Neuroanesthesia: Goals and Objectives

Goal
1. CA1-2 residents are assigned to Neurosurgical Cases for 1 to 2 months to develop competency in the routine perioperative anesthetic management of uncomplicated Craniotomies, Spine surgery, Neuroradiologic, and Neurovascular procedures.
2. The ability to independently practice neuroanesthesia with an experienced care team is the expected outcome of this rotation.

Objectives
1. Patient Care
   a. Evaluate a patient’s risk for developing increased ICP perioperatively using:
      i. CT scan or MRI
      ii. Physical symptoms
      iii. History
      iv. ICP monitor
      v. Regional anesthetic techniques
   b. Manage increased ICP intraoperatively using various methods
      i. Decrease CBF
      ii. Decrease venous pressure
      iii. Other measures to decrease intracerebral pressure
   c. Evaluate and manage a patient with a history of seizures
      i. Manage pre-operative anti-seizure medication
      ii. Evaluate the risk of peri-operative complications based on the type of seizure
   d. Evaluate a Comatose patient
      i. Determine Glasgow Coma Scale
      ii. Determine etiology and adjust pre-op plan accordingly
         1. Infectious
         2. Metabolic
         3. CVA
         4. Cerebral hypoxia
   e. Monitor a patient for venous air embolism using
      i. Pre-cordial doppler
      ii. ET CO2
   f. Adjust fluid administration during craniotomy based on
      i. ICP
      ii. Electrolyte changes
      iii. Hemodynamics
   g. Manage blood pressure in a spine surgery patient at risk for spinal cord ischemia
   h. Turn patient from supine to prone while maintaining head-axial spine stability
   i. Evaluate pressure points in prone position
j. Perform the following technical skills
   i. Interpret MRI or CT of head in patient with brain tumor and identify
      1. Tumor density
      2. Cerebral edema
      3. Midline shift
      4. Ventricular compression
   ii. Attach and test pre-cordial doppler
   iii. Observe various techniques of neurophysiologic monitoring
      1. EEG
      2. SSEP’s
      3. MEP’s
   iv. Place an arterial line using aseptic technique
   v. Manage airway in a patient with an unstable cervical spine
   vi. Perform fiberoptic intubation
      1. In a topically anesthetized patient or
      2. In a simulated patient

2. Medical Knowledge
   a. Reading Assignments: Miller Chapter 52 (19, 26, 35, 76)
   b. Articles from the Neuroanesthesia handout
   c. Specific Cognitive Objectives
      i. Define Cushing’s triad
      ii. List the mechanism of action, dose, mode of elimination, side effects, and
          contraindications of the following medications used to treat Increased ICP
          1. Pentobarbital
          2. Decadron
          3. Mannitol
          4. Lasix
      iii. List the monitors used to detect VAE and indicate what change is detected
      iv. Indicate the frequency ranges for delta, theta, alpha, and beta waves on an EEG
      v. Define EEG burst suppression
      vi. List four methods of treating increased ICP immediately before induction of
          anesthesia

3. Interpersonal and Communication Skills
   a. Establish and maintain professional relationships with the neurosurgical patients, their
      families and the operating room staff involved with their care.
   b. Identify the special needs of spinal cord injury patients in dealing with both the acute and
      chronic aspects of their condition.
   c. Identify the special needs of neurosurgical patients who may have difficulty or be unable
      to communicate with their caregivers.

4. Practice-Based Learning and Improvement
   a. Describe an evidenced-based approach to the treatment of postoperative nausea and
      vomiting
   b. Justify placement of a CVP for VAE during craniotomy based on the results of a
      literature review
c. Self-monitor the effectiveness of arterial line placement and make adjustments in technique to improve success rate

5. Professionalism
   a. Maintain focus on patient care activities during stressful times
   b. Treat patients with respect at all times
   c. Maintain honesty at all times

6. Systems-based Practice
   a. Indicate how your selection of anesthetic technique for managing patients having neurophysiologic monitoring is a part of a team approach geared toward patient safety
   b. Justify the expense of using an intra arterial line during craniotomy for tumor extraction