Rotation Title: Anesthesia for CA-1 General Surgery Rotations

I. Definition: The Anesthesia for General Surgery Rotation includes anesthesia for general surgery , colorectal surgery, urologic surgery, and minimally-invasive surgery.

II. Curriculum: The resident will be assigned to cases involving abdominal, perineal and other general surgery procedures. Assigned readings and lectures will cover the various topics.

III. Performance Assessments:

A. Self Assessment
You (the resident) are to check each box 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. Assessed Competencies (Performance Criteria)

A. Patient Care At the conclusion of this module (but no later than the end of the CA-1 Year), the resident should be able to …

1. Prepare an operating room completely for a major case in a timely manner
2. Assemble the equipment for invasive monitoring
3. Assemble the equipment for blood transfusion
4. Place large-bore intravenous catheters (14–16 Gauge)
5. Perform induction of general anesthesia with minimal assistance for an ASA I-II patient
6. Perform a rapid sequence induction under supervision for ASA I-II patients
7. Safely position anesthetized patients in the lateral, lithotomy, and prone positions
8. Correctly position the patient for internal CVP line insertion
9. Demonstrate skill at central line placement including internal jugular and subclavian catheterization. Complete the procedure in some (35%) cases with minimal assistance
10. Demonstrate skill in arterial line placement, succeeding in the majority (>70%) of cases
11. Administer neuromuscular blockers, monitor their use, and reverse their actions with minimal assistance

B. Medical Knowledge: At the conclusion of this module, the resident should be able to describe …

1. Basic techniques of general surgeries (e.g., colorectal, abdominal, perineal, etc.)
2. The physiology of intraabdominal surgery
3. The acute abdomen
4. The physiological consequences of abdominal surgery
5. Abdominal sepsis
6. Fluid management for abdominal surgery
7. Third-space fluid shifts
8. Indications for blood transfusion
9. The physiology of massive transfusion

10. Anesthetic issues associated with total parenteral nutrition
11. Indications for rapid sequence induction of anesthesia
12. Appropriate ventilator settings for abdominal surgery in an adult patient.
13. Neuromuscular block and NM monitoring for abdominal surgery
14. The anesthetic issues with thyroid and parathyroid procedures
15. The impact of chronic steroid use on the perioperative period
16. Procedures and risks with prone, lateral and lithotomy positions
17. Common positioning injuries
18. The causes, prevention and treatment of hypothermia
19. Indications for invasive monitoring
20. Complications of invasive monitoring

The CA-1 resident on their clinical general anesthesia 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: At the conclusion of this module, the resident should be able to …

1. Show evidence of investigation and evaluation of their own care. Such evidence may be presented to staff at Wednesday morning preoperative conferences, may be reflected in written and oral test scores, or may be placed in resident portfolios (e.g., key word study, journal articles, case discussions, etc.).
2. Demonstrate case counts showing involvement in variety of cases so that comfort level extends to all general case types
3. Attend and/or present at M&M and journal clubs
4. Look up and report to attending physicians the scientific evidence for the appropriate surgical care and anesthetic care of both usual and unusual cases. This should be done at least weekly. A copy of this report may be placed in your portfolio.

D. Interpersonal and Communication Skills: The resident will …

1. Define the correct care plan by consultation with the surgical team
2. Meet for Wednesday morning preoperative rounds to discuss preoperative evaluation and testing
3. Order appropriate preoperative testing during nightly preoperative patient visits or in a preoperative clinic setting (when available)
4. Thoroughly review and update as necessary the patient record before each case including H&P, laboratory work, informed consents and permits
5. Confirm correct plans for antibiotic use by reviewing chart and conferring with the appropriate physician consultant
6. Determine the correct strategy for blood transfusion in non-emergent situations by consultation with surgical service and attending anesthesiologists

E. Professionalism: The resident must …

1. Facilitate room turn-over in high volume surgical schedules
2. Problem solve to prevent surgical delay and cancellation
3. Be sensitive to the diverse population having surgery
4. Adhere to departmental and institutional ethical codes as stated in Appendix B

F. Systems-Based Practice: At the conclusion of this module, the resident should be able to …

1. Understand the workings of the OR with respect to resources available, including OR support services
2. Understand the role of surgery in the treatment of patients
3. Understand cost-effective provision of anesthesia, especially as related to volatile anesthetics and neuromuscular relaxants
4. Understand governmental and private payor systems
5. Understand Medicare Parts A and B

Revised: **April 18, 2007**

Appendix A: Medical Knowledge expected to be mastered during CA-1 General Anesthesia Rotations

Lecture 3

Mechanics of Anesthesia Delivery Systems

1) Pressure Measurement of Gases, Liquids
2) Transducers, Regulators, Medical Gas Cylinders

Flow Velocity

1) Viscosity-Density; Laminar-Turbulent Flow
2) Flowmeters: Rotameter
3) Principles of Doppler Ultrasound

Lecture 4

Properties of Liquids, Gases, and Vapors

1) Diffusion of Gases
2) Solubility Coefficients
3) Relative and Absolute Humidity
4) Critical Temperature, Critical Pressure

Lecture 5

Gas Laws

Lecture 6

Vaporizers

1) Vapor Pressure and Calculation of Anesthetic Concentrations
2) Vaporizer Types and Safety Features

Lecture 7

Uptake and Distribution of Inhalation Agents

1) Uptake and Elimination Curves; Effect of Ventilation, Circulation, Anesthetic Systems
2) Concentration Effect
3) Second Gas Effect
4) Nitrous Oxide and Closed Spaces

Lecture 33

General Preoperative Evaluation

1) Laboratory Evaluation
2) ASA Physical Status Classification
3) American Society of Anesthesiologists (ASA) Preoperative Testing Guidelines
4) Physical Examination

Lecture 34

Perioperative Cardiovascular Evaluation

1) Cardiac patient for non-cardiac surgery
2) American College of Cardiology/American Heart Association Guidelines for Perioperative Cardiovascular Evaluation
3) prophylactic cardiac risk reduction: beta-adrenergic blockers, etc.

Lecture 35

General Principles of Premedication

1) interaction with chronic drug therapy; interaction with anesthetic agents
2) adverse reactions to premedications; patient variability, dose response curves, side effects
3) pediatric and geriatric doses, routes of administration
4) role in patients with allergies
5) alteration of gastric fluid volume and pH, gastroesophageal and pyloric gastroesophageal reflux disease (GERD), sphincter tone
6) NPO Status, Full Stomach and Induction of Anesthesia

Lecture 36

Premedication in Patients with Chronic Disease

1) specific problems in disease states: hyperthyroidism and hypothyroidism, drug abuse, glaucoma, uremia, increased CSF pressure, chronic steroid ingestion, obesity, depression, COPD, hypertension
2) continuation vs. discontinuation of chronic medications: antihypertensives, anti-anginal, antihyperglycemics, antidepressants, platelet inhibitors, etc.

Lecture 37

Neuraxial Anesthesia

1) General: Premedication, Patient Position, Equipment, Monitoring and Sedation
2) Spinal, Epidural, Caudal, Combined Spinal/Epidural
   a) indications, contraindications, techniques, complications, comparison of techniques
   b) sites of actions
   c) factors influencing onset, duration, and termination of action
   d) systemic toxicity, test dose
   e) complications: precipitating factors, prevention, therapy, implications of anticoagulants and platelet inhibitors; American Society of Regional Anesthesia and Pain Medicine (ASRA) guidelines

Lecture 44

Intravenous Fluid Therapy During Anesthesia

1) Water
2) Electrolytes
3) Glucose Requirements and Disposition
4) Crystalloid vs. Colloid

Lecture 45

Traumatic Anesthetic Complications (Etiology, Prevention, Treatment)

1) upper airway, epistaxis
2) larynx, trachea; esophagus
3) eyes; corneal abrasions, blindness
4) vascular; arterial and venous thrombosis; thrombophlebitis; sheared catheter, intra-arterial injections, air embolism, cardiac/vascular perforations, pulmonary artery rupture
5) neurological: pressure injuries of mask, tourniquet, body position, intraneural injections, retractors, peripheral neuropathies, ASA Patient Positioning Guidelines
6) burns

Lecture 47

Pulmonary Complications of Anesthesia (Etiology, Prevention, Treatment)

1) Bronchospasm, Anaphylaxis
   a) latex allergy
2) Laryngospasm
3) Postobstuctive Pulmonary Edema

Lecture 51

Postoperative Analgesia

1) Pharmacology
   (a) drugs: opioids, agonist-antagonists, local anesthetics, alpha-2 agonists, nonsteroidal anti-inflammatory drugs (NSAIDs), N-Methyl-D-Aspartate (NMDA) receptor blockers
   (b) routes: oral, rectal, subcutaneous (SC), transcutaneous, transmucosal, intramuscular (IM), intravenous (IV), including patient-controlled analgesia (PCA), epidural, spinal, intrapleural, other regional techniques
   (c) risks and benefits, complications
2) other techniques; Transcutaneous Electrical Nerve Stimulation (TENS); cryotherapy; acupuncture, hypnosis

Lecture 52

Physiologic Effects after Anesthesia

1) Respiratory Consequences of Anesthesia
2) Cardiovascular Consequences of General and Regional Anesthesia: Differential Diagnosis and Treatment of Postoperative Hypertension and Hypotension
3) Neurologic Consequences of Anesthesia: Confusion, Delirium, Cognitive Dysfunction

Lecture 53

Postoperative Nausea, Vomiting and Aspiration Prophylaxis

1) Use of antacids, Histamine-2 (H_2) blockers, metoclopramide, transdermal scopolamine, droperidol, serotonin antagonists, proton inhibitors, dexamethasone, multimodal therapy, acupressure/acupuncture
2) Pulmonary aspiration of gastric contents

Lecture 94

Neuromuscular Function and Synaptic Transmission

1) morphology of the NMJ; receptors, receptor density
2) membrane potential; mechanism
3) action potential; characteristics, ion flux
4) morphology of the synapse; transmitters, precursors, ions, termination of action, transmission characteristics, presynaptic and postsynaptic functions
5) Skeletal Muscle Contractions; Depolarization, Role of Calcium, Actin, Myosin; Energy Source and Release

Lecture 110

Hepatic Disease

1) preoperative laboratory assessment
2) anesthesia choice (hepatocellular disease, ascites, portal hypertension)
3) postoperative hepatic dysfunction, hepatorenal syndrome
4) hepatic transplantation

Developed: **August 29, 2004**

Appendix B

University of Kansas School of Medicine—Wichita
Department of Anesthesiology Code of Ethics

All residents must agree to subscribe to this code of ethics. Adherence to this code is mandatory before the resident may be considered competent in professionalism.

I. Guiding Ethical Principles

A. Being a physician is a privilege not a right. This privilege is based on the willingness to put patients' interests before personal interests.

B. Work ethic: A physician must have special and unique skills that must be learned in order to best care for patients. A physician must be willing to dedicate sufficient time to acquire, command, and advance these skills through intensive study, broad and focused experiences, and scholarly activities including research.

C. Primum non nocere (First do no harm): For a physician to do no harm, he/she must be competent in the delivery of patient care, have sufficient medical knowledge, be able to communicate and show interpersonal skills, continue to improve as research leads to better methodologies, understand the needs of society as a whole, and finally, have a commitment to carrying out professional responsibilities. These are the six general competencies formulated by the ACGME. Common sense and experience have shown that harm is less likely to happen when a physician is well-rested and mentally alert. Thus, a commitment to personal health including adequate rest is necessary to meet this directive. Limits on work hours serve to help meet this commitment.

D. Medical care should be provided to all, regardless of ethnic background, socioeconomic background, religion or politics.

E. The resident shall have, without retribution, the right to refuse to participate in activities which violate their personal beliefs. However, such right of refusal may not result in direct patient harm including abandonment of the patient. Institutional ethics committees provide a forum (1) to discuss situations whereby a refusal of care may result in patient harm and (2) to provide remedies to ensure that proper patient care occurs.

II. Professional Responsibilities

A. Timeliness
1. Resident agrees to arrive sufficiently early to allow proper set-up time for cases
2. Resident agrees to arrive promptly at educational conferences
3. Resident understands need for prompt and accurate medical records and agrees to comply with requirements for their completion
4. Resident recognizes need to complete departmental paperwork in a timely fashion

Rationale:

1. Timeliness is important to facilitate efficient and effective patient care, and to facilitate the efficient and effective operation of the residency program.

B. Integrity

1. The resident agrees to be truthful and honest at all times
2. The resident agrees to subscribe to the “Art of Conversation”, avoiding injurious speech while showing proper concern, empathy and sympathy
3. The resident will understand that he/she is a representative of the anesthesiology program, its integrated hospitals, and the University of Kansas School of Medicine—Wichita, and will therefore act professionally at all times both within and without the walls of these institutions.
4. The resident will attend to all patients, regardless of their culture, socioeconomic background, gender, religion, or personal beliefs promptly and with compassion.

Rationale

1. Humans are imperfect and will make errors which put patients at risk. Attempts to hide or disguise errors may result in patient harm whereas admitting the error may allow harm from the original error to be avoided or minimized.
2. Patients and their families are often stressed and may face grief-provoking situations. The resident’s interaction with the patients and families may lessen or increase the stress or grief, so it is important residents become skilled in the “Art of Conversation” so as to provide professional care for the patient and their families.
3. The privilege of being a physician includes admiration from the needful community. This admiration of physicians may be beneficial to patient care because trust in the physician will lead the patient to follow the medical advice given. Unprofessional acts that become associated with members of the medical profession or medical institutions destroy this patient trust and may lead to avoidance of proper medical care by those in need. (indeed!)
4. Medical ethics dictates are all patients are deserving of basic medical care, even when the patient cannot afford it or does not understand it. The physician will be cognizant that appropriate effective care must use system resources in an optimal fashion and therefore, all modalities of care will not be available for all patients.

C. Scholarship

1. Learning from personal experiences: The resident agrees to investigate and evaluate their personal experiences in patient care.
2. Learning from others experiences: The resident agrees to appraise and assimilate scientific evidence by attending didactic lectures, scientific meetings, and review courses, as well as reading scientific journals and other off-line and on-line resources. Resident shall attend M&M clubs and journal clubs, and may utilize special interest groups or list-serves to facilitate learning experiences
3. Learning from research: The resident will read and understand research methodologies and will apply research principles to personal research projects

Rationale

1. Personal experience is the most effective form of learning if not ignored. However, anecdotal experience can also mislead and therefore must be investigated to establish its significance.
2. The scientific method is based on the development, testing, and proving of theories. Knowledge of advances in science should be applied to better patient care.
3. Though medicine advanced greatly in the last century, far more is unknown than is known. Physicians must use their knowledge to identify deficits in the knowledge base, so that scientific progress to address those deficits can be made.