New Course Outline

Course Number: PHM302H1

Course Title: Pharmacotherapy 7: Neuropsychiatry

Outline Version Code:

Course Description:

This course is designed to provide pharmacy students with the knowledge in pathobiology, pharmacology, pharmacotherapy and clinical pharmacokinetics required to be a practitioner in neuropsychiatric therapeutics. The course may be taught using a variety of techniques including online lectures, case-based learning and small interactive group learning.

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:

Psychiatry: Describe relevant pharmaceutical considerations in the use of depot injections

Intermediate Level:

Psychiatry: For the following selected mental health disorders, summarize the etiology, neuroscience concepts, epidemiology, clinical presentation, risk factors and progression: schizophrenia, depression, generalized anxiety, bipolar, alcohol, nicotine, benzodiazepine and opioid use disorders; Identify the diagnostic criteria outlined in the DSM-5 used in the diagnosis of the selected disorders.; Compare and contrast the available classes of medications used for the selected disorders based on the following criteria: indications, efficacy, mechanism of action, pharmacokinetics, pharmacodynamics, pharmacogenomics, adverse effects, warnings/precautions, contraindications, drug interactions (drug-drug, drug-food, and drug-laboratory), convenience, cost, formulations and stability; Describe the role of therapeutic drug monitoring in psychiatric disorders, including rationale for use, clinical interpretation, and dose adjustments; Identify key pharmacokinetic parameters that influence the abuse potential of drugs.

Neurology: For the following neurologic conditions, summarize the etiology, pathophysiology, epidemiology, clinical presentation, risk factors and progression: seizure disorders, migraines, and dementia; Identify the appropriate (laboratory, clinical presentation, medical imaging) findings used in the diagnosis and ongoing monitoring of the selected conditions; Compare and contrast the available classes of medications used for the selected disorders based on the following criteria: indications, efficacy, mechanism of action, pharmacokinetics, pharmacodynamics, pharmacogenomics, adverse effects, warnings/precautions, contraindications, drug interactions (drug-drug, drug-food, and drug-laboratory), convenience, cost, formulations and stability; Discuss the role of therapeutic drug monitoring in seizure disorders including rationale for use, clinical interpretation, and dose adjustments.

Advanced Level:

Skills

Introductory Level:
Intermediate Level:

Select relevant data from patient demographics, review of systems (ROS), laboratory tests, medical imaging, and drug therapy in order to identify drug therapy problems; Analyze relevant information from subjective and objective sources, (e.g., review of systems, medical imaging, diagnostic tests, biochemical markers), to identify 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 patient population; 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; Locate reliable sources of information in the area of psychiatric and neurologic therapeutics; Demonstrate the ability to critique and interpret results from observational studies, randomized controlled trials and meta-analyses in psychiatry/neurology.

Advanced Level:

**Attitudes/Values:**

Introductory Level:

Intermediate Level:

The student will undertake assessment and care plan development activities in a manner that illustrates their understanding of the importance of respecting patient autonomy and individual therapeutic goals.; The student will use interprofessional patient-centered care principles to reach decisions for therapeutic alternatives with members of their peer groups; The student will articulate the importance of demonstrating a non-judgmental, empathetic, and professional attitude towards patients who have psychiatric and substance use disorders, which continue to be associated with significant stigma; The student will demonstrate respect and collaboration in team functioning within their small peer groups.

Advanced Level:
2. Rationale for Inclusion in the Curriculum:

Mental Health Disorders account for significant morbidity and mortality worldwide. The World Health Organization lists several mental health disorders on their list of the top 10 leading causes of disability worldwide. In Canada, 1 in 5 Canadians will personally experience a mental illness during their lifetime. (Health Canada - A Report on Mental Illness in Canada, 2002). In Ontario, the Select Committee on Mental Health and Addiction reviewed the mental health system in Ontario and in their final report (2010), recommended that primary care providers should be given the proper tools and support to enable them to develop a greater sensitivity for the mental health and addictions needs of their patients, and that all interdisciplinary primary care models should include a mental health and addictions treatment component. A key recommendation in the College of Physicians and Surgeons of Ontario report entitled, “Avoiding Abuse, Achieving a Balance: Tackling the Opioid Public Health Crisis” (2010) is that enhanced training and ongoing education of health care providers in the safe use of opioids is needed. In 2007, the Canadian Institute for Health Information released a report entitled, “The Burden of Neurological Diseases, Disorders and Injuries in Canada” which indicates that neurological diseases, disorders and injuries represent one of the leading causes of disability in the Canadian population. It is stated that over 9% of acute care hospitalizations and 19% of patient days in acute care hospitals in Canada (2004–2005) were for patients with one of the neurological conditions highlighted in the report. In addition, half of the complex continuing care stays were for patients with a neurological condition. Drug expenditures accounted for approximately half of the direct costs for several neurological disorders. Therefore, it is important that the pharmacotherapy of these disorders be part of the core curriculum for training pharmacists.

3. Pre-requisites:

PHM101H1; PHM112H1; PHM140H1; PHM141H1; PHM142H1; PHM143H1; PHM144H1; PHM145H1; PHM146H1; PHM212H1

4. Co-requisites:

5. Course Contact Hours and Teaching Methodologies:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Didactic (lecture)</td>
<td>27</td>
</tr>
<tr>
<td>Large group problem-based/ case-based learning (group size: 120 )</td>
<td>12</td>
</tr>
<tr>
<td>Laboratory or Simulation</td>
<td></td>
</tr>
<tr>
<td>Tutorial/Seminar/Workshop/Small Group (group size: )</td>
<td></td>
</tr>
<tr>
<td>Experiential</td>
<td></td>
</tr>
<tr>
<td>On-line</td>
<td></td>
</tr>
<tr>
<td>Other (please specify):</td>
<td></td>
</tr>
<tr>
<td><strong>Total Course Contact Hours</strong></td>
<td>39</td>
</tr>
</tbody>
</table>

6. Estimate and description of student’s weekly out-of-class preparation time excluding exam preparation:

Students are expected to complete weekly readings as assigned, in addition to working up patient cases and learning objectives for the biweekly workshops. It is expected that students will spend 1-2 hours per week preparing for lectures and workshops.
7. Topics Covered and Lecture Specific Learning Objectives

**Week 1**

**Lecture Topic:** Intro/Course Overview and Expectations; Neuroscience Concepts of Mental Illness; Neuroscience Concepts and Clinical Presentation of Schizophrenia

**Lecture Learning Objectives:**

After the session, students will be able to:

- Describe the epidemiology of schizophrenia
- Describe the clinical presentation and diagnostic criteria for schizophrenia
- Define treatment resistant schizophrenia (TRS)
- Describe the neurobiology and neurochemistry of schizophrenia

**Week 2**

**Lecture Topic:** Pharmacology of Antipsychotics; Case Workshop: Schizophrenia

**Lecture Learning Objectives:**

At the end of this workshop students will be able to:

1. Describe the key features of schizophrenia:
   
   a. positive symptoms
      
      i. delusions
      
      ii. hallucinations
      
      iii. disorganized thinking
      
      iv. grossly disorganized or abnormal motor behavior
   
   b. negative symptoms
      
      i. flat affect
      
      ii. avolition
      
      iii. anhedonia
      
      iv. Alogia

2. Compare and contrast receptor affinity for D2, 5-HT, H, M, α (none/low/medium/high), formulations, doses, PK parameters, common side effects, serious adverse events, and clinically relevant drug interactions for the following drugs:
   
   a. first generation antipsychotics
      
      i. haloperidol (Haldol®)
      
      ii. chlorpromazine (Largactil®)
      
      iii. zuclopenthixol (Clopixol®)
      
      iv. loxapine (Xylac®)*
      
      v. fluphenazine
      
      vi. flupentixol (Fluanxol®)

   b. second generation antipsychotics
i. aripiprazole (Abilify®)
ii. quetiapine (Seroquel®)**
iii. olanzapine (Zyprexa®)
iv. paliperidone (Invega®)***
v. ziprasidone (Zeldox®)
vi. lurasidone (Latuda®)
vi. asenapine (Saphris®)
viii. clozapine (Clozaril®)

* Include the new inhalation powder formulation of loxapine (Adasuve®) that has been approved in the US but not yet in Canada

** Discuss the PK differences between quetiapine IR and XR

*** Include the new Invega Trinza® formulation that has been approved just recently in Canada

3. Discuss the role of long acting injections in the treatment of schizophrenia; be sure to include transitioning from oral to depot formulations and advantages and disadvantages of depot injections.


5. Describe the various extrapyramidal symptoms (acute dystonia, akathisia, Parkinsonianism, tardive dyskinesia); include mechanism, cardinal signs and symptoms, timeframes, and management strategies.

The following learning objectives relate to the use of clozapine in the treatment of schizophrenia:

6. Describe the requirements needed before clozapine can be considered as a treatment option.

7. Describe the following regarding the Clozapine Support and Assistance Network (CSAN): a. purpose of CSAN b. monitoring parameters of CSAN c. criteria and responses for statuses (green, yellow, red)

8. Describe the following adverse events particular to clozapine and management strategies (pharmacological and non-pharmacological) for each:
   a. Sialorrhea
   b. Constipation
   c. Hypotension
   d. Drowsiness
   e. Seizures
   f. nocturnal enuresis
   g. myocarditis
   h. agranulocytosis

9. Describe the rationale for categorizing antipsychotic medication as typical agents vs. atypical agents.

10. Describe the relevance of potency as it relates to typical antipsychotic medication (low potency vs. medium potency vs. high potency)

**Week 3**

**Lecture Topic:** Pharmacology of Antidepressants; Neuroscience Concepts and Clinical Presentation of Depression

**Lecture Learning Objectives:**
By the end of this session, with respect to major depressive disorder (MDD), students will be able to:

- discuss key theories in the neurobiology of the disorder
- describe the clinical presentation
- list the key diagnostic features
- state common goals of therapy
- identify first line treatments and common adverse effects
- recognize the key roles a pharmacist can play

**Week 4**

Lecture Topic: Neuroscience Concepts and Clinical Presentation of Anxiety; Pharmacology of Lithium and Mood Stabilizers; Case Workshop: Depression

Lecture Learning Objectives:

By the end of this lecture/case discussion students will be able to:

- Differentiate between normal vs. pathological anxiety
- List the different types of anxiety disorders (AD) and key defining features
- Recognize the diagnostic criteria and clinical presentation of generalized anxiety disorder (GAD)
- Justify the place in therapy for the following medications in the treatment of GAD
  - Benzodiazepines
  - Antidepressants
  - Pregabalin
- Differentiate between the time course of anxiolytic effect for benzodiazepines, antidepressants and pregabalin
- Apply knowledge and skills to solve patient cases (GAD)

At the end of this workshop students will be able to:

1. List the goals of therapy for patients with MDD.

2. Compare/contrast/explain the mechanism of action; efficacy; relevant pharmacokinetics, clinically important drug interactions, adverse effects; availability/cost, dosing range, and place in therapy for:
   
   a. SSRIs (fluoxetine, paroxetine, citalopram, escitalopram, sertraline, fluvoxamine)
   b. SNRIs (venlafaxine, desvenlafaxine, duloxetine)
   c. vortioxetine
   d. levomilnacipran
   e. vilazodone
   f. bupropion
   g. mirtazapine
   h. trazodone
   i. TCAs (amitriptyline, nortriptyline, desipramine, imipramine, clomipramine)
   j. quetiapine
   k. MAOIs (phenelzine, tranylcypromine, moclobemide)

3. Discuss the evidence for and approach to patient care of commonly highlighted or severe adverse effects of antidepressants.
a. GI side effects (including GI bleeding)
b. suicidality
c. sexual side effects
d. serotonin syndrome

4. Make recommendations to patients and the healthcare team about Health Canada warnings regarding the use of citalopram in doses > 40 mg/day.

5. Describe the features and approach to patient care for Antidepressant Discontinuation Syndrome.

6. Describe strategies for switching of antidepressants (within a class, and from class to class).

7. Discuss the role of ketamine in the treatment of major depressive disorder (indication, efficacy, safety, adherence/availability etc) – try to use primary literature.

8. Briefly outline the approach to TRD (treatment-resistant depression) and various augmentation strategies used for the treatment of major depressive disorder.

9. Provide a brief description of the following outcome scales used in major depressive disorder: the Hamilton Depression Scale 7 (HAM-D 7), Montgomery-Asberg Depression Scale (MADRS), Beck Depression Inventory (BDI), Patient Health Questionnaire 9 (PHQ-9) and Edinburgh Postnatal Depression Scale (EPDS).

10. Briefly describe electroconvulsive therapy (ECT) and repetitive transcranial magnetic stimulation (rTMS) – what is it, when would you use it, is it effective?

11. Be able to answer the following questions if asked by a patient and/or family member?
   a. How long will it take for me to feel better?
   b. How long will I have to take this medication for?
   c. Is there anything more natural I can take for depression? (Look at the recommendations for St. John's wort)
   d. I want to get pregnant – are antidepressants safe?
   e. My son is only a teenager – which antidepressant is best for him?

Week 5
Lecture Topic: Neuroscience Concepts and Clinical Presentation of Bipolar Disorder; Therapeutic Drug Monitoring of Lithium and Valproate

Lecture Learning Objectives:

For Bipolar Disorder do the following:

− Describe the epidemiology and risk factors
− Explain the current neurobiology concepts
− Define the diagnostic criteria from DSM-V
− Recognize the signs and symptoms and clinical presentation of mania and depression
− List the pharmacologic and non-pharmacologic treatment options and describe their place in therapy
− Identify key resources and guidelines that guide treatment
By the end of this lecture students will be able to:

- describe the role of therapeutic drug monitoring of lithium, valproate and carbamazepine in bipolar disorder.
- discuss the rationale for using therapeutic drug monitoring in bipolar disorder.
- interpret the clinical implication of TDM results.
- use TDM to inform dose adjustments.

**Week 6**

**Lecture Topic:** Pharmaceutics of CNS Drug Delivery; Case Workshop: Bipolar Disorder

**Lecture Learning Objectives:**

By the end of our discussion, you should be able to:

1. Identify intricacies of common and novel dosage forms used in treating psychiatric disorders and solve common clinical issues involving pharmaceutics

2. Recognize the main challenges in CNS drug delivery and evaluate intranasal administration as a CNS delivery method

3. Appraise contemporary drug formulations, and their associated controversies, in treatment of resistant psychiatric disorders

At the end of this workshop students will be able to:

1. Compare and contrast the following for Lithium, Divalproex Sodium/Valproic Acid, Lamotrigine and Carbamazepine as mood stabilizers.
   - the mechanism of action
   - efficacy
   - relevant pharmacokinetics
   - adverse effects
   - clinically important drug interactions
   - formulations available
   - cost/availability

2. Discuss the place in therapy for atypical antipsychotics in management of bipolar disorder.
   - Which agents have evidence to support their use in bipolar disorder?
   - Which agents are used for mania?
   - Which agents are used for depression?
   - Do they have a role in maintenance therapy?

3. Summarize the evidence for the use of Lurasidone for Bipolar Depression (look at primary literature)

4. Discuss the role of antidepressants to manage bipolar depression.
5. Describe the role of TDM in bipolar disorder (ranges, evidence to support utility in bipolar disorder, if/why/when/how frequently levels should be taken).
   - Lithium
   - Divalproex/Valproic Acid
   - Carbamazepine

6. Compare and contrast the evidence for divalproex sodium/valproic acid versus lithium for suicide prevention in bipolar disorder.

7. Describe the clinical presentation of lithium toxicity and the management strategies.

**Week 7**

**Lecture Topic:** Pharmacology of Anti-Epileptic Medications; Neuroscience Concepts and Clinical Presentation of Seizure Disorders

**Lecture Learning Objectives:**

After the lecture, students will be able to:

1. Understand how to inhibit excitatory neuronal signalling
2. Understand how to enhance inhibitory neuronal signalling
3. Describe the primary mechanism of action of anticonvulsants
4. Note unique characteristics of anticonvulsants

At the end of the second lecture, students will be able to:

**Knowledge**

- Differentiate key presenting signs and symptoms of seizure types
- Understand the various components of an epilepsy diagnosis
- Outline the approach to acute and chronic management of epilepsy
- Describe goals of pharmacologic and non-pharmacologic therapy
- Highlight common pharmacotherapy issues in seizure patients

**Attitude**

- Gain empathy for patients with seizure disorders and the impact of their diagnosis on quality of life

**Skills (case discussions)**

- Develop patient and caregiver specific careplans to monitor efficacy and safety of pharmacotherapy
Week 8  
**Lecture Topic:** Therapeutic Drug Monitoring of Anti-Epileptic Medication (Phenytoin); Patient Interviews; Case Workshop: Seizure Disorders

**Lecture Learning Objectives:**

After the lecture, students will be able to:

- To understand the pharmacokinetic characteristics of phenytoin, and why we monitor serum phenytoin concentrations.
- To become familiar with a population-based estimation technique for dosing phenytoin (i.e. Bayesian nomogram) based on one steady-state serum concentration.
- To be able to demonstrate the ability to individualize phenytoin dosage for a specific patient based on two steadystate serum concentrations.

At the end of this workshop students will be able to:

1. Discuss the epidemiology, etiology, pathophysiology, and clinical presentation of seizures.

2. Discuss common triggers of seizures and seizure safety principles.

3. Discuss the classification of seizures and epilepsies by semiology (signs), brain area(s) affected, and related clinical syndromes. Specifically, we will talk about:
   - Childhood absence seizures
   - Generalized and secondarily generalized tonic clonic seizures
   - Simple partial seizures and complex partial seizures
   - Juvenile myoclonic seizures
   - Febrile seizures
   - Status epilepticus

4. Summarize the initial clinical, electrographic, and radiologic evaluation of a patient with seizures.

5. Describe the general approach and goals of therapy in the treatment of seizures and of epilepsy.

6. Discuss commonly used anticonvulsants in terms of pharmacokinetics, adverse effects, clinically important drug interactions, formulations, cost/availability, and safety/efficacy monitoring parameters.

7. Describe strategies for initiation and discontinuation of anticonvulsant therapy.

8. Discuss strategies to manage common, unique, dose-related, and idiosyncratic adverse events associated with anticonvulsant therapies.

9. Appreciate challenges of anticonvulsant therapy in specific patient populations:
   - Pediatric
   - Women of childbearing age
   - Geriatric
   - Status epilepticus
10. Briefly discuss non-pharmacologic therapy for epilepsy (i.e., diet, surgery, and vagal nerve stimulation [VNS], deep brain stimulation [DBS]) and their place in therapy.

11. Briefly discuss the importance and clinical utility of therapeutic drug level monitoring in epilepsy.

**Week 9**

**Lecture Topic:** Neuroscience Concepts and Clinical Presentation of Alcohol and Nicotine Use Disorders; Pharmacokinetic Principles and Treatment of Substance Use Disorders

**Lecture Learning Objectives:**

After the lecture, students will be able to:

- Define substance use disorder, particularly in the context of alcohol and tobacco use disorders
- Describe the general neurobiological basis for addiction
- Summarize effects of alcohol and tobacco use
- Recognize signs and symptoms of alcohol and tobacco withdrawal
- Recommend appropriate pharmacotherapy for alcohol and nicotine withdrawal management
- Recommend appropriate pharmacotherapy for alcohol and tobacco use disorders
- Justify the role of the pharmacist in assessing and managing patients with alcohol and/or tobacco use disorders

After the second lecture, students will be able to:

1. For the drugs of abuse presented in class, predict the extent of ionization, the potential metabolites that could be formed, and the primary route of elimination.

2. For the drugs presented in class (nicotine, cocaine, benzos), identify the key pharmacokinetic parameters that influence their increased abuse potential.

3. Given the PK consequences of using different routes of administration, provide an explanation why some may be favoured over others.

4. Understand some of the pharmacokinetic reasons for individual differences in drug response to drugs of abuse.

**Week 10**

**Lecture Topic:** Pharmacology of Opioids and Benzodiazepines; Neuroscience Concepts and Clinical Presentation of Benzodiazepine Use Disorder; Case Workshop: Alcohol and Nicotine Use Disorders

**Lecture Learning Objectives:**

- Students will be able to utilize their knowledge of GPCR pharmacology in the context of opioid drugs
- Students will be able to employ their knowledge of the effects of opioids to their understanding of the therapeutic and untoward effects of these drugs
- Students will be able to compare the therapeutic and adverse effects of numerous opioid drugs

Students will be able to:

- Recall the molecular target of benzodiazepines
－ Apply their knowledge of molecular pharmacology to the mechanism of action of benzodiazepines
－ Appreciate how the structure of the GABA receptor determines the activity of benzodiazepines
－ Appreciate how the physicochemical properties of benzodiazepines influence the therapeutic use of these drugs
－ Apply their knowledge of the pharmacological effects of benzodiazepines to the therapeutic use of these drugs

By the end of this workshop, students will be able to:


• Facilitated question: Describe when medically-assisted alcohol withdrawal treatment is indicated.

• Facilitated question: Describe and discuss the advantages and disadvantages of symptom-triggered and fixed-dose approaches to benzodiazepine treatment in the management of alcohol withdrawal.

3. Compare and contrast naltrexone, acamprosate and disulfiram with respect to the following:

－ Mechanism of action
－ Indication/efficacy
－ Relevant pharmacokinetics
－ Clinically relevant adverse effects
－ Clinically important drug interactions
－ Formulations available
－ Cost/availability – EAP criteria
－ Place in therapy for:
  a. General population
  b. Patients currently taking opioids
  c. Pregnant women
  d. Those with poor creatinine clearance
  e. Those with liver dysfunction
  f. Underlying cardiovascular disease


5. Compare and contrast nicotine replacement therapy, bupropion, cytisine and varenicline (and combinations of these products) with respect to the following:

Mechanism of action

－ Indication/efficacy
－ Relevant pharmacokinetics
－ Clinically relevant adverse effects
Clinically important drug interactions
Formulations available
Cost/availability
Place in therapy for:
  a. General population
  b. Pregnant women
  c. Those with liver dysfunction
  d. Underlying cardiovascular disease
  e. Concomitant psychiatric illnesses


7. Describe the effects of smoking (and smoking cessation) on CYP enzyme activity and its clinical relevance.

8. Prescribe appropriate pharmacotherapy for smoking cessation and execute an outcome based monitoring plan with clear timelines.

Week 11
Lecture Topic: Pharmacology of Opioids and Benzodiazepines; Neuroscience Concepts and Clinical Presentation of Opioid Use Disorder (Methadone and Suboxone)

Lecture Learning Objectives:
After the lecture, students will be able to:

  – Define opioid use disorder
  – Describe the neurobiological basis for opioid use disorders
  – Describe signs and symptoms of:
    a. Opioid intoxication and overdose
    b. Opioid withdrawal
    c. Opioid use disorder
  – Evaluate pharmacotherapy for:
    a. Opioid intoxication and overdose
    b. Opioid withdrawal
    c. Opioid use disorder
  – Justify the pharmacist’s role in preventing, identifying and treating of opioid use disorders

Week 12
Lecture Topic: Pharmacology of Acetylcholinesterase Inhibitors; Clinical Presentation and Management of Dementia; Case Workshop: Opioid Use Disorders

Lecture Learning Objectives:
After the lecture, students will be able to:
- Describe the epidemiology of dementia
- Describe the clinical presentation of dementia (including behavioural and psychological symptoms), distinguishing it from delerium
- Recognize commonly used evaluative scales and staging/diagnostic criteria
- Briefly discuss the pathophysiology of 4 types of dementia
  - Alzheimer’s Dementia (AD)
  - Lewy Body Dementia (LBD)
  - Vascular Dementia (VaD)
  - Frontotemporal Dementia (FTD)
- Apply medication therapy management strategies to patients with dementia (Pharmacological, non-pharmacological/alternative)

By the end of this workshop students will be able to:

1. Apply the diagnostic criteria for an opioid use disorder.

2. Opioid withdrawal:
   a. Describe the features and characteristics of the opioid withdrawal syndrome.
   b. Describe the role of medically-assisted opioid withdrawal treatment in the overall treatment of opioid addiction.

3. Compare and contrast the mechanism of action, efficacy, relevant pharmacokinetics, adverse effects, clinically important drug interactions, formulations, cost/availability, dispensing process, and place in therapy for methadone and buprenorphine/naloxone in the treatment of opioid use disorders.

4. Summarize the CPSO’s Methadone Maintenance Treatment Program Standards and Clinical Guidelines (2011) (https://www.cpso.on.ca/uploadedFiles/members/MMTGuidelines.pdf), with special focus on:
   a. Section 6: Dosing during initiation, stabilization and maintenance.
   b. Section 7: Urine Drug Screening (UDS)
   c. Section 8: Take-home doses.

   a. Facilitated questions pertaining to precipitated withdrawal: What is it? How can it be avoided? How should it be managed if it occurs?


   a. Facilitated Question: How does the abuse liability of zopiclone compare to the benzodiazepine hypnotics?

   b. Facilitated Question: Would this analysis influence your recommendations for specific hypnotic medications in the future?

8. Create a tapering protocol for patients on benzodiazepines and benzodiazepine-like medications (i.e., “z-drugs”).

9. Evaluate the impact of concurrent benzodiazepine and opioid use based on:


Week 13
Lecture Topic: Pharmacology of Migraine Medications; Neuroscience Concepts and Clinical Presentation of Migraines

Lecture Learning Objectives:

- After the lecture, students will be able to:
- Describe the prevalence and clinical presentation and diagnostic criteria of migraines.
- Distinguish between migraines +/- aura, medication overuse headache, menstrual migraines
- Explain how migraines are diagnosed.
- Describe the phases of a migraine.
- Briefly describe common theories explaining the pathophysiology of migraines.
- Compare and contrast the goals and principles of therapy for abortive vs. preventive migraine therapy.
- Compare and contrast the therapeutic agents used in abortive management of migraines?
- Describe adjuvant medication therapy for acute management of migraines.
- Compare and contrast the therapeutic agents used to prevent migraines?
- Explain which medications you would use in the management of menstrual migraines.
- Discuss treatment approaches for medication overuse headache.
### 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 ☐ Presentation ☐ Participation ☐ Mid-term ☐ Final Exam</td>
<td>Evidenced-Based Clinical Assessment Assignment</td>
<td>Written Essay</td>
<td>30%</td>
<td>-5% for Clinical Question - 25% for final paper</td>
</tr>
<tr>
<td>☐ Assignment ☐ Presentation ☐ Participation ☐ Mid-term ☐ Final Exam</td>
<td>Relevant knowledge and skills</td>
<td>MCQ</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>☐ Assignment ☐ Presentation ☐ Participation ☐ Mid-term ☐ Final Exam</td>
<td>Relevant knowledge and skills</td>
<td>MCQ</td>
<td>35%</td>
<td></td>
</tr>
<tr>
<td>☐ Assignment ☐ Presentation ☐ Participation ☐ Mid-term ☐ Final Exam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Expectation for pass grades for all Pharmacy courses is 60%*

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

Late Assignment: Students who fail to submit an assignment by the specified due date will receive a deduction of 10% for each day beyond the due date (and time) (including weekends/holidays), to a maximum of 50%. Assignments will not be accepted for grading after 5 late days.

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

Students who miss an examination, including quiz or test, and who have a valid petition filed with the Registrar’s office, will be eligible to complete a make-up assessment. For missed examinations, the make-up will be an examination. For missed quizzes, the make-up will be at the discretion of the course coordinator(s), and may include, for example, a make-up quiz or assignment of selected Case Workshop questions for the relevant course topic.

Missed Assignment: Students who fail to submit an assignment by the specified due date, and who have a valid petition filed with the Registrar’s office will be eligible to submit the completed assignment, or an alternative assignment based on course requirements, with no academic penalty.
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,
communication and conflict resolution with health team members and adapt the approach to the situation appropriately;

☐ 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.