

**University of Rhode Island, College of Pharmacy
Department of Biomedical and Pharmaceutical Sciences**

PHARMACOKINETICS II

BPS-504 Outline

Fall 2009

GENERAL INFORMATION

Course coordinator	Fatemeh Akhlaghi, Pharm.D., Ph.D.
Office	Fogarty 154
Phone	(401) 874-9205
Email	fakhlaghi@mail.uri.edu
Office Hours	Thursday 3-4 pm or by appointment

GUEST LECTURER

Michele A. Danish, Pharm.D., St. Joseph Health Services

TEACHING ASSISTANTS

Shripad Chitnis, PhD candidate
Joyce Macwan, PhD candidate
PharmD students on academic rotation

CLASS SCHEDULE

THURSDAY 1-2:50 PM

Fogarty 214

THURSDAY 4-4:50 PM

Fogarty 214*

* Can be a problem session in some weeks

Each class consists of a two-hour lecture on Thursday afternoons followed by a one-hour lecture and/or problem solving session on the same afternoon. For the problem sessions, the class will be split into two sections to be held at the following locations; however, please note that some Thursday classes (designated with an asterisk in the Table at page 5) are held as a lecture in **Fogarty 214**:

Section 1 (R01) Fogarty 214
Section 2 (R02) TBD

Read the assigned material before coming to class. Every lecture block will have goals and objectives and assigned reading material in your handout. Reading this information before class will increase your understanding of the subject material presented in the lecture. Often, the text information is necessary background knowledge that the instructor uses as a base to build upon.

Come to class!!! It is very important that you attend both the lecture and problem sessions. While most information presented will have an assigned section in your coursenote, you will miss some very important material if you miss the lectures.

Students with disabilities: Any student with a documented disability is welcome to contact Dr. Akhlaghi early in the semester so that we may work out reasonable accommodations to support his/her success in this course. Students with disabilities should also contact Disability Services for Students, Office of Student Life, 330 Memorial Union, 874-2098. Note: All accommodations are on a case-by-case basis and depend on discussions with the student, current documentation, and university policy.

Office hours: You are strongly encouraged to see **Dr Akhlaghi** at her office hours if you need help with the material or problem sessions. Alternatively TAs for the course, **Mr. Chitnis** (shripadchitnis@yahoo.co.in) or **Ms. Macwan** (joyce_macwan@mail.uri.edu) will be able to help you with the material if you arrange to meet them in advance. Several PharmD students on academic rotation will also be helping with the teaching of this course. A list of their names and email addresses will be available at a later date.

REQUIRED TEXTS

The course pack will be available in the first week of classes from Icopy at URI Emporium. In addition the following book is required for the course:

Burton M.E., Shaw L.M., Schentag J.J., Evans W.E. (2006) Applied Pharmacokinetics & Pharmacodynamics: Principles of Therapeutic Drug Monitoring, Lippincott Williams & Wilkins; 4th edition, ISBN: 0-7817-4431-8.

RECOMMENDED TEXT

White J.R., Garrison M.W., Koda-Kimble M.A. (1998) Basic Clinical Pharmacokinetics Handbook, 3rd edition, Applied Therapeutics, ISBN: 0-915486-21-0

This is a small handbook (\$25) that will be very useful for pharmacokinetic calculations for this class and your rotations next year.

COURSE OBJECTIVE

The BPS 504 is aimed to address important issues in clinical pharmacokinetics and concentration effect relationships. Pharmacokinetics II builds on the concepts, knowledge and skills that students have learnt and practiced in Pharmacokinetics I (BPS 403) in the Spring Semester. The primary goal of this course is to extend the student's knowledge of clinical pharmacokinetics, and to gain the necessary skills in order to provide a clinical drug monitoring service as a graduate of the Doctor of Pharmacy program.

The course has five major learning objectives, so at the completion, the students will be able to:

1. Appreciate the principles of therapeutic drug monitoring and clinical pharmacology.
2. Understand and interpret published pharmacokinetic and pharmacodynamic information.
3. Effectively utilize concentration information in dose individualization of narrow therapeutic index drugs.

4. Understand the implications of drug interactions and pharmacogenomics on dose requirement and drug concentration.
5. Understand the sources of variability in pharmacokinetics including the effect of physiological (i.e. age, gender, pregnancy) or pathological conditions (i.e. renal and hepatic dysfunction, diabetes, obesity).

LEARNING OBJECTIVES

At the successful completion of this course you will be able to:

- Understand and appreciate the pharmacokinetic and pharmacodynamic information from reference material.
- Apply pharmacokinetic principles, in a scientific manner, to solve a clinical problem.
- Appreciate sources of pharmacokinetic and pharmacodynamic variability that contribute to the variability in drug response in special populations and to be able to predict drug dosing requirements for such populations.
- Describe the mechanism of and predict the effects of metabolic drug interactions.
- Learn the importance of therapeutic drug monitoring and how it can be used to optimize patient care in a variety of clinical settings.
- To be able to calculate initial and maintenance dosage regimen for therapeutically monitored drugs.

REQUIREMENTS

1. Course notes
2. Scientific calculator (i.e. one with “e” button). Texas Instrument model #84 or comparable models are strongly recommended.
3. Ability to read Microsoft Word and PDF files sent by email

EXAMINATIONS

Mid-Semester Exam 1: Oct 8th, 2009
Mid-Semester Exam 2: Nov 12th, 2009
Final Exam: to be determined (Final Exam Period: Dec. 15-19, 21, 22)

There may be pop quizzes some days of class.

SNOW DAYS: If a class scheduled for an exam is cancelled because of snow, the examination will be held in the next class.

STUDENT EVALUATION

Homeworks and Quizzes	15%
Mid-Semester Exam 1	15%
Mid-Semester Exam 2	25%
Final Exam	45%

Please note that the final exam will be cumulative, covering the material taught throughout the semester. The second mid-Semester exam however will only cover the material taught since the first exam. Students will also be evaluated for their participation in problem sessions and effort on the homework session. Final letter grades will be assigned as follows, however, from time to time some scaling may be implemented:

<u>Letter Grade</u>	<u>Numeric Range (%)</u>
A	93 - 100
A-	90 - 92
B+	87 - 89
B	84 - 86
B-	80 - 83
C+	77 - 79
C	74 - 76
C-	70 - 73
D+	67 - 69
D	60 - 66
F	Less than 60

		Thurs	Lectures (1-2:50 PM) Fogarty 214		Thurs	Recitation (4-4:50 PM) Fogarty 214 or TBD	
Week	1	10-Sep	Introduction to clinical pharmacology and Therapeutic Drug Monitoring (TDM)	FA	10-Sep	Drug dosing in renal and hepatic impairment*	FA
Week	2	17-Sep	Pharmacotherapy for asthma management	FA	17-Sep	Problems	FA
Week	3	24-Sep	Immunosuppressive agents (cyclosporine, tacrolimus, sirolimus, MPA)	FA	24-Sep	Problems	FA
Week	4	1-Oct	Digoxin pharmacokinetics	FA	1-Oct	Problems	FA
Week	5	8-Oct	Methotrexate pharmacokinetics	MD	8-Oct	Exam 1	MD
Week	6	15-Oct	Phenytoin and valproic acid clinical pharmacokinetics	FA	15-Oct	Problems	FA
Week	7	22-Oct	Anticoagulant clinical pharmacokinetics and monitoring	MD	22-Oct	Problems	MD
Week	8	29-Oct	Bioavailability and Bioequivalence, NCA	FA	29-Oct	Multiple short infusions*	FA
Week	9	5-Nov	Aminoglycoside monitoring	FA	5-Nov	Problems	FA
Week	10	12-Nov	Lithium TDM	FA	12-Nov	Exam 2	FA
Week	11	19-Nov	Altered Pharmacokinetics	FA	19-Nov	Altered Pharmacokinetics*	FA
Week	12	26-Nov	<i>Thanksgiving day, no class</i>	FA	26-Nov	<i>Thanksgiving day, no class</i>	FA
Week	13	3-Dec	Altered Pharmacokinetics	FA	3-Dec	Altered Pharmacokinetics*	FA
Week	14	10-Dec	Altered Pharmacokinetics	FA	10-Dec	Altered Pharmacokinetics*	FA

* Both sessions meet at Fogarty 214.

Altered pharmacokinetics: effects of drug formulation, pregnancy, age, gender, obesity and diabetes, concomitant medications, genetic and ethnic differences (pharmacogenetics and pharmacogenomics) on pharmacokinetics

NCA: non compartmental analysis