New Course Outline

Course Number: PHM204H1

Course Title: Pharmacotherapy 5: Cardiovascular Diseases

Outline Version Code:

Course Description:
This course is designed to provide students with the knowledge in pathophysiology, pharmacology, pharmacotherapy, clinical pharmacokinetics, required to be a practitioner in cardiovascular therapeutics in addition to modified release pharmaceutics will be covered in this course. The course will be taught using a variety of techniques including lectures and workshops.

Semester:
☐ Fall
☒ Winter
☐ Summer

Course Type:
☐ Elective
☐ Selective
☒ Mandatory

1. Course Learning Objectives:
Upon completion of this course, students will have achieved the following level of learning objectives:
Introductory = knowledge and comprehension of concepts, definitions
Intermediate = application of concepts to simple situations
Advanced = application of concepts to more complex situations with ability to synthesize and evaluate
Knowledge

Introductory Level:

- 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 on-going monitoring of the listed disease states.
- Discuss the non-drug measures used to manage the listed disease or therapeutic conditions.
- Describe how the above non-drug measures can influence medication regimens.
- Describe the pharmacetic considerations when using controlled released medications.
- Describe how pharmacogenomics affects the use of select cardiovascular medications (e.g., warfarin, clopidogrel)
- Outline the rationale of therapeutic drug monitoring for specific drugs (e.g., digoxin)

Intermediate Level:

- 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
- Differentiate the pathophysiology of common drug-induced cardiovascular diseases (e.g., dyslipidemias, arrhythmias, heart failure, stroke).
- 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.

Advanced Level:

Skills

Introductory Level:

- Locate reliable sources of information in the area of cardiovascular therapeutics
- Select, critique and apply reliable sources of information in the area of cardiovascular therapeutics in a given scenario.

Intermediate Level:

- Select relevant data from; patient demographics, review of systems, laboratory tests, medical imaging and drug therapy in order to identify drug therapy problems.
- 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.
- 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).
- Develop a care plan for a given clinical situation.
- Justify the proposed interventions of the care plan to meet the stated goals of therapy.
- Evaluate the quality, accuracy, and completeness of the care plan.

Advanced Level:

**Attitudes/Values:**
Introductory Level:

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

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

- The student will demonstrate respect and collaboration in team functioning

Intermediate Level:

Advanced Level:

2. Rationale for Inclusion in the Curriculum:

Cardiovascular disease is the number one cause of death in Canada. The knowledge of the therapeutics of a variety of cardiovascular conditions is essential for a pharmacist irrespective of practice setting.

3. Pre-requisites:

PHM 146/PSL 205/PHM 143 - Anatomy, Physiology and pathophysiology of the cardiovascular system, venous system
PHM 140 - Molecular pharmacology
PHM 142/144 - Pharmacokinetics
PHM 141 - Pharmaceutics
PHM 101 - General Medicine I

4. Co-requisites:

5. Course Contact Hours and Teaching Methodologies:
### 6. Estimate and description of student’s weekly 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 ens

### 7. Topics Covered and Lecture Specific Learning Objectives

#### Week 1

**Lecture Topic:** Course Overview; Epidemiology of CV disease, Risk Factors & Risk Assessment; Pathophysiology of atherosclerosis/dyslipidemias; Pharmacology of lipid lowering medications.

**Lecture Learning Objectives:**
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 absorption inhibitor, niacin, omega-3 fatty acids.
10. Discuss what advice wouldyou 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

Week 2
Lecture Topic: Pathophysiology of Hypertension; Dyslipidemia workshop

Lecture Learning Objectives:
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 absorption inhibitor, niacin, omega-3 fatty acids.
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

Week 3
Lecture Topic: Pharmacotherapy of hypertension; Pharmacology of antihypertensives

Lecture Learning Objectives:
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

Week 4
Lecture Topic: Pharmacology of antiplatelets/anticoagulants; Hypertension workshop

Lecture Learning Objectives:

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

**Week 5**
**Lecture Topic:** Pathophysiology of Venous Thromboembolism; Pharmaceutics

**Lecture Learning Objectives:**

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, dabigatran
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;
   a. Membrane reservoir (e.g., solution-diffusion, osmotic pump)
   b. Matrix release (e.g., diffusion, dissolution, swelling & erosion tablets, ion exchange)
   c. 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.

**Week 6**
**Lecture Topic:** Applied Pharmaceutics; Venous Thromboembolism

**Lecture Learning Objectives:**

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, dabigatran
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;
   a. Membrane reservoir (e.g., solution-diffusion, osmotic pump )
   b. Matrix release (e.g., diffusion, dissolution, swelling & erosion tablets, ion exchange)
   c. 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.

**Week 7**
**Lecture Topic:** Acute Coronary Syndromes; Pharmacogenomics; Pharmacotherapy of Secondary Prevention

**Lecture Learning Objectives:**
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).

Week 8
Lecture Topic: Pathophysiology of heart failure; Secondary prevention of Coronary Artery Disease Workshop

Lecture Learning Objectives:
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).

Week 9
Lecture Topic: Pharmacology of Heart Failure Medications; Pharmacotherapy of Heart Failure

Lecture Learning Objectives:
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

Week 10
Lecture Topic: Pathophysiology of arrhythmias; Pharmacology of antiarrhythmics (make up for March 19); Heart Failure Workshop

Lecture Learning Objectives:

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 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

**Week 11**
**Lecture Topic:** Pathophysiology and Treatment of stroke

**Lecture Learning Objectives:**

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.

**Week 12**
**Lecture Topic:** Pharmacokinetics of CV medications; Atrial Fibrillation and Stroke Workshop

**Lecture Learning Objectives:**

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.

**Week 13**
**Lecture Topic:** Primary Prevention and Peripheral Arterial Disease

**Lecture Learning Objectives:**

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
8. Assessment Methodologies Used:

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Course Learning Objectives Addressed</th>
<th>Assessment Method Used</th>
<th>Percent of Course Grade</th>
<th>For Group Work: Individualized or same mark for all group members</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Assignment</td>
<td>☐ Presentation</td>
<td>☐ Participation</td>
<td>☑ Mid-term</td>
<td>☐ Final Exam</td>
</tr>
<tr>
<td>☑ Assignment</td>
<td>☐ Presentation</td>
<td>☐ Participation</td>
<td>☑ Mid-term</td>
<td>☐ Final Exam</td>
</tr>
<tr>
<td>☑ Assignment</td>
<td>☐ Presentation</td>
<td>☐ Participation</td>
<td>☑ Mid-term</td>
<td>☐ Final Exam</td>
</tr>
<tr>
<td>☑ Assignment</td>
<td>☐ Presentation</td>
<td>☐ Participation</td>
<td>☑ Mid-term</td>
<td>☐ Final Exam</td>
</tr>
</tbody>
</table>

Expectation for pass grades for all Pharmacy courses is 60%

9. Policy and procedure regarding late assignments/examinations/laboratories:

N/A

10. Policy and procedure regarding missed assignments/examinations/laboratories:

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 or large 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).
11. AFPC Education Outcomes addressed (check all those that apply):
- Refer to AFPC Educational Outcomes for Professional Programs for further information about the role and key competencies.

As Care Providers, pharmacy graduates:

**CP1 – Practice within the pharmacist scope of practice and expertise**

- **CP1.1** Apply knowledge from the foundational sciences to make decisions relevant to the contemporary and evolving scope of pharmacist practice;
- **CP1.2** Integrate AFPC Communicator, Collaborator, Leader-Manager, Health Advocate, Scholar, and Professional roles in their practice of pharmacy;
- **CP1.3** Recognize and respond to the complexity, uncertainty and ambiguity inherent in pharmacy practice;
- **CP1.4** Explain the benefits, risks and rationale associated with pharmacist-provided care as an important step in obtaining and documenting consent to pharmacist care;
- **CP1.5** Recognize and take appropriate action when signs, symptoms and risk factors that relate to medical or health problems that fall into the scope of practice of other health professionals are encountered.

**CP2 – Provide patient-centred care**

- **CP2.1** Collect, interpret, and assess relevant, necessary information about a patient’s health-related care needs;
- **CP2.2** Formulate assessments of actual and potential issues and in collaboration with the patient and other health team members as appropriate, prioritize issues to be addressed in a given patient encounter;
- **CP2.3** Create and document plans in collaboration with the patient and other health team members as appropriate, and make recommendations to prevent, improve or resolve issues;
- **CP2.4** Implement plans in collaboration with the patient and other health team members as appropriate, including:
  - CP2.4.1 obtaining consent
  - CP2.4.2 making a referral or consulting others
  - CP2.4.3 adapting, initiating, renewing/continuing, discontinuing or administering medication as authorized
  - CP2.4.4a dispensing and/or
  - CP2.4.4b compounding and/or
  - CP2.4.4c delegating/authorizing such tasks to others appropriately
  - CP2.4.5 engaging the patient or care-giver through education, empowerment and self-management, and
CP2.4.6 negotiating the role of pharmacy and non-pharmacy team members in continuity and transitions of care.

☐ CP2.5 Follow-up by monitoring, evaluating progress toward achievement of the patient's goals of therapy, adjusting plans in collaboration with the patient and health team members across the care continuum.

CP3 – Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety

☐ CP3.1 Recognize and respond to harm and potential harm from health care delivery, including patient safety incidents;

☐ CP3.2 Adopt strategies that promote patient safety and address human and system factors;

As Communicators, pharmacy graduates:

CM1 – Communicate in a responsible and responsive manner that encourages trust and confidence

☒ CM1.1 Select and use oral, non-verbal and written communication strategies (tools, techniques, technologies, etc.) effectively so that the patient's best interests are foremost;

☒ CM1.2 Provide timely, clear responses that are tailored to the context and audience;

☒ CM1.3 Express facts, evidence, opinions and positions accurately and effectively, with clarity and confidence;

☒ CM1.4 Listen, actively solicit and respond appropriately to ideas, opinions and feedback from others;

☒ CM1.5 Use language, pace, tone, and non-verbal communication that is suitable for:

  a) the intended outcomes of the communication, and
  b) the complexity, ambiguity, urgency and/or difficulty of a situation, conversation or conflict

☒ CM1.6 Seek and synthesize relevant information from others in a manner that ensures common understanding and where applicable, clarifies and secures agreement and/or consent;

☐ CM1.7 Compose and share oral, written, and electronic information in a manner that optimizes patient safety, dignity, confidentiality, and privacy.

CM2 – Communicate in a manner that supports a team approach to health promotion and health care

☐ CM2.1 Engage in respectful, empathetic, compassionate, non-judgmental, culturally safe, tactful conversations with patients, communities, populations, and health team members;

☐ CM2.2 Demonstrate awareness of the impact of one's own experience level, professional culture, biases and power and hierarchy within the health team on effective working relationships,
CM2.3 Demonstrate accuracy and appropriateness of communication as well as respect for the role of other health team members when disclosing information about harmful or potentially harmful situations;

☐ CM2.4 In word and in action, convey the importance of teamwork in patient-centred care, patient safety, health care quality improvement and health program delivery.

As Collaborators, pharmacy graduates:

CL1 – Work effectively with members of the health team including patients, pharmacy colleagues and individuals from other professions

☒ CL1.1 Establish and maintain positive relationships;

☒ CL1.2 Recognize, respect and negotiate the roles and shared/overlapping responsibilities of team members;

☒ CL1.3 Join with others in respectful, effective shared decision-making.

CL2 – Hand over the care of the patient to other pharmacy team members and non-pharmacy team members to facilitate continuity of safe patient care

☐ CL2.1 Determine when and how care should be handed over to another team member;

☐ CL2.2 Recognize, respect and honour the negotiate shared and overlapping responsibilities of patients, pharmacy team members and other health members when handovers occur;

☐ CL2.3 Demonstrate safe handover of care, using oral, written, and electronic communication, during a patient transition to a different care provider or setting.

As Leader-Managers, pharmacy graduates:

LM1 – Contribute to optimizing health care delivery and pharmacy services

☐ LM1.1 Work with others to apply quality improvement strategies and techniques to optimize pharmacy care;

☐ LM1.2 Contribute to a culture of patient safety;

☐ LM1.3 Confirm the quality, safety, and integrity of products;

☐ LM1.4 Use health informatics to improve the quality of care, manage resources and optimize patient safety.

LM2 – Contribute to the stewardship of resources in health care systems
☐ LM2.1 Apply evidence and management processes to achieve cost appropriate care;

☐ LM2.2 Allocate health care resources for optimal patient care;

☐ LM2.3 Contribute to the management of finances and health human resources in pharmacy practice settings;

LM3 – Demonstrate leadership skills

☐ LM3.1 Demonstrate leadership skills to enhance pharmacy practice and health care.

LM4 – Demonstrate management skills

☐ LM4.1 Work with others to apply the principles of effective management and supervision of health human resources and medication use systems;

☐ LM4.2 Use effective strategies to manage and improve their own practice of pharmacy.

As Health Advocates, pharmacy graduates:

HA1 – Respond to an individual patient’s health needs by advocating with the patient within and beyond the patient care environment

☐ HA1.1 Work with patients to address determinants of health that affect them and their access to needed health services or resources;

☒ HA1.2 Work with patients to increase opportunities to adopt healthy behaviours;

☒ HA1.3 Incorporate disease prevention, health promotion and health surveillance into interactions with individual patients.

HA2 – Respond to needs of communities or populations they serve by advocating with them for system-level change in a socially accountable manner

☐ HA2.1 Work with community or population to identify the determinants of health that affect them;

☐ HA2.2 Participate in health promotion and disease prevention programs.

As Scholars, pharmacy graduates:

SC1 – Apply medication therapy expertise to optimize pharmacy care, pharmacy services and health care delivery

☒ SC1.1 Use knowledge and problem-solving to arrive at recommendations and decisions that are appropriate, accurate, and practical;
SC1.2 Use professional experience to solve routine, previously encountered problems;
SC1.3 Use established decision-making frameworks and apply learning required to manage new situations and problems.

SC2 – Integrate best available evidence into pharmacy practice

☐ SC2.1 Generate focused questions related to needs for information, recommendations and decisions in practice;
☐ SC2.2 Use systematic approaches in the search for best available evidence;
☒ SC2.3 Critically appraise health-related research and literature;
☒ SC2.4 Incorporate best available evidence in the decision-making process.

SC3 – Contribute to the creation of knowledge or practices in the field of pharmacy

☐ SC3.1 Apply scientific principles of research and scholarly inquiry;
☐ SC3.2 Apply ethical principles that underlie research and scholarly inquiry.

SC4 – Teach other pharmacy team members, the public and other health care professionals including students

☐ SC4.1 Provide effective education to others;
☐ SC4.2 Employ appropriate teaching roles when teaching others;
☒ SC4.3 Deliver effective feedback in teaching and learning situations;
☐ SC4.4 Use appropriate learning assessment and evaluation strategies when working with patients, team members, students and teachers.

As Professionals, pharmacy graduates:

PR1 – Committed to apply best practices and adhere to high ethical standards in the delivery of pharmacy care

☐ PR1.1 Exhibit professional behaviour whether face-to-face, in writing, or via technology-enabled communication. Professional behaviour includes, but is not limited to:

  a) demonstrating honesty, integrity, humility, commitment, altruism, compassion, respect for diversity and patient autonomy;
  b) being accessible, diligent, timely and reliable in service to others;
  c) abiding by the principle of non-abandonment;
  d) maintaining appropriate interpersonal boundaries;
  e) maintaining professional composure, demeanor, and language even in difficult situations, and;
f) maintaining privacy and confidentiality;

PR1.2 Use ethical frameworks as one component of professional judgment;

PR1.3 Recognize and respond to situations presenting ethical dilemmas, including conflicts of interest;

PR1.4 Engage in activities that:
   a) protect the public, and;
   b) advance the practice of pharmacy.

PR2 – Able to recognize and respond to societal expectations of regulated health care professionals

PR2.1 Take responsibility and accountability for actions and inactions;

PR2.2 Demonstrate a commitment to patient safety and quality improvement;

PR2.3 Honour the laws, ethical codes, and regulatory requirements (by-laws, standards, policies) that govern the self-regulated profession of pharmacy;

PR2.4 Demonstrate an understanding of federal, provincial/territorial, and municipal laws, policies and standards that apply to pharmacy workplaces;

PR2.5 Demonstrate an ability to maintain competence to practice through evaluating areas for improvement and planning, undertaking learning activities to address limitations in competence and/or performance and incorporating learning into practice;

PR2.6 Identify and respond to unprofessional, unethical, and illegal behaviours in pharmacists, other pharmacy team members, and other health professionals.

PR3 – Committed to self-awareness in the management of personal and professional well being

PR3.1 Set professional and personal goals, priorities, and manage their time to balance patient care, workflow, and practice requirements;

PR3.2 Examine, reflect upon, and manage personal attributes (knowledge, skills, beliefs, biases, motivations, emotions, etc.) that could influence self-development and professional performance;

PR3.3 Adapt their practice of pharmacy to fulfill evolving professional roles;

PR3.4 Recognize and respond to self and colleagues in need.