AMERICAN ACADEMY OF FAMILY PHYSICIANS

Recommended Curriculum Guidelines for Family Medicine Residents

Cardiovascular Medicine

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

Introduction

Each family medicine residency program is responsible for its own curriculum. The AAFP Commission on Education's Subcommittee on Graduate Curriculum has created this guide as an outline for curriculum development, and it should be tailored to the needs of the program. Through a series of structured and/or longitudinal experiences, the curricula below will support the overall achievement of the core educational competencies defined by the Accreditation Council for Graduate Medical Education and provide guideposts to program requirements specific to family medicine. For updates and details, please refer to the ACGME website at www.acgme.org. 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.

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 SDOH.

The depth of experience required for each resident depends on 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.

Patient Care

At the completion of residency, residents should be able to:

1. Perform a focused cardiac history and physical examination, document findings, develop a differential diagnosis and plan for further evaluation and management
2. Apply evidence-based knowledge regarding primary, secondary and tertiary prevention of cardiovascular disease
3. Understand the influence of race, gender, culture and SDOH on cardiovascular health
4. Demonstrate an ability to perform cardiopulmonary resuscitation and procedures necessary to stabilize a patient experiencing sudden cardiac arrest
5. Manage and titrate medications in cardiovascular disorders
6. Select and interpret appropriate studies, including 12-lead and continuous electrocardiogram monitoring, chest radiographs, echocardiograms and stress testing
7. Perform basic life support, advanced cardiac life support and pediatric advanced life support
8. Manage patients requiring a temporary or permanent pacemaker
9. Manage cardiovascular conditions, including acute myocardial infarction, congestive heart failure, conditions requiring anticoagulation, severe asymptomatic hypertension and hypertensive emergencies, dysrhythmias and conduction disturbances, with evidence-based follow-up care
10. Manage patients after cardiac interventions, including percutaneous coronary intervention/coronary artery bypass surgery, valvular surgery and congenital heart disease surgery
11. Manage patients with preeclampsia with severe features and superimposed preeclampsia
12. Provide indications for referral to cardiology, cardiothoracic surgery and genetics
13. Supervise cardiovascular rehabilitation

Medical Knowledge

Family medicine residents should demonstrate the ability to apply knowledge of the following:

1. Normal cardiovascular anatomy and physiology
2. Changes in cardiovascular physiology related to 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. ECG
    b. Chest radiography
    c. Echocardiography
    d. Stress testing
        i. Exercise
        ii. Echocardiography, using exercise or pharmacologic techniques
        iii. Nuclear, using exercise or pharmacologic techniques
    e. ECG monitoring (in-hospital/telemetry and ambulatory/Holter or event monitor)
    f. Ultrasound
        i. Point-of-care ultrasound: evaluation of inferior vena cava volume, pericardial effusion, myocardial contractility
        ii. Ankle-brachial index
        iii. Carotid
    g. Computed tomography, calcium scoring and computed tomography angiography
    h. Magnetic resonance imaging and magnetic resonance angiography
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. IVC filter
        vii. Electrophysiologic ablation
        viii. Cardioversion
7. Relevant laboratory interpretation, including -high-sensitivity C-reactive protein, cardiac enzymes, lipids, lipoprotein(a), B-type natriuretic peptide 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 and non-ST elevation myocardial infarction 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. Neurologic
    ii. Orthostatic hypotension
    iii. Vasovagal
d. Dysrhythmias
    i. Tachyarrhythmia
        1) Supraventricular
        2) Ventricular
        3) Reentrant
    ii. Bradyarrhythmia
    iii. Ectopy
        1) Atrial
        2) Ventricular
e. Hypertension
    i. Essential
    ii. Secondary
    iii. Pulmonary
f. Dyslipidemia and medication management
    i. Familial hypercholesterolemia
g. Pulmonary heart disease
    i. Cor pulmonale
h. Heart failure
    i. Heart failure with reduced ejection fraction
    ii. Heart failure with preserved ejection fraction
    iii. Heart failure with recovered ejection fraction
i. Venous thromboembolic disease
    i. Deep vein thrombosis
    ii. Pulmonary embolism
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. Dilated
    ii. Restrictive
    iii. Hypertrophic cardiomyopathy
    iv. Left ventricular noncompaction
    v. 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

Interpersonal Communication

At the completion of residency, residents should be able to:

1. Recognize the importance of lifestyle factors and SDOH on the development and exacerbation of cardiovascular disease
2. Demonstrate the ability to counsel patients regarding lifestyle changes
3. Incorporate and address biopsychosocial issues in overall management, including SDOH, sexual function, gender-affirming care, depression and family dynamics
4. Provide patient education that clarifies disease processes and promotes prevention, self-care and evidence-based management

5. Demonstrate awareness of the importance of the physician and patient working as partners to promote optimal cardiovascular health
6. Show a compassionate approach to the care of patients and families who have cardiovascular disease
7. Provide support to the individual and family through consultation, evaluation, treatment and rehabilitation
8. Promote a safe environment where patients and others involved in their care can actively engage in their care decisions
9. Assist patients and others involved in their care in locating reputable medical information on the internet and other sources
10. Discuss internet safety and protection of health information

Systems-Based Practice

At the completion of residency, residents should be able to:

1. Facilitate a multidisciplinary approach to the care of individuals who have cardiovascular disease
2. Work with physicians, nurses, pharmacists, registered dietitians and other health care professionals who care for patients who have common cardiovascular diseases
3. Coordinate consultations with specialists and other health care providers to optimize the care of patients
4. Understand the psychosocial and economic impact of cardiovascular disease on the individual and family and use of the health care system to assist patients and communities faced with health inequities

Practice-Based Learning

At the completion of residency, residents should be able to:

1. Commit to lifelong learning about cardiovascular disease
2. Demonstrate the ability to critically appraise and apply evidence to effectively manage patients with cardiovascular disease
3. Analyze performance on quality indicators such as lipid profile and blood pressure goals and develop strategies for improvement in these metrics

Professionalism

At the completion of residency, residents should be able to:

1. Have sensitivity to and knowledge of the emotional aspects of cardiovascular illness
2. Have awareness of and willingness to overcome their own biases, attitudes and stereotypes regarding cardiovascular illness and recognize how these affect patient care

3. Articulate acceptance of the patient's right to self-determination while providing empathy
4. Demonstrate sensitivity to differences among patients' and their families' approaches to cardiovascular disease, which are influenced by the individual's gender, race, age, ethnicity, religion and culture
5. Demonstrate awareness of implicit bias, particularly in relationship to race and ethnicity

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, during their family medicine inpatient service, during emergency medicine rotations, in the intensive/cardiac care unit, during resuscitations and through internal medicine elective experiences. Additionally, residents should have PALS, BLS and ACLS certifications during training.

Family medicine residents electing additional training in cardiology — particularly residents 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, in 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 how they provide cardiac 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

Libby P, Bonow RO, Mann DL, Tomaseli GF, Bhatt DL, Soloman SD, Braunwald E. *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*. 12th ed. Philadelphia, Pa: Saunders; 2022.

Strauss DG, Schocken DD. *Marriott's Practical Electrocardiography.* 13th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2022.

O'Keefe, James. The Complete Guide to ECGs. 5th ed. Jones and Bartlett Learning; 2019

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:

AAFP, *American Family Physician* by Topic. Coronary Artery Disease/Coronary Heart Disease. www.aafp.org/pubs/afp/topics/by-topic.coronary-artery-disease-coronary-heart-disease.html

AAFP. Board review questions, including cardiology groupings. www.aafp.org/cme/all/board-review-questions.mem.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/resources

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Revised 06/2015 by Northwestern University Feinberg School of Medicine Department of Family and Community Medicine, Chicago, IL
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