

**Advanced Pharmacologic Applications in Primary Care  
Modules and Objectives**

<b>Presentation</b>	<b>Time</b>	<b>Objectives</b>	<b>Learning Activities</b>
<b>Unit 1: Basic Principles of Pharmacology and Therapeutics</b>	<b>150 minutes</b>	<p style="text-align: center;"><b>Pharmacodynamics</b></p> <ul style="list-style-type: none"> <li>• Define drug "receptors" with respect to specificity of drug action.</li> <li>• List and describe the types of forces involved in drug-receptor binding.</li> <li>• Describe in general terms how drug-receptor binding subsequently leads to tissue responses.</li> <li>• Describe drug dose-response relationships including agonist and antagonist actions. Graphic representations will be helpful.</li> <li>• List and describe the types of receptor-independent drug action.</li> </ul> <p style="text-align: center;"><b>Pharmacokinetics</b></p> <ul style="list-style-type: none"> <li>• List and describe the five mechanisms by which drugs pass through membranes.</li> <li>• List and describe the four general routes of administration of drugs, including factors which affect absorption, onset of action and advantages and disadvantages of each.</li> <li>• Describe how drugs are distributed throughout the body; include factors which alter capillary permeability, entry of drugs into cells, distribution into special fluid compartments, volume of distribution, and drug binding.</li> <li>• Explain the concepts of clearance, volume of distribution, and half-life as related to drug therapy</li> <li>• Describe the hepatic microsomal and non-microsomal mechanisms that are responsible for drug metabolism.</li> <li>• List and describe five factors that can affect drug metabolism.</li> <li>• List the routes of excretion of drugs and describe factors that affect the major routes.</li> </ul> <p style="text-align: center;"><b>Pharmacotherapeutics</b></p> <ul style="list-style-type: none"> <li>• List and describe how patient characteristics, drug characteristics and other factors influence the effects of drugs.</li> <li>• List and describe the five types of adverse drug reactions; include subtypes where appropriate.</li> <li>• Define LD50, ED50 and therapeutic index used in drug evaluation.</li> <li>• List and describe the three major types of drug interactions and give examples of each.</li> <li>• Choose the most appropriate dose of a medication based on the patient's renal function</li> </ul>	Assigned Readings WebBased Materials Unit Exam

<p><b>Unit 2: Anti-infectives I</b></p>	<p><b>150 minutes</b></p>	<ul style="list-style-type: none"> <li>• List the major classes of antimicrobial agents and summarize the basic properties of the individual classes, including mechanism of action, spectrum of activity and adverse effects, drug interactions and patient information.</li> <li>• Define the terms bacteriocidal and bacteriostatic and discuss their relationship to mechanism of action and clinical efficacy.</li> <li>• Define the terms MIC, MLC, concentration-dependent killing, time-dependent killing, and post-antibiotic effect.</li> <li>• Identify appropriate anti-microbial agents to prescribe under specific clinical conditions.</li> <li>• Explain the concept of antimicrobial resistance, how resistance develops and what you as a prescriber can do to minimize the development of resistance bacterial strains.</li> <li>• Identify and discuss reasons for antimicrobial therapy failure in a clinical situation.</li> <li>• Describe the clinical situations when combination therapy should be employed in the treatment of an infection</li> </ul>	<p>Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam</p>
<p><b>Unit 3: Anti-infectives II</b></p>	<p><b>150 minutes</b></p>	<p style="text-align: center;"><b>Antifungal Agents</b></p> <ul style="list-style-type: none"> <li>• List the major classes of antifungal agents and summarize the basic properties of the individual classes, including mechanism of action, spectrum of activity and adverse effects, drug interactions and patient information.</li> <li>• Identify appropriate anti-microbial agents to prescribe under specific clinical conditions.</li> </ul> <p style="text-align: center;"><b>Antiviral Agents</b></p> <ul style="list-style-type: none"> <li>• List the major classes of antiviral agents and summarize the basic properties of the individual classes, including mechanism of action, spectrum of activity and adverse effects, drug interactions and patient information.</li> <li>• Identify appropriate anti-viral agents to prescribe under specific clinical conditions.</li> <li>• Utilize the HIV Guidelines in order to access information related to adverse effects and drug interactions with HAART.</li> </ul>	<p>Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam</p>

<b>Unit 4: Cardio-vascular and Renal Systems I</b>	<b>150 minutes</b>	<b>Hypertension</b> <ul style="list-style-type: none"> <li>• List the major classes of antihypertensive agents and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Discuss the differences between primary, secondary and essential hypertension.</li> <li>• Explain the importance of life-style modifications in the treatment of hypertension.</li> <li>• Identify appropriate antihypertensive agents to prescribe under specific clinical conditions.</li> <li>• Explain the importance of medication compliance in the treatment of hypertension.</li> <li>• Identify and discuss reasons for antihypertensive therapy failure in clinical situations.</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam
<b>Unit 5: Cardio-vascular and Renal Systems II</b>	<b>150 minutes</b>	<b>Chronic Congestive Heart Failure</b> <ul style="list-style-type: none"> <li>• List the major classes of medications used in the treatment of heart failure and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Discuss the differences between acute and chronic heart failure; low output and high output congestive heart failure.</li> <li>• Explain the underlying pathophysiology of low-output CHF and discuss the role of reflex sympathetic activation in the symptomatology of CHF.</li> <li>• Define the terms afterload, preload, cardiac output and contractility.</li> <li>• Explain the role of life-style modifications in the treatment of heart failure.</li> <li>• Identify appropriate medications to prescribe in the treatment of CHF under specific clinical conditions.</li> <li>• Explain the importance of medication compliance in the treatment of CHF.</li> <li>• Discuss the clinical staging of CHF and the appropriate medications used for the various stages.</li> </ul> <p style="text-align: center;"><b>Angina</b></p> <ul style="list-style-type: none"> <li>• List the major classes of anti-anginal agents and summarize the basic properties of the individual classes, including mechanism of action, adverse effects, drug interactions, contraindications and patient information.</li> <li>• Identify appropriate anti-anginal agents to prescribe under specific clinical conditions.</li> <li>• Describe the differences between classic and variant angina, including responsiveness to medication(s).</li> <li>• Define and differentiate chronic stable angina and unstable angina.</li> <li>• Discuss the rationale for the need of a “nitrate-free</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam

		<p>interval” in the treatment of chronic stable angina.</p> <ul style="list-style-type: none"> <li>• Discuss the role of life-style modifications in the treatment of ischemic heart disease and angina.</li> </ul>	
<b>Unit 6: Hematologic System I</b>	<b>150 minutes</b>	<p style="text-align: center;"><b>Dyslipidemias</b></p> <ul style="list-style-type: none"> <li>• List the major classes of medications used in the treatment of dyslipidemias and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Discuss the differences between primary and secondary dyslipidemia.</li> <li>• Identify and describe the 6 classes of lipoproteins and their pathways for transport through the circulation.</li> <li>• Define the known risk factors for atherosclerosis and CHD.</li> <li>• Define the LDL treatment goals based on risk factor assessment.</li> <li>• Explain the importance of life-style modifications in the treatment of dyslipidemia, including the TLC diet.</li> <li>• Identify appropriate medications to prescribe in the treatment of dyslipidemia under specific clinical conditions.</li> <li>• Explain the importance of medication compliance in the treatment of dyslipidemia.</li> </ul> <p style="text-align: center;"><b>Anemias</b></p> <ul style="list-style-type: none"> <li>• Compare and contrast iron-deficiency, folic acid deficiency anemia and B12 deficiency anemia in terms of causes, hematologic findings, symptoms, diagnosis and treatment.</li> <li>• Identify food sources of iron, folic acid and B12 and preventive measures that may be taken to decrease risk for development of anemia.</li> <li>• Discuss the use of iron, folic acid and B12 in the treatment of anemia, including treatment regimens and adverse effects.</li> <li>• Discuss the use Erythropoietin in the treatment of Chronic Anemias including monitoring and adverse effects</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam
<b>Unit 7: Hematologic System II</b>	<b>150 minutes</b>	<p style="text-align: center;"><b>Thromboembolic Disorders</b></p> <ul style="list-style-type: none"> <li>• List the major classes of medications used in the treatment of thromboembolic disorders and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Compare and contrast the pharmacology and use of unfractionated heparin vs. low molecular weight heparins.</li> <li>• Define the known risk factors for thrombosis and embolism.</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam

		<ul style="list-style-type: none"> <li>• Define INR, PT, aPTT and be able to interpret the appropriateness of lab test results in specific clinical situations.</li> <li>• List the major drug-drug and drug-nutrient interactions observed with warfarin (Coumadin).</li> <li>• Be able to identify appropriate medications to prescribe in the treatment of thromboembolic disorders under specific clinical conditions.</li> <li>• Describe the signs and symptoms of excessive anticoagulation and discuss the treatment(s) for excessive anticoagulation induced by heparin and warfarin.</li> </ul>	
<b>Unit 8: Respiratory System</b>	<b>150 minutes</b>	<p style="text-align: center;"><b>Asthma</b></p> <ul style="list-style-type: none"> <li>• List the major classes agents used to treat Asthma and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Diagnose, classify, and determine treatment goals for a patient given clinical signs and symptoms and spirometry findings</li> <li>• Discuss the importance of life-style modifications in the treatment of Asthma</li> <li>• Describe how to assess and monitor asthma using Peak Flow Meters</li> <li>• Identify appropriate asthma agents to prescribe under specific clinical conditions.</li> <li>• Explain the importance of medication compliance in the treatment of asthma.</li> <li>• Counsel a patient on the use of a dry powder or aerosol inhaler and the use of a spacer.</li> </ul> <p style="text-align: center;"><b>COPD</b></p> <ul style="list-style-type: none"> <li>• List the major classes agents used to treat COPD and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Compare and contrast Asthma, Chronic Bronchitis, and Emphysema</li> <li>• Discuss the importance of life-style modifications in the treatment of COPD.</li> <li>• Describe how to assess and monitor COPD</li> <li>• Identify appropriate COPD agents to prescribe under specific clinical conditions.</li> <li>• Explain the importance of medication compliance in the treatment of COPD.</li> <li>• Describe the most common causes, clinical presentation, and general treatment of a patient with COPD.</li> </ul> <p style="text-align: center;"><b>Allergic Rhinitis</b></p> <ul style="list-style-type: none"> <li>• Explain pathologic and pathophysiologic characteristics of allergic rhinitis</li> <li>• Discuss the pharmacokinetics, pharmacology, side effects, drug interactions, and proper dosing of</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam

		<p>commonly used medications for allergic rhinitis</p> <ul style="list-style-type: none"> <li>Given a patient case, select an appropriate treatment regimen, monitoring parameters and patient related consultation recommendations considering the patient's diagnosis and unique characteristics</li> <li>Assess a patient's pharmacotherapeutic regimen for safety and efficacy using clinical signs, symptoms and laboratory data</li> <li>Counsel patients on the appropriate use of nasal preparations</li> </ul>	
<b>Unit 9: Endocrine System</b>	<b>150 minutes</b>	<p style="text-align: center;"><b>Diabetes</b></p> <ul style="list-style-type: none"> <li>List the major classes of agents used in the treatment of diabetes and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>Discuss the two types of diabetes and their risk for development, including medications that may impair glucose tolerance; identify appropriate medications to prescribe for each, including monotherapy and combination therapy.</li> <li>Understand the importance of medication compliance in the treatment of diabetes.</li> <li>Identify and discuss reasons for therapy failure in clinical situations in patients with diabetes.</li> <li>Discuss the importance of lifestyle modification in patients with diabetes.</li> <li>Identify the long-term complications associated with diabetes and discuss strategies for prevention of these complications.</li> <li>Identify signs and symptoms of diabetes and lab values used to make a diagnosis of diabetes; discuss the use of these labs to indicate degree of diabetes control and prevention of long-term complications.</li> </ul> <p style="text-align: center;"><b>Osteoporosis</b></p> <ul style="list-style-type: none"> <li>Summarize the basic properties of medications used in the treatment and prevention of osteoporosis, including mechanism of action, adverse effects, drug interactions, contraindications and patient information.</li> <li>Be able to identify appropriate agents to prescribe under specific clinical conditions for the treatment and prevention of osteoporosis.</li> <li>Identify the types of osteoporosis and discuss behavioral modification strategies for prevention of osteoporosis.</li> <li>Compare and contrast the use of the T-score and the Z-score for diagnosis and monitoring of osteoporosis, as well as the use of peripheral vs. central bone mineral density testing instruments.</li> <li>Identify and discuss the modifiable and non-modifiable risk factors for development of osteoporosis, including medications that can</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam

		<p>decrease bone density.</p> <p style="text-align: center;"><b>Thyroid Disorders</b></p> <ul style="list-style-type: none"> <li>• Identify signs and symptoms of hypo- and hyperthyroidism.</li> <li>• Discuss the lab values used to diagnosis and monitor thyroid disease.</li> <li>• List the major classes of agents used in the treatment of thyroid disorders and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information</li> <li>• Identify medications that may cause drug-induced hypothyroidism.</li> </ul>	
<b>Unit 10: Reproductive System</b>	<b>150 minutes</b>	<p style="text-align: center;"><b>Hormone Replacement Therapy</b></p> <ul style="list-style-type: none"> <li>• Summarize the basic properties of estrogens and progestins used for hormone replacement therapy, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Compare and contrast the dosing regimens of estrogen and progestins used for hormone replacement therapy, including the rationale for use of the various regimens.</li> <li>• Discuss the advantages and disadvantages of topical estrogen administration compared to oral administration.</li> <li>• Compare and contrast the types of estrogens and progestins available for hormone replacement therapy.</li> <li>• Discuss the risks vs. benefits of recommending hormone replacement therapy to a post-menopausal woman</li> </ul> <p style="text-align: center;"><b>Contraception</b></p> <ul style="list-style-type: none"> <li>• Compare and contrast use of combination oral contraceptives vs. progestin-only contraceptive agents, including efficacy, mechanism of action, drug interactions and adverse effects.</li> <li>• Discuss the advantages and disadvantages of using injectable hormonal contraceptives vs. oral contraceptives.</li> <li>• Identify the “ideal candidate” for combination oral contraceptive therapy</li> <li>• List the additional clinical uses of oral contraceptives other than contraception.</li> <li>• Discuss the differences between monophasic, biphasic and triphasic oral contraceptives.</li> <li>• Identify patient information to provide to patients using hormonal contraceptives of any type.</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam

		<p><b>Menstrual and Gynecologic Disorders</b></p> <ul style="list-style-type: none"> <li>• Discuss the use of estrogens, progestins and hormonal antagonists in the treatment of conditions such as PMS, dysmenorrhea, endometriosis, etc.</li> <li>• Identify uses of DES, tamoxifen, clomiphene and GnRH agonists or analogues and discuss the major adverse effects and risks associated with the use of these agents.</li> </ul>	
<b>Unit 11: CNS I</b>	<b>150 minutes</b>	<p><b>Antiepileptic Drugs</b></p> <ul style="list-style-type: none"> <li>• List the major agents used to treat seizure disorders and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Compare and contrast the different types of seizures and the AED commonly used to treat each seizure type.</li> </ul> <p><b>Anti-Parkinson agents</b></p> <ul style="list-style-type: none"> <li>• List the major classes agents used to treat Parkinson's disease and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Discuss how to manage various adverse effects or decreases in efficacy associated with anti-Parkinson's treatment.</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam
<b>Unit 12: CNS II</b>	<b>150 minutes</b>	<p><b>Antidepressants</b></p> <ul style="list-style-type: none"> <li>• List the major agents used to treat depression and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Discuss the risk of suicide and suicidal ideation with the use of antidepressants</li> <li>• Discuss the mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information of lithium therapy</li> </ul> <p><b>Antipsychotics</b></p> <ul style="list-style-type: none"> <li>• List the major classes agents used to treat schizophrenia and psychotic symptoms and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>• Compare and contrast atypical and typical antipsychotics in terms of mechanism of action, effectiveness and adverse effects</li> <li>• Discuss the risk of type 2 diabetes and obesity associated with the use of atypical antipsychotics</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam



		<p><b>Sedatives/ Hypnotics/ Anxiolytics</b></p> <ul style="list-style-type: none"> <li>List the major agents used to treat anxiety and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>List the major sedative/hypnotic agents and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> </ul>	
<b>Unit 13: CNS III</b>	<b>150 minutes</b>	<p><b>Opioid</b></p> <ul style="list-style-type: none"> <li>List the major opioid agents used to treat pain and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>Compare and contrast the concepts of tolerance, dependence, and addiction</li> <li>Discuss general principles of pain management</li> </ul> <p><b>NSAIDs</b></p> <ul style="list-style-type: none"> <li>List the major NSAID agents used to treat pain and inflammation and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>Explain how to manage the drug interaction between NSAIDs and aspirin</li> <li>Discuss the clinical data and potential mechanism of coxibs causing an increase risk of developing a cardiovascular event</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam
<b>Unit 14: Gastro-intestinal Pharmacology</b>	<b>150 minutes</b>	<ul style="list-style-type: none"> <li>List the major opioid agents used to treat nausea, vomiting, diarrhea, constipation, peptic ulcers, and GERD and summarize the basic properties of the individual classes, including mechanism of action, clinical use, adverse effects, contraindications, drug interactions and patient information.</li> <li>Compare and contrast the clinical presentation and treatment (pharmacologic and nonpharmacologic) of chronic and acute diarrhea</li> <li>Compare and contrast the clinical presentation and treatment (pharmacologic and non-pharmacologic) of primary and secondary constipation</li> <li>Compare and contrast the treatments of chemotherapy-induced nausea and vomiting (CINV) (acute and delayed) and post-operative nausea and vomiting (PONV)</li> </ul>	Assigned Readings Web Based Materials Discussion of Case Studies Unit Exam
<b>Unit 15: Prescribing in Oklahoma</b>	<b>90 minutes</b>	<ul style="list-style-type: none"> <li>Discuss considerations of prescribing as an advanced practice nurse in Oklahoma</li> </ul>	Assigned Readings Web Based Materials Discussion of

			Case Studies
<b>Final Exam</b>	<b>60 minutes</b>		Final Comprehensive Exam