

Introduction to PICU Rotation

Mission Statement

The goal of the Pediatric Critical Care rotation for the University of Missouri-Columbia Pediatric Residency Program is to provide an outstanding exposure to complex, critically ill children while enabling the Pediatric Resident and/or the Internal Medicine-Pediatric Resident to develop the necessary technical and thinking skills to initiate care for those children. The specific educational agenda and set of core didactic experiences they will be exposed to have been developed to assure attainment of these goals.

The care of the most severely ill or injured child requires the cooperation of multiple specialties. The goal of the PICU rotation is to expose the Resident to those many disciplines, to gain experience in the care of the very sick child and to have exposure to all elements of the domain of critical care for children. The overarching goal is to teach family and patient centered care within the context of the critical care unit. Philosophically, this goal is achieved by understanding that the PICU is an open unit and requires that the Resident integrate care through multiple practitioners in an interdisciplinary process.

The Resident on service is directly involved in all phases of care of the child in the PICU. Decisions regarding Patient Care utilize Evidence Based Medical Knowledge within the structure of Practice-Based Learning. The Resident is expected to improve his/her Communication and Interpersonal Skills through daily rounds and discussion with families and all members of the care team. Through a practice model that understands the context of the PICU in the wider realm of Medical Care of the Complex, Critically Ill Child the Resident will be exposed to a System Based Practice of Care. The Resident is expected to demonstrate Improvement throughout the rotation while incorporating all the Professionalism of a technically skilled, compassionate and caring Physician. This Rotation is highly technical while requiring a high level of direct patient contact (high touch).

PICU Rotation Expectations

The PICU experience will vary throughout the Resident's time. The PL-1 Resident will be expected to perform comprehensive history and physical examinations on the critically ill child. In addition, the PL-1 Resident should be able to formulate an initial differential diagnosis and initial treatment plan based on those differentials. The PL-2 should be able to evaluate a patient and formulate a complete evidence based care plan which is checked out with the Attending Intensivist. The PL-2 and PL-3 Residents should be able to do the same and, in addition, will be expected to practice more independently and function in a more supervisory role if there are Medical Students or PL-1 Residents rotating through the PICU. Each Resident, regardless of his or her level within the Residency, will be expected to perform those technical skills appropriate for their level of training. Any of the skills required by the ACGME should be attempted by the Resident. Those completed entered into their personal log book, and those not completed will be discussed with the Attending Intensivist. All the educational offerings of the PICU staff are open to the Residents, regardless of training level.

It will be the responsibility of the Resident to: Write orders, write daily (sometimes more than once a day) notes, and write/dictate Transfer/Discharge Notes when the PICU patient leaves the PICU.

Rounds: will usually occur at 0900. The Resident should be ready to discuss/present the patient in a problem-oriented fashion and will have all the pertinent information available when rounds commence. Afternoon check out rounds will coincide with the needs of the on call Resident. These rounds should discuss the salient points regarding patient care and will provide the on call Resident with information about any anticipated (or even unanticipated) problems. In addition, the checkout rounds will provide the oncoming Resident with a plan or action for each patient during the overnight period.

On the weekend and holidays: rounds will be scheduled with the Resident and Attending per their discretion.

Residency Program

Pediatric Intensive Care Unit

Goals and Objectives

The goal of the University Hospital PICU rotation is to develop the ability of junior residents to evaluate and manage critically ill children with a broad range of medical and surgical problems. The rotation is based in an 11-bed referral pediatric intensive care unit. Residents are the primary caregivers for their patients, under the close supervision of critical care attendings and fellows. Residents care for patients in the PICU admitted with both medical and/or surgical problems. The objectives of this rotation are designed to further the residents' development of competency in the following six areas:

- I. Patient Care
- II. Medical Knowledge
- III. Practice-Based Learning and Improvement
- IV. Interpersonal and Communication Skills
- V. Professionalism
- VI. Systems-Based Practice

I. Patient Care

Residents will have primary responsibility for the management of PICU patients from the time of admission until transfer to the inpatient floor, another facility, or discharge.

At the time of admission, the resident will perform a complete history and physical and review any medical records that accompany the patient. Emergent needs of the patient will be addressed immediately. After evaluating the patient, the resident will formulate a differential diagnosis and plan appropriate diagnostic and therapeutic interventions, in coordination with the intensive care team.

Through thoughtful review of diagnostic results and frequent reassessment of the patient, the resident will reconsider the clinical status of the patient, along with the differential diagnoses on a continuing basis, making changes to management plans as appropriate. Residents will be directly involved in decision-making regarding patient readiness for step-down of care.

At all times, it is the resident's responsibility to educate and work with the patient and family, maintaining a strong therapeutic alliance, and prioritizing Family Centered Care

As medically indicated, residents will perform appropriate diagnostic and therapeutic procedures after obtaining informed consent from the patient and/or family, with supervision from the PICU staff. Residents will document procedures in the chart and in their personal logbooks. On this rotation, these may include:

- arterial puncture
- bag mask ventilation
- central line placement
- endotracheal intubation
- intravenous catheter placement
- thoracentesis and chest tube insertion
- venipuncture

During this rotation, residents are expected to further develop their proficiency in the following areas related to the intensive care of critically ill children:

- cardiopulmonary resuscitation
- initial evaluation and resuscitation of critically ill patients
- invasive ICP monitoring
- management of shock
- mechanical ventilator management
- sedation and analgesia

Goal: Resuscitation & Stabilization

Become familiar with rapid resuscitation and stabilization of the critically ill child, both in and out of the PICU setting.

Objectives:

- Demonstrate knowledge of appropriate steps in resuscitation and stabilization of the pediatric patient, with particular emphasis on airway management and resuscitative pharmacology, including appropriate utilization of precalculated drug dosing cards.
- Describe the common causes and management of acute deterioration in the previously stable PICU patient.
- Demonstrate ability to function appropriately in codes and resuscitation as part of the PICU team and during scheduled mock codes performed throughout the hospital and clinic setting.
- Successfully complete the PALS training course during residency.

Goal: Recognition & Management of Common Signs and Symptoms

Learn how to recognize and manage common signs and symptoms seen in critically ill children.

Objectives:

- Demonstrate ability to rapidly recognize signs or symptoms which may herald the patient's acute deterioration and to perform a directed, pertinent history and physical examination.
- Formulate an age-appropriate differential diagnosis.
- Recognize criteria for admission to the discharge from the PICU, as well as indications for emergent intervention prior to transport to the PICU.
- Devise a plan for stabilization, further evaluation, definitive management, and anticipation of potential problems.
- Describe the physiologic basis for selected therapies, and potential complications of those therapies.

II. Medical Knowledge

Residents will draw from the wide range of patient diagnoses requiring admission to a referral intensive care unit to broaden their exposure to complex disease processes.

The patient population at this referral center includes patients admitted for complex, rare, or multi-organ system disease, trauma, cardiac surgery, and general surgery. In addition to patients from the area, residents will care for those children transferred from outside hospitals for higher levels of care, including nitric oxide therapy, and pediatric surgical interventions.

During this rotation, it is expected that residents will manage patients diagnosed with, but not limited to:

- Acute Traumatic Brain Injury
- Diabetic Ketoacidosis
- Respiratory Failure
- Sepsis/Septic Shock
- Upper Airway Disease (including stridor, foreign bodies, congenital anatomical abnormalities)
- Toxic Ingestions/Poisonings
- Renal Failure
- Trauma (including MVA, spinal cord injury, self-inflicted)

Goal: Management of Common Diagnoses in the PICU

Understand how to manage certain common diagnoses in the PICU setting.

Objectives:

- For each of the following diagnoses requiring the PICU monitoring and management:
 - Discuss the pathophysiologic basis of the disease or injury
 - Discuss indications for admission to and discharge from the PICU

- Discuss recognition, stabilization, diagnostic and management priorities.
- Describe potential acute and long-term consequences and complications of the disease and therapy, as well as prognostic implications thereof.
- Common Diagnoses in the PICU
 - General: near-drowning, shock (hypovolemic, distributive, cardiogenic), burns, poisonings
 - Cardiovascular: congestive heart failure, tamponade, supraventricular tachycardia, hypertensive crises, management of the infant with congenital heart disease.
 - Respiratory: ARDS, respiratory failure, asthma, pneumothorax, upper airway obstruction
 - GI/Surgical: stress ulcers, GI bleeding, abdominal trauma, acute abdomen, nutritional issues
 - Hematologic/Oncologic: anemia, thrombocytopenia, neutropenia, DIC, tumor cell lysis
 - Infectious Disease: sepsis, meningitis, encephalitis
 - Neurologic: status epilepticus, head injury, increased ICP, cerebral edema
 - Fluid/Electrolytes/Metabolism: severe dehydration, DKA, SIADH, DI, acid-base imbalance, inborn errors of metabolism

Goal: Management & Decision-Making

Develop an organized and systematic approach to complex PICU patients

Objectives:

- Develop and maintain a detailed problem list with appropriate prioritization, to include ongoing, past, and anticipated problems
- Develop a systematic treatment plan for the patient's problem list, as well as anticipatory plans for potential problems.
- Coordinate with multiple consultants to provide an organized and cohesive treatment plan.
- Coordinate smooth transition of care upon transfer out of the PICU.
- Recognize limits of one's knowledge and skills, utilizing assistance as needed.

Goal: Diagnostic Testing

Understand the appropriate ordering and interpretation of laboratory and imaging studies in the PICU.

Objectives:

- Explain the indications for and limitations of specific laboratory/imaging studies.
- Recognize age-appropriate normals.
- Interpret abnormalities in the context of specific physiologic derangements.
- Discuss therapeutic impact and options based on abnormal findings.

Goal: Monitoring & Therapeutic Modalities

Understand the application of physiologic monitoring and special technology and treatment in the PICU.

Objectives:

- Describe the indications for and limitations of invasive patient monitoring such as CVP, PAP, PCWP, systemic arterial pressure, and ICP.
- Describe general techniques for performing the above procedures.
- Describe indications for, appropriate use, monitoring of effect, limitations, and potential complications of the following therapies:
 - Oxygen administration by cannula, masks, hood.
 - Basic ventilator management.
 - Analgesics, sedatives, and muscle relaxants.
 - Enteral and parenteral nutrition.
 - Blood product administration.
 - Vasoactive drug administration.

III. Practice-Based Learning and Improvement

In caring for patients, residents will utilize a broad range of published medical information available through web-based resources, as well as print textbooks and the hospital library. It is expected that decisions about patient care will be informed by review, synthesis and application of studies available in the literature.

Residents will take part in daily radiology rounds, reviewing radiologic imaging of their patients with the PICU team.

Residents will attend regular lectures on topics important to the care of critically ill children given by the intensive care unit staff.

IV. Interpersonal and Communication Skills

Residents will take part in daily collaborative interdisciplinary team rounds, which include intensive care attending, surgical attendings, intensive care nurses, respiratory therapists, pharmacists, and medical students. Residents collaborate with other team members including subspecialty consultants, social workers, dietitians, occupational and physical therapists, chaplains and other support staff.

This rotation will stress the importance of coordination of care among various medical, surgical and subspecialty services. Residents will facilitate discussion among clinician members of the team and the family.

Residents will meet regularly with parents to listen to their concerns and keep them updated on their child's condition and care plan. Family-Centered Care is a standard of care in the PICU.

Daily notes in the chart clearly documenting patients' progress, diagnostic results and ongoing plan will be completed in order to maintain an accurate medical record and share information among team members. More frequent entries will be made when a patient's status is rapidly changing.

When leaving the rotation, an off-service summary will be prepared and made part of the medical record.

Residents will provide feedback to students and attendings on an ongoing basis throughout the rotation, completing written evaluations at the completion of the rotation. Similarly, they will receive regular verbal feedback and a final written evaluation from the PICU attending that will be placed in their permanent record. Residents will use constructive feedback to guide their efforts in ongoing learning and self-improvement.

Goal: Medical Records

Understand how to maintain accurate timely, and legally appropriate medical records on complex and critically ill children.

Objectives:

- Maintain daily, timed progress notes, with updates as necessary, clearly documenting patient's progress and details of the ongoing evaluation and treatment plan.
- Prepare appropriate and timely discharge and transfer notes.

Goal: Teamwork & Consultation

Learn to function effectively as a team member in the PICU.

Objectives:

- Communicate well and work effectively with fellow residents, attending, consultants, nurses, ancillary staff, and referring physicians.
- Learn how to assist referring physicians in stabilization and preparation of a critically ill child for transport to the PICU.

Goal: Patient Support/ Advocacy

Understand the need for providing comprehensive and supportive care to the PICU patient and his/her family.

Objectives:

- Recognize and evaluate the psychosocial needs of acutely ill children and their families.
- Demonstrate respect and sensitivity and develop effective, compassionate skills in dealing with death/dying issues in the PICU.
- Utilize and learn from the expertise of chaplains, psychologists, psychiatrists, social workers, and child life specialists in the care of PICU patients and their family.
- Anticipate/identify risk factors in the child and family, with appropriate intervention and referral.

V. Professionalism

Residents will interact with an extremely ethnically and socio-economically varied patient population that is treated in this referral intensive care unit. Patients will include those living in local communities, as well as those transferred to University Hospital because of emergent and complex medical problems.

Residents will care for patients independent of their ability to pay for services.

Residents will provide compassionate, empathic and culturally sensitive communication with patients and families. They will be particularly sensitive to the unique situation of parents of critically ill and dying children. They will demonstrate sensitivity and responsiveness at all times to patients' culture, gender, sexual orientation and disabilities.

Maintenance of patients' confidentiality will be of highest priority.

Residents will at all times demonstrate ethical and professional behavior. During this rotation, in particular, residents will deal with issues of end of life care and withdrawal of support, potential for long-term disabilities and chronic illness.

When appropriate, residents will utilize the University Hospital Ethics Consultation Service to facilitate team meetings to discuss difficult issues.

Residents will ensure that patients and families give informed consent for all aspects of care.

Goal: Medical Ethics & Legal Issues in the PICU

Become familiar with ethical and medico-legal considerations in the care of critically ill children in the PICU.

Objectives:

- Discuss concepts of futility, withdrawal, and withholding of care.
- Describe hospital policy on DNR orders.
- Define brain death and describe criteria for organ donation.
- Become proficient at performing detailed history (time line) and physical exams, including diagrams of skin findings in suspected child abuse cases.
- Become familiar with procedures to involve the hospital ethics committee as well as legal representation for difficult social, religious, and legal cases (i.e., Jehovah's witness).

VI. Systems-Based Practice

Residents are expected to provide high quality, but cost-effective health care. They will collaborate with case managers and other team members to begin discharge planning before patients are transferred to the inpatient floor.

The resident will communicate regularly with the patient's primary care physician, documenting these contacts in the medical record.

At all times, residents will act in accordance with the legal mandate in the State of Missouri to report any suspicions of child abuse or neglect, being familiar with the process by which such suspicions are reported. The **Child Protection Consultation Team** will be a unique resource for residents working in the complex referral atmosphere of this rotation.

Goal: Financial Issues & Cost Control

Understand key aspects of cost control in the PICU.

Objectives:

- Demonstrate awareness of costs and cost-controls in PICU care and their potential impact on families and the community as a whole
- Avoid ordering routine scheduled laboratory and imaging studies without interim reassessment of the need for those studies.
- Become familiar with and utilize social services and other available resources for patient's financial assistance.

Evaluation:

On clinical rotations, general pediatric or subspecialty, the service/supervisor is to report observed competencies in 6 areas including patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skill, professionalism, and systems-based practice as denoted in the above objectives.