ACGME International

Advanced Specialty Program Requirements for Graduate Medical Education in Cardiovascular Disease Residency

Initial Approval:

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Int. Introduction

Background and Intent: Programs must achieve and maintain Foundational Accreditation according to the ACGME-I Foundational Requirements prior to receiving Advanced Specialty Accreditation. The Advanced Specialty Requirements noted below complement the ACGME-I Foundational Requirements. For each section, the Advanced Specialty Requirements should be considered together with the Foundational Requirements.

Int. I. Definition and Scope of the Specialty

A residency in cardiovascular disease focuses on prevention, diagnosis, and management of disorders of the cardiovascular system. In the residency model, cardiovascular education and training begin after a foundational phase in clinical internal medicine.

Int. II. Duration of Education

Int. II.A. The educational program in cardiovascular disease must be 48 to 60 months in length.

I. Institution

I.A. Sponsoring Institution

See International Foundational Requirements, Section I.A.

I.B. Participating Sites

I.B.1. A residency in internal medicine or a transitional year must be available at the primary clinical site or at a participating site that provides a required rotation for the cardiovascular disease program.

II. Program Personnel and Resources

II.A. Program Director

II.A.1. See International Foundational Requirements, Section II.A.

II.B. Faculty

II.B.1. In addition to the program director, there must be an associate program director who is an internal medicine physician and who is responsible for the oversight of the internal medicine-related clinical educational experience.

II.B.2. Faculty members with expertise in the following subspecialty areas of cardiology must function on an ongoing basis to provide education and as integral parts of the clinical components of the program in both inpatient

and outpatient settings:

II.B.2.a) critical care cardiology;

II.B.2.b) electrophysiology;

II.B.2.c) heart failure;

II.B.2.d) interventional cardiology; and,

II.B.2.e) multimodality imaging.

II.B.3. An expert in adult congenital cardiology should be available for consultation and patient care.

II.C. Other Program Personnel

II.C.1. Residents must have regular interaction with electrophysiologists and cardiac surgeons, such as at catheterization conferences, in patient care planning, and/or through remote technology.

II.C.2. The following personnel must be available to provide multidisciplinary patient care and education:

II.C.2.a) dietitians;

II.C.2.b) language interpreters;

II.C.2.c) nurses;

II.C.2.d) occupational therapists;

II.C.2.e) physical therapists; and,

II.C.2.f) social workers.

II.D. Resources

II.D.1. The following must be present at the primary clinical site or at a participating site that provides required clinical experiences for the cardiovascular disease program:

II.D.1.a) a cardiac intensive care unit; and,

II.D.1.b) an active cardiac surgery program.

II.D.2. The following laboratory services must be present at the primary clinical site or at a participating site that provides a required rotation for the cardiovascular disease program:

II.D.2.a) cardiac catheterization laboratories, including cardiac hemodynamics and a full range of interventional cardiology;

II.D.2.b) cardiac radiology laboratory, including magnetic resonance imaging (MRI) and computed tomography (CT);

II.D.2.c) cardiac radionuclide laboratories;

II.D.2.d) echocardiography laboratories, including Doppler and transesophageal echocardiography;

II.D.2.e) electrocardiogram (ECG), ambulatory ECG, and exercise testing laboratories;

II.D.2.f) electrophysiology laboratories; and,

II.D.2.g) a non-invasive vascular laboratory.

III. Resident Appointment

III.A. Eligibility Criteria

See International Foundational Requirements, Section III.A.

III.B. Number of Residents

See International Foundational Requirements, Section III.B.

III.C Resident Transfers

See International Foundational Requirements, Section III.C.

III.D. Appointment of Fellows and Other Learners

See International Foundational Requirements, Section III.D.

IV. Specialty-Specific Educational Program

IV.A. ACGME-I Competencies

IV.A.1. The program must integrate the following ACGME-I Competencies into the curriculum.

IV.A.1.a) Professionalism

IV.A.1.a).(1) Residents must demonstrate a commitment to professionalism and an adherence to ethical principles. Residents must demonstrate:

IV.A.1.a).(1).(a) compassion, integrity, and respect for others;

IV.A.1.a).(1).(b) responsiveness to patient needs that supersedes self-interest;

IV.A.1.a).(1).(c) respect for patient privacy and autonomy;

IV.A.1.a).(1).(d) accountability to patients, society, and the

profession;

IV.A.1.a).(1).(e) sensitivity and responsiveness to a diverse patient population, including to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation;

IV.A.1.a).(1).(f) ability to recognize and develop a plan for one's own personal and professional well-being; and,

IV.A.1.a).(1).(g) commitment to professionalism and an adherence to ethical principles.

IV.A.1.b) Patient Care and Procedural Skills

IV.A.1.b).(1) Residents must provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents must demonstrate competence in:

IV.A.1.b).(1).(a) a variety of roles within a health system with progressive responsibility, including serving as the direct provider, the leader or member of an interprofessional or multi-disciplinary team of providers, as a consultant to other physicians, and as a teacher to patients, patients' families, and other health care workers;

IV.A.1.b).(1).(b) the prevention, counseling, detection, and diagnosis and treatment of adult cardiovascular diseases;

IV.A.1.b).(1).(c) managing patients in a variety of health care settings, including inpatient and various ambulatory settings, to include the emergency setting;

IV.A.1.b).(1).(d) managing patients across the spectrum of clinical disorders seen in the practice of general internal medicine;

IV.A.1.b).(1).(e) using clinical skills of interviewing and physical examination;

IV.A.1.b).(1).(f) using the laboratory and imaging techniques appropriately;

IV.A.1.b).(1).(g) providing care for a sufficient number of undifferentiated acutely and severely ill patients;

IV.A.1.b).(1).(h) using critical thinking and evidence-based tools;

IV.A.1.b).(1).(i) using population-based data; and,

IV.A.1.b).(1).(j) providing care for patients with whom they have limited or no physical contact, through the use of

telemedicine.

IV.A.1.b).(2). Residents must demonstrate competence in prevention, evaluation, and management of:

IV.A.1.b).(2).(a) acute myocardial infarction and other acute coronary syndromes;

IV.A.1.b).(2).(b) adult congenital heart disease;

IV.A.1.b).(2).(c) arrhythmias;

IV.A.1.b).(2).(d) cardiomyopathy;

IV.A.1.b).(2).(e) cardiovascular evaluation of patients undergoing non-cardiac surgery;

IV.A.1.b).(2).(f) congestive heart failure;

IV.A.1.b).(2).(g) coronary heart disease, including:

IV.A.1.b).(2).(g).(i) acute coronary syndromes; and,

IV.A.1.b).(2).(g).(ii) chronic coronary artery disease.

IV.A.1.b).(2).(h) diseases of the aorta;

IV.A.1.b).(2).(i) heart disease in pregnancy;

IV.A.1.b).(2).(j) hypertension;

IV.A.1.b).(2).(k) infectious and inflammatory heart disease;

IV.A.1.b).(2).(l) lipid disorders and metabolic syndrome;

IV.A.1.b).(2).(m) need for end-of-life (palliative) care;

IV.A.1.b).(2).(n) pericardial disease;

IV.A.1.b).(2).(o) peripheral vascular disease;

IV.A.1.b).(2).(p) pulmonary hypertension;

IV.A.1.b).(2).(q) thromboembolic disorders; and,

IV.A.1.b).(2).(r) valvular heart disease.

IV.A.1.b).(3). Residents must be able to perform all medical, diagnostic, and surgical procedures considered essential for the prevention and treatment of cardiovascular disease, including:

IV.A.1. b).(3).(a) conscious sedation;

IV.A.1.b).(3).(b) direct cardioversion or defibrillation;

IV.A.1.b).(3).(c) echocardiography;

IV.A.1.b).(3).(d) ECG stress testing;

IV.A.1.b).(3).(e) right and left heart catheterization, to include coronary arteriography;

IV.A.1.b).(3).(f) placement and management of temporary pacemakers, to include transvenous and transcutaneous; and,

IV.A.1.b).(3).(g) programming and follow-up surveillance of permanent pacemakers and implantable cardioverter defibrillators (ICD).

IV.A.1. b).(4). Residents must treat each patient's conditions with practices that are patient-centered, safe, scientifically based, effective, timely, and cost-effective.

IV.A.1. b).(5). Residents must use diagnostic and/or imaging studies relevant to the care of the patient, including interpretation of:

IV.A.1.b).(3).(a) ambulatory ECG recordings;

IV.A.1.b).(3).(b) chest x-rays;

IV.A.1.b).(3).(c) electrocardiograms; and,

IV.A.1.b).(3).(d) nuclear cardiology, to include single-photon emission computerized tomography (SPECT) myocardial perfusion imaging and ventriculograms.

IV.A.1.c) Medical Knowledge

IV.A.1.c).(1) Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care. Fellows must demonstrate knowledge of:

IV.A.1.c).(1).(a) the scientific method of problem solving and evidence-based decision-making;

IV.A.1.c).(1).(b) indications, contraindications, and techniques for, and limitations, complications, and interpretation of results of those diagnostic and therapeutic procedures integral to the discipline, including the appropriate indications for and use of screening tests and procedures;

IV.A.1.c).(1).(c) evaluating patients with an undiagnosed and

undifferentiated presentation;

IV.A.1.c).(1).(d) recognizing and providing initial management of emergency medical problems;

IV.A.1.c).(1).(e) the following content areas of basic science:

IV.A.1.c).(1).(e).(i) cardiovascular anatomy;

IV.A.1.c).(1).(e).(ii) cardiovascular metabolism;

IV.A.1.c).(1).(e).(iii) cardiovascular pathology;

IV.A.1.c).(1).(e).(iv) cardiovascular pharmacology, including drug metabolism, adverse effects, indications, the effects on aging, relative costs of therapy, and the effects of non-cardiovascular drugs on cardiovascular function;

IV.A.1.c).(1).(e).(v) cardiovascular physiology;

IV.A.1.c).(1).(e).(vi) genetic causes of cardiovascular disease; and,

IV.A.1.c).(1).(e).(vii) molecular biology of the cardiovascular system.

IV.A.1.c).(1).(f) primary and secondary prevention of cardiovascular disease, including:

IV.A.1.c).(1).(f).(i) biostatistics;

IV.A.1.c).(1).(f).(ii) cardiac rehabilitation;

IV.A.1.c).(1).(f).(iii) cerebrovascular disease;

IV.A.1.c).(1).(f).(iv) clinical epidemiology; and,

IV.A.1.c).(1).(f).(v) current and emerging risk factors.

IV.A.1.c).(1).(g) evaluation and management of patients with:

IV.A.1.c).(1).(g).(i) adult congenital heart disease;

IV.A.1.c).(1).(g).(ii) cardiac trauma;

IV.A.1.c).(1).(g).(iii) cardiac tumors;

IV.A.1.c).(1).(g).(iv) cerebrovascular disease; and,

IV.A.1.c).(1).(g).(v) geriatric cardiology.

IV.A.1.c).(2) Residents must demonstrate sufficient knowledge specific to cardiology including application of technology

appropriate for the clinical context, including evolving technologies.

IV.A.1.d) Practice-Based Learning and Improvement

IV.A.1.d).(1) Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and lifelong learning. Residents are expected to develop skills and habits to be able to meet the following goals:

IV.A.1.d).(1).(a) identify strengths, deficiencies, and limits in one's knowledge and expertise;

IV.A.1.d).(1).(b) identify and perform appropriate learning activities;

IV.A.1.d).(1).(c) incorporate feedback and formative evaluation into daily practice;

IV.A.1.d).(1).(d) locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;

IV.A.1.d).(1).(e) set learning and improvement goals;

IV.A.1.d).(1).(f) systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement; and,

IV.A.1.d).(1).(g) use information technology to optimize learning.

IV.A.1.e) Interpersonal and Communication Skills

IV.A.1.e).(1) Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, patients' families, and health professionals.

IV.A.1.e).(1).(a) communicate effectively with patients, patients' families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;

IV.A.1.e).(1).(b) communicate effectively with physicians, other health professionals, and health-related agencies;

IV.A.1.e).(1).(c) work effectively as a member or leader of a health care team or other professional group;

IV.A.1.e).(1).(d) educate patients, patients' families, students, other residents, and other health professionals;

IV.A.1.e).(1).(e) act in a consultative role to other physicians and health professionals;

IV.A.1.e).(1).(f) maintain comprehensive, timely, and legible medical records; and,

IV.A.1.e).(1).(g) communicate with patients and patients' families to partner with them to assess their care goals, including, when appropriate, end-of-life goals.

IV.A.1.f) Systems-Based Practice

IV.A.1.f).(1) Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, including the social determinates of health, as well as the ability to call effectively on other resources in the system to produce optimal care. Residents must:

IV.A.1.f).(1).(a) advocate for quality patient care and optimal patient care systems;

IV.A.1.f).(1).(b) coordinate patient care across the health care continuum as relevant to their clinical specialty;

IV.A.1.f).(1).(c) incorporate considerations of value, cost awareness, and risk-benefit analysis in patient and/or population-based care as appropriate;

IV.A.1.f).(1).(d) participate in identifying system errors and implementing potential systems solutions;

IV.A.1.f).(1).(e) understand health care finances and their impact on individual patients' health decisions;

IV.A.1.f).(1).(f) work effectively in various health care delivery settings and systems relevant to their clinical specialty; and,

IV.A.1.f).(1).(g) work in inter-professional teams to enhance patient safety and improve patient care quality.

IV.B. Regularly Scheduled Educational Activities

IV.B.1. The educational program must include didactic instruction based upon the core knowledge content in internal medicine and cardiovascular disease.

IV.B.1.a) The program must ensure that residents have an opportunity to review all knowledge content from conferences that they could not attend.

IV.B.2. Residents must have a sufficient number of didactic sessions to ensure resident-to-resident and resident-to-faculty member interaction.

IV.B.3. Patient-based teaching must include direct interaction between residents and attending physicians, bedside teaching, discussion of pathophysiology, and the use of current evidence in diagnostic and therapeutic decisions. Teaching must be:

IV.B.3.a) formally conducted on all inpatient and consultative services; and,

IV.B.3.b) conducted with a frequency and duration sufficient to ensure a meaningful and continuous teaching relationship between the assigned teaching attending physician and the resident.

IV.C. Clinical Experiences

IV.C.1. Assignment of rotations must be structured to minimize the frequency of rotational transitions, and rotations must be of sufficient length to provide a quality educational experience, defined by continuity of patient care, ongoing supervision, longitudinal relationships with faculty members, and meaningful assessment and feedback.

IV.C.2. Rotations must be structured to allow residents to function as a part of an effective interprofessional team that works together toward the shared goals of patient safety and quality improvement.

IV.C.3. Rotations must be structured to minimize conflicting inpatient and outpatient responsibilities.

IV.C.4. At least 12 months of the program must be in educational experiences that reflect the practice of internal medicine in the country or jurisdiction, to include:

IV.C.4.a) two months of critical care medicine;

IV.C.4.b) six months of general internal medicine other than cardiology; and,

IV.C.4.c) two months each in any two of the following subspecialties:

IV.C.4.c).(1) endocrinology;

IV.C.4.c).(2) nephrology;

IV.C.4.c).(3) neurology; and,

IV.C.4.c).(4) pulmonology.

IV.C.4.d) experiences in both the inpatient and outpatient settings.

IV.C.5. Residents must have at least 36 months of clinical experience in cardiology, including inpatient and special experiences, to include:

IV.C.5.a) at least four months in the cardiac catheterization laboratory;

IV.C.5.b) at least six months in non-invasive cardiac evaluations, consisting of:

IV.C.5.b).(1) at least three months of echocardiography and Doppler;

IV.C.5.b).(2) at least two months of nuclear cardiology, including each fellow's active participation in a minimum of 80 hours of daily nuclear cardiology study interpretation during the rotation;

IV.C.5.b).(3) at least one month of experience in other non-invasive cardiac evaluations, including ECG stress testing, ECG interpretation, and ambulatory ECG monitoring (continuous and event recording); and,

IV.C.5.b).(3).(a) These rotations may be done concurrently with other rotations.

IV.C.5.b).(4) experience in cardiac tomography, positron emission tomography (PET), cardiac magnetic resonance imaging (CMRI), and peripheral vascular imaging.

IV.C.5.b).(4).(a) These rotations may be done concurrently with other rotations.

IV.C.5.c) at least two months devoted to electrophysiology; and,

IV.C.5.d) at least nine months of non-laboratory clinical practice activities, including consultations, cardiac care units, post-operative care, and experience in congenital heart disease, preventive cardiology, and vascular medicine.

IV.C.6. Residents must have formal instruction in and clinical experience with performance of procedures and technical skills relevant to their future practice and as performed by cardiologists in the country or jurisdiction, including:

IV.C.6.a) conscious sedation;

IV.C.6.b) intra-aortic balloon counterpulsation;

IV.C.6.c) intra-cardiac electrophysiologic studies;

IV.C.6.d) MRI;

IV.C.6.e) percutaneous transluminal coronary angioplasty and other interventional procedures;

IV.C.6.f) pericardiocentesis;

IV.C.6.g) placement and management of temporary pacemakers, including transvenous and transcutaneous; and,

IV.C.6.h) programming and follow-up surveillance of permanent pacemakers and ICDs.

IV.C.7. The program must provide educational experiences in team-based care

that allow residents to interact with and learn from other health care professionals.

IV.C.8. The educational program must provide residents with elective experiences relevant to their future practice or to further skill/competence development.

IV.C.9. Residents must have experience in the role of a cardiology consultant in the inpatient and outpatient setting.

IV.C.10. Residents should participate in training using simulation.

IV.C.11. Residents should have a structured continuity ambulatory clinic experience for the duration of the program that exposes them to the breadth and depth of cardiology.

IV.C.11.a) This experience should average one half-day each week throughout the educational program.

IV.C.11.b). The continuing patient care experience should not be interrupted by more than one month, excluding vacation.

IV.D. Scholarly Activity

IV.D.1. Residents' Scholarly Activity

IV.D.1.a) All residents must engage in at least one of the following scholarly activities: participation in grand rounds; posters; workshops; quality improvement presentations; podium presentations; grant leadership; non-peer-reviewed print/electronic resources; articles or publications; book chapters; textbooks; webinars; service on professional committees; or serving as a journal reviewer, journal editorial board member, or editor.

IV.D.2. Faculty Scholarly Activity

See International Foundational Requirements, Section IV.D.2.

V. Evaluation

V.A.1. At least one member of the general internal medicine faculty must be a member of the Clinical Competency Committee.

VI. The Learning and Working Environment

VI.A. Principles

See International Foundational Requirements, Section VI.A.

VI.B. Patient Safety

See International Foundational Requirements, Section VI.B.

VI.C. Quality Improvement

See International Foundational Requirements, Section VI.C.

VI.D. Supervision and Accountability

VI.D.1. A first year resident must not provide primary ongoing care for more than 15 inpatients.

VI.D.2. Second- or third-year residents or other appropriate supervisory physicians (e.g., subspecialty residents or attending physicians) with documented experience appropriate to the acuity, complexity, and severity of patient illness, must be available on site at all times to supervise first year residents.

VI.D.3. Direct supervision of procedures performed by each resident must occur until competence has been acquired and documented by the program director.

VI.E. Professionalism

See International Foundational Requirements, Section VI.E.

VI.F. Well-Being

See International Foundational Requirements, Section VI.F.

VI.G. Fatigue

See International Foundational Requirements, Section VI.G.

VI.H. Transitions of Care

See International Foundational Requirements, Section VI.H.

VI.I. Clinical Experience and Education

See International Foundational Requirements, Section VI.I.

VI.J. On-Call Activities

VI.J.1. Residents must not be assigned more than two months of night float during any year of the educational program, or more than four months of night float over three years of the educational program.

VI.J.2. Residents must not be assigned to more than one month of consecutive night float rotation.