

Dr.NTR University of Health Sciences

Vijayawada

SYLLABUS

**“POST DOCTORAL FELLOWSHIP
COURSE IN CRITICAL CARE MEDICINE”**

for the academic year 2018-19

1. Name of the information Course: Fellowship course in Critical care medicine
2. Duration of the course: One year
3. Eligibility Criteria for admission: MD / D.N.B in General Medicine / Anaesthesia / Pulmonology / Emergency medicine recognised by MCI/National Board of Examinations.

Intake capacity: 2 per year.

4. Complete curriculum of the course:

a. **Goal**:

The candidates must gain ample knowledge, skills and experience in the diagnosis and treatment of patients with acute, serious, and life – threatening medical and surgical diseases. He/She should be aware of his/her limitations and should be able to decide the point of referral.

b. **Objectives**:

- To train the candidates in the principles and practice of intensive care, maintenance of artificial airway, mechanical ventilation and cardiopulmonary resuscitation.
- To meet the growing need for trained critical care medicine specialists
- To provide care and intensive monitoring of acute illness / trauma / serious infections / multiorgan dysfunction.
- To provide quality education and research in critical care medicine so that the intensive care infrastructure including trained man power improves in public hospitals.
- To improve patient care and to reduce mortality in all secondary and all tertiary levels of health care, in academic / government institutions and other hospitals.
- To help in the holistic growth and development of critical care medicine as a specialty including patient care, teaching/training and research.
- To develop the spirit of collaboration, co-operation and leadership among the involved disciplines and to evolve as an efficient ICU team.

5. Course Content:

A. **Knowledge**: The course contents under the cognitive domain include following:

I. Resuscitation and initial management of the acutely ill patients:

- 1.1 Timely approach to the recognition, assessment and stabilization of the acutely ill patients with disordered physiology
- 1.2 Cardiopulmonary resuscitation
- 1.3 Post-resuscitation management
- 1.4 Triage and prioritization of patients for ICU admission
- 1.5 Assessment and initial management of the trauma patient
- 1.6 Assessment and initial management of the patient with burns

1.7 Fundamentals of the management of mass casualties

II. Diagnosis: Assessment, Investigation, Monitoring and data interpretation of the actively ill patients

2.1 history taking and clinical examination

2.2 timely and appropriate investigations

2.3 understanding of echocardiology (transthoracic/transoesophageal), indications and interpretation of results

2.4 understanding of electrocardiography (ECG/EKG), indications and interpretation of results

2.5 Appropriate microbiological sampling and interpretation of results

2.6 Interpretation of results from blood gas samples

2.7 Organization and interpretation of wide range of clinical imaging including bed-side chest X-ray, ultrasound, CT scan, MRI and nuclear imaging relevant for the diagnosis and management of critically ill and injured patients.

2.8 Understanding and interpretation of physiological variables

2.9 Integration of clinical findings with laboratory, radiology, microbiology and other investigations to form appropriate differential diagnosis and management strategy.

III. Disease Management:

3.1 **Acute disease** – Management of the care of the critically ill patient with the following specific acute medical conditions

3.1.1 Acute myocardial infarction

3.1.2 Pulmonary embolism

3.1.3 Cardiogenic shock

- 3.1.4 Life threatening arrhythmias
- 3.1.5 Pericardial tamponade
- 3.1.6 Acute ischemic stroke
- 3.1.7 Intracranial hemorrhage
- 3.1.8 Status epilepticus
- 3.1.9 Head & spine trauma
- 3.1.10 Acute neuromuscular failure (opp/GBS/MG/Snakebite, etc)
- 3.1.11 Acute severe asthma
- 3.1.12 Acute exacerbation of COPD
- 3.1.13 Severe community acquired pneumonia
- 3.1.14 Chest trauma
- 3.1.15 Acute hypoxemia respiratory failure including ARDS
- 3.1.16 Acute GI Bleed
- 3.1.17 Acute liver failure
- 3.1.18 Acute pancreatitis
- 3.1.19 Acute abdomen
- 3.1.20 Neutropenia
- 3.1.21 Acute coagulation disorders
- 3.1.22 Thrombocytopenia
- 3.1.23 Sepsis and septicemic shock
- 3.1.24 Meningitis
- 3.1.25 Acute hemorrhagic fevers
- 3.1.26 Severe forms of tropical infections like malaria, Typhoid, etc.
- 3.1.27 Acute renal failure
- 3.1.28 Eclampsia

3.1.29 Acute poisoning

3.1.30 Anaphylaxis and Anaphylactoid reaction

3.1.31 Hypotensive and hypertensive emergencies

3.2 Chronic disease – Identifications of the chronic and co morbid disease in the acutely ill patients

Organ system failure

3.3 Management of patients with, or at risk of, circulatory failure

3.4 Management of patients with, or at risk of, acute renal failure

3.5 Management of patients with, or at risk of, acute liver failure

3.6 Management of patients with, or at risk of, neurological impairment

3.7 Management of patients with, or at risk of, acute gastrointestinal failure

3.8 Management of patients with, or at risk of, acute lung injury syndromes (ALI/ARDS)

3.9 Management of patients with, or at risk of, septic shock

3.10 Management of patients with, or at risk of, severe sepsis/septic shock with multi-organ dysfunction / failure

3.11 Management of patients following intoxication with drugs or environmental toxins

3.12 Recognition of life-threatening maternal peri-partum complications like acute fatty liver of pregnancy, HELLP and eclampsia/preeclampsia etc. and their management.

IV. Therapeutic interventions / Organ system support in single or multiple organ

failure:

4.1 principles of safe prescription

4.2 principles of safe delivery of life-support therapies

- 4.3 antimicrobial drug therapy – fundamental principles and ICU specific issues
- 4.4 transfusion therapy – fundamental principles and ICU specific issues
- 4.5 circulatory therapies - fundamental principles and ICU specific issues
pertaining to fluid therapy including dynamic variables of fluid
responsiveness and vasoactive /inotropic drugs
- 4.6 mechanical circulatory assist devices
- 4.7 initiation, management and weaning of the patients from invasive and non-
invasive ventilatory support
- 4.8 initiation, management and weaning of the patients from renal replacement
therapy
- 4.9 management of electrolyte, glucose and acid-base disturbances
- 4.10 Nutritional assessment and support

V. *Peri-operative care:*

- 5.1 Management of the pre & post operative care of the high risk surgical patients
- 5.2 Fundamentals of the management of the care of patients following cardiac
surgery
- 5.3 Fundamentals of the management of the patients following craniotomy
- 5.4 Fundamentals of the management of the patients following solid organ
transplantation
- 5.5 Fundamentals of the management of the pre and post-operative trauma care of
the trauma patients

VI. *Transportation:*

- 6.1 Transportation of the mechanically ventilated critically ill patient outside the
ICU

6.2 Understanding of the special considerations required during patient transport by air.

B. **Procedures / Skills:** The course contents under the psychomotor domain include various intensive care practical procedures related to various organ systems.

I. *Respiratory system:*

- 1.1 oxygen therapy – fundamental principles and ICU specific issues
- 1.2 fiberoptic laryngoscopy
- 1.3 emergency airway management
- 1.4 difficult and failed airway management
- 1.5 endotracheal suction
- 1.6 fiberoptic bronchoscopy and BAL in the intubated patient
- 1.7 percutaneous tracheostomy and minitracheostomy
- 1.8 thoracocentesis via a chest drain

II. *Cardiovascular system:*

- 2.1 peripheral venous catheterization
- 2.2 arterial catheterization
- 2.3 surgical isolation of vein/artery
- 2.4 ultrasound techniques for vascular localization
- 2.5 central venous catheterization
- 2.6 defibrillation and cardioversion
- 2.7 cardiac pacing (transvenous or transthoracic)
- 2.8 fundamentals of pericardiocentesis
- 2.9 measurement of cardiac output and derived haemodynamic variable

III. *Central Nervous System:*

- 3.1 lumbar puncture (intradural/spinal)

3.2 basic understanding of neuraxial pain medication like epidural analgesia

IV. ***Gastrointestinal system:***

4.1 nasogastric tube placement

4.2 abdominal paracentesis

4.3 sengstaken tube (or equivalent) placement

4.4 fundamentals of upper GI endoscopy

4.5 measurement and interpretation of intra-abdominal pressure

V. ***Genitourinary system:***

5.1 Urinary catheterization

VI. ***Comfort, pain-relief and recovery:***

6.1 Understanding of the physical and psychosocial consequences of critical illness for patients and families and methods of prevention and management

6.2 Assessment, prevention and treatment of pain and delirium

6.3 Sedation, analgesia and neuromuscular blockade

6.4 Communication of the continuing care requirements of patients at ICU discharge to health care professionals, patients and relatives

6.5 Management of the safe and timely discharge of patients from the ICU.

VII. ***End of life care:***

7.1 management of the process of withholding or withdrawing treatment with the multidisciplinary team

7.2 discussion of the end of life care with patients and their families / surrogates

7.3 management of palliative care of the critically ill patient

7.4 brain-stem death testing

7.5 Management of the physiological support of the organ donor

VIII. Patient safety and health systems management:

8.1 leadership in daily multidisciplinary ward round

8.2 infection control in ICU

8.3 environmental hazards

8.4 safety for patients & staff in ICU

8.5 understanding of critical incidents, adverse events, complications related to ICU care

8.6 Organisation of multi-disciplinary case conference and counseling sessions with family

8.7 Critical appraisal and application of guidelines, protocols and care bundles

8.8 Understanding of scoring systems for assessment of severity of illness and case mix

8.9 Understanding of the managerial & administrative responsibilities of the critical care specialist.

C. Ethics, attitudes and professionalism:

I. Communication skills:

1.1 communication with patients and relatives

1.2 communication with members of the health care team

1.3 management of records/documentation

1.4 teaching and training of the multidisciplinary members of critical care team

II. Professional relationships with patients and relatives:

2.1 Involvement with patients (or their surrogates) in decision making.

2.2 understanding of cultural and religious beliefs and an awareness of their impact on decision making

2.3 Understanding of privacy, dignity, confidentiality and legal constraints on the use of patient data

III. ***Professional relationships with members of the health care team:***

3.1 Collaboration, consultation, team work

3.2 Continuity of care through effective hand-over of clinical information

3.3 Supportive care outside the ICU

3.4 Supervision and delegation of duties and responsibilities to others

IV. ***Self-governance:***

4.1 Understanding of the responsibilities for safe patient care

4.2 Formulation of clinical decisions with respect for ethical and legal principles: understanding of learning opportunities and integration of new knowledge into clinical practice

4.3 Participation in multidisciplinary teaching

4.4 Participation in research or audit under supervision participation in the team approach with respect for team members

D. General Topics:

- Research methodology
- Teaching methodology

6. Framework of Training:

1. Teaching and learning methodology:

- Clinical case discussion
- Morbidity-mortality discussion
- Audit presentation
- Lectures, seminars and journal clubs
- Presentation of progress report on the research projects
- Simulation laboratory
- Joint inter-departmental academic meets with radiology, microbiology, etc.

- Departmental clinical meetings, grand rounds and clinico-pathological meetings
- Multi-departmental combined grand rounds/joint academic activities of the institution.

2. Clinical and practical training:

- The candidates should follow full time in-service residency and should be given increasing responsibilities on a gradual basis for independently managing complicated, critically ill patients.
- Teaching and training of students shall include graded all round patient care responsibility including resuscitation, clinical diagnosis, invasive diagnostic and therapeutic procedures and advanced decision making in the management of critically sick medical and surgical patients.
- Training in thorough and holistic patient evaluation
- Training in ABC (airway, breathing and circulation) including practical training and complete understanding of airway armamentarium, breathing circuits, rapid sequence intubation, initiation-maintenance-termination of mechanical ventilation, invasive or non-invasive hemodynamic monitoring and safe insertion of central venous and intra-arterial catheters, etc.
- Training in Therapeutic interventions/organ system support in single or multiple organ failure.
- Management of critically ill brain dead patients for organ retrieval procedures.

3. Postings: 12 months in the Department of Critical care medicine including Special Postings in the following Departments

• IMCU	– 60 days
• General medicine	- 15days
• ICCU	- 60 days
• Nephrology department	- 15days
• Neurology department	- 15days
• Neuro ICU	- 30 days
• Medical gastroenterology	– 15 days
• Burns ICU	– 15 days
• Basic Anaesthesia skills	– 30 days
• Post Anaesthesia care	– 30 days
• Emergency OT	- 15 days
• Casualty	- 30 days
• Surgical ICU	- 15 days
• Ortho ICU	- 15 days

Candidates will have to attend all the Intensive care units in the hospital by rotation. They have to be on duty/call duty 24*7 days.

4. Attendance: 80% attendance as per the University regulations.

5 Seminars, journal clubs, bedside case discussion and reviews in Critical care medicine.

6 Recent Advances in Critical care medicine

7 Research methodology in Critical care medicine.

8. Research conference at state level - 1
9. Research conference at national level – 1

7. Log Book:

Logbook of daily activity should be maintained by the candidate where in all the departmental procedures, extra departmental procedures, case presentations, observations, seminars, journal clubs, etc will be regarded periodically inspected by the guide for formative assessment during the residency program.

The guide should provide frequent and constructive feed back to the trainee on regular basis about the overall integrated coherent and longitudinal assessment and to provide suggestions for improvement in the performance.

8. Reference Books:

1. Critical Care Medicine: Principles of Diagnosis and Management in the Adult (second edition) by Joseph E. Parrillo and R. Phillip Dillinger.
2. Civetta, Taylor & Kirby's Critical Care - Lippincott Williams & Wilkins (LWW) Author(s): Gabrielli, Andrea; Layon, A. Joseph; Yu, Mihae.
3. Critical Care Challenges: Disorders, Treatments, and Procedures - Lippincott Williams & Wilkins (LWW) Author(s): Springhouse.
4. Critical Care Medicine: The Essentials - Lippincott Williams & Wilkins (LWW) by Marini, John J.; Wheeler, Arthur P.
5. Critical Care Handbook of the Massachusetts General Hospital - Lippincott Williams & Wilkins (LWW) by Bigatello, Luca M.; Alam, Hasan B.; Allain, Rae M.; Bittner, Edward A.; Hess, Dean R.; Pino, Richard M.; Schmidt, Ulrich.
6. Handbook of Critical Care Drug Therapy - Lippincott Williams & Wilkins (LWW) by Gregory M. Susla PharmD, FCCM; Anthony F. Suffredini MD, FCCM; Dorothea McAreavey MD, FACC; Michael A. Solomon MD.
7. Textbook of Critical Care, 6th Edition by Jean-Louis Vincent, MD PhD, Edward Abraham, MD, Patrick Kochanek, MD, Frederick A. Moore, MD, FACS, FCCM and Mitchell P. Fink, MD.
8. Textbook of Critical Care, 5e (Textbook of Critical Care (Shoemaker) Mitchell P. Fink, Edward Abraham, Jean-Louis Vincent & Patrick Kochanek.
9. Critical Care Medicine: Churchill's Ready Reference by Jean-Louis Vincent, Serge Brimiouille
10. Clinical Critical Care Medicine by Lauren Van Saders, RN, MS, CS, APRN, BC.
11. Cardiac intensive care by Jeremias, Allen.

12. Cardiothoracic Critical Care by Sidebotham, David.
13. Clinical cardiac pacing, defibrillation and resynchronization therapy by Ellenbogen, Kenneth.
14. Clinical critical medicine by Albert, Richard.
15. Clinical procedures in Emergency medicine by Roberts, James.
16. Critical care medicine by Parrillo, Joseph.
17. Critical care Nephrology by Ronco, Claudia.
18. Critical care secrets by Parsons, Polly.
19. Cryoablation of cardiac arrhythmias expert consult – online and print by Bredikis, Audrius.
20. Emergency medicine by Adams, James.
21. Emergency medicine secrets by Markovchick, Vincent.
22. Emergency Radiology: the requisites by Soto, Jorge.
23. Emergency Ultrasound: principles and practice by Gaspari, Romolo.
24. Evidence based practice of critical care by Deutschman, Clifford.
25. Textbook of critical care by Vincent, Jean-Louis.

9. Suggested Journals:

- American journal of Emergency medicine
- Critical care clinics
- Heart & Lung: The journal of acute and critical care
- Journal of Critical Care
- Journal of the American college of certified wound specialists
- The journal of tissue viability
- Annals of Emergency Medicine
- Emergency medicine clinics of north America
- Resuscitation

- Toxicology
- Journal of emergency medicine