



**Accreditation Council for
Graduate Medical Education**

**ACGME Program Requirements for
Graduate Medical Education
in Adult Cardiothoracic Anesthesiology**

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Revised Common Program Requirements effective: July 1, 2015

Revised Common Program Requirements effective: July 1, 2016

At its May 28, 2015 meeting, the Review Committee for Anesthesiology voted to allow exceptions to the Eligibility Requirements for Fellowship Programs in Section III.A. Thus, Requirement III.A.3. has been revised.

ACGME Program Requirements for Graduate Medical Education in Adult Cardiothoracic Anesthesiology

One-year Common Program Requirements are in BOLD

Introduction

Int.A. Residency and fellowship programs are essential dimensions of the transformation of the medical student to the independent practitioner along the continuum of medical education. They are physically, emotionally, and intellectually demanding, and require longitudinally-concentrated effort on the part of the resident or fellow.

The specialty education of physicians to practice independently is experiential, and necessarily occurs within the context of the health care delivery system. Developing the skills, knowledge, and attitudes leading to proficiency in all the domains of clinical competency requires the resident and fellow physician to assume personal responsibility for the care of individual patients. For the resident and fellow, the essential learning activity is interaction with patients under the guidance and supervision of faculty members who give value, context, and meaning to those interactions. As residents and fellows gain experience and demonstrate growth in their ability to care for patients, they assume roles that permit them to exercise those skills with greater independence. This concept--graded and progressive responsibility--is one of the core tenets of American graduate medical education. Supervision in the setting of graduate medical education has the goals of assuring the provision of safe and effective care to the individual patient; assuring each resident's and fellow's development of the skills, knowledge, and attitudes required to enter the unsupervised practice of medicine; and establishing a foundation for continued professional growth.

Int.B. Adult cardiothoracic anesthesiology is devoted to the pre-operative, intra-operative, and post-operative care of adult patients undergoing cardiothoracic surgery and related invasive procedures.

The majority of the clinical education involves caring for patients in the operating room, other anesthetizing locations, and intensive care units, and includes experience providing anesthesia for cardiac, non-cardiac thoracic, and intrathoracic vascular surgical procedures, as well as for non-operative diagnostic and interventional cardiac and thoracic procedures.

Int.C. The educational program in adult cardiothoracic anesthesiology must be 12 months in length. ^(Core)

I. Institutions

I.A. Sponsoring Institution

One sponsoring institution must assume ultimate responsibility for the program, as described in the Institutional Requirements, and this

responsibility extends to fellow assignments at all participating sites. (Core)*

The sponsoring institution and the program must ensure that the program director has sufficient protected time and financial support for his or her educational and administrative responsibilities to the program. (Core)

- I.A.1. The sponsoring institution must sponsor an Accreditation Council for Graduate Medical Education (ACGME)-accredited anesthesiology residency. (Core)
- I.A.2. There must be interaction between the core anesthesiology residency and the fellowship which results in coordination of educational, clinical, and scholarly activities. (Core)
 - I.A.2.a) The fellowship must not compromise the clinical experience and the number of cases available to the residents in the core anesthesiology residency. (Core)

I.B. Participating Sites

- I.B.1. **There must be a program letter of agreement (PLA) between the program and each participating site providing a required assignment. The PLA must be renewed at least every five years. (Core)**

The PLA should:

- I.B.1.a) **identify the faculty who will assume both educational and supervisory responsibilities for fellows; (Detail)**
- I.B.1.b) **specify their responsibilities for teaching, supervision, and formal evaluation of fellows, as specified later in this document; (Detail)**
- I.B.1.c) **specify the duration and content of the educational experience; and, (Detail)**
- I.B.1.d) **state the policies and procedures that will govern fellow education during the assignment. (Detail)**

- I.B.2. **The program director must submit any additions or deletions of participating sites routinely providing an educational experience, required for all fellows, of one month full time equivalent (FTE) or more through the Accreditation Council for Graduate Medical Education (ACGME) Accreditation Data System (ADS). (Core)**

II. Program Personnel and Resources

II.A. Program Director

- II.A.1. **There must be a single program director with authority and accountability for the operation of the program. The sponsoring**

institution's GMEC must approve a change in program director. ^(Core)

II.A.1.a) The program director must submit this change to the ACGME via the ADS. ^(Core)

II.A.2. Qualifications of the program director must include:

II.A.2.a) requisite specialty expertise and documented educational and administrative experience acceptable to the Review Committee; ^(Core)

II.A.2.b) current certification in the subspecialty by the American Board of Anesthesiology, or subspecialty qualifications that are acceptable to the Review Committee; and, ^(Core)

II.A.2.c) current medical licensure and appropriate medical staff appointment. ^(Core)

II.A.2.d) current certification in anesthesiology by the American Board of Anesthesiology;

II.A.2.e) current appointment as a member of the anesthesiology faculty; ^(Core)

II.A.2.f) completion of a cardiothoracic anesthesiology fellowship, or at least three years of participation as a program director or faculty member in a clinical cardiothoracic anesthesiology fellowship, and certification in advanced peri-operative transesophageal echocardiography (TEE) by the National Board of Echocardiography (NBE); ^(Core)

II.A.2.g) at least three years of post-fellowship experience in clinical cardiothoracic anesthesiology; and, ^(Core)

II.A.2.h) demonstrated ongoing academic achievements appropriate to the subspecialty, including publications, the development of educational programs, or the conduct of research. ^(Core)

II.A.3. The program director must administer and maintain an educational environment conducive to educating the fellows in each of the ACGME competency areas. ^(Core)

The program director must:

II.A.3.a) prepare and submit all information required and requested by the ACGME; ^(Core)

II.A.3.b) be familiar with and oversee compliance with ACGME and Review Committee policies and procedures as outlined in the ACGME Manual of Policies and Procedures; ^(Detail)

- II.A.3.c) obtain review and approval of the sponsoring institution's GMEC/DIO before submitting information or requests to the ACGME, including: ^(Core)**
- II.A.3.c).(1) all applications for ACGME accreditation of new programs; ^(Detail)**
- II.A.3.c).(2) changes in fellow complement; ^(Detail)**
- II.A.3.c).(3) major changes in program structure or length of training; ^(Detail)**
- II.A.3.c).(4) progress reports requested by the Review Committee; ^(Detail)**
- II.A.3.c).(5) requests for increases or any change to fellow duty hours; ^(Detail)**
- II.A.3.c).(6) voluntary withdrawals of ACGME-accredited programs; ^(Detail)**
- II.A.3.c).(7) requests for appeal of an adverse action; and, ^(Detail)**
- II.A.3.c).(8) appeal presentations to a Board of Appeal or the ACGME. ^(Detail)**
- II.A.3.d) obtain DIO review and co-signature on all program application forms, as well as any correspondence or document submitted to the ACGME that addresses: ^(Detail)**
- II.A.3.d).(1) program citations, and/or, ^(Detail)**
- II.A.3.d).(2) request for changes in the program that would have significant impact, including financial, on the program or institution. ^(Detail)**
- II.A.3.e) devote at least 50 percent of his or her clinical, educational, administrative, and academic time to cardiothoracic anesthesiology; and, ^(Detail)**
- II.A.3.f) ensure that all fellows maintain accurate procedure logs. ^(Core)**
- II.B. Faculty**
- II.B.1. There must be a sufficient number of faculty with documented qualifications to instruct and supervise all fellows. ^(Core)**
- II.B.1.a) Full-time faculty members must devote all professional time to the program. ^(Core)**
- II.B.2. The faculty must devote sufficient time to the educational program**

to fulfill their supervisory and teaching responsibilities and demonstrate a strong interest in the education of fellows. (Core)

- II.B.3.** The physician faculty must have current certification in the subspecialty by the American Board of Anesthesiology, or possess qualifications judged acceptable to the Review Committee. (Core)
- II.B.4.** The physician faculty must possess current medical licensure and appropriate medical staff appointment. (Core)
- II.B.5.** There must be at least three program faculty members, equal to or greater than two FTE, including the program director. (Core)
- II.B.5.a)** For programs with two or more fellows, a ratio of at least one FTE faculty member to one fellow must be maintained. (Core)
- II.B.6.** Faculty members must have education and experience in the care of adult cardiothoracic patients that meets or exceeds completion of a one-year adult cardiothoracic anesthesiology program. (Core)
- II.B.7.** In addition to the program director, at least one faculty member must have certification in advanced peri-operative TEE by the NBE. (Core)
- II.B.8.** The faculty must include individuals with expertise in other subspecialties of anesthesiology. (Core)
- II.B.9.** Faculty members must maintain an active role in scholarly pursuits pertaining to cardiothoracic anesthesiology, as evidenced by involvement in education and scholarship that pertains to the care of adult cardiothoracic patients. (Core)

II.C. Other Program Personnel

The institution and the program must jointly ensure the availability of all necessary professional, technical, and clerical personnel for the effective administration of the program. (Core)

- II.C.1.** Physicians with special training and/or experience in cardiovascular disease, clinical cardiac electrophysiology, cardiac and non-cardiac thoracic surgery, general vascular surgery, congenital heart disease, pulmonary diseases, and critical care medicine must be available. (Detail)
- II.C.2.** Allied health staff members and other support personnel who have experience and expertise in the care of cardiothoracic patients must be available. (Detail)

II.D. Resources

The institution and the program must jointly ensure the availability of adequate resources for fellow education, as defined in the specialty program requirements. (Core)

- II.D.1. The number and diversity of patients available to the program must support the required inpatient and outpatient experience for each fellow. ^(Core)
- II.D.2. The program must have access to the following resources:
- II.D.2.a) intensive care units for both surgical and non-surgical cardiothoracic patients; ^(Core)
 - II.D.2.b) an emergency department in which cardiothoracic patients are managed 24 hours a day; ^(Core)
 - II.D.2.c) operating rooms equipped for the management of cardiothoracic patients; ^(Core)
 - II.D.2.d) a post-anesthesia care area, equipped for the management of cardiothoracic patients, located near the operating room suite; ^(Core)
 - II.D.2.e) monitoring and advanced life support equipment representative of current levels of technology; ^(Core)
 - II.D.2.f) laboratories, available at all times, that provide prompt results, including blood chemistries, blood gas and acid base analysis oxygen saturation, hematocrit/hemoglobin, and coagulation function; ^(Core)
 - II.D.2.g) facilities, available at all times, to provide prompt, non-invasive and invasive diagnostic and therapeutic cardiothoracic procedures, including echocardiography, cardiac stress testing, cardiac catheterization, electrophysiological testing and therapeutic intervention, cardiopulmonary scanning procedures, and pulmonary function testing; ^(Core)
 - II.D.2.h) facilities and equipment for research in cardiothoracic anesthesiology; and, ^(Core)
 - II.D.2.i) prompt, reliable systems for communication and interaction with supervisory physicians. ^(Core)

II.E. Medical Information Access

Fellows must have ready access to specialty-specific and other appropriate reference material in print or electronic format. Electronic medical literature databases with search capabilities should be available. ^(Detail)

III. Fellow Appointments

III.A. Eligibility Requirements – Fellowship Programs

All required clinical education for entry into ACGME-accredited fellowship programs must be completed in an ACGME-accredited residency program, or in an RCPSC-accredited or CFPC-accredited residency program located in Canada. ^(Core)

Prior to appointment in the program, fellows must have successfully completed an ACGME- or RCPSC-accredited residency in anesthesiology. ^(Core)

III.A.1. Fellowship programs must receive verification of each entering fellow's level of competency in the required field using ACGME or CanMEDS Milestones assessments from the core residency program. ^(Core)

III.A.2. Fellow Eligibility Exception

A Review Committee may grant the following exception to the fellowship eligibility requirements:

An ACGME-accredited fellowship program may accept an exceptionally qualified applicant, who does not satisfy the eligibility requirements listed in Sections III.A. and III.A.1., but who does meet all of the following additional qualifications and conditions: ^(Core)**

III.A.2.a) Assessment by the program director and fellowship selection committee of the applicant's suitability to enter the program, based on prior training and review of the summative evaluations of training in the core specialty; and ^(Core)

III.A.2.b) Review and approval of the applicant's exceptional qualifications by the GMEC or a subcommittee of the GMEC; and ^(Core)

III.A.2.c) Satisfactory completion of the United States Medical Licensing Examination (USMLE) Steps 1, 2, and, if the applicant is eligible, 3, and; ^(Core)

III.A.2.d) For an international graduate, verification of Educational Commission for Foreign Medical Graduates (ECFMG) certification; and, ^(Core)

III.A.2.e) Applicants accepted by this exception must complete fellowship Milestones evaluation (for the purposes of establishment of baseline performance by the Clinical Competency Committee), conducted by the receiving fellowship program within six weeks of matriculation. This evaluation may be waived for an applicant who has completed an ACGME International-accredited residency based on the applicant's Milestones evaluation conducted at the conclusion of the residency program. ^(Core)

III.A.2.e).(1)

If the trainee does not meet the expected level of Milestones competency following entry into the fellowship program, the trainee must undergo a period of remediation, overseen by the Clinical Competency Committee and monitored by the GMEC or a subcommittee of the GMEC. This period of remediation must not count toward time in fellowship training. ^(Core)

**** An exceptionally qualified applicant has (1) completed a non-ACGME-accredited residency program in the core specialty, and (2) demonstrated clinical excellence, in comparison to peers, throughout training. Additional evidence of exceptional qualifications is required, which may include one of the following: (a) participation in additional clinical or research training in the specialty or subspecialty; (b) demonstrated scholarship in the specialty or subspecialty; (c) demonstrated leadership during or after residency training; (d) completion of an ACGME-International-accredited residency program.**

III.A.3.

The Review Committee for Anesthesiology does allow exceptions to the Eligibility Requirements for Fellowship Programs in Section III.A. ^(Core)

III.B.

Number of Fellows

The program's educational resources must be adequate to support the number of fellows appointed to the program. ^(Core)

III.B.1.

The program director may not appoint more fellows than approved by the Review Committee, unless otherwise stated in the specialty-specific requirements. ^(Core)

III.B.2.

The presence of other learners or staff members in the program must not interfere with the appointed fellows' education. ^(Core)

IV. Educational Program

IV.A.

The curriculum must contain the following educational components:

IV.A.1.

Skills and competencies the fellow will be able to demonstrate at the conclusion of the program. The program must distribute these skills and competencies to fellows and faculty at least annually, in either written or electronic form. ^(Core)

IV.A.2.

ACGME Competencies

The program must integrate the following ACGME competencies into the curriculum: ^(Core)

IV.A.2.a)

Patient Care and Procedural Skills

IV.A.2.a).(1)

Fellows must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Fellows: (Outcome)

IV.A.2.a).(1).(a)

must demonstrate competence by following standards for patient care and established guidelines and procedures for patient safety, error reduction, and improved patient outcomes; (Outcome)

IV.A.2.a).(1).(b)

must demonstrate competence in: (Outcome)

IV.A.2.a).(1).(b).(i)

pre-operative patient evaluation and optimization of clinical status prior to the cardiothoracic procedure; (Outcome)

IV.A.2.a).(1).(b).(ii)

interpretation of cardiovascular and pulmonary diagnostic test data; (Outcome)

IV.A.2.a).(1).(b).(iii)

hemodynamic and respiratory monitoring; (Outcome)

IV.A.2.a).(1).(b).(iv)

pharmacological and mechanical hemodynamic support; and, (Outcome)

IV.A.2.a).(1).(b).(v)

peri-operative critical care, including ventilatory support and peri-operative pain management. (Outcome)

IV.A.2.a).(1).(c)

must maintain current certification in advanced cardiac life support. (Outcome)

IV.A.2.a).(2)

Fellows must be able to competently perform all medical, diagnostic, and surgical procedures considered essential for the area of practice. Fellows: (Outcome)

IV.A.2.a).(2).(a)

must demonstrate competence in providing anesthesia care for patients undergoing cardiac surgery with and without extracorporeal circulation; (Outcome)

IV.A.2.a).(2).(b)

must demonstrate competence in providing anesthesia care for patients undergoing thoracic surgery, including operations on the lung, esophagus, and thoracic aorta; (Outcome)

IV.A.2.a).(2).(c)

must demonstrate competence in advanced-level peri-operative TEE; (Outcome)

IV.A.2.a).(2).(d)

must be able to independently manage intra-aortic

balloon counterpulsation and be actively involved in the management of other extracorporeal circulatory assist devices; and, ^(Outcome)

IV.A.2.a).(2).(e)

must demonstrate competence in management of cardiopulmonary bypass (CPB). ^(Outcome)

IV.A.2.b)

Medical Knowledge

Fellows 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: ^(Outcome)

IV.A.2.b).(1)

must demonstrate knowledge of how cardiothoracic diseases affect the administration of anesthesia and life support to adult cardiothoracic patients, including: ^(Outcome)

IV.A.2.b).(1).(a)

embryological development of the cardiothoracic structures; ^(Outcome)

IV.A.2.b).(1).(b)

pathophysiology, pharmacology, and clinical management of patients with cardiac disease, to include cardiomyopathy, heart failure, cardiac tamponade, ischemic heart disease, acquired and congenital valvular heart disease, congenital heart disease, electrophysiologic disturbances, and neoplastic and infectious cardiac diseases; ^(Outcome)

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

pathophysiology, pharmacology, and clinical management of patients with respiratory disease, to include pleural, bronchopulmonary, neoplastic, infectious, and inflammatory diseases; ^(Outcome)

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

pathophysiology, pharmacology, and clinical management of patients with thoracic vascular, tracheal, esophageal, and mediastinal diseases, to include infectious, neoplastic, and inflammatory processes; ^(Outcome)

IV.A.2.b).(1).(e)

non-invasive cardiovascular evaluation, to include electrocardiography, transthoracic echocardiography, TEE, stress testing, and cardiovascular imaging; ^(Outcome)

IV.A.2.b).(1).(f)

cardiac catheterization procedures and diagnostic interpretation, to include invasive cardiac catheterization procedures, including angioplasty, stenting, and transcatheter laser and mechanical ablations; ^(Outcome)

- IV.A.2.b).(1).(g) non-invasive pulmonary evaluation, to include pulmonary function tests, blood gas and acid-base analysis, oximetry, capnography, and pulmonary imaging; ^(Outcome)
- IV.A.2.b).(1).(h) pre-anesthetic evaluation and preparation of adult cardiothoracic patients; ^(Outcome)
- IV.A.2.b).(1).(i) peri-anesthetic monitoring, both non-invasive and invasive (intra-arterial, central venous, pulmonary artery, mixed venous saturation, cardiac output); ^(Outcome)
- IV.A.2.b).(1).(j) pharmacokinetics and pharmacodynamics of medications prescribed for medical management of adult cardiothoracic patients; ^(Outcome)
- IV.A.2.b).(1).(k) pharmacokinetics and pharmacodynamics of anesthetic medications prescribed for cardiothoracic patients; ^(Outcome)
- IV.A.2.b).(1).(l) pharmacokinetics and pharmacodynamics of medications prescribed for management of hemodynamic instability; ^(Outcome)
- IV.A.2.b).(1).(m) extracorporeal circulation, to include: myocardial preservation; effects of CPB on pharmacokinetics and pharmacodynamics; cardiothoracic, respiratory, neurological, metabolic, endocrine, hematological, renal, and thermoregulatory effects of CPB; and coagulation/anticoagulation before, during, and after CPB; ^(Outcome)
- IV.A.2.b).(1).(n) inotropes, chronotropes, vasoconstrictors, and vasodilators; ^(Outcome)
- IV.A.2.b).(1).(o) circulatory assist devices, to include intra-aortic balloon pumps, left and right ventricular assist devices, and extracorporeal membrane oxygenation (ECMO); ^(Outcome)
- IV.A.2.b).(1).(p) pacemaker insertion and modes of action; ^(Outcome)
- IV.A.2.b).(1).(q) cardiac surgical procedures, to include: minimally invasive myocardial revascularization; valve repair and replacement; pericardial, neoplastic procedures; and heart and lung transplantation; ^(Outcome)
- IV.A.2.b).(1).(r) thoracic aortic surgery, to include: ascending, transverse, and descending aortic surgery with

- circulatory arrest; CPB employing low flow and or retrograde perfusion; lumbar drain indications and management; and spinal cord protection, including cerebral spinal fluid (CSF) drainage; ^(Outcome)
- IV.A.2.b).(1).(s) esophageal surgery, to include varices, neoplastic, colon interposition, foreign body, stricture, and tracheoesophageal fistula; ^(Outcome)
- IV.A.2.b).(1).(t) pulmonary surgery, to include segmentectomy (open or video-assisted), thoracoscopic or open, lung reduction, bronchopulmonary lavage, one-lung ventilation, lobectomy, pneumonectomy and bronchoscopy, including endoscopic, fiberoptic, rigid, laser resection; ^(Outcome)
- IV.A.2.b).(1).(u) post-anesthetic critical care of adult cardiothoracic surgical patients; ^(Outcome)
- IV.A.2.b).(1).(v) peri-operative ventilator management, to include intra-operative anesthetics, and critical care unit ventilators and techniques; ^(Outcome)
- IV.A.2.b).(1).(w) pain management of adult cardiothoracic surgical patients; ^(Outcome)
- IV.A.2.b).(1).(x) research methodology/statistical analysis, the fundamentals of research design and conduct, and the interpretation and presentation of data; ^(Outcome)
- IV.A.2.b).(1).(y) quality assurance/improvement; and, ^(Outcome)
- IV.A.2.b).(1).(z) ethical and legal issues, and practice management. ^(Outcome)

IV.A.2.c) Practice-based Learning and Improvement

Fellows are expected to develop skills and habits to be able to meet the following goals:

- IV.A.2.c).(1) **systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement; and,** ^(Outcome)
- IV.A.2.c).(2) **locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems.** ^(Outcome)

IV.A.2.d) Interpersonal and Communication Skills

Fellows must demonstrate interpersonal and communication

skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. (Outcome)

Fellows must demonstrate:

- IV.A.2.d).(1) effective communication skills, including: (Outcome)
- IV.A.2.d).(1).(a) obtaining informed consent; (Outcome)
- IV.A.2.d).(1).(b) communicating the patient care and management plan; and, (Outcome)
- IV.A.2.d).(1).(c) explaining complications/errors and their management to patients and families. (Outcome)
- IV.A.2.d).(2) skills in preparing and presenting educational material for medical students, graduate medical education staff members, and allied health personnel; and, (Outcome)
- IV.A.2.d).(3) competence in providing clinical consultations. (Outcome)

IV.A.2.e)

Professionalism

Fellows must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. (Outcome)

Fellows must demonstrate:

- IV.A.2.e).(1) compassion, integrity, and respect for others; (Outcome)
- IV.A.2.e).(2) responsiveness to patient needs; (Outcome)
- IV.A.2.e).(3) respect for patient privacy and autonomy; (Outcome)
- IV.A.2.e).(4) accountability to patients, society, and the profession; (Outcome)
- IV.A.2.e).(5) sensitivity and responsiveness to a diverse patient population, including diversity in gender, age, culture, race, religion, disabilities, and sexual orientation; and, (Outcome)
- IV.A.2.e).(6) compliance with institutional, departmental, and program policies. (Outcome)

IV.A.2.f)

Systems-based Practice

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other

resources in the system to provide optimal health care.
(Outcome)

Fellows must:

- IV.A.2.f).(1) work in interprofessional teams to enhance patient safety and improve patient care quality; and, (Outcome)
- IV.A.2.f).(2) participate in identifying system errors and implementing potential system solutions. (Outcome)
- IV.A.3. Curriculum Organization and Fellow Experiences
- IV.A.3.a) The curriculum must include at least six months of clinical anesthesia experience, to include: (Core)
- IV.A.3.a).(1) cardiac experience, including: (Core)
- IV.A.3.a).(1).(a) a minimum of 100 cardiac surgical procedures with at least 50 requiring CPB; (Core)
- IV.A.3.a).(1).(b) a minimum of 25 aortic and/or mitral valve repairs or replacements, to include at least five mitral repairs or replacements and five aortic repairs or replacements requiring CPB; (Core)
- IV.A.3.a).(1).(c) a minimum of 25 myocardial revascularization procedures with or without CPB; (Core)
- IV.A.3.a).(1).(d) management of patients undergoing procedures in each of two or more of the following categories: (Core)
- IV.A.3.a).(1).(d).(i) adult correction/revision of congenital cardiac lesions; (Core)
- IV.A.3.a).(1).(d).(ii) cardiac and lung transplantation; (Core)
- IV.A.3.a).(1).(d).(iii) placement of circulatory assist devices including left heart bypass, ventricular assist devices, intra-aortic balloon pumps, and ECMO; and, (Core)
- IV.A.3.a).(1).(d).(iv) electrophysiology procedures requiring general anesthesia. (Core)
- IV.A.3.a).(2) thoracic experience, including: (Core)
- IV.A.3.a).(2).(a) anesthetic management of at least 15 patients undergoing non-cardiac thoracic surgery, including procedures involving airway/lung repair, lung

- resection (open and/or video-assisted segmentectomy, lobectomy, and pneumonectomy), and esophageal resection/repair; and, ^(Core)
- IV.A.3.a).(2).(b) anesthetic management of patients undergoing endovascular and/or open repair of the thoracic aorta, to include the management of CSF drainage. ^(Core)
- IV.A.3.b) Each fellow is required to have at least a one-month experience managing adult cardiothoracic surgical patients in a critical care (intensive care unit (ICU)) setting. ^(Core)
- IV.A.3.c) Each fellow must have two months of clinical elective rotations related to the care of the cardiac patient, such as inpatient cardiology, invasive cardiology, medical (cardiology) critical care, pediatric cardiac anesthesiology, and extracorporeal perfusion. ^(Core)
- IV.A.3.c).(1) Elective rotations should be at least two weeks in duration. ^(Detail)
- IV.A.3.c).(2) A research project in cardiothoracic anesthesiology may be substituted for one or two months of clinical elective rotations. ^(Detail)
- IV.A.3.d) Fellows must perform and interpret TEE examinations such that they meet NBE requirements for certification in advanced peri-operative TEE. ^(Core)
- IV.A.4. Clinical Components
- IV.A.4.a) Clinical experience must include direct clinical care of patients and supervisory experience. ^(Core)
- IV.A.4.a).(1) At a minimum, 35 cases must be performed by each fellow as the primary anesthesia provider under the supervision of a faculty anesthesiologist. ^(Core)
- IV.A.4.a).(1).(a) For these 35 cases, the fellow should not be supervising a resident or student. ^(Core)
- IV.A.4.a).(1).(b) A resident or second fellow may perform a TEE examination under faculty member supervision, but all other aspects of care must be the responsibility of the fellow. ^(Core)
- IV.A.4.a).(1).(c) Supervision of residents and other anesthesia providers by fellows must be under the direct supervision of a faculty anesthesiologist. ^(Core)

- IV.A.4.a).(1).(d) Faculty members must provide feedback to help fellows develop skills in supervision. ^(Core)
- IV.A.4.a).(2) Fellows must have experience with anesthetic management of adult patients for cardiac pacemaker and automatic implantable cardiac defibrillator placement, surgical treatment of cardiac arrhythmias, cardiac catheterization, and cardiac electrophysiologic diagnostic/therapeutic procedures. ^(Core)
- IV.A.4.a).(2).(a) The majority of this experience should be obtained in non-operating room environments to encourage multidisciplinary interaction. ^(Detail)
- IV.A.4.b) Fellows must successfully complete advanced peri-operative echocardiography education. ^(Core)
- IV.A.4.c) Fellows should be involved in continuing quality improvement and risk management. ^(Core)
- IV.A.5. The didactic curriculum should include lectures, peer-review case conferences, and/or morbidity and mortality conferences, as well as interdepartmental conferences or departmental grand rounds. ^(Core)
- IV.A.5.a) Subspecialty conferences, including review of all current complications and deaths, seminars, and clinical and basic science instruction, must be regularly conducted. ^(Detail)
- IV.A.5.b) Fellows must actively participate in the planning and production of these meetings. ^(Detail)
- IV.A.5.c) Fellows and faculty members should regularly attend all lectures, conferences, seminars, and workshops. ^(Core)
- IV.A.5.c).(1) Faculty members should be the leaders in the majority of the sessions. ^(Detail)
- IV.A.5.d) Multidisciplinary conferences should include participation from faculty members from cardiology, cardiothoracic surgery, critical care, pediatrics, and pulmonary medicine. ^(Core)
- IV.A.5.d).(1) Fellows must attend a minimum of 10 multidisciplinary conferences that are relevant to cardiothoracic anesthesiology, especially in cardiothoracic surgery, cardiovascular medicine, critical care, pediatrics, pulmonary medicine, and vascular surgery, ^(Core)

IV.B. Fellows' Scholarly Activities

- IV.B.1. All fellows must complete a scholarly project. ^(Core)

IV.B.1.a) The results of such projects must be disseminated through a variety of means, including publication or presentation at local, regional, national, or international meetings. ^(Core)

V. Evaluation

V.A. Fellow Evaluation

V.A.1. The program director must appoint the Clinical Competency Committee. ^(Core)

V.A.1.a) At a minimum the Clinical Competency Committee must be composed of three members of the program faculty. ^(Core)

V.A.1.a).(1) The program director may appoint additional members of the Clinical Competency Committee.

V.A.1.a).(1).(a) These additional members must be physician faculty members from the same program or other programs, or other health professionals who have extensive contact and experience with the program's fellows in patient care and other health care settings. ^(Core)

V.A.1.a).(1).(b) Chief residents who have completed core residency programs in their specialty and are eligible for specialty board certification may be members of the Clinical Competency Committee. ^(Core)

V.A.1.b) There must be a written description of the responsibilities of the Clinical Competency Committee. ^(Core)

V.A.1.b).(1) The Clinical Competency Committee should:

V.A.1.b).(1).(a) review all fellow evaluations semi-annually; ^(Core)

V.A.1.b).(1).(b) prepare and ensure the reporting of Milestones evaluations of each fellow semi-annually to ACGME; and, ^(Core)

V.A.1.b).(1).(c) advise the program director regarding fellow progress, including promotion, remediation, and dismissal. ^(Detail)

V.A.2. Formative Evaluation

V.A.2.a) The faculty must evaluate fellow performance in a timely manner. ^(Core)

V.A.2.a).(1) Faculty members responsible for teaching must provide

critical evaluations of each fellow's progress and competence to the program director at the end of six and 12 months of education. ^(Core)

V.A.2.a).(1).(a) Assessment should include essential character attributes, acquired character attributes, fund of knowledge, clinical judgment, and clinical psychomotor skills, as well as specific tasks and skills for patient management and critical analysis of clinical situations. ^(Detail)

V.A.2.a).(2) There must be periodic evaluation of patient care (quality assurance). ^(Core)

V.A.2.b) The program must:

V.A.2.b).(1) provide objective assessments of competence in patient care and procedural skills, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice based on the specialty-specific Milestones; ^(Core)

V.A.2.b).(2) use multiple evaluators (e.g., faculty, peers, patients, self, and other professional staff); ^(Detail)

V.A.2.b).(3) provide each fellow with documented semiannual evaluation of performance with feedback; and, ^(Core)

V.A.2.b).(4) review fellow procedure logs to ensure each fellow's progress in achieving the required breadth and depth of experience. ^(Detail)

V.A.2.c) The evaluations of fellow performance must be accessible for review by the fellow, in accordance with institutional policy. ^(Detail)

V.A.3. Summative Evaluation

V.A.3.a) The specialty-specific Milestones must be used as one of the tools to ensure fellows are able to practice core professional activities without supervision upon completion of the program. ^(Core)

V.A.3.b) The program director must provide a summative evaluation for each fellow upon completion of the program. ^(Core)

This evaluation must:

V.A.3.b).(1) become part of the fellow's permanent record maintained by the institution, and must be accessible

for review by the fellow in accordance with institutional policy; ^(Detail)

V.A.3.b).(2) **document the fellow's performance during their education; and,** ^(Detail)

V.A.3.b).(2).(a) Fellows must achieve an overall satisfactory evaluation after completion of 12 months of education. ^(Core)

V.A.3.b).(2).(a).(i) Remediation efforts must be undertaken when deficiencies are identified. ^(Core)

V.A.3.b).(3) **verify that the fellow has demonstrated sufficient competence to enter practice without direct supervision.** ^(Detail)

V.B. Faculty Evaluation

V.B.1. **At least annually, the program must evaluate faculty performance as it relates to the educational program.** ^(Core)

V.B.2. **These evaluations should include a review of the faculty's clinical teaching abilities, commitment to the educational program, clinical knowledge, professionalism, and scholarly activities.** ^(Detail)

V.C. Program Evaluation and Improvement

V.C.1. **The program director must appoint the Program Evaluation Committee (PEC).** ^(Core)

V.C.1.a) **The Program Evaluation Committee:**

V.C.1.a).(1) **must be composed of at least two program faculty members and should include at least one fellow;** ^(Core)

V.C.1.a).(2) **must have a written description of its responsibilities; and,** ^(Core)

V.C.1.a).(3) **should participate actively in:**

V.C.1.a).(3).(a) **planning, developing, implementing, and evaluating educational activities of the program;** ^(Detail)

V.C.1.a).(3).(b) **reviewing and making recommendations for revision of competency-based curriculum goals and objectives;** ^(Detail)

V.C.1.a).(3).(c) **addressing areas of non-compliance with ACGME standards; and,** ^(Detail)

- V.C.1.a).(3).(d)** reviewing the program annually using evaluations of faculty, fellows, and others, as specified below. ^(Detail)
- V.C.2.** The program, through the PEC, must document formal, systematic evaluation of the curriculum at least annually, and is responsible for rendering a written, annual program evaluation. ^(Core)
- The program must monitor and track each of the following areas:
- V.C.2.a)** fellow performance; ^(Core)
- V.C.2.b)** faculty development; ^(Core)
- V.C.2.c)** progress on the previous year’s action plan(s); and, ^(Core)
- V.C.2.d)** twice-yearly documented meetings to review program goals and objectives, as well as program effectiveness in achieving them. ^(Core)
- V.C.3.** The PEC must prepare a written plan of action to document initiatives to improve performance in one or more of the areas listed in section V.C.2., as well as delineate how they will be measured and monitored. ^(Core)
- V.C.3.a)** The action plan should be reviewed and approved by the teaching faculty and documented in meeting minutes. ^(Core)
- VI. Fellow Duty Hours in the Learning and Working Environment**
- VI.A. Professionalism, Personal Responsibility, and Patient Safety**
- VI.A.1.** Programs and sponsoring institutions must educate fellows and faculty members concerning the professional responsibilities of physicians to appear for duty appropriately rested and fit to provide the services required by their patients. ^(Core)
- VI.A.2.** The program must be committed to and responsible for promoting patient safety and fellow well-being in a supportive educational environment. ^(Core)
- VI.A.3.** The program director must ensure that fellows are integrated and actively participate in interdisciplinary clinical quality improvement and patient safety programs. ^(Core)
- VI.A.4.** The learning objectives of the program must:
- VI.A.4.a)** be accomplished through an appropriate blend of supervised patient care responsibilities, clinical teaching, and didactic educational events; and, ^(Core)

- VI.A.4.b) not be compromised by excessive reliance on fellows to fulfill non-physician service obligations. (Core)**
- VI.A.5. The program director and sponsoring institution must ensure a culture of professionalism that supports patient safety and personal responsibility. (Core)**
- VI.A.6. Fellows and faculty members must demonstrate an understanding and acceptance of their personal role in the following:**
- VI.A.6.a) assurance of the safety and welfare of patients entrusted to their care; (Outcome)**
 - VI.A.6.b) provision of patient- and family-centered care; (Outcome)**
 - VI.A.6.c) assurance of their fitness for duty; (Outcome)**
 - VI.A.6.d) management of their time before, during, and after clinical assignments; (Outcome)**
 - VI.A.6.e) recognition of impairment, including illness and fatigue, in themselves and in their peers; (Outcome)**
 - VI.A.6.f) attention to lifelong learning; (Outcome)**
 - VI.A.6.g) the monitoring of their patient care performance improvement indicators; and, (Outcome)**
 - VI.A.6.h) honest and accurate reporting of duty hours, patient outcomes, and clinical experience data. (Outcome)**
- VI.A.7. All fellows and faculty members must demonstrate responsiveness to patient needs that supersedes self-interest. They must recognize that under certain circumstances, the best interests of the patient may be served by transitioning that patient's care to another qualified and rested provider. (Outcome)**
- VI.B. Transitions of Care**
- VI.B.1. Programs must design clinical assignments to minimize the number of transitions in patient care. (Core)**
 - VI.B.2. Sponsoring institutions and programs must ensure and monitor effective, structured hand-over processes to facilitate both continuity of care and patient safety. (Core)**
 - VI.B.3. Programs must ensure that fellows are competent in communicating with team members in the hand-over process. (Outcome)**
 - VI.B.4. The sponsoring institution must ensure the availability of schedules**

that inform all members of the health care team of attending physicians and fellows currently responsible for each patient's care.
(Detail)

VI.C. Alertness Management/Fatigue Mitigation

VI.C.1. The program must:

VI.C.1.a) educate all faculty members and fellows to recognize the signs of fatigue and sleep deprivation; (Core)

VI.C.1.b) educate all faculty members and fellows in alertness management and fatigue mitigation processes; and, (Core)

VI.C.1.c) adopt fatigue mitigation processes to manage the potential negative effects of fatigue on patient care and learning, such as naps or back-up call schedules. (Detail)

VI.C.2. Each program must have a process to ensure continuity of patient care in the event that a fellow may be unable to perform his/her patient care duties. (Core)

VI.C.3. The sponsoring institution must provide adequate sleep facilities and/or safe transportation options for fellows who may be too fatigued to safely return home. (Core)

VI.D. Supervision of Fellows

VI.D.1. In the clinical learning environment, each patient must have an identifiable, appropriately-credentialed and privileged attending physician (or licensed independent practitioner as approved by each Review Committee) who is ultimately responsible for that patient's care. (Core)

VI.D.1.a) This information should be available to fellows, faculty members, and patients. (Detail)

VI.D.1.b) Fellows and faculty members should inform patients of their respective roles in each patient's care. (Detail)

VI.D.2. The program must demonstrate that the appropriate level of supervision is in place for all fellows who care for patients. (Core)

Supervision may be exercised through a variety of methods. Some activities require the physical presence of the supervising faculty member. For many aspects of patient care, the supervising physician may be a more advanced fellow. Other portions of care provided by the fellow can be adequately supervised by the immediate availability of the supervising faculty member or fellow physician, either in the institution, or by means of telephonic and/or electronic modalities. In some circumstances, supervision may

include post-hoc review of fellow-delivered care with feedback as to the appropriateness of that care. ^(Detail)

VI.D.3. Levels of Supervision

To ensure oversight of fellow supervision and graded authority and responsibility, the program must use the following classification of supervision: ^(Core)

- VI.D.3.a) **Direct Supervision – the supervising physician is physically present with the fellow and patient. ^(Core)**
- VI.D.3.b) **Indirect Supervision:**
 - VI.D.3.b).(1) **with direct supervision immediately available – the supervising physician is physically within the hospital or other site of patient care, and is immediately available to provide Direct Supervision. ^(Core)**
 - VI.D.3.b).(2) **with direct supervision available – the supervising physician is not physically present within the hospital or other site of patient care, but is immediately available by means of telephonic and/or electronic modalities, and is available to provide Direct Supervision. ^(Core)**
- VI.D.3.c) **Oversight – the supervising physician is available to provide review of procedures/encounters with feedback provided after care is delivered. ^(Core)**
- VI.D.4. **The privilege of progressive authority and responsibility, conditional independence, and a supervisory role in patient care delegated to each fellow must be assigned by the program director and faculty members. ^(Core)**
 - VI.D.4.a) **The program director must evaluate each fellow’s abilities based on specific criteria. When available, evaluation should be guided by specific national standards-based criteria. ^(Core)**
 - VI.D.4.b) **Faculty members functioning as supervising physicians should delegate portions of care to fellows, based on the needs of the patient and the skills of the fellows. ^(Detail)**
 - VI.D.4.c) **Fellows should serve in a supervisory role of residents or junior fellows in recognition of their progress toward independence, based on the needs of each patient and the skills of the individual fellow. ^(Detail)**
- VI.D.5. **Programs must set guidelines for circumstances and events in which fellows must communicate with appropriate supervising faculty members, such as the transfer of a patient to an intensive**

care unit, or end-of-life decisions. ^(Core)

VI.D.5.a) Each fellow must know the limits of his/her scope of authority, and the circumstances under which he/she is permitted to act with conditional independence. ^(Outcome)

VI.D.6. Faculty supervision assignments should be of sufficient duration to assess the knowledge and skills of each fellow and delegate to him/her the appropriate level of patient care authority and responsibility. ^(Detail)

VI.E. Clinical Responsibilities

The clinical responsibilities for each fellow must be based on PGY-level, patient safety, fellow education, severity and complexity of patient illness/condition and available support services. ^(Core)

VI.F. Teamwork

Fellows must care for patients in an environment that maximizes effective communication. This must include the opportunity to work as a member of effective interprofessional teams that are appropriate to the delivery of care in the specialty. ^(Core)

VI.F.1. Interprofessional teams may include non-physician health care professionals, such as medical assistants, specialized nurses, and technicians. ^(Detail)

VI.G. Fellow Duty Hours

VI.G.1. Maximum Hours of Work per Week

Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities and all moonlighting. ^(Core)

VI.G.1.a) Duty Hour Exceptions

A Review Committee may grant exceptions for up to 10% or a maximum of 88 hours to individual programs based on a sound educational rationale. ^(Detail)

VI.G.1.a).(1) In preparing a request for an exception the program director must follow the duty hour exception policy from the ACGME Manual on Policies and Procedures. ^(Detail)

VI.G.1.a).(2) Prior to submitting the request to the Review Committee, the program director must obtain approval of the institution's GMEC and DIO. ^(Detail)

- VI.G.2. Moonlighting**
- VI.G.2.a) Moonlighting must not interfere with the ability of the fellow to achieve the goals and objectives of the educational program. ^(Core)**
- VI.G.2.b) Time spent by fellows in Internal and External Moonlighting (as defined in the ACGME Glossary of Terms) must be counted towards the 80-hour Maximum Weekly Hour Limit. ^(Core)**
- VI.G.3. Mandatory Time Free of Duty**
- Fellows must be scheduled for a minimum of one day free of duty every week (when averaged over four weeks). At-home call cannot be assigned on these free days. ^(Core)**
- VI.G.4. Maximum Duty Period Length**
- Duty periods of fellows may be scheduled to a maximum of 24 hours of continuous duty in the hospital. ^(Core)**
- VI.G.4.a) Programs must encourage fellows to use alertness management strategies in the context of patient care responsibilities. Strategic napping, especially after 16 hours of continuous duty and between the hours of 10:00 p.m. and 8:00 a.m., is strongly suggested. ^(Detail)**
- VI.G.4.b) It is essential for patient safety and fellow education that effective transitions in care occur. Fellows may be allowed to remain on-site in order to accomplish these tasks; however, this period of time must be no longer than an additional four hours. ^(Core)**
- VI.G.4.c) Fellows must not be assigned additional clinical responsibilities after 24 hours of continuous in-house duty. ^(Core)**
- VI.G.4.d) In unusual circumstances, fellows, on their own initiative, may remain beyond their scheduled period of duty to continue to provide care to a single patient. Justifications for such extensions of duty are limited to reasons of required continuity for a severely ill or unstable patient, academic importance of the events transpiring, or humanistic attention to the needs of a patient or family. ^(Detail)**
- VI.G.4.d).(1) Under those circumstances, the fellow must:**
- VI.G.4.d).(1).(a) appropriately hand over the care of all other patients to the team responsible for their continuing care; and, ^(Detail)**

- VI.G.4.d).(1).(b)** document the reasons for remaining to care for the patient in question and submit that documentation in every circumstance to the program director. ^(Detail)
- VI.G.4.d).(2)** The program director must review each submission of additional service, and track both individual fellow and program-wide episodes of additional duty. ^(Detail)
- VI.G.5. Minimum Time Off between Scheduled Duty Periods**
- VI.G.5.a)** Fellows must be prepared to enter the unsupervised practice of medicine and care for patients over irregular or extended periods. ^(Outcome)
- Anesthesiology subspecialty fellows are considered to be in the final years of education. ^(Detail)
- VI.G.5.a).(1)** This preparation must occur within the context of the 80-hour, maximum duty period length, and one-day-off-in-seven standards. While it is desirable that fellows have eight hours free of duty between scheduled duty periods, there may be circumstances when these fellows must stay on duty to care for their patients or return to the hospital with fewer than eight hours free of duty. ^(Detail)
- VI.G.5.a).(1).(a)** Circumstances of return-to-hospital activities with fewer than eight hours away from the hospital by fellows must be monitored by the program director. ^(Detail)
- VI.G.5.a).(1).(b)** The Review Committee defines such circumstances as: required continuity of care for a severely ill or unstable patient, or a complex patient with whom the fellow has been involved; events of exceptional educational value; or, humanistic attention to the needs of a patient or family.
- VI.G.5.a).(1).(c)** Fellows in the final years of education may extend the eight-hour duty-free period when called upon to provide continuity of clinical care that is of critical importance to the patient and that provides unique educational value to the fellow. ^(Detail)
- VI.G.5.a).(1).(d)** Exceptions to the eight-hour duty-free period must be determined in consultation with the supervising faculty member. ^(Detail)

VI.G.6. Maximum Frequency of In-House Night Float

Fellows must not be scheduled for more than six consecutive nights of night float. (Core)

VI.G.7. Maximum In-House On-Call Frequency

Fellows must be scheduled for in-house call no more frequently than every-third-night (when averaged over a four-week period). (Core)

VI.G.8. At-Home Call

VI.G.8.a) Time spent in the hospital by fellows on at-home call must count towards the 80-hour maximum weekly hour limit. The frequency of at-home call is not subject to the every-third-night limitation, but must satisfy the requirement for one-day-in-seven free of duty, when averaged over four weeks. (Core)

VI.G.8.a).(1) At-home call must not be so frequent or taxing as to preclude rest or reasonable personal time for each fellow. (Core)

VI.G.8.b) Fellows are permitted to return to the hospital while on at-home call to care for new or established patients. Each episode of this type of care, while it must be included in the 80-hour weekly maximum, will not initiate a new “off-duty period.” (Detail)

***Core Requirements:** Statements that define structure, resource, or process elements essential to every graduate medical educational program.

Detail Requirements: Statements that describe a specific structure, resource, or process, for achieving compliance with a Core Requirement. Programs and sponsoring institutions in substantial compliance with the Outcome Requirements may utilize alternative or innovative approaches to meet Core Requirements.

Outcome Requirements: Statements that specify expected measurable or observable attributes (knowledge, abilities, skills, or attitudes) of residents or fellows at key stages of their graduate medical education.

Osteopathic Recognition

For programs seeking Osteopathic Recognition for the entire program, or for a track within the program, the Osteopathic Recognition Requirements are also applicable.

http://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/Osteopathic_Recognition_Requirements.pdf