

# UNIVERSITY OF MINNESOTA CHILDREN'S HOSPITAL - FAIRVIEW PEDIATRIC ANESTHESIA CURRICULUM

## DESCRIPTION OF ROTATION OR EDUCATIONAL EXPERIENCE

An anesthesia rotation at Fairview-University hospital is provided under the direction of Dr. Michael Sweeney. Specific goals of this rotation include gaining concentrated experience in a variety of procedures (intubation, airway management, central and arterial lines, IV's, etc.), the use of many sedative/anesthetic agents including the reversal of such agents, and perioperative patient management.

## ROTATION GOALS

The overall goal of this rotation is to provide educational and clinical opportunities to acquire the knowledge, clinical skills and professional attitudes required to assess, manage and recover patients requiring sedatives, analgesia and anesthesia, including necessary technical procedures to support and monitor them.

## PATIENT CARE

### Goals

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, including;

1. Understand important developmental and anatomic considerations impacting delivery of anesthesia in neonates and children
2. Become proficient in critically assessing infants and children with complex medical and surgical issues
3. Become proficient in recognizing appropriate need for, establishing and interpreting invasive cardiorespiratory monitoring
4. Understand and manage post-anesthetic issues

### Objectives

Fellows will arrive at an appropriate hour, pre-round on previous consultations and begin intakes of new consultations. Consultations may be requested from any inpatient hospital service and the emergency department.

#### 1. Develop practical skills pertaining to patient care including:

- Performing appropriately focused history and physical exam.
- Synthesis of differential diagnoses and plans for patient management.
- Ability to coordinate diagnoses and plans for patient management.

#### 2. Foster the involvement of sound clinical judgment and efficient clinical practical skills through:

- Experience with technical skills related to airway management, including the difficult airway
- Experience with establishing and utilizing invasive monitoring
- Experience with intravenous sedation and analgesia techniques
- Experience with management of gradual and rapid blood loss
- Experience in neonatal and pediatric resuscitation

#### 3. Develop diagnostic and therapeutic procedural skills that will be developed with one-on-one faculty supervision include:

- Arterial Blood Gas Interpretation.
- Pulmonary Function Test Interpretation.
- Thorax and Chest Examination Interpretation.
- Chest CT or MRI Scan Interpretation.
- Ventilatory support, weaning and respiratory care techniques
- Hemodynamic Monitoring Techniques.
- Diagnostic Fiberoptic Bronchoscopy Performance and Results Interpretation

### Competencies

1. Faculty Rotation Evaluation
2. Patient log
3. Procedure log
4. Staff 360 evaluation
5. Patient 360 Evaluation

### **MEDICAL KNOWLEDGE**

#### Goals

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.

#### Objectives

Residents will demonstrate an investigatory and analytical thinking approach to clinical situations, know and apply the basic and clinically supportive sciences which are appropriate to Pediatric Anesthesia.

1. Participation in management and/or discussions pertaining to individual patients should subsequently enable to fellows to understand:

- Pre-anesthetic assessment and preparation of the pediatric patient
- Neonatal and pediatric and developmental anesthetic pharmacology, including:
  - Dosing formulas for children
  - Inhalational agents (uptake, elimination, induction, emergence)
  - Intravenous agents (induction, maintenance, antagonists)
  - Muscle relaxants (neuro-muscular physiology, depolarizing vs. non-depolarizing relaxants, reversal), anti-cholinergic agents, post-operative analgesia
- Developmental anatomy and physiology pertinent to anesthetic issues (airway anatomy, vascular anatomy and size, lung volumes and compliance, etc.)
- Interpretation of neonatal and pediatric laboratory results, including blood gasses, electrolytes and coagulation tests
- Assessment and management of the normal and difficult pediatric airway
- Intraoperative temperature regulation and maintenance
- Methods and goals of mechanical ventilator support
- Management of massive fluid and/or blood loss
- Perioperative fluid therapy
- Implications of common diseases and surgical interventions in infants and children
- Postoperative pain management assessment and therapy
- Assessment and management of common pediatric post-anesthesia care unit (PACU) problems
- Advanced life support for pediatric patients including
  - Emergency airway management and respiratory support
  - Pharmacological support of circulation
  - Arrhythmia management
- Anesthetic implications of major pediatric surgical interventions
  - Neonatal emergencies
  - Solid organ transplantation
  - Craniotomy
  - Craniofacial reconstruction
  - Scoliosis repair
  - Understanding of chronic pain conditions and management options
  - Recognition and treatment of perioperative vital organ dysfunction
  - Transport of critically ill pediatric patients

2. Acquisition and safe performance of technical skills, including:
- Management of the normal pediatric airway with and without tracheal intubation
  - Management techniques for the difficult pediatric airway
  - Vascular access placement for fluid and pharmacological therapy
    - Peripheral IV
    - Central venous lines (Internal jugular, subclavian, femoral)
  - Vascular access for invasive hemodynamic monitoring
    - Arterial access
    - Central venous access
    - Swan-Ganz placement

Competencies

1. Faculty Rotation Evaluation
2. Society of Critical Care Medicine's Multidisciplinary Critical Care Knowledge Assessment Program (MCKKAP) in-service examination
3. Procedure log, including annotations regarding technical insights, level of comfort performing procedure, complications
4. Awareness of NACHRI BSI initiative
5. PALS and NLS certification

**PRACTICE-BASED LEARNING AND IMPROVEMENT**

Goals

Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life long learning.

Objectives

1. Attend complications conferences/M & M to analyze the anesthesia experience and the experience of others in such a way as to foster improvement in patient care
2. Participate in feedback with faculty to help improve patient management
3. Maintain procedure log
4. Attend didactic anesthesia lectures during their rotation

Competencies

1. Maintain procedure log, including annotations regarding technical insights, level of comfort performing procedure, complications
2. Faculty Rotation Review
3. Post-operative patient rounds

**SYSTEMS BASED PRACTICE**

Goals

Residents 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, including:

Objectives

1. Understand the effect of patient management decisions and professional practices upon other health care professionals, the health care organization, and the larger society
2. Appreciate the differences in medical practice, particularly differences in anesthetic technique and surgical requirements, and their effect upon medical management.
3. Understand team approach to how patients present, are investigated, assessed and optimized for their surgical procedures and how their management impacts this team approach

3. Practice cost-effective health care and resource allocation while maintaining an uncompromised quality of care, including technical equipment and supplies, blood products, pharmaceuticals and laboratory testing
4. Advocate for quality patient care and assist patients in dealing with system complexities
5. Acknowledge medical errors and assist in developing or improving systems for their prevention.
6. Transport of patients from their ward location to the OR and from the OR to the PACU or their ward location safely and rapidly
7. Use of other consultants (ie- pediatric cardiologist) to prepare complex patients prior to surgery

Competencies

1. Staff 360 evaluation
2. Participate in relevant M & M
3. Participate in relevant QI
4. Review “Pause for the Cause”

**PROFESSIONALISM**

Goals

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles and sensitivity to diverse populations.

Objectives

1. Demonstrate sensitivity and responsiveness to patients’ culture, age, gender and disabilities
2. Demonstrate respect, compassion and integrity for the skills and efforts of the OR and PACU staff
3. Contribute to efficient practice in the OR
- 4 Complete pre-, intra- and post-operative documentation in accordance with Departmental standards

Competencies

1. Communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds as evidenced by satisfactory family 360 evaluation
2. Communicate effectively with physicians and other health professionals as evidenced by a satisfactory staff 360 evaluation

**INTERPERSONAL AND COMMUNICATION SKILLS**

Goals

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.

Objectives

1. Communicate relevant information to patient and families
2. Learn appropriate interpersonal skills to effectively relate to pediatric patients and their families in a calm, caring manner during pre-operative assessment, when explaining process of anesthesia and risks and benefits of options
3. Communicate with surgical team and/or primary care team to obtain needed studies and optimize planning and timing for anesthesia
4. Communicate all significant intraoperative and perioperative issues personally to a member of the referring clinical team
5. Document complete procedure note for all procedures
6. Recognize psychological response of the pediatric patient about to undergo anesthesia
7. Recognize psychological response of the adult(s) caring for the pediatric patient about to undergo anesthesia

Competencies

1. Communicate effectively with patients and families across a broad range of socioeconomic and cultural backgrounds as evidenced by satisfactory 360 evaluation

2. Communicate effectively with physicians and other health professionals as evidenced by a satisfactory staff 360 evaluation
3. Maintain comprehensive, timely, and legible medical records for all procedures

**TEACHING METHOD(S)**

1. One-on-one instruction at the bedside and during procedures
2. Faculty role model during bedside interaction, during teaching sessions, and during OR cases

**ASSESSMENT METHOD – RESIDENT(S)**

End-of-rotation evaluation by Pediatric Anesthesia staff and reviewed with fellow

**ASSESSMENT METHOD – ROTATION**

The fellows provide an anonymous review of the rotation, including comment on patient volume, quality of supervision and overall value of rotation

**LEVEL OF SUPERVISION**

The fellow is directly supervised by Pediatric Anesthesia faculty

**EDUCATIONAL RESOURCES**

Critical Care fellows' office library

Computer-assisted literature reviews

Difficult Airway workshop

PALS, NLS

Suggested References:

Cote: A Practice of Anesthesia for Infants and Children

Greeley William and Nichols David. Pediatric Cardiovascular Anesthesia and Intensive Care

Katz et al. Anesthesia and Uncommon Pediatric Diseases