University of Minnesota Anesthesiology Residency Program

PEDIATRIC ANESTHESIA
ROTATION GOALS AND OBJECTIVES

Goals: The overall goal of the rotation is to provide an introduction and understanding of the perioperative care of newborns, infants and children undergoing a wide variety of surgical procedures. During the rotation the resident will acquire knowledge and technical skills pertaining to pediatric anesthesiology as follows:

- Understand the critical assessment areas of infants and children presenting for surgery
- Understand the important anatomical considerations which impact delivery of anesthesia to infants and children presenting for surgery
- Understand the important physiological principles associated with pediatric anesthesia and how these effect anesthetic care
- Develop proficiency in using the critical monitoring devices utilized during pediatric anesthesia
- Understand principles and procedures of commonly performed surgeries in infants and children during routine and complicated pediatric anesthesia care
- Understand the occurrence and prevention of anesthetic complications that manifest following pediatric anesthesia
- Understand the critical post-anesthetic care of the pediatric patient

With the completion of the rotation the resident will be able to demonstrate proficiency in preoperative evaluation, intraoperative and postoperative care including basic understanding of the anesthetic care of neonates, infants and children so as to be able to provide safe and compassionate pediatric anesthesia.

Objectives: Objectives for the pediatric anesthesiology rotation are listed by ACGME core competency.

Patient Care: Upon completion of the pediatric anesthesiology rotation the resident is expected to:

- Perform a complete preoperative evaluation of the pediatric patient presenting for general, urological, orthopedic, ENT, neurosurgical, ambulatory and other surgical procedures.
- Understand the principles of sedation and monitoring for pediatric patients having procedures outside the operating room such as radiological procedures.
- Evaluate the anesthetic risks and necessary interventions to minimize risks;
- Chose an anesthesia induction plan including the need or otherwise for parental or other care-giver presence
- Decide on the need for more than routine anesthesia monitoring
- Learn setting up of the operating room for age-appropriate needs (drugs, equipment and fluids)
• Perform the techniques of rapid IV access in newborns, infants and children
• Develop the ability to respond rapidly when needed and as directed by changing medical condition.
• Provide preoperative, intraoperative and postoperative care of patients undergoing general, urological, orthopedic, ENT, neurosurgical, ambulatory and other surgical procedures.
• Recognize, treat and prevent postoperative pain in children and infants.
• Transport critically ill patients to and from the O.R. safely.

Medical knowledge: Upon completion of this rotation residents are expected to:

• Understand principles of anesthesia for newborns, infants and children as it applies to their anatomy and physiology.
• Understand the pathophysiologic processes involved in pediatric surgical conditions and their interaction with anesthetics.
• Understand the pharmacology of anesthetic agents and their effects on newborns, infants and children (examples of anesthetic agents include sevoflurane, desflurane, isoflurane for inhaled anesthetic agents; midazolam, propofol and thiopental for IV agents and all the opioids).
• Understand principles of temperature regulation for newborns, infants and children.
• Develop a working knowledge about airway care for newborns, infants and children.
• Understand the risks, benefits including indications and contraindications of invasive procedures including commonly performed blocks (such as caudal block, ilio-inguinal nerve block and epidural catheter placement), placement of central venous and arterial catheters.

Practice-Based Learning and Improvement: The resident will learn evidence-based medicine as it relates to pediatric anesthesia. The resident will demonstrate continuing effort to improve performance and furthering knowledge by attending educational activities as they relate to pediatric anesthesia lectures, conferences, journal clubs. Upon completion of this rotation residents are expected to:

• Seek and incorporate feedback (physician, patient, peers) and their own insight to focus on areas in their performance that need improvement.
• Critically evaluate the literature and try to make patient care decisions based upon scientific evidence.
• Recognize his/her own limits and to practice within them while striving to safely expand these limits.

Interpersonal and Communications Skills: Because this is a unique age group involving newborns, infants and children, after an experience in the rotation in pediatric anesthesia, the resident is expected to:

• Effectively communicate with pediatric patients and their parents and other care-givers concerning preoperative assessment
• Explain the anesthesia procedures and the role of an accompanying adult companion when indicated.
• Answer patient and family questions honestly and with sensitivity.
• Communicate pertinent data about the newborn, infant or child to the attending anesthesiologist.
• Understand the emotional and psychological impact of a child’s illness upon the child and the family, and use this knowledge to guide his/her interactions.

Professionalism: The resident should demonstrate professional practice in their interactions with babies and children, their parents/care-givers, colleagues, and other members of the health care team. Upon completion of this rotation the resident is expected to:

• Complete all pre, intra and post-operative documentation in accordance with departmental requirements
• Fulfill clinical duties in a timely and effective manner.
• Demonstrate respect and sensitivity to the patients and their families.
• Remain calm and focused in situations where the patients are frightened or upset.

Systems-based Practice: The resident will understand and appreciate the team approach in taking care of newborns, infants and children needing anesthesia care. He or she will practice preoperative sedation/anesthesia in this unique age group, mask induction and airway skills including intravenous catheter placement and use of intraoperative analgesic methods to facilitate the occurrence of excellent patient outcomes in a timely and cost-effective manner. Upon completion of this rotation the resident is expected to:

• Use all available sources of patient information available to construct an appropriate anesthetic plan
• Constructively participate in efforts to improve our system(s) of delivery of care
• Apply evidence-based, cost-conscious strategies regarding patient perioperative care
• Understand the necessary components of a comprehensive pediatric surgical unit

Assessments: Resident performance in pediatric anesthesiology is assessed through the following:

• At the end of this rotation residents will deliver a 20-minute presentation to their peers on a topic of his or her choosing, relevant to the practice of pediatric anesthesia.
• Verbal feedback, based on the evaluation of the faculty will be given to each resident informally throughout the rotation and formally at the halfway point, and at the end of the rotation.
• Written evaluation using a global rating system of the 6 core competencies is completed at the end of the rotation.

Suggested reading
TEXTBOOKS
1. Smith’s Anesthesia for Infants and Children 6th Edition (there is a copy in the library)
2. Pediatric Anesthesia, Editor George Gregory 4th Edition

Topics that residents must read:

- Anatomy & Physiology in relation to Pediatric Anesthesia
- Techniques and Procedures of Pediatric Anesthesia
- Pharmacology of Pediatric Anesthesia
- Medical Conditions Influencing Anesthesia Care
- Psychological Aspects of Pediatric Anesthesia
- Postoperative Care and Pain Management
- Pediatric Specialties of Common Interest:
  - Otolaryngology
  - General and thoracoabdominal surgery
  - Neurosurgery
  - Urologic Surgery
  - Ophthalmology
  - Dental Surgery
  - Orthopedic Surgery
  - Plastic and Reconstructive Surgery
  - Anesthesia outside the Operating Room
    - MRI, CT Scan, Radiological procedures

Didactic Lectures that address important pediatric anesthesiology topics:

- Pre-Anesthetic Evaluation of Newborns, Infants and Children
- Anesthesia Induction in Pediatric Patients & age related effects of volatile agents
- Common problems in pediatric anesthesia:
- Bronchial asthma, URI, Sickle Cell Anemia, Hemophilia, the ex-premie
- Management of the Pediatric Airway
- Pediatric Neuro/Craniofacial Anesthesia
- CPR in Children (Orientation)
- OR Equipment, OR and PACU Tour
- Neonatal Surgical Emergencies
- Neonatal Cardiac Physiology – The Transitional Circulation
- Anemia and Blood Component Therapy
- Pediatric Regional Anesthesia
- Pain Management in Infants and Children
- Syndromes and Their Anesthetic Implications
- Neuromuscular Blocking Agents in Children
- Anesthesia for Airway Surgery
• Non-Cardiac Surgery in children With Heart Disease
• Inotropic Support in Children
• T & A and Obstructive Sleep Apnea
• Laparoscopic Surgery in Children
• Non-OR Anesthesia