American University of Beirut Medical Center
Department of Anesthesiology

Neuro-Anesthesia Rotation Goals and Objectives

Location: AUBMC

Rotation Coordinator: Dr. C. Zeeni

Rotation Duration: all residents will spend a minimum of 2 months on the Neuro-anesthesia rotation during their residency.

Rotation Goals and Objectives

I. Patient Care

Goal: Residents must be able to provide patients undergoing neurological procedures with care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

Learning Objectives:

A CA 1 resident at the end of the rotation should be able to:
- Recognize signs and symptoms of acute changes in intracranial pressure (ICP).
- Insert an arterial line under direct supervision.
- Recognize the different types of anesthetic agents used in elective craniotomy surgeries.
- Formulate a safe anesthetic management and monitoring plan for a neurosurgical patient, including consideration of anesthetic medication and gas effects on neuro-monitoring modalities.

A CA 2 resident at the end of the rotation should be able to:
- Understand the type and severity of major neurosurgical problem(s), as well as other medical problems that may affect the pathology.
- Recognize signs and symptoms of acute changes in ICP and institute proper treatment.
- Understand the rationale for the choice of agents in an elective craniotomy.
- Understand the anesthetic implications of the sitting position and manage such a case, with direction.
- Understand the specifics of the neurosurgical patient population, which may require special techniques such as awake intubation and positioning.
- Skillfully place arterial lines, and central lines under direct supervision.
- Manage an anesthetic for major spine surgery with a potential for massive transfusion.
A CA 3 resident at the end of the rotation should be able to:
- Manage specific perioperative complications such as seizures, cerebral ischemia, intracranial hypertension, intraoperative aneurysm rupture, major bleeding, air embolism, cranial nerve dysfunction and neuroendocrine disturbance (DI, SIADH).
- Perform a thorough preoperative assessment of a complex neurosurgical patient.
- Formulate a safe anesthetic management and monitoring plan for a neurosurgical patient, including consideration of anesthetic medication and gases effects on neuro-monitoring modalities.
- Respond to information provided by different monitoring modalities such as evoked potentials for the management of a neurosurgical patient.
- Skillfully place arterial lines and central lines.
- Independently transport and transfer care to a secondary provider.

II. Medical Knowledge

Goal: Residents must demonstrate knowledge and apply established and evolving advances in the management of patients undergoing neurological surgery from both the surgical and the anesthetic perspective.

Learning Objectives:

A CA1/CA2/CA3 resident at the end of the rotation should be able to:
- Explain the indications, uses and complications, and defend reasoning of the following procedures: deliberate hypothermia, induced hypertension, and controlled hypotension.
- Create an anesthetic plan describing the preoperative and intraoperative considerations in patients for awake craniotomy with tissue resection near eloquent areas.
- Describe the use of SSEP/ MEP and the anesthetic effects on them; describe the use of motor strip detection during awake craniotomy.
- Understand the basic anatomy of the nervous system, including blood supply to the brain and spinal cord etc.
- Understand the general concepts of cerebrospinal fluid physiology.
- Understand the concepts involved in cerebral blood flow (CBF) and factors that affect it.
- Understand the general use of fluids including crystalloid, colloid, dextrose-containing solutions and osmotic and non-osmotic diuretics in patients with intracranial pathology.
- Understand the management of increased intracranial pressure for craniotomy and the use of hyperventilation, barbiturate infusions, osmotic and loop diuretics and CSF drainage.
- Achieve adequate positioning for the patient, and recognize the possible related consequences.
- Understand venous air embolism – its prevention, diagnosis and treatment in both the sitting and prone positions.
- Understand the basics of neuro-physiologic monitoring in spine surgery, the appropriate effects of anesthetics and the potential use of intraoperative “wake-up” tests for motor evaluation.
– Understand the pathophysiology of acute and chronic spinal cord injury at any level, its disruption of normal CNS, hemodynamic and respiratory physiology (with particular attention to autonomic dysreflexia), and what impact this disruption has on anesthetic management. The consequences of using depolarizing muscle relaxants in these patients should be understood.

References:
– Cottrel and Young's Neuroanesthesia Mosby editions.
– Gupta and Gelb's essentials of Neuroanesthesia.

All books are available in our library in the department next to the anesthesia resident lounge.

III. Interpersonal and Communication Skills:

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

Learning Objectives:

A CA1/CA2/CA3 resident at the end of the rotation should be able to:
– Master the Junior rotation objectives
– Elicit patient medical history and obtain other pertinent information efficiently in a clear, accurate, and concise manner while being sensitive to the needs of the patients and their families.
– Take the initiative and clarify, direct inquiries to, and discuss concerns with the surgical and nursing staff when necessary.
– Discuss anesthetic plan, risks and alternatives in an appropriate detail while showing sensitivity to patient’s needs and concerns. Provide accurate information to the inquiries patients may have.
– Utilize the necessary verbal, non-verbal and written communication skills with the attending, residents, OR staff and other health professionals, e.g. intensivists, hospitalists, and surgeons.
– Deliver concise, organized case presentations to the staff that include pre-anesthetic concerns and management of complex cases.
– Apply the necessary knowledge, analytical and communication skills and defend the anesthetic plan and perioperative management of cases of various complexities.

IV. Professionalism:

Goal: Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. This includes but it is not limited to recognition of one’s own limitations, ability to explain the anesthesia plan to the patients and their families, obtain proper informed consent and respect patient privacy and autonomy.
Learning Objectives:

A CA1/CA2/CA3 resident at the end of the rotation should be able to:
- Demonstrate responsibility and physical and mental attentiveness in a positive and constructive manner.
- Cope with diversions, and minimize distractions while maintaining vigilance.
- Initiate interactions with patients, colleagues and peers using respectful communication and conscientious behaviors.
- Arrive for clinical and learning responsibilities in a timely and punctual fashion; prepare to perform tasks, explain reasoning and reasoning process.
- Employ electronic/technology and communication devices in a timely fashion to support patient care and teamwork.
- Answer pages in a timely manner.
- Demonstrate willingness to show consideration and appreciation for patients and coworkers.
- Interact with colleagues and peers in a respectful and conscientious manner.
- Respond to questions, requests for information, follow-up, and other communication in a timely manner.
- Exhibit compassion, empathy and support in patient care and professional interactions.
- Communicate in an open, inclusive manner ensuring appropriate patient care and teamwork.
- Demonstrate truthful and ethical standards in professional interactions and conduct.
- Adhere to departmental and university policies and procedures.
- Exhibit honesty in recordkeeping and medical records.
- Present information, concerns, and suggestions without bias or for personal gain.
- Report concerns, errors, or potential problems to attending.
- Inform patients and appropriate caregivers about care and care options.

V. Practice Based Learning and Improvement:

Goal: 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.

Learning Objectives:

A CA1/CA2/CA3 resident at the end of the rotation should be able to:
- Effectively utilize information technology in anesthesiology practice.
- Use information technology to manage information, support self-education and facilitate learning of students and other health care professionals.
- Apply knowledge of study designs and statistical methods to the critical review of basic science, literature and clinical trials.
- Critically evaluate and assimilate evidence from scientific studies as related to patient’s care management.
VI. **System Based Practice:**

*Goal:* 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.

**Learning Objectives:**

*A CA1/CA2/CA3 resident at the end of the rotation should be able to:*

- Recognize how their patient care affects other health care professionals, the health care organization, and the larger society and how these elements of the system affect their own practice.
- Design a care plan utilizing the skills and needs of different medical teams and other health care professionals involved in patient care.
- Practice cost-effective health care that does not compromise patient safety or quality of care.
- Work effectively with others as a member or leader of a health care team.