



Fellowship in Advanced Respiratory Care- Adult Critical Care

Curriculum

Module	1
Title	Introduction to Critical Care and ICU Assessment
Duration	Three months

Basic Life Support and Advanced Cardiovascular Life Support Certification + Research Module

- The candidates are expected to obtain BLS and ACLS provider certification from American Heart Association, within a month of commencement of Fellowship Program.
- Those candidates, who already have the BLS and ACLS cards, are expected to have its validity till the completion of Fellowship.
- The candidates are expected to complete a short course on Research Methodology (Online/ On-site), which will prepare them for short thesis and case study publication.

A review on Cardiopulmonary Diseases and Other common ICU Presentations

This module focuses on various cardiopulmonary diseases that are common to the critical care areas and are candidates are expected to understand the detailed pathophysiology of diseases that include, but not limited to ARDS, CCOVID-ARDS, COPD, Trauma, Pulmonary hypertension, Pneumothorax, Sepsis, Shock, Pulmonary embolism, Asthma, Burns, MI, CHF and Pulmonary edema, Neuromuscular diseases, Renal diseases, Liver diseases, Acute Pancreatitis, Tetanus, Poisonings and GI Bleed.

Patient Assessment and ICU Monitoring Devices

This module details the various components of cardiopulmonary, neurologic, renal, gastrointestinal, metabolic, musculoskeletal and other systemic assessments as well as to reinforce the early recognition of clinical deterioration of critically ill patients. This module also includes various monitoring equipment in ICU, including multipara monitors, End-tidal CO₂, Pulse-oximetry, transducers, ECG etc.

Respiratory Mechanics, Cardiovascular Assessment and Hemodynamics

This module overviews the vital components of detailed assessment of respiratory system and advanced cardiovascular assessment. In addition, the module also covers various components of basic to advanced hemodynamic monitoring like Cardiac output monitoring, Thermodilution methods, including normal and abnormal values, and its clinical implications in critically ill patient.



Module	2
Title	Respiratory Diagnostics and Therapeutics
Duration	Three months

Aerosol Medicine and Pharmacology

This module will detail the common drugs (pulmonary and non-pulmonary) used in the treatment of critically ill patients. Furthermore, the importance of the effects/side effects, the role of the respiratory therapists in ICU pharmacology like sedatives, muscle relaxants, airway and cardiovascular pharmacology and the basic antimicrobial medications are focused here. This module will also focus on the importance of all aerosolized pharmacologic agents (bronchodilators and non-bronchodilators) via aerosol or instillation. Optimization of aerosol delivery during mechanical ventilation will also be discussed in this module. The candidates are expected to understand various aerosol delivery devices and their technology.

Airway Clearance Techniques and Airway Management

This module will explain the importance of airway clearance and various techniques as well as the indications and contraindications of various airway clearance techniques like Chest Physiotherapy and Mechanical devices to aid secretion clearance. The module also focuses to enhance skill competencies required to use basic to advanced airway adjuncts and to perform effective Bag Mask Ventilation. The candidates are expected to learn in detail about all areas of Difficult Airway Management

Medical Gas Therapy and Humidification

This module will explain the science and application of medical gases like Oxygen, Heliox, and Inhaled Nitric Oxide and its delivery devices and specification of various gas sources like tanks, cylinders and hospital gas storage and delivery system. The candidates are expected to be expertized in the indications, contraindications, dose calculation and complications of these medical gases. The candidates are also expected to learn various types of humidification used in respiratory critical care.

Diagnostics: Imaging and Laboratory

This module will focus on the utility of various diagnostic imaging tests, including: radiographs, computerized tomography, magnetic resonance imaging, ICU ultrasound, and nuclear scans. The lab module will detail normal and abnormal values in relation to blood chemistries, sputum and blood cultures, cardiac markers, fluid analysis, and blood gases.



Module	3
Title	Advances in Mechanical Ventilation and ICU Procedures
Duration	Three months

Non-Invasive Ventilation

This module provides the detailing of various modes, indications, contraindications, hazards, side effects, and beneficial effects of non-invasive ventilation. This module will detail the updates in NIV and High Flow Nasal Cannula (HFNC).

Invasive Mechanical Ventilation

This module provides a detailed review of the basics to the advances of various modes and settings of invasive mechanical ventilation. This also includes the comprehensive objectives of appropriate initial mechanical ventilation settings, titration of settings, ventilator graphics interpretation, disease specific ventilation and weaning techniques. Advanced study objectives also includes permissive hypercapnia, ventilator induced lung injuries, diaphragmatic dysfunction and advanced modes and technologies in volume, pressure and dual modes, automated weaning, Electrical Impedance Tomography and HFOV.

Adjuncts in Oxygenation and Ventilation

This session emphasized the importance of alternative methods to improve oxygenation including ECLS, Prone ventilation, Inhaled NO, Heliox, independent lung ventilation and all other adjuncts in disease specific ventilation.

ICU Procedures, Patient Transport and Equipment Troubleshooting

- This module focuses on a variety of procedures performed in the critical care areas and the role of respiratory therapist in assisting and performing them. Some of these procedures include but not limited to: endotracheal intubation/extubation, ET tube adjustments, assisting in bedside percutaneous tracheostomy, arterial line insertion and monitoring, assisting in CVL insertion and monitoring, mini bronchial alveolar lavage and assisting in intercostal drainage insertion and monitoring.
- Another objective of this module is the preparation and escort for Inter and Intra-hospital Transport of Critically ill ventilated patients
- The candidates are expected to understand the troubleshooting of all respiratory related equipment including, but not limited to such as mechanical ventilators, aerosol generators and blood gas machines.



Module	4
Title	Multidisciplinary Critical Care and Other Core Areas
Duration	Three months

Multidisciplinary Critical Care

This module focusses on the role and scope of practice of Respiratory Therapist in diverse areas like Neurological and Neurosurgical Critical care, Obstetric critical care, Cardio-thoracic critical care, Coronary critical care, Trauma and Emergency care. The candidates are expected to learn the importance of fluid resuscitation and management in this module.

Clinical Microbiology, Infectious diseases and Infection Control Practices:

This course is designed to provide an extensive overview of the microbial structure, functioning, and diversity of microorganisms, growth and pathogenesis and immunology are presented with important bacterial, viral, parasitic and mycotic infections discussed from the standpoint of etiology, epidemiology, and pathogenesis and laboratory diagnosis. This module will also review the infections that are commonly seen in ICU patients in the intensive care unit and a special focus on various transmission routes. The candidates are expected to understand other aspects of infection control processes like sterilization and disinfection in the ICU and prophylactic measures for infectious sources, emphasizing more about ventilator associated events (VAE), CLABSI, CAUTI etc.

Nutritional Assessment and ICU Rehabilitation

This module focusses on the nutritional requirement of the critically ill patients, especially who are mechanically ventilated. The candidate is expected to understand the importance of indirect calorimetry and energy expenditure, and its importance in the outcome of ICU patient population. The Fellows are expected to expertize the ICU rehabilitation;

Health Management, Disaster Management, Ethics, Quality and Safety

This module details the ethical concepts and conflicts, commonly seen in critical care areas, including patient autonomy, informed consent, end of the life care, withdrawal of life support, and organ donation. This module will also cover the importance of multidisciplinary team performance and important components of healthcare quality and patient safety and the importance of effective disaster management plan in ICU. This module will also cover the domains like Leadership, Effective communication, Constructive Criticism and Hospital Information System/ Electronic Medical Record Systems



Competency Checklist (Continuous Assessment throughout the Fellowship Period)

Name of the Student: _____

Procedure	Date	Date
Basic Airway Management		
Bag Valve Mask ventilation		
Nasopharyngeal and Oropharyngeal Airways		
Advanced Airway Management		
Endotracheal Intubation		
Laryngeal Mask Insertion		
Laryngeal Tube Insertion		
Adjuncts for Intubation like Bougie, Stylet, Light-wand, Airway Exchanger		
Assistance in Surgical Airway- Tracheostomy, Cricothyrotomy		
Difficult Airway Management		
Bronchoscopy guided Intubation		
Video-laryngoscopy		
Care of Patients with Artificial Airway		
ET Tube care		
Tracheostomy care		
Oxygen therapy and Other Medical Gas Therapy		
Devices		
Cylinders		
Interfaces		
Oxygen and Other Medical Gas Supply and their Control in the ICU and Hospital		
Aerosol Therapy		
Medications		
Types of Devices		
Compressors		
Interfaces		



Setting up, Initiation, Titration and Liberation of Invasive and Non-invasive Mechanical Ventilation		
Cardio Pulmonary Resuscitation- BLS and ACLS		
Vascular Access		
Arterial Blood Gas Analysis		
Peripheral Arterial Line Insertion		
Assisting in Central Arterial Cannulation		
Assisting in Central Venous Line Insertion		
Inter and Intra-hospital transport of critically ill ventilated patients- Checklists to Final documentation		
Chest Imaging		
Chest X-ray		
CT scan of Chest		
Airway, Diaphragmatic and Lung Ultrasound - To scan and interpret independently		
Assisting in vascular ultrasound		
Bronchial Hygiene and Airway Clearance Techniques		
Technical and Clinical aspects of Tracheal Suctioning		
Chest Physiotherapy		
PEP therapy		
Autogenic Drainage		
Rehabilitation in ICU		
Assisting in ventilated patient mobilization		
Breathing exercises		
Active Cycle of Breathing Techniques		
Troubleshooting and Calibration of ICU equipment		
Ventilators and Circuits		
Nebulizers and Compressors		
Vascular transducers		
ETCO2		
Pulse Oximetry		
Gas storage- Cylinders, Tanks		
Flow regulators		
Suction Equipment		

***This checklist needs to be printed out on a weekly basis, and to be signed by the Faculty**



Name and Signature of Assigned Faculty: _____

Date of Completion: _____

Remarks: _____

Reference Resources:

Books
1. Critical Care Update 2019- S Todi (ISCCM)
2. ICU Protocols- R Chawla (ISCCM)
3. Textbook of Critical Care- JL Vincent
4. Egan's Fundamentals of Respiratory Care- RM Kacmarek
5. Mechanical Ventilation: Physiological and Clinical Applications- SP Pilbeam
6. Mechanical Ventilation: Clinical Application- V Deshpande
7. Clinical Application of Mechanical Ventilation- D Chang
8. Rau's Respiratory Care Pharmacology- DS Gardenhire
9. Mosby's Respiratory Care Equipment- JM Cairo
Journals
1. Indian Journal of Critical Care Medicine (ISCCM)
2. Indian Journal of Respiratory Care (IARC)
3. Respiratory Care Journal (AARC)
4. Critical Care Medicine (SCCM)
5. Intensive Care Medicine Journal (ESICM)
6. Canadian Journal of Respiratory Therapy (CSRT)

Contact Details:	
ISCCM Office	IARC Office
Indian Society of Critical Care Medicine (ISCCM) Unit 13 and 14, First Floor, Hind Service Industries Premises Co-op. Society Near Chaitya Bhoomi Off Veer Savarkar Marg Dadar Mumbai - 400028	Indian Association of Respiratory Care (IARC) , C/o ISCCM Cochin City Branch 8th Floor, Door No: 37//2701-H5 IMA House, JN Stadium Road, Palarivattom P.O, Cochin, Kerala, India. PIN: 682025