Maharashtra University of Health Sciences,

Nashik

SYLLABUS

"Fellowship Course in Critical Care Medicine"

Fellowship Course in Critical Care Medicine

1. Proper name of the certificate course: **Fellowship Course in Critical Care Medicine**

2. Duration of the course: **12 months**

3. Eligibility criteria for admission : **MD General Medicine**

   OR

   MD Chest Medicine

   OR

   MD Anaesthesia

   OR

   DNB in respective speciality /Superspeciality as per MCI Guidelines, if any;

   Intake capacity: **As per decided by the University from time to time**

4. Complete curriculum of the course **Appendix**

5. Teaching scheme: Total periods and periods allotted to each topic: **Appendix II**
6. Text books and reference books:

   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 in details:

   (Number of question papers, Number of marks to each question paper, Duration of question paper, practical examination etc.)

   Theory paper: See Point No 13 below Practical examination: See Point No 13 below
8. Infrastructure required for conducting the course.

   Intensive care units: Medical Neuro Intensive Care Unit

   Intensive Coronary Care Unit

   Dialysis Unit

   Surgical ICU

   Emergency Medicine ICU

   Classrooms for didactic teaching:

Radiology, Pathology and Biochemistry – routine and emergency:
Library: General library with relevant books and journals:

Department library with relevant books and journals:

Cases: The medical ICU admits approximately 1000 patients per year provides a wide range of patients for learning critical care.

ICU equipment:

Class 1 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 (add visiting faculty)

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

Visiting faculty: Will include two or three experts from the field of Critical Care Medicine who have excellent knowledge as well as teaching experience.

10. Advertisement

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

Basic qualification: As determined for each certificate/fellowship course- each individual department to write

11. Interview

By a panel of experts of three - including the head of the institute and at least one external expert and an internal expert

12. Selection

A total of 2 candidates per year will be selected for each course. Selection will be based on performance at interview 30%, University level academic merits (20%) publications if any (20%), and recommendations from PG teacher (20%)

13. Pattern of Exam

Each year an examination coordination committee (ECC) consisting of three teachers running Fellowship/certificate courses will be nominated by the director. Both theory and practical Examinations will be concluded within 15 days of the end of the course.

Examination will be conducted in individual colleges. Each examination will have one Internal and one external examiner (approved by the ECC).

Theory

One paper of three hours duration – maximum 100 marks

10 short notes of 10 marks each to be attempted from 12 questions. Passing marks 50% All theory examinations will be held on a single day for all courses of similar lengths.

Practicals

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

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 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

Candidate will be allowed 15 minutes to examine each patient and review all the investigations. At the end of 15 minutes, the candidate will be examined for 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

This will cover following aspects:

- Drugs and infusions
- Interpretation of blood tests
- Reading of Xrays, ECGs, CT scans, MRI scans
- Demonstration of bedside procedures on mannequin
- Legal and ethical issues
- Cardiopulmonary resuscitation

Passing marks 50%.
Candidates have to pass individually in both theory and practical.

14. Announcement of results

Results will be announced on the Website and Notice board within one week 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 -6 months depending on the length of the course.

15. Award of Fellowship

Certificates will be awarded by the MUHS after the results will be sent to the MUHS.
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. On all matters pertaining to the examinations

APPENDIX I

Complete curriculum of the course

COURSE OBJECTIVES

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

- Understand the theoretical basis of organ dysfunction and critical illness
- Apply these principles to treat critically ill patients
- Develop the knowledge and skills to diagnose critical illnesses and their complications
- Critically evaluate published literature
- Learn to practice evidence-based medicine in managing critically ill patients
- Develop skills of communication with family members of critically ill patients
- 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:

General

- Pharmacology
- Pharmacokinetics and drug interactions
- Analgesia and sedation
- Muscle relaxants,
- Inflammation and anti-inflammatory agents
- Polytrauma,
- Transport of the critically ill
- Systemic Inflammatory Response Syndrome (SIRS)
- Multi-Organ Dysfunction syndrome (MODS)
- Management of the brain-dead organ donor

- Ethical and legal issues in the ICU
- Care of the terminally ill patient
- Communication skills
- Perioperative management of critically ill patients

Respiratory

- Management of airways
- Pulmonary edema
- Adult respiratory distress syndrome
- Hypercapnic respiratory failure
- Severe asthma and COPD
- Respiratory infections – community- and hospital-acquired
- Chest trauma
- Respiratory muscle disorders
- Thoracic surgery

Cardiovascular

- Haemodynamic instability and shock
- Cardiac arrest
- Acute myocardial infarction
- Unstable angina
- Severe heart failure
- Common arrhythmias and conduction disturbances,
- Cardiomyopathies
- Valvular heart disease
- Myocarditis
- Cardiac tamponade
- Pulmonary embolism
- Aortic dissection
- Hypertensive crisis
- Peripheral vascular diseases
- Cardiovascular surgery post-operative care

Neurology

- Coma
- Status epilepticus
- Head trauma
- Intracranial hypertension
- Cerebrovascular accidents and cerebral vasospasm
- Meningo-encephalitis
- Acute neuromuscular disease (including myasthenia & Guillain Barre syndrome)
- Post anoxic brain damage
- Acute confusional states
- Spinal cord injury
- Neurosurgery – post-operative care
- Brain death.

Renal

- Olguria/ anuria
- Acute renal failure
- Renal replacement therapy (RRT)
- Continuous RRT

Metabolic and Nutritional

- Fluid balance
- Electrolyte balance and its disorders
- Acid-base disorders
- Endocrine disorders (including diabetes mellitus, acute adrenal insufficiency, pituitary disorders, hyper- and hypothyroidism)
- Nutrition in critical illness
- Enteral and Parenteral nutrition,
- Monitoring of nutrition

Haematological

- Disseminated intravascular coagulation and other coagulation disorders,
- Thrombocytopenia
- Hypercoagulable states and anticoagulation

- Haemolytic syndromes
- Acute blood loss and anaemia
- Neutropenia
- Blood component therapy,

Immunological disorders

- Systemic lupus erythematosus

Infections

- Severe infection due to aerobic and anaerobic bacteria
- Acute severe viral infection
- Fungal and parasites infections with sepsis and organ failure
- Nosocomial infection,
- Infection in the immunocopromised host
- Tropical disease,
- Antimicrobial therapy,

Gastrointestinal and hepatic disorders

- Inflammatory bowel diseases
- Pancreatitis
- Acute and chronic liver failure
- Prevention and treatment of acute upper G.I. bleeding
- Management of acute lower GI bleeding
- Peritonitis,
- Mesenteric vascular disease
- Perforated viscus
- Bowel obstruction
- Abdominal trauma
- Abdominal surgery – post-operative care

Obstetric

- Preeclampsia, eclampsia
- HELLP syndrome
- Acute fatty liver of pregnancy
- Amniotic fluid embolism
- Postpartum haemorrhage
- Obstetric shock
- Puerperal sepsis

Environmental Hazards

- Burns
- Hypo-and hyperthermia
- Near-drowning
- Electrocution
- Radiation injury
- Chemical injuries
- Animal bites and stings

Toxicology

- Acute intoxications
- Drug overdose
- Serious adverse reactions to drugs
- Anaphylaxis.
- Envenomation

INTERVENTION AND PROCEDURES

The intensivist must be able to perform the following procedures:

Respiratory

- Maintenance of a patent airway,
- Endotracheal intubation (oral and nasal)
- Emergency cricothyrotomy
- Suctioning of the airway,
- Oxygen therapy
- Bag and mask ventilation
- Initiation and maintenance of mechanical ventilation (Invasive & noninvasive) in various disease states
- Weaning from mechanical ventilation
- Assessment of gas exchange and respiratory mechanics.placement of a intercostal tube
- Fiberoptic bronchoscopy
- Interpretation of arterial and mixed venous blood gases,

Cardiovascular & Renal

- Cardiopulmonary resuscitation - Basic Life Support (BLS), Advance Life Support (ALS)
- Placement of a central venous catheter

- Pulmonary artery (Swan Ganz) catheterization
- Renal replacement therapy (RRT) – continuous RRT
- Arterial catheterization
- Invasive pressure monitoring
- Measurement and interpretation of the hemodynamic variables
- Defibrillation
- Transvenous pacing
- Bedside echocardiography

Diagnostic :-

Ultrasound evaluation of critically ill patients

a) Abdomen : Detection of fluid/hemoperitoneum, liver/spleen tear

b) Cardiac : Tamponade, ejection fraction estimation

c) Vascular : Deep vein thrombosis, placement of IV canula.

Neurologic

- Basic interpretation of brain CT/MRI scan
- Intracranial pressure monitoring

Metabolic and Nutritional

- Implementation of intravenous fluid therapy
- Enteral and parental nutrition.

Haematologic

- Correction of haemostatic and coagulation disorders
- Interpretation of a coagulation profile
- Implementation of thrombolysis
- Use of blood components

Renal

- Bladder catheterization
- Renal replacement techniques

Gastrointestinal

- Placement of nasogastric tube
- Placement of esophageal / gastric tamponade balloon

APPENDIX II

TEACHING SCHEME

Structure of training

During the training period, the candidate will develop

a) Knowledge of path 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:

Learning session will be including:

- 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. 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 modifying treatment as per change in status.
9. Supervising the work of junior residents
10. Teaching junior residents, nurses and other Para-medical staff

Clinical rotation:

- Medical and Neurological ICU (MNICU) 9 months.
- Emergency Medical Services ICU 1 month.
- Surgical ICU 1 month.
- Intensive Cardiac Care Unit (ICCU) 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. Gastorintestinal 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 the departments of Medicine, Cardiology, Surgery, Emergency Medicine
2. Visiting faculty
3. Eminent guest speakers
4. Use of collection 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 cases that they see during the fellowship period, and also bedside procedures that they perform.

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 1year fellowship period.