1 Chapter 11
Principles of Pharmacology

2 Giving Medications
• You will be responsible for administering certain drugs
• You will be responsible for assisting patients self administer other drugs
• Not understanding how medications work, places the patient and yourself in ______________________
• Giving medications is serious business

3 Pharmacology Definitions (1 of 2)
• Pharmacology
  • The study of the properties and effects of ______________________ and medications
• Pharmacodynamics
  • Process by which medication works on the ______________________
• Dose
  • Amount of medication given
• Action
  • ______________________ effects expected on the body

4 Pharmacology Definitions (2 of 2)
• Indications
  • Therapeutic uses for a particular drug
• Contraindications
  • Conditions in which a medication should ______________________ be given
• Side effects
  • Actions of a drug other than the desired ones

5 How Medications Work
• Receptors are sites on cells where chemicals (medications included) can bind and cause reactions.
• Receptors are located throughout the body
• Agonist: causes ______________________ of receptors
• Antagonist: binds to a receptor and ______________________ other
• Antagonist: binds to a receptor and
other medications

6 □ Medication Names
1. Trade name
   • Brand name given by __________________________
   • Generic name
   • Original chemical name
2. Prescription drugs
   • Given by pharmacists according to doctor’s order
   • Over-the-counter (OTC) drugs
   • Available without a __________________________

7 □ Routes of Administration (1 of 5)
• Enteral Medications: enter the body through the digestive system
  • Absorbed __________________________
  • Oral and via rectum
• Parenteral Medications: enter the body through other than the digestive tract
  • Absorbed more rapidly

8 □ Routes of Administrations (2 of 5)
________________________ (IV) injection (quickest route)
• Injected directly into the vein
• Oral (PO)
  • Taken by mouth; enters body through digestive system
• Sublingual
  • Placed under the __________________________; absorbed by mucous membranes

9 □ Routes of Administrations (3 of 5)
• Intramuscular (IM) injection
  • Injection into the __________________________
• Intraosseous (IO)
  • Injection into the bone marrow
• Subcutaneous (SC) injection
  • Injection into tissue between __________________________ and muscle
• Intranasal
Medication is pushed through a device called a mucosal atomizer device (MAD) that aerosolized the liquid for delivery into the nostril.

10 **Routes of Administration (4 of 5)**

- Transcutaneous
  - Medications absorbed through the
- Inhalation
  - Medications inhaled into the lungs
- Per rectum (PR)
  - Administration by rectum
- Endotracheally
  - Given into lungs via an ____________________ tube

11 **Routes of Administration (5 of 5)**

12 **Dosage Forms (1 of 4)**

- Tablets
  - Materials mixed with medication and ____________________ under pressure
- Capsules
  - Gelatin shells filled with powdered or l__________________ medication

13 **Dosage Forms (2 of 4)**

- Solutions
  - Liquid mixture of one or more substances
  - Mixture will not separate by filtering or letting it stand.
- Suspensions
  - Mixture of fine particles distributed throughout a liquid by ____________________

14 **Dosage Forms (3 of 4)**

- Metered-dose inhaler
  - Miniature spray canister, used to direct medication through the mouth into the lungs
- Topical medications
  - Lotions, creams, and ointments applied to ____________________

15 **Dosage Forms (4 of 4)**

- Transcutaneous medications
• Designed to be absorbed through the skin
• Gels
  • Semi-liquid substances administered ______________________
  • Gases for inhalation
  • Oxygen
  • Nitrous Oxide

16  Medications Carried on EMS Unit

17  Oxygen
• Required by all ______________________ of the body
• Administered as a gas for inhalation
• Enhances ______________________, requiring caution near sources of ignition
• Generally administered via:
  • Nonrebreathing mask
  • Nasal cannula

18  Activated Charcoal
• Suspension used to absorb ingested ______________________
• Often combined with a laxative
• Administered orally as a suspension
• Don’t give to patients with altered ______________________

19  Oral Glucose
• ______________________ is used by cells for energy.
• Patients with low blood glucose are ______________________.
• It is administered orally as a gel.
• Don’t give to an unconscious patient or one who cannot protect their airway

20  Other Medications
• Aspirin (ASA)
  - ______________________ function inhibitor
  -Given to patients with cardiac chest pain
  -Reduces fever, pain, and inflammation
  -Contraindications:
    -Hypersensitivity to aspirin
    -______________________________ damage, bleeding disorder,
asthma
- Allergic to aspirin
- Should not be given to children

21 Other Medications
- Nitroglycerin (NTG)
  - ____________________________
    - Given for cardiac chest pain
    - BP must be monitored before each dose
    - Available in tablet or spray form
    - Should not be used with ____________________________ medications

22 Other Medications
- Albuterol (Ventolin)
  - ____________________________
    - Given for respiratory distress
    - Given via nebulizer
- Xopenex (Levalbuterol)
  - Bronchodilator
    - Given for respiratory distress (normally after Albuterol or if patient is already taking Xopenex
    - Given via nebulizer

23 Other Medications
- Duoneb
  - Bronchodilator
    - Given for respiratory distress
    - Given via nebulizer

24 Other Medications
Glucagon:
- Polypeptide ____________________________ identical to human glucagon
- Increases blood glucose and relaxes ____________________________ muscles of the GI tract
- Acts only on liver glycogen, converting it to glucose
• Given IV, IM, or SC

25 **Intranasal Medications**
- Naloxone
  - Used to reverse the effects of an ________________ overdose
  - The most common technique for naloxone administration is via the intranasal route

26 **Assisted-Administration Medications**

27 **Epinephrine**
- Increases heart rate and blood pressure and ________________ muscle tone of bronchi
- Eases breathing problems in asthma or allergic reactions
- May be delivered by MDI, SC, or IM
- Also called ________________, released inside body under stress

28 **Administering Epinephrine by Injection**
- Sterilize skin.
- Insert needle at ________________ degree angle and draw plunger back.
- Inject medication.
- Dispose of needle.

29 **Metered-Dose Inhaler**
- Medication should be delivered as the patient is inhaling.
- Device may include ________________.

30 **Weights and Measures**
- Based primarily on Metric system
- **Gram**: basic unit for measuring ________________ (weight)
- **Liter**: basic unit for measuring volume (cc’s)
- **Kilo** = 1,000
- **Milli** = 1/1,000th
- 1 Kilogram = ________________ pounds
- 1 liter = 1.05 quarts
6 “Rights of Drug Administration
   • Right Patient
   • Right ____________________________
   • Right Dose
   • Right Route
   • Right ____________________________
   • Right Documentation

32 General Steps to Administer Medications (1 of 2)
   • Obtain orders from medical control.
   • ____________________________ orders back to medical control.
   • Verify proper medication and prescription.
   • Verify form, dose, and route of the medication.
   • Check ____________________________ date and condition of the medication.

33 General Steps to Administer Medications (2 of 2)
   • Reassess vital signs, especially heart rate and blood pressure, at least every ____________________________ minutes or as the patient’s condition changes.
   • Document! Time, Drug, Dosage, Route, Effects

34 Patient Medications
   • Clue you in to patient ____________________________
   • Especially helpful when patient has altered mental status
   • Include over-the-counter medications and dietary supplements

35 Medication Errors
   • Inappropriate use of a medication could lead to patient ____________________________.
   • If a medication error occurs:
     • Provide appropriate patient care.
     • Notify medical control.
     • Document thoroughly, ____________________________, and honestly.
     • Talk with your supervisor or medical director.
• Talk with your supervisor or medical director.