

Program Requirements for Graduate Medical Education in Pediatric Anesthesiology

Effective: July 1, 2004

I. Introduction

I.A. Definition and Scope of the Specialty

Pediatric anesthesiology is the subspecialty of anesthesiology devoted to the preoperative, intraoperative, and postoperative anesthetic care of pediatric patients.

I.B. Duration and Scope of Education

Subspecialty training in pediatric anesthesiology shall be 12 months in duration, beginning after satisfactory completion of the residency program in anesthesiology. Subspecialty training in pediatric anesthesiology is in addition to the minimum requirements described in the Program Requirements for the core program in anesthesiology.

The clinical training in pediatric anesthesiology must be spent caring for pediatric patients in the operating rooms, other anesthetizing locations, and in intensive care units. The training will include experience in providing anesthesia both for inpatient and outpatient surgical procedures and for nonoperative procedures outside the operating rooms, as well as preanesthesia preparation and postanesthesia care, pain management, and advanced life support for neonates, infants, children, and adolescents.

I.C. Goals and Objectives

The subspecialty program in pediatric anesthesiology must be structured to ensure optimal patient care while providing residents the opportunity to develop skills in clinical care and judgment, teaching, administration, and research. The subspecialist in pediatric anesthesiology should be proficient not only in providing anesthesia care for neonates, infants, children, and adolescents undergoing a wide variety of surgical, diagnostic, and therapeutic procedures, but also in pain management, critical perioperative care, and advanced life support. To meet these goals, the program should provide exposure to the wide variety of clinical problems in pediatric patients, as outlined in V.B., that are necessary for the development of these clinical skills.

II. Institutional Organization

II.A. Sponsorship

A pediatric anesthesiology program should function whenever feasible in direct association and/or affiliation with an ACGME-accredited core anesthesiology program. However, a pediatric anesthesiology program may be conducted in either a general hospital or a children's hospital. If the program is conducted in a general hospital, there must be within the same institution a fully accredited core

anesthesiology program with which the pediatric anesthesiology program is associated. When the core program and the subspecialty program are conducted within the same institution, the division of responsibilities between residents in the core program and those in the subspecialty program must be clearly delineated.

If the pediatric anesthesiology program is conducted in a children's hospital, there are two sponsorship options:

- II.A.1. The program may be under the sponsorship of another institution that conducts a fully accredited core anesthesiology residency program, in which case there must be an affiliation agreement between the two institutions.
- II.A.2. The program may be under the direct sponsorship of the children's hospital, in which case the children's hospital must be the sponsoring institution for an ACGME-accredited core pediatric residency and at least one pediatric subspecialty program that is under a primary specialty other than pediatrics. There must also be a GMEC in the children's hospital that assumes the responsibility of a sponsoring institution as stipulated in the Institutional Requirements.

II.B. Institutional Policy

There should be an institutional policy governing the educational resources committed to pediatric anesthesiology programs.

III. Faculty Qualifications and Responsibilities

III.A. Program Director

III.A.1. Qualifications of the Program Director

The program director in pediatric anesthesiology must be an anesthesiologist who is certified by the American Board of Anesthesiology or who possesses qualifications judged to be acceptable by the RRC. The program director also must be licensed to practice medicine in the state where the institution that sponsors the program is located (certain federal programs are exempted) and have an appointment in good standing to the medical staff of an institution participating in the program

The program director must have completed a pediatric anesthesiology training program or have equivalent educational and clinical qualifications in providing anesthesia care for pediatric patients. He/she must devote sufficient time to provide adequate leadership to the program and supervision for the residents. The clinical director of the pediatric anesthesiology service may be someone other than the program director.

III.A.2. Responsibilities of the Program Director

- III.A.2.a) Preparation, periodic review, and, if necessary, revision of a written outline of the educational goals of the program with respect to the knowledge, skills, and other attributes of residents at each level of training and for each major rotation or other program assignment. This statement must be distributed to residents and members of the teaching staff. It should be readily available for review.
- III.A.2.b) Selection of residents for appointment to the program in accordance with institutional and departmental policies and procedures.
- III.A.2.c) Selection and supervision of the teaching staff and other program personnel.
- III.A.2.d) Supervision of residents through explicit written descriptions of supervisory lines of responsibility for the care of patients. Such guidelines must be communicated to all residents and faculty. Residents must be provided with prompt, reliable systems for communication and interaction with supervisory physicians.
- III.A.2.e) Implementation of fair procedures, as established by the sponsoring institution, regarding academic discipline and resident complaints or grievances.
- III.A.2.f) Preparation of an accurate statistical and narrative description of the program, as requested by the Residency Review Committee (RRC).

III.B. Faculty

Although the number of faculty members involved in teaching residents in pediatric anesthesiology will vary, it is recommended that at least three faculty members be involved, and that these be equal to or greater than two full-time equivalents, including the program director. A ratio of no less than one full-time equivalent faculty member to one subspecialty resident shall be maintained. The RRC understands that *full-time* means that the faculty member devotes essentially all professional time to the program.

There must be evidence of active participation by qualified physicians with training and/or expertise in pediatric anesthesiology beyond the requirement for completion of a core anesthesiology residency. The faculty must possess expertise in the care of pediatric patients and must have a continuous and meaningful role in the subspecialty training program.

The program should include teaching in multidisciplinary conferences by faculty in pediatric and neonatal intensive care, pediatric medicine, and pediatric surgery.

The pediatric anesthesiology program director and faculty responsible for teaching subspecialty residents in pediatric anesthesiology must maintain an active role in scholarly pursuits pertaining to pediatric anesthesiology, as evidenced by participation in continuing medical education as well as by involvement in research as it pertains to the care of pediatric patients.

IV. Clinical and Educational Facilities and Resources

The following resources and facilities are necessary to the program:

- IV.A. Intensive care units for both newborns and older children.
- IV.B. An emergency department in which children of all ages can be effectively managed 24 hours a day.
- IV.C. Operating rooms adequately designed and equipped for the management of pediatric patients. A postanesthesia care area adequately designed and equipped for the management of pediatric patients must be located near the operating room suite.
- IV.D. Pediatric surgical patients in sufficient volume and variety to provide a broad educational experience for the program. Surgeons with special pediatric training and/or experience in general surgery, cardiovascular surgery, neurosurgery, otolaryngology, ophthalmology, orthopedics, plastic surgery and urology must be available.
- IV.E. Monitoring and advanced life-support equipment representative of current levels of technology.
- IV.F. Allied health staff and other support personnel.
- IV.G. Facilities that are readily available at all times to provide prompt laboratory measurements pertinent to the care of pediatric patients. These include but are not limited to measurement of blood chemistries, blood gases and pH, oxygen saturation, hematocrit/hemoglobin, and clotting function.

If adequate clinical experiences are not provided in the primary institution, arrangements should be made to ensure that adequate clinical experiences are obtained. The total time in rotations outside the primary institution for the purpose of supplemental experience should not exceed three months and should be approved by the RRC.

V. Educational Program

V.A. Goals and Objectives

The director and teaching staff must prepare and comply with written goals for the program. All educational components of the program should be related to the program goals. The program design must be approved by the RRC as part of the regular review process. A written statement of the educational objectives must be given to each resident.

V.B. Clinical Components

The subspecialty resident in pediatric anesthesiology should gain expertise in the following areas of clinical care of neonates, infants, children, and adolescents:

- V.B.1. Preoperative assessment of children scheduled for surgery
- V.B.2. Cardiopulmonary resuscitation and advanced life support
- V.B.3. Management of normal and abnormal airways
- V.B.4. Mechanical ventilation
- V.B.5. Temperature regulation
- V.B.6. Placement of venous and arterial catheters
- V.B.7. Pharmacologic support of the circulation
- V.B.8. Management of both normal perioperative fluid therapy and massive fluid and/or blood loss
- V.B.9. Interpretation of laboratory results
- V.B.10. Management of children requiring general anesthesia for elective and emergent surgery for a wide variety of surgical conditions including neonatal surgical emergencies, cardiopulmonary bypass, and congenital disorders
- V.B.11. Techniques for administering regional anesthesia for inpatient and ambulatory surgery in children
- V.B.12. Sedation or anesthesia for children outside the operating rooms, including those undergoing radiologic studies
- V.B.13. Recognition, prevention, and treatment of pain in medical and surgical patients
- V.B.14. Consultation for medical and surgical patients
- V.B.15. Recognition and treatment of perioperative vital organ dysfunction, including in the postanesthesia care unit
- V.B.16. Diagnosis and perioperative management of congenital and acquired disorders
- V.B.17. Participation in the care of critically ill infants and children in a neonatal and/or pediatric intensive care unit

V.B.18. Transport of critically ill patients between hospitals and/or within the hospital

V.B.19. Psychological support of patients and their families

In preparation for roles as consultants to other specialists, subspecialty residents in pediatric anesthesiology should have the opportunity to provide consultation under the direction of faculty responsible for teaching in the pediatric anesthesiology program. This should include assessment of the appropriateness of a patient's preparation for surgery and recognition of when an institution's personnel, equipment, and/or facilities are not appropriate for management of the patient.

V.C. Didactic Components

The didactic curriculum, provided through lectures and reading, should include the following areas, with emphasis on developmental and maturational aspects as they pertain to anesthesia and life support for pediatric patients:

V.C.1. Cardiopulmonary resuscitation

V.C.2. Pharmacokinetics and pharmacodynamics and mechanisms of drug delivery

V.C.3. Cardiovascular, respiratory, renal, hepatic, and central nervous system physiology, pathophysiology, and therapy

V.C.4. Metabolic and endocrine effects of surgery and critical illness

V.C.5. Infectious disease pathophysiology and therapy

V.C.6. Coagulation abnormalities and therapy

V.C.7. Normal and abnormal physical and psychological development

V.C.8. Trauma, including burn, management

V.C.9. Congenital anomalies and developmental delay

V.C.10. Medical and surgical problems common in children

V.C.11. Use and toxicity of local and general anesthetic agents

V.C.12. Airway problems common in children

V.C.13. Pain management in pediatric patients of all ages

V.C.14. Ethical and legal aspects of care

V.C.15. Transport of critically ill patients

- V.C.16. Organ transplantation in children
- V.C.17. All pediatric anesthesiology residents should be certified as providers of advanced life support for children.

Subspecialty conferences, including morbidity and mortality conferences, journal reviews, and research seminars, should be regularly attended. Active participation of the subspecialty resident in pediatric anesthesiology in the planning and production of these conferences is essential. However, the faculty should be the conference leaders in the majority of the sessions. Attendance by residents at multidisciplinary conferences, especially those relevant to pediatric anesthesiology, is encouraged.

VI. Resident Duty Hours and the Working Environment

Providing residents with a sound academic and clinical education must be carefully planned and balanced with concerns for patient safety and resident well-being. Each program must ensure that the learning objectives of the program are not compromised by excessive reliance on residents to fulfill service obligations. Didactic and clinical education must have priority in the allotment of residents' time and energies. Duty hour assignments must recognize that faculty and residents collectively have responsibility for the safety and welfare of patients.

VI.A. Supervision of Residents

- VI.A.1. All patient care must be supervised by qualified faculty. The program director must ensure, direct, and document adequate supervision of residents at all times. Residents must be provided with rapid, reliable systems for communicating with supervising faculty.**
- VI.A.2. Faculty schedules must be structured to provide residents with continuous supervision and consultation.**
- VI.A.3. Faculty and residents must be educated to recognize the signs of fatigue and adopt and apply policies to prevent and counteract the potential negative effects.**

VI.B. Duty Hours

- VI.B.1. Duty hours are defined as all clinical and academic activities related to the residency program, ie, patient care (both inpatient and outpatient), administrative duties related to patient care, the provision for transfer of patient care, time spent in-house during call activities, and scheduled academic activities such as conferences. Duty hours do not include reading and preparation time spent away from the duty site.**
- VI.B.2. Duty hours must be limited to 80 hours per week, averaged over a four-week period, inclusive of all in-house call activities.**

VI.B.3. Residents must be provided with 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call. One day is defined as one continuous 24-hour period free from all clinical, educational, and administrative activities.

VI.B.4. Adequate time for rest and personal activities must be provided. This should consist of a 10 hour time period provided between all daily duty periods and after in-house call.

VI.C. On-Call Activities

The objective of on-call activities is to provide residents with continuity of patient care experiences throughout a 24-hour period. In-house call is defined as those duty hours beyond the normal work day when residents are required to be immediately available in the assigned institution.

VI.C.1. In-house call must occur no more frequently than every third night, averaged over a four-week period.

VI.C.2. Continuous on-site duty, including in-house call, must not exceed 24 consecutive hours. Residents may remain on duty for up to 6 additional hours to participate in didactic activities, maintain continuity of medical and surgical care, transfer care of patients, or conduct continuity clinics. During the 6 additional hours, residents may not administer anesthesia in the OR for a new operative case or manage new admissions to the ICU. As a general rule, the resident may not manage non-continuity patients in the 6 hours post-call.

VI.C.3. No new patients may be accepted after 24 hours of continuous duty, except in outpatient continuity clinics. A new patient is defined as any patient for whom the resident has not previously provided care. A patient admitted to the ICU from surgery is considered a new patient.

VI.C.4. At-home call (pager call) is defined as call taken from outside the assigned institution.

VI.C.4.a) The frequency of at-home call is not subject to the every third night limitation. However, at-home call must not be so frequent as to preclude rest and reasonable personal time for each resident. Residents taking at-home call must be provided with 1 day in 7 completely free from all educational and clinical responsibilities, averaged over a 4-week period.

VI.C.4.b) When residents are called into the hospital from home, the hours residents spend in-house are counted toward the 80-hour limit.

VI.C.4.c) The program director and the faculty must monitor the demands of at-home call in their programs and make scheduling adjustments as necessary to mitigate excessive service demands and/or fatigue.

VI.D. Moonlighting

VI.D.1. Because residency education is a full-time endeavor, the program director must ensure that moonlighting does not interfere with the ability of the resident to achieve the goals and objectives of the educational program.

VI.D.2. The program director must comply with the sponsoring institution's written policies and procedures regarding moonlighting, in compliance with the Institutional Requirements III. D.1.k.

VI.D.3. Moonlighting that occurs within the residency program and/or he sponsoring institution or the non-hospital sponsor's primary clinical site(s), ie, internal moonlighting, must be counted toward the 80-hour weekly limit on duty hours.

VI.E. Oversight

VI.E.1. Each program must have written policies and procedures consistent with the Institutional and Program Requirements for resident duty hours and the working environment. These policies must be distributed to the residents and the faculty. Monitoring of duty hours is required with frequency sufficient to ensure an appropriate balance between education and

VI.E.2. Back-up support systems must be provided when patient care responsibilities are unusually difficult or prolonged, or if unexpected circumstances create resident fatigue sufficient to jeopardize patient care.

VII. Peer Interaction

Subspecialty residents in pediatric anesthesiology should become experienced in teaching principles of pediatric anesthesiology, including topics such as management of patients requiring sedation outside the OR's, pain management, and life support, to other resident physicians, medical students, and other health care professionals. Residents should also participate in planning and conducting conferences.

VIII. Scholarly Activities

The subspecialty training program in pediatric anesthesiology should provide the opportunity for active resident participation in research projects pertinent to pediatric anesthesia. Subspecialty residents should be instructed in the conduct of scholarly activities and the evaluation of investigative methods and interpretation of data, including

statistics; they should have the opportunity to develop competence in critical assessment of new therapies and of the medical literature.

IX. Additional Required Components

There should be prompt access to consultation with other disciplines, including pediatric subspecialties of neonatology, cardiology, neurology, pulmonology, radiology, critical care, emergency medicine, and pediatric subspecialties of surgical fields. To provide the necessary breadth of experience, an accredited residency training program in pediatrics is required within the institution. Residency programs or other equivalent clinical expertise in other specialties, particularly pediatric general surgery and pediatric surgical subspecialties, such as otolaryngology, cardiovascular surgery, urology, neurosurgery, ophthalmology, and orthopedics, and pediatric radiology are highly desirable.

X. Evaluation

- X.A. Faculty responsible for teaching subspecialty residents in pediatric anesthesiology must provide critical evaluations of each resident's progress and competence to the pediatric anesthesiology program director at the end of 6 months and 12 months of training. These evaluations should include attitude, interpersonal relationships, fund of knowledge, manual skills, patient management, decision-making skills, and critical analysis of clinical situations. The program director or designee must inform each resident of the results of evaluations at least every 6 months during training, advise the resident on areas needing improvement, and document the communication. Subspecialty residents in pediatric anesthesiology must obtain overall satisfactory evaluations at completion of 12 months of training to receive credit for training.
- X.B. There must be a regular opportunity for residents to provide written, confidential evaluation of the faculty and program.
- X.C. Periodic evaluation of patient care (quality assurance) is mandatory. Subspecialty residents in pediatric anesthesiology should be involved in continuous quality improvement, utilization review, and risk management.
- X.D. Periodic evaluation of subspecialty training objectives is encouraged.

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