Chapter 8
Medication Administration

Chapter Goal
- Use appropriate techniques to administer medication

Learning Objectives
- Discuss legal aspects affecting medication administration
- Discuss “6 rights” of drug administration, & correlate with medication administration principles
- Discuss medical asepsis & differences between clean & sterile techniques
- Describe use of antiseptics & disinfectants
Learning Objectives

- Describe use of body substance isolation precautions when administering medication
- Describe indications, necessary equipment, required techniques, precautions, & general principles of medication administration via inhalation
- Differentiate among different dosage forms of oral medications

Learning Objectives

- Describe necessary equipment & general principles of oral medication administration
- Describe the indications, necessary equipment, required techniques, precautions, & general principles of rectal medication administration
- Differentiate among various percutaneous routes
- Differentiate among different parenteral routes

Learning Objectives

- Describe necessary equipment, required techniques, complications, & general principles for parenteral medication preparation & administration
- Describe indications, necessary equipment, required techniques, precautions, & general principles of intravenous administration
- Synthesize pharmacological management plan including medication administration
Learning Objectives

- Integrate pathophysiological principles of medication administration with patient management

Introduction

- Potential for positively affecting patient outcome
- Important to have basic knowledge of mathematical principles
- Ability to choose best way to administer drug
- Drugs can act on body quickly or slowly

Protection from Contaminants

- Universal & BSI precautions
  - Always wear gloves
  - Don protective eyewear to protect your mouth, nose, & eyes
  - Wear gowns when splashes may occur
  - Appropriate hand washing—most important
Protection from Contaminants

- Medical asepsis
  - Environment free of living disease-causing microorganisms
  - Routinely used in direct patient care areas
  - Most aseptic environment is sterile one
  - Sterile technique
  - Virtually impossible to achieve sterile technique
  - Medically clean procedures & techniques

Protection from Contaminants

- Antiseptics & disinfectants
  - Chemical agents
  - Disinfectants—toxic to living tissue
  - Antiseptics—applied to skin, mucous membranes

Protection from Contaminants

- Handling & disposal of needles & other sharp instruments
  - Extreme care
  - CDC recommendations
    - Do not recap needles
    - Needles should be cut or bent for disposal
    - Dispose all sharp items into puncture-resistant container immediately after use
Guidelines for Administering Drugs

- Risks associated with drug administration
- You must understand pathophysiology & pharmacology
- Tremendous responsibility
- Poor documentation can lead to fatal error

Guidelines for Administering Drugs

- Safe & effective medication administration
  - “Right” patient
  - “Right” drug
  - “Right” dose
  - “Right” route
  - “Right” time
  - “Right” documentation
  - Ensure safety when administering

Guidelines for Administering Drugs

- Medication errors caused by:
  - Wrong drug or dose
  - Error in drug calculations
  - Wrong route
  - Wrong patient
  - Incorrect interpretation of medication orders
Guidelines for Administering Drugs

- Incidents involving medication errors
  - Accept responsibility
  - Immediately advise medical direction, supervisor
  - Notify receiving physician
  - Assess & monitor patient
  - Document error
  - Modify personal practice
  - Follow EMS procedures for documentation & quality improvement

- Before giving medication:
  - Identify need
  - Contact medical direction
  - Confirm order
  - Write down order
  - Reassure patient
  - Select medication container
  - Employ BSI
  - Record vital signs

- After giving medication:
  - Advise medical direction
  - Record administration time
  - Watch for patient response
  - Record vital signs

- Medication routes based on:
  - Specific medication
  - Desired rate of absorption
  - Specific site of action
**Medication Routes: Enteral**

- Oral administration
  - Absorption through lining of GI tract
  - Most popular method
  - Efficiently absorbed
  - Some drugs cannot be given orally
- Rectal administration
  - When oral ingestion prohibited
  - Medications quickly absorbed—often irregular and incomplete
  - Cause irritation of rectal mucosa
  - Local or systemic action
  - In forms of suppositories or solutions
  - Antiemetics and local analgesics
  - Few emergency drugs

**Medication Routes**

- Orogastric/nasogastric administration
  - Orogastric tube—from mouth to stomach
  - Nasogastric (NG) tube—from nose to stomach

- Percutaneous routes
  - Absorbed through skin or mucous membranes
  - Bypass digestive tract
  - Transdermal administration
  - Mucous membranes

**Medication Routes: Percutaneous**

- Topical (transdermal)
  - Applied directly to skin
- Sublingual
  - Under tongue
- Buccal
  - Between cheek gum
- Eye (ocular)
- Nasal
- Ear (aural)
Medication Routes: Percutaneous

- Sublingual
- Buccal

Eye (ocular)
- Pull lower eyelid down; administer drops into conjunctival sac
- Apply gentle pressure to inner corner of eyelid for 1–2 min
Medication Routes: Percutaneous

- Ear (aural)
  - Pull ear upward & out in adult
  - Pull earlobe down and back in children <3 yrs old

Medication Routes: Parenteral

- Outside GI tract—by injection

Parts of needle, gauges

- Compare types of syringes
Packaging & Preparation: Vials

- Clean rubber stopper with alcohol
- Draw amount of air into vial equal to amount of drug to be withdrawn
- Insert needle through rubber stopper; inject air into vial
- Turn vial upside down
  - Keep tip of needle below level of medicine
  - Medicine will fill syringe
- Remove needle
- Invert syringe; flick barrel to expel trapped air
- Cover needle if not being used immediately

Withdrawal Medication from Vial

- Draw solution into syringe; invert needle
- Break glass top

Packaging & Preparation: Ampules
Medication from Ampule

Packaging & Preparation: Mix-o-Vial
- Remove protective cap
- Push rubber plunger on top

Packaging & Preparation: Prefilled Syringes
- Confirm drug type, concentration, & dose
- Check for cloudiness & expiration
Packaging & Preparation: Prefilled Syringes

- Pop caps off syringe, drug cartridge
- Screw them together

Packaging & Preparation: Prefilled Syringes

- Invert syringe
- Expel excess air

Packaging & Preparation

Adding medication to IV bag
Techniques for Delivering Parenteral Drugs

- Intradermal administration—directly into skin
  Insert needle, bevel up at 15° angle
  Wheal produced by injection

Intradermal Injection

To perform the following procedure, you will need:
- A 30-gauge 1/2-inch needle
- A 1-mL syringe

Techniques for Delivering Parenteral Drugs

- Subcutaneous administration—into loose connective tissue between dermis of skin & muscle layer
Subcutaneous Administration

- Cleanse area

- Pinch skin; inject needle at 45° angle to skin

Subcutaneous Administration

- Aspirate for blood

- Apply pressure to injection area to disperse medication

- Dispose of used sharp objects in proper waste container

Subcutaneous Administration
Intramuscular Administration: Deltoid Muscle

- Easily accessed; better perfused
- Small amounts
- Risk: close to radial nerve
- Patient should sit or lie flat
- Use nondominant arm when possible

Intramuscular Administration: Dorsogluteal Muscle

- Place patient on side with hip and knee flexed or prone, toes pointing inward
- Disadvantages
  - Use only for adults
  - Near sciatic nerve
  - Fatty tissue may obscure site
  - Need longer needle
  - Potential for injury
- Do not use site in older adults or obese adults or those with flabby, sagging buttocks

Intramuscular Administration: Dorsogluteal Muscle

- Divided into imaginary quadrants
- Injection goes in upper outer quadrant below curved bone
- Imaginary line between posterior superior iliac spine & greater trochanter
- Injection is up/out from this line
Intramuscular Administration:
Vastus Lateralis Muscle

- Good injections site for
  - Adults
  - Children
  - Infants
- Patient should be in supine or sitting position

Intramuscular Administration:
Vastrogluteal Muscle

- Advantages
  - Good landmarks
  - Little danger
  - Easily identified
  - Adults/children >7 mos
- Disadvantage
  - Needle may touch bone during injection

Intramuscular Administration

- Stretch skin across site
- Inject needle at 90° angle to skin
- Pull back plunger to aspirate; check needle placement
Intramuscular Administration

- Slowly push in plunger
- Massage skin over site

Comparison of Angle of Injection
Intravenous Administration

- Directly into bloodstream
- Rapidly absorbed & distributed
- No margin for error
- May be administered as bolus

Intravenous Administration

- Prepare correct drug volume
- Cleanse IV tubing site; insert needle into site

Intravenous Administration

- Pinch tubing above injection site to stop flow of IV
- Administer correct dosage at recommended rate
- Resume IV flow; monitor patient
Continuous IV Infusion

- Volume control devices
  - Ensure precise delivery
  - Valuable when delivering medications that cause toxicity
  - Delivered until after patient transfer to ED

Intraosseous Administration

- Needle into bone infuses medication directly into bone marrow
- Highly vascular
- Administration is same as IV route
- Direct communication to peripheral circulation
Pulmonary Route

- Aerosol administration
  - Place liquid medication into closed chamber
  - Patient breathes nebulized medication
  - Can act:
    - Directly on structures of lung
    - Absorbs into systemic circulation
  - Commonly administered via nebulizer

- Mix drug with saline

- Connect nebulizer to T-piece, mouthpiece, oxygen regulator

- Patient inhales aerosol slowly; exhales after 3-5 seconds
MDI Administration

- Assist patient with MDI
- Spacing device may be used

Endotracheal Administration

- Preoxygenate patient
- Inject med through catheter to ET tube

Summary

- Use medically clean procedures & techniques to reduce risk of infection
- Employ BSI precautions
- Know proper measures for self-protection
- Tremendous potential to positively affect patients’ outcomes
Summary

- Responsible for appropriate drug, accurate dosage, & administering at precise rate via correct route
- Follow “six rights” of drug administration
- *Medication route* refers to way drug is delivered

Summary

- Enteral administration = absorption through gastrointestinal tract
- Percutaneous administration = absorption through mucous membranes, skin
- Sublingual administration = placed under tongue
- Parenteral route = deliver outside gastrointestinal tract

Summary

- Syringe: disposable plastic, consists of plunger, body or barrel, flange, & tip
- Hypodermic needle: consists of hilt, shaft, & beveled tip
- Hypodermic needle lengths range from ⅜ to 1½ in
- *TB syringe*—narrow; total capacity = 1 mL
Summary

- Vials—glass or plastic containers with plastic or metal top covering self-sealing rubber stopper
- Ampules—breakable glass medication containers
- Prefilled syringes—tamper-proof package includes glass container holding pre-measured amount of medication & syringe with attached needle

Summary

- Continuous infusion is adding medication to IV solution & infusing it over period of time
- Intradermal drug administration is injecting drug directly into skin
- Subcutaneous administration is injection of drug into loose connective tissue between dermis & muscle layer
- Intramuscular administration is injection of drug through skin into muscle

Summary

- Intradermal injections: inject needle at 15-degree angle
- Subcutaneous injections: inject needle at 45-degree angle
- Intramuscular injections: inject needle at 90-degree angle
Summary

- Intravenous medications delivered through IV line
- Intraosseous administration—place rigid needle into bone to infuse fluid, medication directly into bone marrow
- Pulmonary route—aerosol medication via nebulizer, MDI, or ET tube

Questions?