

# AMERICAN ACADEMY OF PEDIATRICS

Section on Anesthesiology

## Guidelines for the Pediatric Perioperative Anesthesia Environment

**ABSTRACT.** The American Academy of Pediatrics proposes the following guidelines for the pediatric perioperative anesthesia environment. Essential components are identified that make the perioperative environment satisfactory for the anesthesia care of infants and children. Such an environment promotes the safety and well-being of infants and children by reducing the risk for adverse events.

Discussions related to decreasing anesthesia risks for children have generated proposals that range from implementing performance-based practitioner clinical privileging, suggesting that fellowship-trained anesthesiologists be required to provide anesthesia for children under a specific age and mandating that all infants and critically ill children requiring anesthesia be cared for in hospitals with special neonatal and/or pediatric care units.<sup>1-15</sup> Although defining important concerns, such proposals have not addressed the facility-based components needed for the pediatric perioperative anesthesia environment, the absence of which can hinder the care provided by the anesthesiologist, usually the principal, but often not the sole, member of the perioperative anesthesia care team.<sup>16</sup>

Important facility-based component issues for the perioperative anesthesia environment include but are not limited to the training and experience of the health care team; the resources committed to the care of infants and children in the preoperative and postoperative (as well as the intraoperative) care periods; and intraoperative and postoperative techniques for airway management, fluid administration, temperature regulation, vascular catheter insertion, monitoring, and pain management. Patient care facilities and their medical staffs who wish to provide pediatric anesthesia care must be able to address these issues in a competent manner.

The American Academy of Pediatrics recommends the following guidelines for the pediatric perioperative anesthesia environment. They are intended for use with patients requiring general and regional anesthesia. Other documents of the American Academy of Pediatrics address the issues involved in the administration of sedation for diagnostic and therapeutic procedures.<sup>17</sup>

These guidelines of the American Academy of Pediatrics are intended to supplement rather than to

replace the Standards and Guidelines of the American Society of Anesthesiology for the perioperative care of patients receiving anesthesia.<sup>18</sup> In addition, the American Academy of Pediatrics has published guidelines concerning medical staff appointment and delineation of privileges in hospitals, and facilities and equipment in the care of pediatric patients in a community hospital.<sup>19,20</sup> The guidelines extend the concepts noted in these documents to the pediatric perioperative anesthesia environment.

The term perioperative is defined as the periods of time and those areas of a patient care facility in which the patient preparation for, performance of, and recovery from surgical procedures occur.

Anesthesia care required under emergency circumstances may preclude the strict use of these guidelines.

### PATIENT CARE FACILITY AND MEDICAL STAFF POLICIES

#### Designation of Operative Procedures/Categorization of Pediatric Patients Undergoing Anesthesia/The Annual Minimum Case Volume to Maintain Clinical Competence

There should be a written policy designating and categorizing the types of pediatric operative, diagnostic, and therapeutic procedures requiring anesthesia on an elective and emergent basis, and indicating the minimum number of cases required in each category for the facility to maintain its clinical competence in their performance. This policy should be based on the capability of the patient care facility and its medical staff to care for pediatric patients requiring anesthesia. The categories should identify patients at increased anesthesia risk. They will be used to determine facility capability and whether anesthesiologists providing or directly supervising the anesthesia care for patients in a specific category will require special clinical privileges. The categories should include patient age, procedures for which postoperative intensive care is anticipated, and patients with special anesthesia risks based on coexisting medical conditions.

Information available on anesthesia adverse outcomes suggests neonates are at higher risk than are older infants and, in turn, older infants are at greater risk than pediatric patients older than 2 years of age.<sup>21-28</sup> The following age categories are recommended: 0 to 1 month, 1 to 6 months, 6 months to 2 years, and older than 2 years. Because of the anatomic, physiologic, and psychological differences between children and adults, additional differentiation

The recommendations in this statement do not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

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of pediatric age groups for patients older than 2 years is recommended.

Anesthesia care for pediatric patients should be provided or supervised by anesthesiologists with clinical privileges as noted below. The annual minimum case volume required to maintain clinical competence in each patient care category should be determined by the facility's Department of Anesthesia.

### **Clinical Privileges of Anesthesiologists**

#### *Regular Clinical Privileges*

Anesthesiologists providing clinical care to pediatric patients should be graduates of an anesthesiology residency training program accredited by the Accreditation Council for Graduate Medical Education or its equivalent.

#### *Special Clinical Privileges*

In addition to the requirement noted above, anesthesiologists providing or directly supervising the anesthesia care of patients in the categories designated by the facility's Department of Anesthesia as being at increased anesthesia risk should be graduates of an Accreditation Council for Graduate Medical Education pediatric anesthesiology fellowship training program or its equivalent or have documented demonstrated historical and continuous competence in the care of such patients.

### **Pain Management**

There should be a patient care facility policy for effective pediatric pain treatment in the perioperative anesthesia environment. Pain management strategies need to be tailored to the types of surgical procedures, the individual variations of pain perception, and the options available for analgesic intervention. The American Society of Anesthesiologists has published practice guidelines for acute pain management in the perioperative setting.<sup>29</sup> However, each Pediatric Pain Management Service must establish its own set of standard protocols to optimize patient care, to facilitate ongoing education and training, and to ensure that hospital personnel are knowledgeable and skilled with regard to effective and safe use of treatment options available. Parents of infants and children undergoing operative procedures on an outpatient basis should receive instructions on pain management at home.<sup>30</sup>

## **PATIENT CARE UNITS**

### **Preoperative Evaluation and Preparation Units**

A separate preoperative unit or an area within a general preoperative unit should be available and designated to accommodate pediatric patients and their families. It should have age- and size-appropriate equipment required for the preoperative evaluation and preparation of the infant or child.

### **Operating Room**

#### *Anesthesiologists*

An anesthesiologist with pediatric anesthesia experience should be responsible for the organization of the pediatric anesthesia services.

### *Other Health Care Providers Involved in the Perioperative Care of the Infant or Child*

Nursing and technical personnel involved in the care of infants and children should be trained and experienced in routine and emergency pediatric perioperative care. Important considerations in the training of such personnel include: 1) the ability to formulate drugs and infusions in appropriate doses, concentrations, and volumes for pediatric patients; and 2) expertise in the methods of respiratory therapy administration for infants and children.

The facility's operating room administration should be responsible for the organization of pediatric perioperative ancillary and/or support services. These team members should work in concert with the anesthesia service to organize both day-to-day and emergency procedures for infants and children in the perioperative environment.

#### *Clinical Laboratory and Radiologic Services/Availability and Capabilities*

Clinical laboratory and radiologic services should be available at all times when patients are being cared for at the facility. The clinical laboratory must have the capability to provide hematologic and chemical analyses on small samples.

#### *Pediatric Anesthesia Equipment and Drugs*

There should be a full selection of equipment available for application to the pediatric patient. This equipment should be easily accessible and well-maintained.

A resuscitation cart with equipment appropriate for pediatric patients of all ages, including pediatric defibrillator paddles, is required. The anesthesiologist should be educated in recognition of cardiac dysrhythmias, have equipment for accurate recording of abnormal cardiac rhythms, and know how to use defibrillators that can deliver pediatric doses of energy accurately.<sup>31</sup>

Resuscitation cardiac drugs should be available in appropriate pediatric concentrations. A written pediatric dose schedule for these drugs should be immediately available.<sup>32-34</sup>

Other necessary items include:

- Airway equipment for all ages of pediatric patients including ventilation masks, tracheal tubes, oral and nasopharyngeal airways, laryngoscopes with pediatric blades, fiber-optic airway equipment, and bronchoscopes;
- A separate, fully stocked "difficult airway cart" containing specialized equipment for management of the difficult pediatric airway by a variety of techniques for airway control, ventilation, and intubation including but not limited to fiber-optic bronchoscopy, and emergency cricothyrotomy;
- Positive-pressure ventilation systems appropriate for infants and children;
- Devices for the maintenance of normothermia (eg, warming lamps, circulating warm-air devices, room thermal regulation capability, airway humidifiers, and fluid-warming devices);
- Intravenous fluid administration equipment in-

cluding pediatric volumetric fluid administration devices, intravascular catheters in all pediatric sizes, and devices for intraosseous fluid administration<sup>35</sup>;

- Noninvasive monitoring equipment for the measurement of electrocardiography, blood pressure, pulse oximetry, capnography including anesthetic gas concentrations, temperature, and inhaled oxygen concentration; and
- Equipment for the measurement of arterial and central venous pressures in infants and small children.

#### Postanesthesia Care Unit

##### Nursing Staff

Postanesthesia recovery nurses with pediatric education and experience who are knowledgeable in intraoperative pediatric anesthesia management are required. Training and experience in pediatric airway management and basic resuscitation techniques, as well as the ability to recognize a child in distress and provide immediate assistance while calling for support staff/resuscitation team, are necessary. Pediatric Advanced Life Support Course certification should be required.

##### Anesthesiologist/Physician Staff

An anesthesiologist or other physician trained and experienced in pediatric perioperative care including the management of postoperative complications and the provision of pediatric cardiopulmonary resuscitation should be immediately available to evaluate and treat any child in distress. Pediatric Advanced Life Support or Advanced Pediatric Life Support certification is recommended.

##### Pediatric Anesthesia Equipment and Drugs

The pediatric anesthesia equipment and drugs specified in "Operating Room" above should be available for patients in the Postanesthesia Care Unit.

Every child admitted to the postanesthesia care unit should have his/her vital signs monitored.

Suction equipment and oxygen should be available at each bedside.

A respiratory oxygen delivery system should be available for use in the transport of infants and children from the operating room to the postanesthesia care and/or postoperative intensive care unit when medically indicated.

#### POSTOPERATIVE INTENSIVE CARE

Patient care facilities in which operative procedures are performed that involve postoperative intensive care should have an intensive care unit (neonatal or pediatric) appropriate for the age of the patient. The intensive care unit should be designed, equipped, and staffed to meet state and federal standards for the care of critically ill neonates, infants, and/or children.<sup>36</sup> The only exception is an operative procedure required in a life-or-death emergency.

Patient care facilities (including outpatient surgical centers) that perform operative procedures for which postoperative intensive care is not anticipated

should have a clearly delineated plan to transfer children to an appropriate facility when unexpected complications arise.

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#### ACKNOWLEDGMENT

The Committee appreciates the support of the following medical groups in the preparation of this document: the Executive Committee of the Section on Anesthesiology, the Society for Pediatric Anesthesia, the Study Group on Pediatric Anesthesiology, and the Bay Area Pediatric Anesthesiology Consortium.

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Section on Anesthesiology  
*Pediatrics* 1999;103;512  
DOI: 10.1542/peds.103.2.512

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OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

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*Pediatrics* 1999;103;512

DOI: 10.1542/peds.103.2.512

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