

Primary Health Care Initiatives (PHCI) Project
Contract No. 278-C-00-99-00059-00
Abt. Associates Inc.

BASICS OF DRUG THERAPY

LEARNING OBJECTIVES

- Understand the basic concepts of drug therapy
- Understand the interactions between a medication and the human body
- Develop a pattern of patient education for prescribed medications

TEACHING STRATEGIES

- Use concrete examples of medications as much as possible to illustrate points
- This is an overview only of the basic concepts; detailed descriptions are not necessary

MATERIALS AND EQUIPMENT NEEDED

- White board and markers
- Overhead projector and transparencies of major points

LEARNING POINTS

- Definitions
 - Pharmacology: Specific actions of a drug in the body and in the laboratory
 - Pharmacotherapy: Using drug therapy to treat a specific disease
 - Pharmacokinetics: Relationship between time and concentration of the drug in the body
 - Pharmacodynamics: Relationship between exposure to the drug and its effect on the body
- Pharmacokinetics
 - Absorption of a drug – factors that affect absorption:
 - o Oral drugs (liquids and pills) Absorption depends on:
 - Amount of acid in stomach
 - Activity of stomach – amount of time drug spends in stomach
 - Liquids absorbed faster than pills
 - Type of pill – some are designed to dissolve over long period of time (“Long-acting” medication)
 - o Injectable medications
 - Generally absorbed the fastest, and so the most rapid acting
 - Also excreted the fastest
 - o Rectal medications
 - Generally absorbed more slowly

- Commonly used when patient is vomiting
- o Transdermal medications
 - Designed to be slowly absorbed over 1-3 days
 - Only certain medications absorbed reliably through the skin (estrogen, nitroglycerine, nicotine, etc.)
- Distribution
 - o Amount of drug in various tissues of the body
 - o May be bound to fatty tissue (“lipophilic”) or in water part of body (“hydrophilic”)
 - o Lipophilic drug generally persist longer in the body (eg. Diazepam); hydrophilic drugs are excreted earlier (eg. Penicillin)
- Metabolism
 - o Conversion of drug in body to other compounds (metabolites)
 - o Active metabolites continue drug activity, while inactive metabolites do not
 - o Eg. Diazepam – has many active metabolites – activity can last as long as 14 days after one dose, especially because drug is lipophilic
 - o Generally takes place by the liver, although can occur in other tissues
 - o Rate of metabolism of a drug can determine how long it is active in the body
- Excretion
 - o Generally refers to elimination of the drug by the kidneys or the liver
 - o The faster the drug is eliminated, the less time it is active
- “Steady-State” drug conditions
 - o When the rate of drug coming into the body equals the rate of drug removal
 - o Concentration of the drug is the same after each repeated dose
 - o Generally occurs after 2-7 days of taking a drug, depending on the level of absorption, metabolism, and excretion
 - o Most important with chronic medication, such as anti-hypertensive or anti-diabetic drugs
- Pharmacodynamics:
 - Drug effects include beneficial effects and toxic/adverse/side effects
 - Difference between good effects and side effects may depend on condition of patient
 - Example – sleepiness caused by promethazine (Phenergan) – can be a side effect when drug used as an antihistamine, but a beneficial effect when drug used to help promote sleep
 - Every drug has some side effects – major distinction is how severe they are, and how much patient is willing to tolerate them
 - Important Point – patient must be aware of most common side effects to encourage cooperation in taking medication

CRITICAL ELEMENTS FOR EVALUATION OF COMPETENCE

- Understand significant elements of drug absorption, metabolism, excretion and distribution in the body
- Describe the important elements of patient counseling for each medication