Body System: Cardiovascular

Session Topic: Adult Heart Murmurs

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
• Physicians demonstrate significant deficiencies in cardiac auscultation skills; especially if the patient is female, and particularly when male physicians are attempting to correctly auscultate the mitral valve region and palpate for the apical impulse on female versus male patients. • Physicians are often challenged to identify pathologic murmur, using physiologic and pharmacologic maneuvers in the differential diagnosis, determining when referral is appropriate, and recognizing when the murmur is benign or needs follow-up. • Physicians need to be kept up to date on recent (2014) ACC/AHA) guidelines on the management of patients with valvular heart disease.	1. Distinguish innocent and abnormal heart murmurs in patients and classify them as systolic, diastolic or continuous. 2. Formulate a differential diagnosis of specific cardiac sounds and explain the pathology of heart murmurs to patients. 3. Evaluate diagnostic factors in patients with suspected heart murmurs using cost-effective cardiac testing. 4. Coordinate referral and follow-up to a cardiologist for patients with a pathologic cardiac examination, or who has cardiac symptoms and questionable findings on the cardiac examination.	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
	Interpersonal and Communication Skills		Practice-Based Learning and Improvement

	Professionalism	X	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 specific case-based examples illustrating how to apply ACC/AHA guidelines to practice
- Provide specific case-based examples illustrating the diagnosis & distinction of innocent and abnormal heart murmurs in adult patients
- Provide specific strategies and resources for coordinating referral and follow-up to a cardiologist for patients with a pathologic cardiac examination, or who has cardiac symptoms and questionable findings on the cardiac examination.
- Provide recommendations regarding guidelines for Medicare reimbursement.
- Provide recommendations to maximize office efficiency and guideline adherence to the diagnosis and management of
- Provide an overview of newly available treatments, including efficacy, safety, contraindications, and cost/benefit relative to existing treatments.
- Provide instructions regarding the incorporation and use of the PCMH/ACO/Primary Care Core Measure Set into practice.

Needs Assessment

Murmurs can be benign, but they can also be the first signs of pathological changes in the heart valves. Cardiac auscultation is one of the most useful investigative tools available to a physician to detect alterations in cardiovascular anatomy and physiology. Auscultation has a reported sensitivity of 70 percent and a specificity of 98 percent for detection of valvular heart disease. However, the sensitivity and specificity vary substantially with the expertise of the examiner.[1] Distinguishing a pathological murmur from a physiological murmur can be difficult, and some studies indicate that as few as 35% of internal medicine and family medicine residence are able to correctly diagnose a heart murmur using auscultation.[2,3] While signs and symptoms usually depend on the cause (i.e., systolic vs. diastolic functioning) and its severity, some patients exhibit more obvious signs, including blue coloring of the skin; poor eating and abnormal growth, which

is especially common in infants; shortness of breath; excessive sweating; chest pain; dizziness or fainting; and fatigue.

Data from a recent American Academy of Family Physicians (AAFP) CME Needs Assessment survey indicates that family physicians have a significant knowledge gap with regard to diagnosing and managing adult heart murmurs.[4] More specifically, CME outcomes data from 2013-2015 AAFP FMX (formerly Assembly): *Adult Heart Murmur* sessions suggest that physicians have knowledge and practice gaps with regard to the diagnosis and evaluation of heart murmur, especially related to auscultation; identifying pathologic murmur; using physiologic and pharmacologic maneuvers in the differential diagnosis; determining when referral is appropriate; and recognizing when the murmur is benign or needs follow-up.[5-7]

A review of the literature validates that physicians at all training levels demonstrate significant deficiencies in cardiac auscultation skills; especially if the patient is female, and particularly when male physicians are attempting to correctly auscultate the mitral valve region and palpate for the apical impulse on female versus male patients.[8,9] Additionally, aortic stenosis affects 3% of persons older than 65 years; and primary care physicians should consider aortic stenosis in adults who present with any of the cardinal symptoms accompanied by a systolic murmur.[10] Physicians may want to consider the following evidence-based recommendations:[10]

- Transthoracic echocardiography is indicated when there is a loud unexplained systolic murmur, a single second heart sound, a history of a bicuspid aortic valve, or symptoms that might be caused by aortic stenosis.
- Aortic valve replacement is the only treatment that improves mortality in patients with symptomatic severe aortic stenosis.
- Watchful waiting is recommended for most patients with asymptomatic aortic stenosis.
- In asymptomatic patients, serial Doppler echocardiography is recommended every six to 12 months in patients with severe aortic stenosis, every one to two years in those with moderate disease, and every three to five years in those with mild disease.
- Antimicrobial prophylaxis for bacterial endocarditis is not recommended for patients with aortic stenosis unless they have undergone aortic valve replacement or have a history of endocarditis.

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.

In addition to patients older than 65 years of age, all persons undergoing preparticipation physical evaluations should be questioned about exertional symptoms, the presence of a heart murmur, symptoms of Marfan syndrome, and family history of premature serious cardiac conditions or sudden death.[11]

In order to make an accurate diagnosis and appropriate selection of therapeutic interventions, physicians need to be kept up to date on major advances in diagnostic imaging, interventional cardiology and surgical approaches.[12] Awareness of surgical history can help rule out sounds made by prostheses. A prosthetic mitral valve produces a distant click early in diastole that is loudest at the apex and transmitted precordially. A prosthetic aortic valve, on the other hand, causes a sound early in systole. Animal tissues may be silent, and pacemakers no longer produce a sound.[13]

If an abnormal murmur is suspected, physicians may order a chest x-ray, echocardiogram, electrocardiogram, or additional cardiac testing. An echocardiogram is the standard for establishing the cause of a murmur, and family physicians should have working knowledge of current American College/American Heart Association (ACC/AHA) guidelines on the management of patients with valvular heart disease, including recommendations for the use echocardiography in patients with symptomatic and asymptomatic murmurs.[14,15]

Family physicians may choose to refer some patients to sub-specialists for further evaluation and testing, but family physicians should still coordinate care and help explain the potential findings to families. In cases in which specific cardiac abnormalities are confirmed, family physicians are able to offer guidance on steps that can be taken to ensure long-term health, especially when the patient is a child. Depending upon the etiology, family physicians also should be able to discuss potential treatment options, as well as options that may limit progression of further disease, when available. 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.[16,17]

The American Academy of Family Physicians Academy has participated in the Core Measures Collaborative (the Collaborative) convened by America's Health Insurance Plans (AHIP) since August 2014. The Collaborative is a multi-stakeholder effort working to define core measure sets of various specialties promoting alignment and harmonization of measure use and collection across both public and private payers.

Participants in the Collaborative included Centers for Medicare and Medicaid Services (CMS), the National Quality Forum (NQF), private payers, provider organizations, employers, and patient and consumer groups. This effort exists to decrease physician burden by reducing variability in measure selection, specifications and implementation– making quality measurement more useful and meaningful for consumers, employers, as well as public and private clinicians.

With significant AAFP input, a PCMH/ACO/Primary Care Core Measure Set has been developed for primary care. The goal of this set is to decrease burden and allow for more congruence between payer reporting programs.[18]

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

- Radiologic evaluation of suspected congenital heart disease in adults[13]
- Diagnosis and evaluation of heart failure[14]
- 2014 American College of Cardiology/American Heart Association (ACC/AHA) guidelines on the management of patients with valvular heart disease[15]
- Guideline on antibiotic prophylaxis for dental patients at risk for infection[19]
- Simple Tools to Increase Patient Satisfaction With the Referral Process[16]
- Engaging Patients in Collaborative Care Plans[20]
- FamilyDoctor.org. Heart Murmurs | Overview (patient resource)[21]

References:

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9. Chakkalakal RJ, Higgins SM, Bernstein LB, et al. Does patient gender impact resident physicians' approach to the cardiac exam? *Journal of general internal medicine.* Apr 2013;28(4):561-566.

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