Course Outline and Syllabus for Students

Course Number: PHM 204H1

Course Title: Pharmacotherapy 5: Cardiovascular Diseases

Course Co-Ordinators:

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Clinical Pharmacy Specialist/Leader
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Teaching Assistants:
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Course Description:
This course is designed to provide students with the knowledge in pathobiology, pharmacology, pharmacotherapy, clinical pharmacokinetics, pharmaceutics required to be a practitioner in cardiovascular therapeutics. The course will be taught using a variety of techniques including lectures and workshops.

Required: Yes

Classes:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Room</th>
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</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>4:00 - 5:00 pm</td>
<td>PB B250</td>
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<tr>
<td>Thursday</td>
<td>1:00 – 3:30 pm (Groups A&amp;B)</td>
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<td></td>
<td>3:30 – 6:00 pm (Groups C&amp;D)</td>
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<tr>
<td></td>
<td>Please note the workshops will start on the hour or 1/2 hour not at 1:10 or 3:40</td>
<td>PB B250 – Groups A&amp;C</td>
</tr>
<tr>
<td>Friday</td>
<td>3:00 – 5:00 pm</td>
<td>PB B250</td>
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Office Hours: Fridays 2 – 3 pm Please contact instructor for additional times

Course Learning Objectives: Upon completion of this course, students will have achieved the following level of learning objectives:

Knowledge

1. Summarize for the following diseases or therapeutic conditions (hypertension, dyslipidemia, acute coronary syndrome, secondary prevention of coronary artery disease, heart failure, arrhythmias, stroke, venous thromboembolism) the etiology including drug-induced causes, pathophysiology, epidemiology, clinical presentation, risk factors, risk stratification, prevention and natural history (Intermediate)

2. Differentiate the pathophysiology of common drug-induced cardiovascular diseases (e.g., dyslipidemias, arrhythmias, heart failure, stroke). (Intermediate)
3. Identify the appropriate physical exam (e.g., vascular, chest,) clinical biochemistry (e.g., lipid profile, cardiac markers, electrolytes, BNP), and medical imaging and tests findings (e.g., coronary angiogram, cardiac stress testing, electrocardiogram, cardiac ultrasound, VQ scan, ABI) used in the diagnosis and ongoing monitoring of the listed disease states. (introductory)

4. Compare and contrast the relevant (available, investigational, complementary and alternative, emerging) classes of agents used for the selected diseases or therapeutic conditions based on the following criteria; indications, efficacy, mechanism of action, pharmacokinetics, pharmacodynamics, pharmacogenomics, adverse effects, contraindications, drug interactions (drug-drug, drug-food, drug-laboratory), convenience, cost, formulations, stability. (intermediate)

5. Discuss the non-drug measures used to manage the listed disease or therapeutic conditions. (introductory)

6. Describe how the above non-drug measures can influence medication regimens. (Introductory);

7. Describe the pharmaceutic considerations when using controlled released medications.

8. Describe how pharmacogenomics affects the use of select cardiovascular medications (e.g., warfarin, clopidogrel)

9. Outline the rationale of therapeutic drug monitoring for specific drugs (e.g., digoxin)

Skills

1. Select relevant data from; patient demographics, review of systems, laboratory tests, medical imaging and drug therapy in order to identify drug therapy problems. (intermediate)

2. Synthesize relevant information from subjective and objective sources (ROS, medical imaging, diagnostic test, biochemical markers) list all the objective findings to determine drug therapy problems, urgency, and priority for a given clinical situation. (intermediate)

3. Justify the selection of a preferred alternative for a given therapeutic scenario based on the assessment of relevant therapeutic alternatives and specific population (e.g., geriatrics). (intermediate)

4. Develop a care plan for a given clinical situation. (intermediate)

5. Justify the proposed interventions of the care plan to meet the stated goals of therapy. (intermediate)

6. Evaluate the quality, accuracy, and completeness of the care plan. (intermediate)

7. Locate reliable sources of information in the area of cardiovascular therapeutics (introductory)

8. Select, critique and apply reliable sources of information in the area of cardiovascular therapeutics in a given scenario. (introductory)

Attitudes/Values

1. The student will undertake assessment and care plan development activities in a manner respecting patient autonomy and the individual therapeutic goals.

2. The student will use interprofessional patient centered care principles to reach decisions for therapeutic alternatives.

3. The student will demonstrate respect and collaboration in team functioning
Out-of-Class preparation time (excluding exam preparation):

You should expect to spend a minimum of 3-5 hours outside of class per week preparing for lectures and workshops (more the week of workshops). Out of class preparation should include reading the relevant chapter in Dipiro prior to lectures on the pathophysiology and pharmacotherapy.

Workshops will cover the topics of dyslipidemia, hypertension, and venous thromboembolism, secondary prevention of myocardial infarction, heart failure and stroke /atrial fibrillation. The workshop starts with an individual quiz in addition there will be a quiz that is completed by the entire group. For the remainder of the workshop you and your teammates will be asked to apply your knowledge to identify and resolve drug therapy problems in patient cases. To prepare for the workshops you should review the pathophysiology and pharmacotherapy lectures, complete the pre-readings (which will include at a minimum clinical practice guidelines) and review the learning objectives for the workshop to ensure you are have the required knowledge.

Required Resources/Textbooks/Readings:


Weekly Readings As Assigned (posted on blackboard)

Recommended Resources/Textbooks/Readings:

RxFiles: Objective Comparisons for Optimal Therapy

Brunton LL et al. Goodman and Gilman's The Pharmacologic Basis of Therapeutics 12th Edition


Assessment:

Examinations (80%)

A midterm and a final examination will consist of a combination of multiple choice and short answer questions. Examinations are designed to evaluate the student’s ability to identify and resolve drug therapy problems for individual patient scenarios. The examinations are not cumulative, and are based on material covered during lectures, assigned course readings and workshops.

Team Quiz and Workshop assignments (10%)

Students will work collaboratively during workshops in groups pre-assigned by course co-ordinators. Students are encouraged to actively participate in their teams in workshops during team and class discussion. Students will submit peer evaluations for their group members. The grade determined from assessment of teammates will serve as modifier for up to 50% the participation grade.

Individual Quizzes (10%)

Students will individually complete a 5 question multiple choice quiz at the beginning of each workshop (5 in total) that covers content in pre-readings, lectures and learning objectives provided.
Assessment Summary

<table>
<thead>
<tr>
<th>Examinations</th>
<th>Description</th>
<th>Weight</th>
<th>Content Covered</th>
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<tbody>
<tr>
<td></td>
<td>Midterm Exam</td>
<td>40%</td>
<td>Weeks 1-6</td>
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<tr>
<td></td>
<td>Final Exam</td>
<td>40%</td>
<td>Weeks 7-13</td>
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<tr>
<td>Participation</td>
<td>Team Quizzes</td>
<td>5%</td>
<td>Workshops 1-6 (Dyslipidemia, Hypertension,</td>
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<td></td>
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<td>Venous thromboembolism, Secondary Prevention,</td>
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<td>Heart Failure, Atrial Fibrillation)</td>
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<td></td>
<td>Workshop Assignments</td>
<td>5%</td>
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<td></td>
<td>(Care plans)</td>
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<tr>
<td></td>
<td>Peer Assessment</td>
<td>Modifier (up to 50% of participation grade)</td>
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<tr>
<td>Quizzes</td>
<td>Individual MCQ quizzes</td>
<td>10%</td>
<td>Workshops 1-6</td>
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Peer assessment: Peer assessment will be conducted online. You will receive an invitation to the program. Students will be asked to distribute points amongst team. The total points for each member will then be used to calculate a modifier and this modifier will be used to adjust the combined group grade (quiz + care plan) up to 50%. Peer assessment will be completed within 3 days after each workshop.

Course Pass Grade: 60%

Policy and procedure regarding make-up assignments/examinations:

Missed Exam/Test Policy

Students who miss an examination or a test and who have a valid petition filed with the Registrar’s office will be eligible to complete a make-up examination or test. The format of this examination or test will be at the discretion of the course coordinator, and may include, for example, an oral examination.

Missed Tutorial/small group session Policy:

For students who miss a scheduled workshop and who have a valid petition filed with the Registrar’s office there will be no make-up workshop or assignment but rather will have the grade distribution modified to compensate for the missed session (e.g., if one workshop is missed then each remaining individual quiz will be worth 2% (10%/5), group quiz 1% (5%/5) and group care plan 1% (5%/5).

Policy and procedure regarding supplemental assignments/examinations/laboratories:
As per faculty policy.

Learning Objectives for each topic

Dyslipidemia

1. Define common terminology in cardiovascular risk assessment
2. Describe the major and minor risk factors for CV disease
3. Describe risk stratification tools for cardiovascular disease
4. Discuss normal lipoprotein physiology,
5. Review classification system for dyslipidemia
6. List signs and symptoms of dyslipidemia
7. Describe appropriate measurement and assessment of lipid profile and patient
8. List drugs that cause dyslipidemia as a side effect and the effect that they cause. Highlight ones that you would deem clinically significant. Please note the mechanism of this side effect if known.
9. Compare and contrast the following agents with respect to; effect on lipid profile, potency, onset and peak effect, metabolism, clinically significant drug interactions, adverse effects, monitoring parameters; statin, PCSK-9 inhibitors, fibrate, bile acid resin, cholesterol
10. Discuss what advice would you provide to a patient about drinking grapefruit juice while taking a statin.
11. Critically appraise a randomized controlled trial and apply it to a case scenario
12. Highlight the CCS guidelines for the choice of agents for a patient with dyslipidemia. Be prepared to explain why statins are the first line therapy.
13. Compare and contrast the US lipid guideline to the Canadian guideline
14. Differentiate between myopathy, myalgia, myositis and rhabdomyolysis. Describe how you would assess a patient that is taking a statin who complains of muscle aches
15. Describe how you would monitor a patient on a statin
16. State when combination dyslipidemia therapy should be considered. What combinations of agents are recommended?
17. Highlight lipid lowering medications in development
18. Highlight complementary medicines that are commonly used to treat dyslipidemia and state their effect on the lipid profile if known.
19. Instruct a patient on the effects of non-pharmacologic therapy on their lipid profile

### Hypertension

1. List drugs that can cause or exacerbate hypertension. Highlight ones that you would deem clinically significant. Please briefly explain the mechanism of this side effect if known.
2. Summarize the indications for initiation of pharmacotherapy outlined in the CHEP Guidelines. Include explanations for the choice of blood pressure targets, as well as when to initiate pharmacotherapy vs. lifestyle modification.
3. Describe a randomized controlled trial and results using the PICO format and critically appraise the trial. Explain how this trial has influenced treatment guidelines.
4. Outline the guideline recommendations for choice of pharmacotherapy in patients without compelling indications.
5. Compare and contrast the following agents with respect to: relevant pharmacokinetics, adverse effects, clinically important drug interactions, and dosing (for hypertension): thiazide diuretics, calcium channel blockers, ACE inhibitors, angiotensin receptor blockers.
6. Outline the approach to choice of pharmacotherapy in selected patients populations with hypertension. Explain the rationale for the first line agents for various scenarios; isolated systolic hypertension, ischemic heart disease, recent MI, left ventricular systolic dysfunction, left ventricular hypertrophy, cerebrovascular disease, non-diabetic kidney disease, diabetes with or without nephropathy.
7. Discuss the role of combination therapy in the management of hypertension.
8. List the indications for home blood pressure monitoring
9. Describe the education you would provide to a patient with respect to home blood pressure monitoring.
10. Summarize the types of pharmacist interventions that have been studied in hypertension and their outcomes.
11. Describe approaches to facilitate adherence to treatment in patients with hypertension.
12. Instruct a patient on non-pharmacologic strategies to lower blood pressure.
13. Describe the choice of therapy for managing hypertension in pregnancy.

### Venous Thromboembolism

1. Describe the pathophysiology, etiology and risk factors for venous thromboembolism.
2. Identify the clinical presentation and describe the diagnosis of acute deep vein thrombosis and pulmonary embolism.
3. Summarize the clinical practice guideline recommendations for the approach to initial anticoagulant therapy in the management of acute DVT of the leg, and acute PE.
4. Compare and contrast the mechanism of action, relevant pharmacokinetics, dosing for treatment of VTE, clinically important drug interactions (PK/PD), side effects, and monitoring parameters (including lab tests) for the following antithrombotics: unfractionated heparin, low molecular weight heparin, fondaparinux, warfarin, rivaroxaban, apixaban,
5. Summarize the efficacy and safety of the direct oral anticoagulations (rivaroxaban, apixaban, dabigatran) for the treatment of VTE.

6. Describe the recommended duration of anticoagulation therapy in patients with venous thromboembolism.

7. Describe the approach to initiation, maintenance dosing and monitoring of warfarin therapy.

8. Describe the education you would provide for a patient being initiated on oral anticoagulant therapy

### Pharmaceutics

1. Define controlled or modified release with respect to dosage forms
2. Define biopharmaceutics
3. Illustrate how drug absorption can be influenced by CR/MR dosage forms
4. Describe the differences between single and multiple unit CR/MR dosage forms
5. List the benefits for CR/MR dosage forms from a pharmacokinetics perspective
6. Compare and contrast the following CR/MR dosage forms with respect to a) ‘structure’ and b) release mechanisms for:
   - Membrane reservoir (e.g., solution-diffusion, osmotic pump)
   - Matrix release (e.g., diffusion, dissolution, swelling & erosion tablets, ion exchange)
   - Hybrid systems
7. Describe what influences diffusion within polymers
8. Identify what type or class of controlled/modified release a drug falls into by non-medicinal ingredients.
9. Consider the pharmaceutic properties of a modified release drug to resolve problems encountered during clinical practice.

### Acute Coronary Syndrome and Secondary Prevention

1. Describe the pathophysiology and diagnosis of ACS.
2. List the treatment goals for a patient presenting with an ACS.
3. Describe the general approach to treatment for a patient with STEMI and NSTACS.
4. Identify appropriate monitoring parameters for pharmacological therapies.
5. Compare and contrast the following agents with respect to: pharmacologic and pharmacokinetic differences, dosing (including target doses), clinically significant drug interactions, adverse effects, availability. Be prepared to discuss the important differences between agents within the same class. (ASA, clopidogrel, prasugrel, ticagrelor, beta-blockers, aldosterone antagonists, nitrates)
6. Update the drug charts from previous weeks for information pertinent to secondary prevention of MI (target doses, contraindications) for the following agents: ACE inhibitors, calcium channel blockers,
7. Summarize the efficacy and role of following agents in the secondary prevention of MI: ASA, Dual antiplatelet therapy, beta-blockers, ACE inhibitors (post-MI and vascular protection), Aldosterone antagonists, calcium channel blockers, nitrates, oral anticoagulants, statins
8. Outline and explain the duration of dual antiplatelet therapy following Percutaneous Coronary Intervention (PCI), ST-Elevation ACS and Non-ST-Elevation ACS.
9. Highlight the possible indications for triple therapy (dual antiplatelet therapy plus an oral anticoagulant) and the concerns of triple therapy (including strategies to minimize the risk of bleeding).

### Heart Failure

1. Summarize the etiology, pathophysiology, epidemiology, clinical presentation, risk factors and classification models for heart failure
2. Differentiate the pathophysiology of drug-induced heart failure
3. Identify the appropriate physical exam, clinical biochemistry and medical imaging and tests findings used in the diagnosis and on-going monitoring of heart failure
4. Identify the cause of the patient’s heart failure and the precipitating cause given a patient
scenario.
5. List drug-induced causes of heart failure and discuss the mechanism if known.
6. Summarize the lifestyle modifications and self-care activities that patients with heart failure, particularly symptomatic heart failure should follow.
7. Compare and contrast the onset of action, kinetics, adverse effects and clinically relevant drug interactions, dosing, cost and monitoring parameters for; (for classes with more than one agent available in Canada, be prepared to discuss clinically important differences between the agents: ACE inhibitors, ARB, LCZ 696, beta-blockers, aldosterone antagonists, loop diuretics, metolazone, digoxin
8. State the role in therapy in the management of reduced ejection fraction heart failure (REF-EF) of the following agents: ACE inhibitors, ARB, beta-blockers, aldosterone antagonists, diuretics, digoxin, nitrates (and the combination of nitrates and hydralazine), warfarin
9. Rationalize the treatment algorithm from the Canadian Cardiovascular Society clinical practice guidelines
10. Explain the rationale of the combination of a loop diuretic with metolazone. Define and discuss alternative methods to manage with diuretic resistance.
11. Describe and critically appraise a randomized clinical trial
12. Describe the goals of therapy and treatment options for a patient with preserved ejection fraction heart failure (PEF-HF).

Cardiovascular Pharmacogenetics
1. Interpret a genotype for a given P450 enzyme and describe anticipated response on drug action
2. Identify information sources for interpreting pharmacogenetic information
3. Describe role of the pharmacist in the field of pharmacogenomics

Arrhythmias
1. Explain the normal conduction of electrical impulses within the heart
2. Outline how the normal conduction is represented in the monophasic action potential and the surface ECG
3. Describe the etiology of arrhythmias, in particular atrial fibrillation and torsade de pointes
4. List the risk factors for atrial fibrillation and torsade de pointes
5. Describe the natural history of atrial fibrillation
6. Describe the signs and symptoms associated with atrial fibrillation and torsade de pointes
7. Define of proarrhythmia
8. Describe non-drug methods for controlling/treating arrhythmias and the impact these therapies have on drug therapy.
9. Explain the mechanism of action and pharmacokinetics of available antiarrhythmic medications
10. Explain how antiarrhythmics affect the electrical conduction
11. Compare and contrast the efficacy, relevant pharmacokinetics, dosing, adverse effects and monitoring parameters specific to atrial fibrillation; beta-blockers, diltiazem, verapamil, digoxin
12. With reference to the treatment algorithms in the Canadian Cardiovascular Society Guidelines for atrial fibrillation describe the role of each heart rate slowing drug in the management of atrial fibrillation. Highlight what our goals of therapy/monitoring parameters are for a patient who a rate control strategy is chosen.
13. Highlight the efficacy (with respect to conversion to and maintain sinus rhythm), important pharmacokinetics, dosing, adverse effects and monitoring parameters for; amiodarone, dronedarone, flecainide, propafenone, sotalol,
14. Rationalize the Canadian Cardiovascular Society Guidelines for atrial fibrillation algorithm for medications to maintain sinus rhythm
15. Describe the tools used to predict stroke and bleeding risk in patients with atrial fibrillation (e.g. CHADS2, CHADS2Vasc, HAS-BLED). Describe how these tools are used to inform
decisions about therapy.
16. Compare and contrast the pharmacology, onset of action, kinetics, adverse effects and clinically relevant drug interactions, dosing and cost of; dabigatran, rivaroxaban, apixaban, edoxaban, warfarin
17. Describe and critically appraise the following trials: RE-LY, ROCKET-AF, ARISTOTLE, ENGAGE – TIMI 48

**Stroke**

1. Describe the etiology and pathophysiology of stroke
2. Recognize the signs and symptoms of stroke
3. Assess risk factors for stroke
4. Discuss management of hyperacute and acute stroke
5. List goals of therapy and recommended pharmacotherapy for secondary stroke prevention
6. Describe the efficacy and safety of antiplatelet agents for secondary stroke prevention (non-cardioembolic).
7. List the antiplatelet agents (alone or in combination) for a patient with a cardioembolic stroke (e.g, stroke secondary to atrial fibrillation). Describe the guideline recommendations surrounding choice of antiplatelet therapy for a patient with a cardioembolic stroke.

**ASA for Primary Prevention**

1. State the recommendations from various guidelines with respect to ASA for primary prevention
2. State the limitations of the above recommendations
3. Be able to assist a patient in determining if they should take ASA for primary prevention

**Peripheral Arterial Disease**

1. Recognize the signs and symptoms of peripheral arterial disease (PAD)
2. List goals of therapy and recommended pharmacotherapy for PAD

**Pharmacology**

1. Outline the mechanism of action of the following medications: statins, fibrates, bile acid resins, cholesterol absorption inhibitors, PCKS-9 inhibitors, ACE inhibitors, ARB, renin inhibitors, NEP inhibitors, diuretics, beta-blockers, calcium channel blockers, alpha blockers, hydralazine, methyldopa, clonidine ASA, ADP receptor antagonists, GP IIb/IIIa receptor antagonist, heparins, direct thrombin inhibitors, Xa inhibitors, antiarrhythmics, aldosterone antagonists, inotropes, vasopressors, digoxin
Topic Outline and Tentative Schedule:

Instructors will do their utmost to ensure that the schedule remains as printed; however, due to unforeseen circumstances, lectures may need to be rescheduled. Students will be notified as soon as possible of any changes.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Time</th>
<th>Topic</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>1</td>
<td>Tuesday January 3</td>
<td>4-5 pm</td>
<td>Course Overview</td>
<td>H Kertland</td>
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<td></td>
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<td></td>
<td>Epidemiology of CV disease, Risk Factors &amp; Risk Assessment</td>
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<td></td>
<td>Friday January 6</td>
<td>3-5 pm</td>
<td>Pathophysiology of atherosclerosis/dyslipidemias</td>
<td>H Kertland</td>
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<td>Pharmacology of lipid lowering medications</td>
<td>M Erclik</td>
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<tr>
<td>2</td>
<td>Tuesday January 10</td>
<td>4-5 pm</td>
<td>Pathophysiology of Hypertension</td>
<td>N Crown</td>
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<td></td>
<td>Thursday</td>
<td>Small Groups</td>
<td>as assigned</td>
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<td></td>
<td>January 12</td>
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<td>Dyslipemia workshop</td>
<td>H Kertland</td>
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<td>Quiz at start of workshop</td>
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<tr>
<td>3</td>
<td>Tuesday January 17</td>
<td>4-5 pm</td>
<td>Pharmacotherapy of Hypertension</td>
<td>H Kertland</td>
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<tr>
<td></td>
<td>Friday January 20</td>
<td>3-5 pm</td>
<td>Pharmacology of antihypertensives</td>
<td>M Erclik</td>
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<tr>
<td>4</td>
<td>Tuesday January 24</td>
<td>4-5 pm</td>
<td>Pharmacology of antiplatelets/anticoagulants</td>
<td>M Erclik</td>
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<td></td>
<td>Thursday</td>
<td>Small Groups</td>
<td>as assigned</td>
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<td></td>
<td>January 26</td>
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<td>Hypertension workshop</td>
<td>N Crown</td>
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<td>Quiz at start of workshop</td>
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<tr>
<td>5</td>
<td>Tuesday January 31</td>
<td>4-5 pm</td>
<td>Pathophysiology of Venous Thromboembolism</td>
<td>A Bond</td>
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<td></td>
<td>Friday February 3</td>
<td>3-5 pm</td>
<td>Pharmaceutics</td>
<td>P Lee</td>
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<tr>
<td>6</td>
<td>Tuesday February 7</td>
<td>4-5 pm</td>
<td>Applied Pharmaceutics (pre-class cases to be completed)</td>
<td>P Lee</td>
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<td>5-6 pm An Hour with Heather – Optional (Exam Preparation)</td>
<td>H Kertland</td>
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<td></td>
<td>Thursday</td>
<td>Small Groups</td>
<td>as assigned</td>
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<td></td>
<td>February 9</td>
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<td>Venous Thromboembolism Workshop</td>
<td>H Kertland</td>
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<td>Quiz at start of workshop</td>
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<td></td>
<td>Monday February 13</td>
<td>9 – 11 am</td>
<td>MIDTERM EXAM</td>
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<td>Exam Centre 300 A – Ghorhonian</td>
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<td>Exam Centre 310 Gibney – O</td>
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<td>Exam Centre 320 P – Z</td>
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<tr>
<td>7</td>
<td>Tuesday February 14</td>
<td>4 – 5 pm</td>
<td>Acute Coronary Syndromes</td>
<td>C Bucci</td>
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<td></td>
<td>Friday February 17</td>
<td>3 – 5 pm</td>
<td>Pharmacogenomics</td>
<td>M. Piquette–</td>
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<td>Pharmacotherapy of Secondary Prevention</td>
<td>Miller</td>
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<tr>
<td>8</td>
<td>Tuesday February 28</td>
<td>4 – 5 pm</td>
<td>Heart Failure Pathophysiology</td>
<td>K Leblanc</td>
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<td></td>
<td>Thursday March 2</td>
<td>Small Groups</td>
<td>as assigned</td>
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<td></td>
<td>Secondary Prevention workshop</td>
<td>C Bucci</td>
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<td>Quiz at start of workshop</td>
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<tr>
<td>9</td>
<td>Tuesday March 7</td>
<td>4-5 pm</td>
<td>Pharmacology of heart failure medications</td>
<td>M Erclik</td>
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<td></td>
<td>Friday March 10</td>
<td>3 – 5 pm</td>
<td>Pharmacotherapy of Heart Failure</td>
<td>K Leblanc</td>
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<tr>
<td>10</td>
<td>Tuesday March 14</td>
<td>4 – 6 pm</td>
<td>Pathophysiology of arrhythmias</td>
<td>H Kertland</td>
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<td>Pharmacology of antiarrhythmics</td>
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<td></td>
<td>Thursday March 16</td>
<td>Small groups</td>
<td>as assigned</td>
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<td>Heart Failure Workshop</td>
<td>H Kertland</td>
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<td></td>
<td></td>
<td></td>
<td>Quiz at start of workshop</td>
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February 20-24 READING WEEK
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Time</th>
<th>Topic</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>11</td>
<td>Friday March 24</td>
<td>3 – 5 pm</td>
<td>Pathophysiology and Treatment of stroke</td>
<td>H Kertland</td>
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<tr>
<td>12</td>
<td>Tuesday March 28</td>
<td>4-5 pm</td>
<td>Pharmacogenomics of Cardiovascular Drugs</td>
<td>N Crown</td>
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<td>Thursday March 30</td>
<td>Small groups as assigned</td>
<td>Atrial Fibrillation and Stroke Workshop Quiz at start of workshop</td>
<td>H Kertland</td>
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<tr>
<td>13</td>
<td>Tuesday April 4</td>
<td>3-4 pm</td>
<td>Primary Prevention of CAD and Peripheral Arterial Disease</td>
<td>H Kertland</td>
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<td>Friday April 8th</td>
<td>3-5pm</td>
<td>Hour with Heather Examination Preparation</td>
<td>H Kertland</td>
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<td>TBD</td>
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<td>Final Exam</td>
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