Rotation Title: CA-3 Intensive Care Unit Rotation

I. Definition: The CA-3 ICU rotation is a one-month rotation for CA-3 anesthesiology residents. It is a mandatory rotation as a part of the advanced anesthesiology training curriculum.

II. Curriculum: This rotation provides anesthesiology residents with further experience in the care of critically ill patients. The anesthesiology residents provide primary care for assigned ICU patients, attend didactic conferences, and participate in case-discussions and journal clubs. The CA-3 rotation builds on the knowledge acquired during the CA-2 ICU rotation. A broad perspective of Critical Care Medicine will be provided so that an anesthesiology resident may achieve a more complete understanding of:

A. The assessment and management of critically ill patients, including postoperative and severely injured patients.
B. The use of advanced modalities of ventilation
C. The use of newer medications in the critical ill patient, especially those with shock and sepsis.
D. Limitations of invasive monitoring

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. Competencies Assessed (Performance Criteria):

A. Patient Care: The CA-3 resident should be able to:

1. Complete histories and physicals on critically ill patients
2. Coordinate the care of patients including admission, evaluation, and management of all patients for whom he is responsible.

B. Medical Knowledge The CA-3 resident should be able to:

1. Describe basic differential diagnoses, physiology, and management for common and uncommon problems of the following organ systems or disease states.

a. Respiratory
b. Cardiac
c. Renal
d. Gastrointestinal and hepatic
e. Neurological
f. Metabolic
g. Shock

2. Describe the pharmacology and use of the following classes of drugs:

   a. Antiarrhythmics
   b. Antihypertensives
   c. Inotropes
   d. Vasoactive pressors
   e. Antimicrobials
   f. Antithrobotics/anticoagulants
   g. Sedatives, anesthetics, and neuromuscular blocking drugs

3. Describe the indications, contraindications, and/or interpretation of the following:

   a. Tracheal intubation
   b. Mechanical ventilation, including basic ventilator modes and weaning techniques.
   c. Pulmonary artery catheter placement
   d. Radiographic tests
   e. Renal replacement therapy, including techniques for dialysis
   f. Blood gases, electrolytes
   g. Hemodynamic profiles
   h. Bedside central pressure monitoring
   i. Noninvasive techniques for assessing oxygenation and gas exchange
   j. Enteral and parenteral nutrition
   k. Techniques for pain management and sedation

The CA-3 resident on their SICU rotation shall be responsible for mastering all material listed in Appendix A. These will be assessed by written and oral examinations

C. Interpersonal and Communications Skills: The resident should be able to:

1. Effectively communicate with patients and family members, colleagues, nursing staff, respiratory therapists, administrative staff, and other support personnel.

D. Practice-Based Learning and Improvement

1. The resident should be able to perform the following procedures and manage complications from

   a. Arterial line placement (radial, brachial, femoral)
   b. Insertion of a pulmonary artery catheter
   c. Endotracheal intubation
   d. Insertion of subclavian or jugular venous catheters

E. Systems-Based Practice

1. Residents should show facility in obtaining consults
2. Residents should demonstrate full knowledge of medical records systems
3. Residents should utilize social services and other hospital services as needed to provide optimal patient care

V. Conference and Literature Assignments

A. The Intensive Care Unit Manual (Lanken) 2001
B. Contemporary Critical Care
C. Journal club articles, conferences, and assignments

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Appendix A: Medical Knowledge expected to be mastered during the CA-3 SICU Rotation

Lecture 101

Coma States

1) traumatic, infectious, toxic-metabolic, cerebrovascular accident (CVA), cerebral hypoxia
   a) Glasgow Coma Scale, management of traumatic brain injury
   b) therapeutic barbiturate coma
2) drug intoxication (CNS drugs, carbon monoxide, insecticides, nerve gases)

Lecture 107

Hepatic Physiology

1) dual blood supply and its regulation
2) metabolic and synthetic functions
3) excretory functions
4) mechanisms of drug metabolism and excretion; cytochrome P450

Lecture 108

Nutrition

1) parenteral: peripheral or central vein, hyperalimentation, solutions used and complications, anesthetic implications
2) enteral: GI elemental diets, routes of delivery, complications, anesthetic implications

Lecture 111

Intestinal Obstruction

1) causes: paralytic ileus; mechanical, vascular
2) physiological changes: fluid and electrolyte; respiratory
3) anesthetic management: full stomach; fluid therapy; nitrous oxide

Lecture 112

Renal Physiology

1) Blood Flow, Glomerular Filtration, Tubular Reabsorption and Secretion
2) Renal Function Tests
3) Hormonal Regulation of Extracellular Fluid
4) Hormonal Regulation of Osmolality
5) Regulation of Acid-Base Balance
6) Drug Excretion
7) Water and Electrolytes: Distribution and Balance; Compartments

Lecture 113

Diuretics

1) mechanism of action
2) comparison of drugs
3) effect on electrolyte and acid-base balance
4) adverse effects

Lecture 114

Renal Disease

1) pathophysiology of renal disease; risk factors for acute renal failure
2) anesthetic choice in reduced renal function
3) anesthetic management in renal failure, arteriovenous (A-V) shunts
4) anesthetic management in renal transplantation
5) perioperative oliguria and anuria
6) pharmacologic prevention and treatment of renal failure; osmotic and loop-acting diuretics, low-dose dopamine, fenoldopam

Lecture 115

Dialysis and Hemofiltration

1) hemodialysis
2) peritoneal dialysis
3) continuous hemofiltration (arteriovenous, venovenous)

Lecture 122

Carcinoid Syndrome

Lecture 123

Diabetes Mellitus

1) pathophysiology
2) control of blood glucose
3) elective anesthesia - perioperative management
4) emergency anesthesia - hypoglycernia; hyperglycernia and ketoacidosis
5) hyperosmolar coma
6) pancreas transplantation

Lecture 126

Hematologic Disorders

1) disease of blood
   (a) anemias; compensatory mechanisms
   (b) potycythemias; primary vs. secondary
   (c) clotting disorders: congenital, acquired, pharmacologic (anticoagulants and antagonists)
   (d) hemoglobinopathies, porphyrias

Lecture 127

Transfusion Medicine

1) Transfusions
   (a) blood preservation, storage
   (b) blood filters and pumps
   (c) effects of cooling and heating; blood warmers
   (d) blood components, volume expanders
   (e) preparation for transfusion: type and cross, type and screen, uncrossmatched blood, autologous blood, designated donors
   (f) synthetic and recombinant hemoglobins
2) reactions to transfusions
   (a) febrile
   (b) allergic
   (c) hemolytic: acute and delayed
3) complications of transfusions
   (a) infections: hepatitis, human immunodeficiency virus (HIV), cytomegalovirus (CMV), others
   (b) citrate intoxication
   (c) electrolyte and acid base abnormalities
   (d) massive transfusion: coagutopathies, hypothermia
   (e) pulmonary, transufion-related acute lung injury
4) alternatives to tranfusion
   (a) hemodilution
   (b) sequestration
   (c) autotransfusion
   (d) blood substitutes
   (e) erythropoietin

Lecture 128

Acute Postoperative and Post-traumatic Pain

1) ASA Practice Guidelines