Chapter 23
Medication Administration

Pharmacology

- This is the study of drugs and their action on the living body.
- The action of any drug on the body is a complicated process.

Pharmaceutical Phase
- The discovery or making of the drug

Pharmacokinetic Phase
- The movement of the drug’s active ingredients to the site where the intended action of the drug

Pharmacodynamic Phase
- Interaction of the drug’s active ingredient with the body’s cells
**Pharmacology**

- **Drug Dosage**
  - The amount of a drug prescribed for the patient by the physician.
  - The prescribed amount/dose of drug given at one time.

- **Drug Actions and Interactions**
  - Two general types
    - **Local**: affect only the area where the drug is placed
    - **Systemic**: affect the entire body

- **Drug interaction**: one drug alters another drug
  - **Potentiation**: one drug increases the action or effect of another drug
  - **Incompatibility**: drugs that do not combine chemically with other drugs
  - **Antagonist**: drug that will block the action of another drug
- **Idiosyncratic response** to a drug is an individual’s unique hypersensitivity to a particular drug.
- A reduced response to a drug is called **tolerance**.
- An **adverse drug reaction** is a harmful, unintended reaction to a drug administered at a normal dosage.
- **Contraindications** are conditions under which the drug should not be given.
- **Interactions** are modifications of the effect of a drug when administered with another drug.

## Pharmacology

- Factors that may affect how patients respond to medication: What do you think?
  - Age
  - Weight
  - Physical health
  - Psychological status
  - Environmental temperature
  - Gender
  - Amount of food in the stomach
  - Dosage forms

## Medication Orders

- The PT is ethically and legally responsible for ensuring that the patient receives the correct medication ordered by the physician.
- Medication orders should include the following:
  - Patient’s name
  - Date and time of the order
  - Name of the drug
  - Dosage of the drug
  - Route of administration
  - Time or frequency drug is given
  - Signature of pharmacist
  - Any special instructions
Medication Orders

- Controlled Substances
  - Opioids, barbiturates, and other controlled drugs that have a high possibility for abuse or addiction are double-locked.
  - "Narcotic keys" are kept by designated med person per shift.
  - Each controlled drug used is logged into the narcotic log book.
  - At the end of each shift, controlled drugs are carefully counted by a team member from the outgoing shift and a team member from the incoming shift.
  - Always have a witness to the "wasting" of a controlled substance.

Medication Orders

- Types of Orders
  - Standing Orders
    - Already written by a physician for all patients on a particular unit or area
    - Carried out without having to call the physician
  - Verbal Orders
    - May be given in the presence of an PT, LPN/LVN or an RN immediately after the telephone call
    - Should be written on the chart and signed by the physician as soon as possible (policy & procedure)

Medication Administration

- Six Rights
  - Right medication
  - Right dose
  - Right time
  - Right route

- Right patient
- Right documentation
Medication Orders

- Important Considerations of Medication Administration.
  Everyone read out loud!
  - If you did not pour it, do not give it.
  - If you gave it, chart it.
  - Do not chart for someone else or have someone else chart for you.
  - Do not transport or accept a container that is not labeled.
  - If you elect to omit a dose based on your nursing judgment, let another PT or nurse help make the decision. If medication is omitted, document “Dose omitted because…” Report to the physician.

Medication Orders

- Never leave a medication with a patient or family member. Watch the patient take it and swallow it.
- Always return to assess the patient’s response.
- Chart as soon as possible after giving medication.
- If a patient refuses medication, do not force it; chart “Refused medication because of…”
- If you make an error, report it immediately.

Routes of Administration

- Enteral
  - Via the GI Tract
    - Powders
    - Pills
    - Tablets
    - Liquids or suspensions
    - Suppositories
**Routes of Administration**

- Percutaneous
  - Through the Skin or Mucous Membranes
    - Topical
    - Instillation
    - Inhalation

- Parenteral
  - Methods Other than the GI Tract; Needle Route
    - Ampules
    - Vials
    - Intramuscular
    - Subcutaneous
    - Intradermal
    - Intravenous

**Enteral Administration**

- Preparation of Tablets, Pills, and Capsules
  - These preparations enter the GI tract and are absorbed more slowly into the bloodstream than via any other route.
  - The slow absorption rate makes the PO (by mouth) route relatively safe.
  - Some PO medications are irritating to the patient's GI tract and larger tablets may be difficult for some patients to swallow.
Skill 23-1: Step 5

Skill 23-2: Step 13

Enteral Administration

- Preparation of Liquid Medications
  - Liquid medications are often given to children, to patients who cannot swallow tablets, pills, or capsules; and to geriatric patients.
  - Medications may be given via a nasogastric, gastrostomy, or jejunostomy tube.
  - Liquids must not be given to unconscious patients because of the possibility of aspirating.
Enteral Administration

- Tubal Medications
  - Nasogastric (NG) tubes are used to administer liquid medications to unconscious patients, dysphagic patients, and those who are too ill to eat.
  - Many medications come in liquid form; if they do not, solid tablets may be pulverized in a mortar and pestle, and capsules can be opened.
  - Not all tablets are safe to use when crushed, and not all capsules are safe to use when opened.

Skill 23-3: Step 13

Skill 23-3: Step 16
### Enteral Administration

- **Suppositories**
  - Cone-shaped, egg-shaped, or spindle-shaped medication made for insertion into the rectum or vagina.
  - Dissolves at body temperature and absorbed directly into the bloodstream.
  - Useful for infants, patients who cannot take oral preparations, and those with nausea and vomiting.
  - Stored in cool place so they do not melt.

### Percutaneous Administration

- With these routes, medications are absorbed through the skin or the mucous membranes.
- Most produce a local action, but some produce a systemic action.
- Drugs include topical applications, instillations, and inhalations, ointments, creams, powders, lotions, and transdermal patches.
- Absorption is rapid but of short duration.

#### Ointments
- An oil-based semisolid medication; may be applied to the skin or a mucous membrane.

#### Creams
- Semisolid, non-greasy emulsions that contain medication for external application.

#### Lotions
- Aqueous preparations that are used as soothing agents that relieve pruritus, protect the skin, cleanse the skin, or act as astringents.
Percutaneous Administration
- Transdermal Patches (Topical Disk)
  - Adhesive-backed medicated patches applied to the skin provide sustained, continuous release of medication over several hours or days.

- Eyedrops and Eye Ointments
  - Care should be taken to keep all ophthalmic preparations sterile by not touching the dropper or the tube to the eye.

- Eardrops
  - Containers of solutions to be used as eardrops will be labeled “otic.” They must be at room temperature when applied.

Figure 23-3

- Nosedrops
  - Nosedrops are for individual use only.

- Nasal Sprays
  - Sprays absorbed quickly, less medication is used and wasted when administered in this manner.

- Inhalation
  - Drugs may be absorbed through the mucous membranes of the respiratory tract.

- Inhalers
  - Inhalers are used by respiratory therapy and anesthesiologists.
**Percutaneous Administration**
- **Sublingual Administration**
  - Drug is administered by placing it beneath the tongue until it dissolves.
  - Drug may be a tablet or liquid squeezed out of a capsule.
  - It is rapidly absorbed into the bloodstream.
- **Buccal Administration**
  - A tablet is placed between the cheek and teeth, or between the cheek and gums.
  - Absorption into the capillaries of the mucous membranes of the cheek gives rapid onset of the drug's active ingredient.

**Parenteral Administration**
- **Equipment**
  - **Syringes**
    - Syringe consists of a barrel, a plunger, and a tip.
    - Outside of the barrel is calibrated in milliliters, minims, insulin units, and heparin units.
  - **Types**
    - Tuberculin syringe
    - Insulin syringe
    - Three-milliliter syringe
    - Safety-Lok syringes
    - Disposable injection units

**Figure 23-4**
- Plunger
- Barrel
- Tip
- Measure dose here
- Avoid touching
Figure 23-5

Figure 23-6

Figure 23-7
Percutaneous Administration

- Equipment (continued)
  - Needles
    - Parts are the hub, shaft, and beveled tip.
    - Opening at the needle’s beveled tip is the lumen.
    - Size of the diameter of the inside of the needle’s shaft determines the gauge of the needle; the smaller the gauge, the larger is the diameter.
  - Needle gauge selection is based on the viscosity of the medication.
Percutaneous Administration

- Equipment (continued)
  - Needle Length
    - Selected based on the depth of the tissue into which the medication is to be injected
    - Intradermal: 3/8 to 5/8 inch
    - Subcutaneous: 5/8 to 1/2 inch
    - Intramuscular: 1 to 1 1/2 inch

- Intravenous Needles
  - Butterfly (scalp needle)

Needle length and gauge.

(From Clayton, B.D., Stock, Y.N. [2004]. Basic pharmacology for nurses. [13th ed.]. St. Louis: Mosby.)

Percutaneous Administration

- Needleless Devices
  - Devices are designed with a sheath or guard that covers the needle after it is withdrawn from the skin.
  - Intravenous catheters have been designed with blunt-edged cannulas, shields, or needle guards to minimize injuries.
  - IV tubing with recessed and shielded needle connectors have been designed further reducing needlesticks.
**Percutaneous Administration**

- **Intramuscular Injections**
  - Involves inserting a needle into the muscle tissue to administer medication
  - **Site Selection**
    - Gluteal sites
    - Vastus lateralis muscle
    - Rectus femoris muscle
  - **Z-track Method**
    - Used to inject medications that are irritating to the tissues

**Figure 23-15, C**

Locating IM injection for ventrogluteal site.


**Figure 23-16, C & D**

Locating right dorsogluteal site. Giving IM injection in left dorsogluteal site.

Giving IM injection in vastus lateralis site on adult.


Rectus femoris muscle.


(From Clayton, B.D., Stock, Y.N. [2004]. Basic pharmacology for nurses. [13th ed.]. St. Louis: Mosby.)

Giving IM injection in deltoid site.

**Figure 23-20**

**Percutaneous Administration**

- **Intradermal Injections**
  - Introduction of a hypodermic needle into the dermis for the purpose of instilling a substance such as a serum, vaccine, or skin test agent.
  - Not aspirated.
  - Small volumes (0.1 ml) injected to form a small bubblelike wheal just under the skin.
  - Used for allergy sensitivity tests, TB screening, and local anesthetics.
  - A tuberculin syringe used with a 25-gauge, 3/8 to 5/8 inch needle.

Percutaneous Administration

- Subcutaneous Injections
  - Injections made into the loose connective tissue between the dermis and the muscle layer
  - Drug absorption slower than with IM injections
  - Given at a 45-degree angle if the patient is thin or at a 90-degree angle if the patient has ample subcutaneous tissue
  - Usual needle length is 1/2 to 5/8 inch and 25 gauge
  - Used to administer insulin and heparin

Figure 23-22

- Subcutaneous injection. Angle and needle length depend on the thickness of skinfold.

(Figure from Elkin, M.K., Perry, A.G., Potter, P.A. [2004]. Nursing interventions and clinical skills [3rd ed.]. St. Louis: Mosby.)

Percutaneous Administration

- Intravenous Therapy
  - Provide fluid and electrolyte maintenance, restoration, and replacement
  - Administer medication and nutritional feedings
  - Administer blood and blood products
  - Administer chemotherapy to cancer patients
  - Administer patient-controlled analgesics
  - Keep a vein open for quick access
Stress

- I can't take it anymore
- It's time to go for a med break
- How am I going to deliver it?
- Just do it.

Percutaneous Administration

- Methods of Intravenous Administration
  - IV push
  - Intermittent venous access device
  - Intermittent infusion (or piggyback)
  - Continuous infusion
  - Electronic pumps and controllers
  - Patient controlled analgesia
  - Volumetric chambers

Figure 23-24
The end

- Psychiatric Technician students do not complain or cry, except these two