

Chapter 17

Dosage Calculation and Medication Administration

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Lesson 17.1

1. Demonstrate use of the most common equivalents of metric and apothecary measurement systems.
2. Correctly convert units of measurement within and between the metric, apothecary, and household measurement systems.
3. Apply mathematics skills to solve dosage calculation problems accurately.
4. Demonstrate the methods of calculating pediatric dosages.

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Mathematics and Dosage Calculation Review

- The metric system
 - Volume—liters
 - Weight—grams
 - Length—meters
- The apothecary system
 - Volume—fluid ounce, pint, quart
 - Weight—grains, ounce, pound
- The household system
 - Teaspoon, tablespoon, ounce, cup

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Big to Small Rule

1. Write down BIG → SMALL
2. Place the large unit under the word *big* and the small unit under the word *small*
3. Move the decimal point three places in the direction of the arrow; add zeros

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Mathematics Skills

- Fractions
- Decimal fractions
- Percents
- Ratios and proportions
- Calculating medications using the mg/kg method



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Pediatric Dosage Considerations

- Young's rule
- Clark's rule
- Fried's rule
- Body surface area

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Lesson 17.2

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5. Describe each phase of drug action.
6. Explain how decreased hepatic and renal functioning affect medication absorption and excretion.
7. Discuss the principles of drug action and interactions.
8. Discuss factors that affect a patient's response to medications.

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Lesson 17.2

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9. Identify the nurse's responsibilities regarding medication administration.
10. List the six "rights" of medication administration.
11. Describe factors to consider in choosing routes of medication administration.

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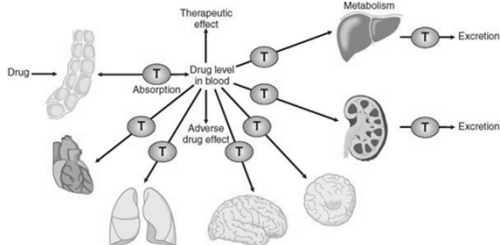
Pharmacology

- The study of drugs and their action on the living body
- Phases of drug action
 - Pharmaceutical phase
 - Pharmacokinetic phase
 - Pharmacodynamic phase

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Medication Absorption and Excretion

- Liver—metabolizes drugs
- Kidneys—eliminate metabolites of drugs from the body



Drug Actions and Interactions

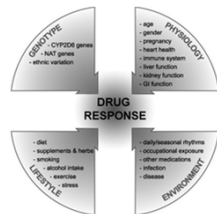
- Actions
 - > Local versus systemic
- Interactions
 - > Potentiation or synergism
 - > Compatibility
 - > Incompatibility
- Agonist vs. antagonist
- Idiosyncratic reactions
- Toxicity
- Adverse drug reactions



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Factors that Affect Patients' Response

- Age
- Weight
- Physical condition
- Environmental temperature
- Gender
- Amount of food in the stomach
- Ethnicity
- Route of administration



Medication Orders

- The nurse is legally and ethically responsible for ensuring that the patient receives the correct medication that has been ordered by the health care provider



Drug Distribution Systems

- Unit dose system
- Computer-controlled dispensing systems

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“Six Rights” of Medication Administration

- Right medication
- Right dose
- Right time
- Right route
- Right patient
- Right documentation



Routes of Administration

- Enteral administration
- Percutaneous administration
- Parenteral administration



The slide features three images: a diagram of a person's mouth and throat showing enteral administration, a photo of a person receiving an intramuscular injection (percutaneous), and a photo of a person receiving an intravenous injection (parenteral).

Lesson 17.3

(Slide 1 of 2)

12. Discuss the use of the Joint Commission's abbreviations to prevent medication errors.
13. Explain the importance of accurately transcribing medication orders.
14. Define *controlled substance*.
15. Discuss the three preferred sites for intramuscular injections in adults.

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Lesson 17.3

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16. Describe the correct techniques for locating intramuscular injection sites.
17. Describe the procedures for irrigating the eye, the ear, and the nose.
18. Describe the correct techniques for administration of vaginal and rectal medications.

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Joint Commission's "Do Not Use" List

- Health care facilities must have a list of abbreviations not to be used in documentation
 - Must include those banned by The Joint Commission



Transcribing Orders

- Verbal orders should be transcribed or entered into a computer, per facility policy
- Clarify unclear information with the health care provider



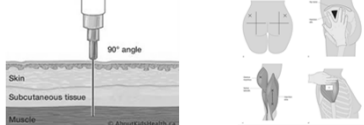
Controlled Substances

- Include opioids, barbiturates, and other medications
- High possibility for abuse, addiction, or theft
- Must be kept in a secured area



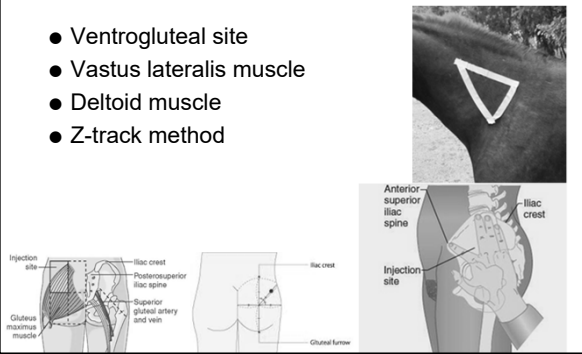
Sites for Intramuscular Injections

- Ensure site is free of pain, infection, necrosis, ecchymosis, and abrasions
- Consider the location of underlying bones, nerves, and major blood vessels, and amount of solution to be injected
- Ventrogluteal site is preferred, but vastus lateralis and deltoid muscle can be used



Locating Sites for IM Injections

- Ventrogluteal site
- Vastus lateralis muscle
- Deltoid muscle
- Z-track method



Eye, Ear, and Nose Irrigation

- Irrigations involve a gentle washing of an area with a stream of solution delivered through a syringe
- Medication instillation into eyes, ears, and nose



Vaginal and Rectal Medications

- Suppository
- Enema
- Douche
- Cream, foam, jelly