

THE TAMIL NADU Dr. M.G.R. MEDICAL UNIVERSITY

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**SYLLABUS
FOR**

D.M. PAEDIATRIC CRITICAL CARE

ACADEMIC YEAR 2026 – 2027

The Tamil Nadu Dr. M.G.R. University, Guindy

Syllabus- D.M. Paediatric Critical Care

Preamble

The competency-based postgraduate training programme for DM in Paediatric Critical Care Medicine aims to produce a specialist who is competent to handle all basic and advanced life-threatening problems in children. The postgraduate student must gain deep knowledge and practical experience in the diagnosis and treatment of paediatric patients with acute, serious, and life-threatening medical and surgical diseases.

He / She should acquire skills in the supervision of paediatric paramedical staff and be able to work as a team leader of the paediatric healthcare providers.

The core components of clinical services revolve around life-support therapies under one roof to critically sick paediatric patients (medical, surgical, and trauma) who are admitted to the Paediatric Intensive Care Unit (PICU). Paediatric Critical Care specialists are also expected to take care of any critically sick child admitted to any emergency or step-down ward of the hospital as the situation warrants

Need-Based Assessment of the Course

DM in Paediatric Critical Care Medicine is a highly specialized postgraduate training programme in India that requires strategic planning for successful inception and growth. In this specialty, due to the convergence of knowledge and skills with the involvement of various primary paediatric sub-specialties, there is a clear need for structured training.

Trauma, severe sepsis, and respiratory failures are increasingly important problems affecting young individuals and children. Paediatric Critical Care is required to intensively monitor paediatric patients in trauma, manage serious paediatric infections and multi-organ dysfunction syndrome (MODS), and navigate unique developmental physiology.

1. ELIGIBILITY

Candidate for admission to the DM Paediatric critical care shall be required to have qualified in MD/ DNB Paediatrics or any other equivalent degree recognized by National Medical Commission and should have obtained permanent registration certificate from NMC or any other state medical council.

2. DURATION OF THE COURSE

The period of certified study and training for DM Paediatric critical care course shall be three calendar years/ 36 months

No exemption shall be given from this period of study and training for any other experience gained prior to the admission.

3. COMMENCEMENT OF COURSE

The academic year for DM Paediatric critical care course shall commence from April 1/ October 1 of the academic year or from the dates notified by the university.

4. LATE ADMISSION

Late admissions are possible up to 30 days from the commencement of the course.

5. EXAMINATION

The university examinations shall be at the end of the course i.e., 36 months. Examinations will be held twice a year starting on April 1 or October 1.

6. ATTENDANCE REQUIREMENTS FOR ADMISSION TO EXAMINATION

No candidate shall be permitted to appear for the examination, unless he/she has put 90% attendance during his/her period of study and training in the affiliated institution. He/she should produce the necessary certificates of study, attendance and progress from the head of the Institution. Candidates admitted after April 30 shall take their examination in October only after the completion of 36 months.

7. CONDONATION OF ATTENDANCE

There shall be no condonation of attendance in this super specialty course of study and training.

8. MAINTENANCE OF LOG BOOKS / e-LOGBOOKS

- 1) Every candidate should maintain a record of skills he has acquired during three years training period certified by various heads of departments in which he/she has undergone training.
- 2) The candidates should also be required to participate in the teaching and training programme of MBBS students and MD(Paediatrics) post graduates.
- 3) In addition, the Head of the Department shall involve their post graduates candidates in seminars, journal clubs, group discussions and participation in clinical, clinic-pathological conferences. They shall also be involved in clinical audit periodically.
- 4) Candidates are also required to attend 2 regional/ national/ international conferences and make at least one presentation in any of these conferences during their course in relevant subjects. These should be entered in the log book/e-logbook.
- 5) The Head of the Department shall scrutinize the log book /e-logbook once in 3 months.
- 6) At the end of the course, the candidate should summarise the contents and get the Log Book /e-logbook certified by the HOD.
- 7) The Log Book /e-logbook should be submitted at the time of practical examination for the scrutiny of board the board of examiners.

9. THESIS

A thesis on a topic relevant to Paediatric Critical care must be chosen, designed, carried out, written and submitted to the University before the candidate can appear for the written examination.

10. SCHEME OF TRAINING

The training has to be mainly in the Department of Paediatric Intensive/ Critical care in the Institute. However, this is supplemented by intensive care sections of relevant departments like

- 1) Paediatric Emergency Medicine
- 2) Cardiothoracic surgery
- 3) Neuro surgery
- 4) Paediatric Surgery
- 5) Paediatric Pulmonology
- 6) Paediatric ENT
- 7) Paediatric Anaesthesia
- 8) Neonatology
- 9) Paediatric Cardiology
- 10) Transplant medicine (Bone Marrow and Organ)

POSTING DETAILS

Posting	I year	II year	III year
1.PICU	8 months	7 months	11 months
2. Pediatric ER	1 month	45 days	1 month
3.Cardiothoracic Surgery		1 month	
4.Neuro surgery		15 days	
5.Pediatric Pulmonology	15 days	15 days	
6.Pediatric Anesthesia including procedural sedation	15 days	15 days	
7.Pediatric ENT	15 days	15 days	
8. Pediatric Hemato oncology and BMT	15 days	15 days	
9.Pediatric cardiology	15days		-
10. Organ transplant	15days		

CURRICULUM

Section 1

I. SPECIFIC CREDENTIALS

Each trainee should achieve provider and/or instructor status in one or more of the following:

1. Basic life support
2. Advanced Trauma Life Support
3. Paediatric Advanced Life Support

4. Neonatal Advanced Life Support

II. COGNITIVE SKILLS

- Trainees should begin to expand their understanding of the physiology, pathophysiology and therapy of disorders, beyond the level of a post graduate resident. In the first 3 months, it is expected that trainees will complete, by independent reading:
 1. A paediatric critical care textbook and
 2. A basic physiology textbook.
- These sources will be supplemented by interactive sessions, Problem Based Learning, seminars, symposium and lectures. Attending at least 75% of the PICU academics is mandatory. By the end of the year, trainees are expected to have a thorough grasp of the basic normal physiology of the body and the mechanisms organ systems use to cope with physiologic derangements and stress.
- By the 6th month of training, they should begin to shift their focus from studying textbooks to appreciating current literature
- Trainees are expected to be adapt at utilizing the medical literature. This includes the ability to use electronic resources such as PubMed to search for relevant topics, as well as the ability to critically appraise the merits and deficiencies of an article.

Section 2: Subject-Specific Objectives

At the end of training in Paediatric Critical Care Medicine, the postgraduate student should have acquired the following knowledge and skills:

General Objectives

- To manage the daily clinical and administrative operations of a modern PICU.
- To Provide dynamic leadership for the multidisciplinary PICU team.
- To facilitate the learning of paediatric residents, fellows, and junior colleagues.
- To Integrate complex clinical information to make rapid decisions for critically ill children.
- To Plan professional development to contribute to the holistic growth of the specialty.

Specific Learning Objectives

- To Perform advanced resuscitation and stabilization of the acutely ill paediatric patient.
- To Plan and perform therapeutic interventions/organ system support in single or multiple organ failure in paediatric conditions associated with trauma, burns, severe infections, and metabolic derangements.
- To Plan paediatric end-of-life care, including ethical decision-making and palliative support.
- To Organize and execute peri-operative care of paediatric surgical, neurosurgical, and paediatric trauma patients.

- To Plan and execute paediatric infection control procedures and standard operative procedures and bundle care approach in the PICU.
- To Operate paediatric-specific monitoring and other equipments, detect alterations in their functioning, and troubleshoot errors.
- To Communicate effectively and empathetically to the parents /guardians of the critically ill children regarding critical illness and breaking bad news.
- To Analyse the quality of medical literature and apply evidence-based Paediatric care bundles.
- To participate in future areas of paediatric clinical research.

Section 3: Subject-Specific Competencies

(A) Cognitive Domain (Knowledge)

At the end of the course, the student should be able:

- To apply paediatric anatomy, developmental physiology, biochemistry, and weight-based pharmacology to daily clinical practice.
- To apply the above basic concepts in understanding the pathophysiology in acutely ill children.
- To plan and implement resuscitation and initial stabilization and transport of acutely ill paediatric patients from emergency triage to the PICU.
- To perform diagnosis, assessment, investigation, monitoring, and data interpretation of acutely ill children.
- To manage paediatric critical care in secondary and advanced tertiary care facilities.
- To implement advanced organ system support (e.g., mechanical ventilation, renal replacement therapy) in single or multi-organ failure.
- To organize peri-operative care for complex paediatric surgical interventions.
- To offer safe, specialized support for the transport and transfer of critically ill children (inter-hospital and intra-hospital).
- To have accurate knowledge on paediatric fluid balance, enteral and total parenteral nutrition in critically ill children.
- To plan and execute clinical research in paediatric intensive care fields.
- To help in the implementation of strict infection control and antibiotic stewardship programs in the PICU.
- To monitor and maintain safety standards for paediatric patients and health care workers in the PICU.
- To identify and analyse the critical incidents, adverse drug events and complications related to PICU care.
- To organize and participate in multidisciplinary and structured counselling sessions with families/guardians of critically ill children.

- To implement paediatric-specific clinical guidelines, protocols and care bundles.
- To demonstrate understanding of paediatric scoring systems for assessment of severity of illness and risk of mortality (e.g., PRISM, PIM, PELOD).
- To demonstrate understanding of the managerial and administrative responsibilities of a paediatric critical care specialist.
- To be able to maintain Electronic Medical Records.

(B) Affective Domain (Attitudes & Professionalism)

1. Comfort, Pain-Relief, and Recovery

- To understand the physical and psychosocial consequences of critical illness on paediatric patients, their parents and siblings.
- To prevent and manage paediatric delirium, ICU-related psychological trauma, and post-intensive care syndrome in children.
- To communicate the continuum of care requirements of paediatric patients at PICU discharge to step-down staff, primary paediatricians, and parents/guardians.

2. End-of-Life Care

- To manage the process of withholding or withdrawing life-sustaining treatment with the multidisciplinary PICU team.
- To discuss paediatric end-of-life care and palliative care pathways with parents, families, or legal surrogates.

3. Health Systems Management

- To lead daily multidisciplinary PICU ward rounds with nurses, respiratory therapists, physiotherapists and clinical pharmacologists.

4. Ethics, Attitudes, and Communication Skills

- To communicate sensitively with paediatric patients using age-appropriate language.
- To communicate clearly and transparently with parents, legal guardians, and members of the healthcare team.
- To involve parents or legal surrogates actively in the shared clinical decision-making process.
- To understand cultural, spiritual, and religious beliefs, recognizing their impact on paediatric medical decisions.
- To understand privacy, dignity, confidentiality, and legal constraints on the use of paediatric patient data.
- To collaborate, consult, and work effectively within the paediatric healthcare team.
- To supervise and delegate duties and responsibilities to junior residents and nursing staff safely.

Section 4: Psychomotor Domain (Procedural Skills)

At the end of the 3-year training program, the student must acquire and demonstrate independent proficiency in the following paediatric-specific procedural skills:

1. Respiratory System Techniques

- **Oxygen Therapy:** To master fundamental principles of high-flow nasal cannula (HFNC), non-invasive ventilation (NIV), and paediatric-specific oxygen delivery interfaces.
- **Fibreoptic Laryngoscopy:** To perform direct visualization of paediatric upper airways for anatomical assessment.
- **Emergency Airway Management:** To perform rapid sequence intubation (RSI) using paediatric-appropriate endotracheal tube sizes (cuffed and uncuffed) and paediatric laryngoscope blades.
- **Difficult and Failed Airway Management:** To apply paediatric difficult airway algorithms, including use of video laryngoscopes, laryngeal mask airways (LMAs), and surgical airways.
- **Endotracheal Suction:** To perform safe, non-traumatic closed endotracheal suctioning.
- **Fibreoptic Bronchoscopy & BAL:** To perform therapeutic and diagnostic bronchoscopy with bronchoalveolar lavage in the intubated child.
- **Tracheostomy Management:** To perform or manage paediatric percutaneous/surgical tracheostomy and manage acute tracheostomy complications.
- **Thoracocentesis:** Perform needle decompression and insert appropriate sized chest drains for pneumothorax or empyema.

2. Cardiovascular System Techniques

- **Peripheral Venous Catheterization:** Gain rapid peripheral IV access in infants and children.
- **Arterial Catheterization:** To place indwelling arterial lines (e.g., radial, femoral, dorsalis pedis) for continuous blood pressure monitoring in paediatric patients.
- **Intraosseous (IO) Access:** To establish emergency intraosseous access in critically ill children when intravenous access fails.
- **Ultrasound-Guided Vascular Access:** To utilize ultrasound techniques for the precise localization and cannulation of paediatric veins and arteries. Including PICC
- **Central Venous Catheterization:** To insert paediatric triple-lumen central venous catheters (femoral, internal jugular, subclavian) using appropriate size-to-weight calibrations.
- **Defibrillation and Cardioversion:** To deliver synchronized cardioversion and defibrillation using paediatric paddles and weight-appropriate energy dosing (Joules/kg).

- **Cardiac Pacing:** To assist or execute emergency transvenous or transthoracic cardiac pacing tailored to paediatric heart rates.
- **Pericardiocentesis:** To perform emergency ultrasound-guided pericardiocentesis for cardiac tamponade in children.
- **Hemodynamic Monitoring:** To measure paediatric cardiac output and interpret derived hemodynamic variables using specialized paediatric monitors- Invasive and Non-Invasive monitoring.

3. Central Nervous System Techniques

- **Lumbar Puncture:** to perform diagnostic and therapeutic lumbar punctures safely across varying paediatric age groups (infants to adolescents).
- **Continuous EEG Monitoring:** to be able to utilize continuous EEG monitoring for the Neurological Evaluation of critically ill paediatric patients.
- **Neuraxial Pain Management:** to perform paediatric epidural and maintain caudal analgesia infusions for post-operative or trauma pain control.

4. Gastrointestinal System Techniques

- **Nasogastric / Orogastric Tube Insertion:** to place and verify the position of gastric feeding tubes based on paediatric anatomical measurements.
- **Abdominal Paracentesis:** To perform ultrasound-guided diagnostic and therapeutic peritoneal fluid aspiration.
- **Variceal Haemorrhage Management:** to place a paediatric-sized Sengstaken-Blakemore tube (or age-appropriate balloon tamponade equivalent) to manage refractory upper gastrointestinal bleeding.
- **Upper GI Endoscopy Support:** to demonstrate a core understanding of diagnostic and therapeutic paediatric upper gastrointestinal endoscopy indications.
- **Procedural Sedation:** to utilize appropriate agents with weight based dosing for procedural sedation during procedures.
- **Intra-Abdominal Pressure Monitoring:** to set up, measure and interpret paediatric intra-abdominal pressure via a urinary catheter trans-bladder method in the early detection and management of abdominal compartment syndrome.

5. Genitourinary System and Renal Replacement Techniques

- **Urinary Catheterization:** to perform sterile urethral catheterization using weight-appropriate, paediatric-specific Foley catheters.
- **Peritoneal dialysis** to perform and maintain PD, CAPD
- **Haemodialysis** – to insert and maintain HD catheter initiate and give instructions for continuing haemodialysis
- **CRRT-** to place and maintain the catheter and able to write prescription for CRRT
- **plasmapheresis** to place and maintain the catheter and write prescription for PLEX when indicated

Section 5: Course Syllabus

1. Resuscitation and Initial Management of the Acutely Ill Paediatric Patient

1.1 Paediatric Triage and Rapid Stabilization

- To apply a structured, timely approach (e.g., Paediatric Assessment Triangle (PREM)) to rapidly recognize, assess, and stabilize acutely ill paediatric patients with disordered physiology.
- To differentiate age-specific normal variations from abnormal vital signs in infants, toddlers, children, and adolescents.

1.2 Paediatric Cardiopulmonary Resuscitation

- To execute advanced life support protocols based strictly on paediatric algorithms (e.g., Paediatric Advanced Life Support - PALS).
- To perform high-quality chest compressions and ventilation configurations tailored to the child's age and physical size.
- To manage shockable and non-shockable rhythms using paediatric defibrillators and weight-based drug dosing.

1.3 Post-Resuscitation Management

- To implement neuroprotective strategies, including targeted temperature management (TTM) adjusted for the paediatric population.
- To optimize post-cardiac arrest oxygenation, ventilation, and hemodynamic support to avoid secondary tissue injury

1.4 PICU Triage and Admission Prioritization

- To establish objective priority criteria for PICU admissions based on physiologic instability, therapeutic requirements, and paediatric scoring models.
- To coordinate bed management and resource allocation within the paediatric critical care unit.

1.5 Paediatric Trauma Management

- To execute initial primary and secondary surveys for paediatric polytrauma, recognizing unique paediatric anatomical vulnerabilities (e.g., compliant chest walls, internal organ displacement).
- To implement massive transfusion protocols tailored to weight-based volumes, and stabilize traumatic brain injuries (TBI) or spinal cord injuries in children.

1.6 Paediatric Burns Management

- To calculate total body surface area (TBSA) burned using paediatric-specific charts (e.g., Lund-Browder diagram).
- To manage aggressive fluid resuscitation using paediatric-appropriate fluid formulas (e.g., Parkland formula combined with maintenance fluids containing dextrose).
- To control paediatric burn pain, prevent heat loss, and manage inhalation injuries or dynamic airway swelling.

1.7 Paediatric Mass Casualties

- To adapt triage systems for multi-casualty incidents involving infants and children (e.g., JumpSTART triage algorithm).
- To coordinate decompression protocols and psychological first aid tailored to paediatric victims and their guardians.

2. Diagnosis: Assessment, Investigation, Monitoring and Data Interpretation of the Acutely Ill Paediatric Patient

2.1 Paediatric History Taking and Clinical Examination Perform detailed paediatric-specific history taking, incorporating birth history, developmental milestones, immunization status, and weight trajectory.

- To conduct non-threatening, age-appropriate physical examinations across the paediatric spectrum (infants to adolescents).
- To identify subtle clinical signs of impending respiratory or cardiovascular collapse unique to paediatric physiology (e.g., grunting, nasal flaring, chest wall retractions, and prolonged capillary refill).

2.2 Timely and Appropriate Investigations

- To order targeted diagnostic tests efficiently, prioritizing minimally invasive methods to preserve circulating blood volume in small children (iatrogenic blood loss prevention).
- To select and schedule imaging and laboratory panels based on rapid differential diagnoses of acute paediatric critical illnesses.

2.3 Paediatric Focused Echocardiography

- To demonstrate structural understanding of Paediatric Point-of-Care Ultrasound (POCUS) and functional transthoracic echocardiography (TTE).
- To identify indications for urgent echocardiography, including suspected myocarditis, pericardial tamponade, acute pulmonary hypertension, and undiagnosed congenital heart disease (CHD) presenting as shock.
- To interpret results for ventricular function, fluid responsiveness, and contractility estimation in a paediatric setting. (*Transesophageal echocardiography is restricted to a supportive/observational understanding in paediatric patients*).

2.4 Paediatric Electrocardiography (ECG/EKG)

- To interpret paediatric ECGs by applying age-specific norms for heart rates, PR intervals, QRS duration, and T-wave vectors from infancy through adolescence
- To recognize critical paediatric arrhythmias, including supraventricular tachycardia (SVT), ventricular tachycardia (VT), complete heart block, and long QT syndromes.

2.5 Paediatric Microbiological Sampling

- To perform accurate, sterile microbiological sampling, including weight-appropriate blood culture volumes, sterile cerebrospinal fluid (CSF) collection, urine sampling, and endotracheal aspirates.

- To interpret paediatric culture results, minimal inhibitory concentrations (MIC), and rapid molecular diagnostics to implement immediate narrow-spectrum targeted antimicrobial therapy.

2.6 Paediatric Blood Gas Interpretation

- To interpret arterial, venous, and capillary blood gas samples using age-adjusted reference ranges.
- To diagnose complex acid-base disorders, including metabolic acidosis secondary to poor tissue perfusion, inborn errors of metabolism, or paediatric diabetic ketoacidosis (DKA) and poisoning.

2.7 Paediatric Clinical Imaging

- To organize and interpret bedside paediatric chest and abdominal X-rays, recognizing proper placement of endotracheal tubes, central lines, and enteric tubes based on paediatric anatomy.
- To utilize paediatric lung ultrasound to identify pneumothorax, consolidation, and pleural effusions.
- To interpret cranial ultrasound (for infants with open fontanelles), measure ONSD, interpret computed tomography (CT), and magnetic resonance imaging (MRI) scans for paediatric traumatic brain injury, stroke, or central nervous system infections.
- To apply strict **ALARA (As Low As Reasonably Achievable)** radiation safety principles across all imaging modalities for paediatric patients.

2.8 Physiological Variables & Monitoring Systems

- To monitor and interpret continuous, age-specific paediatric physiological variables, including heart rate, respiratory rate, non-invasive and invasive arterial blood pressure, and central venous pressure and non invasive cardiac monitoring
- To set up and interpret functional monitoring systems, including pulse oximetry plethysmography, end-tidal capnography (EtCO₂), and near-infrared spectroscopy (NIRS) for regional tissue oxygenation.

2.9 Clinical Integration & Management Strategy

- To synthesize raw clinical findings rapidly with laboratory, radiology, and microbiology data to construct comprehensive differential diagnoses for complex paediatric presentations.
- To formulate, implement, and dynamically modify evidence-based paediatric management strategies based on serial clinical data points.]

System wise Disease Based syllabus - MODULES

Module 1: Cardiovascular Medicine (CV-1)

- **Overarching Competency:** To diagnose, stabilize, and manage acute circulatory failure, dangerous arrhythmias, structural heart emergencies, and perioperative complications using advanced hemodynamic profiling.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
CV-1.1	To differentiate the physiological profiles of shock subtypes (hypovolemic, neurogenic, septic, cardiogenic) to implement targeted fluid and vasoactive resuscitation bundles.	Knowledge	Written Exam / MCQ
CV-1.2	To select, calculate, and titrate vasoactive and inotropic medications based on systemic receptor profiles and therapeutic patient metrics.	Skill	Clinical Audit / Case Scenario
CV-1.3	To identify malignant cardiac rhythms on an ECG and execute timely pharmacological or electrical cardioversion/pacing according to ACLS guidelines.	Skill	High-Fidelity Simulation
CV-1.4	To distinguish between cardiogenic and noncardiogenic pulmonary edema and apply appropriate clinical unloading strategies.	Knowledge	Case-Based Discussion
CV-1.5	To diagnose acute cardiac tamponade bedside and perform or assist in emergency pericardiocentesis under ultrasound guidance.	Skill	DOPS / Simulation
CV-1.6	To manage acute decompensations of valvular heart diseases, critical cardiomyopathies, myocarditis, and severe pulmonary hypertension (cor pulmonale).	Knowledge	Viva Voce
CV-1.7	To formulate a treatment plan for a hypertensive emergency by safely lowering mean arterial pressure without inducing end-organ ischemia.	Skill	Mini-CEX / Chart Review
CV-1.8	To monitor the adverse hemodynamic effects caused by positive pressure ventilatory assist devices on right and left ventricular preload and afterload.	Knowledge	Viva Voce
CV-1.9	To evaluate tissue oxygen transport metrics (DO ₂ , VO ₂), extraction ratio, mixed venous saturation) to optimize systemic perfusion.	Skill	Case Review / Spotter Exam

CV-1.10	To manage the perioperative care of paediatric and congenital cardiac surgery patients, accounting for structural anatomical alterations.	Knowledge	Written Exam
CV-1.11	To measure and monitor cardiac output using noninvasive techniques like aortic Doppler and indicator dilution methods.	Skill	Logbook Verification
CV-1.12	To communicate transparently with families regarding the high-risk nature of emergency mechanical circulatory support interventions.	Attitude	OSCE Checklist /

Module 2: Respiratory Medicine & Airway Management (RE-2)

- **Overarching Competency:** To formulate management strategies for acute respiratory failure, execute advanced mechanical ventilation techniques, troubleshoot ventilator problems, and master emergency airway algorithms.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
RE-2.1	To diagnose hypoxemic (ARDS), hypercapnic, and acute-on-chronic respiratory failure, implementing appropriate initial oxygen delivery pathways including Invasive and non-invasive ventilation.	Knowledge	Written Exam / MCQ
RE-2.2	To prescribe a lung-protective ventilation strategy for ARDS utilizing low tidal volumes, optimal PEEP, and permissive hypercapnia protocols.	Skill	High-Fidelity Simulation
RE-2.3	To set up, program, and troubleshoot advanced ventilator modes (e.g., APRV, PRVC, HFOV, split-lung, and one-lung ventilation systems) ECMO initiation and maintenance	Skill	DOPS / Practical Exam
RE-2.4	To manage life-threatening status asthmaticus, massive gastric aspiration, near-drowning events, and upper airway obstructions.	Knowledge	Case-Based Discussion
RE-2.5	To direct the critical care response to major chest trauma, including flail chest	Knowledge	Spotter Exam / Case Study

stabilization, rib fractures, and pulmonary contusions.

RE-2.6	To recognize, prevent, and treat ventilator-induced lung injuries (VILI), specifically barotrauma, volutrauma, and atelectrauma.	Knowledge	Viva Voce
RE-2.7	To execute standardized, evidence-based weaning protocols and determine precise extubation readiness criteria Use bedside ultrasound evaluation for diaphragmatic excursions	Skill	Mini-CEX / Chart Audit
RE-2.8	To perform a rapid sequence intubation (RSI) using emergency airway algorithms, including backup difficult airway maneuvers.	Skill	DOPS / Manikin Simulation
RE-2.9	To perform an elective or emergency percutaneous tracheostomy and manage long-term artificial airway maintenance or complications.	Skill	DOPS (Direct Observation)
RE-2.10	To safely execute positional respiratory therapy protocols, specifically prone positioning and rotational therapy matrices.	Skill	Direct Observation Checklist
RE-2.11	To diagnose and manage critical pleural space disorders (pneumothorax, hemothorax, empyema, chylothorax) via chest tube insertion. Instillation of streptokinase and other drugs intrapleural	Skill	DOPS / Logbook Entry
RE-2.12	To monitor respiratory mechanics (airway pressures, compliance, resistance loops) alongside advanced adjuvant therapies like inhaled nitric oxide.	Skill	Bedside Demonstration
RE-2.13	To diagnose critical illness polyneuropathy and monitor prolonged neuromuscular blockade effects using train-of-four nerve stimulation.	Knowledge	Case-Based Discussion
RE-2.14	To ensure team coordination and safety during emergency intubations, demonstrating clear leadership and role delegation under high stress.	Attitude	360° Feedback

Module 3: Renal Medicine & Fluid/Acid-Base Balance (RN-3)

- **Overarching Competency:** To analyse, diagnose, and manage acute renal dysfunction, fluid-electrolyte imbalances, acid-base derangements, and renal replacement therapies in critically ill patients.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
RN-3.1	To differentiate the pathophysiology, etiology, and diagnostic criteria of prerenal, intrinsic renal, and postrenal acute kidney injury.	Knowledge	Written Exam / Viva Voce
RN-3.2	To systematically evaluate a critically ill patient with oliguria using urine electrolytes and fractional excretion indices (FeNa)(FeUrea).	Skill	Mini-CEX / Case-Based Discussion
RN-3.3	To interpret complex mixed acid-base disorders and formulate an emergency management plan.	Knowledge	Spotter Exam / Case Scenario
RN-3.4	To determine the indications, initiate, and monitor HD, PD continuous renal replacement therapy (CRRT) modalities (CVVH, CVVHD, CVVHDF) and Plasmapheresis	Skill	DOPS / Simulation
RN-3.5	To calculate precise drug dosing adjustments for narrow-therapeutic-index antimicrobials in patients with fluctuating renal clearance.	Skill	Chart Audit / Logbook
RN-3.6	To recognize, diagnose, and manage secondary systemic complications of rhabdomyolysis and Hemolytic Uremic Syndrome (HUS).	Knowledge	Viva Voce
RN-3.7	To demonstrate empathetic communication when consenting family members for emergency hemodialysis or plasma exchange.	Attitude	OSCE / Simulated Patient

Module 4: Central Nervous System & Neuro-Critical Care (NE-4)

- **Overarching Competency:** Evaluate altered consciousness, manage acute intracranial emergencies, execute neurological protection protocols, and coordinate care for neurosurgical and brain-dead patients.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
NE-4.1	To systematically evaluate a comatose patient, differentiate metabolic from structural causes, and calculate accurate prognostic scores.	Skill	Mini-CEX / Bedside Exam
NE-4.2	To implement a multimodal management protocol for elevated intracranial pressure (ICP) and accurately interpret ICP waveform derangements.	Skill	DOPS / Simulation
NE-4.3	To execute the rapid sequence management protocol for a patient in status epilepticus according to current guidelines.	Skill	High-Fidelity Simulation
NE-4.4	To diagnose acute neuromuscular respiratory failure (e.g., Guillain-Barré, Myasthenia Gravis) and determine clear criteria for mechanical ventilation.	Knowledge	Case-Based Discussion
NE-4.5	To manage hemodynamic and intracranial targets for patients with traumatic brain injury and intracranial haemorrhages (SAH, ICH, Epidural, Subdural, Axonal Shear).	Knowledge	Written Exam / MCQ
NE-4.6	To formulate a safe, tiered plan for conscious sedation, deep sedation, and neuromuscular blockade, including train-of-four monitoring and managing shunt function/dysfunction.	Skill	DOPS / Clinical Audit
NE-4.7	To perform a rigorous, legally compliant brain death evaluation and complete formal certification according to institutional and national protocols.	Skill / Attitude	/ OSCE / Checklist

Module 5: Metabolic, Endocrine & Electrolyte Homeostasis (ME-5)

- **Overarching Competency:** To detect, monitor, and treat acute endocrine crises, metabolic decompensations, and macro/micronutrient deficiencies under critical stress conditions.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
ME-5.1	To calculate a critically ill patient's resting energy expenditure using indirect calorimetry and design an individualized enteral/parenteral nutrition plan incorporating immune nutrition.	Skill	Portfolio / Logbook
ME-5.2	To identify and manage acute adrenal crisis and relative adrenal insufficiency using appropriate diagnostic stimulation tests and stress-dose steroids.	Knowledge	Case-Based Discussion
ME-5.3	To distinguish between and treat Diabetic Ketoacidosis (DKA) and Hyperosmolar Hyperglycemic State (HHS) utilizing dynamic insulin-fluid protocols and strict glucose management.	Skill	Mini-CEX / Chart Review
ME-5.4	To correct severe, life-threatening dysnatraemias (hyponatremia/hyponatremia) and macro-mineral imbalances (K, Mg, Ca, PO ₄) safely to prevent central pontine myelinolysis. Demonstrate management of Fluid overload	Knowledge	Written Exam / Scenario
ME-5.5	To recognize clinical emergencies related to pheochromocytoma, insulinoma, colloid osmotic pressure shifts, and inborn errors of metabolism.	Knowledge	Viva Voce
ME-5.6	To respect patient autonomy and cultural beliefs regarding the initiation, withholding, or withdrawing of artificial nutrition and hydration.	Attitude	360-Degree Evaluation

Module 6: Infectious Diseases & Antimicrobial Stewardship (ID-6)

- **Overarching Competency:** To implement strict infection control, execute optimal antimicrobial stewardship, and manage sepsis and opportunistic infections in immunocompromised cohorts.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
ID-6.1	To apply current international consensus definitions (surviving Sepsis guidelines) to rapidly screen, identify, and risk-stratify septic shock using the qSOFA/SOFA frameworks.	Knowledge	MCQ / Spotter Exam
ID-6.2	To select and optimize empiric antimicrobial regimens (antibacterial, antifungal, antiviral, antitubercular, antiparasitic) based on PK/PD profiles and resistance mechanisms.	Skill	Clinical Audit / Case Review
ID-6.3	To differentiate causes of ICU-acquired fever and manage device-associated or hospital-acquired infections (VAP, CLABSI, CAUTI, Tetanus).	Knowledge	Written Exam
ID-6.4	To employ tailored management strategies for severe infections and biological modifiers in the immunosuppressed host (Oncology, Transplant, HIV/AIDS).	Knowledge	Case-Based Discussion
ID-6.5	To demonstrate error-free compliance with universal precautions, personal protective equipment (PPE), and transmission-based isolation protocols to mitigate risks to healthcare workers.	Skill	Direct Observation
ID-6.6	To recognize and report adverse drug reactions to antimicrobial agents and champion institutional antimicrobial stewardship policies.	Attitude	Multi-Source Feedback

Module 7: Acute Haematology & Oncology (HO-7)

- **Overarching Competency:** To diagnose and treat acute coagulopathies, direct evidence-based blood component therapy, and manage acute oncologic emergencies in the ICU.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
HO-7.1	To diagnose and manage acute defects in haemostasis, including Disseminated Intravascular Coagulation (DIC), thrombocytopenia, and Thrombotic Microangiopathies.	Knowledge	Written Exam / Case Study
HO-7.2	To prescribe targeted blood component therapy (PRBCs, FFP, Platelets, Cryoprecipitate, Factor Concentrates, Albumin) utilizing strict restrictive transfusion triggers.	Skill	Logbook / Chart Audit
HO-7.3	To implement, monitor, and reverse systemic anticoagulation and fibrinolytic therapies safely, incorporating pharmacologic agents that modify transfusion needs. Demonstrate the interpretation and management strategies using TEG -ROTEM	Skill	DOPS / Simulation
HO-7.4	To identify and manage acute chest syndrome, vaso-occlusive crises in Sickle Cell Disease, and execute plasmapheresis or treatments for ICU-acquired anaemia.	Knowledge	Viva Voce
HO-7.5	To manage oncologic emergencies in the ICU, including Tumour Lysis Syndrome, hyper viscosity syndrome, and acute chemotherapy-induced toxicities.	Knowledge	Case-Based Discussion
HO-7.6	To communicate transparency regarding the risk in post transplants, benefits, and alternatives of blood product transfusions when obtaining informed consent. To able to recognise and manage Post BMT issues and other emergencies	Attitude	OSCE / Checklist

Module 8: Gastrointestinal & Genitourinary Disorders (GG-8)

- **Overarching Competency:** To evaluate, stabilize, and manage acute life-threatening gastrointestinal haemorrhages, fulminant hepatic failure, acute surgical abdomens, and postoperative complications in the ICU.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
GG-8.1	To execute immediate resuscitation and medical/pharmacological stabilization protocols for massive upper (variceal/non-variceal) and lower gastrointestinal bleeding.	Skill	High-Fidelity Simulation / Mini-CEX
GG-8.2	To diagnose acute and fulminant liver failure, identify clinical criteria for liver transplantation, and manage secondary encephalopathy, coagulopathy, and cerebral edema.	Knowledge	Case-Based Discussion
GG-8.3	To adjust maintenance and therapeutic drug dosing regimes accurately according to quantified degrees of hepatic impairment.	Skill	Chart Audit / Logbook
GG-8.4	To identify early clinical and radiological signs of GI tract perforation and coordinate urgent surgical intervention.	Knowledge	Spotter Exam / Case Scenario
GG-8.5	To manage postoperative complications including enterocutaneous fistulas, high-output stomas, deep wound infection, and fascial evisceration.	Skill	DOPS (Direct Observation)
GG-8.6	To prescribe evidence-based stress ulcer prophylaxis protocols while balancing risks of ventilator-associated pneumonia and <i>Clostridioides difficile</i> .	Knowledge	MCQ / Written Exam
GG-8.7	To practice transparent inter-disciplinary communication during perioperative handovers of complex surgical patients.	Attitude	Multi-Source Feedback

Module 9: Environmental Hazards and Toxicology (EH-9)

- **Overarching Competency:** To recognize, risk-stratify, and manage acute toxidromes, severe envenomations, temperature-related injuries, dysbarism, skin/wound failure, and exposures to chemical, biological, or radiological threats.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
EH-9.1	To identify clinical signs of acute organophosphate, rodenticide, hydrocarbon aspiration, and plant poisoning (e.g., yellow oleander), executing targeted decontamination and antidotal therapy.	Skill	High-Fidelity Simulation / Mini-CEX
EH-9.2	To grade snake envenomation severity, manage anti-snake venom (ASV) hypersensitivity reactions, and treat localized or systemic complications of scorpion stings.	Skill	Bedside Exam / Case Review
EH-9.3	To differentiate toxidromes from drug overdoses or withdrawal states (Acetaminophen, Iron, Barbiturates, Narcotics, Salicylates, Alcohols, Cocaine, TCAs), implementing targeted elimination pathways.	Knowledge	Spotter Exam / MCQ
EH-9.4	To design active internal and external rewarming or cooling protocols for severe hypothermia, frostbite, hyperthermia, and heat shock states.	Skill	DOPS / High-Fidelity Simulation
EH-9.5	To diagnose and provide initial critical care stabilization for altitude sickness, decompression sickness, and complex skin/wound care failure.	Knowledge	Written Exam
EH-9.6	To coordinate and implement institutional decontamination and triage protocols during simulated chemical, biological, or radiological terrorism events.	Skill / Attitude	/ Disaster Simulation Drill

Module 10: Immunology and Transplantation (IT-10)

- **Overarching Competency:** To Coordinate medical optimization for deceased organ donors, execute post-transplant immunosuppressive strategies, and manage transplant-related infectious or rejection crises.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
IT-10.1	To apply standardized protocols for the physiological maintenance and hemodynamic optimization of deceased organ donors to preserve target organ viability.	Skill	Clinical Audit / Logbook
IT-10.2	To outline national regulatory laws, procurement networks, preservation strategies, transportation, and legal allocation frameworks governing organ transplantation.	Knowledge	Written Exam
IT-10.3	To formulate, monitor, and titrate multi-drug immunosuppressive regimens for post-transplant patients within the ICU environment.	Knowledge	Case-Based Discussion
IT-10.4	To diagnose, differentiate, and treat acute graft rejection episodes and opportunistic transplant-related infectious diseases.	Knowledge	Viva Voce
IT-10.5	To exhibit deep empathy, cultural humility, and clear communication loops when discussing organ procurement options with grieving family members.	Attitude	OSCE / Simulated Patient

Module 11: Monitoring, Bioengineering, and Biostatistics (MB-11)

- **Overarching Competency:** To Calibrate, troubleshoot, and interpret multimodal invasive, non-invasive, respiratory, neuro-, and metabolic monitoring platforms to guide precision ICU care.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
MB-11.1	To calculate and interpret objective ICU prognostic indices, severity scores, and therapeutic intervention metrics (APACHE, SOFA) to predict outcomes.	Skill	Portfolio / Chart Audit
MB-11.2	To calibrate, and troubleshoot strain gauge transducers, signal conditioners, and gain adjustments to maintain and accurately measure using invasive arterial, CVP, and PA catheters.	Skill	DOPS (Direct Observation)

MB-11.3	To synthesize derived invasive and non-invasive hemodynamic variables to accurately characterize shock states, cardiac performance, and fluid responsiveness.	Knowledge	Case Scenario / Viva Voce
MB-11.4	To interpret advanced neuromonitoring data streams including ICP waveforms, cerebral blood flow markers, EEGs, jugular venous bulb oximetry, and transcranial Doppler studies.	Skill	Simulation / Spotter Exam
MB-11.5	To evaluate advanced respiratory monitoring streams (airway pressure, compliance, resistance loops, dead space fractions, capnography) to mitigate ventilator-induced injury.	Skill	Bedside Exam / DOPS
MB-11.6	To interpret metabolic monitoring metrics (oxygen consumption, carbon dioxide production, respiratory quotient) derived via indirect calorimetry.	Knowledge	Case-Based Discussion
MB-11.7	To demonstrate strict compliance with electrical safety thresholds, electronic thermoregulation devices, and computerized ICU information systems.	Knowledge	MCQ

Module 12: Ethics and Administration (EA-12)

- **Overarching Competency:** To navigate complex ethical dilemmas regarding end-of-life care, direct ICU administrative workflow models, ensure billing/documentation compliance, and lead patient safety initiatives.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
EA-12.1	To apply strict legal and ethical principles when securing informed consent for clinical procedures, research study enrolments, or organ procurement.	Knowledge	Viva Voce
EA-12.2	To facilitate consensus-building family meetings regarding medical futility, outcome forecasting, withholding or withdrawing life support, and quality of end-of-life care.	Attitude	OSCE / Multi-Source Feedback

EA-12.3	To implement transparent, evidence-based triage protocols for ICU admissions and discharges during periods of severe resource constraints or mass surges.	Skill	Case Simulation Exercises
EA-12.4	To lead multi-disciplinary ICU teams utilizing effective team-building strategies, contracting workflows, and varied staffing models (physician, nurse, ancillary technicians).	Skill Attitude	/ 360-Degree Evaluation
EA-12.5	To generate legally compliant medical records that fulfil institutional documentation, patient safety, auditing, and billing/coding benchmarks including EMR	Skill	Chart Review / Portfolio

Module 13: Clinical Genetics and Advanced Pharmacology (GP-13)

- **Overarching Competency:** To integrate genetic insights into patient risk profiling and apply advanced pharmacokinetic/pharmacodynamic principles to maximize drug safety in multi-organ failure.

Competency No.	Specific Learning Objective (SLO)	Domain	Assessment Method
GP-13.1	To identify clinical presentations of adult-manifesting congenital or storage disorders within the ICU and facilitate formal genetic counselling access.	Knowledge	Case-Based Discussion
GP-13.2	To explain how genetic polymorphisms influence individual drug metabolism, therapeutic efficacy, and toxic drug profiles.	Knowledge	Written Exam / MCQ
GP-13.3	To map drug administration profiles using basic pharmacokinetic (absorption, distribution, clearance) and pharmacodynamic principles modified by critical illness.	Knowledge	Viva Voce
GP-13.4	To calculate precise drug dosing adjustments for critically ill patients experiencing severe hepatic impairment or acute/chronic renal failure.	Skill	Logbook /e-logbook/ Chart Audit
GP-13.5	To maintain uncompromised safe medication practices via strict compliance with EMR order entries and double-check systems to eliminate medication errors.	Skill Attitude	System Audit // Multi-Source Feedback

14.RM.1	To formulate a precise paediatric research question using the PICO framework and select an appropriate study design with Cognitive child-centric outcome measures (e.g., ventilator-free days, Functional Status Scale).	Thesis Protocol Assessment / Viva Voce
14.RM.2	To perform a sample size power analysis tailored to paediatric disease incidence rates to Cognitive prevent underpowered clinical studies.	Written Assignment / Journal Club
14.RM.3	To define primary and secondary paediatric outcome metrics and evaluate potential measurement Cognitive errors or uncertainties across developing age groups.	Presentation / Thesis Progress Review
14.RM.4	To critically appraise multi-centre paediatric trial datasets and meta-analyses to implement Cognitive evidence-based paediatric care bundles in the PICU.	Journal Club Assessment / Portfolio
14.RM.5	To categorize data structures (nominal, ordinal, interval, ratio) and accurately plot paediatric data using growth velocity Psychomotor curves, histograms, and scatter plots.	Biostatistics Workshop / Practical Log
14.RM.6	To evaluate normal bell curves and parametric distributions within paediatric physiological Cognitive cohorts to differentiate normal vs. skewed distributions.	Written Examination (MCQs)
14.RM.7	To calculate means, medians, modes, standard deviations, variances, and interquartile ranges adjusted for age-stratified Cognitive / Psychomotor paediatric variables.	Practical Exercise Written Test

14.RM.8	To apply basic probability principles to determine clinical significance and calculate precision ranges using confidence intervals.	Cognitive	Written Examination
14.RM.9	To formulate null and alternative hypotheses for a prospective paediatric critical care clinical trial.	Cognitive	Thesis Protocol / Viva Voce
14.RM.10	To select and execute the correct statistical test (e.g., Student's t-test, ANOVA, Chi-square, Mann-Whitney U) for a given paediatric dataset.	Psychomotor	Computer-based Data Analysis Test
14.RM.11	To analyse a paediatric study design to minimize Type I (α) and Type II (β) errors, ensuring ethical safety for enrolled child subjects.	Cognitive	Journal Club / Written Exam
14.RM.12	To review published paediatric literature to identify and rectify data p-hacking, improper subgroup slicing, and selective reporting errors.	Affective / Cognitive	Journal Club / Peer Review Simulation

Clinical and Technical Skills Domain

Code	Competency Statement	Domain	Level of Entrustment	Suggested T-L Method	Assessment Method
CC.1.1	To elicit a problem-oriented medical history and perform an accurate physical examination relevant to the paediatric critically ill patient.	Cognitive / Psychomotor	Level 4: Independent	Bedside clinics, Case-based discussion (CBD)	Mini-CEX, Portfolio

CC.1.2	To formulate a structured differential diagnosis, assessment, and therapeutic plan based on basic critical care pathophysiology. Cognitive	Level Independent	Case-based 4: learning (CBL), Grand Rounds	Viva-Voce, Script Concordance Test
CC.1.3	To prioritize interventions and execute timely stabilization of a critically ill child during initial presentation. Psychomotor	Level Independent	High-fidelity 4: simulation, Emergency room triage	Simulation assessment, Logbook
CC.1.4	To justify , order, and interpret advanced diagnostic and invasive monitoring studies in the PICU. Cognitive	Level Independent	Ward rounds, Objective 4: Data interpretation sessions	Structured Clinical Exam (OSCE)
CC.1.5	To appraise current medical literature and apply evidence-based medicine principles to optimize bedside patient care. Cognitive	Level Independent	4: Journal club, Evidence-based rounds	Checklist-based journal presentation
CC.1.6	To supervise junior residents and house surgeons, and deliver effective medical education to the healthcare team. Affective Cognitive	/ Level Independent	Peer 4: teaching, Bedside mentoring	Multisource feedback (360-degree), Mini-CEX

2. Core Procedural Skills Domain

A. Airway & Respiratory Management

Code	Procedural Competency	Domain	Level of Entrustment	T-L Method	Assessment Tool
CC.2.1	To maintain an open airway in a non-intubated paediatric patient. Including non invasive ventilation	Psychomotor	Level Independent	4: Simulation Lab, Emergency Room	DOPS, Logbook
CC.2.2	To perform effective bag-mask ventilation in a paediatric patient.	Psychomotor	Level Independent	4: Simulation Lab, PICU Bedside	DOPS, Checklists
CC.2.3	To perform endotracheal intubation safely, anticipating a difficult airway.	Psychomotor	Level Independent	4: Operating Theatre, Simulation	DOPS, Logbook
CC.2.4	To diagnose and manage a acute pneumothorax (needle decompression/chest tube insertion).	Psychomotor	Level Independent	4: Simulation, Bedside emergency	DOPS, Video-based review

B. Circulation & Cardiovascular Management

Code	Procedural Competency	Domain	Level of Entrustment	T-L Method	Assessment Tool
CC.2.5	To perform arterial puncture and indwelling cannulation.	Psychomotor	Level Independent	4: Bedside hands-on training	DOPS, Logbook
CC.2.6	To insert central and peripheral venous catheters under ultrasound guidance.	Psychomotor	Level Independent	4: Simulation, Bedside under supervision	DOPS, Checklist
CC.2.7	To perform urgent pericardiocentesis in acute cardiac tamponade.	Psychomotor	Level Under Supervision	3: High-fidelity simulation lab	Simulation Objective Assessment

CC.2.8	To interpret dynamic electrocardiograms and continuous cardiac monitoring.	Cognitive	Level 4: Independent	ECG teaching sessions, Ward rounds	OSCE, Spotters
CC.2.9	To perform basic echocardiogram and assess functional status to aid management Execute synchronized cardioversion and manual defibrillation safely.	Psychomotor	Level 4: Independent	ACLS/PALS simulation training	Simulation assessment, Logbook

C. Advanced & Specialized Procedures

Code [1]	Procedural Competency	Domain	Level of Entrustment	T-L Method	Assessment Tool
CC.2.10	To perform diagnostic and therapeutic thoracentesis and paracentesis.	Psychomotor	Level 4: Independent	Bedside clinics, USG guidance	DOPS, Logbook
CC.2.11	To assist with/Perform flexible fiberoptic bronchoscopy in the PICU.	Psychomotor	Level 3: Under Supervision	Skill lab, Procedure suite	DOPS, Procedural Log
CC.2.12	To initiate, monitor, and manage peritoneal dialysis.	Psychomotor	Level 4: Independent	Ward clinics, Nephrology rounds	Logbook certification
CC.2.13	To coordinate and manage haemodialysis / Plasma Exchange /CRRT circuits in the PICU.	Psychomotor	Level 3: Under Supervision	Interactive workshops, Bedside	DOPS, Portfolio
CC.2.14	To perform Point-of-Care Ultrasound	Psychomotor	Level 4: Independent	Focused POCUS workshops	Objective Structured Assessment of

	(POCUS) for critical care triage and retriage.			Ultrasound Skills (OSAUS)
CC.2.15	To formulate, prescribe, and monitor Parenteral Nutrition (TPN). Total Cognitive	Level Independent	Nutrition 4: rounds, Case scenarios	Case-based discussion (CBD)

3. Research Domain

Code [1]	Competency Statement	Milestone Timeline	Teaching-Learning Method	Assessment Tool
CC.3.1	To formulate a viable research question, design a protocol, and submit a plan for ethical clearance.	Month 1	Research methodology workshop, Guide meetings	Review of written research protocol
CC.3.2	To execute data collection, perform statistical analysis, and generate a final project report/thesis.	Months 2 to 26	Regular progress reviews, Biostatistics support	Thesis evaluation by a review panel
CC.3.3	To defend research findings articulately during scientific evaluations. Note: Should have completed Basic research methodology course and certified for the same during the first year BCBR certification is a must in the first year.	Exit Exam	Paper/Poster presentation	Final Exit Exam Viva-voce

4. Professional Development, Ethics & Administration (AETCOM)

Code	Competency Statement	Domain	Suggested Teaching-Learning Method	Assessment Tool
CC.4.1	To demonstrate absolute respect for patient privacy, confidentiality, and autonomy while delivering care.	Affective	Role modelling, Ethics workshops	Reflection narratives, 360-degree feedback
CC.4.2	To communicate effectively, empathetically, and transparently with grieving families regarding prognosis or critical choices.	Affective	Roleplay, Facilitated time communication	Mini-CEX, Patient/Attendant feedback
CC.4.3	To collaborate seamlessly as a professional unit with cross-functional multi-disciplinary consulting teams.	Affective	Inter-professional ward rounds	Multisource feedback (Nurses, Consultants)
CC.4.4	To analyse personal clinical limitations and exhibit a proactive commitment toward lifelong learning.	Affective	Portfolio maintenance, Mentorship sessions	Self-assessment tools, Logbook review
CC.4.5	To assist in the administrative framework, resource allocation, and daily operations of the PICU.	Affective	Administrative postings, Rotational shift handling	Faculty appraisal, Portfolio log

5. Definition of CBME Assessment Metrics (For Reference)

- **DOPS:** To direct Observation of Procedural Skills (Real-time evaluation checklist during a procedure).
- **Mini-CEX:** To mini-Clinical Evaluation Exercise (15-minute observed clinical encounter focused on a specific task).
- **Level 3 Supervision:** To capable of performing the task under direct supervision (helper/advisor present).

- **Level 4 Supervision:** To trusted to perform the task independently without direct supervision. [1]

PROFESSIONAL DEVELOPMENT

Training in professional development is an ongoing process. Much of this training will come from interaction with colleagues while working in the PICU. In their behaviour, trainees should:

- To show respect for patients, families and other health care professionals.
- To develop a dedication to their patients well being.
- To establish effective communication skills with other members of the health care team as well as patients and their families.
- To respect a patient's privacy and confidentiality.
- To demonstrate professional responsibility, time management skills and effective work habits.
- To demonstrate high moral and ethical standards.
- To develop the attitudes and skills necessary for lifelong learning.
- To understand how one's own beliefs and biases may affect patient care decisions.
- The subspecialty trainee should begin to identify personal strengths and weaknesses as related to a career in Critical Care Medicine.
- Trainees should be involved in administration by assisting the faculty in day-to-day administration as and when required.

a. ACADEMIC SCHEDULE:

The teaching programme will be tailored to improve the knowledge, skills and attitude of the trainees. Learning should be essentially self directed and primarily from clinical work. The formal teaching program is meant only to act as supplement / direction. The typical teaching schedule will be as follows:

- **On all days**
 - 8:00 am to 9:00 am – Consultant rounds where trainees will present the patient's clinical details and discuss pathophysiological disturbances and ongoing resuscitation and organ support plans.
 - 9:00 am to 9:30 am – Interaction with parents/ caregivers. The trainees should attend the meeting of consultant with caregivers and enhance their communications skills and ability to develop a rapport with the caregivers
- **Mondays**
 - Seminar / topic presentation – Trainees will be reviewing a topic in critical care with adequate audio-visual aids.
- **Wednesday**
 - Seminar / topic presentation – Trainees will be reviewing a topic in critical care with adequate audio-visual aids.

- **Friday**

- Grand rounds - Teaching rounds by consultant with special emphasis on Critical care issues and proper documentation of patient data.

- **Saturday**

- Medical care review /mortality meeting- All the children who expired in the previous week will be presented with special emphasis on the probable cause of death and the pathophysiological disturbances.

EVALUATION

The candidate will be comprehensively evaluated for his competency in delivering patient care, development of skills and attitude by his performance in PICU rounds, seminars, presentations and other daily academic activities. This will form part of the internal assessment as documented in his log book /e-logbook throughout his posting.

A. CONDITIONS FOR CERTIFICATION:

Research project and Log book/e-logbook

The candidates have to maintain a log book/e-logbook of all their activities including case records of interesting patients, academic activities, procedures performed.

Submit the certificates for successful completion of the mandatory courses as mentioned in the curriculum.

They will have to submit a completed project work which will be a mandatory requirement for the exit exams.

Internal assessment

It will be done periodically at the end of each year / postings. The candidate needs to secure minimum 50% marks in the internal assessment for appearing for the final exam

Exit examination:

1. Theory Paper

- Total 400 marks (100X4)

Paper I- Applied basic sciences and research methodology

Paper II- Concepts of paediatric critical care, emergency care and acute stabilization

Paper III - Critical care organ systems (Physiology, pathology and Organ support)

Paper IV - Recent advances in Critical care

2. Clinical and practical - Total 400 marks

Clinical cases (PICU) – 2

Emergency ward rounds- 2 cases

OSCE – for Procedures, interpretation of investigations

Viva-Voce - Grand viva, Radiology, Drugs, Project work

The indicative list of topics covered by the theory exam is as follows:

PAPER I – Applied basic sciences and research methodology

- Basics anatomy / physiology / biochemistry with relevance to Critical care
- Innate immunity and inflammation
- Cellular adaptation to stress
- Shock and reperfusion injury
- Pharmacology
- Infection control
- Fluids and electrolytes
- Multiple organ dysfunction syndrome
- Study designs
- Statistical inference

PAPER II - Concepts of paediatric critical care, emergency care and acute stabilization

- Airway management
- Cardiopulmonary resuscitation
- Invasive procedures
- Recognition and initial management of shock
- Poisonings
- Envenomation syndromes
- Life support technologies
- Mechanical ventilation
- Renal replacement therapies

- Blood products in PICU

PAPER III - Critical care organ systems (Physiology, pathology and Organ support)

- Respiratory diseases
- Cardiac diseases
- Neurologic diseases
- Infectious diseases
- Liver diseases
- Immunological diseases
- Oncological and haematological diseases
- Renal endocrine and metabolic diseases

PAPER IV - Recent advances in Critical care

- Advances in molecular mechanisms of cell injury
- Advanced modes of organ supports
- Newer drugs
- Quality of life after critical care
- **Feedback:**
 - **Feedback should be given to the trainees on regular basis. • The feedback should be about the overall integrated, coherent and longitudinal assessment of the trainee.**
 - **The feedback should be in the form of constructive suggestions for improvement in their performance. Assessment shall be carried by supervising teachers with focus on:**
 - **1 Acquisition and application of knowledge and skills**
 - **2 Clinical reasoning and judgment in uncertain situations**
 - **3 Problem solving skills - Situation/Problem Based Learning**
 - **4 Skill development for diagnostic and therapeutic procedures**
 - **5 All above through departmental and extra department rotation**

III. RECOMMENDED BOOKS

1. Rogers textbook of Paediatric Intensive Care – Fifth Edition
2. Paediatric Critical care - Bradley P. Fuhrman, Jerry J. Zimmerman – Fifth Edition
3. Paediatric critical care medicine. Basic science and clinical evidence – Derek.S.Wheeler, Hector.R.Wong, Thomas P Shanley
4. Mechanical Ventilation. Neil R. MacIntyre Richard D. Branson – Second edition
5. Respiratory Physiology: The essential – John B West
6. Pulmonary Pathophysiology: The essentials— John B West
7. Clinical Blood gases: Assessment and management – William Murray
8. Drug Doses- Frank Shann
9. PICU Hand Book- Frank Shann
10. Applied Cardiovascular Physiology – Michael Pinsky

Journals

1. Paediatric critical care medicine
2. Critical Care Medicine
3. Intensive Care Medicine
4. American Journal of Respiratory and Critical Care Medicine
5. Chest
6. Critical Care Journal
7. Internet Journal of emergency and Intensive Care Medicine
8. Journal of Critical Care
9. Journal of Paediatric Critical Care Medicine
10. Journal of Tropical Paediatrics.

D.M. Paediatric Critical Care - Practical Examination Scheme:

Part A	Marks	Duration
Long Case (2 nos.)	150 Marks (75 each)	60 minutes -30 minutes each
Short Case (1 no)	50 Marks	30mins
Counselling and Micro teaching	25+25 Marks	30 mins
OSCE	30 Marks	15 mins
Dissertation	20 Marks	15 mins

Part B	Marks	Duration
Viva -Critical Appraisal Instruments/radiology/drugs PALS	25 Marks 25 marks 25 marks	60minutes
Log Book	25 marks	
Grant Total	Part A+ Part B= Total 400 Marks	Minimum Pass = 50% i.e 200 Marks
