The Department of Anesthesiology has established a rotation consisting of one to two months of subspecialty training in pediatric anesthesia during the second and third years of clinical anesthesia. Residents also have the opportunity to provide care for pediatric patients throughout the residency. They may elect to pursue their second required month’s rotation either at UMass or at Hasbro Children’s Hospital, Providence; or may choose to pursue additional electives in the subspecialty at other institutions or in this program. Resident training includes experience with providing anesthesia for inpatient and outpatient surgical procedures and for nonoperative diagnostic and therapeutic procedures outside the operating room. Residents are involved with preanesthesia evaluation and preparation, post anesthesia care, and pain management. Anesthesia residents at the University of Massachusetts are exposed to a wide variety of clinical problems in neonates, infants, children and adolescents.

GOALS

The resident will be expected to develop the skill and knowledge necessary to administer anesthesia to infants and children in cases that would be encountered in a general anesthesia practice. The techniques and problems unique to the pediatric practice will be the area of principle education

INTRODUCTION TO PEDIATRIC ANESTHESIA (CA1 year)

CA 1 residents do not complete a formal month block but do participate in many pediatric anesthetics as result of working with a CA 2 or CA 3 resident or with a faculty member when a pediatric case is assigned to the room.

The resident at the CA1 level will be expected to do/know the following:

I. MEDICAL KNOWLEDGE

- Understand the anatomic differences in the airway of neonates, children and adults and how these differences impact airway management.

- Understand the differences between the equipment needs of pediatric anesthesia versus adult anesthesia to include breathing circuits, circle systems, masks, airways, endotracheal tubes, and laryngoscopes

- Be familiar with cardiovascular, respiratory, renal, hepatic, and central nervous system physiology of the pediatric patient

- Be familiar with the medical and surgical problems that are common in children
II. PATIENT CARE

- Be able to prepare anesthesia machine and cart with the proper equipment and drugs appropriate for the age and size of the patient
- Become efficient in the gathering of information and recording information in the preoperative evaluation note
- Become proficient in examining the patient to assess airway and to rule out any acute problems such as cardiac or respiratory problems that need to be addressed prior to induction of an anesthetic
- Be able to manage a normal pediatric airway by bag mask
- Be able to provide proper equipment to aid temperature regulation in the operating room
- Have the proper drugs available for pharmacologic support of the circulation
- Be able to interpret laboratory results
- Be familiar with the best technique for insertion of peripheral venous catheters
- Be able to manage normal perioperative fluid therapy
- Be able to recognize and treat pain in the neonate and child

III. INTERPERSONAL AND COMMUNICATION SKILLS

- Discuss with the attending faculty the findings on the preoperative assessment and the choice of anesthetic for each patient
- Obtain appropriate pre-anesthetic history from family, provide basic discussion of planned anesthetics, and obtain informed consent from family

IV. PROFESSIONALISM

- Understand the role that each member of the health care team plays in the care of the pediatric patient

V. PRACTICE-BASED LEARNING

- Arrive for cases prepared by reading the appropriate section of a pediatric anesthesia text, as suggested by the pediatric attending

VI. SYSTEMS-BASED PRACTICE

- Be able to participate in the preoperative assessment of children scheduled for surgery and complete a legible report
CA-2 REQUIRED ROTATION

I. MEDICAL KNOWLEDGE

At the conclusion of the rotation, the resident should:

- Be able to demonstrate an understanding of specific disease states, medical/surgical conditions and syndromes, as they relate to the management of pediatric patients
- Discuss the rationale for the choice of anesthetic agents to include inhaled agents, narcotics, and muscle relaxants in newborns based on physiologic and pharmacologic principles
- Be able to discuss premedication and induction techniques which are common in pediatric anesthesia
- Be aware of the disease states of particular concern in the pediatric population i.e. neuromuscular disorders, family history of malignant hyperthermia etc.
- Know and apply pediatric anatomy and physiology to the anesthetic management of pediatric patients
- Be able to describe the different breathing circuits used in the pediatric population, along with indications and contraindications
- Be able to describe the differences in drug effect for the pediatric compared to adult population
- Be able to describe means of fluid replacement therapy, including calculations of estimated blood volume and allowable blood loss
- Be able to describe blade options, as well endotracheal tube sizing, for pediatric airway management
- Be able to describe alternatives for induction in the pediatric patient
- Be able to describe alternatives in management for difficult/problematic airways i.e. Pierre-Robin, pyloric stenosis, bleeding tonsil, epiglottitis
- Be aware of NPO guidelines in the pediatric population
- Be able to discuss the cognitive and developmental stages of pediatric patients

II. PATIENT CARE

At the conclusion of the rotation, the resident should be able to:

- Perform a complete preanesthesia evaluation of the pediatric patient
- Be able to devise an appropriate anesthetic plan
- Be able to manage an appropriate anesthetic for routine pediatric cases, including the premedication, induction, intraoperative management, emergence, and transport to either PACU or PICU
- Manage children with a normal airway utilizing mask, bag and oral airway
- Intubate children with a normal airway with skill and rapidity utilizing an appropriate sized blade and endotracheal tube
- Obtain appropriate intravenous access in at least 50% of cases
- Attempt intraarterial access when appropriate
- Be able to assemble all necessary equipment for a pediatric cases, including circuit, non-invasive cuff, fluid warmers, IV set-ups
- Be able to perform simple pediatric regional anesthesia (caudal blocks) with staff supervision
- Be able to recognize and treat inadvertent one-lung ventilation
- Be able to recognize and manage laryngospasm in the pediatric patient
- Be able to recognize and treat post-intubation croup

III. PROFESSIONALISM

At the conclusion of this rotation, the resident will be able to:

- Arrange and participate in a parent-present induction of anesthesia
- Demonstrate respect and compassion for both the patient and their family, with an understanding of the particular stresses placed on parents during a child’s hospitalization
- Act calmly and efficiently during a period of surgical or anesthetic crisis

IV. COMMUNICATION AND INTERPERSONAL SKILLS

At the conclusion of the rotation, the resident will:

- Understand the need for, and be able to perform, preoperative consultations of ill children and communicate with staff anesthesiologists, surgical team and family re: needs and concerns
- Work effectively with others as a member of the team
- Understand the need for, and demonstrate, an ability to create and sustain a trusting relationship/rapport with patients and their families
- Demonstrate the effective use of listening skills, and elicit and provide information using nonverbal, explanatory, questioning, and writing skills

V. SYSTEMS-BASED PRACTICE

At the conclusion of the rotation, the resident should:

- Know how to partner with health care managers and health care providers to assess, coordinate, and improve the care of the patient and know how these activities can affect system performance (e.g. the safe and efficient transfer of a pediatric patient from the OR or PACU to the PICU)
- Have an awareness of cost savings measures that are efficacious and non-compromising of quality of care
- Understand the need to be an advocate for patients and their families in an often complex system during an often overwhelming and stressful period
VI. PRACTICE-BASED LEARNING

At the conclusion of the rotation, the resident should:

- Be able to access current literature to provide evidence-based care
- Be able to describe educational resources available and demonstrate ability to access them when presented with an unfamiliar syndrome, medication etc.
- Be able to analyze and discuss their case experiences and outcomes with pediatric faculty, and suggest and put into practice improvements

CA-3 REQUIRED ROTATION

I. MEDICAL KNOWLEDGE

At the conclusion of this advanced rotation, the resident should be able to:

- Describe the pathophysiology and anesthetic implications of neonatal surgical emergencies such as congenital diaphragmatic hernia, gastrochisis, intestinal obstruction, necrotizing enterocolitis, esophageal atresia, tracheoesophageal fistula, meningomyelocele, and patent ductus arteriosus and their anesthetic management
- Be able to define anesthetic considerations in caring for infants and children, both healthy and with co-existing disease, for both routine and complex procedures
- Describe the pathophysiology of common congenital heart disease lesions and their anesthetic implications
- Discuss pain management in pediatric patients of all ages

II. PATIENT CARE

At the conclusion of this advanced rotation, the resident should be able to:

- Be able to develop an anesthetic plan and carry it out(with minimal staff assistance), from decision re: preoperative sedation and parental presence, inhalation vs. intravenous induction, intraoperative management and appropriate postoperative analgesia for routine pediatric cases
- Participate in the care of critically ill neonates and children
- Complete PACU orders for pediatric patients
- Provide postoperative analgesia using epidural and intrathecal narcotics and be facile with the treatment of potential complications associated with their use
- Be proficient in assessment of infants and children presenting for surgery, particularly those children presenting with associated disease states
- Be able to recognize and treat common intra-op and post-op anesthetic complications in the pediatric patient
• Be moderately proficient in the manual skills of airway management, venous and arterial access, and caudal/epidural placement in the pediatric population

• Understand the importance of, and become proficient in temperature regulation, glucose and electrolyte management, and fluid management

III. INTERPERSONAL AND COMMUNICATION SKILLS

During the course of this rotation, the resident is expected to show increasing competency in each of the following:

• Understand the role of communication in easing anxieties of both pediatric patients and their families, and exhibit confidence and empathy in discussion with family members

• Creating a therapeutic and ethically sound relationship with children so they are able to maintain trust in the anesthesiologist

IV. PROFESSIONALISM

During the course of this rotation, the resident is expected to show increasing competency in each of the following:

• Have the knowledge and communications skills expected of a consultant anesthesiologist, with the ability to cogently express concerns to surgical team members

• Work together with other members of the health care team, including pediatricians and pediatric nurses, to optimize patient care, while acknowledging the occasional stressful aspects of care of the sick child.

• Demonstrating respect, compassion and integrity with parents and their child

• Demonstrating a responsiveness to the needs to patients and society that supersedes self-interest

• Demonstrating sensitivity and responsiveness to patient’s culture, age, gender and disabilities

V. PRACTICE-BASED LEARNING

During the course of this rotation, the resident is expected to show increasing competency in each of the following:

• The investigation and evaluation of their patient care practices

• Appraising and assimilating scientific evidence

• Understand preparation for complex pediatric cases
VI.  SYSTEMS-BASED PRACTICE

During the course of this rotation, the resident is expected to show increasing competency in each of the following:

- The demonstration of continued awareness of and responsiveness to the health care system and social systems involved in pediatric care

- Be involved in systems-based analysis, i.e. root cause analysis of complications that develop during or after an anesthetic for a pediatric patient

- Understand the need to operate efficiently when many outpatient cases are grouped together