ICU ROTATION: GOALS AND OBJECTIVES

I. EDUCATIONAL PURPOSE AND GOALS
The educational objective of the Critical Care rotation is to provide the trainee (Critical Care Fellow, Pulmonary/Critical Care Fellow, and Resident) with meaningful exposure to a wide variety of adult Critical Care illnesses in both medical and surgical patients. Bedside and didactic teaching and clinical responsibility are tailored to the level of training in the residence and fellow. The sophistication of educational principles and clinical responsibility progress through residency and fellowship years in an attempt to best meet the educational needs of the specific trainee and to ensure the delivery of safe, high-quality care.

The 40 Bed ICU is a closed unit allowing primary patient management responsibility to a team which includes a PGY-1, 2, or 3 resident and a Critical Care Subspecialty Resident. All teams are individually supervised and instructed by a Critical Care Medicine attending physician. General rotation goals for skill development include emphasis on the core competencies as relates to the care of the critically ill as well as specific objectives which include skill development in recognition, resuscitation, and prioritization, diagnosis and management of patients with life threatening physiologic disturbances. A core lecture series provides a didactic review of pathophysiology in basic areas of Critical Care medicine.

II. TEACHING METHODS AND ASSOCIATED GOALS
An educational program for the PGY 1, 2, or 3 residents is integrated into an ACGME accredited Critical Care training program and includes the following teaching/learning opportunities. The core competencies (Medical Knowledge – MK, Patient Care – PC, Interpersonal and Communication Skills – CS, Professionalism – PR, Practice Based Learning and Improvement – PBL&I, System Based Practice – SBP) associated with specific learning exercises are delineated in parentheses:

A. Patient teaching and management rounds - 8 : 30 AM to 11:30 AM

Includes rounds Monday through Friday with a multidisciplinary critical care team including; attending physician, critical care nurse, respiratory therapist, and Pharm D; as needed team members include dietary, clinical supervisors, patient care coordinators and representatives from pastoral care. The subspecialty resident on the Nutrition Support rotation makes suggestions to the primary care teams regarding issues of nutritional assessment and support. Subspecialty residents on this rotation learn that optimal patient care requires appropriate physician leadership, medical knowledge, accurate bedside decision making, and efficient implementation of care plans, multidisciplinary expertise and good communication. (MK, PC, SBP, CS, PR)

B. Night Float / Integration into a System of Care

The primary care team sets the plan for the day and signs out instruction to the night float residents. The night float resident team consists of one subspecialty resident and one resident. This team admits new patients, provides emergency care as needed, and titrates the management plan formulated on daily rounds by the primary care team. An overlapping
period of time each evening allows the night float resident team to transition and assume nighttime coverage responsibility. The night float experience places each resident and subspecialty resident in a leadership position. The night float team is supervised by onsite critical care attending physicians both at the bedside and in the eICU. All critical care attending physicians take "home call" every night to insure appropriate night float resident team backup. This system insures that the night float resident team has immediate backup by an attending physician familiar with the patient. An overlapping period of time each morning allows the night float resident team to transition care of new patients to the primary care teams and to discuss any changes that may have occurred to patients during the previous night. Residents and subspecialty residents learn that the ICU provides the patient 24 hour/day care in the context of a well structured, time refined system that requires all component participants to understand their roles to optimize system function and, therefore, patient care. (MK, PC, CS, SBP, PR)

C. Critical care core curriculum lecture series.

Didactic education in the diagnosis and management of common acute life threatening organ failure. (MK, PC)

D. Critical care core reading list. Essential readings to compliment lectures and patient care. (MK, PC)

E. Critical care grand rounds (Weekly).

Guest speakers, critical care faculty and subspecialty residents lecture on important critical care topics. (MK, PC)

F. Patient care conference

Difficult cases discussed by multiple attending physicians with emphasis on communication issues, ethical issues, ICU administration issues and alternative therapeutic approaches (PC, PBL&I, SBP)

G. Journal club/literature review Twice per month; subspecialty residents critically analyze recently published articles on critical care topics (PBL&I)

H. Supervised critical care procedures.

Bedside instruction in critical care procedures including; airway management, tracheal intubation, central venous catheter insertion, arterial cannulation, thoracostomy tube insertion and maintenance, pulmonary artery catheter insertion, maintenance and interpretation, percutaneous tracheostomy, fiberoptic bronchoscopy, thoracentesis, paracentesis, lumbar puncture (MK, PC)

I. Clinical Research Programs

All residents are instructed in the clinical protocols currently active and are expected to recognize when their patients are candidates for inclusion and notify appropriate personnel. (PBL&I, PR)

J. III. SPECIFIC EDUCATIONAL CONTENT

Four resident teams are assigned patients on a rotational basis as they are admitted to the Critical Care Units. The case mix includes patients with medical, surgical, traumatic and neurological diseases with a severity of illness that has rendered the patient physiologically unstable or in need of close observation to assure an optimal outcome. As a consequence the resident experiences a high volume of patients with single organ and multiple organ failure. Resident
physicians provide 24 hour day coverage (night call every four days) within the Critical Care Units and have in-house supervision 12 hours a day by Critical Care faculty. In addition there is 24 hour a day in-house Critical Care subspecialty resident backup for all resident trainees. Residents on the Critical Care rotation are responsible for all patient care and no other house staff is permitted to write orders on ICU patients. Residents on rotation perform all invasive procedures (with or without supervision) as appropriate for their level of training.

Specific areas of instruction include but are not limited to:

A. Decision analysis in the care critically ill
B. Principles of resuscitation
C. Instruction on bedside monitoring and bioengineering techniques including specific principles related to respiratory, hemodynamic and neurologic monitoring. This includes instruction on calibration, zeroing and trouble shooting of commonly used pressure monitoring systems, transducers, amplifiers and recorders.
D. Instruction regarding indications, contraindications, complications, limitations, performance and understanding of common critical care/ICU procedures and use of ICU equipment including:
   - Establishment and maintenance of open airway in non-intubated, unconscious, and paralyzed patients
   - Use of all common forms of mechanical ventilation including pressure-cycled, volume-cycled, time-cycled, and flow-cycled modalities
   - Use of common respiratory equipment including supplemental oxygen cannulae, reservoir masks, continuous positive-pressure masks, humidifiers, and incentive spirometers
   - Instruction and practice of elective and emergency airway management techniques including rapid sequence intubation techniques
   - Instruction and practice in the techniques of conscious sedation
   - Emergency management of pneumothorax including needle decompression, insertion of thoracostomy tubes and proper use of thoracostomy tube drainage systems
   - Arterial puncture and blood sampling techniques
   - Insertion of central venous, arterial and pulmonary artery balloon floatation catheters.
   - Basic and advanced cardiopulmonary resuscitation
   - Electrical cardioversion
   - Performance of thoracentesis and diagnostic evaluation of pleural fluid
   - Performance of percutaneous tracheostomy
   - Performance of fiberoptic bronchoscopy
E. Instruction on indications, contraindications, complications, limitations, and understanding of common critical care/ICU procedures and use of
equipment including:

- Pericardiocentesis
- Transvenous pacemaker insertion
- Peritoneal dialysis
- Peritoneal lavage
- Intracranial pressure monitoring

F. Instruction and experience is provided for the following:

- Hemodynamic and respiratory monitoring including cardiac output determinations thermodilution and other techniques, understanding of airway pressure, volume and flow characteristics and calculation of oxygen content, intrapulmonary shunt, alveolar-arterial gradients
- Evaluation of oliguria
- Massive transfusion, indications, management and complications
- Diagnosis and management of coagulation disorders
- Interpretation of antimicrobial sensitivity patterns
- Interpretation of antimicrobial blood levels
- Assessment and monitoring of nutritional status

G. Opportunities to learn ICU organization and administration are provided in the following venues:

- Daily rounds whereby the attending physician acts as a role model and teaches "on the job" communication skills necessary to function as an effective member of a multidisciplinary team
- Attendance by critical care attending and subspecialty resident at the monthly ICU Administrative meeting
- Attendance by critical care attending physician and subspecialty resident at the monthly Quality Improvement committee meetings
- Attendance by the subspecialty resident at the bi-monthly subspecialty resident "concerns" meetings
- Attendance by the subspecialty residents at the institutional occupational safety and health administration (OSHA) conferences

H. Formal instruction is provided in the following areas:

- Physiology, pathophysiology, diagnosis and therapy regarding:
  1. Cardiovascular system
  2. Respiratory system
  3. Renal system
  4. Gastrointestinal system
  5. Genitourinary system
  6. Neurologic system
  7. Endocrine system
  8. Hematologic system
  9. Musculoskeletal system
  10. Immune system
  11. Infectious diseases
  12. Electrolyte and acid-base physiology, diagnosis and therapy
  13. Metabolic, nutritional, and endocrine effects of critical illness
14. hematologic and coagulation disorders associated with critical illness
15. care of critical obstetric and gynecological disorders
16. management of the immunosuppressed patient
17. management of acute allergic reactions including anaphylaxis
18. management of the trauma patient
19. pharmacokinetics, pharmacodynamics, drug metabolism and excretion
20. use of neuromuscular blocking agents in critical care
21. ethical, legal, and economic aspects of critical care
22. principles of ICU administration and management
23. psychosocial and emotional effects of critical illness on patients and their families
24. issues related to infection control and nosocomial infections in critical care
25. issues related to complications in critically ill patients

IV. **ANCILLARY EDUCATIONAL MATERIALS TO BE USED**
Internet enabled computers are available throughout the medical center. These provide around-the-clock access to Med Line searches, pharmacology databases and other useful reference material (e.g. Ovid, Up-To-Date, Harrison’s Textbook of Medicine On-Line)

V. **METHODS USED IN EVALUATING RESIDENT PERFORMANCE**
Each resident has contact during a monthly rotation with at least two key Critical Care faculty members. As part of daily rounds, faculty members are expected to give regular verbal formative evaluations to each resident as guides for ongoing improvement. Residents receive summative evaluations focused on the ACGME core competencies by supervising key faculty members at the end of the rotation. A healthcare team evaluation including self-evaluation is also completed at the end of the rotation.

Reviewed and approved by the Curriculum Committee July, 2009