Revised: 6/29/07

Rotation Title: Complex General Anesthesia / Major Monitoring

I. Definition: These rotations are CA-3 electives of 1 to 3 month duration for residents selecting the Advanced Clinical Tract.

II. Curriculum: The complex general anesthesia rotation focuses on the provision of general anesthesia for rare, unusual and difficult cases including patients with endocrine abnormalities, e.g., multiple endocrine neoplastic disorder, severe diabetes, pheochromocytoma, etc, end-stage renal disease, respiratory failure, cardiac failure, major trauma, cancer surgeries, etc. The major monitoring rotation is an extension of critical care medicine and involves the resident in cases where major monitoring, e.g., transesophageal echocardiography, pulmonary artery catheter, evoked potentials, etc., is required, e.g., trauma patients, thoracic surgery patients, etc..

III. Performance Assessments:

A. Self Assessment
You (the resident) are to check off each criterion as the material is mastered. Self reflection on your own competencies is critical.

B. Faculty Assessment
Faculty will periodically review your self assessment and discuss their assessments of your competencies. The overall scores on the six competencies will be reported to you at least weekly.

C. Mentor Assessment
Your mentor should meet with you quarterly and review your entire portfolio. The mentor should report areas in which you have deficiencies (for your level of training). This report may be to you and/or to the program director as determined by your mentor.

IV. Basic Textbooks Recommended (in addition to current literature review and specialty texts):

1. Benumof: Anesthesia and Uncommon Diseases
2. Lake et al: Clinical Monitoring
3. Otto: Textbook of Clinical Echocardiography

V. Competencies Assessed (Performance Criteria):

A. Patient Care: During the course of this rotation, the resident is expected to show increasing competency in each of the following …

1. Hemodynamic control of the sick patient
2. Interpretation of hemodynamic and laboratory parameters
3. Anesthetic planning for complex cases
4. Routine placement of arterial and central lines
5. Successful placement of double lumen endotracheal tubes where indicated
6. Application of one lung ventilation
7. Difficult intubation
8. Recognition and successful management of massive intrathoracic bleeding
9. Demonstrating compassionate care for patients
10. Initiation of appropriate analgesia in high-risk patients

B. Medical Knowledge: During the course of this rotation, the resident is expected to show increasing competency in each of the following …

1. Endocrine physiology and management of endocrine disease
2. Evaluation and management of cardiorespiratory failure
3. Evaluation and management of end-stage renal disease, including dialysis and renal transplantation
4. Lung volume reduction and prediction of the outcome of pneumonectomy
5. One lung ventilation and understanding the indications for lung isolation
6. Review and achieve the objectives of the CA-2 neuroanesthesia rotation
7. Thoroughly understand blood transfusion and the coagulation system
8. Understand the immune system and its modulation by various drugs, especially in cancer patient

The CA-2 resident on their complex general anesthesia / major monitoring rotations shall be responsible for mastering all material listed in Appendix A. These will be assessed by written and oral examinations.

C. Practice Based Learning and Improvement: During the course of this rotation, the resident is expected to show increasing competency in each of the following …

1. Reviewing a complex medical history with multisystem organ failure
2. Determining the status and outcome of patients anesthetized by the resident.
3. Reviewing the surgical procedure and anesthetic of completed cases and compare with the anesthetic plan to determine whether the best plan had been formulated
4. Track case counts showing involvement in variety of cases so that comfort level extends to all types of complex surgeries
5. Reviewing scientific evidence for the appropriate surgical and anesthetic care of complex surgical patients.

D. Interpersonal and Communication Skills: During the course of this rotation, the resident is expected to show increasing competency in each of the following …

1. Ability to work with the surgical team to determine appropriate anesthetic for case
2. Ability to discuss intraoperative events and complications with surgeon in a timely manner
3. Appropriate preoperative, intraoperative and perioperative discussions with staff anesthesiologists about cases

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

1. Demonstrating appropriate interest in case by proper preoperative preparation
2. Demonstrating excellent patient care by interactions with patient and families
3. Demonstrating expert use of consultants through communications, both written and verbal, and proper selection of consultants

F. Systems-Based Practice: During the course of this rotation, the resident is expected to show increasing competency in each of the following …

1. Understanding the economics of severe chronic disease
2. Determining the cost-benefit ratio of major monitoring
3. Being an advocate for quality patient care
4. Understand hospital committees that make protocols for complex patient care
5. Use of protocols to improve the care of complex patients

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Appendix A: Medical Knowledge expected to be mastered during CA-3 Complex General Anesthesia Rotation

Lecture 1

Topographical Anatomy as Landmarks

1) Neck: Tracheotomy Site, Cricothyroid Membrane, Internal and External Jugular Veins, Thoracic Duct, Carotid and Vertebral Arteries, Stellate Ganglion, Cervical Spine Landmarks (Vertebra Prominens, Chassaignac's Tubercle)
2) Chest: Pulmonary Lobes, Cardiac Landmarks, Subclavian Vein
3) Pelvis and Back: Vertebral Level of Topographical Landmarks, Caudal Space
4) Extremities: Relationship of Bones, Nerves, and Arteries

Lecture 2

Radiological Anatomy

1) Chest (Including CT and MRI); heart angiography, nuclear imaging techniques
2) Brain and Skull (including CT and MRI)
3) Spine (Cervical, Thoracic, Lumbar), Including CT and MRI
4) Neck (Including Doppler Ultrasound for Central Venous Access)

Lecture 21

Pharmacokinetics and Pharmacodynamics

1) Pharmacokinetics and Pharmacodynamics, Protein Binding; Partition Coefficients; pKa; Ionization; Tissue Uptake, Compartmentization and Exponential Modules
   a) pharmacokinetics of neuraxial drug administration: epidural and subarachnoid
   b) tolerance and tachyphylaxis

Lecture 96

Autonomic Nervous System

1) sympathetic: receptors; transmitters, synthesis; storage; release; responses; termination of action
2) parasympathetic: receptors; transmitters; synthesis; release; responses; termination of action
3) ganglionic transmission
4) reflexes: afferent and efferent limbs

Lecture 98

Pharmacology of CNS Drugs

1) CNS Drugs for Non-Anesthetic Use (Major Actions, Comparison of Drugs; Effect on Respiration; Circulation, Adverse Effects)
   1) pre- and postanesthetic medications
      a) opioids
      b) opioid antagonists, agonist-antagonists
   2) alpha-2 agonists: clonidine, dexmedetomidine
   3) tranquilizers: butyrophenones; benzodiazepines
   4) anticonvulsants: phenytoin, carbamazepine, gabapentin, barbiturates, others
   5) antidepressants, anti-parkinson drugs
   6) arousal agents: physostigmine, benzodiazepine antagonists
   7) antiemetics and aspiration prophylaxis: phenothiazines; butyrophenones; metoclopramide; anticholinergics; serotonin antagonists, antihistamines (H_1-blockers, H_2-blockers, mixed blockers), antacids, proton pump inhibitors

Lecture 166

Practice Management

1) Medicare/Medicaid Requirements
2) Primary Certification
3) Recertification
4) Maintenance of Certification and Related Issues (Professional Standing, Lifelong Learning, Cognitive Knowledge, Clinical Practice Assessment, Systems-Based Practice)