

ANESTHESIOLOGY CRITICAL CARE MEDICINE FELLOWSHIP

Program Goals and Objectives

The curriculum is based on achievement of the clinical competencies outlined below:

Patient Care

- Fellows will provide clinical care and consultation, under the direction and supervision of faculty members, by evaluating a patient's medical condition, determining the need for critical care services, and, as appropriate formulating a plan of care, including:
 - Incorporation of ethical aspects of critical care medicine into practice;
 - Diagnosis and management of cardiovascular dysfunction;
 - Diagnosis and management of pulmonary dysfunction;
 - Diagnosis and management of sepsis and septic shock;
 - Diagnosis and management of renal dysfunction, to include techniques for renal replacement therapies;
 - Diagnosis and management of hematologic disorders, to include coagulopathies;
 - Diagnosis and treatment of hepatic dysfunction;
 - Evaluation and management of central and peripheral nervous system dysfunction;
 - Management of life threatening medical illness, to include oncologic, dermatologic, and endocrinology illnesses;
 - Indications for and interpretation of laboratory results;
 - Psychiatric implications of critical illness;
 - Palliative and end-of-life care;
 - Routine incorporation of standards of care and established guidelines or procedures for patient safety and error reduction
 - Demonstration of patient management and psychomotor (procedural) skills required for the practice of the subspecialty, and demonstrate acquisition of the skills and habits of self- assessment and reflection.
 - Coordinating care across medical specialties, as appropriate, to communicate patient status, plans of care, and long-term needs of the patient to other health care providers, and to collaborate in the management of the critically-ill patient.

- Fellows will demonstrate proficiency in procedural skills and sound clinical judgment in the care of patients with complex medical and surgical conditions in the following proficiency areas:
 - Airway maintenance and management, to include fiberoptic approaches to the airway for both diagnostic and therapeutic purposes;
 - Indications for and placement of percutaneous tracheostomies;
 - Invasive and non-invasive ventilatory support;
 - Techniques for and therapeutic treatment of conditions requiring thoracentesis and/or tube thoracotomy when indicated;
 - Diagnosis and pharmacologic and mechanical support of circulation, myocardial function, and shock;
 - Cardiopulmonary resuscitation (CPR);

- Placement and management of arterial, central venous, and pulmonary arterial catheters;
- Emergent and therapeutic placement of pacemakers;
- Fluid resuscitation and management of massive blood loss;
- Prescribing enteral and total parenteral nutrition;
- Ultrasonography for transthoracic (TTE) and transesophageal (TEE) echocardiography, facilitation of invasive catheter placement, and diagnostic studies and therapeutic interventions relevant to the critically-ill patient; and
- Pain management, sedation, and anxiolysis for the critically-ill patient.

Medical Knowledge

- Fellows will demonstrate knowledge in those areas appropriate for a subspecialist in anesthesiology critical care medicine.
 - Resuscitation;
 - Cardiovascular physiology, pathology, pathophysiology, and therapy;
 - Respiratory physiology, pathology, pathophysiology, and therapy;
 - Renal physiology, pathology, pathophysiology, and therapy;
 - Central and peripheral nervous system physiology, pathology, pathophysiology, and therapy;
 - Pain management, sedation, and anxiolysis for critically-ill patients;
 - Recognition and management of altered states of consciousness, to include delirium;
 - Metabolic and endocrine effects of critical illness;
 - Infectious disease physiology, pathology, pathophysiology, and therapy;
 - Primary hematologic disorders and hematologic disorders secondary to critical illness;
 - Transfusion therapy;
 - Gastrointestinal, genitourinary, obstetric, and gynecologic disorders;
 - Trauma, to include burn management;
 - Monitoring equipment for the care of critically-ill patients and basic concepts of bioengineering, to include the principles of ultrasound, Doppler, and other medical imaging techniques relevant to critical care medicine;
 - Life-threatening pediatric conditions;
 - Palliative and end-of-life care;
 - Pharmacokinetics and dynamics, to include drug metabolism and excretion in critical illness;
 - Coordination of transport and triage of critically-ill patients;
 - Coordination of care for the patient with multisystem failure requiring evaluation and management by a diverse group of providers;
 - Administrative and management principles, to include triage, resource utilization, and rationing of limited resources;
 - Understanding about the value and use of critical care electronic health records and integration with other medical record systems;
 - Medical informatics and biostatistics relevant to critical care medicine;
 - Effective interpersonal and communication skills with patients, family members, and other health care providers;
 - Cost-effective care;

- Ethics and legal issues related to the care of critically-ill patients, to include surrogate decision-making, advance directives, and management of disagreements between providers and patients regarding resource use;
- Psychiatric implications of critical illness;
- Development and implementation of policies and procedures related to ICU administration (admission, discharge, etc.);
- Development and implementation of evidence-based approaches to clinical care and clinical guidelines to optimize patient outcomes and minimize needless variations in care delivery;
- Regulatory requirements that apply to critical care units, including those of The Joint Commission and other regulatory agencies;
- Financial aspects of ICU management and the implications for allocation of institutional resources and overall costs of care;
- Resource utilization, including personnel management and staffing patterns;
- Patient triage and coordination of care with other hospital units (acute care, transitional care, post-anesthesia care unit, etc.);
- Quality of care, patient safety initiatives, and patient and family satisfaction; and
- Risk stratification and outcome measurement, such as Acute Physiology and Chronic Health Evaluation (APACHE) and other scoring systems.

Practice-based Learning and Improvement

- Fellows will demonstrate an ability to analyze, improve, and change practice or patient care.
 - Fellows will actively participate in the Surgical Trauma Intensive Care Unit (STICU) Comprehensive Unit Based Safety Program (CUSP). This multidisciplinary committee is tasked with identifying and implementing quality improvement and patient safety projects in the STICU. Fellows will each be assigned to co-lead one of these projects alongside a non-physician patient care provider. The project will include:
 - 1) Analysis and identification of patient safety or quality improvement need,
 - 2) The design of a process to address this need,
 - 3) The implementation of this project in the STICU,
 - 4) Evaluation of the penetration of the project, and
 - 5) Appraisal of the clinical outcome of the project. The Program Director will work with the fellow to identify a project and select a partner for the work. The project will be supported by the entire multidisciplinary STICU CUSP team, including the medical directors from the SICU and leadership from hospital administration.
 - Fellows will each be required to newly develop or significantly update a clinical patient care guideline for either the core Surgical Trauma Intensive Care Unit (STICU) and/or Cardiothoracic Intensive Care Unit (CTICU).
 - The guideline will be presented at a monthly ICU quality improvement meeting and the fellow will receive constructive feedback from the group.
 - The fellow and mentor will then revise the document, as needed, and submit it for implementation.

- Fellows will all participate in critical care simulation utilizing high-fidelity manikins as part of the educational program.
 - Simulation scenarios will include acutely ill or deteriorating patients and scenarios will be performed both individually and in multidisciplinary groups.
 - Evaluation will include debriefing by content experts and also self-debriefing based on video recording of the scenarios. Fellows will view the video recordings of their performance and be asked to assess themselves based on critical care competencies, including patient care, leadership, and teamwork.
 - The self-assessments will then be discussed with the simulation director and content expert.
- Fellows will then be asked to use similar self-assessments to rate themselves in three subsequent real-life clinical patient care encounters during their ICU rotations. These written self-assessments will be discussed during quarterly meetings with the program director.

Interpersonal and Communication Skills

- Fellows will develop competence in effective communication skills with patients and their families or surrogates, including acquisition of informed consent, communication about prognosis and likelihood of recovery, and disclosure of complications and errors and their management.
- Fellows will develop competence in teaching, including the preparation and presentation of educational material for patients, residents, medical students, and other health care professionals in the subspecialty area, including:
 - The University of Colorado Critical Care Lecture Series, which is designed to cover an extensive critical care curriculum and
 - Research the subject, prepare a slide set, and present the topic at the weekly conference.
- Fellows all participate in daily multidisciplinary rounds in each of the ICUs. At University of Colorado Hospital, ICU rounds include the intensivist team (attending, fellow, advanced practice provider, resident, medical student), critical care nurses, respiratory therapists, pharmacists, dieticians, and case managers.
- Fellows will participate and gradually lead multidisciplinary critical care rounds, including residents and medical students rotating on the ICU services.
 - ICU rotations will also include a progressive role in supervision of resident and medical students.
 - Working alongside faculty intensivists, fellows will learn clinical skills in patient care, including teaching and supervising residents.

Professionalism

- Fellows will develop a commitment to carrying out professional responsibilities and an adherence to ethical principles by demonstrating competence in: compassion, integrity, and respect for others; responsiveness to patient needs that supersedes self-interest; respect for patient privacy and

autonomy; accountability to patients, society, and the profession; and sensitivity and responsiveness to a diverse patient population, including to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

- Fellows will work alongside palliative care specialists with learning concentrating on the following areas:
 - End-of-life communication
 - Ethical and legal decision making
 - Pain in cancer and non-cancer patients
 - Management of non-pain symptoms
 - Medical and neuro-psychiatric co-morbidities in advanced illness
 - Psychosocial and spiritual support
 - Death and dying across cultures
 - Bereavement support for the family
 - Hospice and palliative approach to care interdisciplinary team work

System-Based Practice

- Fellows will develop an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care, including:
 - Three hospital wide critical care committees, including: Critical Care Quality Improvement Committee, Resuscitation Committee, and Trauma Committees.
 - Fellows will attend case manager (social work) conferences.
 - Fellows will be expected to tour one or more long-term acute care hospitals or skilled nursing facilities to gain insight into patient outcomes and the broader medical system in which they will practice
- Fellows will all actively participate in monthly quality improvement meetings in both the core STICU and CTICU (Cardiothoracic ICU) rotations.
- Fellows will participate in the Surgical Trauma Intensive Care Unit Comprehensive Unit-Based Safety Program (STICU CUSP).
- Fellows will each be assigned to co-lead one of these projects alongside a non-physician SICU provider. The project will include:
 - 1) Analysis and identification of patient safety or quality improvement need,
 - 2) The design of a process to address this need,
 - 3) The implementation of this project in the STICU,
 - 4) Evaluation of the penetration of the project, and
 - 5) Appraisal of the clinical outcome of the project.
- Fellows will all actively participate in the monthly quality improvement meetings in both the STICU and CTICU.

- Fellows will function as the triage physician for admissions and discharges from the assigned intensive care units. As the triage physician, the fellow will perform the administrative function of decisions regarding utilization of critical care beds, including the determination of which patients meet admission criteria and which patients must be discharged or transferred to provide open beds for new admissions.