New Course Outline

Course Number: PHM381H1

Course Title: Medical Imaging for Pharmacists

Outline Version Code:

Course Description:
This course will discuss the principles and applications of medical imaging in patient care. There will be an emphasis on radiopharmaceuticals and nuclear medicine imaging (SPECT and PET) but other imaging technologies will be discussed including MRI, ultrasound, X-ray, mammography and CT. These technologies are applied in diagnosing infectious disease, cancer, cardiovascular disease, hepatobiliary and renal dysfunction, and neurological disorders. The emerging role of molecular imaging using PET and SPECT in selecting patients for personalized medicines for cancer as well as monitoring response to these new therapies will be introduced.

Semester: ☒ Winter

Course Type: ☒ Elective

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:
Describe the principles of radioactive decay and state the units of radioactivity, radiation absorbed dose and radiation energy. Explain the principles of different medical imaging modalities (X-ray, CT, mammography, ultrasound, MRI, SPECT and PET). Describe common imaging tests used for imaging the breast, lung, heart, abdomen, genitourinary tract, brain, musculoskeletal system, endocrine glands as well as diseases in these organs. Relate the current and future role of molecular imaging to new personalized medicines for cancer.
Intermediate Level:

Skills
Introductory Level:
Apply knowledge of medical imaging to appreciate features on images representative of normal or disease conditions.

Intermediate Level:

Advanced Level:

Attitudes/Values:
Introductory Level:
Realize the importance of medical imaging in diagnosing disease and in planning and monitoring treatment. Consider the medical imaging tests that would be necessary to appropriately manage the health and drug therapy of a patient. Reflect on the role of other health professionals, especially radiologists in the management of a patient.

Intermediate Level:

Advanced Level:

2. Rationale for Inclusion in the Curriculum:
Medical imaging is essential to the diagnosis, treatment planning and monitoring of patient outcomes. Pharmacists care for patients who routinely have these diagnostic tests. It is important for pharmacists to understand the fundamental principles underlying medical imaging procedures, appreciate the findings that differentiate normal from disease conditions, and be able to discuss these findings using common terminology with other health professionals. It is also important for pharmacists to have insight into the future of molecular imaging and its potentially very important role in appropriately selecting patients for personalized cancer therapies, as well as monitoring their response to these new treatments.
3. Pre-requisites:
PHM202H1
PHM204H1
PHM241H1
PHM301H1

4. Co-requisites:

5. Course Contact Hours and Teaching Methodologies:

<table>
<thead>
<tr>
<th>Didactic (lecture)</th>
<th>Hours: 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large group problem-based/ case-based learning (group size: 50)</td>
<td>Hours:</td>
</tr>
<tr>
<td>Laboratory or Simulation</td>
<td>Hours:</td>
</tr>
<tr>
<td>Tutorial/Seminar/Workshop/Small Group</td>
<td>Hours: 7</td>
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<tr>
<td>Experiential</td>
<td>Hours:</td>
</tr>
<tr>
<td>On-line</td>
<td>Hours:</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>Hours:</td>
</tr>
<tr>
<td><strong>Total Course Contact Hours</strong></td>
<td><strong>Hours: 26</strong></td>
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</tbody>
</table>

6. Estimate and description of student’s weekly out-of-class preparation time excluding exam preparation:
1-2 hours

7. Topics Covered and Lecture Specific Learning Objectives

**Week 1**

**Lecture Topic:**
Introduction to medical imaging technologies, properties of ionizing radiation and radioactive decay. Radiation measurement instrumentation and radionuclide production.

**Lecture Learning Objectives:**

- Recognize the commonly used imaging technologies (X-ray, CT, mammography, ultrasound, MRI, and SPECT and PET).
- Discuss the properties of ionizing radiation used for certain types of medical imaging (X-ray, CT and SPECT/PET).
- Relate the comparative radiation absorbed doses for various medical imaging procedures.
- Distinguish the different types of radioactive decay and emissions (α, β, γ, X-ray).
- Know the units of radioactivity used for measuring the doses of radiopharmaceuticals.
- Discuss the principles of instruments (dose calibrator, Geiger counter, rate meter, intraoperative-probes) for measuring radiation and radioactivity.
- Summarize the different routes to producing medically-useful radionuclides.
- Students will appreciate the different medical imaging modalities, reflect on the concepts of radioactive decay and types of emissions and consider the units for doses of radiopharmaceuticals and the preparation and quality issues relating to radiopharmaceuticals.
Week 2
Lecture Topic:
SPECT and PET imaging technologies and an overview of radiopharmaceuticals used in nuclear medicine. Radiopharmaceutical preparation and quality control.

Lecture Learning Objectives:
- Distinguish the principles of SPECT and PET imaging technologies.
- Recognize radiopharmaceuticals commonly used in nuclear medicine (more detailed discussion in the application lectures).
- Explain the common approaches to preparing radiopharmaceuticals and assessing their quality.
- Students will consider the effects of radiation absorbed dose in reflecting on different types of imaging studies, and will acquire an understanding of the different instruments used to measure radioactivity and radiation, realize the principles underlying imaging in nuclear medicine (SPECT and PET) as well appreciate the range of radiopharmaceuticals used.

Week 3
Lecture Topic:
X-ray and CT imaging technologies and contrast agents used in CT. MRI imaging technology.

Lecture Learning Objectives:
- Explain the principles of X-ray and CT imaging technology.
- List common contrast agents used in CT (e.g. iodinated contrast agents, barium).
- Explain the principles of MRI imaging technology.
- Describe the basic principles of magnetic resonance.
- Recognize the difference between T1 and T2 weighted images.
- Describe how spin-echo pulse sequences (TR and TE) are used to enhance contrast in MRI.
- Students will appreciate the fundamental principles of X-ray, CT and MRI imaging and will reflect on how images using these technologies are formed as well as consider how contrast agents are used to improve the quality of the images.

Week 4
Lecture Topic:
MRI imaging technology (continued). Ultrasound imaging technology and contrast agents.

Lecture Learning Objectives:
- Explain the principles of signal encoding and image formation in MRI.
- Recognize the term K-space and how it is used to store information for image reconstruction in MRI.
- Describe the components of MRI instruments (Magnets, RF coils, gradient coils).
- Appreciate MRI safety concerns (patients, staff and public).
- List the common contrast agents used in MRI (gadolinium, others).
- Recognize the concepts of functional MRI (fMRI, MRS).
- Explain the principles of ultrasound imaging.
- Describe the principle of Doppler ultrasound and how it is used for imaging.
- Know some new contrast agents introduced for ultrasound imaging.
Students will appreciate the fundamental principles of MRI and ultrasound imaging and will reflect on how images using these technologies are formed as well as how contrast agents are used to improve the quality of the images.

**Week 5**

**Lecture Topic:**
Breast imaging.
Lung imaging.

**Lecture Learning Objectives:**
- Recognize how mammography is used for screening and diagnosis of breast cancer.
- Recognize the role of ultrasound and MRI in breast imaging.
- Describe the principles of scintimammography and PET in imaging breast cancer.
- Review how Image-guided biopsy and surgery aid in the management of breast cancer.
- Describe how the sentinel lymph node is detected in breast cancer and its role in staging the disease.
- Recognize the features of a normal chest X-ray/CT including common views.
- Recognize the features of an abnormal chest X-ray/CT in certain diseases (e.g. pneumonia, empyema, atelectasis, pleural effusion, pneumothorax, COPD).
- Recognize features representative of normal or disease conditions on breast or lung images.
- Students will reflect on the role of imaging in screening for breast cancer, in diagnosing the disease, and in aiding its surgical treatment.
- Students will realize the features of a normal X-ray/CT of the lung and recognize abnormalities associated with disease.

**Week 6**

**Lecture Topic:**
Lung imaging (continued).
Cardiac imaging.

**Lecture Learning Objectives:**
- Describe the features of pulmonary embolism on a V/Q scan.
- Recognize the characteristics of drug-induced or radiation-induced lung disease on lung imaging.
- Recognize the features of lung cancer, metastases to lung and a solitary pulmonary nodule on lung imaging.
- Describe the principles of myocardial perfusion imaging and ejection fraction measurement.
- Recognize the principles of coronary angiography in myocardial perfusion assessment.
- Recognize features representative of normal or disease conditions on lung or heart images.
- Students will consider the imaging tests used to diagnose pulmonary embolism, and will appreciate the changes in a chest X-ray or CT scan associated with adverse effects of drug or radiation treatment as well as consider the tests used to diagnose lung malignancies and metastases.
- Students will appreciate the imaging approaches to diagnosing heart disease.
Week 7
Lecture Topic:
"Read with the Expert" – Breast Imaging Cases
"Read with the Expert" – Lung Imaging Cases

Lecture Learning Objectives:
- Recognize how the principles of breast and lung imaging are used in patient management.
- "Read with the Expert" sessions will be presented by radiologists specializing in breast and thoracic imaging who will show interesting cases that use the imaging technologies discussed in the lectures.
- Recognize features representative of normal or disease conditions on breast or lung images.
- Students will appreciate the role of the radiologist as a member of the health care team in diagnosing breast and lung disease and how this influences the treatment plan for patients.

Week 8
Lecture Topic:
"Read with the Expert" – Cardiac Imaging Cases
Abdominal Imaging.

Lecture Learning Objectives:
- Recognize how the principles of cardiac imaging are used in patient management.
- "Read with the Expert" session will be presented by a radiologists specializing in cardiac imaging who will show interesting cases that use the imaging technologies discussed in the lectures.
- Recognize normal and common abnormal findings on abdominal imaging including colon cancer, liver tumours and metastases, and fatty liver and cirrhosis and abdominal abscesses and perforation.
- Differentiate the principle of virtual colonoscopy compared to optical colonoscopy for colon cancer detection.
- Recognize features representative of normal or disease conditions on heart or abdominal images.
- Students will appreciate the role of the radiologist as a member of the health care team in diagnosing heart disease and how this influences the treatment plan for patients.
- Students will realize the imaging tests used to diagnose common diseases in the abdomen, particularly colon cancer and liver disease.

Week 9
Lecture Topic:
Abdominal Imaging (continued), Endocrine Imaging.
"Read with the Expert" – Abdominal Imaging Cases

Lecture Learning Objectives:
- Recognize the features of biliary tract obstruction on abdominal imaging.
- Recognize the features of pancreatitis and pancreatic cancer on abdominal imaging.
- Describe the techniques for spleen imaging and assessing GI bleeding.
- Discuss the approaches for imaging the thyroid and parathyroid and for detecting diseases of these organs.
- Explain the principles for imaging thyroid cancer and other endocrine tumours.
- Discuss how the principles of abdominal imaging are used in patient management.
- "Read with the Expert" session will be presented by a radiologist specializing in abdominal imaging who will show interesting cases that use the imaging technologies discussed in the lectures.
− Recognize features representative of normal or disease conditions on abdominal or endocrine organ images.
− Students will reflect on the imaging tests used to diagnose cholecystitis, pancreatitis and pancreatic cancer as well as realize the imaging tests used for spleen visualization and for detecting GI bleeding.
− Students will appreciate the types of imaging tests that can be useful in the diagnosis of thyroid and parathyroid diseases and cancer.
− Students will appreciate the role of the radiologist as a member of the health care team in diagnosing abdominal disease and how this influences the treatment plan for patients.

Week 10
Lecture Topic:
Genitourinary Tract Imaging
“Read with the Expert” – Genitourinary Tract Imaging Cases

Lecture Learning Objectives:
− Recognize the features of renal stones and cysts and renal carcinoma on CT and ultrasound imaging.
− Review the principles of imaging studies to evaluate renal function.
− Recognize the features of ovarian cancer and prostate cancer on pelvic imaging.
− Recognize how the principles are used in patient management.
− “Read with the Expert” session will be presented by a radiologist specializing in genitourinary tract imaging who will show interesting cases that use the imaging technologies discussed in the lectures.
− Recognize features representative of normal or disease conditions on genitourinary tract images.
− Students will recognize the imaging tests performed to detect kidney disease, ovarian and prostate cancer and appreciate the principles of evaluating renal function using imaging procedures.
− Students will appreciate the role of the radiologist as a member of the health care team in diagnosing diseases of the genitourinary tract and how this influences the treatment plan for patients.

Week 11
Lecture Topic:
Brain Imaging
“Read with the Expert” – Brain Imaging Cases

Lecture Learning Objectives:
− Discuss the role of imaging in diagnosing cerebrovascular disease (e.g. stroke, hemorrhage).
− Recognize the features of brain malignancies (glioblastoma, astrocytoma, metastases) on CT and MRI images.
− Explain the role of imaging in diagnosing CNS infections (e.g. cerebral abscess, viral infections including AIDS).
− Appreciate the future role of imaging in diagnosing neurodegenerative diseases (e.g. Alzheimers, Parkinsons).
− Recognize how the principles of brain imaging are used in patient management.
− “Read with the Expert” session will be presented by a neuroradiologist or PET imaging specialist who will show interesting cases that use the imaging technologies discussed in the lectures.
− Recognize features representative of normal or disease conditions on brain images.
− Students will reflect on the role of imaging in diagnosing cerebrovascular disease and recognize abnormalities in brain imaging consistent with tumours, infections and neurodegenerative disease.
Students will appreciate the role of the radiologist as a member of the health care team in diagnosing diseases of the brain and how this influences the treatment plan for patients.

Week 12
Lecture Topic:
“Read with the Expert” – Musculoskeletal Imaging Cases
Molecular Imaging and personalized medicine

Lecture Learning Objectives:
- Recognize how the principles of musculoskeletal imaging are used in patient management.
- “Read with the Expert” session will be presented by a radiologist specializing in musculoskeletal imaging who will show interesting cases.
- There is no accompanying lecture for this tutorial since the findings are very subtle and need to be shown by a radiologist.
- The radiologist will cover fractures, arthritis, osteomyelitis, osteosarcoma, and bone metastases from cancer.
- Discuss the concept of molecular imaging and how it can be implemented into the diagnosis of cancer and its treatment.
- Recognize features representative of normal or disease conditions on musculoskeletal or cancer images.
- Students will appreciate the role of the radiologist as a member of the health care team in diagnosing fractures and other bone diseases and will recognize common abnormalities on X-ray, CT, and other imaging tests.
- Students will reflect on the emerging role of molecular imaging in the diagnosis and treatment planning for cancer, as well as its potential to monitor treatment response.

Week 13
Lecture Topic: n/a

Lecture Learning Objectives:
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>
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<tbody>
<tr>
<td>☐ Assignment</td>
<td>☐ Participation</td>
<td>Lectures 1-9 Short and long answer midterm examination. Evaluation of selected example images to recognize normal or disease conditions.</td>
<td>40% n/a</td>
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<td>☐ Assignment</td>
<td>☐ Participation</td>
<td>Lectures 10-19 and Tutorial 7 only Short and long answer midterm examination. Evaluation of selected example images to recognize normal or disease conditions.</td>
<td>60% n/a</td>
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<td>☐ Participation</td>
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Expectation for pass grades for all Pharmacy courses is 60%

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

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

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.

Tutorials are provided by invited radiologists. There is no opportunity to arrange a make-up tutorial session, but Powerpoint notes for the tutorial will be available on the course website whenever possible. Tutorial materials will not be tested (except for Tutorial 7) but are intended to complement the lecture materials on the same topics.
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;
- **CP1.3** Recognize and respond to the complexity, uncertainty and ambiguity inherent in pharmacy practice;
- **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.