MEDICAL INTENSIVE CARE UNIT

Overview

The Medical Intensive Care Unit (MICU) rotation, based at Saint John Medical Center, involves the evaluation and care of unstable and/or critically ill patients admitted to the OU Internal Medicine Critical Care Service. The educational purpose of the rotation is for residents to acquire the knowledge and skills necessary to capably and effectively manage acutely ill and unstable patients. Key elements in this process include learning to: 1) recognize life-threatening illness, 2) determine the underlying cause(s), and 3) implement appropriate interventions in accordance with the clinical situation and patient preferences. In this rotation there is focus on airway management, hemodynamics, and the assessment of multi-system function. There is close supervision of residents during this rotation by dedicated teaching faculty.

The MICU Critical Care Service is comprised of one resident team, each with a dedicated faculty supervisor. The team consists of two PGY-2/3 residents and two to three PGY-1 residents. Medical students may also be assigned to a team. At least one intern and one senior resident will take overnight call together every 4th night in-house. During call periods residents will take no more than 5 admissions per intern and no more than 10 admissions per senior. Residents are scheduled for at least one day off in seven and are not to exceed 30 hours of continuous work, nor are they to work more than 80 hours per week.

Most patients will be admitted from the Emergency Department, but other significant sources of MICU admissions include:
1. Survivors of cardiac resuscitation on the general floors (not surgical or pediatric patients).
2. Unstable patients from other services such as internal medicine, geriatrics, oncology, and obstetrics/gynecology (not pediatrics).
3. Neurosurgical patients with non-traumatic brain injury such as intracranial hemorrhage from hypertension, subarachnoid hemorrhage, etc.
4. Transfers from other hospitals unable to provide the same level of critical care services.

Numerous consultants may become involved in the management of the critically ill patient, but the MICU team retains primary management responsibility, and the MICU assigned teaching faculty retains primary responsibility as attending physician. Social workers, pastoral care providers, and clinical pharmacists work closely with the critical care teams to optimize comprehensive high quality care. A full spectrum of support services is available to assist the Critical Care teams including phlebotomists, ECG, EEG, ultrasound/echocardiography technicians, respiratory therapists, dieticians, a wound care team, and interventional and non-interventional radiologists.

Goals

- To teach residents to become competent and effective in the evaluation and management of critically ill patients.
- To teach residents warning signals of critical illness and impending death.
- To teach a rational approach to the management of the patient who is critically ill, to include the necessary skill set to prevent death and disability if possible.
- To teach the necessary skill set to accept death if inevitable or if the patient would not wish to suffer the consequences of attempts to prevent death.
• To teach invasive procedures (techniques, indications, contraindications) in a supervised fashion progressing the resident to independence as proficiency is demonstrated.
• To understand respiratory failure types and how to manage patients with these problems.
• To understand and manage patients with acute coronary syndromes
• To diagnose and manage cardiac arrhythmias
• To understand how to interpret arterial blood gases and acid-base disorders

Objectives

Unless specified, objectives should be met at all levels of training; if PGY-2 is noted, that objective should be met by conclusion of the PGY-2 year, if PGY-3 is noted, objectives should be met prior to graduation.

Patient Care

• To learn how to interview patients who may have impaired consciousness due to serious illness, or who are unable to communicate with speech due to intubation.
• To gain proficiency in the performance of a comprehensive physical exam, with particular focus on airway, breathing, circulation, and neurologic function.
• To gain proficiency in the physical exam skills necessary to elicit subtle abnormalities in a setting where a comprehensive medical history may not be available.
• To learn to effectively assess and stabilize patients with critical illness.
• To learn how to identify impending death and to intervene to prevent death.
• To learn how to diagnose death, to include brain death.
• To gain proficiency in preventing cardiopulmonary arrest, and managing it if it occurs and the patient is a “full code”
• To learn proficiency at invasive procedures, to include endotracheal intubation, central line placement from subclavian, internal jugular, and femoral approaches, arterial line placement from radial, and femoral approaches, lumbar punctures, thoracentesis, and occasional emergency tube thoracostomy and Swan Ganz.
• To learn proficiency in management of the patient with increased intracranial pressure, and indications for and management of extra ventricular drainage devices.
• PGY-2 To consistently and effectively gather data, order diagnostic tests, interpret data, perform procedures, manage patient therapies, work with/supervise others to provide patient focused care with moderate guidance and assistance from the faculty attending.
• PGY-2 To formulate therapeutic and diagnostic plans with moderate independence.
• PGY-2 To appropriately triage patients into and out of the MICU environment.
• PGY-2 To be able to integrate common sense and clinical judgment with medical knowledge.
• PGY-2 To be able to counsel and educate patients and families with minimal assistance from attending supervisors.
• PGY-2 To be able to present information on critical care topics to junior learners.
• PGY-3 To independently supervise and assist junior learners in the gathering of data, selection of diagnostic tests, and in the interpretation of diagnostic data.
• PGY-3 To effectively manage patient therapies, supervise and coordinate the work of others to provide patient focused care with independence and minimal reliance on guidance and assistance from the faculty attending.
• PGY-3 To demonstrate well developed clinical judgment.
• PGY-3 To be able to independently counsel and educate patients and families and to demonstrate initiative as a counselor and educator.
• PGY-3 To be able to do impromptus bedside teaching about exam findings, medical and critical care topics to junior learners.
• PGY-3 To proficiently and independently perform diagnostic and therapeutic bedside procedures, and to teach and supervise junior learners and team members in the performance of bedside procedures.
• PGY-3 To assess the risk: benefit ratio of aggressive measures versus less aggressive measures (Do Not Resuscitate, etc) given the clinical circumstances and the patient’s identifiable wishes and to independently initiate intervention based on such assessment.

**Medical Knowledge**

• To understand the techniques of airway management.
• To understand the techniques of non-invasive and invasive mechanical ventilation, their indications and clinical application.
• To understand the use of fluid and pressor resuscitation in shock.
• To understand and identify severe inflammatory response syndrome.
• To predict and manage multiple system organ dysfunction.
• To recognize drug overdose: identification of toxidromes, supportive measures, antidote management for those ingestants that have antidotes, management of the suicidal patient.
• PGY-2 To demonstrate a broad fund of knowledge, and active use of knowledge to solve medical problems with moderate guidance and assistance from the faculty attending.
• PGY-3 To demonstrate an expanded fund of knowledge, and an advanced ability to actively use knowledge to solve medical problems with independence and minimal need for reliance on guidance and assistance from the faculty attending.
• PGY-3 To actively share/teach medical knowledge to junior learners.

**Practice Based Learning and Improvement**

• To identify deficiencies in one’s knowledge, skills and attitudes in the care of the ICU patient.
• To develop strategies for correcting deficiencies in one’s knowledge, skills and attitudes in the care of the ICU patient.
• To recognize error and accept constructive criticism.
• To review patient outcomes and identify reasons why selected interventions or management strategies may have failed.
• To review re-admissions to the MICU.
• PGY-2 To role model reflective practice and to facilitate this in interns and students.
• PGY-2 To demonstrate ability to analyze practice performance and carry out needed improvements; locate and appraise scientific literature, apply scientific evidence to the care of patients; and to facilitate the learning of others.
• PGY-3 To demonstrate an advanced ability to: assess one’s own practice and performance, to identify needed practice improvements, to independently initiate practice improvements and evaluate outcomes, and to facilitate this process among junior learners and team members.
• PGY-3 To demonstrate an advanced ability to locate, critically appraise, and apply scientific evidence to the care of patients; and to role model and teach this process to junior learners and team members.
• PGY-3 To identify deficiencies in other team members’ knowledge, skills and attitudes in the care of the ICU patient, and to facilitate improvements.

Interpersonal Skills and Communication

Fundamental skills:

• To communicate in a sensitive and effective manner with patients and families from diverse ethnic and socioeconomic backgrounds.
• To give bad news about death and dying in a culturally sensitive manner.
• To sensitively and effectively discuss end of life issues with patients and families.
• To listen to the patient/family/friend reaction to bad news in a supportive and effective manner, listening for questions that may not be specifically verbalized.
• To answer questions posed by patients and families in a clear and succinct manner, avoiding complex explanations of pathophysiology and technical jargon.
• To discuss error with faculty as well as patient/family/friend where appropriate.
• To communicate effectively with nursing and respiratory staff, accepting suggestions for alternative plan of care from these colleagues where appropriate, and helping to teach these colleagues.
• To communicate effectively with physician colleagues through verbal “sign in” and “sign out” to ensure that the condition, diagnostic evaluation, and plan of care for each new admission, and each patient to be covered is understood.
• To communicate effectively with other physician specialties involved in the care of the patient, in particular to learn to convey urgency effectively where appropriate.
• To dictate a complete history and physical for each new admission.
• To effectively and comprehensively document a daily SOAP note, with appropriate event notes for sudden events.
• To dictate a complete, concise and logical discharge or death summary.
• To ensure patient/family understanding of the patient’s severity of illness and consent to their treatment plans.
• PGY-2 To communicate effectively with the charge nurse regarding triage and prioritization of care.
• PGY-2 To instruct and direct junior physicians and support staff effectively without intimidation.
• PGY-2 To consistently demonstrate effective interpersonal and communication skills by cordial and therapeutic relationships with patients and families, respectful and productive relationships with team members, consultants, and other health care workers, clear instructions to team members, clear check-outs to cross-cover providers, clear and complete written orders, notes and dictations (where applicable).
• PGY-3. To be able to lead or facilitate family meetings, care team meetings, and to role model and teach effective interpersonal and communication skills to students and interns.

Professionalism

• To be professional in all interactions with patients, families, colleagues and all members of the health care team.
• To demonstrate caring and respectful behaviors toward patients, families, colleagues, and health care workers.
• To demonstrate a commitment to honoring the regulations and policies of the hospital and the training program.
• To maintain a professional appearance at all times (clean, neat, and appropriately conservative with lab coat and identification badge).
• To be punctual for rounds, scheduled meetings and conferences, and check out.
• To respond to emergent patient care situations and codes in an efficient and timely manner.
• To demonstrate a commitment to excellence and to ethical principles of care.
• To demonstrate respect for alternative, but appropriate treatment plans.
• To be sensitive and respectful when expressing concerns about alternative and inappropriate treatment plans.
• To maintain confidentiality of patient information.
• PGY-2 To consistently uphold responsibilities, and to demonstrate sensitivity, honesty, and integrity in interactions with patients, families, other providers, and hospital/clinic personnel. To represent one’s self, the training program, and the institution with dignity.
• PGY-3 To role model professional behaviors and to facilitate professionalism among students and interns.

System Based Practice

• To recognize interfaces within and beyond the hospital involved in the delivery of care to a given patient over time (EMSA, ER, ICU, ancillary services, IM teams, rehabilitative services, home care, hospice, etc.)
• To understand the contribution of multidisciplinary resources for the optimal care of the MICU patient.
• To use evidence based, cost conscious strategies in the care of the MICU patient.
• PGY-2 To be aware of immediate and future financial cost to the patient.
• PGY-2 To develop triage skills in the setting of limited resources.
• PGY-2 To consistently and effectively advocate for high quality patient care, provide cost effective care, and to effectively work with consultants and interdisciplinary teams to improve patient care, and to assist interns to do the same.
• PGY-3 To coordinate the care among consultants and multiple disciplines in the provision of continuous, high quality, cost effective care for all assigned patients.
• PGY-3 To educate and communicate effectively with the members of the multidisciplinary team in an effort to assure appropriate and quality care of MICU patients.
• PGY-3 To recognize that different funding sources affect the patient’s access to ongoing care particularly with respect to rehabilitation.
Knowledge to be assessed

To be an effective Internist and inpatient clinician involved in the care and management of critically ill patients, the resident should have knowledge and understanding of the following medical illnesses/condition/topics, (though not exclusively) by the completion of their Medical Intensive Care Experiences:

Cardiovascular
- ACLS
- Acute Coronary Syndrome
  - Unstable angina, NSTEMI, STEMI
- Arrhythmias
- Decompensated Heart Failure
- Cardiogenic Shock
- Pericardial Tamponade
- Complicated Valvular HD
- Vascular Disorders
  - Aneurysms, aortic dissection, arterial embolism and venous thrombi embolism, hypertensive urgencies & emergencies
  - Interpretation of Hemodynamic data

Thoracic/ Pulmonary
- Respiratory Failure (hypoxemic & hypercapnic)
- Airway management
- Non-invasive Mechanical Ventilation
- Invasive Mechanical Ventilation
- Pneumonia
  - Community acquired
  - Health Care associated
  - Hospital acquired
  - Ventilator associated
- Pulmonary embolism
- Pleural effusion
- Pneumothorax
- COPD exacerbation
- Status asthmaticus
- Acute Respiratory Distress Syndrome (ARDS)
- Use of sedatives and neuromuscular blockers

Infectious Disease
- Sepsis Syndrome
- Systemic infections
- Central nervous system infections
- Catheter related infections
- Infection in immunocompromised hosts
- GI, GU, intra-abdominal, soft tissue, bone & joint infections
- Antibiotic use in ICU
- Infection control in ICU
Endocrine/ Metabolism

- Diabetes related
  - Glucose control in ICU
  - Diabetic ketoacidosis
  - Hyperosmolar hyperglycemic syndrome
  - Hypoglycemia with neurologic manifestations
- Adrenal insufficiency
- Thyroid storm
- Myxedema coma
- Pheochromocytoma
- Nutritional support

Gastrointestinal

- Acute pancreatitis
- Liver failure
- GI bleeding
- Gall bladder related disorders
- Mesenteric ischemia
- Clostridium difficile infection

Hematologic/ Oncologic

- Red blood cell, white blood cell diseases
- Platelet disorders including ITP, HIT, TTP
- Coagulopathies including DIC
- Oncologic emergencies/syndromes
- Use of blood components in ICU

Renal/ Electrolytes/ Acid Base Disorders

- Acute kidney injury including acute renal failure
- Acid base disorders
- Sodium/water syndromes (hyponatremia, hematremia)
- Potassium disorders (hyperkalemia, hypokalemia)
- Calcium/phosphate/magnesium disorders
- Interpretation of Arterial Blood Gases
- Rhabdomyolysis
- Indications of dialysis

Neurologic

- Stroke
- Seizures including status epilepticus
- Coma
- Encephalopathy
- Delirium
- Intracranial hemorrhage
- Neuromuscular weakness of critical illness
- Neuroleptic malignant syndrome
- Diagnosis of brain death
Surgery/ Trauma
- Post operative medical management
- Complications of surgical procedures
- Shock
- Major trauma
- Perioperative medical consultation & co-management of surgical patients

Miscellaneous
- Drug poisoning/overdose/toxidromes
- Alcohol intoxication or alcohol withdrawal syndromes
- Drug withdrawal
- Hyperthermia
- Hypothermia
- Other environmental injuries
- Pain control
- Medical complications of pregnancy
- Anaphylaxis
- Withdrawal of life support
- Ethical considerations

Procedural skills
- Cardiopulmonary Resuscitation (ACLS)
- Endotracheal Intubation
- Arterial Catheter Insertion
- Central Venous Catheter Insertion (IJ, subclavian and femoral approach)
- Cardioversion
- Lumbar Puncture
- Thoracentesis/Paracentesis
- Use of Ultrasound in ICU
- Ventilator Management
- Therapeutic Hypothermia

Methods of achieving objectives

Principal Teaching Methods
- Direct patient care under the supervision of the assigned MICU attending
- Daily attending management and teaching rounds
- MICU faculty lead core noon conference series
- Resident review and presentation of assigned topics
- Patient care recommendations from the consultant services
- Review of patient outcomes

Educational Materials
• Assigned readings by MICU faculty (articles provided).
• OU-Tulsa library electronic databases and computerized resources.
• Critical review of relevant text and journal publications.
• MKSAP core topics in Critical Care Medicine

Assessment tools

• The supervising attending will evaluate each resident’s history and physical examination of patients daily.
• The supervising attending will review and evaluate each resident’s written H&P and daily progress notes.
• The supervising attending will monitor each resident’s interaction and communication with patients, families, and other health care team members.
• The supervising attending will critique each resident’s assessment(s) and plan(s) regarding a patient’s acute and chronic conditions.
• The supervising attending will monitor each resident’s self-directed learning efforts.
• The supervising attending will assess each resident’s fulfillment of the objectives detailed above.

Evaluation process

• Faculty and resident will review the goals and objectives at the beginning of the rotation. The resident will sign an attestation statement verifying review of the goals and objectives.
• The supervising attending will provide verbal feedback throughout and at the completion of the MICU Rotation.
• A formal evaluation document will be completed by the MICU Attending through MedHub at the conclusion of the rotation.
• Each resident signs an acknowledgement of the evaluation through MyEvaluations.com.
• Residents will enter procedures performed in MedHub for “sign-off” by the supervising physician.
• Nurses will periodically evaluate residents’ professionalism.
• Each resident will enter procedures performed under the supervision of the attending into MyEvaluations.com for signature by the supervising faculty attending.

Teaching Faculty

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This document was reviewed by the faculty of the Department of Internal Medicine, University of Oklahoma College of Medicine, Tulsa, December 15, 2010. The faculty approve of and support the contents of this document.