YENEPOYA

(DEEMED TO BE UNIVERSITY)
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Accredited by NAAC with 'A' Grade

YENEPOYA MEDICAL COLLEGE

PROGRAM AND PROGRAM SPECIFIC/COURSE OUTCOMES

POSTGRADUATE PROGRAM

MD ANAESTHESIOLOGY

PROGRAM OUTCOMES

POSTGRADUATE PROGRAM

MD ANAESTHESIOLOGY

PO1 Theoretical knowledge: The student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Statistics and Physics) as applied to Anaesthesia. The student should acquire in-depth knowledge including recent advances. He/she should be fully conversant with the bedside procedures (diagnostic and therapeutic) and have knowledge of latest diagnostics and therapeutics procedures available including radiological methods.

PO2 Teaching: The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students. The student should be familiar with the latest teaching (computer and power point presentation) modes including simulators training and evidence based medical education.

PO3 Attitude development: The student should develop attitude that leads to appropriate communication with colleagues to function in a group in Operating Room /Intensive Care Unit, and develop the ability to function as a leader in the operating room.

PROGRAM SPECIFIC/COURSE OUTCOME

POSTGRADUATE PROGRAM

MD ANAESTHESIOLOGY

The student during the training programme, should acquire the following competencies:

A. Cognitive domain

1. Demonstrate knowledge of Anatomy related to;
2. Diaphragm, upper and lower airway, heart and coronary circulation ,
3. Regional anaesthesia - field block, central neuraxial, blockade, block for acute pain states
4. Procedures like -Intramuscular injections, arterial and venous cannulations and
5. Patient Positioning under anaesthesia
6. Demonstrate knowledge of Physiology of various systems (respiratory, cardiovascular, hepatobiliary, renal, endocrine, pregnancy, haematological, neuromuscular, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP, central, autonomic and peripheral nervous systems, metabolic response to stress and trauma) in detail and translate its application in a problem solving manner.
7. Demonstrate knowledge of Biochemistry relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases. Demonstrate knowledge of commonly used drugs in anaesthesia practice (premedication, induction agents - intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants) - general principles, concepts of pharmacokinetics and pharmacodynamics, drug interactions with the other drugs taken concomitantly by the patient and anaphylactoid reactions.
8. Demonstrate knowledge of gas laws, medical gas supply system, fluidics, electricity, diathermy and oxygen therapy.
9. Demonstrate knowledge of 'principles of physics' that govern functions of basic anaesthesia delivery equipment, airway devices – (laryngoscopes, airways etc), breathing systems and monitors, fiber optics, Lasers, Pacemakers and defibrillators, monitoring equipments (used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block), Sterilization of equipments, manufacture, filling and transport of gases and liquid oxygen. etc.

10. Demonstrate knowledge of importance of pre-anaesthetic assessment and optimization of a patient; consisting of evaluation, interpretation of laboratory investigation as applied to the care of the patients in planning and conduct of general anaesthesia.
11. Demonstrate knowledge of basic life support, advanced cardiac, trauma life support, and neonatal resuscitation according to latest guidelines.
12. Demonstrate knowledge of principles of sterilization and universal precautions, selection, maintenance and sterilization of anaesthesia and related equipment, Infection control, cross contamination in OT and ICU. Immune response and anaesthesia.
13. Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.
14. Demonstrate knowledge of principles of artificial ventilation, management of unconscious patients, oxygen therapy, shock- (pathophysiology and management) and various protocols related to Intensive Care Unit.
15. Demonstrate knowledge of post-operative care in the post-anaesthesia recovery room, in terms of management of
16. Post-operative pain: various modalities
17. Nausea and vomiting
18. Identified emergencies and postoperative complications.
19. Special precautions to be taken in specific surgical patients.
20. Demonstrate knowledge of acute pain management, chronic pain therapy & therapeutic nerve blocks, acupuncture, acupressure and other non-conventional methods of treatment.
21. Describe documentation, medico-legal aspects of anaesthesia and concept of informed consent.
22. Demonstrate knowledge of research methodology and basics of biostatistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
23. Demonstrate ability to interpret blood gas analysis and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
24. Explain blood coagulation mechanism, and their disturbances, rational use of blood and blood components.
25. Demonstrate knowledge pertaining to special anaesthetic techniques as relevant to:

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26. Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
27. Associated medical disorders in surgical patients
28. Geriatric and pediatric anaesthesia, Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
29. Induced hypothermia, incidental, environmental safety of patient.
30. Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
31. Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
32. Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
33. Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator, Multiple organ failure
34. Demonstrate knowledge pertaining to care of terminally ill, Hospices management, Do not resuscitate orders.
35. Demonstrate knowledge of general principles of medical audit and Critical incident reporting.
36. Demonstrate knowledge of Ethics and clinical trial.
37. Demonstrate knowledge of Hospital, ICU and OT design and planning.
38. Demonstrate knowledge of Medical education including evidence based medical education.
39. Demonstrate knowledge of principles of human resources and material management.

B. Affective Domain:

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

C. Psychomotor domain

At the end of the course, the student should acquire skills in the following broad areas and be able to:

- Demonstrate ability as a perioperative physician, in terms of
  - Acquiring mastery incareful and relevant history taking, physical examination in clinical evaluation of the patient preoperatively.
  - Collecting and synthesizing preoperative data from parent hospital and other sources and to develop a rational strategy for the peri-operative care of the patient.
  - Thorough and systematic approach to preoperative evaluation of patients with and without systemic diseases, undergoing different types of operations.
  - Prioritizing problems, present cases clearly and systematically to attending consultants.
  - Developing working relationships with consultants in other specialties to assist in preoperative evaluation and get a good consultation.
  - Interacting with preoperative patients and developing effective counseling techniques for different anaesthetic techniques and peri-operative procedures.
  - Assessing and explaining risk of procedure and taking informed consent.
  - Managing information in preoperative evaluation and outcome enhancement and communication skill to patients and relatives.
  - Ability to choose and order the required investigations to be done in a particular patient peri operatively

- Demonstrate ability in performing
  - Pre-operative equipment check
  - Selection of drugs
  - Preparation of work table etc.

- Identify conditions like difficult airway by following difficult airway algorithms.
- Demonstrate ability to establish topical airway anaesthesia for awake intubation

- Demonstrate management of a Failed intubation drill on a Mannequin according to latest guidelines
- Demonstrate ability to monitor and assess depth of anaesthesia
- Demonstrate abilities to manage body fluid composition; volume status; replacement of fluid and blood loss; use of whole blood and blood components.
- Demonstrate abilities to manage Electrolyte and acid base derangements; osmolarity and osmolality.
- Demonstrate acquisition of skills to initiate mechanical ventilation; select appropriate type and mode of ventilator; and monitor proper functioning of ventilator.
- Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical co relation
- Demonstrate ability to manage co-morbid conditions and anaesthesia
- Demonstrate ability to perform cannulation of arteries, central and peripheral veins.
- Demonstrate ability in using and interpreting the following routine non-invasive and invasive monitors intra-operatively:
    a. Electrocardiogram with ST-segment analysis
    b. Noninvasive blood pressure
    c. Capnograph: values and changes in values and waveform.
    d. Pulse oximetry: values and changes in values
    e. Neuromuscular blockade monitor
    f. Invasive arterial pressure: waveform and changes in the waveform
    g. Central venous pressure: values and waveform
    h. Pulmonary artery pressure: Values and waveforms, pulmonary capillary wedge tracing.
        i. Cardiac output
        ii. Mixed venous oxygen saturation
        iii. Evoked potential
        iv. Transesophageal echocardiography: basic understanding

- Demonstrate skills in providing basic life support, advanced cardiac life support, trauma life support and paediatric-neonatal life support, train medical and paramedical staff in BLS and ALS.

- Demonstrate mastery in common procedures like vascular access, use of latest invasive and non-invasive monitoring equipment, lumber puncture, management of appropriate mechanical ventilation and total care of Intensive Care Patient.
- Demonstrate ability to administer general anaesthesia and regional anaesthesia for ASA I to V, under supervision.
- Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
- Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.
- Demonstrate ability to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries, able to manage critically ill patients and treat intractable pain.
- Demonstrate following abilities in Emergency Anaesthesia, Trauma and Resuscitation:
  - Organize resources in case of mass casualty.
  - Perform triage.
  - Assess, transport and manage mass casualties / disaster management and camp anaesthesia.
  - Manage massive haemorrhage and massive blood transfusion.
  - Transport critically ill patient.
  - Perform anaesthetic management of geriatric patients with fracture neck of femur
  - Manage severe burns patients, rapidly progressing spinal compression, massive haemoptysis and lobectomy, peritonitis from various suspected causes, preparation and management of bowel obstruction, septicaemic shock, acute upper airway obstruction such as foreign body, epiglottitis, infections, cardiac tamponade from examples post cardiac surgery, malignant pericardial effusion, peri-operative management of rupture aneurysm of abdominal aorta
  - Basic Cardiac Life Support and Advanced Cardiac Life Support, Basic Trauma Life Support, Advanced Trauma Life Support, and Cerebral preservation.
  - Management of intra-operative cardiac arrest ϖManagement of intra-operative bronchospasm.