Medication Dosage Forms and Routes of Administration
Learning Outcomes

• Explain need for more than one dosage form
• List advantages/disadvantages of various dosage forms
• Outline characteristics of various liquid forms
  – solutions, emulsions, suspensions
• List & explain advantages/disadvantages/differences of various routes of administration
Key Terms

- Aerosol
- Aqueous solution
- Buccal
- Douche
- Elixir
- Emulsion
- Endotracheal
- Enema
- Extractive
- Inhalant
- Intra-arteria
- Intra-articular
- Intracardiac
- Intradermal
- Intramuscular
- Intraperitoneal
- Intrapleural
- Intrathecal
Key Terms

- Intratracheal
- Intrauterine
- Intravenous
- Intraventricular
- Intravesicular
- Intravitreal
- Irrigant
- Jelly
- Lozenge
- Nonaqueous
- Oil-in-water (O/W) emulsion
- Ointment
- Parenteral
- Percutaneous
- Solution
- Subcutaneous
- Subgingival
Key Terms

• Sublingual
• Suspension
• Topical
• Transdermal
• Transmucosal
• Water-in-oil (W/O) emulsion
Medication Dosage Forms

• Most common dosage forms are liquids & solids

• Routes have advantages
  – liquid medications are easier for children
  – alternative routes needed for medications degraded by stomach acid, digestive enzymes
Liquid Dosage Forms

• Fluid medium – *vehicle*
  – water
  – alcohol
  – glycerin
  – mineral oil
Liquid Medication Pluses

• Advantages
• Faster-acting
• Easier to swallow
• More flexibility
• Practical (eye drops for example)
Liquid Med Disadvantages

• Shorter dating
• Unpleasant taste
• Inconvenient
  – may spill
  – require careful measuring
  – special storage or handling requirements
    • refrigeration or shaking before use
Solutions

- Evenly distributed = homogeneous
- Aqueous solutions - purified water as vehicle
- Gargles
- Oral rinses
- Wash
- Irrigating solutions
- Enemas
- Sprays
Viscous Aqueous Solutions

- Sticky, thick, sweet
- Liquid or semisolid
- Syrup
- Jellies
Nonaqueous solutions

• Use solvents, or dissolving liquids, other than water
  – alcohol (ethyl alcohol or ethanol)
  – glycerin
  – mineral oil,
  – propylene glycol.

• Hydroalcoholic solutions
  – elixirs
  – spirits

• Collodions
Extractives

• Concentrated preparations
• Extracts
• Tinctures
• Fluidextracts
Emulsions

• Mixtures of two liquids that normally do not mix
  – internal phase
  – external or continuous phase
• Emulsifying agent
• Oil-in-water (O/W) emulsions
• Water-in-oil (W/O) emulsions
Suspensions

- Undissolved solids in gas or liquid
- Suspensions need to be shaken before use
- Lotions.
- Magmas and milks
- Gels
- Mucilages
Solid Dosage Forms

• Tablets, capsules, suppositories, lozenges
• Routes:
  – vaginal
  – rectal
  – urethral
Tablets

• Molded tablets
• Compressed tablets
• Inert ingredients
  – binders
  – diluents
  – lubricants
  – colorants
  – disintegrators
Tablet Terminology

• Coating
  – sugar-improves flavor, smell
  – enteric –delays dissolution
• Sublingual
• Buccal
• Effervescent
• Chewable
• Vaginal tablets
Capsules

- Drug contained within gelatin shell
- Sizes
  - 000 (large), 00, 0, 1, 2, 3, 4, and 5 (small)
- May be sealed shut or banded, or meant to be opened
- Soft gelatin capsules
- Caplets
Miscellaneous Dosage Forms

• Lozenges (troches or pastilles)
  – antiseptic, local anesthetic, antibiotic, analgesic, antitussive, astringent, decongestant

• Suppositories
  – rectal, vaginal, urethral
  – molded from soft, solid material (called base)
    • cocoa butter or glycerin
Semi-solid Dosage Forms

- Ointments
  - semisolid medication
- Primary types
  - oleaginous
  - anhydrous
  - emulsion
  - water-soluble
- Occlusive (provide a barrier)
- Hydrophobic (repel water)
Creams

- Semisolid O/W or W/O emulsions
- Easily worked into skin (vanish)
- Feel lighter than ointments
- Allow skin to “breathe”
Pastes

• Semisolid medication
• Intended for topical application
• Adhere to skin
• Protect skin
Miscellaneous Dosage Forms

- Extended-release
- Powders
- Granules
- Inhalants
- Aerosols
- Liniments
- Shampoos & creme rinses
- Wipes & scrubs
- Transdermal patches
### Extended-Release Med Abbrev.

- **CD**  Controlled-diffusion
- **CR**  Controlled-release, continuous-release
- **CRT** Controlled-release tablet
- **LA**  Long-acting
- **SA**  Sustained-action
- **SR**  Sustained-release, slow-release
- **TD**  Time-delay
- **TR**  Time-release
- **XL**  Extra-long
- **XR**  Extended-release
Routes of Administration

• Oral: abbreviated PO, from Latin per os (by mouth)
  – Sublingual, Buccal, Transmucosal, Subgingival

• Enteral- by way of the intestine
  – Nasogastric (tube) (NG or NGT)
  – Gastrostomy (tube) (GT)
  – percutaneous endoscopic gastrostomy (tube) (PEG)
  – Jejunostomy (tube)
**Parenteral** Bypassing Gastrointestinal Tract

- Implant
- *Intra-arterial* = Into artery (IA)
- *Intra-articular* = Into joint (IA)
- *Intracardiac* = Into heart muscle (IC)
- *Intradermal* = Into top layers of skin (ID)
- *Intratracheal, endotracheal* = Into trachea (IT)
- *Intramuscular* = Into muscle (IM)
- *Intraperitoneal* = Into peritoneal (abdominal) cavity
**Parenteral** Bypassing Gastrointestinal Tract

- **Intrapleural** = Into pleura (sac surrounding lungs)
- **Intrathecal** = Into space around spinal cord
- **Intrauterine** = Into uterus
- **Intravenous** = Into vein (IV)
- **Intraventricular** = Into ventricles of brain
- **Intravesicular** = Into urinary bladder
- **Intravitreal or intravitreous** = Into eye
- **Subcutaneous** = Immediately under skin (SubQ, SC, SQ)
Misc. Routes of Administration

• Inhalation
• Nasal Intranasal = Into the nose
• Ophthalmic = Into the eye
• Otic, aural = Into the ear
• Percutaneous = Through skin
• Rectal = Through anus into rectum
• Topical = Applied to skin or mucous membranes
• Transdermal = Through skin