Pediatric Intensive Care Unit Elective
Goals and Objectives (PL3/4)

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Residents are required to have sufficient knowledge of their patients in order to present them to the team on rounds, and to construct a differential diagnosis and treatment plan. They are required to appropriately document all patient care information, including admission notes, daily progress notes, discharge notes and transfer notes unless excused by the attending of record.

The Pediatrics Milestone Project provides a framework for the assessment of the development of the resident physician in key dimensions of the elements of physician competency in the context of their participation in an ACGME-accredited residency program. 1.

<table>
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<tr>
<th>COMPETENCY 1. Patient Care: Residents are expected to provide patient care that is compassionate, appropriate and effective for the promotion of health, prevention of illness, treatment of disease and at the end of life. They will:</th>
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<tr>
<td>• Gather accurate, essential information from all sources, including medical interviews, physical examinations, medical records and diagnostic/therapeutic procedures</td>
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<td>• Interpret laboratory and physiologic data and recognize patient deterioration or improvement</td>
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<td>• Organize and prioritize responsibilities to provide patient care that is safe, effective, and efficient</td>
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<td>• Make informed recommendations about preventive, diagnostic and therapeutic options and interventions that are based on clinical judgment, scientific evidence, and patient/family preference</td>
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<td>• Develop, negotiate and implement effective patient management plans and integration of patient care in consultation with the attending physician</td>
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<td>• Demonstrate appropriate care of acutely ill children, including patients with major medical illnesses, surgical patients, patients with significant trauma, and patients with congenital heart disease</td>
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<td>• Provide transfer of care that insures seamless transitions</td>
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<td>• Observe and/or perform the diagnostic and therapeutic procedures considered essential to the practice of pediatric critical care medicine:</td>
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<td>• Endotracheal intubation</td>
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<td>• Mechanical ventilation</td>
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<td>• Bag mask ventilation</td>
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<td>• Arterial puncture</td>
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<td>• Peripheral arterial line</td>
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<td>• Peripheral venous line</td>
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<td>• Central venous line</td>
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</table>
• Basic cardiac life support
• Advanced cardiac life support
• Placement, chest tube
• Placement, nasogastric tube
• Venipuncture
• Lumbar puncture
• Tracheotomy tube change

COMPETENCY 2. Medical Knowledge: Residents are expected to demonstrate knowledge of established and evolving biomedical, clinical and social sciences, and the application of their knowledge to patient care and the education of others. Residents will apply an open-minded, analytical approach to acquiring new knowledge, access and critically evaluate current medical information and scientific evidence. They will develop clinically applicable knowledge of the basic and clinical sciences that underlie the practice of pediatric critical care medicine and apply this knowledge to clinical problem-solving, clinical decision-making, and critical thinking. Specifically, the residents will:

• Identify acutely ill patients and determine which patients require care in the intensive care unit
• Recognize need for appropriate initial stabilization of acutely ill patients – understand proper indications for stabilization, potential complications, and demonstrate skill in the initial management of critically ill patients:
  • Recognition and initial management of shock
  • Cardiopulmonary resuscitation
  • Airway management
  • Invasive procedures
  • Transport
• Assess the process by which decisions are made with respect to the care of acute critical illnesses
• Describe and demonstrate how to use the equipment and perform procedures necessary to appropriately monitor and support critically ill children
  • Pulse oximetry
  • End-tidal CO2 monitoring
  • Hemodynamic monitoring (arterial, central venous, noninvasive cardiac output determination)
  • Mechanical ventilation
  • Hemodynamic support
  • Intracranial pressure monitors
  • Continuous EEG
• Recognize impending organ system failure and understand basic pathophysiologic and pharmacologic principles related to clinical presentation and management decisions
  • Respiratory (status asthmaticus, acute or respiratory failure, ALI/ARDS, pneumonia)
  • Cardiology (congenital heart disease, cardiogenic shock, pulmonary hypertension, heart failure)
  • Neurology (post-op surgical management, neuromuscular disease, coma, status epilepticus, hypoxic-ischemic or metabolic encephalopathy, stroke, neoplasms, brain death)
  • Infectious disease (sepsis, critical viral infections, CNS infections, opportunistic infections, nosocomial infections)
  • Immunology/Inflammatory (solid organ or bone marrow/stem cell transplant complications, immunodeficiency, autoimmune disorders)
  • Oncology/Hematology (oncologic or hematologic emergencies, coagulation issues, sickle cell disease)
  • Nephrology (acute renal failure, hypertensive crisis, electrolyte disturbances)
  • Endocrinology (diabetes, adrenal dysfunction)
  • Gastroenterology (acute abdomen, liver dysfunction, pancreatitis)
  • Nutrition (refeeding syndrome, malnutrition)
  • Environmental crises (trauma, drowning, burns, poisoning)
• Demonstrate knowledge to recognize alterations in mental status, respiratory
distress/respiratory failure and cardiovascular compromise
• Locate, appraise, and assimilate evidence from scientific studies related to their
patients' health problems
• Recite treatment algorithms related to Pediatric Advanced Life Support and participate in the
management of children requiring emergency life support
• Manage advanced life support technologies
  • ECMO
  • Renal replacement therapy
  • Plasma exchange/plasmapheresis
• Review the general concepts of medical reversibility and futility
• Participation in ancillary services, residents will be proficient in:
  • **Introduction to Bedside Nursing**
    • Establishing intravenous access
    • Delivering medications via pump system
    • Setting up monitors
    • Setting up invasive hemodynamic monitoring (arterial, central venous lines)
    • Endotracheal and oral care
    • Systems-based practices (lab draws, point-of-care testing)
  • **Introduction to Respiratory Therapy Care**
    • Reviewing methods of oxygen administration and support
    • Administering respiratory treatments
    • Pulmonary hygiene (suctioning, CPT/therapy vests)
    • Introduction to non-invasive positive pressure ventilation (BIPAP, CPAP, ram cannula, HFNC)
    • Introduction to mechanical ventilators, set up, and maintenance
  • **Introduction to Pharmacy**
    • Introduction to pharmacokinetics and pharmacodynamics (distribution, elimination)
    • Understanding sedation and analgesia in critical care
    • Developing resource utilization tools
  • **Introduction to Nutrition Services**
    • Introduction to nutrition needs in critical illness
    • Developing nutrition plans for patients based on energy expenditure
    • Reviewing different types of formula

• Complete the Pediatric Critical Care Core Curriculum:
  o Pediatric Residency Critical Care Curriculum Lecture Series
    o Morning Didactic Sessions
    o Case-Based Learning Curriculum
  o Radiology Rounds
  o Clinically Applied Pathophysiology Series; topics include:
    o Fluids
    o Hematologic emergencies
    o Blood products
    o Electrolytes
    o Acid-base disturbances
    o Respiratory failure
    o Respiratory mechanics of the upper airway
    o ARDS
    o Mechanical ventilation
    o Sepsis: basic science, management
    o Shock states
    o Pressors
COMPETENCY 3. Practice-Based Learning and Improvement: Residents are expected to be able to use scientific evidence and methods to investigate, evaluate, and improve patient care practices, and:

- Identify areas for improvement and implement strategies to enhance knowledge, skills, attitudes and processes of care
- Identify and perform appropriate learning activities to guide personal and professional development
- Analyze and evaluate practice experiences and implement strategies to continually improve the quality of patient care
- Develop and maintain a willingness to learn from errors and use errors to improve the system or processes of care
- Use information technology or other available methodologies to access and manage information, support patient care decisions and enhance both patient and physician education
- Incorporate formative evaluation feedback into daily practice

COMPETENCY 4. Interpersonal and Communication Skills: Residents are expected to demonstrate interpersonal and communication skills that enable them to establish and maintain professional relationships with patients, families, and other members of health care teams, and:

- Use effective listening, nonverbal, questioning, and narrative skills to communicate with patients and families
- Communicate with parents and other family members of critically ill patients in a compassionate and appropriate manner
- Provide effective and professional consultation to other physicians and health care professionals
and sustain therapeutic and ethically sound professional relationships with patients, their families, and colleagues
- Interact with consultants in a respectful, appropriate manner
- Maintain comprehensive, timely, and legible medical records
- Complete evaluations of the attending, staff and rotation
- Demonstrate skill in working with the multidisciplinary team involved in the care of acutely ill patients

**COMPETENCY 5. Professionalism:** Residents are expected to demonstrate behaviors that reflect a commitment to continuous professional development, ethical practice, an understanding and sensitivity to diversity and a responsible attitude toward their patients, their profession and society, and:

- Demonstrate humanism, compassion, integrity, and respect for others; based on the characteristics of an empathetic practitioner (Humanism)
- Demonstrate sensitivity and responsiveness to the gender, age, culture, religion, sexual preference, socioeconomic status, beliefs, behaviors and disabilities of patients and professional colleagues
- Perform with a sense of duty and accountability to patients, society, and the profession (Professionalization)
- Exhibit high standards of ethical behavior which includes maintaining appropriate professional boundaries (Professional Conduct)
- Recognize self-awareness of one’s own knowledge, skill, and emotional limitations that leads to appropriate help-seeking behavior
- Display trustworthiness that makes colleagues feel secure when one is responsible for the care of patients
- Adhere to principles of confidentiality, scientific/academic integrity, and informed consent
- Understand the capacity to accept that ambiguity is part of clinical medicine and to recognize the need for and to utilize appropriate resources in dealing with uncertainty

**COMPETENCY 6. Systems-Based Practice:** Residents are expected to demonstrate both an understanding of the contexts and systems in which health care is provided, and the ability to apply this knowledge to improve and optimize health care, and:

- Access and utilize the resources, providers and systems necessary to provide optimal care (social services, pharmacists, nutritionists, case managers, physical/occupational therapists)
- Recognize the limitations and opportunities inherent in various practice types and delivery systems, and develop strategies to optimize care for the individual patient
- Apply evidence-based, cost-conscious strategies to prevention, diagnosis and disease management
- Advocate for patients and their families and help them to navigate the medical system complexities
- Collaborate with other members of the health care team to assist patients in dealing effectively with complex systems and to improve systematic processes of care

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