Pediatric Intensive Care Unit (PICU)
ROTATION DESCRIPTION AND EXPECTATIONS (RDE)
Pediatric Emergency Medicine Subspecialty Residency - University of Calgary

ROTATION DESCRIPTION

Rotation structure

Procedures

PEM educational leadership is in discussion with PICU educational leadership to ensure procedural opportunities are available for PEM residents. The main procedures targeted will be intubations, IV starts, and long IV starts with US guidance. To help facilitate this:

1. PICU educational leadership will reinforce that PEM residents are senior residents and should be given the opportunity to perform procedures as described above, especially on their own patients.
2. When a procedural opportunity is available, PEM residents will advocate to the PICU attending by discussing their interest in the procedure, their skill level, and their comfort with the procedure.
3. PEM residents can also seek out other procedural opportunities such as through the transport team when the resident has completed their rounding for the day.

Rotation length

Standard rotation length is 4 weeks with 1:4 in-house call. Vacation is allowed per the PEM Vacation and Education and Leave Policy (https://docs.google.com/document/d/1pQddx9VLT74sny263koOMLAg_MWns9Au/edit?usp=sharing&ouid=100114742872973660072&rtpof=true&sd=true).

Vacation Policies

1. We do not suggest taking days off within the first week of the PICU rotation. There are orientation-teaching sessions that occur daily during that time which serve as important introductions /refreshers to key areas in the PICU world that are important to attend.

2. Please find attached the dates during which vacation requests are accepted for each block. In order to create a request timeframe that is fair for all residents we accept vacation requests starting three blocks in advance of your time in PICU. We then accept vacation requests up until the eight week cut off as delineated by PARA. Please note for the first block we will accept vacation requests from the date the master ROTA is released up until eight weeks prior to the start of the block.

3. Please send your requests for time off to Mary.Fras@albertahealthservices.ca and donovan.duncan@albertahealthservices.ca. We endeavor to respond to your requests as promptly as we are able, but please recognize that we receive many emails with multiple requests so if you have not heard back from us, we encourage you to email again as a reminder. We appreciate your patience as we ensure we are granting requests in an appropriate and fair manner.

Assessment

At the end of the rotation, the daily evals are compiled into an ITAR by Dr. Donovan Duncan (donovan.duncan@ahs.ca).

EPAs

The following EPAs have been mapped to this rotation and can be obtained:

**Refers to EPAs that must be prioritized on this rotation, very likely to occur*

*FOD	**1**	Assessing and Providing Initial Management for Patients who are Critically Ill
*FOD	**2**	Assessing and Providing Initial Management for Patients with a Suspected Multi-System Trauma
FOD	**4**	Communicating with Patients and Families About Assessment Findings and Management Plans
*FOD	**5**	Working Effectively with Other Members of the Interprofessional Team
*CORE	**1**	Providing Resuscitation for Patients who are Critically Ill
*CORE	**2**	Managing Patients with an Acute Injury
*CORE	**3**	Managing Patients with a Complex Presentation of an Acute Illness
*CORE	**5**	Managing Patients with a Acute Toxic Ingestion or Exposure
*CORE	**7**	Providing Sedation and Systemic Analgesia for Patients Undergoing Procedures in the ED
*CORE	**8**	Performing the Procedures of Pediatric Emergency Medicine
CORE	**9**	Performing and Interpreting Point-Of-Care Ultrasound to Guide Patient Management
*CORE	**11**	Managing Emotionally Charged Interactions with Patients, Families and/or Other Health Care Professionals
CORE	**12**	Coordinating Care with Other Services
CORE	**13**	Providing Clinical Teaching and Supervision

The following procedural EPAs have been mapped to this rotation and can be obtained:

**Refers to EPAs that must be prioritized on this rotation, very likely to occur*

*Bag/Valve/Mask Ventilation (2)
Cardioversion/Defibrillation (1)
Chest Tube Placement - Percutaneous (1)
Chest Tube Placement - Traditional (1)
*Endotracheal Intubations (3) *- Min 1 infant* *- Min 1 adolescent/adult*
Gastrostomy Tube Replacement/Temporization (1)*
Intraosseous Insertion (1)
Lumbar Puncture in an Infant (1)
Lumbar Puncture in a Child or Adolescent/Adult (1)
*Laryngeal Mask Airway Insertion (1)
Surgical Airway (1)

ROTATION EXPECTATIONS (PEM Competencies 2023)

Medical Expert

Knowledge:

1.1. Demonstrate a commitment to high-quality care of their patients
1.2. Integrate the CanMEDS Intrinsic Roles into their practice of Pediatric Emergency Medicine
1.3. Apply knowledge of the clinical and biomedical sciences relevant to Pediatric Emergency Medicine
- 1.3.1. Growth and development, including physical, psychological, social, and sexual
- 1.3.2. Anatomy, physiology, and pathophysiology as related to clinical presentations in Pediatric Emergency Medicine
  - 1.3.2.1. Anatomy of the internal organs and the musculoskeletal and neurologic systems, including surface anatomy and sonoanatomy, to guide diagnostic and therapeutic procedures
  - 1.3.2.2. Physiology and pathophysiology as it applies to the cardiovascular, pulmonary, gastrointestinal and hepatobiliary, genitourinary, gynecologic, endocrine, neurological, musculoskeletal, hematologic, immunologic and integumentary systems, including pregnancy
  - 1.3.2.3. Pathophysiology of shock and infection
- 1.3.3. Etiology of community and hospital-acquired infections
- 1.3.4. Epidemiology of illness and injury
  - 1.3.4.1. Major causes of illness by age
  - 1.3.4.2. Major causes of injury by age
  - 1.3.4.3. Major causes of death by age
- 1.3.5. Immunization
  - 1.3.5.1. Indications for immunization after injury or potential exposure to infectious agents
  - 1.3.5.2. Management of the under vaccinated child
- 1.3.6. Principles of investigation and testing
  - 1.3.6.1. Minimization of pain and distress
  - 1.3.6.2. Diagnostic imaging modalities and their indications, contraindications, and risks
  - 1.3.6.4. Indications for and methods of sedation and immobilization
  - 1.3.6.5. Utility, applications, and limitations of point-of-care ultrasound (POCUS)
- 1.3.7. Non-pharmacologic approaches to the management of pain
- 1.3.8. Pharmacology as it relates to the pharmacokinetics, pharmacodynamics, mechanism of action, routes of delivery, and adverse effects of the following:
  - 1.3.8.1. Analgesics and sedatives
  - 1.3.8.2. Antimicrobials
  - 1.3.8.3. Cardiovascular medications
  - 1.3.8.4. Endocrine medications
  - 1.3.8.5. Immune-modulating therapies
  - 1.3.8.6. Medications used in resuscitation
  - 1.3.8.7. Neuropsychiatric medications
  - 1.3.8.8. Respiratory medications
  - 1.3.8.9. Alternative and complementary medications and products
- 1.3.9. Use of blood products, including indications, precautions, and dosing
  - 1.3.9.1. Massive blood transfusion protocol

1.3.10. Toxicology as relevant to clinical presentations in Pediatric Emergency Medicine
- 1.3.10.1. Drug overdoses
- 1.3.10.2. Substances of abuse and misuse
- 1.3.10.3. Other poisonings and ingestions
- 1.3.10.4. Methods to prevent absorption and enhance elimination
- 1.3.10.5. Antidotes, including indications, precautions, and dosing

1.3.11. Acute care, including emergencies and critical care
- 1.3.11.1. Algorithms for neonatal resuscitation, including neonatal resuscitation program (NRP) guidelines or equivalent
- 1.3.11.2. Algorithms for pediatric cardiopulmonary resuscitation, including pediatric advanced life support (PALS) guidelines or equivalent
- 1.3.11.3. Assessment and management of major trauma, including advanced trauma life support (ATLS) guidelines or equivalent
- 1.3.11.4. Invasive and non-invasive mechanical ventilation
- 1.3.11.5. Indications for and techniques of cooling and warming procedures
- 1.3.11.6. Indications for and techniques of providing procedural sedation
- 1.3.11.7. Role and logistics of both inter- and intrahospital transport of acutely ill children
- 1.3.11.8. Neurologic determination of death
- 1.3.11.9. Principles of organ and tissue donation

1.3.12. Injury
- 1.3.12.1. Injury prevention and analysis of injury events
- 1.3.12.2. Mechanisms of injury
- 1.3.12.3. Environmental exposures, including biological, chemical, hyperbaric, and radiation
- 1.3.12.4. Animal bites and envenomations
- 1.3.12.5. Management of the injured patient

1.3.13. Clinical features, diagnostic criteria, epidemiology, natural history, pathophysiology, complications, and prognosis of illnesses in the following categories
- 1.3.13.1. Allergic
- 1.3.13.2. Cardiovascular
- 1.3.13.3. Endocrinologic
- 1.3.13.4. Gynecologic and obstetrical
- 1.3.13.5. Gastrointestinal and hepatobiliary
- 1.3.13.6. Hematologic
- 1.3.13.7. Inborn errors of metabolism
- 1.3.13.8. Infectious
- 1.3.13.9. Neurologic
- 1.3.13.10. Oncologic
- 1.3.13.11. Ophthalmic
- 1.3.13.12. Orthopedic
- 1.3.13.13. Otolaryngologic
- 1.3.13.14. Psychiatric and behavioural
- 1.3.13.15. Renal and genitourinary
- 1.3.13.16. Respiratory
- 1.3.13.17. Rheumatologic

1.3.14. Social determinants of health
- 1.3.14.1. Impact of poverty and food and housing insecurity
- 1.3.14.2. Factors influencing access and barriers to healthcare
- 1.3.14.3. Factors placing children at risk of maltreatment and neglect

1.3.15. Factors impacting the health of Indigenous peoples
- 1.3.15.1. Effects of colonization on and the healthcare disparities of Indigenous peoples
- 1.3.15.2. Historical agreements and legislation that govern healthcare
- 1.3.15.3. Epidemiology of medical conditions affecting Indigenous children, and recommendations for screening
- 1.3.15.4. Jordan's Principle
- 1.3.15.5. Traditional healing practices
- 1.3.15.6. Truth and Reconciliation Commission of Canada: Calls to Action report and implications for health care

1.3.16. Legal and regulatory issues in the care of children
- 1.3.16.1. Assent and consent
- 1.3.16.2. Capacity and medical decision-making
- 1.3.16.3. Involuntary hospitalization and treatment
- 1.3.16.4. Mandatory reporting
- 1.3.16.5. Privacy and confidentiality
- 1.3.16.6. Pronouncement of death and the role of the coroner or the medical examiner

1.3.17. Prehospital medicine
- 1.3.17.5. Medical considerations of air transport
- 1.3.17.6. Equipment and transportation needs specific to children

1.4. Perform appropriately timed clinical assessments with recommendations that are presented in an organized manner

2. Perform a patient-centred clinical assessment and establish a management plan

2.1. Prioritize issues to be addressed in a patient encounter
- 2.1.1. Recognize and manage crisis situations and critical illness or injury

2.2. Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion
- 2.2.1. Adapt the assessment to the child's age and developmental level
- 2.2.2. Elicit the history in a timely manner
- 2.2.3. Gather information about psychosocial and family considerations relevant to the presentation
- 2.2.4. Use collateral sources of information to complete or substantiate clinical information
- 2.2.6. Perform clinical assessments in a manner that recognizes and minimizes pain and distress
- 2.2.7. Perform timely and selective clinical reassessments to optimize and facilitate patient care
- 2.2.8. Perform specialized examination techniques when indicated, including
  - 2.2.8.1. Newborn examination
  - 2.2.8.3. Urogenital examination
  - 2.2.8.4. Assessment of child maltreatment
- 2.2.9. Select investigations with attention to diagnostic utility, safety, availability, and cost
- 2.2.10. Interpret the results of laboratory investigations

2.2.11. Interpret the following investigations
- 2.2.11.1. Electrocardiograms
- 2.2.11.2. Medical imaging, including
  - 2.2.11.2.1. Radiographs
    - 2.2.11.2.1.1. Abdominal
    - 2.2.11.2.1.2. Chest
    - 2.2.11.2.1.3. Skull
    - 2.2.11.2.1.4. Spine and extremity
  - 2.2.11.2.2. Critical findings of
    - 2.2.11.2.2.1. Abdominal/pelvic computed tomography (CT) and ultrasound
    - 2.2.11.2.2.2. Chest CT
    - 2.2.11.2.2.3. Cranial CT
    - 2.2.11.2.2.4. Imaging done as a part of a trauma protocol
  - 2.2.11.2.3. POCUS examinations

2.2.12. Use sound clinical reasoning and judgment to guide diagnostic and management decisions, including in circumstances where complete clinical or diagnostic information is not immediately available

2.2.13. Recognize and mitigate the risk of over-investigation and over-diagnosis

2.3. Establish goals of care in collaboration with children and their families, which may include slowing disease progression, treating symptoms, achieving cure, improving function, and palliation

2.4. Establish patient-centred management plans for:

2.4.1. Resuscitation of critically ill presentations
- 2.4.1.1. Airway emergencies
- 2.4.1.2. Cardiopulmonary arrest
- 2.4.1.3. Respiratory failure or arrest
- 2.4.1.4. Anaphylaxis
- 2.4.1.5. Shock
- 2.4.1.6. Sepsis
- 2.4.1.7. Trauma
  - 2.4.1.7.1. Blunt and penetrating injuries
  - 2.4.1.7.2. Burns: chemical, electrical, and thermal

2.4.2. Acute medical and surgical presentations and findings, including
- 2.4.2.1. Systemic
  - 2.4.2.1.1. Acute intoxication and withdrawal
  - 2.4.2.1.2. Brief resolved unexplained event (BRUE)
  - 2.4.2.1.3. Drowning and submersion injuries
  - 2.4.2.1.4. Fever of unknown origin
  - 2.4.2.1.5. Hypertension
  - 2.4.2.1.6. Hypothermia and cold-related injuries
  - 2.4.2.1.7. Hyperthermia and heat-related illnesses
  - 2.4.2.1.8. Poor feeding, weight loss, and failure to thrive
  - 2.4.2.1.9. Toxidromes

2.4.2.2. Cardiovascular
- 2.4.2.2.1. Chest pain
- 2.4.2.2.2. Congestive heart failure
- 2.4.2.2.3. Cyanosis
- 2.4.2.2.4. Dysrhythmias
- 2.4.2.2.5. Heart murmurs
- 2.4.2.2.6. Syncope

2.4.2.4. Dermatologic
- 2.4.2.4.3. Desquamating conditions
- 2.4.2.4.4. Drug reactions

2.4.2.5. Endocrinologic
- 2.4.2.5.1. Adrenal insufficiency
- 2.4.2.5.2. Diabetic ketoacidosis
- 2.4.2.5.3. Hypocalcemia and hypercalcemia
- 2.4.2.5.4. Hypoglycemia and hyperglycemia
- 2.4.2.5.5. Thyroid storm

2.4.2.6. Gastrointestinal and hepatobiliary
- 2.4.2.6.1. Abdominal mass
- 2.4.2.6.2. Abdominal pain
- 2.4.2.6.3. Constipation
- 2.4.2.6.4. Diarrhea
- 2.4.2.6.5. Dysphagia
- 2.4.2.6.6. Gastrointestinal (GI) bleeding, upper and lower
- 2.4.2.6.7. Hepatosplenomegaly
- 2.4.2.6.8. Jaundice
- 2.4.2.6.9. Vomiting

2.4.2.8. Hematologic
- 2.4.2.8.1. Anemia
- 2.4.2.8.2. Asplenia and splenic dysfunction
- 2.4.2.8.3. Disorders of coagulation
- 2.4.2.8.4. Hepatosplenomegaly
- 2.4.2.8.5. Lymphadenopathy
- 2.4.2.8.6. Petechiae
- 2.4.2.8.7. Transfusion reactions

2.4.2.9. Inborn errors of metabolism
- 2.4.2.9.1. Acidosis
- 2.4.2.9.2. Hyperammonemia
- 2.4.2.9.3. Hypoglycemia
- 2.4.2.9.4. Dysmorphism
- 2.4.2.9.5. Organomegaly

2.4.2.10. Infectious diseases
- 2.4.2.10.1. Body fluid exposures
- 2.4.2.10.2. Lymphadenitis
- 2.4.2.10.3. Postinfectious vasculitis
- 2.4.2.10.4. Skin and soft tissue infections

- 2.4.2.11. Neurologic
  - 2.4.2.11.1. Altered level of consciousness and coma
  - 2.4.2.11.2. Ataxia
  - 2.4.2.11.3. Dizziness and vertigo
  - 2.4.2.11.4. Focal neurological deficits
  - 2.4.2.11.5. Headache
  - 2.4.2.11.6. Hypotonia and hypertonia
  - 2.4.2.11.7. Paralysis
  - 2.4.2.11.8. Seizure
  - 2.4.2.11.9. Weakness
- 2.4.2.14. Orthopedic
  - 2.4.2.14.1. Arthritis and arthralgia
- 2.4.2.15. Otolaryngologic
  - 2.4.2.15.1. Epistaxis
  - 2.4.2.15.3. Neck mass
  - 2.4.2.15.6. Tonsillar hemorrhage
- 2.4.2.16. Psychiatric and behavioural
  - 2.4.2.16.1. Aggression
  - 2.4.2.16.2. Agitation
  - 2.4.2.16.3. Anxiety
  - 2.4.2.16.4. Crying infant
  - 2.4.2.16.5. Depression
  - 2.4.2.16.7. Psychosis
  - 2.4.2.16.9. Suicidal ideation
- 2.4.2.17. Renal and genitourinary
  - 2.4.2.17.1. Acidosis and alkalosis
  - 2.4.2.17.2. Fluid and electrolyte abnormalities
  - 2.4.2.17.4. Hematuria
- 2.4.2.18. Respiratory
  - 2.4.2.18.1. Apnea
  - 2.4.2.18.2. Chest pain
  - 2.4.2.18.3. Cough
  - 2.4.2.18.4. Dyspnea
  - 2.4.2.18.5. Hemoptysis
  - 2.4.2.18.6. Inhalational injury
  - 2.4.2.18.7. Stridor
  - 2.4.2.18.8. Wheeze
- 2.4.2.19. Rheumatologic
  - 2.4.2.19.1. Fever and inflammatory syndromes
  - 2.4.2.19.2. Monoarthritis
  - 2.4.2.19.3. Polyarthritis
- 2.4.2.20. Conditions presenting in special populations, including
  - 2.4.2.20.1. Patients with
    - 2.4.2.20.1.1. Cancer
    - 2.4.2.20.1.2. Complex or chronic pain

2.4.2.20.1.3. Medical complexity, including children dependent on technology
2.4.2.20.1.4. Neurodevelopmental disorders and intellectual complexity
2.4.2.20.2. Patients who are
2.4.2.20.2.1. At the end of life
2.4.2.20.2.2. Gender diverse
2.4.2.20.2.3. Immunocompromised, including transplant recipients
2.4.2.20.2.4. Victims of neglect or physical or sexual abuse or assault
2.4.2.20.3. Recent immigrants, international adoptees, and refugees
2.4.2.20.4. Returning travelers

3. Plan and perform procedures and therapies for the purpose of assessment and/or management

3.1. Determine the most appropriate procedures or therapies
3.2. Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy
3.3. Prioritize procedures or therapies, taking into account clinical urgency and available resources
3.4. Perform procedures in a skillful and safe manner, adapting to unanticipated findings or changing clinical circumstances
3.4.1. Neonatal and pediatric resuscitation
3.4.1.1. Oxygen delivery and suctioning
3.4.1.2. Airway adjuncts and positioning techniques
3.4.1.3. Bag and mask ventilation
3.4.1.4. Placement of laryngeal mask airway (LMA)
3.4.1.5. Rapid sequence intubation
3.4.1.6. Direct and indirect laryngoscopy
3.4.1.7. Management of the difficult airway
3.4.1.8. Removal of supraglottic foreign body
3.4.1.9. Emergency cricothyrotomy and transtracheal ventilation
3.4.1.10. Initiation of mechanical ventilation
3.4.1.11. Chest compressions
3.4.1.12. Cardiacpacing, external
3.4.1.13. Cardioversion: vagal maneuvers, chemical, and electrical
3.4.1.14. Defibrillation
3.4.2. Trauma life support
3.4.2.4. Pericardiocentesis
3.4.2.5. Thoracostomy: finger and tube
3.4.3. Vascular access
3.4.3.1. Peripheral *(+/- ultrasound guided)*
3.4.3.2. Central (competency not expected but exposure if possible).
3.4.3.3. Intraosseous
3.4.3.5. Venipuncture for sampling
3.4.3.6. Arterial puncture for sampling
3.4.3.7. Arterial puncture for line placement
3.4.4. POCUS examinations
3.4.4.1. Identification of

3.4.4.1.1. Abdominal or pelvic free fluid
3.4.4.1.2. Cardiac standstill
3.4.4.1.3. Hemothorax or pleural effusion
3.4.4.1.4. Pericardial effusion
3.4.4.1.5. Pneumothorax
3.4.4.2. Facilitation of
3.4.4.2.2. Nerve block
3.4.4.2.3. Vascular access
3.4.5. Procedural sedation and analgesia
3.4.5.1. Administration of local and regional anesthesia
3.4.5.2. Systemic sedation and analgesia
3.4.9. Head and neck
3.4.9.3. Management of post-tonsillectomy bleeding
3.4.10. Injury and wound management
3.4.10.1. Burn management
3.4.11. Neurologic
3.4.11.1. Lumbar puncture and measurement of cerebrospinal fluid pressure
3.4.14. Respiratory
3.4.14.1. Replacement of a tracheostomy cannula
3.4.14.2. Tracheal suctioning

4. Establish plans for ongoing care and, when appropriate, timely consultation

4.1. Implement a patient-centred care plan that supports ongoing care, follow-up on investigations, response to treatment, and further consultation
4.1.1. Determine the need for and provide vaccination or post-exposure prophylaxis
4.1.2. Determine the need for consultation with another physician
4.1.3. Determine the need for referral to mental health or psychological services
4.1.4. Determine the need for referral for social supports

5. Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety

5.1. Recognize and respond to harm from healthcare delivery, including patient safety incidents

For Communicator, Collaborator, Leader, Health Advocate, Scholar, Professional competencies, please review the appropriate section of the Pediatric Emergency Medicine Competencies document at: https://www.royalcollege.ca/content/dam/documents/ibd/pediatric-emergency-medicine/pem-competencies-e.pdf