BIOL G200: PHARMACOLOGY - MEDICATIONS AND DRUGS

Item	Value
Top Code	049900 - Other Biological Sciences
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)

Course Description

This course covers the classification of medications and basic principles of pharmacology from legislation and pharmacokinetics through receptor theory, pharmacodynamics and pharmacotherapeutics. Medications will be grouped by body systems and treatment options will be related to the pathophysiological state of the patient. Drug groups are discussed rather than individual medications, with emphasis on autonomic, central nervous system, and cardiovascular agents. Drugs affecting all body systems will be discussed. PREREQUISITE: BIOL G221 or BIOL G225. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Course outcomes
2. Describe how core concepts in pharmacology relate to human physiology.
3. Identify appropriate drugs based on their mechanisms of action.
4. Identify the major drug groups and their therapeutic uses.
5. Predict potential side effects from the use of drugs in the major drug groups studied.
6. Explain how drugs interact with receptors to either enhance or block a physiologic response.

Course Objectives

- 1. Describe membrane properties with respect to drug passage noting the effects of solubility, size, and ionization and especially the role of pH in the ionization of acidic and alkaline medications.
- 2. Describe fundamentals of drug mechanisms of action noting receptor and non-receptor based examples and the interacting roles of full and partial agonists and competitive and noncompetitive antagonists.
- 3. Classify major drug groups based upon their mechanism of action, chemical structure, and major therapeutic uses.
- 4. Evaluate the benefits and risks of using each kind of drug studied. Relate these benefits and risks to various physiological and pathological states the patient might display
- 5. Relate the sites and mechanisms of action, patterns of absorption, distribution, transformation , and excretion of drugs to possible drug interactions and to individual patient differences.
- 6. Employ knowledge of drug legislation in determining the proper way to handle and administer drugs.
- 7. Develop skills and vocabulary to use pharmacological literature and drug references to identify and evaluate therapeutic uses, side or toxic effects, and special cautions or contraindications of drugs.
- 8. Outline from memory all major drug groups that could potentially affect each different body system.
- 9. Develop computer skills to accurately and efficiently use online medical texts and drug reference texts.

Lecture Content

Course Introduction Online orientation to computer skills for health professionals Legislation: drug approval and testing process Experimental designs Fundamentals efficacy vs. potency half-life dosing Administration of medications Drug references Routes of Administration local administration systemic administration Actions of drugs in the body Receptor theory full agonists antagonists partial agonists Drug absorption factors Drug distribution factors Drug metabolism factors Drug elimination factors Pharmacodynamics the physical state of the patient genetic differences mechanisms of drug interactions Drugs of the peripheral nervous system voluntary vs. autonomic systems Synapse structure Peripheral nervous system receptors alpha, beta 1, beta 2, muscarinic, nicotinic Clinical usefulness and adverse effects of peripheral nervous system drugs Central and direct skeletal muscle relaxants Cardiovascular drugs Pathpophysiology of the cardiovascular system basics of the conduction system automaticity functional refractory system arrythmias angina blood pressure disorder blood and coagulation disorders Therapeutic uses and adverse effects of cardiac drugs cardiac glycosides anti-arrhythmics cardiac stimulants </ li> anti-anginal agents anti-hypertensive agents hemopoietic agents hemostatics anti-coagulants thrombolytics anti-lipemics Central nervous system drugs (CNS) Fundamentals of CNS stimulation and depression Drug abuse Physical vs. psychological drug dependence CNS receptors Drug groups studied: stimulants depressants anti-epileptic agents anti-parkinsonian agents narcotic analgesics non-narcotic analgesics anti-depressants anti-anxiety agents anti-psychotics drugs for bipolar disorders anti-convulsants Respiratory Drugs Respiratory gases Respiratory stimulants Bronchodilators Respiratory anti-inflammatory agents Anti-tussives Demulcents Expectorants Nasal decongestants Histamine antagonists Gastrointestinal Drugs Histamine antagonists Antacids and antisecretory agents Proton pump inhibitors Digestants Emetics and anti-emetics cathartics anti-diarrheics carminatives contrast media Drugs affecting the eye, skin, and mucous membranes Miotics, mydriatics Drugs to reduce fluid formation Anti-infectives Anti-inflammatory agents Drugs affecting the skin and mucous membranes Emollients Antiseptics Keratolytics Topical corticosteroids Systemic acne medications Anti-infectives and antineoplastics Colonization vs. infection Broad vs. narrow spectrum choices Bacteriostatic vs. bactericidal action Bacterial resistance Factors affecting drug selection Drug groups studied: penicillins cephalosporins carapenems monobactams vancomycin bacitracin aminoglycocides quinolones macrolides tetracycline

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)

Reading Assignments

A.Required Readings. Text Drug reference books: Physician'sDesk Reference (PDR) and Drugs Facts and Comparisions

Writing Assignments

1. Students should use drug reference standards found in library reserve section to complete assignments related to the drug groups studied in class. Assignments should require detail beyond that presented in class.2. Analyze current professional journal articles using principles and vocabulary learned in class.3. Write essays and short answers demonstrating proficiency in published course objectives.

Out-of-class Assignments

Library research and reading assignments.

Demonstration of Critical Thinking

1. Use knowledge of pharmacological, physiological and pathological principles to evaluate drug safety and effectiveness in various clinical situations. 2. Discuss fundamental principles of pharmacodynamics and pharmacokinetics including receptor theory and membrane characteristics. 3. Discuss current drug approval methods contrasting benefits and risks of the current process. 4. Predict potential drug properties and interactions given fundamental facts such as protein binding properties or solubility and ionization characteristics of the drugs involved. 5. Given various alternatives, select and defend your choice of therapy for a given patient including benefits and risks for the individual.

Required Writing, Problem Solving, Skills Demonstration

1. Students should use drug reference standards found in library reserve section to complete assignments related to the drug groups studied in class. Assignments should require detail beyond that presented in class. 2. Analyze current professional journal articles using principles and vocabulary learned in class. 3. Write essays and short answers demonstrating proficiency in published course objectives.

Eligible Disciplines

Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required.

Textbooks Resources

1. Required B. Roohk. Pharmacology: An Introduction to Basic Drug Groups, 14th ed. Bonnie Roohk Press, 2012 Rationale: . 2. Optional Lehne. Pharmacology for Nursing Care or equivalent work., 7th ed. Saunders/ Elsevier, 2012

Other Resources

1. Purchase or have regular access to: 2. Physician's Desk Reference 3. Drug Facts and Comparison