Surgical Critical Care Fellowship

The overall goal of the advanced residency training in Pediatric Surgical Critical Care at the Children’s Hospital of Pittsburgh of UPMC (CHP) is to provide advanced proficiency in the care and management of critically ill surgical patients ranging in age from extreme prematurity through adulthood, with emphasis on the pediatric surgical critical care patient.

At the conclusion of the training program, the Surgical Critical Care Fellow (SCCF) will be qualified for certification in Surgical Critical Care by the American Board of Surgery, and able to assume responsibility for the critical care management of the surgical patient.

Goals and Objectives

During the training program, the SCCF will demonstrate mastery of the six competencies set forth by the Accreditation Council of Graduate Medical Education (ACGME) and be afforded increased responsibility and independence according to his/her skill. It is essential that the SCCF:

1. Demonstrate an understanding of the pathophysiology of critically ill or injured premature infants, neonates, toddlers, school aged children, and adolescents, and adults with emphasis on the unique features of each age group.
2. Participate in the emergency evaluation of infants and children with surgical disease and trauma. Participation in trauma and pediatric cardiopulmonary resuscitation is required. The fellow must achieve Pediatric Advanced Life Support (PALS) certification, and American College of Surgeon’s Advance Trauma Life Support (ATLS) certification, and are encouraged to pursue the additional qualifications to become an ATLS instructor.
3. Define the principles of care of the critically ill surgical patient.
4. Develop the technical skills required to assist with the management of the critically ill surgical patient, including, but not limited to, the insertion of invasive monitoring devices, endotracheal or tracheostomy tube intubation, extracorporeal membrane oxygenation (ECMO) cannulation, thoracostomy tube insertion, gastrostomy tube insertion, and hemodialysis or peritoneal catheter insertion.
5. Apply the multi-disciplinary nature of today’s medical environment and effectively work with all members of the patient care team to achieve the best outcome for the patient.
6. Be an active participant in the educational process, both during the residency and beyond. SCCFs are to consult the literature and perform self-study during their training, and participate in scholarly activities.

Scholarly Activity

It is the expectation that the SCCF will participate in scholarly activities during their fellowship. The SCCF is encouraged to participate in various research activities in the Division of Pediatric General and Thoracic Surgery. Research methodology and statistics are covered in journal clubs and didactic lectures, as well as during direct involvement in research activities. While the one-year timeframe of the training program does not allow for a formal research rotation, provisions can be made to provide additional research training should the SCCF desire. In addition, resources are provided for the SCCF to attend one national academic meeting related to pediatric surgical critical care during the training period. Additional opportunities and resources are available for the SCCF to present the results of their research during the Fellowship program.

Application and Selection Process

Pediatric Surgical Critical Care has a listing on the American Pediatric Surgical Association (APSA) website, AMA/FRIEDA, and the Surgical Critical Care Program Directors Society (SCCPDS) website. Interested applicants contact our office regarding availability of fellowship positions and we request an updated CV and three letters of
recommendation. We typically interview applicants from mid-May to mid-June. Once the faculty agrees on a candidate, typically in July, the applicant is extended an offer.
Surgical Critical Care Rotations

The SCCF rotates on several surgical and critical care services during their 12-month training. A principal rotation, totaling three months, would be as a member of the Pediatric Surgery/Trauma team at Children’s Hospital of Pittsburgh of UPMC (CHP). Additional electives and rotations include the CHP Anesthesia, CICU, NICU, and PICU; Magee Womans Hospital of UPMC NICU; UPMC Mercy Hospital Burn Unit; Presbyterian University Hospital CITCU, Nephrology, and SICU/Trauma. The learning objectives for these rotations include:

Patient Care
The SCCF is responsible for providing administrative leadership and critical care service of the patients during the individual critical care rotations. They are also be responsible for the trauma service while on the Surgical/Trauma service at CHP, including conducting bedside rounds, assigning duties to fellows and physician extenders, coordinating care among multiple physician and ancillary providers. Specific patient care duties include:

1. Directing the care of patients admitted to the trauma surgery service and critically ill pediatric surgical patients.
2. Manage the care of the injured child from initial emergency department resuscitation to ultimate discharge including ICU care and post-discharge planning.
3. Interpret physiologic data in the context of the age of the child.
4. Develop the technical skills necessary to practice pediatric surgical critical care, including, but not limited to: endotracheal intubation, central venous access, arterial access, ECMO cannulation, tube thoracostomy. The fellow should demonstrate proficiency in these procedures across the age spectrum encompassed by the program.
5. The SCCF may participate in the operative management of patients while on the Pediatric Surgery/Trauma rotation.

Medical Knowledge
During the course of the fellowship, the SCCF must attain knowledge regarding critically ill pediatric surgical and trauma patients. This includes, but is not limited to:

1. Hemodynamic monitoring including the use of noninvasive and invasive monitoring devices.
2. Hemodynamic support including the appropriate use of fluids and pharmacologic agents, ventricular assist devices
3. Identify patients who are suffering from shock.
4. Apply the principles of nutritional support and becoming facile with the prescribing of total parenteral nutrition solutions and the various different enteral nutrition formula and delivery systems.
5. Demonstrate understanding of the indications for initiation and the management of renal replacement therapy and plasmaphoresis.
6. Describe the role of infection in critical illness as well as its diagnosis and management in both immunocompetent and immunoincompetent hosts.
7. Explain the role that endocrine and metabolic abnormalities have on the host response to illness, and effectively diagnosis and manage these disorders.
8. Develop an understanding of the indications for transfusion of blood, blood components, and use this knowledge to effectively treat patients with primary or secondary hematologic and coagulation disorders.
9. Describe the diagnostic and therapeutic interventions used to treat illness of multiple organ systems.
10. Discuss the ethical issues surrounding the care and treatment of critically ill neonates, infants, children and adults.

Practice-Based Learning
Practice-based learning is the basis for life-long learning habits. The SCCF must actively participate in the
evaluation of their patient care skills, as well as appraise and assimilate the evidence from the surgical literature. They must also have an important role as teachers on the service.

**Interpersonal and Communication Skills**
It is imperative that the SCCF demonstrate competency in communication and in teamwork. The SCCF must work with members of the patient’s primary service to insure the smooth functioning of the patient care team. It is expected that the resident: effectively interact with colleagues in allied disciplines, demonstrate effective and compassionate communication skills with parents, and age appropriate methods of communicating with children, actively participate in the teaching and supervising of junior house staff, provide timely and accurate documentation of the plan of care through the medical record.

**Professionalism**
The surgical critical care fellow is a leader in care delivery to critically ill children with surgical disease. It is therefore imperative that the surgical critical care fellow develop strong skills in professionalism. These are manifested by a demonstration of a commitment to patient care, an adherence to the policies that regulate the medical environment, both from health care regulatory agencies and the ACGME, and sensitivity to issues of race, gender, and culture as they relate to medical practice. As the fellow progresses through the program, there is an increasing emphasis on administrative activities, such as team leadership and conference preparation.

**Systems-Based Practice**
Surgical critical care is a sub-specialty in both pediatric and adult health care systems. It is, therefore, required that the SCCF learn the tools required to effectively function in this environment. They need to be able to demonstrate effective coordination of patient care, considerations of cost-containment, risk-benefit analysis, patient advocacy, inter-professional teamwork, and develop administrative experience by participating in multi-disciplinary conferences such as Medical Advisory Committee, Trauma Conference, Tumor Board, ECMO Conference, and NICU Committee.

**Rotations and Electives on other UPMC Services**
The length of these rotations varies from two weeks to two months.

1. **CHP of UPMC Anesthesia** allows the SCCF to gain increased familiarity with airway instrumentation in a controlled environment and to understand the basic principles of anesthesia management.
2. **CHP UPMC CICU** primary goal is to develop skills necessary for care of patients with congenital cardiac disease, and demonstrate competence in routine and specialized intubation/ventilation techniques and management of pediatric patients with congenital heart disease.
3. **CHP UPMC NICU** involves management of neonatal and pediatric patients who have undergone major surgery, including those involving general surgical, cardiac, thoracic, neurosurgical, head and neck, orthopedic, organ transplantation, and urologic procedures.
4. **CHP UPMC PICU** where the primary goal is to develop the skills necessary to care for the critically ill pediatric patient; and demonstrate appropriate evidence based, direct care to pediatric patients with critical illness and injury, including life threatening trauma and multisystem organ failure.
5. **Magee of UPMC NICU** rotation enables the SCCF to develop necessary skills to care for critically ill, premature infants, including the management of premature neonates.
6. **UPMC Mercy Burn Unit** will provide an overview of the principles of evaluating burn victims, and rapid diagnosis will be emphasized. Rapid interpretation of clinical findings, laboratory values, and radiologic results will be stressed as important aspects of management.
7. **CTICU at UPMC Presbyterian** the overall goal is to provide the SCCF with an in-depth understanding of pathophysiology of patients with severe cardiac disease and to develop skills necessary to appropriately diagnose and manage these disorders.
8. **Nephrology at UPMC Presbyterian** rotation should provide the SCCF with the ability to identify, manage and prevent various types of acute kidney injury. The SCCF should be able to diagnose and treat various types and
severities of acute kidney injury, and have an understanding of problems that occur with all types of renal replacement therapy.

9. *SICU/Trauma at UPMC Presbyterian* requires the SCCF to demonstrate evidenced based, direct care to patients with critical illness and injury, including life threatening trauma and multisystem organ failure.

For additional information, please visit [http://www.chp.edu/our-services/surgery-pediatric](http://www.chp.edu/our-services/surgery-pediatric)