Core Concepts in Pharmacology 5th edition Holland Solutions Manual

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CHAPTER 2
DRUG CLASSES, SCHEDULES, AND CATEGORIES

LEARNING OUTCOME 1

Discuss the prototype approach to drug classification and the basis for which drugs are placed into therapeutic and pharmacologic classes.

Core Concept

2.1 Drugs may be organized by their therapeutic and pharmacologic classifications.

SUGGESTIONS FOR CLASSROOM ACTIVITIES

- Discuss prototype drugs that have been replaced with a new, improved drug in a pharmacologic class.
- Discuss different therapeutic classes of drugs.
- Describe different mechanisms of action of drugs.
- Discuss drugs that have the same therapeutic classification but have different mechanisms of action.
- Design a matching quiz involving the mechanisms of action of drugs.

SUGGESTION FOR CLINICAL ACTIVITIES

- Have students identify the therapeutic and pharmacologic classifications of the drugs for their assigned patient.

LEARNING OUTCOME 2

Distinguish between a drug's chemical name, generic name, and trade name.

Core Concept

2.2 Drugs have more than one name.

SUGGESTIONS FOR CLASSROOM ACTIVITIES

- Provide the chemical, generic, or trade name of a drug and have students give the other two names.
- Assign different students a generic, trade, or chemical name. Have the students try to find their correct matches to form a trio.

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- Have a timed quiz that asks students to list how many generic and trade names they can come up with for popular drugs. Whoever gets the most in the time frame wins.

SUGGESTIONS FOR CLINICAL ACTIVITIES

- Have students identify the chemical, generic, and trade names for the drugs an assigned patient is receiving.
- Have students identify the mechanisms of action of drugs on assigned patients.

LEARNING OUTCOME 3

Explain how trade name drugs are different from generic equivalent drugs.

Core Concept

2.3 The differences between trade name drugs and their generic equivalents include price, formulations, and, most importantly, bioavailability.

SUGGESTIONS FOR CLASSROOM ACTIVITIES

- Discuss the advantages and disadvantages for drug companies and patients if only trade name drugs were used.
- Discuss the advantages and disadvantages of using generic name drugs.

SUGGESTION FOR CLINICAL ACTIVITIES

- Have students determine a list of trade name drugs that are on their facility's negative formulary.

LEARNING OUTCOME 4

Discuss why drugs are sometimes placed on a restrictive list and referred to as *scheduled drugs* or *controlled substances.*

Core Concept

2.4 Drugs with a potential for misuse and abuse are categorized into schedules.

SUGGESTIONS FOR CLASSROOM ACTIVITIES

• Discuss the differences between physical and psychological dependence.

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• Discuss how scheduled drugs must be ordered.

SUGGESTION FOR CLINICAL ACTIVITIES

• Have students compile a list of scheduled drugs in their own state.

LEARNING OUTCOME 5

Identify the five pregnancy categories and explain what each category represents.

Core Concept

2.5 In order to assess fetal risks, all prescription drugs are classified according to safety in pregnancy categories.

SUGGESTIONS FOR CLASSROOM ACTIVITIES

- Identify the five pregnancy categories and explain what each category represents.
- Design a matching quiz involving the schedules of pregnancy drugs in various safety categories.

GENERAL CHAPTER CONSIDERATIONS

1. Have students study and learn the key terms listed at the beginning of the chapter.
2. Have students complete the end-of-chapter questions in their book.
3. Use the Classroom Response Questions provided in PowerPoint to assess students prior to the lecture.

REFERENCES

- U.S. Governmental Drug Regulation: *http://www.usdoj.gov/dea/index.htm*

STUDENT WORKBOOK AND RESOURCE GUIDE

- Chapter 2 activities
- *Separate purchase*

PEARSON NURSE'S DRUG GUIDE

- *Separate purchase*

CLASSROOM RESPONSE QUESTION POWERPOINTS

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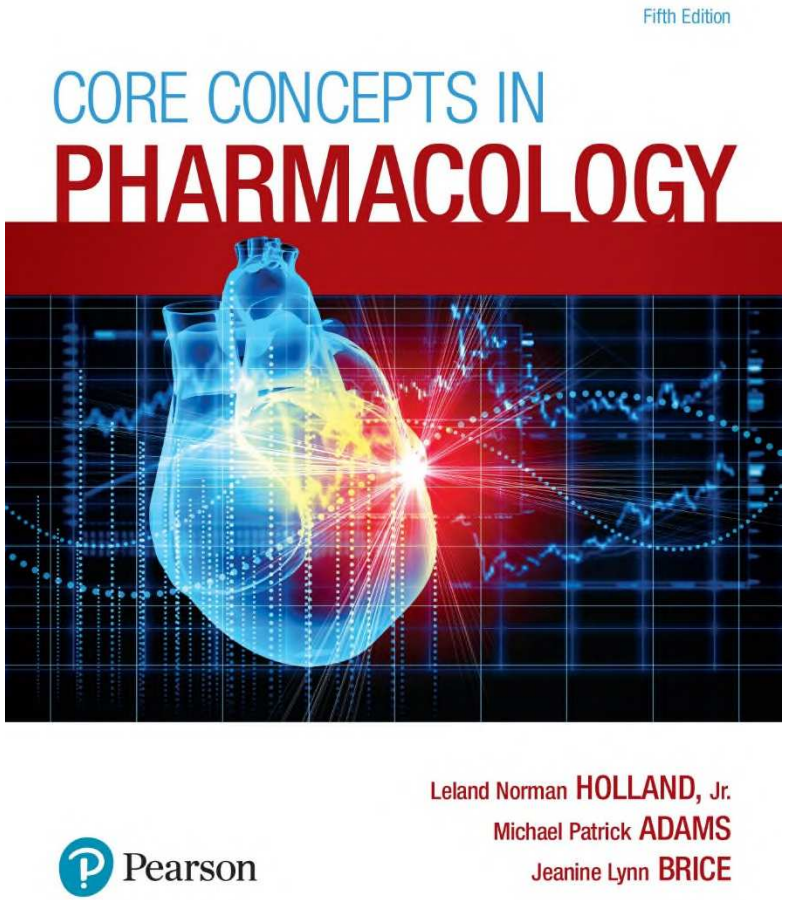
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Core Concepts in Pharmacology

Fifth Edition



Chapter 2

Drug Classes, Schedules, and Categories

ALWAYS LEARNING

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Core Concept 2.1

Drugs may be organized by their therapeutic and pharmacologic classifications.

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Drug Classification

- Therapeutic
  - What the drug does clinically
- Pharmacologic
  - How the drug produces its effect in the body

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Table 2.1
Organizing Drugs by Therapeutic Classification

Therapeutic Focus	
Cardiac care: Drugs affecting cardiovascular function	
Therapeutic Usefulness	**Therapeutic Classification***
influencing blood clotting	anticoagulant
lowering blood cholesterol	antihyperlipidemic
lowering blood pressure	antihypertensive
treating abnormal heartbeat	antidysrhythmic
treating chest pain (angina)	antianginal drug

**Note:* Although the names of some therapeutic classifications may sound complicated, drug terminology will become more familiar as you study drugs and drug classes. When studying this topic, always refer to a medical dictionary and a drug guide.

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Table 2.2
Organizing Drugs by Pharmacologic Classification

Focusing on Physiological Action

Therapy for high blood pressure may be achieved by:

Mechanism of Action	Pharmacologic Classification
lowering plasma volume	diuretic
blocking heart calcium channels	calcium channel blocker
blocking enzyme activity	ACE inhibitor
blocking stress-related activity	adrenergic blocker (drug that inhibits actions of the sympathetic nervous system)
dilating peripheral blood vessels	vasodilator

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Core Concept 2.2

Drugs have more than one name.

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Drug Naming

- Chemical
- Generic
- Trade
- Combination

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Chemical

- Assigned by IUPAC
- A drug has only one chemical name
- Often complicated and difficult to pronounce and remember
- Drugs sometimes characterized by a *portion* of their chemical structure
  - Examples: phenothiazines, thiazides

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Generic

- Assigned by U.S. Adopted Name Council
- Less complicated/easier to remember than chemical names
- Routinely used by healthcare providers
- Pharmacology students generally must memorize

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Trade

- Assigned by the company marketing the drug
- Selected for marketability
- Easy to remember
- Also called *proprietary*, *product*, or *brand* name
- Proprietary
  - Exclusive rights to originating company for 17 years after submitted to FDA

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Combination

- More than one active generic ingredient
- Challenging to remember

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Table 2.3
Trade Name Products Containing Popular Generic Drugs

Generic Drugs	Trade Names
aspirin	Acuprin, Anacin, Aspergum, Bayer, Bufferin, Ecotrin, Empirin, Magnaprin, Miniprin, Ridiprin, Sloprin, Uni-Buff, Uni-Tren, Zorprin
diphenhydramine	Aler-Dryl, Allergia-C, Benadryl, Compoz Nighttime Sleep Aid, Diphedryl, Diphenadryl, Hydramine, Nytol, Pardryl, PediaCare Children's Allergy, Sominex, Unisom
ibuprofen	Advil, Dolgesic, Genpril, Haltran, IB Pro, Midol, Motrin, Nuprin, Rufen, Tab-Profen, Ultraprin

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Concept Review 2.2

- What are the differences between a chemical, a generic, and a trade name? Which name is most often used to describe the active ingredients within a drug product?

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Core Concept 2.3

The differences between trade name drugs and their generic equivalents include price, formulations, and, most importantly, bioavailability.

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Brand Name vs. Generic

- Usually generic are less expensive
- Bioavailability
  - Physiologic ability of drug to reach its target cells and produce its therapeutic effect
- Negative formulary
  - List of trade name drugs that pharmacists may not dispense as generic drugs

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Core Concept 2.4

Drugs with a potential for misuse and abuse are categorized into schedules.

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Scheduled Drugs

- High potential for abuse
- Five general categories called schedules
- Schedule I–V
  - Highest to lowest potential for abuse
- Controlled substance
  - Restricted by Controlled Substances Act of 1970 and later revisions
  - Strict guidelines for monitoring substances

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Table 2.4
Major Drug Schedule and Examples

Drug Schedule	Abuse Potential	Physical Dependence	Psychological Dependence	Examples
I	Very High	High	High	heroin, lysergic acid diethylamide LSD), peyote, methaqualone, and 3,4-methylenedioxymethamphetamine (“ecstasy”)
II	High	High	High	hydromorphone, methadone, meperidine, oxycodone, and fentanyl; amphetamine, methamphetamine, methylphenidate, amobarbital, glutethimide, and pentobarbital
III	Moderate	Moderate	High	products containing not more than 90 mg of codeine per dosage unit, buprenorphine products, benzphetamine, phendimetrazine, ketamine, and anabolic steroids
IV	Low	Low	Low	carisoprodol, clonazepam, clorazepate, diazepam, lorazepam, midazolam, temazepam, and triazolam
V	Very Low	Low	Low	cough preparations containing not more than 200 mg of codeine per 100 mL

Source: Data from List of controlled substances, U.S. Department of Justice, Drug Enforcement Administration, Office of Diversion Control, n.d.

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Core Concept 2.5

In order to assess fetal risks, all prescription drugs are classified according to safety in pregnancy categories.

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Drug Categories

- Teratogen
  - Any substance that will harm a developing fetus or embryo
- Drugs are placed into one of five *pregnancy categories:* A, B, C, D, and X
  - Drugs in category A are the safest
  - Those in category X are the most harmful

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Table 2.5
Categories of Safety in Pregnancy

Safety Category	Explanation	Examples
A Lowest Risk	Studies have not shown a risk to women or to the fetus.	ferrous fumarate (Ferranol), levothyroxine (Synthroid), potassium chloride (KCl), potassium gluconate (Kaon Tablets), prenatal multivitamins, thyroglobulin (Proloid)
B	Animal studies have not shown a risk to the fetus or, if they have, studies in women have not confirmed this risk.	amoxicillin (Amoxil), fluoxetine (Prozac), insulin (Humulin R), loperamide (Imodium), penicillins, ranitidine (Zantac)
C	Animal studies have shown a risk to the fetus, but controlled studies have not been performed in women.	acyclovir (Zovirax), amitryptiline (Elavil), furosemide (Lasix), hydrochlorothiazide (HydroURIL), iron dextran (K FeRON), mineral oil (Fleet Mineral Oil), senna (Senokot)
D	Use of this drug category may cause harm to the fetus, but it may provide benefit to the mother in a life-threatening situation or when a safer therapy is not available.	ACE inhibitors, alcohol, cortisone acetate (Cortistan), nonsteroidal anti-inflammatory drugs in the third trimester, tetracyclines
X Highest Risk	Studies have shown a significant risk to women and to the fetus.	castor oil (Purge), isotretinoin, methotrexate, most oral contraceptives, norethindrone (Norlutin), oxymetholone (Anadrol), progesterone (oral forms), statins, warfarin (Coumadin)

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