# 2011 PHARMACOTHERAPY PREPARATORY REVIEW AND RECERTIFICATION COURSE

## Program Faculty Affiliations and Learning Objectives

**SESSION 1: Pediatrics, Geriatrics and Gastrointestinal Disorders**

**PEDIATRICS**

**Kirsten H. Ohler, Pharm.D., BCPS**
Clinical Assistant Professor
University of Illinois
Chicago, Illinois

1. Describe the most common pathogens associated with neonatal and pediatric sepsis/meningitis.
2. Describe current therapeutic options for the management of neonatal and pediatric sepsis/meningitis.
3. Identify the drugs available for preventing and treating respiratory syncytial virus (RSV).
4. Describe the most common causative organisms of otitis media and potential treatment options.
5. Identify the recommended pediatric immunization schedule and barriers to routine immunization.
6. Discuss the differences in anticonvulsant pharmacokinetics and adverse effects between children and adults.
7. Describe the current drug therapy for treating patients with attention deficit hyperactivity disorder (ADHD).

**GERIATRICS**

**Jennifer M. Dugan, Pharm.D., BCPS**
Primary Care Clinical Pharmacy Specialist
Kaiser Permanente Colorado
Evergreen, Colorado

1. Identify age-related pharmacokinetic and pharmacodynamic changes in older people.
2. Evaluate the pharmacotherapy regimens of older people to support the maintenance of optimal physical and mental function.
3. Identify inappropriate medication prescribing in older people.
4. Recommend appropriate pharmacotherapy for patients with dementia.
5. Evaluate the risks and benefits of the use of antipsychotics (including atypical antipsychotics) in older patients with dementia.
6. Recommend appropriate interventions for patients suffering from behavioral symptoms related to dementia.
7. Identify the types of urinary incontinence and recommend appropriate treatments.

8. Given a patient's American Urology Association symptom index for benign prostatic hyperplasia, recommend appropriate therapy.
9. Recommend appropriate analgesic therapy for older patients with osteoarthritis.
10. Discuss risks and benefits of medication classes used to treat rheumatoid arthritis

**GASTROINTESTINAL DISORDERS**

**Brian Hemstreet, Pharm.D., BCPS**
Associate Professor
University of Colorado at Denver and Health Sciences Center
Denver, Colorado

1. Review and apply national guideline treatment strategies to the following gastrointestinal (GI) disorders: gastroesophageal reflux disease (GERD), peptic ulcer disease (PUD), ulcerative colitis (UC), Crohn's disease, viral hepatitis, alcoholic liver disease, and upper GI bleeding.
2. Recommend appropriate pharmacologic and nonpharmacologic interventions for the treatment of GERD.
3. Differentiate between clinical signs, symptoms, risk factors, and treatment of both Helicobacter pylori– and nonsteroidal anti-inflammatory drug (NSAID)-associated PUD.
4. Discuss the role of pharmacologic intervention in the treatment of nonvariceal upper GI bleeding.
5. Review the clinical differences in signs, symptoms, and treatment of Crohn's disease and UC.
6. Identify the common manifestations of alcoholic liver disease and their treatment.
7. Review the treatment of both acute and chronic viral hepatitis.
8. Recognize pertinent information for educating patients and prescribers regarding the appropriate use of pharmacologic agents for various GI disorders.
9. Understand commonly encountered statistical tests and concepts using GI disorders as examples.

**SESSION 2: Biostatistics: A Refresher, and Clinical Trials: Fundamentals of Design and Interpretation, Ambulatory Care and Endocrine and Metabolic Disorders**

**BIOSTATISTICS: A REFRESHER**

**Kevin M. Sowinski, Pharm.D., FCCP**
Purdue University College of Pharmacy
Indiana University School of Medicine
West Lafayette and Indianapolis, Indiana

1. Describe differences between descriptive and inferential statistics.
2. Identify different types of data [nominal, ordinal, continuous (ratio and interval)] to determine an appropriate type of statistical test (parametric vs. nonparametric).
3. Describe strengths and limitations of different types of measures of central tendency (mean, median mode) and data spread (standard deviation, range, IQR).

4. Describe the concepts of normal distribution and the associated parameters that describe the distribution.
5. State the types of decision errors that can occur when using statistical tests and the conditions under which they can occur.
6. Describe hypothesis testing and state the meaning of and distinguish between p-values and confidence intervals (CIs).
7. Describe areas of misuse or misrepresentation that are associated with various statistical methods.
8. Interpret statistical significance for results from commonly used statistical tests.
9. Describe the similarities and differences between correlation and regression; learn how to apply them appropriately.
10. Identify the use of survival analysis and different ways to perform and report it.

## CLINICAL TRIALS: FUNDAMENTALS OF DESIGN AND INTERPRETATION

**Kevin M. Sowinski, Pharm.D., FCCP**
Purdue University College of Pharmacy
Indiana University School of Medicine
West Lafayette and Indianapolis, Indiana

1. Define and compare and contrast the concepts of internal and external validity, bias and confounding in clinical study design.
2. Identify potential sources of bias in clinical trials; select strategies to eliminate or control for bias.
3. Outline the hierarchy of clinical study design.
4. Compare and contrast the advantages and disadvantages of various clinical study designs (e.g., retrospective, case-control, cohort, randomized controlled clinical trials, systematic reviews and meta-analysis).
5. Apply various biostatistics to clinical trial design and use them to interpret results.
6. Define and evaluate odds ratios, relative risks and other risk estimates. Compute and evaluate Number Needed to Treat (NNT).

## AMBULATORY CARE

**Ila M. Harris, Pharm.D., FCCP, BCPS**
Associate Professor
University of Minnesota Medical School
Minneapolis, Minnesota

1. Select appropriate acute and preventive treatment for patients with asthma, chronic obstructive pulmonary disease, and conditions requiring anticoagulation.
2. Classify a patient according to his or her asthma severity class, and assess his/her control, according to the National Institutes of Health National Heart, Lung and Blood Institute.
3. Discuss indications for warfarin and goal international normalized ratio (INR) for specific patients, and adjust therapy according to INR and other clinical findings and patient factors.

4. Describe how to approach and treat a patient receiving warfarin who needs to undergo an invasive procedure.
5. Determine the appropriate immunizations for an adult given his/her age and medical conditions.

**ENDOCRINE AND METABOLIC DISORDERS**

**Brian K. Irons, Pharm.D., BCPS, BC-ADM**
Associate Professor of Pharmacy Practice
Division Head– Primary Care
Texas Tech University Health Sciences Center
Lubbock, Texas

1. Differentiate between the diagnostic and classification criteria for various metabolic and endocrine disorders including type 1 and 2 diabetes mellitus (DM), and disorders of the thyroid, adrenal, and pituitary glands.
2. Compare and contrast the various therapeutic agents used in treating endocrine and metabolic disorders.
3. Select appropriate treatment options for a given patient presenting with one of the above disorders.
4. Describe the therapeutic management of diabetes-related complications.

**SESSION 3: Neurology, General Psychiatry, Infectious Diseases, HIV/Infectious Diseases and Nephrology**

**NEUROLGY**

**Melody Ryan, Pharm.D., BCPS**
Associate Professor
University of Kentucky
Lexington, Kentucky

1. Differentiate between various antiepileptic drugs based on use and adverse effects.
2. Develop a treatment strategy for status epilepticus.
3. Identify appropriate treatment strategies for primary and secondary stroke prevention.
4. Determine the appropriateness of treatment with tissue plasminogen activator for acute stroke.
5. Examine common adverse effects associated with treatment of Parkinson disease.
6. Differentiate between regimens for acute and prophylactic treatment of migraine, tension, and cluster headaches.
7. Identify common adverse effects of disease-modifying therapies for multiple sclerosis.

**GENERAL PSYCHIATRY**

**Kelly C. Lee, Pharm.D., BCPP**
Assistant Professor of Clinical Pharmacy
University of California San Diego
La Jolla, California

1. Describe pharmacotherapeutic options for managing the following psychiatric problems: depression, bipolar disorder, schizophrenia, anxiety disorders, insomnia, and alcohol withdrawal.
2. Describe the drugs used to treat the above disorders in terms of unique pharmacological properties, therapeutic uses, adverse effects, and cognitive and behavioral effects.
3. Formulate a pharmacotherapeutic treatment plan when presented with a patient having depression, bipolar disorder, schizophrenia, an anxiety disorder, or insomnia.
4. Discuss the treatment of substance abuse using alcohol abuse as a model.

## INFECTIOUS DISEASES

**Curtis L. Smith, Pharm.D., BCPS**
Professor
Ferris State University
Lansing, Michigan

1. Describe appropriate treatment of patients with pneumonia, urinary tract infections, central nervous system infections, skin and soft tissue infections, osteomyelitis, intra-abdominal infections, and endocarditis.
2. Identify appropriate preventive therapy for pneumonia, central nervous system infections, endocarditis, and surgical wound infections.

## HIV/INFECTIOUS DISEASES

**Curtis L. Smith, Pharm.D., BCPS**
Professor
Ferris State University
Lansing, Michigan

1. Describe appropriate treatment of patients with human immunodeficiency virus, including initiation and monitoring therapy.
2. Discuss appropriate treatment of the various acquired immunodeficiency syndrome opportunistic infections, including primary and secondary prophylaxis.
3. Describe appropriate treatment and preventive therapy for tuberculosis, including infections with drug-resistant organisms.

## NEPHROLOGY

**Edward F. Foote, Pharm.D., BCPS, FCCP**
Professor
Wilkes University
Wilkes-Barre, Pennsylvania

1. Categorize acute kidney injury (AKI) as prerenal, intrinsic, or postrenal, based on patient history, physical examination, and laboratory values.
2. List risk factors for AKI and formulate strategies to decrease risk of AKI in specific patient populations.

3. Develop a care plan to manage AKI.
4. Identify medications and medication classes associated with acute and chronic kidney damage.
5. Discuss factors that determine the efficiency of dialysis of drugs. For specific agents, calculate the amount of drug removed by dialysis.
6. Identify the stage of chronic kidney disease (CKD) based on patient history, physical examination, and laboratory values.
7. List risk factors for the progression of CKD and formulate strategies to slow the progression of CKD.
8. Describe the common complications of CKD.
9. Develop a care plan to manage the common complications observed in patients with CKD (e.g., anemia, secondary hyperthyroidism).

**SESSION 4: Oncology Supportive Care, Men's and Women's Health, Pharmacokinetics: A Refresher, Fluids, Electrolytes, and Nutrition and Critical Care**

**ONCOLOGY SUPPORTIVE CARE**

**LeAnn Norris, Pharm.D., BCPS, BCOP**
Clinical Assistant Professor
Department of Clinical Pharmacy and Outcomes Sciences
South Carolina College of Pharmacy
Columbia, South Carolina

1. Identify, assess, and recommend appropriate pharmacotherapy for managing common complications of cancer chemotherapy, including nausea and vomiting; myelosuppression and the appropriate use of growth factors; infection; anemia and fatigue; cardiotoxicity; and extravasation injury.
2. Assess and recommend appropriate pharmacotherapy for managing cancer-related pain.
3. Assess and recommend appropriate pharmacotherapy for managing oncologic emergencies, including hypercalcemia, hyperuricemia, and spinal cord compression.

**MEN'S AND WOMEN'S HEALTH**

**Shareen El-Ibiary, Pharm.D., BCPS**
Associate Professor
Department of Pharmacy Practice
Midwestern University College of Pharmacy
Glendale, Arizona

1. Recommend appropriate treatment options for patients with osteoporosis, menopausal symptoms, infertility and sexual dysfunction.
2. Identify drugs that are considered safe and unsafe in pregnancy and lactation.
3. Modify contraceptive regimens based on estrogen- and progestin-related adverse effects or drug interactions.
4. Devise a pharmacotherapeutic plan for appropriate contraceptive use, misused contraceptive methods, and use of emergency contraception.

5. Identify the common sexually transmitted diseases and recommend appropriate pharmacotherapy.

**PHARMACOKINETICS**

**Curtis L. Smith, Pharm.D., BCPS**
Professor
Ferris State University
Lansing, Michigan

1. Identify and provide examples using basic pharmacokinetic concepts commonly used in clinical practice, including elimination rate constant, volume of distribution (Vd), clearance, and bioavailability.
2. Describe specific pharmacokinetic characteristics of commonly used therapeutic agents, and pharmacokinetic alterations in patients with renal and hepatic disease.
3. Define important issues as they relate to drug concentration sampling and interpretation.

**FLUIDS, ELECTROLYTES, AND NUTRITION**

**Judith Kristeller, Pharm.D., BCPS**
Associate Professor
Wilkes University
Wilkes Barre, Pennsylvania

1. Calculate the osmolarity of intravenous fluids and compare with normal plasma osmolarity.
2. Recommend an appropriate intravenous fluid regimen and monitoring parameters based on a patient's clinical characteristics.
3. Discuss the appropriate use and risks of hypertonic and hypotonic saline, and recommend a treatment regimen and monitoring parameters to ensure safe and effective use of these intravenous fluids.
4. Assess electrolyte abnormalities and recommend an appropriate pharmacologic treatment plan based on individual patient signs and symptoms.
5. Discuss appropriate indications for the use of enteral and parenteral nutrition.
6. Recommend a patient-specific enteral formula, infusion rate, and monitoring parameters.
7. Recommend a patient-specific parenteral nutrition formula and monitoring plan based on type of intravenous access, nutritional needs, comorbidities, and clinical condition.
8. Discuss strategies for preventing complications associated with enteral and parenteral nutrition.

**CRITICAL CARE**

**Judith Kristeller, Pharm.D., BCPS**
Associate Professor
Wilkes University
Wilkes Barre, Pennsylvania

1. Discuss strategies for preventing complications in intubated critically ill patients.
2. Recommend a regimen to provide optimal analgesia and sedation in critically ill patients.

3. Discuss the differences in treatment of hypovolemic and septic shock.
4. Discuss appropriate use of fluids, vasopressors, antibiotics, corticosteroids, and recombinant human activated protein C in patients with severe sepsis or septic shock.
5. Recommend pharmacologic therapy to prevent stress ulcers, venous thromboembolism, and hyperglycemia in critically ill patients.

**SESSION 5: Cardiology I, Cardiology II and Cardiology III**

**CARDIOLOGY I**

**Jo E. Rodgers, Pharm.D., BCPS**
Clinical Associate Professor
Division of Pharmacotherapy and Experimental Therapeutics
School of Pharmacy
University of North Carolina
Chapel Hill, North Carolina

1. Formulate evidence-based treatment strategies for patients with acute decompensated heart failure.
2. Describe an appropriate treatment strategy for atrial and ventricular arrhythmias using evidence-based medicine.
3. Prepare a treatment strategy for a newly diagnosed patient with idiopathic pulmonary arterial hypertension.
4. Select appropriate pharmacologic therapy and develop a monitoring plan for antihypertensive drug therapy for managing hypertensive crises.

**CARDIOLOGY II**

**Barbara S. Wiggins, Pharm.D., FCCP, FNLA, FAHA, BCPS (AQ Cardiology), CLS**
Hospital Corporation of America
Richmond, Virginia

1. Distinguish between the different Acute Coronary Syndromes (ST-Segment Elevation Myocardial Infarction, or STEMI), (Non-ST Segment Elevation Myocardial Infarction, or NSTEMI), and Unstable Angina or UA) by diagnosis as well as treatment.
2. Develop a pharmacotherapy treatment plan for a patient presenting with the various Acute Coronary Syndromes.
3. Develop a pharmacotherapy treatment plan for a patient with Peripheral Arterial Disease (PAD).
4. Demonstrate an understanding of the pathophysiology, prognosis, and economic impact of Peripheral Arterial Disease.
5. Identify and determine the appropriate therapeutic goals for a patient with dyslipidemia based on cardiovascular risk factors.
6. Develop a pharmacotherapy treatment plan for a patient with dyslipidemia based on various cholesterol targets as well as cardiovascular risk factors.

**CARDIOLOGY III**

**Robert L. Page, II, Pharm.D., MSPH, FCCP, FASHP, FAHA, BCPS, CGP**
Associate Professor of Clinical Pharmacy & Physical Medicine
Clinical Specialist
Division of Cardiology
University of Colorado at Denver Health Sciences Center
School of Pharmacy
Aurora, Colorado

1. Recommend patient-specific pharmacologic management of chronic heart failure, with an emphasis on mortality-reducing drugs and their target dosages.
2. Develop an appropriate pharmacologic and monitoring plan for patients with atrial fibrillation.
3. Given a patient with hypertension, outline the optimal pharmacologic management based on practice guidelines and clinical trial evidence.
4. Create an evidence-based drug regimen for a patient with coronary artery disease in both the presence and absence of stable angina.