

**Pharmacotherapeutics I (PHM 685D - #59515) First Day Handout  
Fall 2016, M&F 9-12 a.m., PHR 2.108**

**Course Description:** An integrated approach to the treatment of inflammatory, cardiovascular, and hematological disease. Prerequisites: Completion of the first professional year (i.e., P2 status).

**Faculty:**

| Faculty  | E-mail   | Phone         | Location            |
|--|--|---------------|---------------------|
| Patrick Davis, PhD<br>Course Coordinator<br>Chem Biol & Med Chem | <a href="mailto:davispi@austin.utexas.edu">davispi@austin.utexas.edu</a>                   | 512-475-9751  | Austin - PHR 5.112D |
| Nile Barnes, PharmD<br>Pharmacy Practice                         | <a href="mailto:jnbarnes@austin.utexas.edu">jnbarnes@austin.utexas.edu</a>                 | 512-232-3494  | Austin - PHR 2.222D |
| Bryson Duhon, PharmD<br>Pharmacotherapy                          | <a href="mailto:duhon@uthscsa.edu">duhon@uthscsa.edu</a>                                   | 512-567-8355  | San Antonio         |
| Christine Duvauchelle, PhD<br>Pharmacology/Toxicology            | <a href="mailto:duvauchelle@mail.utexas.edu">duvauchelle@mail.utexas.edu</a>               | 512-471-1090  | Austin - PHR 5.224D |
| Walter Fast, PhD<br>Chem Biol & Med Chem                         | <a href="mailto:walt.fast@austin.utexas.edu">walt.fast@austin.utexas.edu</a>               | 512-232-4000  | Austin - BME 6.202D |
| James Karboski, PharmD<br>Pharmacy Practice                      | <a href="mailto:karboski@austin.utexas.edu">karboski@austin.utexas.edu</a>                 | 512-232-2628  | Austin - PHR 2.222  |
| Jim Koeller, MS<br>Pharmacotherapy                               | <a href="mailto:Koeller@uthscsa.edu">Koeller@uthscsa.edu</a>                               | 210-567-8355  | San Antonio         |
| Francis Lam, PharmD<br>Pharmacotherapy                           | <a href="mailto:lamf@uthscsa.edu">lamf@uthscsa.edu</a>                                     | 210- 567-8319 | San Antonio         |
| Seongmin Lee, PhD<br>Chem Biol & Med Chem                        | <a href="mailto:seongminlee@mail.utexas.edu">seongminlee@mail.utexas.edu</a>               | 512-471-1785  | Austin - PHR 3.206A |
| Rick Morrisett, PhD<br>Pharmacology/Toxicology                   | <a href="mailto:ramorris@austin.utexas.edu">ramorris@austin.utexas.edu</a>                 | 512-471-1911  | Austin - PHR 5.218C |
| Laurajo Ryan, PharmD<br>Pharmacotherapy                          | <a href="mailto:ryanl@uthscsa.edu">ryanl@uthscsa.edu</a>                                   | 210-567-8320  | San Antonio         |
| Carla Vandenberg, PharmD<br>Pharmacology/Toxicology              | <a href="mailto:carla.vandenberg@austin.utexas.edu">carla.vandenberg@austin.utexas.edu</a> | 512-471-5199  | Austin - DPI 2.208  |
| Casey Wright, PhD<br>Pharmacology/Toxicology                     | <a href="mailto:cww@austin.utexas.edu">cww@austin.utexas.edu</a>                           | 512-232-8331  | Austin – BME 3.510C |

Faculty are expected to inform students concerning their office hours (including electronic office hours, if appropriate) during their first lectures in the course

- Course Texts:**
1. Goodman & Gilman, Pharmacol. Basis of Therapeutics, 12<sup>th</sup> Edition, 2011. [Available Online through Access Pharmacy]
  2. Dipiro, Talbert, Yee, et al. *Pharmacotherapy: A Pathophysiologic Approach*, 9th. Edition, McGraw-Hill, 2014. [Available Online through Access Pharmacy]
  3. Chisholm-Burnes, et al., *Pharmacotherapy: Principles and Practice*, 3<sup>rd</sup> Ed., McGraw-Hill, 2013. [Available Online through Access Pharmacy]
  4. Foye, *Principles of Medicinal Chemistry*, 7<sup>th</sup> (2013) Edition Lippincott, 2013.

Note: Exam questions may come from assigned text or web-based readings.

**Communication:** Email and *Canvas*® are the official mechanisms for communication in this course. Be sure to check your email daily and *Canvas*® announcements daily so that you do not miss important information.

**Web Resources:**

1. The *official Canvas*® web site for this course can be accessed either through UTDirect or via [canvas.utexas.edu](http://canvas.utexas.edu). Either access point is UTEID-protected, and provides you links to the courses in which you are currently enrolled. You are strongly encouraged to visit this site for additional resources associated with this course (your grades, electronic quizzes, powerpoint presentation, previous exams, the discussion board, contacting faculty by Email, electronic versions of suggested and *required* readings and hyperlinks).

The website will also be used for official, course-related announcements and to exchange class information and questions via the discussion board. Be aware that any messages posted to the discussion board are available to all enrolled students and faculty.

If you encounter problems with accessing Canvas® please contact the ITS helpdesk at: 512-475-9400 or the Canvas tutorials at [canvas.utexas.edu](http://canvas.utexas.edu)

2. Video-streamed recordings of lectures are intended to facilitate learning for those students who find this type of supplementation useful; they are not a substitute for attending class. Although recordings of these lectures will be available to you for the semester, this is for supplementation only; your instructors expect you to attend all scheduled lectures. If an individual faculty member chooses to not make his/her lectures available by video-streaming, it is that faculty member's responsibility to so inform you. It is also faculty prerogative as to whether to administer announced or unannounced quizzes during lectures (be sure to bring your classroom response system (CRS) "clickers" to each and every class). If a faculty member chooses to do so, the points for these quizzes will replace questions on their portion of the upcoming exam.
3. Viewing video-streamed recordings of lectures is primarily intended for on-campus computer facilities (e.g., LRC Library, 3.116 computer lab, or other computer facilities available on your specific campus). However, it should be possible to view the streaming video off-campus using RoadRunner® or DSL broadband connections. Your faculty are not in a position to troubleshoot your video-streaming problems, so please do not ask them to do so; rather, you should access the LRC 's help website at <https://www.utexas.edu/pharmacy/help/> to address those problems. Any other questions should go to the LRC at <http://www.utexas.edu/pharmacy/resources/lrc/>
4. **Redistribution of Class Recordings: Redistribution of Class Recordings or Other Course Material:** If video-recordings of a class are made available by the College of Pharmacy for any

course, they are intended solely for the purpose of review by student currently enrolled in the that class. Faculty and students utilizing class video-recordings should be careful to not compromise the privacy of either themselves or other users (<http://registrar.utexas.edu/students/records/ferpa>), or the rights of the presenter. Students are also free to make their own recordings of lectures unless specifically prohibited from doing so by the presenter. Any additional distribution of College- or student-generated recordings (regardless of format) is prohibited without the written and signed permission of the presenter and students identifiable on the recording. Likewise, all course materials developed by the faculty member (handouts, powerpoints, etc) are the intellectual property of that faculty member and cannot be distributed further without the permission of that faculty member.

**Fall 2016, M&F 9-12, PHR 2.108**  
**Pharmacotherapy I (685D) - Lecture Schedule**

|                    |     |              |   |
|--------------------|-----|--------------|---|
| <i>Aug 26</i>      | 0.5 | Davis        | Syllabus Coverage; Course Policies                                      |
|                    |     |              | <b>MODULE 1 – Labs/Renal/Autonemics</b>                                 |
| <i>26</i>          | 1.5 | Koeller      | Laboratory values in clinical practice                                  |
| <i>26</i>          | 1.5 | Koeller      | Fluid & Electrolytes  |
| <i>29,29</i>       | 2   | Koeller      | Acid/Base   |
| <i>29,2</i>        | 2   | Koeller      | Acute Renal Failure   |
| <i>2,2</i>         | 2   | Koeller      | Chronic Renal Failure/Dialysis  |
| <i>9,9</i>         | 2   | Duvauchelle  | Pharmacology of Cholinergic & Anticholinergic Systems                   |
| <i>9,12</i>        | 2   | Duvauchelle  | Pharmacology of Adrenergic Mechanisms                                   |
| <i>12,12,16</i>    | 3   | Seongmin Lee | Medicinal Chemistry of Autonomic Drugs                                  |
|                    |     |              | <b>Exam #1 over Module 1</b><br><b>Sept 22<sup>nd</sup> @ 7:00 p.m.</b> |
|                    |     |              | <b>MODULE 2 – Inflammatory Diseases</b>                                 |
| <i>16,16</i>       | 2   | Lee          | Med Chem of Anti-inflammatory Drugs                                     |
| <i>19</i>          | 1   | Duvauchelle  | Pathophys/Pharmacology of Inflammatory Disorders                        |
| <i>19,19</i>       | 2   | Duvauchelle  | Steroidal and NSAIDs  |
| <i>23,23,23,26</i> | 4   | Ryan         | Arthropathies (Rheumatoid, Osteo-, Gouty)                               |
| <i>26</i>          | 1   | Ryan         | Lupus Erythematosus (SLE)   |
| <i>26</i>          | 1   | Ryan         | Inflammatory Bowel Disease  |
|                    |     |              | <b>Exam #2 over Module 2</b><br><b>Oct 6<sup>th</sup> @ 7:00 p.m.</b>   |
|                    |     |              | <b>MODULE 3 - Hypertension</b>  |
| <i>30</i>          | 1   | Vandenberg   | Pathophysiology of Hypertension   |
| <i>30</i>          | 1   | Fast         | ACEI/ARB/Renin Inhibitor Med Chem                                       |
| <i>30</i>          | 1   | Fast         | Calcium Channel Med Chem  |
| <i>Oct 3</i>       | 1   | Vandenberg   | Pcology of ACEI/ARB/Renin Inhibitor                                     |
| <i>3</i>           | 1   | Vandenberg   | Pcology of Calcium Channel Blocking Agents 1                            |
| <i>3</i>           | 1   | Vandenberg   | Pcology of Adrenergic Agents  |
| <i>7,7,7</i>       | 3   | Karboski     | Management of Hypertension  |

|          |     |             |  |
|----------|-----|-------------|--|
|          |     |             | <b>MODULE 3 – Arrhythmias</b>  |
| 10,10    | 2   | Morrisett   | Pathophys. Of Arrhythmias  |
| 10,14    | 2   | Morrisett   | Intro to Electrocardiography   |
| 14,14    | 2   | Morrisett   | Drugs for Arrhythmias  |
| 17,17,17 | 3   | Lam         | Management of Arrhythmias  |
|          |     |             | <b>Exam #3 over Modules 3<br/>Oct 27<sup>th</sup> @ 7:00 p.m.</b>    |
|          |     |             |  |
|          |     |             | <b>MODULE 3 – Heart Failure and Acute CV Disease</b>                 |
| 21       | 1   | Karboski    | Pathophysiology of Heart Failure                                     |
| 21,21    | 2   | Fast        | Inotropic-, Antiarrhythmic, and Beta-Agents Med Chem                 |
| 24,24    | 2   | Fast        | Nitrodilators Med Chem   |
| 24,28    | 2.0 | Fast        | Diuretics – Med Chem   |
| 28,28    | 2.0 | Wright      | Diuretic Pharmacology  |
| 31,31    | 2   | Vandenberg  | Cardiac Stimulants and Inotropics                                    |
| 31 Nov 4 | 2   | Vandenberg  | Nitrodilators Pharmacology   |
| 4,4      | 2   | Karboski    | Chronic HF Management Issues   |
| 7        | 1   | Nile Barnes | Acute HF Management  |
| 7        | 0.5 | Nile Barnes | Review of Acute Coronary Syndromes (ACS)                             |
| 7        | 1.5 | Nile Barnes | Angina Management  |
| 11,11    | 2   | Nile Barnes | AMI Management   |
| 11       |     |             | Open Class Period (Contingency)                                      |
|          |     |             | <b>Exam #4 over Module 3<br/>Nov 17<sup>th</sup> @ 7:00 p.m.</b>     |
|          |     |             |  |
|          |     |             | <b>MODULE 4 – Blood Clotting and Hyperlipidemia</b>                  |
| 14       | 1   | Fast        | Pathophysiology of Blood Clotting                                    |
| 14,14    | 2   | Fast        | Anticoagulants   |
| 18,18,18 | 3   | Ryan        | Management of TED and Clotting                                       |
| 21,21    | 2   | Fast        | Pathophys Lipids and Drugs for Hyperlipidemias                       |
| 21,28    | 2   | Duhon       | Atherosclerosis – Epidemiology, Pathophys, Clinical                  |
| 28       | 1   | Ryan        | Therapeutic Lifestyle Changes for Atherosclerosis                    |
| 28       | 1   | Duhon       | Management of Stroke   |
| Dec 2    | 3   | Ryan        | Anemia, Pituitary, and Adrenal Disorders                             |
|          |     |             | <b>Exam #5 over Module 4<br/>[Non-Cumulative Part of Final Exam]</b> |

## Pharmacotherapeutics I (PHR 685D) Course Policies

### Examinations:

There will be four-2hr summary examinations throughout the semester, plus a final exam administered during the Final Exam period (which will consist of a non-cumulative portion over module 4 and a cumulative portion over modules 1-3). Semester exams will be given on **Thursday evenings** from 7:00-9:00 p.m. in the rooms specified in the following schedule:

| Exam Date & Time               | Location | Coverage               | Faculty                                       | Points     |
|--------------------------------|----------|------------------------|---|------------|
| Sept 22 <sup>nd</sup> , 7-9 pm | TBD      | Module 1               | Koeller, Duvauchelle, Lee                     | 128        |
| Oct 6 <sup>th</sup> , 7-9 pm   | TBD      | Module 2               | Lee, Duvauchelle, Ryan                        | 88         |
| Oct 27 <sup>th</sup> , 7-9 pm  | TBD      | Modules 3              | Vandenberg, Karboski,<br>Fast, Morrisett, Lam | 144        |
| Nov 17 <sup>th</sup> , 7-9 pm  | TBD      | Module 3               | Vandenberg, Karboski,<br>Fast, Wright, Barnes | 160        |
| Final Exam TBD                 | TBA      | Module 4<br>Cumulative | Fast, Ryan, Duhon<br>All Faculty              | 128<br>130 |

Exam weighting is based upon the number of lectures applying to that exam. The five summary exams will consist of four-2 pt questions per lecture hour; the final will consist of two-1pt questions per lecture hour. (Total = 778 pts). The format and emphasis for exams is entirely the prerogative of the faculty, irrespective of exam format and emphasis in previous exams.

It is also faculty prerogative as to whether to administer announced or unannounced quizzes during lectures (be sure to bring your classroom response system (CRS) “clickers” to each and every class). If a faculty member chooses to do so, the points for these quizzes will replace questions on their portion of the upcoming exam.

***Students must arrive on time for examinations.*** All instructions and known corrections will be made at the beginning of the examination period and will not be repeated. Semester exams will begin promptly at the designated time (7:00 p.m.) and will be picked promptly at 9:00 p.m. (120 minutes). The final examination will last three hours. Students arriving after any students have completed the exam and left the room may not be allowed to sit for the exam, and may receive a score of zero for the exam.

***No allowances will be made for an exam being missed, other than documented illness or emergency.*** The student must contact the course coordinator for confirmation ***prior to the exam.*** If permission is granted to delay the exam, it is the student’s responsibility to complete the College Form titled “Student Request for Alternate Exam Time” for final consideration and ***final approval*** by the Faculty member. In this event, the nature of the make-up will be at the discretion of the course coordinator (oral, written, increased weighting on the final, etc.). An unexcused absence from an exam may result in a grade of "zero" for that exam.

The grading of objective questions will be based upon the scantron sheets turned in; i.e., not on answers written on the exam papers. After the exams have been graded and an item analysis performed (Measurement & Evaluation Center), questions may be discarded or otherwise adjusted at the discretion of the Course Coordinator in consultation with the faculty before arriving at final grades.

### Return of Exams; Posting Class Scores & Keys:

Your summary examination and scantron copy will be returned to you within a reasonable time after taking the exam. Following the grading of each exam, the exam key will be posted as an “Announcement” on the Canvas® course website. Individual student scores can be accessed using the Canvas® “Gradebook” (only you have access to your grades), and individual grades will not be publicly posted in any manner.

### Post-Exam Remarks and **Reconsideration Requests:**

If there is a disagreement over the answer to a specific question, the student should submit a written explanation via email (with appropriate documentation) to the instructor & course coordinator within 72 hours of the Canvas® announcement of posting of the exam results & key as described above. Documentation may include statements from textbooks, handouts, packets, or current scientific reprints; your lecture notes are *not* authoritative documentation. The explanation must be clear, rational, and concise. This policy does not apply to addition or other grading errors; we will simply make corrections when identified. Copy the course coordinator (Dr. Davis) on your email submissions to document that it was submitted in time for reconsideration. Note that faculty are instructed to not respond to reconsideration requests until the deadline has passed, so do not expect an immediate response to your request (be patient). The reconsideration policy does not apply to the final examination (non-cumulative or cumulative part) because of time constraints on submitting grades.

### Final Exam **Re-Examination Policy:**

There is no final exam re-examination allowed for this course.

### **Module Mastery:**

Because of the importance of each and every therapeutic module, a student doing very well on one module while failing another module (and having an overall average that would be passing) is not considered acceptable by the faculty. **There are four modules in this course, and students must pass each and every module** with a grade of at least 70% in order to pass the course. If a module is not passed on the summary exam(s), that portion of the comprehensive final will be scrutinized to assess whether the student has finally mastered the material. If the student *does not* achieve 70% on that portion of the comprehensive final with this second attempt, a course grade of “F” will be assigned for the course grade. If the student *does* demonstrate mastery, the score originally attained on the summary exam still applies (i.e., the original score earned) and will be used to calculate the final course grade. For those students who do not demonstrate module mastery on material involving the non-cumulative portion of the final exam (associated with Module 4), there will be one makeup exam given over just that module. The student must pass this second opportunity to demonstrate module mastery or a grade of F will be assigned an F in the course. If the student *does* pass this second opportunity to demonstrate module mastery (by score 70% or higher), the score originally attained on examinations associated with that module (i.e., the first scores earned) will be used to calculate the final course grade.

**The best advice I can give you** is (i) to achieve a passing score on the module in the first place; (ii) if not, make sure that you **review your errors** on the summary exam(s) with the appropriate faculty to address any deficiencies before the final; and (iii) do not underestimate the importance of the module 4 material on the final exam (it demands module mastery just like any other modules, and is frequently underemphasized by students in studying for finals).

### Course Grading:

|          |              |              |              |
|----------|--------------|--------------|--------------|
| A Range: | A = 100%-93% | A- = 92%-90% |              |
| B Range: | B+ = 89%-87% | B = 86%-83%  | B- = 82%-80% |
| C Range: | C+ = 79%-77% | C = 76%-73%  | C- = 72%-70% |
| D Range: | D+ = 69%-67% | D = 66%-65%  |              |
| F =      | Below 65%    |              |              |

This scale may be curved more leniently in the final analysis of grades at the discretion of the course coordinator in consultation with the instructors.

### Professionalism:

We expect that all students will demonstrate professionalism in all aspects of this course. Respect for others should be demonstrated in class, with communication between instructors and students, during discussions, and in completed assignments. Any conduct deemed unprofessional will be dealt with in accordance to policies of the College of Pharmacy and The University of Texas. Failure to act professionally (either repeatedly or egregiously) could result in failure of this course.

### Oath of Pharmacist:

Students are required to adhere to the principles that guide our profession including the oath taken by all pharmacist practitioners.

“At this time, I vow to devote my professional life to the service of all humankind through the profession of pharmacy.

- I will consider the welfare of humanity and relief of human suffering my primary concerns.
- I will apply my knowledge, experience, and skills to the best of my ability to assure optimal drug therapy outcomes for the patients I serve.
- I will keep abreast of developments and maintain professional competency in my profession of pharmacy.
- I will maintain the highest principles of moral, ethical, and legal conduct.
- I will embrace and advocate change in the profession of pharmacy that improves patient care.
- I take these vows voluntarily with the full realization of the responsibility with which I am entrusted by the public.”

### Academic Integrity:

The “Statement on Scholastic Integrity of the College of Pharmacy” reads as follows: "Pharmacy practitioners enjoy a special trust and authority based upon the profession's commitment to a code of ethical behavior in its management of client affairs. The inculcation of a sense of responsible professional behavior is a critical component of professional education, and high standards of ethical conduct are expected of pharmacy students. Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including failure of the course involved and dismissal from the college and/or the University. Since dishonesty harms the individual, fellow students, and the integrity of the University and the College of Pharmacy, policies of scholastic dishonesty will be strictly enforced in this class".

Students are expected to work independently on all examinations. Any student suspected of dishonesty will be reported to the Dean of the College of Pharmacy and to the Dean of Students, as per University regulations, with the recommendation that an “F” be assigned for the course grade. Students are expected to have read and understood the current issue of the General Information Catalog published by the Registrar's Office for information about procedures and about what constitutes scholastic dishonesty.

#### Campus Carry:

Students should familiarize themselves with the information provided by the University regarding the implementation of “Campus Carry” legislation. You will find an information sheet specifically for students (as well as sheets for parents, visitors, faculty, and staff) at <http://campuscarry.utexas.edu/info-sheets>."

#### Students with Disabilities:

“Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone) or [www.utexas.edu/diversity/ddce/ssd](http://www.utexas.edu/diversity/ddce/ssd).” All University rules concerning accommodations must be followed, including the student arranging for special accommodations *prior to each examination*. In the absence of such *prearrangement*, it will be assumed that the student is not requesting special accommodations for that exam, and will be expected to take the exam with the rest of the class at the regularly scheduled exam time.

#### Religious Holidays:

If you will miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you must notify me the first week of class so that arrangements for all such students can be made for the full semester.

#### Emergency Procedures:

The following recommendations regarding emergency evacuation from the Office of Campus Safety and Security, 512-471-5767, <http://www.utexas.edu/safety/> :

- Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.
- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.
- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.
- In the event of an evacuation, follow the instruction of faculty or class instructors.
- Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.
- If you have concerns about another students behaviors, particularly if you believe they could potentially harm themselves or others, do not hesitate to contact the Behavior Concerns Advice Line (BCAL): 512-232-5050



## Integrated Pharmacotherapy Course Sequence Objectives (Applies to Each Module)

- I. Describe the **pathophysiology** of disease state(s) in order to identify appropriate drug targets (cellular/molecular targets, biochemical processes, and/or organ system changes) for therapeutic intervention.

Specifically, for each disease state covered:

- Describe the basic pathophysiology of the disease (including the 'normal' process, what is altered in the disease state, and how these alterations lead to the signs & symptoms of the disease);
- Identify risk factors and/or diagnostic indicators (including lab values) for the disease;
- Identify and rationalize the classes of drugs used in treatment of the disease state to address the underlying pathophysiology and/or amelioration of symptoms.

- II. Utilize knowledge of structure-activity relationships and cellular/molecular mechanisms of action for relevant **drug classes** to indicate/rationalize their use in the treatment of specific diseases. Compare & contrast the therapeutic and adverse effects of those drug classes, as well as individual members within the classes.

Specifically, for each **class** of drug:

- Identify the relevant therapeutic targets and, based on those targets, explain the mechanism(s) of action;
- Identify major pathways for metabolism and the pharmacological/therapeutic consequences of metabolism;
- List common and/or serious drug interactions and adverse effects of each class and the most important precautions and contraindications; where possible, rationalize the underlying toxicity mechanism(s) based on mechanism of action;
- Identify any unique storage, handling, or use requirements that impact safety and/or clinical efficacy;
- Describe the relevant pharmacokinetics and pharmacodynamics of the specific members of the class;
- Given all of the properties above, identify unique properties of **single agents** within the drug class, and where/how this would impact therapeutic selection.

- III. Apply established practice guidelines, evidence-based medicine, and **population-based** treatment plans to the relevant disease(s). Utilizing patient-specific parameters (including the complexities of using multiple drug classes and/or the presence of co-morbid conditions or organ dysfunction) develop **patient specific** regimens to treat of the relevant disease(s).

Specifically, for the disease state(s) associated with the module:

- Devise treatment plans based on established guidelines and evidence-based practice, including pharmacological and non-pharmacological therapeutic (e.g. lifestyle) components, and patient specific factors;
- Define general dosing guidelines (e.g., starting dose, maximum doses, timing of doses); for narrow therapeutic index drugs, identify the dose range and limiting toxicities;
- Identify any unique requirements for renal and/or hepatic dosing;
- Identify relevant monitoring parameters for the treatment plan (e.g. definition of treatment success/failure and how to monitor for adverse reactions).

[ADOPTED SPRING-2011]