
FELLOWSHIP IN CRITICAL CARE MEDICINE

D Y PATIL UNIVERSITY, KOLHAPUR

DEPARTMENT OF GENERAL MEDICINE
D Y PATIL MEDICAL COLLEGE, KOLHAPUR

Fellowship Course in Critical Care Medicine

1. **Proper name of certificate course:** Fellowship in Critical Care Medicine (FCCM)
2. **Duration of the course:** 1 year or 2 Semesters.
3. **Eligibility criteria for admission:** MD or DNB passed in General Medicine / Chest Medicine / Anaesthesia

Intake capacity: As per University regulations.

4. **Complete curriculum of the course:** As per decided by the University from time to time - Appendix 1
5. **Teaching scheme:** Total periods and periods allotted to each topic: Appendix II
6. **Text books and reference books:** As recommended from time to time or on curriculum review

1) The ICU book. Paul Marino. 3rd Edition.

2) Manual of Intensive Care Medicine. Irwin and Rippe. 4th Edn.

3) Textbook of Critical Care. 5th Edn. M.P Fink

7. **Scheme of examination:** Examination to be conducted at end of each semester within 15 days of end of semester comprising of theory paper and practical examination.

8. Infrastructure required for conducting the course:

- Hospital:
 - Medical Intensive Care Unit Respiratory Intensive Care unit, Surgical Intensive Care Unit, Dialysis Units, Emergency Care
 - Supportive Areas: Radiology, Pathology & Biochemistry (24 hrs),
- Classroom & Seminar Room for didactic teaching & discussions
- Library
 - General library with relevant books and journals
 - Department library with relevant books and journals

- Material:
- Cases: The medical ICU admits approximately 1200 patients per year provides a wide range of patients for learning critical care.
- ICU equipment:
 - Class I Ventilators
 - Multiparameter monitors
 - Continuous renal replacement therapy
 - Bedside ultrasonography and echocardiography machine
 - Temporary pacemaker
 - Defibrillator
 - Fiberoptic bronchoscope
 - Infusion pumps

9. Faculty required with their qualification and experience

- Intensivist: MD General Medicine with minimum 5 years-experience, post MD in the field of Critical Care Medicine + Teaching experience of 5 years for MBBS students and MD students.

10. Advertisement

- On the institutional website and the intranet
- On the notice boards of the college

Basic qualification: Any candidate with a registered MD or DNB degree in the subjects of General Medicine (Internal Medicine), Chest Medicine or Anaesthesia

11. Interview

By a panel of experts of three - including the head of the institute and 2 internal experts.

12. Selection of candidate: A total number of candidates per year will be as per University regulations. Selection will be based on:

- Performance at interview 30%
- University level academic merits (20%)
- Publications if any (20%)
- Recommendations from PG teacher (20%)

13. Pattern of Exam

- Examination will be conducted at end of semester of training at the college.
- Both theory and practical Examinations will be concluded within 15 days of the end of the semester.
- University will appoint an examination coordination committee (ECC) consisting of three teachers running Fellowship/certificate courses.
- One internal examiner and one external examiner will be appointed by the ECC to conduct the examinations.

Theory

One paper of three hours duration, 10 short notes to be attempted from 12 questions. Each question carry 10 marks each.

Practical

Each candidate will be examined by both examiners simultaneously for between 60 and 90 mins. This will cover a viva-voce and practical.

1) Long case: one case (100 marks)

Candidate will be allowed 30 minutes to examine the patient and review all the investigations. At the end of 30 minutes, the candidate will be examined for not more than 30 minutes for his/her ability to:

- Perform a bedside examination
- Interpret information from bedside monitors
- Systematic assessment of the patient's organ dysfunction

- Diagnose underlying disorders
- Interpret laboratory data with clinical correlation
- Discuss priorities in management

2) Short cases two cases (50 marks each)

Candidate will be allowed 20 minutes to examine each patient and review investigations. He/she will then be examined for not more than 15 minutes on his/her ability to:

Interpret information from physical signs and bedside monitors

- Discuss priorities in management
- Discuss drug treatment of specific problems specific to the patient
- Assess for common problems in the ICU like
 - Fever
 - Hypotension
 - Hypoxaemia
 - Altered mental status
 - Acid-base disorders

3) Viva voce (100 marks)

This will cover following aspects:

- Research project submitted by candidate
- Pharmacotherapy
- Interpretation of laboratory tests
- Reading of Xrays, ECGs, CT scans, MRI scans
- Demonstration of bedside procedures on mannequin
- Legal and ethical issues
- Cardiopulmonary resuscitation

14. Announcement of results

Results will be announced on the Website and Notice board within two weeks of the conclusion of the examination. The result will be only “Fellowship granted/Denied and marks will not be displayed. Repeats will be at the end of no earlier than 3 months depending on the length of the course.

15. Award of Fellowship

Certificates will be awarded by the D Y Patil University after they receive the results from the college. The University (with signature of the Registrar) will award the certificate.

Note- The decision of the Examination Co-ordination Committee will be binding on all matters pertaining to the examinations and on all stakeholders.

APPENDIX I

Complete curriculum of the course:

CORE SUBJECT:

COURSE OBJECTIVES:

At the end of the course, the candidate should be able to:

1. Understand the theoretical basis of organ dysfunction and critical illness
2. Apply these principles to treat critically ill patients
3. Develop the knowledge and skills to diagnose critical illnesses and their complications
4. Critically evaluate published literature
5. Learn to practice evidence-based medicine in managing critically ill patients
6. Develop skills of communication with family members of critically ill patients
7. Apply the highest ethical standards in the practice of medicine

THEORETICAL KNOWLEDGE

The critical care specialist must understand the physiology, diagnosis, prevention and management of the following disorders:

A. General

1. Pharmacology & Pharmacokinetics (emphasis on drug interactions)
2. Analgesia, sedation and Muscle relaxation
3. Immune modulation
4. Polytrauma
5. Transport of the critically ill
6. Systemic Inflammatory Response Syndrome (SIRS)
7. Multi-Organ Dysfunction syndrome (MODS)

8. Management of the brain-dead organ donor
9. Ethical and legal issues in the ICU
10. Care of the terminally ill patient
11. Communication skills
12. Perioperative management of critically ill patients

B. Respiratory

1. Management of airways
2. Pulmonary edema
3. Adult respiratory distress syndrome
4. Hypercapnic respiratory failure
5. Severe asthma and COPD
6. Respiratory infections – community- and hospital-acquired
7. Chest trauma
8. Respiratory muscle disorders
9. Thoracic surgery

C. Cardiovascular

1. Haemodynamic instability and shock
2. Cardiac arrest
3. Acute myocardial infarction
4. Unstable angina
5. Severe heart failure
6. Common arrhythmias and conduction disturbances,
7. Cardiomyopathies
8. Valvular heart disease
9. Myocarditis

10. Cardiac tamponade
11. Pulmonary embolism
12. Aortic dissection
13. Hypertensive crisis
14. Peripheral vascular diseases
15. Cardiovascular surgery post-operative care

D. Neurology

1. Coma
2. Status epilepticus
3. Head trauma
4. Intracranial hypertension
5. Cerebrovascular accidents and cerebral vasospasm
6. Meningo-encephalitis
7. Acute neuromuscular disease (including myasthenia & Guillain Barre syndrome)
8. Post anoxic brain damage
9. Acute confusional states
10. Spinal cord injury
11. Neurosurgery – post-operative care
12. Brain death.

E. Renal

1. Oliguria/ anuria
2. Acute renal failure
3. Renal replacement therapy (RRT)
4. Continuous RRT

F. Metabolic and Nutritional

1. Fluid balance
2. Electrolyte balance and its disorders
3. Acid-base disorders
4. Endocrine disorders (including diabetes mellitus, acute adrenal insufficiency, pituitary disorders, hyper- and hypothyroidism)
5. Nutrition in critical illness
6. Enteral and Parenteral nutrition,
7. Monitoring of nutrition

G. Haematological

1. Disseminated intravascular coagulation and other coagulation disorders,
2. Thrombocytopenia
3. Hypercoagulable states and anticoagulation
4. Haemolytic syndromes
5. Acute blood loss and anaemia
6. Neutropenia
7. Blood component therapy, Immunological disorders
8. Systemic lupus erythematosus

H. Infections

1. Severe infection due to aerobic and anaerobic bacteria
2. Acute severe viral infection
3. Fungal and parasites infections with sepsis and organ failure
4. Nosocomial infection,
5. Infection in the immunocompromised host
6. Tropical disease,
7. Antimicrobial therapy,

I. Gastrointestinal and hepatic disorders

1. Inflammatory bowel diseases
2. Pancreatitis
3. Acute and chronic liver failure
4. Prevention and treatment of acute upper G.I. bleeding
5. Management of acute lower GI bleeding
6. Peritonitis,
7. Mesenteric vascular disease
8. Perforated viscus
9. Bowel obstruction
10. Abdominal trauma
11. Abdominal surgery – post-operative care

J. Obstetric

1. Preeclampsia, eclampsia
2. HELLP syndrome
3. Acute fatty liver of pregnancy
4. Amniotic fluid embolism
5. Postpartum haemorrhage
6. Obstetric shock
7. Puerperal sepsis

K. Environmental Hazards

1. Burns
2. Hypo-and hyperthermia
3. Near-drowning
4. Electrocution
5. Radiation injury
6. Chemical injuries
7. Animal bites and stings

L. Toxicology

1. Acute intoxications
2. Drug overdose

3. Serious adverse reactions to drugs
4. Anaphylaxis.
5. Envenomation

INTERVENTION AND PROCEDURES

The intensivist must be able to perform the following procedures:

Respiratory

1. Maintenance of a patent airway,
2. Endotracheal intubation (oral and nasal)
3. Emergency cricothyrotomy
4. Suctioning of the airway,
5. Oxygen therapy
6. Bag and mask ventilation
7. Initiation and maintenance of mechanical ventilation (Invasive & noninvasive) in various disease states
8. Weaning from mechanical ventilation
9. Assessment of gas exchange and respiratory mechanics
10. Placement of an intercostal tube
11. Fiberoptic bronchoscopy
12. Interpretation of arterial and mixed venous blood gases.

Cardiovascular & Renal

1. Cardiopulmonary resuscitation - Basic Life Support (BLS), Advance Life Support (ALS)
2. Placement of a central venous catheter
3. Pulmonary artery (Swan Ganz) catheterization
4. Renal replacement therapy (RRT) – continuous RRT
5. Arterial catheterization
6. Invasive pressure monitoring
7. Measurement and interpretation of the hemodynamic variables
8. Defibrillation
9. Transvenous pacing
10. Bedside echocardiography

Diagnostic :-

Ultrasound evaluation of critically ill patients

1. Abdomen : Detection of fluid/hemoperitoneum, liver/spleen tear.
2. Cardiac : Tamponade, ejection fraction estimation
3. Vascular : Deep vein thrombosis, placement of IV canula.

Neurologic

1. Basic interpretation of brain CT/MRI scan
2. Intracranial pressure monitoring

Metabolic and Nutritional

1. Implementation of intravenous fluid therapy
2. Enteral and parental nutrition.

Haematologic

1. Correction of haemostatic and coagulation disorders
2. Interpretation of a coagulation profile
3. Implementation of thrombolysis
4. Use of blood components

Renal

1. Bladder catheterization
2. Renal replacement techniques

Gastrointestinal

1. Placement of nasogastric tube
2. Placement of oesophageal / gastric tamponade balloon

Elective subjects:

1. Radiological diagnostic modalities in critical care:

Basic Physics & Medical Physics

General Radiology

Ultra sonogram

C. T. Scan

MRI Scan - 1 Month

Interventional Radiology

2. Perioperative assessment and management of critically ill patients:

Invasive & Non-Invasive monitoring techniques for Pre-peri & Post-operative periods in cardiothoracic centre:

- a. Understanding of basic concepts of monitoring
- b. Indications, cost effectiveness, complications
- c. Equipment usage & knowledge of accessories

Knowledge of the following monitoring:

- a. Cardiac functions :
ECG, ABP, Vent. Pressures, Calculation of cardiac output, resistance, Flow, Echo, Doppler.
& (CAT, PET)
- b. Pulmonary functions :
PFT, Blood gases, Acid-base Pulm. Airway mechanics.
- c. Coagulation Profile :
- d. Neuromuscular blockade

APPENDIX II

TEACHING SCHEME

Structure of training: During the training period, the candidate will develop

- a) Knowledge of pathology, physiology, diagnosis and treatment of various diseases presenting with severe organ dysfunction
- b) Skills to independently perform invasive diagnostic and therapeutic procedures and interventions.

Learning methods:

- Didactic lectures 2 hours /week
- Clinical rounds 2 hours / day
- Clinical Case Discussions 2 hours/week
- Journal Club 1 hour/week
- Seminars by Fellows 1 hour/week
- Workshops 2 days every 6 months
- Guest lectures 2 hours/month
- Clinico pathological meetings 2 hours/month

Clinical Postings:

During the 12 months duration of the fellowship, fellows will be posted in various intensive care units and dialysis unit. Responsibilities of fellows will be as follows:

1. Doing shift duties in the ICU
2. Attending to patients in the ICU
3. Performing initial evaluation of newly admitted ICU patients
4. Planning and initiating resuscitation of new patients

5. Discussing cases with the ICU consultant
6. Writing clinical notes and treatment orders
7. Performing bedside procedures initially under supervision, and later independently.
8. Periodically re-assessing ICU patients and suitably modifying treatment
9. Supervising the work of junior residents
10. Teaching junior residents, nurses and other Para-medical staff

Clinical rotation:

1. Medical and Neurological ICU (MNICU) 6 months
2. Respiratory ICU 3 months
3. Surgical ICU 2 months.
4. Dialysis Unit 1 month

Time allotted to individual subjects/topics

1. Cardiovascular disease and shock 10%
2. Respiratory failure and other respiratory disorders 10%
3. Renal failure and other renal disorders 10%
4. Trauma and post-operative intensive care 10%
5. Neurological and neurosurgical emergencies 10%
6. Gastrointestinal and hepatic emergencies 10%
7. Hematological issues in the critical ill 5%
8. Critical illness in obstetric patients 5%
9. Metabolic disorders and nutrition in the critically ill 10%
10. Toxicologic emergencies 10%

11. Miscellaneous topics in intensive care 10% including communication skills, research methodology, evaluation of published papers, evidence based medicine.

Resources

1. Full-time faculty of departments of Medicine, Surgery, Emergency Medicine
2. Visiting faculty
3. Eminent guest speakers
4. Use of library books, journals and electronic media available in the ICU
5. Use of the general library facilities of the hospital and medical college including books, journals and on-line access to journals

Log Book: Fellows are expected to keep a logbook of typical and interesting cases that they see during the fellowship period, and also a sample of bedside procedures that they perform as per format.

Research:

- In order to strengthen the research capabilities of the fellow, candidates will be required to submit at the end of the fellowship programme a report of a short research project done during the 1 year fellowship period.
- The research project will be done under the guidance and supervision of an appointed course teacher (guide) to be submitted 2 months prior to end of the course (by end of 10th month of the course).

TITLE OF PROGRAM: Fellowship in Critical Care Medicine

Duration of Program: One year

Number of Semesters: 2

Number of Papers: 4

Core Papers: (60% weightage of marks)

1. General, respiratory diseases, cardiovascular diseases, Hematology, infections, obstetrics.
2. Neurology, metabolic and nutritional, immunological disorders, nephrology

Elective Papers: (25% weightage of marks)

Discipline-related: (Allied specialty, Diagnostic modalities, Sub-specialty)

1. Radiological diagnostic modalities in critical care
2. Perioperative assessment and management of critically ill patients.

Foundation Papers: (15% weightage of marks – only compulsory)

- Compulsory:
1. Research Methodology
 2. Medical Ethics

- Value-based (any1):
1. ATCOM
 2. Computer skill
 3. Marathi

Semester wise Paper distribution (Core, Elective & foundations as may be applicable):

1. Semester 1:

Core: General, respiratory diseases, cardiovascular diseases and Hematology, infections, obstetrics.

Foundation (compulsory 1): Research Methodology/Medical Ethics

2. Semester 2:

Core: Neurology, metabolic and nutritional, immunological disorders, nephrology

Elective: Radiological diagnostic modalities in clinical care, Perioperative assessment and management of critically ill patients.

1 Semester = 450 Hours / 90 Days / minimum 15-18 weeks

	SEMESTER 1			SEMESTER 2		
	Hours	Per Week	Credits	Hours	Per Week	Credits
Core	45	2	3	45	2	3
Elective-Discipline	-	-	-	30	2	2
Elective-Generic	-	-	-	-	-	-
Foundation – Compulsory	45	2	3	-	-	-
Foundation – Value Based	10	1	-	10	1	-
Practicals	350	16	11	365	17	12

Assessment for credit courses (Absolute grading method):

Marks	93%	84%	77%	70%	63%	56%	49%
Letter grade	A+	A	B+	B	C+	C	F
Grade point	10	09	08	07	06	05	00