Clinical Pharmacokinetics Spring 2014:
The Clinical Application of Pharmacokinetic and Pharmacodynamic Principles (P-313)

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Course Room and Times: Room 414
Tuesday, 11 AM-12 PM
Thursday, 9 – 11 AM

Office hours for Course Coordinator Thursday, 2-4 PM

Other hours available by appointment

Voice mail and e-mail guidelines: Voice mail and e-mail will be checked daily, Monday-Friday. Reply to all inquiries will be made within 24-48 hours.

Participating Faculty: Please contact faculty member directly for office hours.

Prerequisites: Pharmaceutics, Pharmacokinetics

Disability Disclosure:
Any student who has a need for accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities.

Required Textbooks:

- ☑ Applied Clinical Pharmacokinetics by Larry A Bauer, 2nd edition, McGraw Hill, 2008. Available through Access Pharmacy from library website
- ☑ Applied Therapeutics--The Clinical Use of Drugs (eds. Koda-Kimble et al, 10th Edition, 2012).
- ☑ Pharmacotherapy: A Pathophysiologic Approach (eds. DiPiro et.al.8th Edition, 2011).

Reading Assignments:

Reading assignments are assigned by the participating faculty as stated in the syllabus. Reading assignments are mandatory unless stated otherwise. Other reading assignments, such as primary literature or other reference sources, may be assigned by individual instructors at their discretion. Be prepared to discuss the content of the required readings in class.

Other Requirements:

A scientific calculator - Texas Instrument TI-30Xa or the Casio FX 260 Solar are the ONLY calculators approved for use during examinations. Students using unapproved calculator models will be considered in violation of the School's Academic Code of Conduct.

Course description:

This course is designed to provide students with exposure to and hands-on experience applying pharmacokinetic (PK) and pharmacodynamic (PD) principles. Drug classes most commonly seen in clinical practice will be specifically evaluated and reviewed. The first half of the semester is designed to provide a review of PK and PD principles in various disease states and special patient populations. This will serve as a foundation for application of PK principles to other drug classes.

The second half of the semester will deal with other various drug classes that require therapeutic drug monitoring. Emphasis will be placed on the use of mathematical principles to predict drug disposition in individual patients. Situations and clinical conditions that are likely to alter the concentration:time and/ or concentration:effect relationship will also be emphasized. In addition, concentration:effect and effect:time relationships will be explored and applied to clinical situations.

In an effort to provide as much hands-on exposure as possible, cases will be given out and worked on in assigned groups during scheduled class time (Team-case assignments). These cases will provide a review on the material taught in class lectures.

Professionalism:

***Students displaying unprofessional demeanor in class will have their overall grade decreased by 5 points*.** Examples of actions considered unprofessional include but are not limited to: arriving late/ leaving early, making poor use of class time, allowing cell phones to ring in class and disrupting class. Electronic equipment should ONLY be used for taking notes and working on PK course material during class time. Any student found on social media sites, checking e-mail or on websites unrelated to class discussion will be asked to leave class and/or overall course grade will be decreased by 5 points.

Class attendance:

Students are expected to be in class and prepared to discuss required readings. Course instructors will discuss and review cases during lecture time. These cases may serve as exams questions. Students will only benefit from these cases if they attend all classes. Extra credit or bonus assignments may be offered during lecture time. There will be NO extra-credit offered to students that did not attend class under any circumstances.

TUSP educational competencies emphasized in this course:

- **Think critically, solve complex problems, and make informed, rational, responsible decisions.**
- Assume responsibility for patient outcomes related to drug therapy.
- Self-assess learning needs and design, implement, and evaluate strategies to promote intellectual growth and continued professional competence.
- **Collect information to prevent, identify and solve drug related problems.**
- **Monitor patients to determine if the therapy is appropriate, effective and safe.**
- **Develop a patient centered pharmacy care plan**.
- **Evaluate drug orders or prescriptions.**
- **Perform pharmaceutical calculations.**
- Insure that medications are properly administered.
- Effectively communicate information to patients and health professionals regarding rational drug therapy, wellness and health promotion.
- **Develop systems to prevent, manage and document adverse outcomes of drug therapy.**

Course Objectives:

1. Apply basic pharmacokinetic concepts to dosing of medications given a clinical scenario.
2. Modify dosing regimens and explain differences in pharmacokinetic principles in special patient populations.
3. Properly interpret drug concentrations to determine if a medication regimen needs to be modified.
4. Given a patient case, recommend starting doses for drugs with a narrow therapeutic range.
5. Recommend dosage modifications given drug concentrations and a patient case.
6. Design a patient specific monitoring plan to assure safe and effective drug therapy.

Course Grading:

Your final grade will be based on your performance on four examinations (which includes 1 calculations (basic pharmaceutics) exam), a major quiz and 5 group in-class assignments. The exams will consist of a combination of multiple choice and short answer questions. The final examination will be cumulative.

Each student's final grade will be calculated as follows:

Item	***Percent of Grade***
Examination #1	20%
Examination #2	20%
Major quiz	10%
Pharmaceutical Calculations Exam	10%
Team case assignments	15%
Cumulative final examination	25%

Examinations:

Exams 1, 2 and the final exam may consist of multiple choice, short answer and essay questions. The calculations exam will consist of 20-30 multiple choice basic pharmaceutics calculation questions. A sample exam/review questions will be posted in blackboard for the students review prior to the exam. Students MUST be on time for exams. Any student arriving 20 minutes after the start of an exam **MUST** see the course coordinator or they will not be allowed to take the exam. Students will not be allowed to leave an exam until 30 minutes after it begins. Faculty will not answer questions on the exam content or questions concerning the interpretation of an exam item. Students who miss a scheduled exam are required to notify the course coordinator and Eileen Lichtenstein. Students are required to take the examination during scheduled make-up examination time only, in accordance with the School of Pharmacy's make-up exam policy. Make-up examinations will be **cumulative** and may include short answer and essay questions.

Major quiz:

This quiz is worth 10% of your final grade and will be given during class time. It will consist of multiple choice questions on the pharmacokinetic and pharmacodynamic principles review. There will not be a make-up for this quiz. If you are unable to take the quiz, contact the course coordinator as soon as possible.

Team case assignments (TCA):

Clinical pharmacokinetics is a topic that involves practice and experience in order to apply the concepts to clinical patient scenarios. Students will be assigned to groups they will work with for the whole semester. Students will be required to review reading assignments and class notes prior to these classes in order to contribute to the group discussion. Students will work with their group during class times designated for team-case assignments. Faculty will present cases or questions during these classes and each group will be required to work on the problems during that class time. Group members may be called on to review the solution to the problems or cases at the end of class. Group work will be collected at the end of class and graded. The cases/questions will help students understand and apply the material learned in class as well as serve as exam review questions.

***The team case assignment classes (TCA) are mandatory.** There are no make-ups for the TCA. If you know that you will be absent for a TCA, let the course coordinator know as soon as possible.You will receive a group grade for the case answers turned in at the end of class. The grades for this work counts as 15% of your final course grade. However, each student's grade will vary depending on the scores they receive on the "student-grading-student" evaluation for this assignment. These evaluations will be filled out and collected twice during the semester. The proportion of the TCA grade that each student receives will be calculated as follows:

Points Received on "Student Grading Students" Form (average)	Individual Student's Grade for team assignments Work (percent/proportion of TCA grade)
14-16	100% (1.0)
11-13	85% (0.85)
7-10	70% (0.7)
≤6	55% (0.55)

Grading in this course will be based on a “plus/minus” system, as follows:

Range	Letter Grade	TU Grade Points	Range	Letter Grade	TU Grade Points
93-100	A	4.00	73-76.49	C	2.00
90-92.49	A-	3.67	70-72.49	C-	1.67
87-89.49	B+	3.33	67-69.49	D+	1.33
83-86.49	B	3.00	63-66.49	D	1.00
80-82.49	B-	2.67	60-62.49	D-	0.67
77-79.49	C+	2.33	≤59.49	F	0.00

Incomplete grade policy:

When a student earns an incomplete grade the instructor will contact the student and have them complete a contract identifying what the student must do to earn a grade in the course. Students will receive and “I” for incomplete; however, a default grade (“F”) that the student will receive if the student does not complete the course requirements in the specified timeframe will also be assigned. Students must have a passing grade for every course in order to progress to the next semester.

Academic Cheating:

Plagiarism and academic cheating will not be tolerated at the School of Pharmacy. As a student in a professional school it is assumed that each individual has respect for others and will not receive or provide information in an unauthorized manner. It is assumed that if a student witnesses the improper transmission of information he/she will report such a transaction. Any student participating in cheating will receive a failing grade (“F”) for the course and possible expulsion from the pharmacy program. Students may review the Code of Conduct and Discipline Procedures in the University Policies section of the School of Pharmacy Student Handbook.

Clinical Pharmacokinetics Syllabus- Spring 2014

DATE	HOURS	TOPIC	INSTRUCTOR	READING
Tues 1/21	1	Course Introduction / Administrative issues	C. Rose	Syllabus
Thurs 1/23	2	Pharmacokinetic & Pharmacodynamic Principles Review	J.Gallagher	Bauer Ch 1 & 2
Tues 1/28	1	Quiz on PK/PD review (20 min) Special Populations (Pregnancy& Lactation)	C. Rose	Article in blackboard
Thurs 1/30	1	Special Populations (Pregnancy and lactation)	C. Rose	
Thurs 1/30	1	Special Populations (Pediatrics)	I. Calligaro	Applied Therapeutics Ch 97
Tues 2/4	1	Special Populations (Pediatrics)	I. Calligaro	
Thurs 2/6	2	Special Populations (Geriatrics and obesity)	S. Kent	Geriatrics: Ch 11: Pharmacotherapy
Tues 2/11	1	Special Populations (Geriatrics and obesity)	S. Kent	Obesity: Bauer Ch 3 p. 81-2, Chapter 154: Pharmacotherapy: (Not responsible for treatment section) Obesity: article in blackboard
Thurs 2/13	2	Special Populations (Liver disease)	C. Rose	Article in blackboard
Tues 2/18	1	Team Case Assignments		Geriatrics/obesity
Thurs 2/20	1	Antimicrobial Pharmacokinetics/ Pharmacodynamics	J. Gallagher	
Thurs 2/20	1	Therapeutic drug monitoring	J. Gallagher	
Tues 2/25	1	Team Case assignment		Liver disease
Thurs 2/27	2	**8 – 9:50 AM EXAM #1 – Material up to and including special populations (Liver Disease)**		
Spring Break (no class 3/ 4 and 3/6)				
Tues 3/11	1	Lithium	S. Kent	Bauer Chapter 17
Thurs 3/13	1	Theophylline	C. Rose	Bauer Ch 18 - Intro up to & including use of theophylline serum concentrations to alter doses, & section on conversion from IV to oral
Thurs 3/13	1	Team Case Assignments	C. Rose	Theophylline
Tues 3/18	1	Antiarrhythmics/digoxin	C. Rose	Ch 7 Intro up to & including use of lidocaine serum concentrations to alter doses
Thurs 3/20	2	Antiarrhythmics/digoxin	C. Rose	Bauer Ch 6 Intro up to & including use of digoxin serum concentrations to alter doses
Tues 3/25	1	**9-9:50 AM Calculations exam**		
Thurs 3/27	2	Immunosuppressant agents	N. Sifontis	
Tues 4/1	1	Team case assignments	C. Rose	Antiarrhythmics/digoxin

Thurs 4/3	2	**9-10:50 AM EXAM #2 – Material up to and including Immunosuppressant agents**		
Tues 4/8	**1**	Antiepileptics	C. Fitzgerald	Bauer Ch 10
Thurs 4/10	2	Antiepileptics	C. Fitzgerald	Bauer Ch 12 Intro up to & including initial dosage determinations
Tues 4/15	1	Vancomycin	M. Ranieri	Reading posted in Blackboard
Thurs 4/17	2	Vancomycin	M. Ranieri	Suggested reading: IDSA guidelines in blackboard
Tues 4/22	1	Aminoglycosides	M. Ranieri	Reading posted in blackboard
Thurs 4/24	2	Aminoglycosides	M. Ranieri	
Tues 4/29	1	Aminoglycosides/	M. Ranieri	
Thurs 5/1	2	Team Case Assignment	M. Ranieri/ C. Fitzgerald	Antiepileptics/vancomycin/aminoglycosides
Week of 5/8-5/14	**2**	**FINAL EXAM (Cumulative)**		

Name:_____ **Group #**_____

Temple University School of Pharmacy PY3
Clinical Pharmacokinetics: Students Grading Students

As part of the Clinical Pharmacokinetics course, you have been required to work in small groups to complete the course objectives and to enhance each other's learning. In order to ensure everyone in the group contributes and augments group learning, you have to grade each of the members in your group.

Activity being evaluated

1. The student came to group meetings prepared to discuss material related to the cases.
2. The student was actively involved during group discussions.
3. The student was active in writing-up the case assignments.
4. The student helped me to better understand the material related to the cases.

Evaluation Criteria

4	I strongly agree with this statement.
3	I agree with this statement.
2	Neutral
1	I disagree with this statement.
0	I strongly disagree with this statement.

Student_____ Activity being evaluated Point given 1. 4 3 2 1 0 2. 4 3 2 1 0 3. 4 3 2 1 0 4. 4 3 2 1 0	Student_____ Activity being evaluated Point given 1. 4 3 2 1 0 2. 4 3 2 1 0 3. 4 3 2 1 0 4. 4 3 2 1 0	Student_____ Activity being evaluated Point given 1. 4 3 2 1 0 2. 4 3 2 1 0 3. 4 3 2 1 0 4. 4 3 2 1 0
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Explanation required if grade is ≤ 2 in any category: