9-2002

PHAR 432.01: Biopharmaceutics and Pharmacokinetics

Todd Cochran
University of Montana - Missoula

Biopharmaceutics and Pharmacokinetics

Pharmacy 432
Fall 2002
3 credits

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Class	T,Th	10:10-11:00 am	SB 117
Conference	T,W, or Th	1:10-3:00	SB 113
Exams	Four Fridays	1:10-3:30 pm	SB 114
Format	28 classes, 11 conferences, 4 exams, final exam		

Course Description: Biopharmaceutics and Pharmacokinetics

Biopharmaceutics: Drug absorption, bioavailability, and drug product selection
Pharmacokinetics: The rates of drug **A**bsorption, **D**istribution, **M**etabolism, and **E**xcretion

Course Goals: The goals of this course are to provide the student with:
1. An understanding of the fundamental concepts of pharmacokinetics in humans
2. Skills in the application of pharmacokinetics in dosage regimen design and therapeutic drug monitoring
3. Knowledge about the application of biopharmaceutics in drug product use and selection

Course Objective: At the end of this course you will be able to design and adjust a patient's drug dosage regimen to keep the plasma/serum concentration of the drug within a desired therapeutic range. Along the way, you will gain an understanding of the principles of the ADME of a drug, and how these apply to the optimum utilization of a drug in a patient. The course is designed for you to gain the knowledge and skills to apply biopharmaceutics and pharmacokinetics principles in pharmaceutical care.

Required Materials:
1. Course Pacs: Lecture Notes on Pharmacokinetics; Biopharmaceutics
2. A calculator with natural log (ln) and exponent (e) functions
3. Approximately 30 sheets of 2 or 3 cycle semilog graph paper (photocopy OK)
4. Approximately 10 sheets of linear graph paper
5. Straight edge

Course Outline

Class	Class	CoursePac Pages	Study Problems
Review of kinetics	Sep 3,5	1-12	Kinetics 1-6
Introduction to Pharmacokinetics M	Sep **9***	13-15, 113-115	
* Kinetics (432) will meet Mon 09/09 @ 10:10 in SB117. Med Chem 421 will meet Tue Sept 10 @ 10:10 in SB117			
Intravenous Bolus Injection	Sep 12	16-18, 116-117	PK 1-7
Intravenous Infusion	Sep 17	19-24, 118	8-9
Loading Dose, Clearance	Sep 19	25-29	10-14
Dosage Regimen Adjustment	Sep 19	30-32	15-18
Exam 1 Fri Sep 27 1:10-3:30 pm		110-112	
Oral Drug Administration	Sep 24,26	33-42, 120	19-24
Multicompartment Models	Oct 1,3,8	43-51, 121-123	25-28
Cytochrome P450 enzymes	Oct 10		
Exam 2 Fri Oct 18 1:10-3:30 pm			
Repetitive Drug Administration	Oct 15	52-53	29-31
Repetitive IV Dosing	Oct 17,22	54-65	32-40
Repetitive Oral Dosing, Loading Dose	Oct 24	66-71	41-44
Repetitive IV Infusion	Oct 29	72-75	
Dosage Regimen Design & Adjustment	Oct 31	76-80, 124	45-55
Exam 3 Fri Nov 8 1:10-3:30 pm			

	Class	CoursePac	Problems
Creatinine Clearance	Nov 7	89, 125	
Dosage Adjustment in Renal Disease	Nov 12	90-96	58-70
Nonlinear Pharmacokinetics	Nov 14	97-101	71
Salt Factor	Nov 14	102	72
Clearance Concepts: Physiologic Models	Nov 19	103-107	
Exam 4 Fri Dec 6 1:10-3:30 pm; Includes Sawchuk/Zaske		81-88	56-57
Pharmacokinetics of Drug Interactions	Nov 21		
P-glycoprotein ; Pharmacogenetics	Nov 26		
Factors Affecting Drug Absorption	Dec 3, 5		
Bioavailability and Bioequivalence	Dec 10		
Drug Product Selection; Course Evaluation	Dec 12		
Final Exam **Wednesday Dec 18**, 10:10-12:00 am		126-130	

Conferences

Sept 3-5	*No Conference*	Oct 22-24	7. Rep iv bolus admin
Sept 10-12	1. Kinetics	Oct 29-31	8. Rep oral admin
Sept 17-19	2. iv bolus admin	Nov 5-7	*No Conference (Election Day)*
Sept 24-26	3. iv infusion	Nov 12-14	9. Sawchuk-Zaske Method (CrsPac 81-88)
Oct 1-3	4. Oral admin	Nov 19-21	10. Dosing in renal dysfunction
Oct 8-10	5. Compartment models	Nov 26-28	*No Conference (Turkey Day)*
Oct 15-17	6. CYPs	Dec 3-5	11. Nonlinear PK
		Dec 10-12	*No Conference*

Grading:

Four mid-semester exams @ 50 points	200 points	75%
Final exam (cumulative; 50 pts new, 15 pts prior)	65 points	25%
Total:	265 points	

Bonus points: Each exam will have 5 bonus points from literature articles distributed before each exam.

Approximate grading scale: A = 90%, B = 80%, C = 70%, D = 65%

Course Policies:

Students are expected to take all exams at the scheduled time. If you cannot take an exam at the scheduled time, you must contact Todd Cochran or leave a message with the School secretary Erika Claxton @ 4621 or the Pharmaceutical Sciences secretary Beverly Brooks @ 4765 no later than noon of the day of the exam. Exams normally must be made up within three class days.

If you have questions regarding the grading of your exam, please make an appointment with Todd Cochran to review your exam. Appointments must be scheduled **within 10 days** following the return of your exam. **After that time, adjustment of grades will not be made**. You are encouraged to review the posted exam key before your appointment.

Online Materials: Course handouts that are Word documents will be placed on the School's server at: Network Neighborhood, Skaggs-03, PharmSci, P2, 432
These files can be accessed and printed in the School's Computer Lab.

Help Sessions: 4 Wednesdays at 3:10 pm, SB113: Sept 25, Oct 16, Nov 6, Dec 4
4 Thursdays at 3:10 pm, SB113: Sept 26, Oct 17, Nov 7, Dec 5

Office Hours: M 1-3 pm; Other hours by appointment.