



Children's Hospital Los Angeles

International Leader in Pediatrics

Overall Goals/Objectives - Surgical Critical Care Residency Program

The goal of the Pediatric Surgical Critical Care Residency program is to provide advanced proficiency in the care and management of critically ill surgical patients ranging in age from extreme prematurity to adolescence. At the conclusion of the training program, the PSCCR will demonstrate:

1. Thorough understanding of the pathophysiology of critically ill or injured premature infants, neonates, toddlers, school-aged children, and adolescents with emphasis on the unique features of each age group.
2. Proficiency in pediatric cardiopulmonary resuscitation. It is expected that the resident will achieve Pediatric Advanced Life Support (PALS) certification shortly after arrival.
3. Proficiency in the resuscitation of trauma patients. It is expected that the resident will be certified in the American College of Surgeons Advanced Trauma Life Support (ATLS), and will pursue the additional qualifications to become an ATLS instructor.
4. Thorough understanding of the principles of care of the critically ill pediatric surgical patient, including, but not limited to:
 - a. Hemodynamic monitoring, including the use of noninvasive and invasive monitoring devices.
 - b. Hemodynamic support, including the appropriate use of fluids and pharmacologic agents.
 - c. Recognition of patients who are suffering from shock.
 - d. Management of the injured child from initial emergency department resuscitation to ultimate discharge, including ICU care and post-discharge planning.
 - e. Evaluation of the airway and initiation of respiratory support, including the use of noninvasive devices (oxygen, CPAP, BIPAP) and various modes of mechanical ventilation (pressure and volume cycled, high frequency oscillatory ventilation, pressure support, etc.), as needed.
 - f. Evaluation and management of infants and children who require extracorporeal membrane oxygenation (ECMO).
 - g. Management of pediatric patients with elevated intracranial pressure, including those who sustain severe traumatic brain injury (TBI).
 - h. Management of patients who have undergone major surgery, including general surgical, cardiac, thoracic, neurosurgical, head and neck, orthopedic, plastic and urologic procedures.
 - i. Management of patients who require or who have undergone organ transplantation.
 - j. Understanding the principles of nutritional support and becoming facile with the prescribing of total parenteral nutrition solutions and the various enteral nutritional formulas and delivery systems.
 - k. Understanding the role of infection in critical illness as well as its diagnosis and

management in both immunocompetent and immunocompromised hosts.

- l. Understanding the role that endocrine and metabolic abnormalities play in the host response to illness, and effective diagnosis and management of these disorders.
 - m. Understanding the indications for transfusion of blood and blood components and application of this knowledge to effectively treat patients with primary or secondary hematologic and coagulation disorders.
 - n. Understanding the diagnostic and therapeutic interventions used to diagnose and treat illness of multiple organ system failure or dysfunction.
5. Develop the technical skills necessary to practice pediatric surgical critical care, including, but not limited to: endotracheal intubation, establishment of central venous access, arterial access, ECMO cannulation and tube thoracostomy. The PSCCR should demonstrate proficiency in these procedures across the age spectrum encompassed by the program.

The PSCCR will actively participate in teaching and supervising of junior housestaff.

The PSCCR will demonstrate effective and compassionate communication skills with parents, and age-appropriate methods of communicating with children.

The PSCCR will be responsible for preparing conferences and journal clubs, as assigned by the Program Director, and for presenting patients at the Pediatric Surgery weekly Morbidity and Mortality conference, as well as at the monthly Trauma M&M.

The PSCCR may participate in the operative management of patients as long as this endeavor does not account for more than 25% of his/her time or detract from the educational objectives of the program as a whole, or a specific rotation. The PSCCR will keep a log of all procedures and operations that he/she has performed. This log will be reviewed by the Program Director at quarterly meetings and at the conclusion of the training period.

The PSCCR will participate in the multi-disciplinary Trauma Program Committee meetings in order to develop an understanding of Systems Based Practice.

The PSCCR will be exposed to the various research activities in the Division and will be encouraged to actively participate in them. Research methodology and statistics will be covered in journal clubs, didactic lectures, monthly clinical research conferences as well as through direct involvement in research activities. While the one year time frame of the training program does not allow for a formal research rotation, provisions will be made to provide additional training should the PSCCR desire, through the Biostatistics Core of the Saban Research Institute at CHLA. In addition, resources are provided for the PSCCR to attend one national academic meeting related to pediatric surgical critical care during the training period. Additional resources are available for the resident to present the results of research that was performed during the residency program.

PEDIATRIC SURGERY Objectives:

The overall goal of this pediatric surgery rotation is to develop the skills necessary for assessment and treatment of critically ill infants and children potentially requiring operative interventions. The

following objectives for the pediatric surgery rotation will involve pre-operative, intra-operative and post-operative phases of patient management.

- To understand and develop skills necessary for the management of congenital and acquired pediatric surgical problems, including, but not limited to: congenital birth defects such as diaphragmatic hernia; congenital lung lesions; tracheo-esophageal fistula; abdominal wall defects; midgut volvulus; necrotizing enterocolitis; pediatric malignancies; pediatric trauma; fluid resuscitation and nutritional management; etc.
- To acquire advanced knowledge of pediatric critical care, particularly as it relates to the management of patients with hemodynamic instability, multiple system organ failure, and complex co-existing medical problems.
- To provide education in Basic and Applied Science in Pediatric Surgery related fields. To provide evidence-based knowledge in Pediatric Surgical Practice and Science.
- To provide the opportunity to practice and conduct research in an evidence-based fashion.
- To hone technical decision-making skills. To stimulate development and growth of practice-based learning assuming the highest level of care for all surgical patients.
- To contribute to the professional growth of the Pediatric Surgical Resident with attention to interpersonal skill development.
- To provide a caring and ethical environment conducive to the development and maintenance of these goals.
- To encourage professional development through attendance of institutional conferences as well as regional and national meetings.

To perform complex surgical repairs and reconstructions by gaining experience in operative cases involving multiple age groups.

TRAUMA Objectives:

The overall objective of this rotation is to enable the resident to provide complete care to pediatric victims of trauma.

- Direct the initial Emergency Department evaluation and resuscitation of the injured child.
- Identify and appropriately manage shock in the injured child.
- Interpret physiologic data in the context of the age of the child.
- Appropriately order and interpret diagnostic and imaging studies.
- Manage the care of the critically ill, multi-system trauma patient, according to the overall objectives of the program, with specific attention to the following:
 - Control of increased intracranial pressure in victims of traumatic brain injury
 - Management of hemorrhagic shock
 - Respiratory support
 - Nutritional support
 - Operative intervention, as necessary
 - Vascular support (intra-venous and intra-arterial)
 - Prioritize treatment of injuries based upon the physiologic readiness of the child
- Provide administrative leadership of the trauma service, including conducting bedside rounds, assigning duties to residents and physician extenders, coordinating care between multiple physician and ancillary providers.
- Participate in Trauma Department process improvement.
- Actively participate in the education of junior house staff.

- Demonstrate effective and compassionate communication skills with parents, children, and other caregivers.
- Facilitate the early identification of victims of child-abuse.

Pediatric Intensive Care Unit (PICU) Objectives:

Patient Care

- To learn how to complete effectively and efficiently an assessment and management plan for pediatric surgical and medical patients.
- To learn appropriate preparation and equipment setup for an admission in to the ICU.
- To learn a multifaceted approach to perioperative patient management, with emphasis on safe transport of patient, fluid therapy and pain control.
- To develop the required invasive and non-invasive clinical skills (e.g. intravenous and arterial access, airway management, hemodialysis and ECMO techniques) and the necessary judgment to provide quality care to children of all ages undergoing diagnostic, therapeutic and/or surgical procedures
- To develop knowledge of equipment set-up and computer applications as they relate to Intensive Care.
- To become familiar with the recognition and management of complications arising in the PICU and CTICU from procedures and medications
- To foster feelings of compassion, respect, understanding and service toward patients and their families
- To reinforce the ethical principles of patient care

PICU Professionalism

- To develop a clear understanding of the nature of leadership in the practice of medicine
- To challenge fellows to explore their communication styles and personality traits in relationship to their leadership roles and professional maturity
- To experience a learning community and understand its role in leadership development, and medical practice
- To understand the appropriate roles of the generalist pediatrician, surgeon and the intensivist in these settings
- To develop and practice sensitivity to culture, age and gender issues
- To learn effective supervision of other pediatric and critical care trainees
- To learn the process of self-evaluation and upholding of standards and the process of self-regulation of the profession

PICU Systems-Based Practice

- To better understand the principles and methodology of a systems-based practice and its role in improving patient safety
- To participate in the use of standardized protocols in the care of pediatric patients
- To understand the basic requirements for successful administration of a pediatric critical care unit
- To participate in the decision making in the admitting, discharge, and transfer of patients in the CTICU and PICU.

PICU Practice-Based Learning and Improvement

- To learn to critically analyze available information and evidence-based medicine in patient care decisions

- To learn the value and methodology of the quality assurance (QA) process
- To use a mentoring process to expand one's professional clinical and research activities
- To participate in the evaluation (e.g. GME Toolkit) and assessment process as a means of determining educational outcomes

PICU Interpersonal and Communication Skills

- To promote effective communication with patients, families, colleagues and care team members
- To become an effective member of the care team
- To develop and model effective communication between anesthesiologists, surgeons, intensivists and pediatricians
- To gain additional training and experience in preparation and presentation of didactic lectures

PICU Research

- To provide an opportunity to participate in clinical research projects under the supervision of Faculty
- To participate in critical review of scientific and medical literature
- To develop skills in computer-based literature searches and storage of such references
- To learn how to write a research proposal for a randomized controlled trial which is adequately powered, and submit it through the IRB
- To understand instrumentation and statistical analysis

Center for Newborn and Infant Critical Care (CNICC) Objectives:

The overall goal of this rotation is develop the skills necessary to care for the critically ill, premature infant.

- Understand the normal course of events during fetal development and how this information relates to infants who are born prematurely.
- Understand the effects of prematurity on major organ systems including: neurologic, respiratory, cardiovascular, gastrointestinal, renal, musculoskeletal, and metabolic and the modalities used to treat and support these organs.
- Participate in the delivery room resuscitation of premature/stressed infants.
- Understand and participate in the evaluation of respiratory distress in premature infants, and demonstrate proficiency in surfactant therapy, non-invasive and invasive modes of ventilation, particularly CPAP and HFOV, and nitric oxide administration.
- Understand the issues surrounding the choice of enteral and parenteral nutrition therapies in this age group.
- Discuss the ethical issues related to extremely premature infants and infants born with major malformations.
- Develop skills to effectively and compassionately communicate with parents.
- Demonstrate proficiency in performing common procedures, particularly endotracheal intubation and intravenous access.
- Participate in the education of junior house staff.

ELECTIVE Anesthesia, Childrens Hospital Los Angeles:

The overall goal of this rotation is to develop skills necessary to manage anesthetized pediatric patients, gain experience in intubations for all ages and institute effective pain management

strategies in children.

- To learn how to complete effectively and efficiently an assessment and management plan for pediatric surgical patients.
- To learn appropriate preparation and equipment setup for an admission in to the Operating room.
- To learn a multifaceted approach to perioperative patient management, with emphasis on safe medication administration, fluid therapy and pain control.
- To develop the required invasive and non-invasive clinical skills (e.g. intravenous and arterial access, airway management, hemodialysis and ECMO techniques) and the necessary judgment to provide quality care to children of all ages undergoing diagnostic, therapeutic and/or surgical procedures
- To develop knowledge of equipment set-up and computer applications as they relate to the operating room.
- To become familiar with the recognition and management of complications arising in the post anesthesia unit from procedures and medications

EDUCATIONAL GOALS AND OBJECTIVES

Los Angeles County, University of Southern California

TRAUMA Objectives:

The overall objective of this rotation is to enable the resident to provide complete care to injured victims of trauma. To gain experience in the management of penetrating trauma.

- Direct the initial Emergency Department evaluation and resuscitation of the injured adults and children
- Identify and appropriately manage shock in the injured adults and children.
- Interpret physiologic data in the context of the age of the adult and children.
- Appropriately order and interpret diagnostic and imaging studies.
- Manage the care of the critically ill, multi-system trauma patient, according to the overall objectives of the program, with specific attention to the following:
 - Control of increased intracranial pressure in victims of traumatic brain injury
 - Management of hemorrhagic shock
 - Respiratory support
 - Nutritional support
 - Operative intervention, as necessary
 - Vascular support (intra-venous and intra-arterial)
 - Prioritize treatment of injuries based upon the physiologic readiness of the patient
- Provide administrative leadership of the trauma service, including conducting bedside rounds, assigning duties to residents and physician extenders, coordinating care between multiple physician and ancillary providers.
- Participate in Trauma Department process improvement.
- Actively participate in the education of junior house staff.
- Demonstrate effective and compassionate communication skills with patients, families, children, and other caregivers.
- Facilitate the early identification of victims of abuse.

Burn Rotation, Los Angeles County, University of Southern California:

The overall goal of this rotation is to provide Surgical Critical Care residents with a knowledge base and clinical experience in the assessment and management of patients who have sustained thermal or electrical burn injury.

Specific learning objectives include, but are not limited to

1. Selection and quantification of initial resuscitation fluids.
2. Assessment of burn extent.
3. Observation of primary burn repair in the operating room.
4. Patient evaluation for inhalation injury and its management.
5. Assessment and care of burn wound infection.
6. General principles in management of critically ill patients.
7. Goal-directed didactic lectures to house staff.
Provide two (2) sessions per week. Suggested topics include:
Resuscitation of burn patients
Management of smoke inhalation
Electrical injuries
Management of sepsis
Basic mechanism of physiology
8. Clinical supervision of multidisciplinary house staff.

ELECTIVE HIGH RISK OB/GYN, Los Angeles County, University of Southern California:

The overall goal of this rotation is to develop the skills necessary to care for the critically ill, premature infant.

- Understand the normal course of events during fetal development and how this information relates to infants who are born prematurely.
- Understand the effects of prematurity on major organ systems including: neurologic, respiratory, cardiovascular, gastrointestinal, renal, musculoskeletal, and metabolic and the modalities used to treat and support these organs.
- Participate in the delivery room resuscitation of premature/stressed infants.
- Understand and participate in the evaluation of respiratory distress in premature infants, and demonstrate proficiency in surfactant therapy, non-invasive and invasive modes of ventilation, particularly CPAP and HFOV, and nitric oxide administration.
- Understand the issues surrounding the choice of enteral and parenteral nutrition therapies in this age group.
- Discuss the ethical issues related to extremely premature infants and infants born with major malformations.
- Develop skills to effectively and compassionately communicate with parents.
- Demonstrate proficiency in performing common procedures, particularly endotracheal intubation and intravenous access.
- Participate in the education of junior house staff.