CURRICULUM
MEDICAL ICU ROTATION

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I. Educational Purpose
A fundamental knowledge of critical care medicine is essential to the practice of internal medicine, emergency medicine, anesthesiology and family practice. The UCDMC Medical Intensive Care Unit (MICU) rotation will provide residents with a rigorous experience in the assessment and care of the critically ill medical patient. Housestaff will manage patients in a tertiary care ICU setting as part of a multidisciplinary team, under the direct supervision of fellows and attendings with expertise in critical care medicine. The patient population for our ICU includes a broad spectrum of illness, age, sex and cultural background. The majority of patient care will take place in the MICU.

II. Principal Teaching Methods
A. Directly Supervised Patient Care Activities: Housestaff will learn primarily through direct patient care with close supervision. Housestaff will initially evaluate patients and formulate a diagnostic and therapeutic plan. They will then present the case, including the initial management plan, to the fellow/attending. While fellows and attendings will maintain close supervision of housestaff, residents will have increased responsibility as their training progresses. Formal presentation and discussion of each case will take place on daily multidisciplinary critical care rounds (combined teaching and management rounds). Physical examination findings will also be discussed/confirmed/demonstrated.

Supervision and support of residents are continuously available. Pulmonary/CC fellow and attending physicians are available 24 hrs/day for discussion of cases and for supervision of procedures. Other members of the multidisciplinary ICU team, including nursing staff, respiratory therapists, critical care pharmacists, and nutrition support personnel, all contribute to resident education and support in the unit.

B. Didactic Education: Daily ICU radiograph review will instruct residents in the use and interpretation of imaging studies relevant to the ICU. Additional independent and small group instruction from the fellows and attendings will play an important role in the learning experience. Lastly, senior residents are expected to aid in the education of first-year residents and medical students.

III. Educational Content
A. Patient characteristics, mix of diseases, types of encounters: The cornerstone of the MICU rotation is the direct care of critically ill adult patients under the close supervision of a critical care fellow and attending physician, in concert with other members of the critical care team. Because UCDMC serves as both a community hospital for our local area and a tertiary referral center for inland Northern California we enjoy a very diverse case mix. Patients range in age from 17-100+, have a diversity of problems and severity of illness, and come from a variety of cultural backgrounds. The clinical encounters are all inpatient, and primarily ICU-based.

Topics to be emphasized include:
▪ Assessment and management of the airway, including optimal use of mechanical ventilation
▪ Pathophysiology and management of respiratory failure
▪ Assessment and management of hypotension and shock
▪ Indications for and use of invasive hemodynamic monitoring
▪ Indications for and use of sedatives, analgesics, and neuromuscular-blocking agents
▪ Indications for and use of vasopressors and inotropic agents
▪ Assessment and management of delirium and acute neurologic syndromes
▪ Assessment and management of gastrointestinal bleeding and liver failure
▪ Assessment and management of life-threatening infections, including appropriate antimicrobial selection.
▪ Toxicologic syndromes and their management, including management of drug overdose
▪ Rational use of laboratory and other diagnostic tests
▪ Appropriate use of blood products in the critically ill
▪ Prevention and treatment of nosocomial infections
▪ Assessment and management of electrolyte disorders
▪ Assessment and management of endocrine emergencies
▪ Assessment and management of acute renal failure including use of renal replacement therapy
▪ Prevention of stress ulceration and thromboembolism in the critically ill patient
▪ Nutritional therapy in the ICU, including the use of total parenteral nutrition
▪ Issues in end-of-life care including the withholding and withdrawing of life-sustaining therapies, advance directives, code status and family conferences

B. Clinical Venue: All patients are at the University of California, Davis Medical Center.

C. Procedures: A part of the ICU experience is the performance of the multiple procedures needed for the evaluation, monitoring, and care of patients. Housestaff will be instructed and supervised in the planning and performance of procedures, including: central line insertion, arterial line insertion, right heart catheterization, lumbar puncture, diagnostic and therapeutic thoracentesis, paracentesis, dialysis catheter placement, feeding tube insertion, urinary catheter placement, and arterial blood gas drawing and interpretation. Residents are expected to perform these procedures under the supervision of fellows or attendings before performing them unsupervised.

IV. Educational Goals and Objectives

The MICU rotation will focus upon the recognition, evaluation and management of critically ill patients as part of an intensivist-led multidisciplinary team. Assessment and management of common ICU problems/syndromes/diseases will be emphasized.

A. Rotation specific competencies. Housestaff rotate through the MICU as first-year residents and as senior residents (PGY2 or PGY3). PGY-year specific competencies are outlined below. The competencies are progressive, i.e., PGY2/PGY3 competencies are in addition to PGY1 competencies. Attendings and fellows will evaluate residents at the end of the rotation in the following areas.

B. PGY1 YEAR

▪ Patient Care: PGY1 residents should:
  o obtain an accurate and complete history through medical interviews of the patient and/or family and thorough review of medical records (from inside and outside of UCDMC).
  o perform procedures safely and considerately with appropriate supervision.
  o demonstrate an appropriate physical examination, with particular focus on the following:
    ▪ appropriate technique for pulmonary auscultation and percussion.
    ▪ assessment of JVP on the majority of patients.
    ▪ recognition of pulmonary edema.
perform the following patient-management skills:

- analysis of chest x-ray to assess for cardiac silhouette, cardiomegaly, pulmonary edema, pulmonary infiltrates, pulmonary effusions, line tip location, and ET tube location.
- develop an appropriate differential diagnosis for common critical care problems, including respiratory failure (ventilatory and hypoxic), hypoxia, shortness of breath, gastrointestinal bleeding, hypotension, sepsis, altered mental status, acute renal failure, liver failure.

- **Medical Knowledge:** PGY1 residents should:
  - demonstrate appropriate knowledge for the diagnosis and treatment of common critical care conditions, including: sepsis, pneumonia, COPD/asthma exacerbations, delirium, upper and lower gastrointestinal bleeding, diabetic ketoacidosis/hyperosmolar nonketotic coma, ARDS.
  - demonstrate knowledge of the appropriate use medications, including: antibiotics for hospital-acquired and community-acquired pneumonia, insulin drips, IV sedatives (benzodiazepines, opiates, propofol), vasopressors.
  - demonstrate knowledge of appropriate preventive measures for common ICU complications, including stress ulcer prophylaxis, VTE prophylaxis, VAP prevention, pressure sore prevention and line-infection prevention.
  - understand basic ventilator management (rate, mode, pressure support, etc).

- **Practice-Based Learning and Teaching:** PGY1 residents should:
  - critique own performance and be receptive to constructive criticism.
  - use errors to improve patient care on both a personal and system level.
  - use information sources effectively to support patient care decisions and to educate self, patients and other physicians.

- **Interpersonal and Communication Skills:** PGY1 residents should:
  - develop a good working relationship and rapport with other physicians, health professionals, patients, and families.
  - communicate effectively, including presenting cases precisely and efficiently
  - maintain comprehensive, timely and legible medical records.
  - participate in daily sign-out rounds.

- **Professionalism:** PGY1 residents should:
  - demonstrate respect, compassion and integrity while working with patients, families, colleagues and other health professionals regardless of their background
  - adhere to principles of confidentiality, scientific and academic honestly and informed consent
  - recognizes and identify deficiencies in peer-performance in a constructive manner
  - takes primary responsibility for patient care

- **System-Based Practice:** PGY1 residents should:
  - work with nurses, social workers, respiratory therapists, physicians, and other ancillary personnel in an effective manner.
  - participate actively in improving health systems to optimize patient care.
  - be active in any quality-improvement initiatives in place.
  - work with and within the local and regional medical system to deliver optimal patient care.

C. **PGY2 and PGY 3 Years:**

- **Patient Care:** PGY2/PGY3 residents should:
• directly supervise interns, by participating directly in patient care and personally reviewing all data. Residents should devote particular attention to supervising ECG readings, use of vasopressor agents, and ventilator management.
• directly supervise procedures done by interns (residents must be signed-off on procedures before they can be performed or taught unsupervised). Residents are expected to ask for assistance from fellow or attending when necessary.
• demonstrate appropriate treatment of common critical care conditions (listed in PGY1 section), as well as atypical conditions.
• efficiently and effectively triage acutely ill patients on the non-ICU floors for transfer to the MICU.
• appropriately perform central line placement independently by end of PGY3 year.

• **Medical Knowledge:** PGY2/PGY3 residents should:
  o demonstrate management of the ventilator for common conditions, including asthma, COPD, pneumonia, CHF, and ARDS.
  o understand scientific evidence behind treatment of common critical care conditions.
  o know the indications and contraindications for common critical care procedures, including central line placement, pulmonary artery catheterization, dialysis, arterial line placement, thoracentesis, intubation, and non-invasive ventilation.
  o demonstrate interest in learning, and apply open-minded and analytical approach to acquiring knowledge.
  o access and critically evaluate current medical information and scientific evidence.

• **Practice-Based Learning and Teaching:** PGY2/PGY3 residents should:
  o demonstrate self-initiative and efficacy in the use of information sources to access and retrieve materials to support patient care decisions and to educate self, patients and other physicians.
  o effectively supervise PGY1 residents and senior medical students by providing continuous supervision and guidance, as well as daily teaching on common problems seen in the critical care setting.

• **Interpersonal and Communication Skills:** PGY2/PGY3 residents should:
  o ensure appropriate communication to patients, families, fellows, attendings, nurses, and other ancillary staff occurs in a timely manner.
  o lead a patient care conference with patient and/or family.
  o contact fellow or attending physician at any time that they have unanswered questions regarding the treatment of patients.
  o participate in daily sign-out rounds.

V. Ancillary Educational Materials

A. **Written Curriculum:** An MICU curriculum has been prepared and distributed to all housestaff on the MICU rotation. This handbook provides residents with relevant monographs and is available in paper and electronic versions. Key texts and articles are centrally located within the ICU and electronic sources are readily available to housestaff. Residents are expected to participate in self-directed reading relevant to the patients under their care. The MICU handbook will be supplemented with additional material pertaining to patient cases, such as recent articles from the medical literature. The MICU handbook also references relevant web-based teaching materials.

B. **Autopsies:** Autopsies are integral to medical education, and should be requested on all patients who expire, and review of autopsies and other pathologic material is expected. The Division of
Pulmonary and Critical Care Medicine reviews all deaths, complications and autopsies during a monthly conferences, which residents are encouraged to attend. Additionally, selected autopsies will also be reviewed at the quarterly department of medicine conference for this same purpose.

VI. Methods of Evaluation

Both attending physicians and fellows will provide assessments of residents. In addition to feedback during the workday, written evaluations using the E*Value system, which incorporates the ACGME competencies, will be completed. The basis of the evaluations will be direct observation of the resident’s patient care, performance on daily rounds, participation in discussions, and performance of procedures. Additional information will be obtained through review of chart documentation. It is expected that residents whose performance is substandard in any competency will be counseled as early as possible during the rotation.

The residents will evaluate the attending, the fellow, and the overall MICU experience at the end of their rotation, consistent with ACGME requirements.

VII. Supervision and Schedule

A. Team Structure, Call Schedule, Supervision: The MICU housestaff is organized into four teams; each will admit patients and take overnight call every fourth night. Each team is composed of an intern and a resident at a minimum, but may include additional residents and medical students. The team will work together to provide care, with the resident playing a supervisory role. An MICU fellow and attending provide direct supervision of the residents. Generally, the MICU rotation will be 4 weeks in duration.

B. Curriculum Review: The MICU curriculum is reviewed with the residents at the start of each rotation, and residents are offered the opportunity to ask questions.

C. Rounds: Combined teaching and management rounds are held daily starting at 7:30 AM. Residents must be ready for rounds by 7:30 AM. Rounds start preferentially with new patients and old patients on the post-call team so that they may complete their duties by 10 AM. Residents are expected to examine and evaluate their patients each morning independently and to be present for daily teaching and management rounds. Each team will briefly discuss each of their patients with the fellow each afternoon before providing a comprehensive sign-out to the team on call.

D. Call: Resident teams are on call every 4th night from 7 AM to 7 AM. Post-call residents are expected to leave the hospital promptly after morning rounds. The on-call team is expected to assist the post-call team in patient-care duties. In accordance with ACGME requirement, the total duration of on-call shifts shall not exceed 30 hours (24 +6). There are always 10 hours between shifts.

E. Days off and work hours: Each team member will be scheduled 1 day off per week on a non-admitting day. It is the responsibility of the senior resident to coordinate days off within his/her team, with attention to resident continuity-clinic duties. This schedule ensures compliance with ACGME duty hour mandates (average scheduled hours per week is ~70). In the case that a resident is in danger of exceeding any duty hours limits, it is the resident’s responsibility to communicate this to the fellow or attending, so that accommodations can be made.

F. Clinic: residents and interns do attend continuity clinic 2 or 3 afternoons per 4 week block.