Agenda No. 66.19	Minutes of the Board of Studies Meeting of Dept. Anesthesiology for Revision of Curriculum of PDAF Intensive Care Medicine Anaesthesia held on 20th April, 2023

Ref. PGI/Ans/ BoS/ 2546 /2023 MOST URGENT

To The Dean, SGPGIMS, Lucknow

From Prof. S.P.Ambeshl, HOD, Anaesthesiology

Date 26.04.2023

Sub. Forwarding of minutes of Board of Studies for Academic Board approval.

The Board of Studies meeting was held on 20.04.2023 for the ***Revision of Curriculum of PDAF Intensive Care Medicine*** as per the requirement of NAAC which is being run by the department of Anaesthesiology.

The Minutes of the Board of Studies and Revised Curriculum alongwith list of external experts is attached for further needful.

[Prof.S.P.Ambesh]

Encls:

- Minutes of Board of Studies.
- Revised Curriculum.
- List of external experts.

MINUTES OF THE MEETING OF BOARD OF STUDIES HELD ON 20.04.2023 AT 12 NOON IN THE DEPARTMENT OF ANAESTHESIOLOGY AT SGPGIMS, LUCKNOW.

A meeting of the Board of Studies was constituted by the Dean, SGPGIMS, Lucknow vide IOM No. PGI/ Ans /BoS/3299/2023 Dated 19.04.2023 to "Revise the Curriculum of **PDAF Intensive Care Medicine** as per the requirement of NAAC, which are being run by the department of Anaesthesiology along with Revision of List of External Experts for the Department of Anaesthesiology at SGPGIMS. The meeting for the same has been convened **on 20.04.2023 (Thursday) at 12.00 Noon** in the Seminar Hall of the department. The constituents of the committee are as under :

1.	Prof. S.P.Ambesh Dean & HOD,Anaesthesiology	- Chairman
2.	Prof. C.K.Pandey,HOD, ICU,Medanta Hosp.Lko.	- External Expert
3.	Prof. Monica Kohli, KGMU, Lucknow	- External Expert
4.	Prof.Devendra Gupta, Deptt. of Anaesthesiology	- Member
5.	Prof.Puneet Goyal, Deptt. of Anaesthesiology	- Member
6.	Dr. Sanjay Kumar, Addl.Prof. Anaesthesiology	- Member
7.	Dr.Amit Rastogi,, Addl.Prof.Anaesthesiology	-Member
8.	Dr.Vanshpriya, Assoc.Prof.Anaesthesiology	- Member

The recommendations of the Board of Studies are as under :

The committee members have gone through the old curriculum and after due deliberations, Committee has approved the revised Curriculum of Post Doctoral Advanced Fellowship (PDAF) of Intensive Care Medicine with few addition and deletion of names in the list of external experts attached alongwith.

The Board of Studies meeting ended with vote of thanks.

[Prof.S.P Ambesh]

[Prof.Monica Kohli]

[Prof.C.K.Pandey]

[Prof.Devendra Gupta]

[Prof.Puneet Goyal]

[Dr. Sanjay Kumar]

[Dr. Amit Rastogi]

[Dr.Vanshpriya]

2-Yrs duration Post-Doctoral Advance Fellowship (PDAF) in Intensive Care Medicine

Preamble:

Intensive Care Medicine is an integral component of a tertiary care hospital – based medicine. Daily, thousands or lacs of patients require intensive monitoring of their vitals and management of their medical and surgical severe illnesses or terminal age-related diseases and traumatic injuries. Trauma is the leading cause of morbidity and mortality all over the world. Such a trained physician may be involved with trauma patients beginning with airway and shock resuscitation, post-operative management and critical care. A number of medical institutions are coming up to care expanding population of our country. ***However, there is a countrywide severe shortage of such a trained physician to provide intensive care for acute illnesses/trauma care. So far, this issue has not been addressed seriously at the national level because growth of intensive care and the trained manpower in India have been very slow, patchy and grossly stunted.***The rotation of the trainees in state of art Trauma ICU and Triage/resuscitation bay is the need of the hour and this will expose them to all aspects of trauma care from the earliest of resuscitative efforts as part of multidisciplinary trauma resuscitation team and through postoperative care.

Currently, the institute's department of Anaesthesiology has 28 beds in post op ICU/Ward and 15 beds in Trauma ICU at the Advanced Trauma Centre (ATC). Further, more beds are likely to be added for the care of seriously ill/trauma patients in near future.

The Department of Anaesthesiology proposes to start Two-year Post-Doctoral Advance Fellowship(PDAF) training program in Intensive Care Medicine to impart the training in medical, surgical and trauma intensive care.

Reasons /Justification for creation of 2-Yr Fellowship programmme in Intensive Care Medicine.

1.Trained and qualified personnel dedicated to this field of medical, surgical and trauma intensive care will boost quality service and research in this very important area.

2.Creation of a team of dedicated faculty concentrating on this area would enhance the subspecialty development especially in this part of the country where intensive care management in this area is not well established and well defined.

3. We foresee a huge demand of the intensive care physicians in our country. Our aim is to provide formal training in this important specialty to the eligible medical doctors and produce intensive care physicians to fill the vacuum in the medical institutes/colleges and hospitals so that intensive care can be delivered to the critically ill patients.

Course Duration : **24 months**

Number of candidates : **02/year**

Mode of Selection : **Open entrance examination on annual basis**

Name of Faculty members to impart the training for PDAF

1. Dr SP Ambesh, Professor of Anaesthesiology and Consultant I/C, ICU
2. Dr. Devendra Gupta, Professor Anaesthesiology
3. Dr. Puneet Goyal, ProfessorAnaesthesiology
4. Dr. Amit Rastogi, Additional ProfessorAnaesthesiology
5. Dr. Vansh Priye, Associate ProfessorAnaesthesiology

The 2-yrFellowship Course in Intensive Care Medicine is open to candidate holding postgraduate degree (MD) in the following medical specialties from an Indian University or a Diplomate of the National Board (DNB) or any other qualification approved by the Institute for this purpose from time to time, in either of the following specialties:

1. Anaesthesiology
2. Internal Medicine
3. Emergency Medicine

The advertisement and selection process will be asper the Institute norms prevailing at the time. The selection of the candidates would be open on the basis of examination conducted by SGPGIMS, Lucknow

Pay and perks: Equivalent to that of senior resident (year basis increment) hospital services of Anaesthesiology department. There will be no additional financial burden on the institute

GENERAL OBJECTIVES OF PDAF

1 Immediate Assessment and Therapy (Resuscitation): The trainee should be able to make a quick and accurate assessment of the life-threatening problems in a critically ill patient and apply life supporting therapy. Perform resuscitation and management of the acutely ill adult and pediatric patients.
2 Plan and organize therapeutic interventions/organ system support in single or multiple organ failure in conditions associated with trauma, burns, infections, metabolic derangements etc.
3 Formal Medical Assessment Problem Solving and Decision-Making Following Resuscitation: The trainee should be able to undertake or contribute to the continuing management of the acutely ill patient.
4 The trainees have to understand the core principles of Trauma care, trauma epidemiology, mechanism of injury and prehospital care
5 Trauma resuscitation, blood and blood product transfusions, analgesia, trauma severity assessment and postoperative intensive care
6 Consultation and collaboration: The trainee should understand that consultation with medical, nursing, support staff and family plays a vital role in the management of critically ill patients.

7 Management of System (s) Failure: The trainee should be able to manage a patient with a single or multiple systems failure.

8 Retrieval and Transport: The trainee should be able to supervise the movement of a critically ill or injured patient to a hospital from another hospital, place of injury or site of a mass disaster.

9 Disease and Disease Processes – General Medical and Surgical Conditions: The trainee should have a broad and sound understanding of general medical and surgical conditions together with a detailed knowledge of medical and surgical emergencies.

10 Paediatric Knowledge and Skills: The trainee should be able to recognize life threatening conditions, institute basic or advanced life support, carry out transportation, stabilize the child in the intensive care unit or prepare for management during secondary transportation to apediatric unit.

11 Anaesthesia: The trainee should understand the preoperative, intraoperative and postoperative management of patients receiving general, regional or local anaesthesia.

12 Analgesia: The trainee should be able to provide satisfactory pain relief for patients.

13 Sedation: The trainee should know how to provide adequate rest and sleep for patients in the intensive care ward.

14 Organize peri-operative care of surgical / trauma patients

15 Therapeutic Agents: The trainee should understand the principles and practice of the use of therapeutic agents in the critically ill patient

16 Adverse Reactions to Drugs: The trainee should be able to manage the adverse effects of drugs.

17 Monitoring, Investigations and Interpretation of Data: The trainee should have a detailed knowledge of the investigations and monitoring techniques commonly used in intensive care and a general knowledge of the procedures in medicine and surgery.

18 Principles of Monitoring and patient equipment: The trainee should understand the principles of the measurement of biological variables and have a working knowledge of the practicalities and troubleshooting of equipment on which critically ill patients have everyday dependence.

19 Selection of Monitoring Equipment, etc.: The trainee should know the indications for and the selection of suitable methods of monitoring or investigation taking intoaccount their accuracy, convenience, reliability, hazards, cost and servicing and relevance to the patient's condition.

20 Electrical Safety: The trainee should understand the hazards to patients and staff from electrical equipment.

21 Ionising Radiation: The trainee should appreciate its uses and hazards in the practice of intensive care.

22 Interpretation of Data: The trainee should know how to critically evaluate and use the data that he/she collects.

23 Technical Skills: The trainee should know the indications, contraindications and complications of procedure3s commonly performed in intensive care.

24 Attitudes: The trainee should have those attitudes which cause him/her to act in the best interests of the patients, their relatives and the staff of the intensive care unit.

25 Communicate effectively and empathetically to patients and attendants, about the critical nature of illnesses, end of life care and breaking bad news in contingencies.

26 Administration, Organization and Education: by the end of training the trainee should have some knowledge and skill of the administration and organization of an intensive care unit so that clinical care research and teaching are carried out optimally.

Training schedule:

This is a full time, Two-year training programme as a senior resident under the department of Anaesthesiology, Intensive Care and Pain Medicine

12 months : Postop ward and ICU/HDU (OT Complex)

4 Months :Trauma ICU (at ATC):

2 months : Triage and Emergency at Advanced Trauma Centre (ATC)

6 weeks : Acute pain clinic (Postoperative pain care)

6 Weeks : Cardiac Cath and ECHO Lab

6 Weeks : Radiology Dept (to learn CT scan, MRI, Ultrasound, etc)

4 Weeks : Operation theatres (anaesthesia monitoring, invasive lines, etc)

2 Weeks : Neurology lab (EEG, Nerve conduction studies)

Academic/teaching programmes as part of Fellowship training: The trainees of the fellowship will participate in the following academic activities:

Lectures 2/ month

Seminars 2/month

Journal clubs 3/month

Case audits 1/month

Case discussions 2/week

Programmecontents:

The candidate must gain experience in the diagnosis and treatment of patients with acute, serious, and life threatening medical and surgical diseases as well as traumatic injuries

and care. The present document defines the core curriculum of cognitive knowledge and procedural skills that an intensivist is expected to be equipped with to effectively approach the complex problems encountered in the critically ill patient.

The content of this to-year training in Intensive care medicine deals with the following aspects:

(A) Theoretical knowledge about pathophysiology diagnosis and treatment of a series of disease processes and trauma emergencies.
(B) Specific procedures and interventions that the candidate mustbe able to perform
(C) Certain specialty specific procedures and intervention
(D) Logbook
(E) Research project and audit

Subject specific competencies

A) Cognitive Skills that student should be able to acquire at the end of course:

1. Use the aspects of applied Anatomy, Physiology, Biochemistry and Pharmacology for daily practice.

2. Plan and implement resuscitation and initial management of the acutely ill patients.

3. Perform diagnosis, assessment, investigation, monitoring and data interpretation of the actively ill patients.

4. Manage critical care in secondary and advanced care facilities.

5. Implement therapeutic interventions/organ system support in single or multiple organ failure.

6. Organise peri-operative care.

7. Supervise critical care of children.

8. Offer support for care in transfer of critically ill patients.

9. Organise Clinical Measurement.

10. Plan and execute Research in related fields.

11. Organise infection control in ICU.

12. Discuss safety for patients & staff in ICU.

13. Exhibit good understanding of critical incidents, adverse events, complications related to ICU care.

14. Organize multi-disciplinary case conference and counseling sessions with family.

15. Discuss and explain critical appraisal and application of guidelines, protocols and care bundles

16. Demonstrate understanding of scoring systems for assessment of severity of illness and case mix.

17. Demonstrate good understanding of the managerial & administrative responsibilities of the critical care specialist.

B) Affective Domain

1. Comfort, Pain-Relief and Recovery

- Understanding of the physical and psychosocial consequences of critical illness for patients and families and methods of prevention and management
- Communication of the continuing care requirements of patients at ICU discharge to health care professionals, patients and relatives

2. End of Life Care

- Management of the process of withholding or withdrawing treatment with the multidisciplinary team
- Discussion of the end of life care with patients and their families/surrogates

3. Health Systems Management

- Leadership in daily multidisciplinary ward round

4. Ethics, Attitudes and Professionalism

Communication skills

- Communication with patients and relatives
- Communication with members of the health care team
- Professional relationships with patients and relatives
- Involvement with patients (or their surrogates) in decision making
- Understanding of cultural and religious beliefs and an awareness of their
- impact on decision making
- Understanding of privacy, dignity, confidentiality and legal constraints on
- the use of patient data
- Professional relationships with members of the health care team
- Collaboration, consultation, team work
- Supervision and delegation of duties and responsibilities to others

Psychomotor Domain: At the end of the course, the student should have acquired skills in the following:

1. Respiratory system

Oxygen therapy - Fundamental principles and ICU specific issues

Fibreoptic laryngoscopy

Emergency airway management

Difficult and failed airway management

Endotracheal suction

Fibreoptic bronchoscopy and BAL in the intubated patient

Percutaneous tracheostomy and mini-tracheostomy

Thoracocentesis via a chest drain

2. Cardiovascular system

Peripheral venous catheterization

Arterial catheterization

Surgical isolation of vein/artery

Ultrasound techniques for vascular localization

Central venous catheterization

Defibrillation and cardioversion

Cardiac pacing (transvenous or transthoracic)

Fundamentals of pericardiocentesis

Measurement of cardiac output and derived haemodynamic variable

3. Central Nervous System

Lumbar puncture (intradural/spinal)

Basic understanding of neuraxial pain medication like epidural analgesia

4. Gastrointestinal System

Nasogastric tube placement

Abdominal paracentesis

Sengstaken tube (or equivalent) placement

Fundamentals of upper GI endoscopy

Measurement and interpretation of intra-abdominal pressure

5. Genitourinary System

Urinary catheterization

Colour Coding
Global GREEN
Regional BLUE
National ORANGE
Local (State) PINK

COURSE Curriculum:

Cognitive domain(Knowledge domain)

The Intensive care specialist (Intensivist) must understand the pathophysiology, construct and differential diagnosis and apply the appropriate prophylactic and therapeutic interventions in the following disorders. The list is not comprehensive and can be modified time to time.

Respiratory

A. airway injuries
B. Pneumonia
C. Pulmonary oedema
D. Adult respiratory distress syndrome
E. Pneumothorax, pneumo-hemo /hydrothorax
F. Flail chest
G. Bronchial asthma
H. Neuromuscular disorders
I. Respiratory failure because of various reasons including respiratory and neuromuscularManagement of Airway (including respiratory arrest, upper airway obstruction, thermal

Cardiovascular

Management of:

Hemodynamic instability and shock

Cardiac arrest, acute myocardial infarction, and unstable angina

Heart failure, common cardiac arrhythmias and conduction disturbances complication of specific cardiac disorders (cardiomyopathies, valvular heart disease, atrial or ventricular septal defects, myocarditis)

Cardiac tamponade, pulmonary embolism aortic dissection and hypertensive crisis

Peripheral vascular diseases, post cardiovascular surgery.

Training in cardiopulmonary cerebral resuscitation, including Basic Life support (BLS), advanced Life Support (ALS) and advanced trauma life support (ATLS)

Neurology

Management of: Coma and head trauma, intracranial hypertension, cerebrovascular accidents, meningo-encephalitis, neuromuscular disease like myasthenia gravis and Landre-Guillain-Barre syndrome, post anoxic brain damage, acute confusional state, spinal cord injuries, brain death and post-neurosurgery.

Renal - Management of Oliguria, Acute renal failure and renal replacement therapy.

Gastro-intestinal

Management of Pancreatitis, acute and chronic liver failure, inflammatory bowel disease.

Prevention and treatment of acute G.I. bleeding (including variceal bleeding)

Perforated viscus and bowel obstruction

Metabolic and Nutritional

Management of Fluid, electrolytes and acid base disorders, endocrine disorders including hypoandhyperglycaemic coma nutritional and caloric requirement in sick patients and enteral and parenteral nutrition.

Haematological

Management of Disseminated intravascular coagulation and other coagulation disorders haemolytic syndromes, acute and chronic anaemia, blood component therapy and immune disorders.

Infectious

Management of severeinfections due to aerobic and anaerobic bacteria, viruses, fungi and parasites nosocomial infections in the immunocompromised, tropical diseases antimicrobial therapy and immunotherapy.

Obstetric

Management ofToxaemia (including HELP syndrome) amniotic fluid embolism, eclampsia and postpartumhaemorrhage.

Toxicology and poisoning

Management of Acute intoxications, drug overdose serious adverse reactions and anaphylaxis.

General

Pharmacology, pharmacokinetics and drug interactions, Analgesia, sedation and muscle relaxants, Inflammation and anti-inflammatory agents, Multiple trauma transport of the critically ill patients

Multi system disorders (including multi-organ dysfunction syndrome (MODS)

And the systemic inflammatory response syndrome (SIRS)

Management of the organ donor

1. Resuscitation and Initial Management of the Acutely Ill Patients

Timely approach to the recognition, assessment and stabilization of the acutely ill patients with disordered physiology

Cardiopulmonary resuscitation

Post-resuscitation management

Triage and prioritization of patients for ICU admission

Assessment and initial management of the trauma patient

Assessment and initial management of the patient with burns

Fundamentals of the management of mass casualties

2. Diagnosis: Assessment, Investigation, Monitoring and Data: Interpretation of the acutely ill patients

History taking and clinical examination

Timely and appropriate investigations

Understanding of echocardiography (trans-thoracic/trans-oesophageal), Indications and interpretation of results

Understanding of Electrocardiography (ECG/EKG), Indications and interpretation of the results

Appropriate microbiological sampling and interpretation of results

Interpretation of results from blood gas samples

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

Understanding and interpretation of physiological variables

Integration of clinical findings with laboratory, radiology, microbiology and other

investigations to form appropriate differential diagnosis and management strategy

3. Disease Management

Acute disease

Management of the care of the critically ill patient with following specific acute medical conditions

- Acute Myocardial Infarction
- Pulmonary Embolism
- Cardiogenic Shock
- Life Threatening Arrhythmias
- Pericardial Tamponade
- Acute Ischemic Stroke
- Intracranial Hemorrhage
- Status Epilepticus
- Head & Spine Trauma
- Acute neuromuscular failure (OPP/GBS/MG/Snakebite, etc)
- Acute severe Asthma
- Acute Exacerbation of COPD
- Severe Community acquired pneumonia
- Chest Trauma
- Acute hypoxemia Respiratory Failure including ARDS
- Acute GI Bleed
- Acute Liver Failure
- Acute Pancreatitis
- Acute Abdomen
- Acute coagulation disorders
- Sepsis and Septicemic Shock

- Meningitis
- Acute Hemorrhagic Fevers
- Severe forms of tropical infections like Malaria, Typhoid etc.
- Acute Renal Failure
- Eclampsia
- Bone marrow suppression
- Critical care of mother and child including pre-eclampsia, eclampsia, acute fatty liver of pregnancy, HELLP syndrome, meconium aspiration syndrome, respiratory distress syndrome, transient tachypnoea of the newborn etc.
- Acute poisoning

Chronic Disease

Identifications of the implications of chronic and co morbid disease in the acutely ill patients

Organ System Failure

Management of patients with or at risk of circulatory failure

Management of patients with or at risk of acute renal failure

Management of patients with or at risk of acute liver failure

Management of patients with or at risk of neurological impairment

Management of patients with or at risk of acute gastrointestinal failure

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

Management of patients with or at risk of septic shock

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

Management of patients following intoxication with drugs or environmental toxins

Early recognition and treatment of life-threatening complications, in mother and

child, including but not limited to like eclampsia, preeclampsia, acute fatty liver of pregnancy, HELLP in mother and respiratory distress in child.

Affective domain (Attitudes including Communication and Professionalism)

1.Demonstrate kindness, empathy and compassion towards all patients and their families

2.Treat all patients in a holistic manner

3.Respect the patients' right to information and second opinion.

4.Communicate well with patients and make all efforts to explain the rationale of diagnostic and treatment approach to patients and their caregivers in their own language for ease of understanding.

5.Spend time with patients explaining to them with thoughtfulness and empathy the pros and cons all options and further course of action.

6.Have the skills to participate in seminars, Continued Medical Education programs, panel discussions, lectures to discuss and review recent scientific data to further the cause of Cardiology in the country and increase visibility on national and global platforms.

7.Should have the ability to pass on such information and knowledge gained to other students and colleagues, especially those working in resource-limited settings to improve cardiac care of the region, state and country.

8.Should actively cultivate skills to work in a team, with mutual respect, basic human courtesy and a supportive attitude towards others including other clinicians, para-clinical staff, policy makers and health administrators to improve cardiology services at a regional, state and national level

9.Communicate openly and honestly with all patients and their caregivers, hospital administrators, regulatory authorities, peers and researchers of the cardiology fraternity and other allied members of the public and community leaders

10.Develop a habit of maintaining honest, detailed and comprehensive medical records.

11.Maintain principles of etiquette and abide with the country's laws, adopting ethical practices at all times.

12.Be aware of ethical principles of clinical research as guided by institutional ethical committees.

13.Should demonstrate principles of equality when dealing with individuals of special groups.

14.Should be able to accept feedback and criticisms with an open mind.

15.As a skilled professional, be aware of the value of maintaining punctuality in clinical work.

PSYCHOMOTOR DOMAIN

(A) General Interventions and procedures

The intensivist must be able to perform a number of specific procedures; for all candidates experience is desirable but not limited to or mandatory in the followingareas:

- Maintenance of open airway
- Endotracheal intubation (oral and nasal)
- Intermittent positive pressure ventilation on resuscitation bag
- Intermittent positive pressure ventilation on resuscitation with various modes of ventilation
- Chest physiotherapy and suctioning of airway
- Titration of oxygen therapy and therapy and assessment and measurement of arterial and Titration of oxygen therapy and assessment and measurement of arterial and mixed venous blood gas analysis
- Assessment of gas exchange and respiratory mechanics
- Various modes of weaning from mechanical ventilation
- Placement of intercostal drainage tube
- Fibreoptic bronchoscopy and bronchoalveolar lavage
- Gastroscopy, Percutaneous gastrostomy and jejunal tube placement
- Cricothyrotomy, minitracheotomy and percutaneous dilational tracheostomy
- Placement of central venous catheter through various catheter through approaches.
- Arterial catheterization
- Placement of pulmonary artery (Swan-Ganz) catheter and measurement and interpretation of hemodynamic variables
- Implementation of Cardiovascular support and antiarrhythmic therapy and thrombolysis
- Bedside Ultrasonography/FAST
- Surface and Transesophageal echocardiograpy

(B) Specialty specific interventions and Procedures

The intensivist must be able to perform a number of specific procedures for all candidates experience is desirable but not mandatory in the following areas:

- **Respiratory**
  - Oxygen therapy - Fundamental principles and ICU specific issues
  - Fibreoptic laryngoscopy
  - Emergency airway management

- Difficult and failed airway management
- Endotracheal suction
- Fibreoptic bronchoscopy and BAL in the intubated patient
- Percutaneous tracheostomy and mini-tracheostomy
- Thoracocentesis via a chest drain

- **Cardiovascular system**
  - Peripheral venous catheterization
  - Arterial catheterization
  - Surgical isolation of vein/artery
  - Ultrasound techniques for vascular localization
  - Central venous catheterization
  - Defibrillation and cardioversion
  - Cardiac pacing (transvenous or transthoracic)
  - Fundamentals of pericardiocentesis
  - Measurement of cardiac output and derived haemodynamic variable

- **Neurological**
  Basic interpretation of brain CT/MRI Scan and Ultrasonograpy
  Monitoring of intracranial pressure
  Lumbar puncture and sampling of CSF
  Basic understanding of neuraxial pain medication like epidural analgesia

- **Metabolic and Nutritional**
  Implementation of intravenous fluid therapy
  Enteral and parenteral nutritional therapy
- **Haematological**
  Correction of haemostatic and coagulation disorders
  Interpretation of Coagulation profile including thrombo-elastograph (TEG)
  Implementation of thrombolysis
- **Renal**
  Urinary bladder catheterization
  Renal support techniques including peritoneal dialysis
- **Gastrointestinal**
  Placement of nasogastric tube and oesophageal gastric balloon tamponade tube (Balmore-Sengstaken tube) and jejunal tube
- **General**
  Measurement of severity of illness and outcome assessment
  Exposure to clinical research, ethical and legal aspects of critical care

TEACHING AND LEARNING METHODS

General principles

The basic aim of PDAF training and education is to produce specialists who understand the needs of community health of the state and country and enhance the quality of health care as well as provide an impetus to research, education, and training of the medical community. The PDAF doctor after completion ofskill-based competency training programme should be able to successfully address the medical requirements of the community. Learning during the programme is not only goal-oriented and diadactic but also essentially self-directed and emanates from clinical and academic work. The designated academic sessions are meant to supplement the student's core efforts.

Acquisition of the following cognitive and procedural skills by trainees should be assured by the training department through the use of any of a number of techniques, including didactic sessions, journal clubs or illustrative case reports

Teaching Methodology

The PDAF student shall be given the responsibility of managing and caring for patients in a gradual and phased manner under supervision, after the student demonstrates skill and efficiency at each step. Teaching sessions shall be an overall judicious amalgamation of case presentations, journal clubs, seminars, group discussion related to non-invasive and invasive lab data, cardiac cath meetings, bed-side teaching, focused brief topic presentations as allotted from time to time, case-based learning, integrated and interdepartmental meetings including any other collaborative activity with allied departments, as deemed necessary. Suggested modalities of teaching-learning methods are summarized below but shall not be limited to these. The frequency of the mentioned teaching and learning methods may vary based on perceived requirements, candidates' competencies, work load and overall working schedule. Self-directed motivational learning forms a key part of the training for which although the hours are not specifically ear-marked, but it shall be integrated into day to day learning.

1. **Cardiovascular Physiology, Pathology, Pathophysiology, and therapy**
   a. Shock and its complication
   b. Myocardial infraction and its complications

c. Cardiac rhythm and conduction disturbances; indications for and types of pacemakers
d. Pulmonary embolism thrombus, air fat, amniotic
e. Pulmonary edema; cardiogenic, noncardiogenic
f. Cardiac tamponade and other acute pericardial diseases
g. Acute and chronic life-threatening valvular disorders
h. Acute aortic and peripheral vascular disorders, including A-V fistulas
i. Acute complications of cardiomyopathies and myocarditis
j. Vasoactive and inotropic therapy
k. Pulmonary hypertension and corpulmonale
l. Complications of angioplasty
m. Principles of oxygen transport and utilization
n. Hemodynamic effects caused by ventilatory assist devices
o. Thrombolytic and anticoagulant therapy
p. Perioperative management of patient undergoing cardiovascular surgery
q. Recognition, evaluation, and management of hypertensive emergencies and urgencies

2. Respiratory Physiology, Pathology,Pathophysiology, and Therapy

a. Acute respiratory failure

1- Hypoxemic respiratory failure including acute respiratory distress syndrome

2-Hypercapnic respiratory failure

3-Acute on chronic respiratory failure

b. Status asthmaticus

c. Smoke inhalation, airway burns

d. Aspiration

e. Flail chest, chest trauma, pulmonary contusion

f. Bronchopulmonary infection

g. Upper airway obstruction

h. Near drowning

i. Pulmonary mechanics and gas exchange

j. Oxygen therapy

k. Hyperbaric oxygenation

l. Mechanical ventilation

1-Pressure and volume ventilators

2-Positive end-expiratory pressure, intermittent mandatory ventilation, continuous positive airway pressure, high-frequency ventilation, inverse ratio ventilation, pressure-support ventilation, negative pressure ventilation, differential lung ventilation, pressure control, and noninvasive ventilation

3-Indications for and hazards of mechanical ventilation

4-Barotrauma and volutrauma

5-Criteria for weaning and weaning techniques

6-Extracorporeal membrane oxygenation

7-Permissive hypercapnia

8-Liquid ventilation

m.Airway maintenance

1-Emergency airway management

2-Endotracheal intubation

3-Tracheostomy-open and percutaneous

4-Long-term intubation vs. tracheostomy

n.Ventilatory muscle physiology, pathophysiology, and therapy, including polyneuropathy of the critically ill, and prolonged effect of neuromuscular blockers

o.Pleural diseases

1- Empyema

2- Massive effusion

3- Pneumothorax

4-Hemothorax

p.Pulmonary hemorrhage and massive hemoptysis

q.Nitric oxide

3-Renal Physiology,Pathology , Pathophysiology, and Therapy

a.Renal regulation of fluid balance and electrolytes

b.Renal failure: Prerenal, renal, and postrenal

c.Derangements secondary to alterations in osmolality and electrolytes

d.Acid-base disorders and their management

e. Principles of hemodialysis, peritoneal dialysis, ultrafiltration, continuous arteriovenous hemofiltration (CAVH), and continuous veno-venous hemofiltration (CVVH)

f.Interpretation of urine electrolytes

g.Evaluation of oliguria

h. Drug dosing in renal failure

i.Rhabdomyolysis

4. Central Nervous System (CNS) Physiology, Pathology, Pathophysiology, and Therapy

a.Coma: Metabolic, Traumatic, Infectious, Mass lesions, Vascular-anoxic or ischemic, and Drug induced

b.Hydrocephalus

c.Psychiatric emergencies

d.Perioperative management of patient undergoing neurologic surgery

e.Brain death evaluation and certification

f.Diagnosis and management of persistent vegetative states

g.Management of increased intracranial pressure (ICP), including ICP monitors

h.Status epilepticus

i.Neuromuscular diseases causing respiratory failure

1-Guillian-Barre Syndrome

2-Amyotropic Lateral Sclerosis

3-Myasthenia Gravis

j.Nontraumatic intracranial bleed

1-Subarachnoid

2- Intracerebral

3-Others

5.Metabolic and Endocrine Effects of Critical Illness

a.Colloid osmotic pressure

b.Alimentation

1-Enteral and parenteral

2-Evaluation of nutritional needs including indirect calorimetry

c.Endocrine

1-Disorders of thyroid function (thyroid storm, myxedema coma, sick euthyroid syndrome)

2-Adrenal crisis

3-Disorders of antidiuretic hormone metabolism

4-Diabetes mellitus(1-Ketotic and nonketotic hyperosmolar coma, 2-Hypoglycemia)

6.Infectious Disease Physiology, Pathology, Pathophysiolohy, and Therapy

a. Antibiotics

1-Antibacterial agents

2-Antituberculosis agents

3-Antifungal agents

4-Antiviral agents

5-Agents for parasitic infections

b.Infection control for special care units

1-Development ofantibiotic resistance

2-Universal precautions

3-Isolation and reverse isolation

c.Anaerobic infections

d.Systemic Inflammatory Response Syndrome (SIRS)

e.Tetanus

f.Hospital acquired and opportunistic infections in critically ill

g.Adverse reactions to antimicrobial agents

h.Intensive care unit (ICU) support of the immunosuppressed patient

1-Acquired Immunodeficiency Syndrome (AIDS)

2-Transplant

3-Oncologic

i.Infectious risks to healthcare workers

j.Evaluation of fever in the ICU patient

7.Physiology, Pathology, Pathophysiology, and Therapy of Acute Hematologic and Oncologic Disorders

a.Acute defects in hemostasis

1-Thrombocytopenia/thrombocytopathy

2-Disseminated intravascular coagulation

b. Anticoagulations; fibrinolytic therapy

e. Principles of blood component therapy

i. Platelet transfusion

ii. Packed red blood cells

iii. Fresh frozen plasma

iv. Specific coagulation factor concentrates

v. Albumin, plasma protein fraction

vi. Stroma-free hemoglobin

vii. While blood cell transfusion

viii. Cryoprecipitate.

d. Acute hemolytic disorders including thrombotic microangiopathies

e. Acute Syndromes associated with neoplastic disease and antineoplastic therapy

f. Sickle cell crisis

g. Plasmapheresis

h Prophylaxis against thromboembolic disease.

8. Physiology, Pathology, Pathophysiology, and Therapy of Acute Gastrointestinal (GI) Genitourinary (GU) and Obstetric-Gynecological (Ob-Gyn) disorders

a. Acute pancreatitis with shock

b. Upper gastrointestinal blooding

c. Lower gastrointestinal bleeding

d. Acute and fulminant hepatic failure

e. Toxic megacolon

f. Acute perforation of the gastrointestinal tract

g. Ruptured oesophagus

h Acute inflammatory diseases of the intestine

I Acute vascular disorders of the intestine including mesenteric infarction

j. Obstructive uropathy, acute urinary retention

k. Urinary tract bleeding

l Toxemia of pregnancy; amniotic fluid embolism HELLP (Hemolysis, elevated liver function tests, and low platelet count) syndrome, ovarian hyperstimulation

m. Hydatidiform mole

n. Perioperative management of surgical patients

o. Stress ulcer prophylaxis

p. Drug dosing in hepatic failure

q. Acalculouscholecystitis.

r. Postoperative complications including fistulas would infection and evisceration

9. Environmental Hazards

a. Drug overdose and withdrawal

i. Barbiturates

ii. Narcotics

iii. Insecticides and pesticides

iv. Alcohols

v. Cocaine

vi. Tricyclic Antidepressants

vii. Acetaminophen and Others

b. Temperature-related injuries

i. Hyperthermia

ii. Hypothermia

c. Envenomations.

10. **Immunology and Transplantation.**

a. Principles of transplantation (organ donation, procurement, maintenance of organ donors, preservation, transportation, allocation, implantation, national organization of transplantation activities)

b. Immunosuppression.

c. Organ transplantation: Indications and postoperative care

11. Monitoring, Bio-engineering, Biostatistics

a. Prognostic incidences, severity, and therapeutic intervention scores

b. Principles of electrocardiographic monitoring, measurement of skin temperature and resistance, transcutaneous measurements.

c. Invasive hemodynamic monitoring

i. Principles of strain gauge transducers

ii. Signal conditioners, calibration, gain, adjustment

iii. Display techniques

iv. Principles arterial, central venous and pulmonary artery pressure catheterization and monitoring

v. Assessment of cardiac function and derived hemodynamic.

d. Noninvasive hemodynamic monitoring

e. Thermoregulation

f. CNS brain monitoring (intracranial pressure, cerebral blood flow, cerebral metabolic rate, electroencephalogram, jugular venous bulb oxygenation, transcranial Doppler)

g. Respiratory monitoring (Airway pressure, intrathoracic pressure, tidal volume pulse oximetry, dead space-tidal volume ratio, compliance resistancecapnography, pneumo-tachography)

h. Metabolic monitoring (oxygen consumption, carbon dioxide production, respiratory quotient)

i. Use of computers in critical care units.

j. Electrical safety.

Academic classes:

Teaching and learning methodology given below includes but not limited to Lecture, discussion, student directed learning and Case Based Learning.

1. Clinical Case Discussion

2. Morbidity-Mortality Discussion

3. Audit presentation

4. Lectures, Seminars and Journal Clubs

5. Presentation of progress report on the research projects

6. Simulation Laboratory

7. Joint inter-departmental academic meets with radiology, microbiology etc.

8. Departmental Clinical Meetings, Grand Rounds and Clinico-Pathological Meetings

9. Multi-departmental Combined Grand Rounds / Joint Academic Activities of the Institution

Formal Teaching:

These include regular bedside case presentations and demonstrations, didactic lectures, journal clubs, seminars, discussions related to non-invasive and invasive lab data, cardiac cath meetings, bed-side teaching, case-based learning, interdepartmental meetings and collaborative meetings with allied departments.

This will comprise of the following:

a) Journal Club: 1 hour duration - Paper presentation/discussion - once per week.

b) Seminar: One seminar every week of one hour duration.

c) Lecture/discussion: Lectures on newer topics by faculty, in place of seminar as per need.

d) Case presentation in the ward. Post graduate students will present a clinical case for discussion before a faculty and discussion made pertaining to its management and decision to be recorded in case files.

e) Case conference: Post graduate students are expected to work up one long case or two short cases and present the same to a faculty member and discuss the management.

h) Combined Round/Grand Round: These exercises are to be done for the hospital once a week or twice a month involving presentation of unusual or difficult cases. Presentation of cases in clinical combined/grand rounds and clinical series/research data for the benefit of all clinicians and other related disciplines once in week or fortnightly.

i) Emergency situation: Casualty duty to be arranged by rotation among the students with a faculty cover daily by rotation.

j). Bedside clinical training for patient care management. Daily for half to one hour during ward round with faculty and 1-2 hours in the evening by post graduate students /faculty on emergency duty, bed side patient care discussions are to be made.

k). Clinical teaching: In OPD, ward rounds, emergency, ICU and the operation theatres.

l) PG students shall be required to participate in the teaching and training programme of Undergraduate students and interns.

m) Should have attended two conferences/CMEs/Workshops during tenure.

n) A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

o) LOG BOOK

Postgraduate students shall maintain a log book of the work carried out by them and the training programme undergone during the period of training including details of surgical operations assisted or done independently by M.Ch. trainees. Log book shall be checked and assessed periodically by the faculty members imparting the training.

p) The Department encourages e-learning activities.

q) Clinical and Practical Training/posting:

Teaching and training of students shall include graded all round patient care responsibilities including resuscitation, clinical diagnosis, invasive diagnostic and therapeutic procedures and advanced decision making in the management of critically sick medical and surgical patients.

ASSESSMENT

FORMATIVE ASSESSMENT

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

Periodic Evaluation:

Trainees will be evaluated continuously for their performance in all areas such as clinical and investigative work, case presentations, seminars, journal clubs, procedures etc. Additional periodic assessment will include theory and practical assessment mimicking the final examination should be conducted every 6 months. Such an evaluation will help assessing the progress of the trainees and the quality of the training programme. Evaluation will be communicated to trainees and their feedback would be taken into consideration for modifications in training programme.

Internal Assessment would be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Quarterly assessment during the DM training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity

5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in Postgraduate Student Appraisal form (Annexure I).

SUMMATIVE ASSESSMENT

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.

The summative assessment examination shall include two heads:

A. Theory examination.

B. Practical, Clinical examination and Viva-voce.

Theory examination and Practical/Clinical, Viva-voce shall be separate heads of passing.

Theory examination shall comprise of four papers. Passing percentage shall be cumulatively 50% with minimum of 40% marks in each theory paper.

Practical /Clinical examination consisting of at least one long case, three short cases and viva-voce. Passing percentage shall be 50%.

Passing shall be separate for each head and failing shall be common, meaning thereby that clearance at theory and failure at practical / clinical shall amount to failure at Summative examination and vice versa.

Theory examination: Theory papers: Two

1) Basic Sciences pertaining to Intensive care medicine including pharmacology

2) Clinical and Recent Advances

Practical Examination:

1) One Long case

2) Two short cases

3) Practical viva voce covering affective and cognitive domain. This may include a pedagogic session as well.

4) Examiners: Two internal and two external examiners (list of examiners as annexed)

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:

d. Log book

The candidates would maintain logbooks of procedures performed /assisted which would be countersigned by the departmental faculty members.

(E) Research project and audit

One aspect of medical audit, allotted to each candidate, would be mandatory, and he/she would compile the same.

Each candidate would be allotted one of the departmental projects, depending on the ability of the candidate and the availability of project, in which he/she would assist.

Final eligibility assessment for awarding the Fellowship in Intensive Care Medicine.

Exit examination:As per the prevailing norms of the Institute at the time.

Recommended reading:

Text Books (latest edition)

1. Textbook of Critical Care (Elsevier)

2. Oxford Textbook of Critical Care (Oxford University Press)

3. Critical Care Medicine: Principles of Diagnosis and Management in the Adult (Mosby)

4. Irwin and Rippe's Intensive Care Medicine (LWW)

5. Oh's Intensive Care Manual (Butterworth-Heinemann)

6. Textbook of Critical Care: Common Problems in the ICU Access Code (Saunders)

7. Evidence-Based Practice of Critical Care (Elsevier)

8. Principles and Practice of Mechanical Ventilation (Tobin, Principles and Practice of Mechanical Ventilation) (McGraw-Hill Education / Medical)

9. West's Respiratory Physiology: The Essentials (LWW)

10. Manual of ICU Procedures (Jaypee Hights Medical Pub Inc)

11. Harrison's Principles of Internal Medicine (McGraw-Hill Education/Medical)

Annex-1 (List of External examiners):

Following names have been suggested to be included as the External Examiner for the Final Exit examination of Fellowship in Intensive Care Medicine at SGPGIMS, Lucknow

S. No.	Name of Examiner and post	Place of work	Contact No.
1.	Dr. S Rajeshwari Professor and Head, Dept of Anaesthesiology& Intensive Care	All India Institute of medical Sciences, New Delhi	9810079229
2.	Dr. Rashmi Ramachandran, Professor, Dept of Anaesthesiology& Intensive care	All India Institute of medical Sciences, New Delhi	9811422188
3.	Dr. Dr Narayan L Yadanapudi, Professor of Anaesthesiology and Consultant I/C ICU	PGIMER, Chandigarh	9815836656
4.	Dr. Suresh Singhal, Professor of Anaesthesiology	Pt BD Sharma,PGIMS, Rohtak	9034091115
5.	Dr Monica Kohli, Professor of Anaesthesiology and Consultant I/C ICU	King George's Medical University, Lucknow	9839041228
6	Dr. Chandra Kant Pandey, Head, Anaesthesiology	Medanta Hospital, Lucknow	9540946851
7.	Dr. Dinesh Kumar Singh, Professor of Anaesthesiology and Consultant I/C ICU	Banaras, Hindu University, Varanasi	9415201218
8.	Dr. R. Gopinath, Professor and Head,Dept of Anaesthesiology& Intensive Care	Nizam's Institute of Medical Sciences, Hyderabad	9848024306
9.	Dr Verma PK, Professor Dept of Anaesthesiology and Consultant I/C ICU	Vardhman Mahavir Medical College & Hosp, Safdarjung, N Del	9818402209
10.	Anirban Hom Chaudhary, Dept of Anaesthesiology and Consultant I/C ICU	Maulana Azad med college and GB pant Hospital, New Delhi	9718599410
11.	Dr PK Das, Professor, Dept of Anaesthesiology and Criticl care,	RMLIMS, Lucknow	9936565574
12.	Dr SS Nath, Associate Professor, Dept of Anaesthesiology and Criticl care,	RMLIMS, Lucknow	9648935430