Body System: Cardiovascular		
Session Topic: Cardiovascular Pharmacology		
Educational Format		**Faculty Expertise Required**
REQUIRED	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
OPTIONAL	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. Please describe your interest and plan for teaching a PBL on your proposal form.

Professional Practice Gap	**Learning Objective(s) that will close the gap and meet the need**	**Outcome Being Measured**
• Preventable cardiovascular medication errors are common in the US • Preventable medication errors are higher with regard to look-alike or sound-alike names, omission, dosing, dispensing, and timing • Communication failures and poor care coordination are major sources of medication errors for patients with acute stroke • Physicians are frequently nonadherent to cardiovascular practice guidelines • Patients frequently exhibit poor medication adherence	1. Establish protocols for the consistent application of current practice guidelines for the treatment of common cardiovascular conditions. 2. Determine when a patient's medication history or overall health may produce severe side effects or interfere with treatment for a cardiovascular condition. 3. Develop a collaborative treatment plan for common cardiovascular conditions, emphasizing medication adherence and monitoring. 4. Design a care coordination and communication plan with all members of the cardiovascular care team.	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.

ACGME Core Competencies Addressed (select all that apply)			
X	Medical Knowledge		Patient Care
X	Interpersonal and Communication Skills		Practice-Based Learning and Improvement
	Professionalism		Systems-Based Practice

Faculty Instructional Goals

Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of

new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.

- Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations
- Facilitate learner engagement during the session
- Address related practice barriers to foster optimal patient management
- Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the References section below are a good place to start
    - Visit http://www.aafp.org/journals for additional resources
    - Visit http://familydoctor.org for patient education and resources
- Provide recommendations for establishing protocols for the consistent application of current practice guidelines for the treatment of common cardiovascular conditions.
- Provide recommendations for determining when a patient's medication history or overall health may produce severe side effects or interfere with treatment for a cardiovascular condition.
- Provide strategies and resources for developing a collaborative treatment plan for common cardiovascular conditions, emphasizing medication adherence and monitoring.
- Provide strategies and resources for designing a care coordination and communication plan with all members of the cardiovascular care team.
- Provide recommendations regarding new FDA approved medications for the treatment of a variety of cardiology/vascular diseases; including safety, efficacy, tolerance, and cost considerations relative to currently available options.

Needs Assessment

Of the 214 million office visits to general and family practitioners in the United States in 2010, medications for cardiovascular issues were among the top 5 most prescribed during 85% of those office visits.[1] Many recent reports on patient safety suggest that as many as half of patients suffering acute myocardial infarctions fail to receive aspirin and β-blockers, and thromboprophylaxis with oral anticoagulants is often underutilized in treating patients with atrial fibrillation, due to errors of omission that could cost more lives and cause more disability that errors resulting from negligent practice.[2-4] In addition, of the 450,000 preventable medication-related adverse events that occur each year in the US, cardiovascular medications prescribed to inpatients account a large portion of those errors, averaging one medication error per day.[5] In general, errors are higher with regard to medications with look-alike or sound-alike names, but medication dosing, dispensing, and timing errors are also common; more specifically common medication errors for:[5,6]

- Patients with acute coronary syndrome (ACS) – dosing, omission (initial treatment or resuming treatment), and miscalculation of a patient's weight.
    - Non-optimal dosing of antiplatelet agents
    - Incorrect dosing of fibrinolytic agents
    - Incorrect dosing of anticoagulant agents
- Omission medication errors involving statins

- Patients with acute heart failure are prone to polypharmacy and associated issues with dosing, timing, and drug-drug interactions
- Communication failures and poor care coordination are major sources of medication errors for patients with acute stroke
- Nonadherence to practice guidelines

Data from a recent American Academy of Family Physicians (AAFP) CME Needs Assessment survey indicate that family physicians have knowledge gaps with regard to optimal cardiovascular pharmacological management.[7] More specifically, CME outcomes data from 2012 and 2013 AAFP Assembly: *Cardiovascular Pharmacology* sessions suggest that physicians have knowledge and practice gaps with regard to appropriate use of ACE in first line treatment; appropriate and earlier use of beta-blockers; use of a care coordinator for post discharge; more appropriate use of staging criteria; consistent adherence to guidelines; and more effective use of atenolol, metoprolol, and spironolactone generally.[8,9]

Several factors may contribute to suboptimal use of antiplatelet therapies, including lack of awareness or familiarity with guidelines, complex guidelines, complex medical regimens, poor coordination of care with cardiologists, and lack of knowledge and skills to use adherence-improving tools or resources with their staff or patients.[6,10-12] A recent review of the literature suggests that nonsteroidal anti-inflammatory drug (NSAID) use is associated with increased risk of bleeding and cardiovascular disease in patients receiving antithrombotic therapy.[13,14] Additionally, recent research suggests that testosterone injectables may be associated with an increase in cardiovascular risk.[15-17]

A recent review of the literature reveals the following cardiovascular pharmacology updates:[18,19]

- Oral beta blockers should be started within 24 hours of presentation, if there are no contraindications.
- Treatment with ACE inhibitors is recommended in persons with a left ventricular ejection fraction less than 0.40, hypertension, diabetes mellitus, or stable chronic kidney disease.
- Chewable aspirin without an enteric coating, at a dose of 162 to 325 mg, should be administered as soon as possible.
- Dual antiplatelet therapy with ticagrelor or clopidogrel in combination with aspirin should be given for up to one year in the invasive and ischemia-guided treatment approaches.

The U.S. Food and Drug Administration (FDA) has approved a number of new drugs in recent years for the treatment of a variety of cardiology/vascular diseases.[20] Physicians need to be kept up to date on new treatment options, including safety, efficacy, tolerance, and cost considerations relative to currently available options.

In addition to physician and systems related factors of cardiovascular medication errors, nearly half of the 187 million patients in the US do not take their medications as prescribed, primarily due to poor medication adherence.[21] Identified barriers to medication nonadherence include:[21-25]

- Fragmentation across the health care system, which can limit care coordination or make it difficult for physicians to easily access patient information across different care settings.

- The complexity of the drug therapies, which may lead to a patient's perceived fear of side effects from the medication(s) or general confusion about the regimen.
- Poor communication between a provider and a patient about the medications, or difficulty explaining and understanding the benefits and adverse effects of complex drug therapies.
- Unintentional patient behavioral factors, such as forgetfulness.
- Patients' physical or cognitive impairments.
- Socioeconomic factors, such as low health literacy, and high medication costs, as well as lack of transportation to fill their prescriptions at a pharmacy.
- Newly diagnosed, older heart failure patients with comorbid conditions, polypharmacy, and poor sleep.

Physicians can improve medication adherence by:[26-34]

- Asking if the patient has been taking medications as prescribed.
- Developing a differential diagnosis of nonadherence.
- Tailor the solution to the problem (i.e. adherence solution for a nonadherence problem)
- Prescribe the right drug at the right dose
- Involving the entire care team with medication adherence
- Provide health coaching for patients with chronic conditions
- Develop collaborative care plans
- Integrating a behavioral health specialist into practice
- Use motivational interviewing to encourage patients to change unhealthy behaviors

Physicians can improve patient satisfaction with the referral process by using readily available strategies and tools such as, improving internal office communication, engaging patients in scheduling, facilitating the appointment, tracking referral results, analyzing data for improvement opportunities, and gathering patient feedback.[35,36]

Physicians may improve the efficacy of prescribed cardiovascular medications by engaging in continuing medical education that provides practical integration of current evidence-based guideline-directed medical therapy into their standards of care, including, but not limited to the following the joint guidelines from the American College of Cardiology (ACC) and the American Heart Association (AHA).[37]

Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- ACC/AHA Joint Guidelines[18,37]
- NICE: Medicines adherence. Involving patients in decisions about prescribed medicines and supporting adherence[38]
- Coronary Artery Disease/Coronary Heart Disease. AFP Journal collection[39]
- Atrial Fibrillation. AFP Journal Collection[40]
- Heart Failure. AFP Journal Collection[41]
- Hypertension. AFP Journal Collection[42]
- Updated Guidelines on Outpatient Anticoagulation[43]
- Medication adherence: we didn't ask and they didn't tell[26]
- Health Coaching: Teaching Patients to Fish[27]
- An organized approach to chronic disease care[44]

- The integrated summary: a documentation tool to improve patient care.[45]
- Engaging Patients in Collaborative Care Plans[28]
- Encouraging patients to change unhealthy behaviors with motivational interviewing[30]
- Envisioning new roles for medical assistants: strategies from patient-centered medical homes[31]
- Health coaching for patients with chronic illness[32]
- Adding health education specialists to your practice[33]
- Improving anticoagulation management at the point of care[34]
- Simple tools to increase patient satisfaction with the referral process[35]
- FamilyDoctor.org. High Blood Pressure | Overview (patient education)[46]
- FamilyDoctor.org. Arrhythmia | Overview (patient education)[47]
- FamilyDoctor.org. Heart Failure | Overview (patient education)[48]
- FamilyDoctor.org. Deep Vein Thrombosis | Treatment (patient education)[49]
- FamilyDoctor.org. Caregiving: Caring for an Elderly Relative - Managing Medicines (patient education)[50]
- FamilyDoctor.org. Seniors: Managing Your Medications (patient education)[51]
- FamilyDoctor.org. Working With Your Doctor (patient education)[52]
- FamilyDoctor.org. Prescription Medicines (patient education)[53]

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