



Recommended Curriculum Guidelines for Family Medicine Residents

Cardiovascular Medicine

This document was endorsed by the American Academy of Family Physicians (AAFP).

Introduction

This Curriculum Guideline defines a recommended training strategy for family medicine residents. Attitudes, behaviors, knowledge, and skills that are critical to family medicine should be attained through longitudinal experience that promotes educational competencies defined by the Accreditation Council for Graduate Medical Education (ACGME), www.acgme.org. The family medicine curriculum must include structured experience in several specified areas. Much of the resident's knowledge will be gained by caring for ambulatory patients who visit the family medicine center, although additional experience gained in various other settings (e.g., an inpatient setting, a patient's home, a long-term care facility, the emergency department, the community) is critical for well-rounded residency training. The residents should be able to develop a skillset and apply their skills appropriately to all patient care settings.

Structured didactic lectures, conferences, journal clubs, and workshops must be included in the curriculum to supplement experiential learning with an emphasis on outcomes-oriented, evidence-based studies that delineate common diseases affecting patients of all ages. Patient-centered care and targeted techniques of health promotion and disease prevention are hallmarks of family medicine and should be integrated in all settings. Appropriate referral patterns, transitions of care, and the provision of cost-effective care should also be part of the curriculum.

Program requirements specific to family medicine residencies may be found on the ACGME website. Current AAFP Curriculum Guidelines may be found online at www.aafp.org/cg. These guidelines are periodically updated and endorsed by the AAFP, and in many instances, other specialty societies as indicated on each guideline.

Each residency program is responsible for its own curriculum. **This guideline provides a useful strategy to help residency programs form their curricula for educating family physicians.**

Preamble

Cardiovascular disease is a major cause of morbidity and mortality in our society. The family physician is the most broadly trained health care professional and should be proficient in the diagnosis and management of a variety of cardiovascular disorders. In addition, family physicians are uniquely equipped to provide comprehensive and continuing care to individuals and families, with particular attention to behavioral and lifestyle factors and social determinants of health.

The depth of experience required depends on each resident's expected practice needs, practice location, available facilities, and accessibility of consultants. At times, the family physician may find it appropriate to seek consultation from a cardiologist to either manage or co-manage a patient for optimal care. In other situations, the family physician may need to provide the totality of care to the patient, including cardiovascular care.

Competencies

At the completion of residency training, a family medicine resident should be able to:

- Understand basic and clinical knowledge of normal cardiac anatomy and physiology, as well as the pathophysiology of common cardiovascular diseases (Medical Knowledge)
- Perform a directed cardiac history and physical examination, document findings, develop a differential diagnosis, and plan for further evaluation and management (Patient Care, Medical Knowledge, Interpersonal and Communication Skills)
- Apply evidence-based knowledge regarding primary, secondary, and tertiary prevention of cardiovascular disease (Medical Knowledge, Patient Care)
- Understand the influence of race, gender, culture, and social determinants of health on cardiovascular health (Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Practice-based Learning and Improvement)
- Provide patient education that clarifies disease processes, promotes prevention, self-care, and evidence-based management (Patient Care, Medical Knowledge, Interpersonal and Communication Skills)
- Work with physicians, nurses, pharmacists, nutritionists, and other health care professionals who care for patients who have common cardiovascular diseases (Patient Care, Medical Knowledge, Professionalism, Systems-based Practice)
- Demonstrate an ability to perform cardiac resuscitation and procedures necessary to stabilize a patient experiencing a cardiac emergency (Medical Knowledge, Patient Care)

- Coordinate consultations with specialists and other health care providers to optimize care of patients (Medical Knowledge, Practice-based Learning and Improvement, Professionalism)

Attitudes

The resident should demonstrate attitudes that encompass:

- Awareness of the importance of the physician and patient working as partners to promote optimal cardiovascular health
- A compassionate approach to the care of patients and families who have cardiovascular disease
- Understanding of the psychosocial and economic impact of cardiovascular disease on the individual and family and use of the health care system to assist as needed
- Support of the individual and family through consultation, evaluation, treatment, and rehabilitation
- Recognition of the importance of lifestyle factors and social determinants of health on the development and exacerbation of cardiovascular disease
- Appreciation of a multidisciplinary approach to the care of individuals who have cardiovascular disease

Knowledge

In the appropriate setting, the resident should demonstrate the ability to apply knowledge of:

1. Normal cardiovascular anatomy and physiology
2. Changes in cardiovascular physiology with age, pregnancy, and comorbidities
3. Coronary artery disease risk factors:
 - a. Hyperlipidemia
 - b. Cigarette smoking
 - c. Genetic predisposition
 - d. Sedentary lifestyle
 - e. Hypertension
 - f. Diabetes mellitus
 - g. Obesity
 - h. Poor Nutrition
 - i. Emotional stress
 - j. Gender

4. Cardiovascular history and physical exam
5. Noninvasive diagnostic studies
 - a. Electrocardiography (ECG)
 - b. Chest radiography
 - c. Echocardiography
 - d. Stress testing
 - a. Exercise
 - b. Echocardiography, using exercise or pharmacologic techniques
 - c. Radioisotope, using exercise or pharmacologic techniques
 - e. ECG monitoring (in-hospital/telehealth and ambulatory/Holter or event monitor)
 - f. Vascular ultrasound
 - g. Computed tomography (CT) and computed tomography angiography (CTA)
 - h. Magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA)
6. Invasive diagnostic studies and interventions
 - a. Cardiac catheterization and angiography
 - b. Carotid and peripheral vascular angiography
 - c. Intracoronary and peripheral vascular intervention
 - d. Central venous and peripheral arterial catheter
 - e. Electrophysiologic studies
 - f. Indications and contraindications for therapeutic interventions
 - i. Coronary artery bypass
 - ii. Angioplasty techniques and stent placement
 - iii. Pacemaker insertion
 - iv. Implantable cardioverter-defibrillator
 - v. Valve replacement/repair, percutaneous balloon valvotomy
 - vi. Electrophysiologic ablation
7. Relevant laboratory interpretation, including cardiac enzymes, lipids, and b-type natriuretic peptide (BNP) or pro-BNP
8. Specific diseases/conditions
 - a. Coronary artery disease
 - i. Stable angina
 - ii. Acute coronary syndrome
 - 1) Unstable angina
 - 2) ST elevation myocardial infarction (STEMI) and non-ST elevation myocardial infarction (NSTEMI), and potential associated complications:

- a) Cardiogenic shock
 - b) Dysrhythmias
 - c) Papillary muscle dysfunction and rupture
 - d) Ventricular rupture
 - e) Aneurysm
- b. Peripheral arterial disease
- c. Syncope
 - i. Cardiac
 - ii. Neurally mediated
 - iii. Orthostatic hypotension
- d. Dysrhythmias
 - i. Tachyarrhythmia
 - 1) Supraventricular
 - 2) Ventricular
 - 3) Re-entrant
 - ii. Bradyarrhythmia
 - iii. Ectopy
 - 1) Atrial
 - 2) Ventricular
- e. Hypertension
 - i. Essential
 - ii. Secondary
 - iii. Pulmonary
- f. Dyslipidemia and medication management
 - a. Familial hyperlipidemia
- g. Pulmonary heart disease
 - i. Cor pulmonale
- h. Heart failure
 - i. Heart failure with reduced ejection fraction
 - ii. Heart failure with preserved ejection fraction
- i. Venous thromboembolic disease (VTE)
- j. Valvular heart disease
 - i. Rheumatic
 - ii. Congenital
 - iii. Acquired
- k. Congenital heart disease
 - i. Common left to right shunts (acyanotic)
 - ii. Common right to left shunts (cyanotic)
 - iii. Common obstructive problems
- l. Dissecting aneurysm
- m. Innocent heart murmurs

- n. Peripheral vascular disease
 - i. Aneurysm
 - ii. Carotid atherosclerosis
 - iii. Arterial disease
 - iv. Arteriosclerosis obliterans
- o. Cardiomyopathies
 - i. Congestive (dilated)
 - ii. Restrictive
 - iii. Hypertrophic cardiomyopathy
 - iv. Postpartum
- p. Pericardial disease
- q. Infection-related
 - i. Viral myocarditis
 - ii. Endocarditis
 - iii. Kawasaki disease
- r. Other cardiac disorders
 - i. Immunologic
 - 1) Acute rheumatic fever
 - 2) Autoimmune disorders
 - ii. Psychogenic
 - iii. Traumatic
 - iv. Nutritional
 - v. Myxoma
 - vi. Thyroid dysfunction
 - vii. Marfan syndrome
 - viii. Drug-related, such as cocaine, corticosteroids, or chemotherapeutic agents
- s. Evaluation of cardiac patient for noncardiac surgery
 - i. Cardiac risk, including preoperative assessment tools
 - ii. Preoperative and postoperative management
- t. Antibiotic prophylaxis for valvular disease

Skills

In the appropriate setting, the resident should demonstrate the ability to independently perform or appropriately refer the following:

1. Obtain a cardiac history and perform focused physical examination
2. Counsel regarding lifestyle changes
3. Manage medications in cardiovascular disorders
4. Select, interpret, and/or perform relevant diagnostic procedures
 - a. 12-lead and continuous ECG monitoring

- b. Chest radiographs
 - c. Stress testing
- 5. Perform cardiopulmonary resuscitation (CPR) and advanced cardiac life support (ACLS)
- 6. Manage the patient requiring a temporary or permanent pacemaker
- 7. Manage cardiovascular conditions, including acute myocardial infarction and the post-MI patient; congestive heart failure, conditions requiring anticoagulation; hypertensive urgencies and emergencies, dysrhythmias and conduction disturbances
- 8. Supervise cardiovascular rehabilitation
- 9. Incorporate and address biopsychosocial issues in overall management
 - i. Social determinants of health
 - ii. Sexual function
 - iii. Depression
 - iv. Family dynamics
- 10. Manage patients after an intervention, including
 - i. Percutaneous coronary intervention (PCI)/coronary artery bypass surgery
 - ii. Valve surgery
 - iii. Congenital heart disease surgery

Implementation

Core medical knowledge and skills may be obtained through longitudinal or block rotations and cardiology experiences in intensive care and cardiac care units. Residents will obtain substantial additional cardiology experience throughout the three years of experience in their continuity family medicine practice, on their family medicine inpatient service, during emergency medicine rotations, in the intensive/cardiac care unit, during resuscitations, and through internal medicine elective experiences. Additionally, during their training, residents should have Pediatric Advanced Life Support (PALS), Basic Life Support (BLS) and Advanced Cardiovascular Life Support (ACLS) certification.

Family medicine residents electing additional training in cardiology—particularly residents who are planning to practice in communities without readily available consultation resources—may require skills for which additional training in a structured cardiology education program is strongly recommended. Longitudinal experience in their continuity family medicine practice, on the family medicine inpatient service, in the intensive care unit, and in the emergency department should add experiences in ECG interpretation, stress testing, acute coronary syndrome care, and continued follow up for patients who have cardiovascular problems.

Additionally, residents should be encouraged to evaluate the fashion in which they provide cardiology care for their patients. Using quality improvement processes, learners should engage in practice-based learning and improvement to ensure that patients receive optimal care founded in evidence-based medicine, as well as pay close attention to biopsychosocial issues that can affect management plans.

Resources

Mann DL, Zipes DP, Libby P, Bonow RO. *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*. 11th ed. Philadelphia, Pa: Saunders; 2018.

Wagner GS, Strauss DG. *Marriott's Practical Electrocardiography*. 12th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2014.

Dublin, Dale. *Rapid Interpretation of EKGs*. 6th ed. Tampa, Florida. Cover Publishing Company; 2004

Website Resources

Many resources are available on the internet, including tools for ECG interpretation and cardiac auscultation. We do not endorse any particular website for these purposes but suggest a search for the most current products. Additionally, the following sites are useful in a cardiology curriculum:

American Academy of Family Physicians, *American Family Physician (AFP)* by Topic. Coronary Artery Disease/Coronary Heart Disease.

www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=4

American Academy of Family Physicians. Board review questions, including cardiology groupings. www.aafp.org/online/en/home/cme/boardrev/questions.html

American College of Cardiology. www.acc.org

American College of Chest Physicians. Guidelines and Resources.

www.chestnet.org/Guidelines-and-Resources

American Heart Association. Resources. www.heart.org

Centers for Disease Control and Prevention. Heart Disease.

www.cdc.gov/HeartDisease/

National Institutes of Health, National Heart, Lung, and Blood Institute. Heart and Vascular Resources. www.nhlbi.nih.gov/health-pro/resources/heart

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