

The Florida State University College of Medicine

BMS 6401

Medical Pharmacology 201

Fall 2011

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Instructors

Course Director	Graham A. Patrick, Ph.D.		
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Faculty	Gail Galasko, F gail.galasko@n	Ph.D. <u>ned.fsu.edu</u>	
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	April Johnston, awjohnston@c	Pharm.D. hp.org	

Phillip Treadwell, Pharm.D. phillip.treadwell@tmh.org

Faculty and Course Evaluation

Students will have the opportunity to evaluate each faculty member who teaches a major portion of the course, using a standard evaluation questionnaire. Students will also have the opportunity to evaluate the course at its conclusion. Suggestions and comments concerning the course, its material and conduct, are welcomed and may be made to the Course Director at any time.

Course Overview

Course Goals

This introductory course deals with the concepts of pharmacodynamics (e.g., drug-receptor interactions, signaling mechanisms, and dose-effect relationships) and pharmacokinetics (e.g., drug absorption, distribution, metabolism, and elimination). The course emphasizes the biochemical and physiological bases for understanding drug action, and it introduces many major classes of drugs. Groups of drugs which are specifically considered include those acting on the autonomic nervous system, those most prominently affecting the immune system, those used in treating disorders of the cardiovascular and respiratory systems, and those used in treating neoplastic and infectious diseases.

Learning Objectives

Course Objectives

The student should exhibit the following knowledge, skills, and behaviors:

Knowledge

1. Demonstrate knowledge concerning each major drug class discussed in the course, including:

a. prototype drug(s),

b. mechanism(s) of action,

c. important therapeutic actions and applications, and

d. important (prevalent or life-threatening) adverse effects;

2. Demonstrate knowledge of the variations in drug response between individual patients, based upon disease, genetic traits, or other innate characteristics;

3. Demonstrate knowledge of the effect of age on pharmacodynamics, pharmacokinetics, and responses to therapy, with an emphasis on geriatric patients;

4. Develop an adequate basis of knowledge in pharmacology on which to build as the student advances through the clinical clerkship rotations;

5. Develop knowledge of drug classes and mechanisms into which additional drugs can be incorporated, compared, and contrasted as new drugs are developed and as the practice of medicine dictates.

Skills

1. Demonstrate an understanding of the general types and clinical usage of drugs for treating diseases of each organ system;

2. Demonstrate the ability to recognize and understand the physicochemical and physiological factors that affect the absorption, distribution, metabolism, and elimination of drugs, and how these relate to pharmacokinetics;

3. Demonstrate the ability to interpret dose-response relationships for both desired and undesired drug effects;

4. Demonstrate an understanding of drug-receptor interactions and allied molecular phenomena at a basic level;

5. Demonstrate ability to interpret and analyze literature related to drugs.

Attitudes and behaviors:

1. Demonstrate professional behavior during activities in the course by being in attendance when required, on time, attentive, and a considerate and active participant in discussions.

Integration with COM Goals and Objectives:

Knowledge

* Demonstrate the application of the scientific bases of health, disease, and medicine to common and high impact medical conditions in contemporary society.

* Describe the development, structure and function of the healthy human body and each of its major organ systems at the macroscopic, microscopic, and molecular levels.

* Recognize and discuss the implications of altered structure and function (pathology and pathophysiology) of the body and its major organ systems that are seen in various diseases and conditions.

* Identify changes in the structure and function of the human body associated with the aging process and be able to distinguish normal changes associated with aging from those that denote disease.

* Describe the molecular basis of diseases and maladies and the way in which they affect the body (pathogenesis).

* Demonstrate the ability to use basic biobehavioral and clinical science principles to analyze and solve problems related to the diagnosis, treatment, and prevention of disease.

* Demonstrate the ability to employ a comprehensive, multidisciplinary approach to the care of patients that integrates biomedical and psychosocial considerations.

* Recognize the implications of cultural, social, economic, legal, and historical contexts for patient care.

* Describe strategies to support life long learning via both print and electronic sources to assist in making diagnostic and treatment decisions (e.g., practice guidelines) and to remain current with advances in medical knowledge and practice (e.g., medical information data bases).

Skills

* Demonstrate the ability to evaluate the patient's medical problems and to formulate accurate hypotheses to serve as the basis for making diagnostic and treatment decisions.

* Demonstrate the effective use of pharmacotherapeutic agents and other therapeutic modalities, while teaching patients the importance of preventative medicine, health promotion, and wellness.

* Demonstrate the ability to acquire new information and data and to critically appraise its validity and applicability to one's professional decisions, including the application of information systems technologies for support of clinical decision-making.

* Demonstrate the ability to organize, record, research, present, critique, and manage clinical information.

Attitudes/Behaviors

* Demonstrate awareness of the health care needs of aging patients and a willingness to care for the elderly.

* Demonstrate awareness of the unique health care needs of ethnically diverse populations and communities.

Relationship of course objectives to the "Six Principles" of the Curriculum:

1. The course is student-centered in providing a supportive, respectful environment in which to learn, while requiring that students be active and critical learners.

2. The course provides information that can be applied within a clinical context. Case-based learning and clinical situations are used to present and to reinforce knowledge and analysis.

3. The course is integrated with other courses in the year. Cases and examination questions integrate information from other disciplines, from the prerequisite biomedical sciences, and from clinical situations.

4. The course reinforces professional behavior in the classroom and small group settings. Ethical issues in relation to drug therapy or other drug usage are discussed. Application of biomedical science to patient care, in the form of pharmacotherapy, is a major emphasis of the course. Problem solving and critical thinking are promoted by classroom discussions, case discussions, examination questions, and written critique. Lifelong learning skills and management of information are promoted by the requirement for using online and library sources and by the application of information to novel situations.

5. Scholarship is encouraged primarily through an emphasis on the necessity of evidence-based utilization of drug therapy; e.g. evaluation of drug safety and efficacy, appropriateness of off-label usage of drugs, and post-marketing surveillance of drug effects.

6. Information is included in the course which deals with drug effects in specific populations such as women, geriatric patients, pediatric patients, and patients belonging to specific ethnic groups.

Course Format

The course consists of 45 lecture hours, 4 clinical discussion-tutorial sessions, and 4 small group discussion sessions.

Competencies

FSUCOM – Competencies -Course Title BMS 6401					
Competency Domains	Competencies Covered in the Course	Methods of Assessment			
Patient Care	Х	Lecture, small groups, case-based clinical scenarios, quizzes, and examinations			
Medical Knowledge	Х	Lecture, small groups, quizzes, examinations, paper			
Practice-based Learning	Х	Treatment goals and targets (later built on in 3 rd year clerkships), quizzes and exams			
Communication Skills	х	Drug Ad critique, communication skills in small group exercises and large group discussions			
Professionalism	Х	Socioeconomic & ethical issues related to drug therapy & usage; small group student evaluations			
System-based Practice	Х	Drug Ad critiques to become aware of bias and misleading information related to patient safety & quality improvement			

Policies

Americans with Disabilities Act

Candidates for the M.D. degree must be able to fully and promptly perform the essential functions in each of the following categories: Observation, Communication, Motor, Intellectual, and Behavioral/Social. However, it is recognized that degrees of ability vary widely between individuals. Individuals are encouraged to discuss their disabilities with the College of Medicine's <u>Director of Student Counseling</u> <u>Services</u> and the FSU Student Disability Resource Center to determine whether they might be eligible to receive accommodations needed in order to train and function effectively as a physician. The Florida State University College of Medicine is committed to enabling its students by any reasonable means or accommodations to complete the course of study leading to the medical degree.

The Office of Student Counseling Services

Medical Science Research Building G146 Phone: (850) 645-8256Fax: (850) 645-9452

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

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Student Disability Resource Center

97 Woodward Avenue, South Florida State University Tallahassee, FL 32306-4167 Voice: (850) 644-9566 TDD: (850) 644-8504 sdrc@admin.fsu.edu http://www.fsu.edu/~staffair/dean/StudentDisability

Academic Honor Code

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. (Florida State University <u>Academic Honor Policy</u>)

Attendance Policy

The College of Medicine has detailed attendance policies as they relate to each cohort and events that conflict with course schedules. See pages 28-29 of *FSUCOM Student Handbook* for details of attendance policy, notice of absences and remediation.

For BMS 6401: Unexcused absence from a scheduled examination or quiz may result in a grade of zero (0 %) being assigned for that examination or quiz. Unexcused absence from an activity for which attendance is required (for example, Small Group session) will result in a one-point deduction in the final numerical grade for the course.

Required Materials

Required Textbook	
	Basic and Clinical Pharmacology, 11th Ed. (2009), B.G.Katzung, ed. (Available online at COM Medical Library webpage under "E- Books", then scroll down to "Pharmacology" listing)
Required Website	
	<u>The Medical Letter on Drugs and Therapeutics</u> (required , subject to examination) <i>(on Medical Library webpage under "Drug Information")</i>

Recommended Materials

Textbooks

Goodman and Gilman's The Pharmacological Basis of Therapeutics, 11th ed.

L.L. Brunton et al., eds., 2006. (Available online at COM Medical Library webpage under "E-Books", in the "Pharmacology" listing)

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	<u>Katzung & Trevor's Pharmacology Examination and Board</u> <u>Review</u> , 8 th ed., A.J. Trevor et al. eds., 2008. (An extensive review)
	<u>USMLE Road Map: Pharmacology</u> , 2 nd ed. (2006), B.G. Katzung and A.J. Trevor, eds. (A more abbreviated review)
Websites	
	<u>Therapeutic Guidelines from The Medical Letter</u> (on Medical Library webpage under "Drug Information"/Medical Letter)
	Facts and Comparisons (available on COM Medical Library website under "Drug Information")
	e-Pocrates (available on COM Medical Library website and on handheld devices)
	MD Consult Drug Tab (available on COM Medical Library website under "Drug Information")
	Prescriber's Letter (available on COM Medical Library website under "Drug Information")

Grading

Assignments and weights

Questions pertaining to Medical Pharmacology 201 will be included in the four integrated examinations in the fall semester (total of approximately135 questions) and in the integrated quizzes (total of 30 – 40 questions). In addition, there will be 3 announced quizzes given during Small Groups, including 5 questions each. Each student will also be required to write a critique (1-2 pages, double-spaced, size 12 font) of a print, television, online, or radio advertisement for a drug product, and the critique will be graded on a 5-point scale (i.e., it will be equivalent to 5 examination questions). The types of questions may include computer-graded formats (multiple choice, matching) and open-ended, short answer questions.

Unexcused absence from a scheduled examination or quiz may result in a grade of zero (0 %) being assigned for that examination or quiz. Unexcused absence from an activity for which attendance is required (for example, Small Group session) will result in a one-point deduction in the final numerical grade for the course.

Grading System

FSU COM has adopted a pass/fail grading system which is used in the curriculum for the first and second years. In BMS 6401 a passing grade is achieved by performing at \geq 70% correct responses on the total of all examination and quiz questions and their equivalent included in the course. Less than 70% correct will be a failing grade which will require remediation or repetition of the course, as determined by decision of the Student Evaluation and Promotion Committee in consultation with the Course Director. See <u>page 31</u> of Student Handbook for further Definition of Grades.

BIOMEDICAL SCIENCES 6401 MEDICAL PHARMACOLOGY 201

Fall Semester, 2011 Schedule of Sessions

<u>Date</u>	<u>Day</u>	<u> Time (A.M.)</u>	Topic	Faculty
8/15	Mon.	8:00-8:50	Introduction to the course (Objectives and ground rules of course; introduction to the discipline)	G. Patrick
8/16	Tues.	8:00-8:50	Pharmacokinetics: Drug Absorption and Distribution (Drug passage across membranes; ionization; routes of administration; body compartments)	G. Patrick
8/19	Thur.	10:00-10:50	Pharmacokinetics: Drug Metabolism and Elimination (Hepatic metabolism; renal and other clearance)	G. Patrick
8/19	Thur.	11:00-11:50	Pharmacokinetics: Drug Elimination	G. Patrick
8/22	Mon.	8:00-8:50	Pharmacodynamics: Receptor Theory and Signaling Mechanisms (Receptor types; second messengers)	G. Galasko
8/23	Tues. 1	1:00-11:50	Pharmacodynamics: Dose-Response Relationship (Dose-response curves; agonists and antagonist potency and efficacy)	G. Galasko ts;
8/25	Thur.	9:00-9:50	Pharmacokinetic Principles: Time Course of Drug Action (Zero- and first order kinetics, half-life)	P. Treadwell
8/25	Thur.	10:00-10:50	Pharmacokinetics: Time Course of Drug Action (Drug accumulation, dosing regimens)	P. Treadwell
8/29	Mon.	10:00-10:50	Factors Modifying Drug Effects (Effects of size, age, pathophysiology, idiosyncrasy, tolerance, etc.)	G. Galasko
8/30	Tues.	9:00-9:50	Drug Evaluation and Regulation (Drug development, clinical trials, post-marketing surveillance, drug laws)	G. Patrick
8/31	Wed.	9:00-9:50	Conference: Evaluation of Drug Literature and Advertising (Experimental design, evidence-based evaluation)	G. Patrick/ G. Galasko
9/02	Fri.	10:00-10:50	Pharmacology in Geriatric Patient K. Brun (Body compartments, metabolic changes, pathophysiology, compliance issues, polypharma	nmel-Smith acy)
9/02	Fri.	11:00-11:50	Placebo Effect; Herbal Products	S. Cappendijk

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(Placebos, major herbal preparations, regulation of dietary supplements)

9/06	Tues.	10:00-10:50	Conference: Review of General Principles	G. Patrick/ G. Galasko
9/07	Tues.	8:00-8:50	Introduction to Autonomic Pharmacology (Anatomy, neurotransmitters, receptor types)	G. Patrick
9/09	Fri.	8:00-12:00	EXAMINATION # 1 (covers through 9/06)	
9/13	Tues.	10:00-10:50	Autonomics: Cholinergic Pharmacology (Cholinergic stimulants, cholinesterase inhibitors)	G. Galasko
9/13	Tues.	11:00-11:50	Autonomics: Cholinergic Drugs (Muscarinic blockers)	G. Galasko
9/15	Thur.	8:00-8:50	Autonomics: Cholinergic Drugs (Nicotinic stimulants and blockers; neuromuscula	G. Galasko ar blockers)
9/15	Thur.	9:00-9:50	Autonomics: Cholinergic Drugs	G. Galasko
9/19	Mon.	8:00-8:50	Autonomics: Adrenergic Drugs (Adrenergic receptors, catecholamines)	G. Patrick
9/19	Mon.	9:00-9:50	Autonomics: Adrenergic Drugs (Sympathomimetics – alpha and beta agonists)	G. Patrick
9/20	Tues.	9:00-9:50	Adrenergic Drugs (Alpha and beta blockers, drugs acting on sympathetic nerve endings)	G. Patrick
*9/22	Thur.	10:00-11:50	Clinical Case(s) and Review: Autonomic Drugs (SMALL GROUPS - * with QUIZ)	Staff
9/23	Fri.	10:00-10:50	Cancer Chemotherapy Principles (Cell cycle, resistance, log kill hypothesis)	G. Patrick
9/23	Fri.	11:00-11:50	Biotherapy of Cancer (Gene therapies, antibodies, growth factors)	G. Patrick
9/27	Tues.	10:00-10:50	Antineoplastic Agents (Antimetabolites, antibiotics)	G. Patrick
9/27	Tues.	11:00-11:50	Antineoplastic Agents (Alkylating agents, microtubule inhibitors)	G. Patrick
9/28	Wed.	8:00-8:50	Immunopharmacology (Immunosuppressive agents)	S. Cappendijk
9/28	Wed.	9:00-9:50	Immunopharmacology (Immunosuppressants, immune stimulants)	S. Cappendijk
*9/30	Fri.	10:00-11:50	Chemotherapeutic Principles	Staff

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(SMALL GROUPS - * with QUIZ)

10/07	Fri.	8:00-12:00	EXAMINATION # 2 (covers 9/07 through 9/30)	
10/10	Mon.	9:00-9:50	Principles of Antimicrobial Therapy	G. Galasko
10/11	Tues.	10:00-10:50	Antimicrobial Agents: Cell Wall Synthesis Inhibitors (Penicillins, cephalosporins, other beta-lactams)	G. Galasko
10/11	Tues.	11:00-11:50	Antimicrobial Agents: Protein Synthesis Inhibitors (Tetracyclines, macrolides, streptogramins, chlor	G. Galasko ramphenicol)
10/12	Wed.	8:00-8:50	Antimicrobial Agents: Aminoglycosides, Sulfonamides, Fluoroquinolones, etc.	G. Patrick
10/12	Wed.	9:00-9:50	Antimicrobial Agents: Fluoroquinolones, Miscellaneous	G. Patrick
10/14	Fri.	10:00-10:50	Antimicrobial Agents: Antitubercular and related drugs	G. Patrick
10/14	Fri.	11:00-11:50	Antifungal Agents (Systemic and topical; azoles, amphotericin B, flucytosine)	G. Patrick
10/20	Thur.	10:00-10:50	Antiviral Agents (Drugs for influenza, herpes infections)	P.Treadwell
10/20	Thur.	11:00-11:50	Antiviral Agents (Drugs for HIV infection)	P.Treadwell
10/21	Fri.	10:00-10:50	Clinical Cases: Antimicrobial Agents	G. Patrick/ G. Galasko
10/25	Tues.	10:00-10:50	Antiparasitic Agents (Antimalarials, other antiprotozoal agents)	S. Cappendijk
10/25	Tues.	11:00-11:50	Antiparasitic Agents (Antiprotozoal and anthelmintic agents)	S. Cappendijk
*11/01	Tues.	10:00-11:50	Clinical Cases: Antimicrobial Agents (SMALL GROUPS - *with QUIZ)	Staff
11/04	Fri.	8:00-12:00	EXAMINATION # 3 (covers 10/10 – 11/01)	
11/08	Tues.	11:00-11:50	Lipid-lowering Drugs (Statins, niacin, absorption inhibitors, resins)	A. Johnston
11/10	Thur.	8:00-8:50	Antiarrhythmic Agents (Sodium channel blockers, beta blockers)	M. Overton
11/10	Thur.	9:00-9:50	Antiarrhythmic Agents (Calcium channel blockers, amiodarone)	M. Overton

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12/13	Tues.	8:00-12:00	EXAMINATION (covers 11/08 – 12/06)	
12/06	Tues.	10:00-11:50	INTEGRATED CASE PRESENTATION (Cardiovascular and Pulmonary Case: LARGE C	Staff GROUP)
12/01	Thur.	10:00-11:50	Clinical Discussion: Pulmonary Antimicrobial Therapy	G. Patrick/ G. Galasko
11/29	Tues.	9:00-9:50	Miscellaneous Pulmonary Drugs (Cough suppressants, antihistamines, expectora	G. Patrick nts)
11/28	Mon.	10:00-10:50	Drugs for Asthma (Beta-2 agonists, corticosteroids, leukotriene blockers, mast cell stabilizers, theophylline, anticholinergics)	G. Galasko
11/18	Fri.	8:00-9:50	Integrated Clinical Cases (SMALL GROUPS)	Staff
11/17	Thur.	11:00-11:50	Antihypertensive Agents (ACE inhibitors, ARBs, direct vasodilators)	A. Johnston
11/17	Thur.	10:00-10:50	Antihypertensive Agents (Beta blockers, diuretics, alpha-1 blockers, alpha-2 agonists)	A. Johnston
11/16	Wed.	9:00-9:50	Drugs for CHF, cardiac stimulants (Digitalis glycosides, diuretics, ACE inhibitors)	G. Patrick
11/16	Wed.	8:00-8:50	Anti-Anginal Drugs (Nitrites, beta blockers, calcium channel blockers	G. Patrick s)