

Anesthesiology C-ICU Rotation Objectives

Introduction:

The Critical Care Medicine (CCM) rotation is an opportunity for residents to develop proficiency in recognition and management of patients with the set of medical problems that require Critical Care (CC). On completion of the rotation, the resident will have acquired a sufficient quantity of Critical Care Medicine didactics, learned a set of procedural skills, demonstrate adequate decision making in patient care, and show a caring and compassionate attitude for Critically ill patients. The resident is also expected to pursue current evidence to support and improve the practice of CCM as well as to understand the implications on resource allocation and cost.

The Cardiovascular ICU (8C) offers the resident the opportunity to work in a closed ICU with a small care team. During the C-ICU rotation the resident will have the opportunity to care for those patients with cardiovascular disease both pre-op and post-op. They will have the opportunity to refine clinical decision making skills and procedural skills needed in the care of the critically ill.

Note: Special credentials in Advanced Cardiac Life Support (ACLS) are required prior to the rotation. Credentials in Advanced Trauma Life Support (ATLS) and Fundamental Critical Care Support (FCCS) are recommended.

Objectives:

Medical knowledge:

1. Explain the physiology of the Cardiovascular, Pulmonary, Hematological, Neurological, Endocrine as well as Renal and Gastrointestinal systems.
2. Describe the patho-physiology of common disease processes that might lead to ICU admission and the effects on the Cardiovascular, Pulmonary, Hematological, Neurological, Endocrine as well as Renal and Gastrointestinal systems.
3. Discuss the immediate management of the post-operative cardiac, thoracic, standard surgical patients.
4. Compare and contrast the CABG & valvular patient from the thoracic patient, pre-op, inter-op and post-op.
5. Compare and contrast the Trauma patient from other surgical and medical patients. Please be prepared to discuss the pre-op, inter-op and post-op management concerns.
6. Discuss the common medical problems and concerns associated with the surgical patient; neuro-cognitive, cardiovascular, pulmonary, endocrine, & renal.
7. Discuss the immediate and delayed concerns of the post-surgical cardiothoracic patient.
8. Explain the goals of sedation and analgesia in the ICU. Discuss the various options available to facilitate sedation and analgesia, including sedation scales and various types of sedation medications.

9. Compare and contrast contemporary modes of ventilation and weaning strategies.
10. Explain the goal of basic nutrition support. Discuss the initial nutrition assessment of a CC patient. Identify risk factors associated with poor nutritional health and prepare a nutritional plan, to include formula selection and caloric needs for CC patients.
11. Discuss basic infection control goal and the techniques used to help in the prevention of ventilator associated pneumonia (VAP), urinary tract infections (UTI), central venous line (CVL) and post operative wound infections.
12. Discuss basic patient care protocols and techniques used to help in the prevention of ventilator associated pneumonia (VAP), deep venous thrombosis (DVT), peptic ulcer disease (PUD), central venous line (CVL) and post operative wound infections.
13. Describe treatment strategies for VAP, UTI, CVL, DVT, PUD, soft tissues and intra-abdominal infections.
14. Compare and contrast the most commonly used antibiotics in the ICU. Medications to include Penicillins, Cephalosporins, Carbopenems, Aminoglycosides, Fluoroquinolones, Antifungals and new generation medications such as Daptomicin and Linezolid.
15. Present an organized approach to clinical problem solving including a differential diagnosis, well as systematic approach to the use of diagnostic testing and consultant activities.
16. Participation in Anesthesia Grand Rounds, Cardiac Surgery Grand Rounds, Cardiac Catheterization, Cardiac transplant and Critical Care conference are requested, these are primarily case based or topic based interactive learning programs designed to enhance and reinforce knowledge.
17. Describe and display a systematic approach to the use of diagnostic testing and consultant activities in the ICU.

Patient Care:

1. Differentiate between patients requiring treatment in an ICU and other care settings.
2. Identify ICU patients who are ready for ward transfer and the factors important to facilitate safe patient care transfer.
3. Describe the diagnostic criteria and Demonstrate proficiency in the initiation of treatment plans for patients with impending organ failure. (respiratory, cardiac, neurological, hepatic, renal & gastrointestinal)
4. Identify and initiate timely treatment for the following conditions:
 - a. Cardiac Insufficiency - Arrest
 - b. Respiratory Insufficiency – Arrest
 - c. Acute Lung Injury (ALI)
 - d. Acute Respiratory Distress Syndrome (ARDS)
 - e. Shock, all types
 - f. Sepsis
 - g. Electrolyte and acid-base disturbances
 - h. Overdose
 - i. Increased inter-cranial pressure / Stroke / Closed Head Injury (CHI)

- j. Spinal cord injury
 - k. Pneumo-, hemato- and hydrothorax
 - l. Pulmonary Emboli
 - m. Cardiac Tamponade
 - n. Acute Myocardial infarction / Ischemia
 - o. Intra Abdominal/Pelvic catastrophe
 - p. Multi Organ System Failure
 - q. Acute/Chronic Liver Failure
 - r. Acute/Chronic Renal failure
 - s. Endocrine emergencies
 - t. Hemotological Emergencies
 - u. Compartment Syndrome
 - v. Rhabdomyolysis
5. Use data from appropriate invasive and non-invasive monitoring devices to diagnose, treat & titrate patient therapy.
 6. Explain the indications, contraindications, complications and pitfalls of emergency airway management and ventilator management. Please discuss the following techniques:
 - a. open airways on non-intubated patients
 - b. ventilation by bag-mask systems
 - c. tracheal intubations
 - d. fiber optic intubations;
 - e. bronchoscope use
 - f. contemporary modes of ventilation
 - g. management of complications
 7. Explain the indications, contraindications, & complications of the following ICU associated procedures.
 - a. arterial puncture and cannulation
 - b. insertion of central venous catheters
 - c. pulmonary artery catheters
 - d. dynamic/static electrocardiogram interpretation
 - e. cardioversion
 - f. pericardiocentesis
 - g. thoracentesis
 - h. needle and tube thoracostomy
 - i. pacemaker management: transcutaneous and epicardial
 - j. intra-aortic balloon pump
 - k. ECHO usage
 8. Demonstrate skills with the use of & interpretation of the following equipment: (“*” = required skills) (Demonstrated to CCM staff)
 - a. arterial puncture and cannulation *
 - b. insertion of central venous catheters *
 - c. pulmonary artery catheters *
 - d. dynamic/static electrocardiogram interpretation *
 - e. cardioversion *
 - f. pericardiocentesis
 - g. thoracentesis *

- h. needle * and tube thoracostomy *
- i. pacemaker management: transcutaneous and epicardial *
- j. intra-aortic balloon pump
- k. ECHO usage

Practice based learning:

- Recognize existing and describe additional patient safety monitoring and error reduction strategies that could be employed in the ICU.
- Recognize and describe the process of assessing patient and family satisfaction and its importance in ICU care.
- Recognize and describe basic methods for searching, reviewing and evaluating the medical and scientific literature
- Support ongoing basic and clinical science protocols in the ICU by participating in candidate identification or in proposing future projects.
- Contribute to and support process improvements in the ICU. Meet with nursing or physician staff to assess current practice and make suggestions.

Interpersonal and Communication Skills and Professionalism:

- Demonstrate effective communication with physicians, nurses, consultants and all other members of the healthcare team on rounds and in daily interactions as observed by attending staff or reported to staff.
- Communicates clearly, correctly, and concisely in a written report, stressing the important issues and an articulate plan.
- Communicates clearly, correctly, and concisely in a verbal report, stressing the important issues and an articulate plan.
- Describe safe order writing and the concept of closed loop communication as it relates to verbal orders.
- Displays support & empathy to patients and their families, as witnessed by attending staff or reported to staff.
- Demonstrates good use of consultants when appropriate in managing complex ICU problems. Seek consultation when appropriate with other specialty physicians in managing complex ICU problems.
- Displays and can Discuss the skills and importance in maintaining a good relationships with other healthcare providers
- Respectful and Recognize and use the particular skill sets of other CC practitioners, such as CC nurses, RT, PT, OT, dieticians, pharmacists.
- Considers ethical issues and patient wishes in treatment decisions
- Presents at least two current journal articles or two short presentations on an area of critical care to the ICU team during to course of the rotation.
- Deliver two presentations to the CCM team on a recent journal article or relevant topic. The presentation is to be 5 to 10 minutes in length and may be presented at the end of rounds or after one of the case based learning opportunities.

Systems based Practice:

- Support initiatives to improve care of critically ill patients.
- Discuss the issues of patient safety including the medical systems that put patients at risk, medication, operations, transfusions & nursing ratios.
- Describe the proper procedure to correctly identify a patient to minimize patient errors.
- Recognize and describe basic compensation methodologies for critical care services.
- Recognize, describe and ensure compliance with institutional and unit policies and procedures as well as regulatory policies from accreditation agencies, regulators, and payers

Instructional Methods

The C-ICU – 8C rotation requires participation in Anesthesia Grand Rounds, Cardiac Surgery Grand Rounds, Cardiac Catheterization and Cardiac Transplant Conference on a weekly basis, these are a case based interactive learning programs. In addition, once weekly, the resident presents a topic in Cardiac, Thoracic surgery or Critical Care. The conferences are a forum to review recent literature as well as evidence-based medicine. The CC faculty arranges daily bedside teaching rounds with the cases presented by the house staff. Bedside rounds permit one on one patient and student focused care, including procedural skills and topic oriented discussions.

Assessment and Evaluation

- Daily evaluations by CC faculty during rounds, presentations, conference participation, procedures performed, patient, family & staff interactions.
- Faculty complete a multifaceted evaluation of all residents (Veriform) according to the ACGME outcomes parameters.
- Oral case study examination by CC faculty.
- Pre-and post rotation testing with written multiple-choice questions.
- SCCM is working on achieving this as a web based exam where the residents score will be compared to the national database.

Resident References

- The ICU curriculum CD
- Cardiac ICU Handouts
- Text: Critical Care Medicine: Peri-operative Management, Murray, et.al. Lippincott Williams & Wilkins, 2nd ed. 2002
- Critical Care Medicine: Principles of Diagnosis & Treatment, Parillo & Dellinger Mosby Yearbook, 2nd ed. 2001
- Guidelines for critical care medicine training and continuing medical education. Dorman T, Angood PB, Angus DC et al. Critical Care Med 32(1): 263-272, 20