

# Course Outline and Syllabus for Students

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Outline Development: Philip Lui

**Course Number:** PHM 202H1

**Course Title:** PCT 3 (Endocrinology/Nephrology/Urology)

**Course Description:** This course is designed for pharmacy students to develop a broad understanding of pathophysiology, pharmacology, clinical pharmacokinetics, and pharmacotherapy in major areas of endocrinology, nephrology, and urology. The course will use a problem-based approach with emphasis on the integration and application of fundamental principles to specific clinical situations.

**Required:** Yes

**Elective:** No

## 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

### Urology

1. Discuss the pathophysiology, epidemiology, clinical presentation, risk factors, drugs that may cause/exacerbate, natural history, diagnosis and differential diagnosis for the following conditions: benign prostate hyperplasia, urinary incontinence (stress/urge/overflow incontinence), and erectile dysfunction. [INTERMEDIATE]
2. Compare and contrast the relevant (available, investigational, complementary, alternative and emerging) classes of drugs used for the selected conditions based on the following criteria: indications, mechanism of action, pharmacokinetics, pharmacodynamics, adverse effects, contraindications, drug interactions, convenience, cost, onset of action, formulations, stability, and with special attention to geriatric patients. [INTERMEDIATE]
3. Describe the non-pharmacologic management for the selected conditions. [INTERMEDIATE]

### Endocrinology

1. Discuss the pathophysiology, epidemiology, clinical presentation, risk factors, drugs that may cause/exacerbate, natural history, diagnosis and differential diagnosis for the following conditions: thyroid disorders, metabolic syndrome/ prediabetes, Type 1 and Type 2 diabetes, and associated diabetic complications (including diabetic ketoacidosis, retinopathy, neuropathy, gastroparesis, nephropathy. Note: macrovascular complications will be discussed in subsequent PCT courses). [INTERMEDIATE]
2. Discuss the normal physiology of the menstrual cycle. [INTERMEDIATE]
3. Discuss the normal physiology, epidemiology, clinical presentation, natural history, diagnosis and differential diagnosis of menopause. [INTERMEDIATE]

4. Identify the appropriate (laboratory, clinical biochemistry, pathology, histology, medical imaging) findings use in the diagnosis and on-going monitoring of the selected conditions. [INTERMEDIATE]
5. Identify the treatment targets for thyroid disorders, and diabetes mellitus. [INTERMEDIATE]
6. Compare and contrast the relevant (available, investigational, complementary, alternative and emerging) classes of drugs used for the selected conditions based on the following criteria: indications, mechanism of action, pharmacokinetics, pharmacodynamics, adverse effects, contraindications, drug interactions, convenience, cost, onset of action, formulations, stability, and with special attention to pediatric patients, pregnant women, and geriatric patients. [INTERMEDIATE]
7. Compare and contrast the advantages and disadvantages of 1, 2, 3, 4, and 5 daily injection insulin regimens and insulin pump therapy. [INTERMEDIATE]
8. Describe the non-pharmacologic management for the selected conditions. [INTERMEDIATE]
9. List the strategies for steroid replacement during acute physiologic stress and strategies to taper steroids. [INTRODUCTORY]
10. Discuss ethical issues in the provision of emergency contraception. [INTERMEDIATE]

## **Nephrology**

1. Discuss the pathophysiology, epidemiology, clinical presentation, risk factors and natural history, diagnosis and differential diagnosis for the following conditions: acute kidney injury, chronic kidney disease, and associated complications including anemia and bone mineral disorder. [INTERMEDIATE]
2. Identify the appropriate (laboratory, clinical biochemistry, pathology, histology, medical imaging) findings used in the diagnosis and on-going monitoring of the selected disease conditions. [INTRODUCTORY]
3. Describe the advantages, assumptions and limitations of various methods used to estimate renal function (including Cockcroft-Gault, MDRD, inulin, 24 hour urine collection). [INTERMEDIATE]
4. Describe the difference in renal handling of drugs for pediatric patients, geriatric patients, and pregnant women compared to the general population. [INTERMEDIATE]
5. Describe the effect of renal impairment on absorption, distribution, metabolism, and elimination of drugs. [INTERMEDIATE]
6. List the common drugs with significant renal elimination and identify important patient/drug characteristics to consider when adjusting the dosage for patients with renal impairment and for dialysis. [INTERMEDIATE]
7. Describe the mechanisms of drug induced acute kidney injury. [INTRODUCTORY]
8. Summarize the prevention strategies and general management of acute kidney injury. [INTERMEDIATE]
9. Define and classify the stages of chronic kidney disease. [INTERMEDIATE]
10. Summarize the treatment strategies to prevent and to slow the progression of chronic kidney disease. [INTERMEDIATE]
11. Compare and contrast the relevant (available, investigational, complementary, alternative and emerging) classes of drugs used for the selected conditions (including proteinuria and chronic kidney disease,) based on the following criteria: indications, mechanism of action, pharmacokinetics, pharmacodynamics, adverse effects, contraindications, drug interactions (drug-drug, drug-food, drug-laboratory), convenience, cost, onset of action, formulations, stability with special attention to pediatric patients, pregnant women, and geriatric patients. [INTERMEDIATE]
12. Describe the non-pharmacologic management for the selected conditions. [INTERMEDIATE]

13. Explain the implications on health care policy and drug coverage for high cost medications used in chronic kidney disease [INTERMEDIATE]
14. Describe the indication for renal replacement therapy, the principles of dialysis, the available dialysis modalities (hemodialysis, peritoneal dialysis, continuous renal replacement therapy), kidney transplantation, and the implications on drug therapy. [INTRODUCTORY]
15. Summarize the benefits, risks, and ethics of kidney transplantation. [INTRODUCTORY]

### **Skills**

1. Select relevant data from review of systems, physical examination, laboratory tests, and medical imaging to assess drug therapy needs. [INTERMEDIATE]
2. Apply relevant findings from review of systems, physical examination, laboratory tests, and medical imaging to determine actual and potential drug therapy needs. [INTERMEDIATE]
3. Analyze relevant information from subjective and objective sources (review of systems, physical examination, medical imaging, diagnostic test, biochemical markers) to determine drug therapy problems, urgency, and priority for a given clinical situation. [INTRODUCTORY]
4. Justify the selection of a preferred alternative for a given therapeutic scenario based on assessment of relevant therapeutic alternatives. [INTERMEDIATE]
5. Develop and justify a care plan with follow up for a given clinical situation. [INTERMEDIATE]
6. Evaluate the quality, accuracy, and completeness of the care plan. [INTERMEDIATE]
7. Demonstrate the ability to critique and interpret results from observational studies, randomized controlled trials, and meta-analyses. [INTRODUCTORY]
8. Calculate and interpret different methods of estimating renal function (Cockcroft-Gault, MDRD, 24 hour urine collection). [ADVANCED]
9. Identify common secondary references to source information on pharmacokinetic and dosing recommendation for patients with renal impairment and for dialysis. [INTERMEDIATE]
10. Interpret pharmacokinetic variables used to assess renal elimination of drugs. [INTERMEDIATE]
11. Adjust drug dosages for varying severity of renal impairment and for dialysis. Calculate the dose/interval of selected medications (eg. metformin) for patients with reduced renal function and for dialysis. [INTERMEDIATE]
12. Alter or initiate insulin regimens and adjust insulin doses based on blood glucose readings. [INTERMEDIATE]

### **Attitudes/Values**

1. The student will undertake assessment and care plan development activities in a manner respecting patient autonomy and the individual therapeutic goals. [INTERMEDIATE]
2. The student will use inter-professional patient centered care principles to reach decisions for therapeutic alternatives. [INTERMEDIATE]

## 2. Rationale for Inclusion in the Curriculum:

Drugs used to treat endocrine, nephrologic and urologic conditions are among the top 10 therapeutic classes dispensed in Canada. These conditions are commonly encountered in practice. Pharmacists must have a good working knowledge of the pathophysiology and therapeutics to appropriately assess and manage patients with these conditions. This course will continue to develop the knowledge, skills, and attitudes introduced in General Medicine1 (PHM 101) and will serve as an important foundation for other Pharmacotherapy and Medication Therapy Management courses.

## 3. Pre-requisites:

Anatomy/physiology – topics related to endocrinology, nephrology, and urology.

Pharmacokinetics – knowledge of pharmacokinetics to understand the effect of renal dysfunction on drug elimination and dose adjustment

Biostatistics – general biostatistics to understand and critically appraise clinical trials

General Medicine I (PHM 101)

Patient Care Process (on-line component); on-line components MTM-1 PHM 105

## 4. Statement of agreement from course coordinators of courses for which this course is a pre-requisite:

*Coordinator's Name and course name and/or number:*

## 5. Co-requisites: (for the current and subsequent year)

Medication Therapy Management II – application of therapeutics learned in Pharmacotherapy (GIM 2) course

Critical appraisal – application of critical appraisal skills to clinical trials in endocrinology, nephrology, and urology

## 6. Statement of agreement from coordinators of courses for which this course is a co-requisite:

*Coordinator's Name and course name and/or number:*

## 7. Course Contact Hours and Teaching Methodologies:

Didactic (lecture)	19 hours
Large group problem-based or case-based learning	18 hours
Large Group Size	60 persons
Laboratory or Simulation	0 hours
Tutorial/Seminar/Workshop/Small Group	3 hours
Small Group Size	10 persons
Experiential	0 hours
On-line	0 hours
Other (please specify)*	0 hours
* Other specific information:	
Total course contact hours	39 hours

## 8. Estimate and description of student's weekly out-of-class preparation time excluding exam preparation:

Review learning objectives + prepared materials by classmates (3 –7 hrs/ week), higher during week of case discussions

## 9. Course Coordinator and contact information:

**10. Course Instructors and contact information:**

**11. Required Resources/Textbooks/Readings:**

Pharmacotherapy: A Pathophysiologic Approach, 10th edition, J DiPiro, et al.

**12. Recommended Resources/Textbooks/Readings:**

Goodman and Gilman's The Pharmacological Basis of Therapeutics 11ed.

**13. Topic Outline/Schedule: For each, indicate level of knowledge, skills and attitudes learning objectives**

**Week 1 Sept 7- 1. Course Introduction (Marisa, Karen and Mayce) 2. Pharmacology of drugs for ED, BPH and Urinary Incontinence (Mary Erclik)**

**Topic/Lesson Objectives:** Introduction to PCT III + Pharmacology of Agents that treat the following disease states: Erectile dysfunction, Benign Prostatic Hyperplasia and Urinary Incontinence (lecture:3 hours in total: 1 hour (introduction) + 2 hours)

*Knowledge*

- Discuss pharmacology of PDE inhibitors, alprostadil, alpha blockers, 5-alpha-reductase inhibitors, oxybutynin, tolterodine, trospium, solifenacin, darifenacin

*Skills:* Select and apply pharmacology principles to therapeutics

*Attitudes*

**Preparation/Readings:** Relevant chapter in Goodman and Gilman's The Pharmacological Basis of Therapeutics 11ed.

**Pre-requisite/Co-requisite knowledge and skills:** Autonomic Nervous System and control of smooth muscle tone

**Week 2 Sept 11 lecture (Katie Palmer) September 14 Workshop**

**Topic/Lesson Objectives:** Erectile dysfunction (lecture:1 hour + 4x60 students case discussion:1 hours) and Benign prostate hyperplasia (lecture:1 hour + 4x60 students case discussion:1 hours)

*Knowledge*

- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of erectile dysfunction
- Identify relevant laboratory findings
- Compare and contrast pharmacotherapy used to treat: PDE inhibitor, alprostadil
- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of benign prostate hyperplasia
- Identify relevant laboratory findings
- Compare and contrast pharmacotherapy used to treat BPH: alpha blockers, 5-alpha-reductase inhibitors

*Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plan

*Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipro 10<sup>th</sup> edition

**Pre-requisite/Co-requisite knowledge and skills:** N/A

**Week 3 Sept 18 lecture (Debbie Kwan and Marco Tomas) September 21 Workshop**

**Topic/Lesson Objectives:** Urinary incontinence (lecture:1 hour + 4x60 students case discussion:1 hours) and Menopause (lecture:1 hour + 4x60 students case discussion:1 hours)

*Knowledge*

- Discuss normal physiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of menopause
- Identify relevant laboratory findings
- Compare and contrast pharmacotherapy used to manage symptoms associated with menopause: hormone replacement therapy, non-pharmacologic (eg. herbal)
- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of urinary incontinence (stress/urge/overflow)
- Identify relevant laboratory findings
- Compare and contrast pharmacotherapy used to treat: oxybutynin, tolterodine, trospium, solifenacin, darifenacin
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*Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plan

*Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipro 10<sup>th</sup> edition

**Pre-requisite/Co-requisite knowledge and skills:** N/A

**Week 4 Lecture Sept 25 (Marco Tomas) and Sept 28 Workshop**

**Topic/Lesson Objectives:** Contraception (lecture:1 hour + 4x60 students case discussion:2 hours)

*Knowledge*

- Discuss normal physiology of GnRH/LH/FSH axis and menstrual cycle
- Identify relevant laboratory findings
- Compare and contrast pharmacologic contraception and other non-pharmacologic methods of contraception
- Discuss emergency contraception, ethical issues in provision of emergency contraception

*Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plan

*Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipiro 10<sup>th</sup> edition

**Pre-requisite/Co-requisite knowledge and skills:** N/A

**Week 5 Lecture Oct 2 (Shirley Wu and Henry Halapy) Workshop Oct 5**

**Topic/Lesson Objectives:** Pharmaceutics of oral dosage forms (lecture: 1 hour) and thyroid disorders (lecture:1 hour + 4x60 students case discussion:2 hours)

*Knowledge*

- Discuss the pharmaceutics of regular solid oral tablets/capsule
- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of thyroid disorders
- Identify relevant laboratory findings and treatment targets
- Compare and contrast pharmacotherapy used to treat these conditions: levothyroxine, methimazole, propylthiouracil
- Understand the various actions of steroids on the body and tapering regimens
- Discuss steroid replacement during physiologic stress and steroid taper

*Skills:*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plan

*Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Goodman and Gilman's The Pharmacological Basis of Therapeutics 11ed

**Pre-requisite/Co-requisite knowledge and skills:** N/A

**Week 6 Lecture Oct 12- Mary Erlik**

**Topic/Lesson Objectives:** Pharmacology medications used to treat diabetes, and steroids (lecture: 2 hours)

*Knowledge*

- Discuss pharmacology of metformin, sulfonylureas, metiglinide, glitazones, incretin-based therapy, acarbose, insulin
- Discuss the pharmacology of steroids

*Skills*

- Apply pharmacology and pharmaceutics to therapeutics

**Preparation/Readings:** Relevant chapter in Dipiro 10<sup>th</sup> edition

**Pre-requisite/Co-requisite knowledge and skills:** N/A

## **Week 7 Oct 23 Lecture (Lori MacCallum)**

**Topic/Lesson Objectives:** Diabetes (lecture:2 hours )

### *Knowledge*

- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of type 1 diabetes, type 2 diabetes, metabolic syndrome/ prediabetes
- Identify relevant laboratory findings and treatment targets
- Compare and contrast pharmacotherapy used to treat these conditions: metformin, sulfonylureas, metiglinides, glitazones, incretin-based therapy, acarbose, weight loss agents, bile acid binding agents, insulin, others
- Discuss implications of using drugs in pregnant women and in pediatrics
- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of diabetic ketoacidosis, neuropathy/ gastroparesis, retinopathy
- Identify relevant laboratory findings and treatment targets
- Summarize general treatment of retinopathy
- Discuss implications of using drugs in geriatric patients

### *Skills*

- Select, apply, and analyze relevant laboratory findings
- Develop and justify a care plan
- Alter or initiate insulin regimens and adjust insulin doses based on blood glucose readings

### *Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipiro 10<sup>th</sup> edition

**Pre-requisite/Co-requisite knowledge and skills:** N/A

## **Week 7 Diabetes Small Group Seminar (3 hours) (Oct 26/27)**

### *Knowledge*

- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of type 1 diabetes, type 2 diabetes, metabolic syndrome/ prediabetes
- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of diabetic ketoacidosis, neuropathy, gastroparesis, retinopathy
- Identify relevant laboratory findings and treatment targets
- Compare and contrast pharmacotherapy used to treat these conditions: metformin, sulfonylureas, metiglinides, glitazones, incretin-based therapy, acarbose, weight loss agents, bile acid binding agents, insulin, others
- Compare and contrast pharmacotherapy used to treat these conditions: DKA (insulin), neuropathy (tricyclic antidepressant, anticonvulsants, duloxetine, opioids), gastroparesis (metoclopramide, domperidone, erythromycin)
- Discuss implications of using drugs in geriatric patients
- Explain relevant diabetes self-care counselling including hypoglycaemia treatment, sick day management, alcohol and blood glucose levels, frequency of SMBG, hypoglycaemia and driving safety, foot care, diabetes and exercise, non-pharmacologic management of diabetes.

### *Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plan
- Counsel and adapt diabetes self-care plans - including hypoglycaemia treatment, sick day management, alcohol and blood glucose levels, frequency of SMBG, hypoglycaemia and driving safety, foot care, diabetes and exercise, non-pharmacologic management of diabetes.
- Alter and initiate insulin regimens and adjust insulin doses based on blood glucose readings

### *Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapters in Dipro 10<sup>th</sup> edition, Diabetes Seminar reading package

**Pre-requisite/Co-requisite knowledge and skills:** Diabetes monitoring and administration devices (MTM2)

### **Week 8 Nov 2 Insulin Workshop**

**Topic/Lesson Objectives:** Insulin (4x60 students case discussion: 2 hour)

### *Knowledge*

- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of type 1 diabetes
- Compare and contrast pharmacotherapy used to treat these conditions: insulin
- Compare and contrast the advantages and disadvantages of 1, 2, 3, 4, 5 daily injection insulin regimens and insulin pump therapy.
- Discuss implications of using drugs in geriatric patients

### *Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify a care plan
- Counsel and adapt diabetes self-care plans - including hypoglycaemia treatment, sick day management, alcohol and blood glucose levels, frequency of SMBG, hypoglycaemia and driving safety, foot care, diabetes and exercise, non-pharmacologic management of diabetes.
- Alter and initiate insulin regimens and adjust insulin doses based on blood glucose readings

### *Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipro 10<sup>th</sup> edition, Diabetes Seminar reading package

**Pre-requisite/Co-requisite knowledge and skills:** N/A

### **Week 9 Nov 9 Diabetes Complications Workshop**

**Topic/Lesson Objectives:** Diabetic Complications (4x60 students case discussion:2 hour)

### *Knowledge*

- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of diabetic ketoacidosis, neuropathy, gastroparesis, retinopathy
- Identify relevant laboratory findings and treatment targets
- Compare and contrast pharmacotherapy used to treat these conditions: DKA (insulin), neuropathy (tricyclic antidepressant, anticonvulsants, duloxetine, opioids), gastroparesis (metoclopramide, domperidone, erythromycin)
- Summarize general treatment of retinopathy
- Discuss implications of using drugs in geriatric patients
- Explain relevant diabetes self-care counselling including hypoglycaemia treatment, sick day management, alcohol and blood glucose levels, frequency of SMBG, hypoglycaemia and driving safety, foot care, diabetes and exercise, non-pharmacologic management of diabetes

### *Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plan
- Counsel and adapt diabetes self-care plans specific to complications - including hypoglycaemia treatment, sick day management, alcohol and blood glucose levels, frequency of SMBG, hypoglycaemia and driving safety, foot care, diabetes and exercise, non-pharmacologic management of diabetes
- Alter and initiate insulin regimens and adjust insulin doses based on blood glucose readings, accounting for complications

#### *Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipro 10<sup>th</sup> edition, Diabetes Seminar reading package

**Pre-requisite/Co-requisite knowledge and skills:** N/A

**Week 10 Nov 13 Lecture (Marisa Battistella) and Nov 23 Workshop \*\*Note workshop takes place the following week**

**Topic/Lesson Objectives:** Assessment of renal function, Acute Kidney injury and drug dosing (lecture:2 hour + 4x60 students case discussion:1 hours)

#### *Knowledge*

- Describe the advantages, assumptions and limitations of various methods used to estimate renal function (including Cockcroft-Gault, MDRD, CKD-epi, inulin, 24 hour urine collection)
- Discuss pathophysiology, epidemiology, presentation, risk factors, and diagnosis of acute kidney injury
- Describe the mechanisms of drug induced acute kidney injury
- Identify relevant laboratory findings and treatment targets
- Summarize the prevention strategies and general management of acute kidney injury
- Describe the difference in renal handling of drugs for pediatric patients, geriatric patients, and pregnant women compared to the general population
- Describe the effect of renal impairment on absorption, distribution, metabolism, and elimination of drugs.
- List the common drugs with significant renal elimination and identify important patient/drug characteristics to consider when adjusting the dosage for patients with renal impairment and for dialysis

#### *Skills*

- Calculate and interpret different methods of estimating renal function (Cockcroft-Gault, MDRD, 24 hour urine collection)
- Identify common secondary references to source information on pharmacokinetic and dosing recommendation for patients with renal impairment and for dialysis
- Interpret pharmacokinetic variables used to assess renal elimination of drugs
- Adjust drug dosages for varying severity of renal impairment and for dialysis. Calculate the dose/interval of selected medications (eg., metformin) for patients with reduced renal function and for dialysis

#### *Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipro 10<sup>th</sup> edition

**Pre-requisite/Co-requisite knowledge and skills:** N/A

**Week 11 Nov 20 Lecture (Marisa Battistella) Nov 23 Workshop (note joint workshop with previous week topic)**

**Topic/Lesson Objectives:** Chronic kidney disease and associated complications (lecture:1 hour + 4x60 students case discussion:1 hours)

*Knowledge*

- Define and classify the stage of chronic kidney disease
- Discuss pathophysiology, epidemiology, presentation, risk factors, drugs that may cause/exacerbate, and diagnosis of chronic kidney disease
- Summarize the treatment strategies to prevent and to slow the progression of chronic kidney disease: proteinuria (ACE inhibitor, ARB, CCB, aliskiren)
- Identify relevant laboratory findings and treatment targets
- Describe the indication for renal replacement therapy, the principles of dialysis, the available dialysis modalities (hemodialysis, peritoneal dialysis, continuous renal replacement therapy), kidney transplantations, and the implications on drug therapy
- Summarize the benefits, risks, and ethics of kidney transplantation

*Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plan

*Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** Relevant chapter in Dipiro 10<sup>th</sup> edition

**Pre-requisite/Co-requisite knowledge and skills:** N/A

**Week 12 November 27 Lecture (Karen Cameron) Integrated Cases and Nov 30 Workshop**

**Topic/Lesson Objectives:** Chronic kidney disease and DM review (lecture:1 hour + 4x60 students case discussion:2 hours)

*Knowledge*

- Review of topics from midterm
- Discuss strategies to integrate care plans with multiple disease states and multiple DTPs

*Skills*

- Select, apply, analyze relevant laboratory findings
- Develop and justify care plans
- Demonstrate the ability to critique and interpret results from observational studies, randomized controlled trials, and meta-analyses

*Attitudes*

- 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 inter-professional patient centered care principles to reach decisions for therapeutic alternatives (where appropriate)

**Preparation/Readings:** tbc

**Pre-requisite/Co-requisite knowledge and skills:** N/A

#### 14. Assessment Methodologies Used:

	Format	Content	When	Weight
First exam	MCQ + short answer	Topics 1-6	After week 4	30%
Final exam	MCQ + short answer	Topics 7-13	End of course	45%
SGS	Case Discussion	DM	Week 9	10%
Workshops	Oral Care Plans (7.5%) Pharmacy Care Plans-write up (7.5%)	Topics 1-13	Workshops	15%

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

#### 15. Policy and procedure regarding make-up 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 group session Policy:**

Students who miss a scheduled tutorial/small group session and who have a valid petition filed with the Registrar's office will be eligible to:

- a. Attend a subsequent regularly scheduled small group session/tutorial (if space is available)
- b. Complete assignment

\*Note: this applies only for laboratories or tutorials where summative assessment occurs

##### **Missed Assignment Policy:**

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.

##### **Late Assignment Policy:**

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 (including/excluding weekends/holidays), to a maximum of 50%. Assignments will not be accepted for grading after 5 late days.

#### 16. Policy and procedure regarding supplemental assignments/examinations/laboratories:

As per Faculty policy for supplemental exams.

# AFPC Educational Outcomes

Which AFPC Educational Outcomes will be addressed by this course?

**As Care Providers, pharmacy graduates:**

**1.2 Elicit and complete an assessment of required information to determine the patient's medication related and other relevant health needs.**

1.2.2 obtain and evaluate relevant history from the patient, his/her chart, caregivers and other health care professionals; [INTERMEDIATE]

1.2.3 order, retrieve and assess relevant lab tests and diagnostic assessments; [INTERMEDIATE]

**1.3 Assess if a patient's medication-related needs are being met;**

1.3.3 determine whether a patient's medications are achieving the desired goals including consideration of efficacy and adverse effects; [INTERMEDIATE]

1.3.5 where appropriate, identify a patient's medication-related needs as specific medication therapy problems, and: [INTERMEDIATE]

1.3.6 determine if a patient requires additional care or services consistent with established collaborative practice agreements (see glossary). [INTRODUCTORY]

**1.4 Determine if a patient has relevant, priority health and wellness needs.**

1.4.1 recognize signs, symptoms and risk factors that relate to medical or health problems that fall into the scope of practice of other health care professionals.(Including, for example, signs and symptoms of diabetes mellitus, hypertension, arthritis, stroke, cardiac disease.) [INTERMEDIATE]

1.4.2 recognize signs and symptoms associated with medical emergencies; [INTRODUCTORY]

1.4.3 recognize problems with activities of daily living important to the patient's well-being, and: [INTRODUCTORY]

**1.6 Develop a care plan that addresses a patient's medication-therapy problems and priority health and wellness needs.**

1.6.1 prioritize a patient's medication-related needs; [INTERMEDIATE]

1.6.2 establish goals of medication therapy with the patient (desired endpoints, target values and timeframes for medication therapies) [INTERMEDIATE]

1.6.3 assess alternative strategies and negotiate the therapeutic option best suited to the patient;

1.6.4 integrate the recommended therapeutic options for a patient's medication-related needs into a co-ordinated plan; [INTERMEDIATE]

1.6.5 determine monitoring parameters for desired therapeutic endpoints and potential adverse effect, specifying target values and start, frequency and end time-points for monitoring; [INTERMEDIATE]

**As Communicators, pharmacy graduates:**

**2.1. Communicate non-verbally and verbally with others.**

2.1.4. when speaking, use organized processes and appropriate, precise expressions and vocabulary; [INTERMEDIATE]

**2.2. Communicate in writing.**

2.2.1. write clearly, using organized processes and appropriate vocabulary; [INTERMEDIATE]

2.2.2. correctly apply the rules of syntax, grammar and punctuation, and: [INTERMEDIATE]

**As Collaborators, pharmacy graduates:**

**As Managers, pharmacy graduates:**

**As Advocates, pharmacy graduates:**

**As Scholars, pharmacy graduates:**

**6.1 Demonstrate a thorough understanding of the fundamental knowledge required of pharmacists and apply this knowledge in daily practice.**

6.1.1 rationalize their recommendations and decisions with appropriate, accurate explanations and best evidence; [INTERMEDIATE]

**6.2 Provide drug information and recommendations.**

6.2.3 critically analyze information including primary research articles; [INTERMEDIATE]

6.2.4 determine plausible solutions and select the most appropriate recommendation; [INTERMEDIATE]

**As Professionals, pharmacy graduates:**

**2. Please estimate resource implications associated with teaching methodologies to be used.**

Delivery of pathophysiology lectures: 13 lecture hours

Delivery of pharmacology lectures: 2x2 hour lectures

Delivery of pharmaceuticals topics: Oral dosage forms

Delivery of pharmacotherapy topics

Case discussions: 3 hour small group seminar (4 x 60 students)

Small group seminar: 24 sessions of 10 students (12-15 facilitators)

Support to develop and maintain course materials on learning management software (Blackboard)

Classrooms appropriate for group discussion and case study seminar

**3. Please estimate resources implications associated with assessment methodologies to be used.**

Invigilators for 2 exams

Exam graders for short answer questions - 80 hrs/exam x 2 exams

Admin support for compiling assessment results

Small group seminar: 24 sessions - 12 Clinical instructors x 3.5 hours.

**4. Which of the five curricular themes will be covered in this course? How will integration of these themes be achieved through teaching and assessment methods used?**

Critical reasoning

Critical appraisal

Professionalism/Ethics

Pharmaceutical Care /Patient Care Process

**Approval from Theme Coordinator (name of theme coordinator): no theme coordinator**

**5. Which of the following course evaluation measures will you incorporate in your course to facilitate review and iterative refinement?**

Dixon's Levels (1-4 increasing validity)	Quantitative Measures	Qualitative Measures
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<b>1</b>	<b>Evaluations Forms ('Happiness' Index)</b>	<b>Focus groups / Interviews</b>
<b>2</b>	<b>Pre-testing versus Post-testing</b>	<b>Participant Surveys / Questionnaires</b>
<b>3</b>	<b>Change daily practice or learning habits</b>	<b>Structured Interviews</b>
<b>4</b>	<b>Improve Outcomes</b>	<b>Receiver Questionnaires</b>

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