

# 2020 Cardiology Pharmacy Preparatory Review and Recertification Course

## Learning Objectives

### Primary Prevention of Cardiovascular Disease and Public Health

At the end of this activity you will be able to:

1. Identify the pharmacotherapeutic agents that reduce the risk of developing cardiovascular disease (CVD).
2. Given a patient scenario, develop a treatment plan that incorporates lifestyle modifications and evidence-based pharmacotherapy to reduce the risk of an index cardiac event.
3. Develop a tobacco cessation plan for a patient who requests assistance for a quit attempt.
4. Describe the role of selecting appropriate statin potency for the primary prevention of CVD.
5. Formulate discussion points that should be incorporated into a patient discussion regarding aspirin use for the primary prevention of CVD.
6. Advise a patient on the most appropriate nonpharmacologic and pharmacotherapeutic options for managing obesity.

### Dyslipidemia

At the end of this activity you will be able to:

1. Describe the role of cholesterol and lipoproteins in the development of atherosclerotic cardiovascular disease (ASCVD).
2. Evaluate a patient's ASCVD risk by appropriately using the 10-year ASCVD Risk Pooled Cohort Equations and optional risk markers.
3. Establish goals of therapy, statin intensity and create a monitoring plan for patients receiving lipid-lowering therapies. Establish goals of therapy, select an appropriate statin intensity, and create a monitoring plan for patients receiving lipid-lowering therapies for primary and secondary prevention of ASCVD.
4. Develop an appropriate treatment regimen for patients who are statin intolerant or unable to achieve goals of therapy on maximally tolerated statin therapy, according to the 2018 Guideline on the Management of Blood Cholesterol.
5. Identify appropriate indications for the use of triglyceride-lowering therapies to manage hypertriglyceridemia.
6. Evaluate the needs of special populations (e.g., those with diabetes, older adults, those with kidney disease), and adapt treatment strategies to optimize outcomes.

### Blood Pressure Management in Adult Patients

At the end of this activity you will be able to:

1. Develop an optimal pharmacologic treatment plan for a patient with hypertension (HTN) according to practice guidelines and clinical trial evidence.

2. Demonstrate appropriate drug selection and blood pressure goals for the treatment of HTN according to concomitant conditions and compelling indications.
3. Devise an evidence-based treatment strategy for resistant HTN to achieve blood pressure goals.
4. Construct appropriate drug therapy plans for the treatment of hypotension.

### **Stable Atherosclerotic Disease**

At the end of this activity you will be able to:

1. Recommend patient-specific pharmacologic therapy for the management of stable ischemic heart disease (SIHD).
2. Differentiate between the antianginal options for a patient with refractory angina.
3. Develop an optimal pharmacologic regimen and monitoring plan for patients with peripheral arterial disease (PAD) considering individual patient symptomatology and characteristics.
4. Develop an evidence-based pharmacologic regimen for secondary prevention of ischemic stroke and transient ischemic attack (TIA).
5. Recommend risk factor modification strategies to prevent a recurrent event for patients with SIHD, PAD, and ischemic stroke/TIA.

### **Anticoagulation**

At the end of this activity you will be able to:

1. Recommend a patient-specific pharmacotherapy plan to reduce the risk of stroke in patients with nonvalvular atrial fibrillation (NVAf).
2. Devise an evidence-based pharmacotherapy plan for preventing and treating venous thromboembolism (VTE).
3. Analyze the need for anticoagulant therapy in patients with atrial fibrillation or VTE.
4. Determine appropriate reversal strategies for patients at risk of active bleeding, or actively bleeding while receiving anticoagulation therapy.
5. Determine appropriate selection and dosing of anticoagulant therapy on the basis of patient-specific factors and drug interactions.
6. Evaluate literature and clinical implications of data for patients receiving anticoagulant agents.

### **Arrhythmias**

At the end of this activity you will be able to:

1. Describe the principles of basic electrocardiogram (ECG) interpretation.
2. Compare and contrast risk factors for and etiologies, clinical features, signs and symptoms, and goals of therapy of sinus bradycardia, atrial fibrillation (AF), supraventricular tachycardia (SVT) (including Wolff-Parkinson-White [WPW] syndrome), premature ventricular complexes (PVCs), and ventricular tachycardia (VT).
3. Compare and contrast appropriate pharmacologic and nonpharmacologic treatment options for sinus bradycardia, AF, SVT, PVCs, and VT.
4. Compare and contrast the mechanisms of action of drugs used for ventricular rate control and conversion to and maintenance of sinus rhythm in patients with AF.

5. Describe the risk of thromboembolism in patients with AF and the importance of anticoagulation in this population.
6. Compare and contrast nonpharmacologic and pharmacologic methods of terminating and preventing recurrence of SVT
7. Compare and contrast nonpharmacologic and pharmacologic methods of terminating VT, preventing recurrence, and reducing the risk of sudden cardiac death
8. Develop evidence-based patient-specific pharmacotherapy plans for patients with symptomatic sinus bradycardia, AF, SVT (including WPW), PVCs, and VT.
- 9: Describe common and important drug-drug interactions associated with drugs used for the management of arrhythmias and their complications.

### **Drug-Induced Cardiovascular Disease and Drugs to Avoid in Cardiovascular Disease**

At the end of this activity you will be able to:

1. Identify potential drug-induced cardiovascular diseases.
2. Analyze a medication list to determine causative agents for common drug-induced cardiovascular diseases.
3. Evaluate potential medications that can contribute to the development of torsades de pointes.
4. Review anticancer therapies that cause cardiovascular toxicities.
5. Evaluate patient characteristics and laboratory values to assess the risk of heparin-induced thrombocytopenia and develop an appropriate treatment plan.

### **Chronic Heart Failure**

At the end of this activity you will be able to:

1. Given a patient with heart failure (HF), describe the classifications, staging, clinical presentation, etiologies, and diagnostic considerations.
2. Describe the pathophysiology of HF, focusing on the role that neurohormonal and other vasoactive agents play in HF progression.
3. Given a patient with chronic HF, devise an appropriate pharmacologic and nonpharmacologic therapeutic plan, with an emphasis on guideline-directed therapy and management.
4. Given a patient with chronic HF and several comorbidities, devise an appropriate evidence-based pharmacotherapy plan addressing specific comorbidities related to HF.

## **Acute Decompensated Heart Failure**

At the end of this activity you will be able to:

1. Classify a patient with acute decompensated heart failure (ADHF) into a hemodynamic subset based on signs/symptoms, laboratory values, and hemodynamic measures obtained via pulmonary artery catheter (PAC) monitoring.
2. Design an initial pharmacotherapeutic treatment and monitoring plan for a patient with ADHF based on hemodynamic subset.
3. Devise a modified treatment and monitoring plan in a patient with ADHF and diuretic resistance.
4. Compare and contrast the use of intravenous (IV) vasodilators and positive inotropes in the treatment of ADHF, and among the agents within each drug class.
5. List strategies for reducing the risk of heart failure (HF) readmission among patients recovering from ADHF.

## **Cardiac Transplantation and Mechanical Circulatory Support**

At the end of this activity you will be able to:

1. Evaluate levels of risk in the cardiac transplant candidate.
2. Derive rational peri- and postoperative rejection mitigation strategies in cardiac transplant recipients.
3. . Devise effective thromboprophylactic strategies for patients receiving percutaneous ventricular assist device support.
4. Construct safe and effective drug therapy regimens for patients receiving extracorporeal membrane oxygenation support
5. Design effective treatment plans for patients with complications of durable left ventricular assist device therapy.

## **Acute Coronary Syndromes**

At the end of this activity you will be able to:

1. Distinguish between reperfusion strategies for acute coronary syndrome (ACS): ST-segment elevation myocardial infarction (STEMI) and non–ST-segment elevation (NSTEMI) ACS.
2. Devise a pharmacotherapeutic treatment plan for a patient with STEMI undergoing primary percutaneous coronary intervention (PCI) and for a patient with NSTEMI-ACS undergoing an early invasive or ischemic-guided approach.
3. Differentiate between the best possible pharmacologic options for preventing thrombotic events in the acute management of ACS.
4. Analyze differences in evidence, pharmacology, pharmacokinetics, drug-drug interactions, monitoring, and adverse events between the P2Y<sub>12</sub> inhibitors and anticoagulants used in ACS management.
5. Devise an individualized evidence-based treatment plan for patients in need of secondary prevention post-ACS, including mortality-reducing therapies.

## **Cardiovascular Emergencies**

At the end of this activity you will be able to:

1. Choose appropriate management pathways/treatment for a patient with cardiac arrest according to patient presentation.
2. Differentiate between the various categories of shock.
3. Select the optimal management strategies for the various types of shock.
4. Construct a pharmacotherapy regimen for the various hypertensive crises.
5. Select an appropriate management plan for a patient presenting with acute aortic syndrome.
6. Design a pharmacotherapy plan for the management of acute ischemic stroke.

## **Pulmonary Arterial Hypertension**

At the end of this activity you will be able to:

1. Describe the classification of pulmonary hypertension and implications for treatment.
2. Discuss the importance of pulmonary arterial hypertension (PAH) pathobiology and the role of various pathways as treatment targets in the development of PAH-specific treatment.
3. Define treatment goals for the management of PAH.
4. Outline targeted medications for PAH, including indications, dosing, monitoring, and their place within current treatment algorithms.
5. Identify common adverse effects and drug interactions associated with PAH medications.
6. Highlight appropriate treatment approaches for the management of decompensated PAH.
7. Design a treatment plan for a patient with PAH.

## **Specialized Topics in Cardiovascular Disease**

At the end of this activity you will be able to:

1. Recommend empiric antibiotic therapy for patients with suspected infective endocarditis (IE).
2. Develop a therapeutic plan regarding medication therapy for patients with IE or patients requiring prophylactic therapy for IE prevention.
3. Identify patients who require IE prophylactic therapy.
4. Develop a treatment plan for patients with pericarditis.
5. Recommend appropriate therapy for patients with myocarditis.
6. Plan a medication therapy regimen for patients with valvular heart disease.

## **Pharmacogenomics of Cardiovascular Disease**

At the end of this activity you will be able to:

1. Apply Clinical Pharmacogenetics Implementation Consortium (CPIC) guidance in the clinical setting.
2. Associate clinically actionable genetic polymorphisms with response to cardiovascular pharmacotherapies.
3. For a given patient, estimate therapeutic response to antiplatelet therapy using *CYP2C19* genotype information.
4. For a given patient, analyze the impact of the *SLCO1B1* genotype on the risk of myopathy with statins.
5. For a given patient, estimate the dose of warfarin using *VKORC1* and *CYP2C9* genotype information.

### **Principles of Information Management and Education: Research Design, Biostatistics, Literature, and Education and Training**

At the end of this activity you will be able to:

1. Identify different types of data (nominal, ordinal, continuous) to determine the appropriate type of statistical test (parametric vs. nonparametric).
2. Select appropriate statistical tests based on the sample distribution, data type, and study design.
3. Identify the most appropriate study design to answer a given clinical question.
4. Describe the key tenets of internal and external validity of cardiovascular-related trials.
5. Describe the advantages and disadvantages of surrogate and composite outcomes in cardiovascular studies.

### **Principles of Cardiology Pharmacy Practice Administration: Quality Improvement, Pharmacoeconomics and Safe Medication Use**

At the end of this activity you will be able to:

1. Develop policies, procedures, and clinical protocols related to the medication use process.
2. Identify formulary management activities to improve the prescribing of safe, effective, and affordable treatments in an organization.
3. List high-risk medications and medication-related processes that are suited for a medication use evaluation (MUE) and be capable of managing the MUE process.
4. Identify sources of quality measures relevant to your organization, and use quality and process improvement methods to achieve optimal outcomes.
5. Describe proper documentation practices for clinical pharmacy services and identify the need for accurate documentation.
6. Review pharmacoeconomic principles and their application to patient care.
7. Define a pharmacist's scope of practice and the importance of credentialing and privileging.
8. Compare a medication error, adverse drug event (ADE), adverse drug reaction (ADR), and preventable ADE.
9. Design an ADE reporting program, including committee structure, committee reporting mechanisms, and methods of detecting, reporting, and managing ADEs.