Fall 9-1-2001

PHAR 432.01: Biopharmaceutics and Pharmacokinetics

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Biopharmaceutics and Pharmacokinetics

Pharmacy 432
Fall 2001
3 credits

Todd Cochran
SB242
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Class T, Th 10:10-11:00 am SB 117
Conference M, T, 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 absorption, distribution, metabolism, and excretion

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. Faculty 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:

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<th>Pharmacokinetics</th>
<th>Class</th>
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<th>Pages</th>
<th>Problems</th>
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<tr>
<td>Review of zero and first order kinetics</td>
<td>Sep 4</td>
<td>Sep 10,11,13</td>
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<td>Kinetics 1-6</td>
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<td>Introduction to Pharmacokinetics</td>
<td>Sep 6</td>
<td>13-15, 111</td>
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<td>Intravenous Bolus Injection</td>
<td>Sep 12#</td>
<td>Sep 17,18,20</td>
<td>16-18</td>
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<tr>
<td># Kinetics (432) will meet Wed 9/12 @ 9:10 in SB117, Therapeutics (451) will meet Tue Sept 11 @ 10:10 in SB117</td>
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<td>Intravenous Infusion</td>
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<td>Sep 24,25,27</td>
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<td>Loading Dose, Clearance</td>
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<td>Dosage Regimen Adjustment</td>
<td>Sep 18</td>
<td>30-32, 108-110</td>
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Exam 1 Fri Sep 28 1:10-3:30 pm

| Cytochrome P450 enzymes                   | Sep 20 |
| Oral Administration                       | Sep 25,27 | Oct 1,2,4 | 33-39, 114 |
| Multicompartment Models                   | Oct 2   | Oct 8,9,11 | 40-45, 115-117 |
| Method of Residuals                       | Oct 4   | Oct 15,16,18 | 46-51 |
| Repetitive Drug Administration            | Oct 9   | 52-53 |

Exam 2 Fri Oct 19 1:10-3:30 pm (Thurs Oct 18 6:30-9:00 pm for ASP trippers)

| Repetitive IV Dosing                      | Oct 11,16,18 | Oct 22,23,25 | 54-64 |
| Repetitive Oral Dosing, Loading Dose      | Oct 23     | 65-70 |
| Repetitive IV Infusion                    | Oct 25     | Oct 29,30,1 | 71-82 |
| Dosage Regimen Design & Adjustment        | Oct 30     | Nov 5,6,8 | 83-87, 118 |

Exam 3 Fri Nov 9 1:10-3:30 pm

| Creatinine Clearance                      | Nov 1     | 88, 119 |

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<th>Class</th>
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<td>1-18</td>
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<td>19-31B</td>
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<td>31C-57</td>
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</table>
Dosage Adjustment in Renal Disease  Nov 6,8  Nov 26,27,29  89-95
Nonlinear Pharmacokinetics  Nov 13  96-100
Salt Factor  Nov 13  101
Clearance Concepts: Physiologic Models  Nov 15  102-106
Bayesian Pharmacokinetics  Nov 15

Exam 4  Fri Nov 30  1:10-3:30 pm  120-123  58-72

Biopharmaceutics
Pharmacokinetics of Drug Interactions  Nov 27  Dec 3,4,6
p-Glycoprotein  Nov 29
Factors Affecting Drug Absorption  Dec 4, 6
Bioavailability and Bioequivalence  Dec 11
Drug Product Selection; Course Eval  Dec 13

Final Exam  Monday Dec 17, 8:00-10:00 am

Grading:
Four mid-semester exams @ 50 points  200 points  80%
Final exam (not cumulative)  50 points  20%
Total:  250 points

Bonus points: The four mid-semester exams will have 5 bonus points on each exam.
Bonus point questions will be taken 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 a pharmacy secretary (Erika
Claxton @ 4621 or 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:  Wednesdays at 2:10 pm, SB114: Sept 26, Oct 17, Nov 7, Nov 28

Days off:  The following classes will not be held in lieu of the four Friday exams.
Class:  Tues Nov 20
Conference:  Weeks of Sept 3, Nov 12, Nov 19, Dec 10

Office Hours:  W 2-5 pm; Other hours by appointment.