

Neonatal ICU Rotation

ROTATION DIRECTOR:

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I. Rotation Overview

The Division of Newborn Medicine at the Floating Hospital for Children offers comprehensive services to all newborn infants requiring intensive care or diagnostic evaluation. The Neonatal ICU has 46 beds and is one of the largest facilities in the Greater Boston area. High-risk patients from within Tufts Medical Center's Maternal Fetal Medicine Practice and patients from over twenty community Special Care Nurseries are referred to this NICU.

The overall Goal of the Neonatal Intensive Care Unit (NICU) rotation for fellows in Pediatric Anesthesia is to provide them with a thorough understanding of the common neonatal illnesses, their treatment, and their implications for anesthetic management. The fellow will work as an integral part of the NICU care team and be responsible for care of a maximum of 4 patients in the NICU. The fellow will participate in developing a care plan for their patients and participate

actively in daily teaching rounds and discussions. The Fellow will take responsibility of assigned patients and follow the patients through admission, discharge, or transfer. Participation in overnight call is not mandatory but highly encouraged since it provides the fellow additional opportunity and a broader learning experience.

During their rotation the Pediatric Anesthesia Fellow will function under the direct supervision and guidance of the NICU Medical Director. At the beginning of the NICU rotation, the Pediatric Anesthesia Fellow is instructed in the policies and procedures of the NICU by the NICU director.

- The NICU Director provides the pediatric anesthesia fellow with a copy of Neofax (medication dosing), and a copy of the NICU Manual
- The NICU director provides an overview of the functioning of the NICU
- Introduces the Anesthesia fellow to the staff
- Describes the level of responsibility for the anesthesia fellow.
- Provides a tour of the NICU, including call rooms
- Provides an introduction to neonatology resources such as Tufts University sciences knowledgebase (TUSK), Neonatal Manual and internet resources.

The fellow will receive a summative assessment at the end of the 2 week rotation.

II. Neonatal ICU Faculty

Jonathan M. Davis, MD	Neonatologist -in - Chief
Geoffrey G. Binney, Jr, MD MPH	Associate Chief
Jill L. Maron, MD	Neonatologist
Sunita Pereira, MD	Neonatologist
Christiane Dammann, MD	Director, Neonatal Perinatal Fellowship Program

For complete up to date listing please visit:

http://www.floatinghospital.org/OurServices/NewbornMedicine_NICU/default

III. Teaching Methodology

The ACGME has recognized six general competencies for resident and fellow education. These competencies are:

- Medical Knowledge (MK)
- Patient Care (PC)
- Interpersonal and Communication Skills (ICS)
- Professionalism (PROF)
- Practice Based Learning and Improvement (PBLI)
- Systems Based Practice (SBP)

Competency based education focuses on learner performance (learning outcomes) in reaching specific objectives (goals and objectives of the curriculum).

The Goals and Objectives of the rotation will be met utilizing the following methods:

- Didactic Activities: Core Lecture Series, Monday Anesthesia Grand rounds, Morbidity and Mortality Conferences, Monthly Journal Clubs.
- NICU Thursday Conference (Initial part of the conference is a combined NICU, Pediatric Surgery and Anesthesia session)
- Morning report
- Clinical Assignments and fellow presentations
- PBLI and SBP Activities: (involvement in QA/QI, M&M conferences, Risk Management and Patient Safety Initiatives)
- Guided personal study
- Clinical Research Projects

Recommended Texts, Reading Material and Electronic Resources:

- *Clinical Manual of Neonatology* by Gomella LANGE BOOKS
- *"A Practical Approach to Pediatric Anesthesia"* by Robert Holzman and Thomas Mancuso is a very readable text that is recommended for our fellows.
- *"A Practice of Anesthesia for Infants and Children"* by Charles J. Cote, David Todres has been recently updated and is available in both print and online formats.
- *"Smith's Anesthesia for Infants and Children"* by Davis, Cladis and Motoyama. Eighth Edition 2011. This book has also been thoroughly updated and is available in both print and online formats
- *"Clinical Anesthesia Procedures of the Massachusetts General Hospital"* by Peter Dunn and Keith Baker. The Pediatric Anesthesia and Neonatal Section give a good outline and is an easy read.
- Electronic Access via Tufts Health Sciences Library to multiple reference and research resources (OVID, Medline, MD Consult, Pediatric Anesthesia Journals etc.)
- Computer based learning through TUSK (Tufts University Knowledge Database)
- Pediatric Anesthesia Sections from Major Anesthesia Texts (Miller, Barash etc.)

IV. Evaluation and Assessment Methods

Your clinical performance during the rotation will be assessed using a collection of assessment and evaluation tools to assure that the competency – set goals and objectives have been met. Constructive assessment and feedback will help you focus on areas which and skill sets which need attention so that you can improve in them. Assessment data also will help us improve our rotation and improve your educational experience. Competencies covered using each method are delineated in *italics* below

A. Focused Direct Observation and Feedback

During the rotation fellows will receive direct observation and feedback from the rotation's supervising faculty. This will include verbal feedback and written assessments at the end of the rotation.

All 6 competencies.

B. 360 ° Global Evaluations

These are evaluation by different members of the patient care team (Intensivists, Nursing Staff, Ancillary Staff etc.). Helps provide multiple perspectives of fellow's performance.

Professionalism, Interpersonal and Communication Skills, SBP

C. Participation in Didactic and Educational Activities

Core Lectures, Participation in NICU Case Conferences and M&Ms

PBLI

Interpersonal and Communication Skills

Medical Knowledge

Patient Care

D. Rotation Evaluations by Fellows

Fellows are required to evaluate the rotations at the completion of the rotation and also during the annual confidential program and faculty survey. The aim is for them to self-assess the successful achievement of rotation goals, provide feedback to the program and develop PBLI plans. Fellows are required to fill out the "End of rotation evaluation" form or online via NI. This feedback is important for us to continue improving the rotation and address specific issues. In addition they should complete the annual confidential program survey for anonymous commentary.

Practice Based Learning and improvement.

V. Goals and Learning Objectives

The detailed Goals and Learning Objectives of the Neonatal ICU Elective Rotation for Pediatric Anesthesia Fellows are outlined below. The curriculum has been developed based on the new ACGME competency based education guidelines. The contents of the course curriculum have been compiled based on the Course Guidelines developed by the *ASA Committee on Pediatric Anesthesia*.

A. Medical Knowledge

1. Goals and Learning Objectives:

The fellow will be able to:

1. Define Preterm, Prematurity, Neonate, Infant, and Child.
2. Understand the terms Gestational Age and Post-Conceptual Age.
3. Understand the transition from fetal to neonatal circulation including the effect on vascular and cardiac structures (conversion from parallel to series circulation), fetal hemoglobin and blood gas values, arterial and pulmonary artery pressure changes, and ventricular function.
4. Define NICU Admission Criteria
5. Identify neonates requiring resuscitation
6. Describe standards for neonatal resuscitation
7. Recognize common neonatal surgical emergencies, their epidemiology and presentation
8. Propose appropriate perioperative and anesthetic management of common neonatal surgical emergencies
9. Identify common neonatal critical care problems (e.g. temperature control, respiratory compromise, fluid and electrolyte disturbances, glucose management and circulatory problems)
10. Learn about fluid and electrolyte management in Neonates
11. Fellows will learn about pathophysiology, indications for surgical intervention and anesthetic management of common neonatal surgical emergencies.
 1. Congenital diaphragmatic hernia (CDH)
 2. Inguinal hernia
 3. Intussusception
 4. Necrotizing enterocolitis (NEC)
 5. Omphalocele and Gastroschisis

6. Pyloric stenosis
7. Hydrocephalus requiring ventriculo-peritoneal (VP) shunt insertion or revision
8. Myelomeningocele
9. Craniosynostosis
10. Cleft lip or palate
11. Tracheoesophageal fistula (TEF)

B. Patient Care

1. Goals:

1. Fellows must be able to provide care that is compassionate, appropriate and effective.
2. They should be able to communicate effectively with the care team.
3. They should demonstrate caring and respectful behavior with the team members, patients and their families.

2. Learning Objectives:

1. Complete a history and physical assessment pertinent to the neonate requiring critical care intervention.
2. Evaluate a term and preterm infant and differentiate a healthy infant from a sick infant
3. Present a stratified differential diagnosis of the neonate's illness
4. Prescribe initial management of the neonate's condition
5. Demonstrate the ability to perform peripheral intravenous access
6. Demonstrate the ability to perform umbilical artery/vein cannulation
7. Demonstrate the ability to perform neonatal airway management, including suctioning, bag and mask ventilation and intubation
8. Interpret common laboratory evaluations in neonatal critical care medicine including umbilical cord blood gases, complete blood count and differential, chest x-ray, etc.

9. Diagnose and treat common respiratory problems in term and preterm infants especially RDS, TTN, pneumonia, persistent pulmonary hypertension and meconium aspiration syndrome.
10. Understand fluid and electrolyte balance in the term and preterm neonate
11. Know the common pathogens in neonatal sepsis and diagnose and manage neonatal sepsis
12. Understand common complications of prematurity, such as apnea of prematurity, anemia of prematurity, Hyperbilirubinemia of prematurity, feeding problems in the newborn, necrotizing enterocolitis, intraventricular hemorrhage, bronchopulmonary dysplasia and retinopathy of prematurity.
13. Understand pathophysiology of shock, treatment of cardiogenic, septic shock and hemorrhagic shock. Understand blood product transfusions
14. Be certified in Neonatal resuscitation Program.
15. Provide neonatal resuscitation as well as provide a leadership role in neonatal resuscitation by a team

C. Interpersonal and Communication Skills

1. Goals:

Fellows must be able to demonstrate interpersonal and communication skills that result in effective information exchange. They should be able to work effectively with others as a member or leader of a patient care team. They will learn how to effectively gather information using effective listening, explanatory, questioning and writing skills.

2. Learning Objectives:

1. Fellow will be able to establish a sustained and therapeutic and ethically sound relationship with the parents and/or health care proxy.
2. Will be able to effectively retrieve pertinent medical information from the parents and patient care team members.
3. Obtain informed consent and clearly communicate the options and risks to the parents and families.
4. Will coordinate care and work effectively with other patient care team members
- 5.

D. Professionalism

1. Goals:

Fellows must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

2. Learning Objectives:

1. Fellows will demonstrate respect, compassion and integrity.
2. Fellows will demonstrate a commitment to ethical principles
3. Fellows will demonstrate sensitivity and responsiveness to the needs of parents.
4. Will demonstrate sensitivity towards patient's culture, gender and disabilities.
5. Fellows will demonstrate ability to manage conflict

E. Practice Based Learning and Improvement

1. Goals:

Fellows must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices.

2. Learning Objectives:

1. Learn about the AAP and ASA Standards and Guidelines as pertinent to neonatology. They will learn to analyze and improve on their practices based on the guidelines and standards set forth by the ASA.
2. Will be able to locate, appraise and assimilate evidence from peer reviewed scientific articles related to our subspecialty.
3. They will explore various ways to find information using information technology (e.g. PubMed, Ovid, MD Consult etc.). They will learn to use our institutions Patient Information System to effectively gather information.
4. They will be able to apply knowledge based on the appraised literature and strive to practice evidence based medicine.

5. They will take active part in departmental and institutional Quality Improvement and Risk Reduction projects.

F. Systems Based Practice

1. Goals:

Fellows must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide effective safe care

2. Learning Objectives:

1. Understand the complex emotional atmosphere surrounding delivery of a newborn and be able to act as an advocate for the family in the medical environment
2. Provide appropriate education to ensure parents or caregivers are well informed regarding neonatal care management plans
3. Be aware of ethical issues faced by neonatologists as they balance individual patient care requirements with limited global resources
4. Acknowledge the difficulties and decision-making involved in utilization and allocation of finite health care resources
5. Fellows will learn to promote patient safety and understand ways to reduce medical errors (e.g. ticket to safety initiative, drugs error prevention program etc.)
6. The Fellows will strive to use medical supplies and equipment in a cost effective manner. Will learn strategies to reduce wastage and minimize cost of care.

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