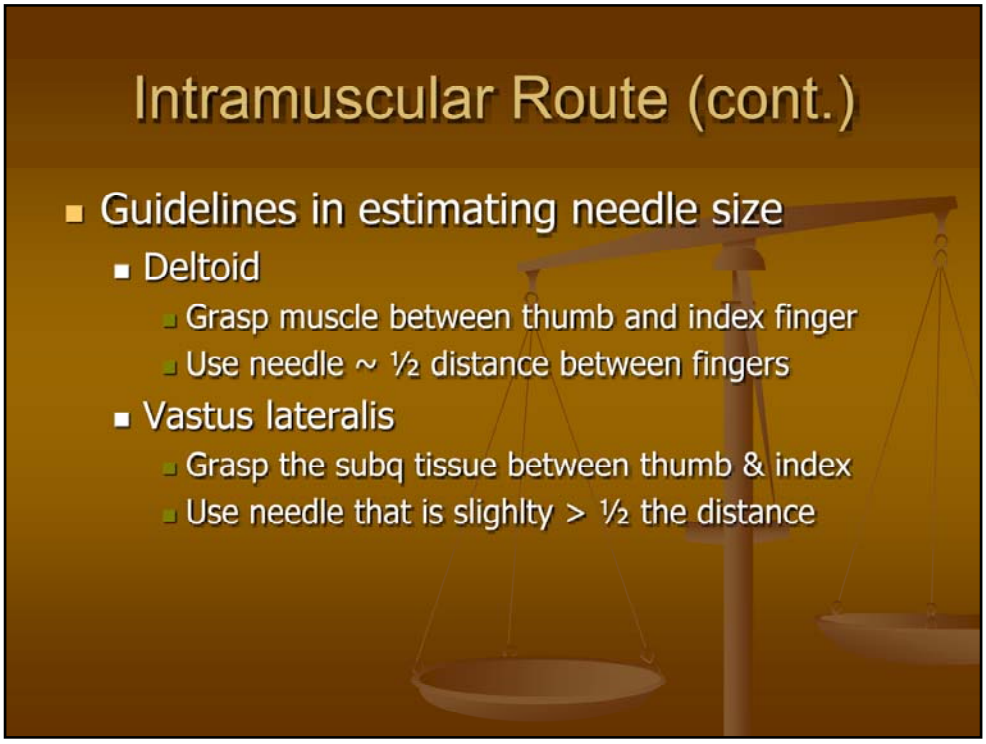


Action 15: Withdrawing needle. (PHOTOS © B. PROUD)

REVIEW NEXT 3 PAGES WHILE VIEWING THIS SLIDE



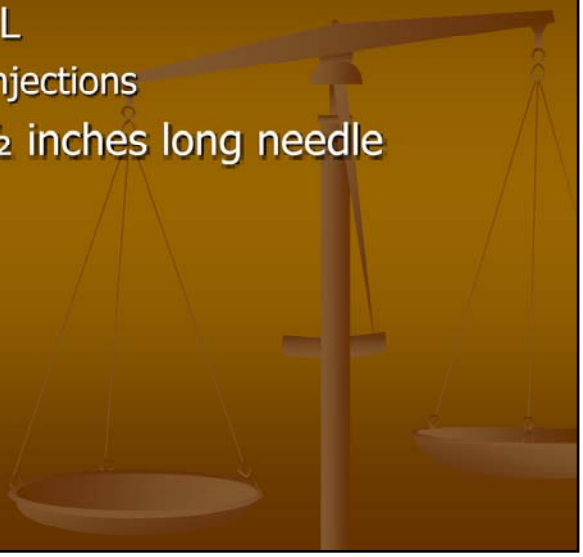
- The vascularity of muscle results in fast drug absorption
  - A aqueous solution is absorbed in 10 – 30 minutes, as opposed to at least 30 mins for subq
  - Risk of hitting blood vessel
- Rotate sites
  - Risk of muscular
- Older adults and children
  - May require a shorter needle

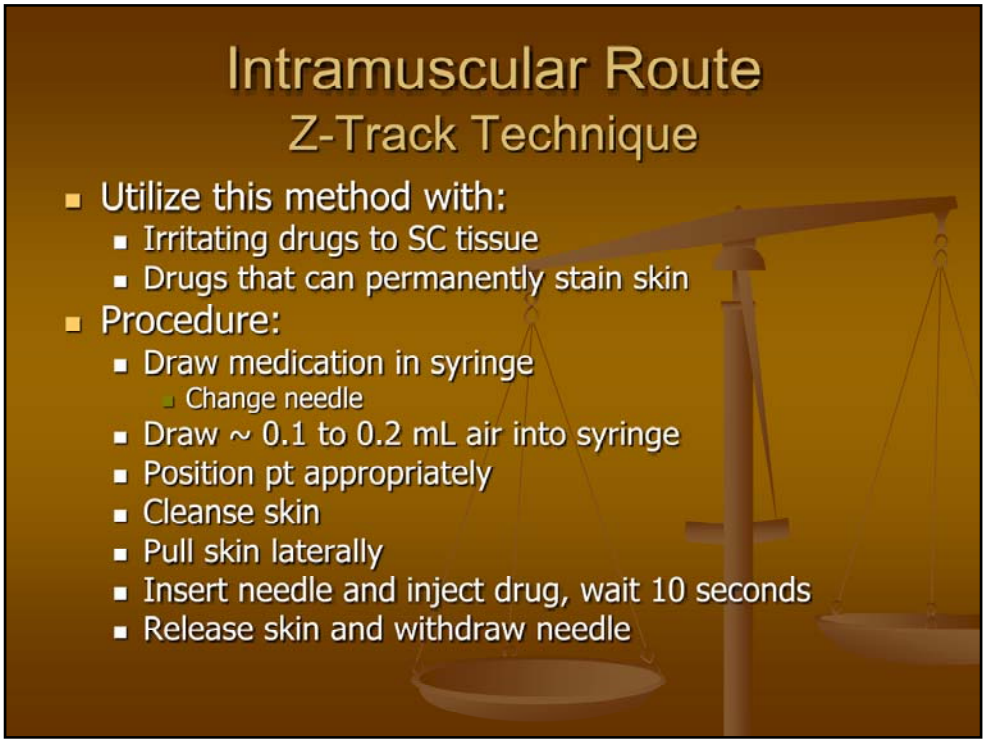


Muscle is less sensitive to irritating and viscous drugs. A normal, well-developed adult can safely tolerate as much as 4 ml *(next slide recommends 3 ml*) of medication in larger muscles such as the gluteus medius. Older infants and small children (<2) should receive no more than 1 ml.

Intramuscular Route
Nursing Responsibilities

- If volume > 3mL
  - Two separate injections
- 22 - gauge, 1 ½ inches long needle
- 90° angle

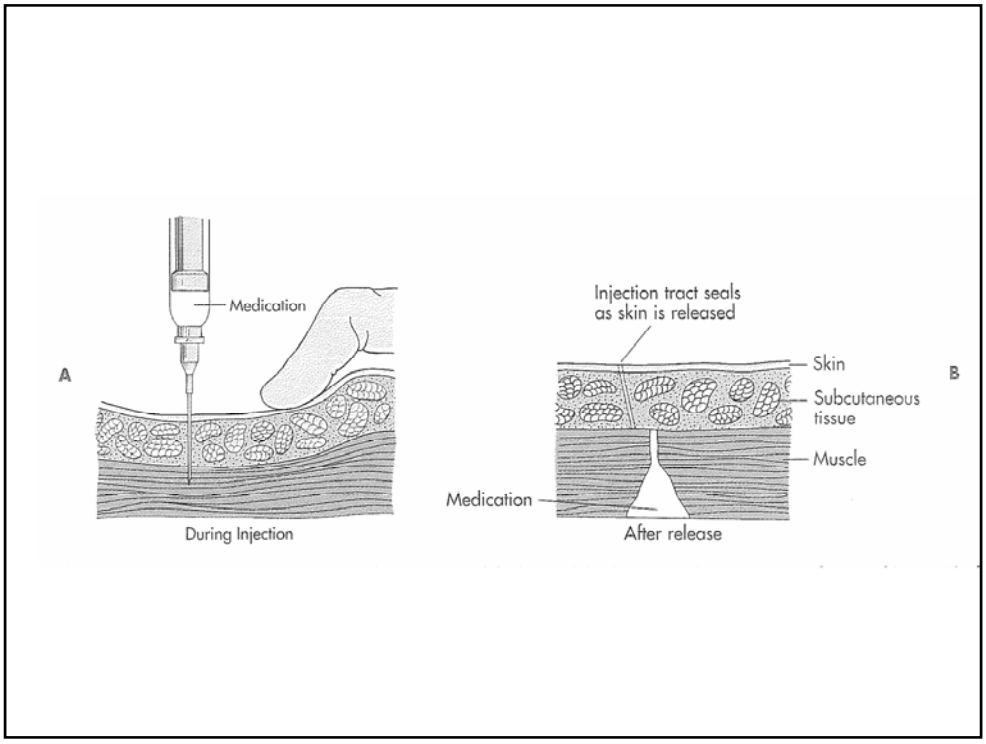




This technique prevents backflow of drug into SC tissue.

The air bubble prevents oozing of drug up though the small hole made by the needle.

Skin, SC tissue and fat should all be laterally displaced.



Picture A – pull on overlying skin before needle insertion and during IM injection moves tissues to prevent later tracking.

Picture B – the Z-track left after injection prevents the deposit of medication through sensitive tissue.

Vastus Lateralis Site

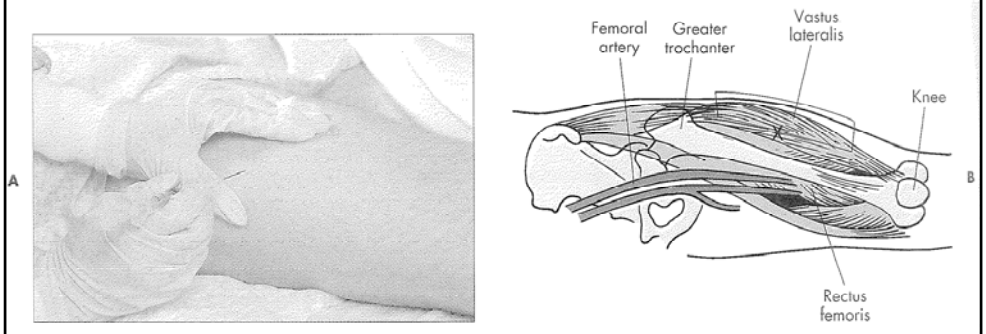


FIGURE 18-13 A, Giving IM injection in vastus lateralis site. B, Landmarks for vastus lateralis site.

- Preferred site for infants under 7 months of age.
- Can also be used in adults.
- Thick and well developed muscle
- Located on the anterior lateral aspect of the thigh
- In adult, it extends from a handbeadth above the knee to a handbreadth below the greater trochanter.
- The middle third of the muscle is suggested for injection
- The width of the muscle usually extends form the midline of the thigh to the thigh's outer side

Deltoid Site

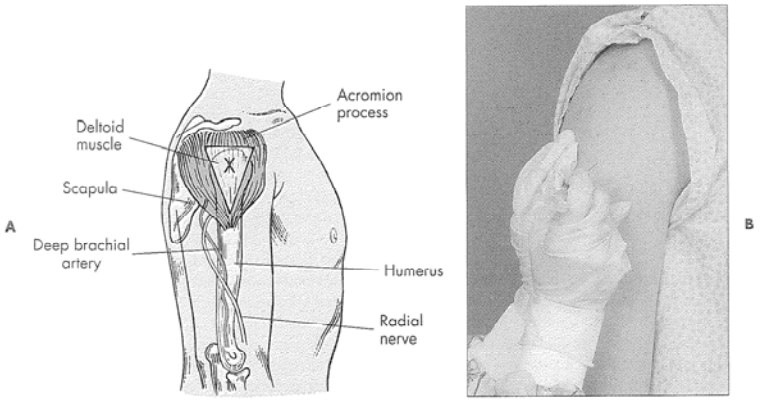


FIGURE 18-14 A, Landmarks for deltoid site. B, Giving IM injection in deltoid site.

EXPLAIN THIS IS THE **IM SITE** – NOT TO BE CONFUSED WITH THE **SUBQ SITE**

- Not well developed in many adults
- Radial and ulnar nerves and the brachial artery lie within the upper arm along the humerus
- Used for only small medication volumes – 0.5 to 1 mls or when other sites unavailable
- Location
    - Fully expose upper arm and shoulder
    - Have pt relax arm
    - Nurse palpates the lower edge of the acromion process
    - Place four fingers across the deltoid, with the top finger along the acromion process
    - The injection site is then three finger widths below the acromion process

VENTROGLUTEAL SITE

Preferred site for adults and anyone over 7 months old

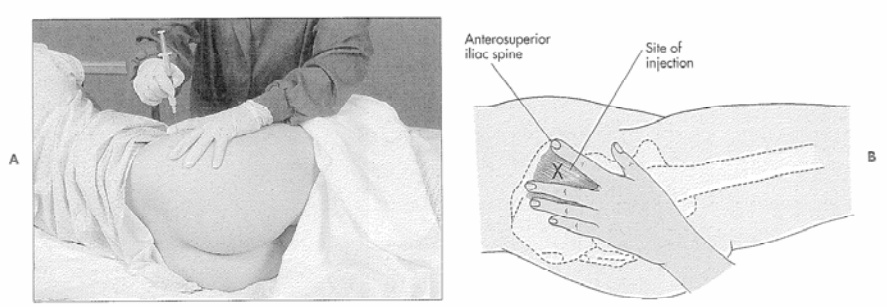


FIGURE 18-12 A, Injection site for ventrogluteal muscle avoids major nerves and blood vessels. B, Anatomical view of ventrogluteal muscle injection site.

VENTORGLUTEAL MUSCLE:

•Involves the gluteus medius and minimus

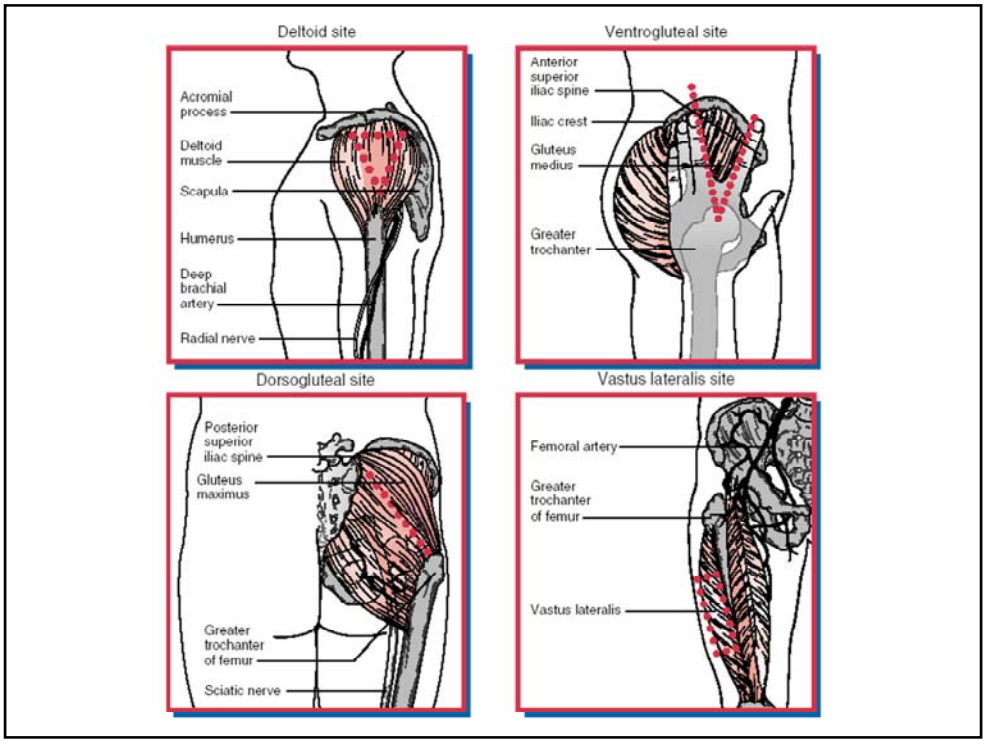
•It is dituated deep and away from major nerves and blood vessels

•Safe site for all pts

•Research shows that this is the only IM site not associated with injuries (fibrosis, nerve damage, abscess, necrosis, muscle contraction, gangrene and pain)

•SITE LOCATION

- •The nurse locates the muscle by placing the heel of the hand over the greater trochanter with the wrist almost perpendicular to the femur. Use the right hand for the left hip and visa versa.
- •The nurse points the thumb toward the pt's groin and the fingers toward the pt's head, points the index finger to the anterior superior iliac spine, and extends the middle finger back along the iliac crest toward the buttock
- •The index finger, the middle finger, and the iliac crest form a V-shaped triangle, and the injection site is in the center if the triangle.



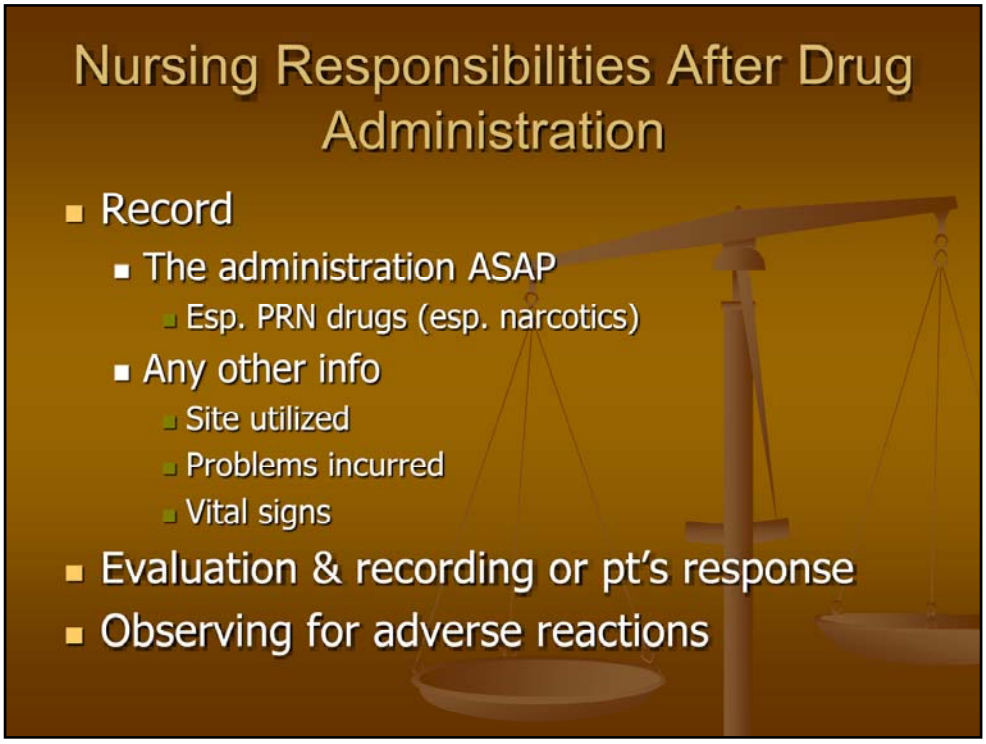
This slide shows all the sites used for IM administration of medications

The sites for IM administration are the deltoids muscle, ventrogluteral or dorsogluteal sites (hip), and the vastus lateralis (thigh). The vastus lateralis is frequently used for infants and small children because it is more developed than the gluteal or deltoid sites. In children who have been ambulating for more than 2 years the ventrogluteal site may be used.

When injecting into the ventrogluteal or dorsogluteal muscles, place the pt in a prone position with toes pointing inward. When using the deltoid, a sitting or lying position can be used. Put the pt in a recumbant (lying on back)position when using the vastus lateralis

THE DORSOGLUTEAL MUSCLE IS NOT RECOMMENDED ANYMORE ALTHOUGH IT ONCE WAS THE MOST FREQUENTLY UTILIZED SITES – IT IS TOO CLOSE TO MAJOR BLOOD VESSELS AND MAJOR NERVES

VIEW THIS SLIDE WHILE REVIEWING NEXT FOUR PAGES



•Evaluation & recording or pt's response

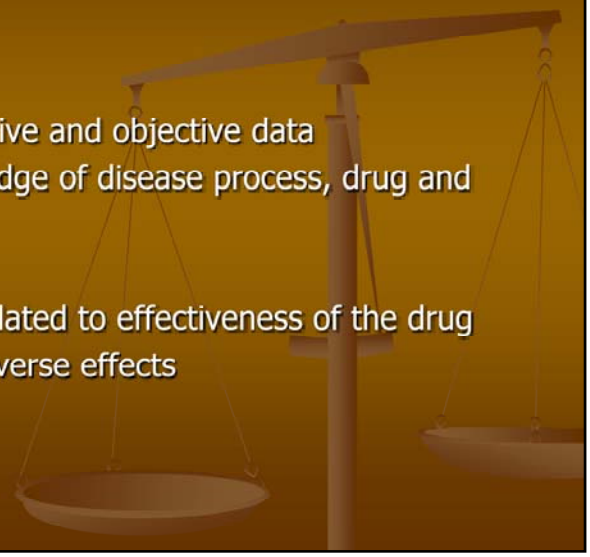
- •May include such facts as pain relief, decrease in body temp, relied of itching an decrease in the number of stools

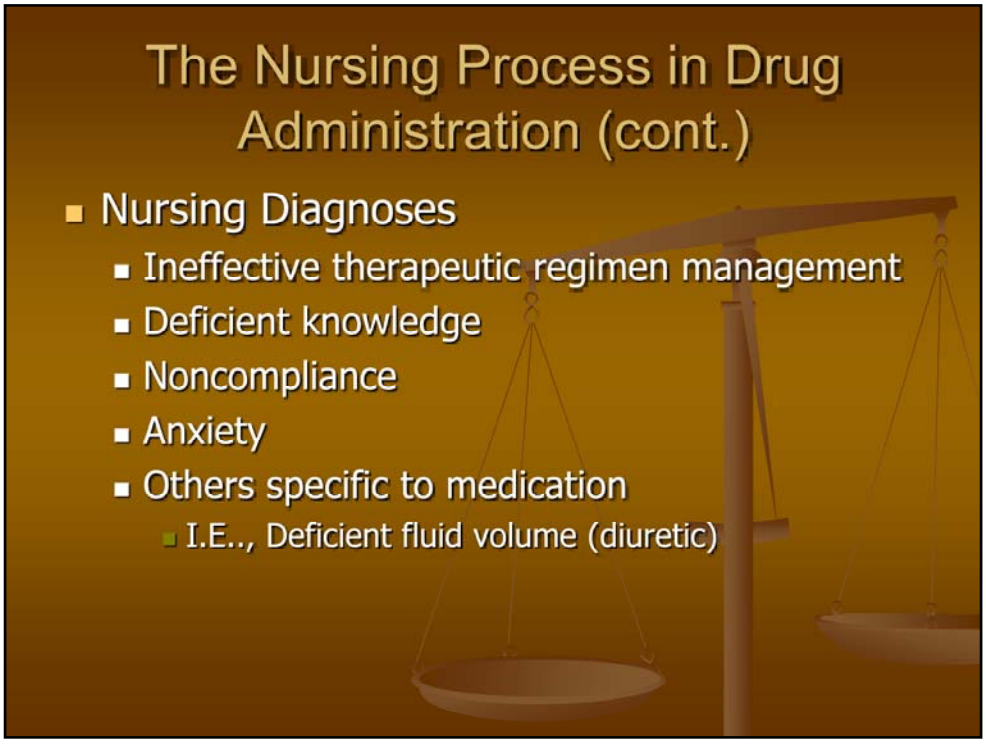
•Observing for adverse reactions

- •The frequency of these observations will depend on the drug given.
- •The nurse must record all suspected adverse reactions and report then to the PCP
- •The nurse must immediately report serious adverse reactions to the PCP

The Nursing Process in Drug Administration

- Assessment
  - Initial
    - Collect subjective and objective data
    - Assess knowledge of disease process, drug and drug regimen
  - Ongoing
    - Collect data related to effectiveness of the drug
    - Monitor for adverse effects




The Nursing Process in Drug Administration (cont.)
Nursing Diagnoses
Ineffective therapeutic regimen management
Deficient knowledge
Noncompliance
Anxiety
Others specific to medication
I.E.., Deficient fluid volume (diuretic)

The Nursing Process in Drug Administration (cont.)

- Planning
  - Set expected outcomes
  - Develop a teaching plan to correct deficient knowledge or reason for non compliance
  - Examples
    - The patient will effectively manage the therapeutic regimen
    - The patient will state the drug regimen
    - The patient will comply with the drug regimen

The Nursing Process in Drug Administration (cont.)

- Implementation
  - Perform any nursing actions before administration of a drug
    - Vital signs
    - Review subjective/objective data
  - Administer drug according to the "Six Rights"
  - Manage adverse reactions
  - Teach patient/family about drug, disease process, treatment regimen, etc.

The Nursing Process in Drug Administration (cont.)

- Evaluation
  - Evaluate the effectiveness of nursing interventions to meet patient outcomes
  - Evaluate effectiveness of the drug regimen
  - Evaluate patient/family's understanding of the drug regimen