

SYLLABUS AND EXAM PATTERN

MD ANESTHESIOLOGY

THE TAMIL NADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI

MD ANESTHESIOLOGY

The curriculum shall train a candidate to manage anaesthesia in a competent, compassionate and caring manner.

Learning shall be self directed and essentially autonomous.

Exposure to all the sub-specialities shall be achieved

A combination of formative and summative assessments shall ensure completion of goals and training.

1. GOALS:

To produce competent and compassionate specialists who

a) shall recognize the health needs and ethically carry out the professional obligations

towards the patient.

b) shall attain all the required competencies within all the sub-specialities in the speciality of

anaesthesiology , enabling good practices at the secondary and tertiary levels of health

care delivery.

c) Shall take effort to be aware and update knowledge about the latest advances and

developments in the field.

d) Shall acquire the basic skills to teach medical and para-medical professionals.

e) Shall orient oneself to the principles of research methodology and epidemiology

2. OBJECTIVES:(Ref: Bloom's taxonomy of learning domains)

A. Knowledge to be gained from the syllabus

B. Skills to be learned from the practical training

C. Attitudes to be developed during the training period

The curriculum shall include

- a) Anatomy, physiology and biochemistry relevant to anaesthesiology.
- b) A thorough knowledge of the pharmacokinetics and pharmacodynamics of anaesthetic drugs .
- c) Knowledge of cardiovascular, respiratory, neurological, hepatobiliary, renal and endocrine homeostasis and related drugs used in patients undergoing anaesthesia.
- d) Physics and principles involved in the construction and functioning of anaesthesia machine and equipment used to provide anaesthesia and patient vital signs monitoring.
- e) Knowledge of the commonly used techniques in General, Regional and Local anaesthesia
- f) Understanding the concept of unconsciousness and its implications in anaesthesia.
- g) Knowledge and management of acute and chronic intractable pain.
- h) Knowledge of intensive care / therapy.
- i) Knowledge of medical statistics
- j) Knowledge and gain expertise in cardiopulmonary resuscitation.
- k) Knowledge of medical ethics.

The course content should stimulate the thought processes of the candidate and encourage the

candidate to acquire new information from books, journals, lectures, seminars and discussions. It

should stimulate reflective thinking and problem solving by critical analysis of events during

anaesthesia and interpretation of the data and logical reasoning.

3. COMPONENTS OF POST-GRADUATE CURRICULUM

THEORETICAL KNOWLEDGE, PRACTICAL AND CLINICAL SKILLS INCLUDING RESEARCH WORK AND THESIS

FIRST YEAR: BASIC TRAINING

Basic Sciences: Knowledge

Post-graduates should understand the principles involved in the measurement of relevant

variables and the requirements of equipment and monitoring in anaesthesia.

Knowledge is

expected in the areas outlined below.

Physics and Clinical Measurement Principles of Measurement .

- SI units
- Behaviour of fluids (gases and liquids)
- Flow of fluids
- Measurement of volumes, flows, and pressures
- Measurement of temperature
- Humidification
- Oximetry
- Analysis of gases
- Capnography
- Electrical safety
- Fires and explosions
- Equipment and Apparatus
- Equipment design and standards
- Gas supply in bulk and cylinders
- Anaesthesia delivery system, including pressure valves and regulators
- Vaporisers
- Breathing systems
- Devices to maintain the airway (laryngoscopes, endotracheal tubes, tracheostomy
- tubes, face masks, laryngeal masks, airways)
- Information systems
- Data storage and retrieval Monitoring
- Anaesthesia record – Manual and electronic record keeping
- Minimum monitoring standards
- Additional monitoring when appropriate (including central venous pressure, pulmonary artery pressure, cardiac output, cerebral function, temperature,

coagulation, blood loss, blood sugar)

Preoperative Assessment / Pre-anaesthesia clinics

- Appropriate history taking
- Physical examination including airway assessment, respiratory, cardiovascular and neurological examinations
- Referral to other specialists when necessary
- Establishment of a rapport with the patient to provide reassurance, disclosure of risk, information, and discussions on complementary medicine and informed consent
- Communication and consultation skills face-to-face, by phone and in writing
- Pulmonary function tests
- Measurement of cardiovascular function
- Interpretation of common radiology and imaging scans and investigations
- Other investigations as appropriate

Conducting Anaesthesia

- Applied cardiac and respiratory physiology
- Applied pharmacology and variability in drug response
- Selection and planning of the anaesthesia technique
- Decision-making relating to postponement or cancellation of surgery
- Routine inhalation and intravenous inductions
- Maintenance of anaesthesia
- Correct usage of anaesthesia delivery systems
- Application and interpretation of monitored variables and neuromuscular blockade
- Use of muscle relaxants
- Application of mechanical ventilation
- Management of the airway and intraoperative complications
- Common regional anaesthesia techniques (eg, epidural and spinal anaesthesia and Regional Nerve blocks)

- Maintenance of accurate records

Postoperative Care

- Safe recovery transport and handover in the post-anaesthesia recovery room
- Post-operative consultations
- Management of postoperative pain, fluid requirements, and nausea and vomiting

Communication skills

- Call for help in Cardio Pulmonary Resuscitation, PACU, in Emergencies
- Establishment of rapport with patients, attenders , relatives of patients Especially in PACU, INTENSIVE CARE UNITS, RECOVERY UNITS to provide reassurance , disclosure of current condition & any procedural information.
- To obtain informed consent from patients or attenders /relatives
- Documentation of events correctly /properly for future verification, research activities .

Basic Sciences : Skills- Clinical skills

Post-graduates should provide safe anaesthesia care and pain management for uncomplicated patients undergoing non-major surgery.

Post-graduates should be competent in the following technical skills -

- Maintenance of an adequate airway
- Rapid sequence induction
- Basic and advanced Life Support for adult and paediatrics
- Aseptic techniques
- Venous access
- Arterial blood gas collection
- Arterial cannulation
- Central venous cannulation
- ECG recording and interpretation
- Lumbar puncture
- Blood culture collection
- Emergency management of a pneumothorax

Post-graduates should be familiar with the following clinical protocols in the delivery of safe

anaesthesia care, and be able to respond accordingly for crisis management.

- Checking of the anaesthesia delivery system
- Airway assessment and anticipation of Difficult airway and its management which may

be acute and may be life threatening

• Inadequate airway; failed intubation, obstructed airway, oesophageal intubation, endobronchial intubation, and unplanned extubation .

- Laryngospasm .
- Bronchospasm .
- Hypertension.
- Hypotension.
- Arrhythmias.
- Myocardial Ischaemia.
- Hypoxia .
- Hypercarbia.
- Hypoventilation.
- Hyperventilation.
- Hypothermia .
- Hyperthermia .
- Malignant hyperthermia.
- Anaphylaxis .
- Residual neuromuscular blockade.
- Inadequate neuraxial blockade .
- Seizures .
- Gas embolism.
- High ventilator peak inspiratory pressures.
- Pulmonary aspiration .
- Pneumothorax.

Basic Sciences: Skills- Educational skills

- Developing a study plan for the rest of the training period
- Reviewing study plans and correcting for deviations (eg, catching up on deficient knowledge or experience)
- Reflecting on previous learning experiences with the aid of the Learning Portfolio
- Linking basic science teaching with clinical practice & Studying effectively

- Participating in small-group learning and educational activities
- Being aware of decision-making processes
- Managing time effectively for study, work and home/leisure
- Giving and receiving feedback
- Developing insight into personal limitations
- Using the Internet including e-mail
- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Carrying out oral presentations and professional communication.

OBSTETRIC ANAESTHESIA AND ANALGESIA: KNOWLEDGE

- Maternal physiology
- Process of labour and delivery
- Foetal and neonatal physiology
- Placental physiology
- Obstetric and post partum pharmacology
- Endocrine pharmacology
- Pharmacological considerations for newborn resuscitation
- Pharmacology of placental drug transfer
- Anatomy — airway, spine, pelvis, birth canal, gravid uterus, and nerve and blood
- supply in pregnancy
- Drugs used for fertility support and IVF
- Ecboolics and tocolytics
- Principles of in-vitro fertilisation
- Antenatal care
- Labour and delivery
- Maternal monitoring during labour
- Caesarean section; indications and levels of urgency
- Abortions and septic abortions
- Postpartum period
- High-risk Obstetrics- medical, obstetric or anaesthesia history
- Pre-existing disease in pregnancy
- Substance abuse during pregnancy

- Pre eclampsia and eclampsia, pathophysiology and management
- Obstetric complications, eg, breech, malpresentation, multiple pregnancy and abnormal placentation
- Obstetric interventions; indications and anticipation of anaesthesia and analgesia
- Amniotic fluid, air and pulmonary embolism, pathophysiology and management
- Obstetric haemorrhage- antepartum, peripartum and postpartum
- Foetal and Neonatal Considerations
- Foetal teratogenicity, carcinogenicity, and congenital abnormalities
- Foetal evaluation and monitoring
- Antepartum and intrapartum foetal compromise
- Foetal death in utero; pathophysiology and psychological issues
- Neonatal resuscitation
- Apgar score and neuro-adaptive scores, and their prognostic significance
- Neonatal surgery - Anaesthesia Management
- Pre-anaesthesia assessment of the pregnant patient and identification of high risk

patients eg: Risk factors in anaesthesia such as Pre-existing diseases like cardiac disease, hypertension, respiratory disease, diabetes, thyroid disease, intracranial disease,

bleeding disorders, renal disease and neuromuscular disease

- Adolescent or elderly primigravid pregnancy
- Morbid obesity
- Thromboembolic disease
- Anaesthesia for non-obstetric surgery in the pregnant patient
- Anaesthesia for elective obstetric procedures
- Anaesthesia for emergency obstetric procedures
- Anaesthesia for Caesarean section
- Pain management in obstetrics – Labour analgesia
- Complications of General Anaesthesia like Difficult airway management, Pulmonary aspiration, Awareness during general anaesthesia
- Complications of Regional Analgesia and anaesthesia, eg, high block, local

- anaesthetic toxicity, neurological sequelae
- Management of inadequate or failed regional anaesthesia and analgesia
- Management of severe haemorrhage; surgical, antepartum and postpartum
- Maternal morbidity and mortality; incidence and legal and ethical issues
- Organisation of an obstetric anaesthesia and analgesia service
- Safe radiation practice during pregnancy

Obstetric anaesthesia-Skills

- Airway assessment in pregnancy
- Rapid sequence induction and Acid Aspiration prevention protocol
- Emergency airway management
- Implementing epidural, spinal, and combined spinal/epidural anaesthesia and analgesia,
- Management of local anaesthetic toxicity
- Management of high regional block
- Management of severe obstetric haemorrhage

Post-graduates should be familiar with clinical drills for crises management especially

- for airway emergencies
- Failure to intubate algorithm in obstetrics
- Advanced Life Support in the obstetric patient
- Resuscitation of the neonate
- Management of pulmonary aspiration during general anaesthesia

II. SECOND YEAR- ADVANCED TRAINING:

Research and Scientific Enquiry: Knowledge

- Proposing a hypothesis
- Information search and literature review
- Research design, bias and appropriate methods of measurement
- Data collection and storage
- Good record keeping
- Common statistical tests and application of statistics
- Interpretation of results
- Responsibilities of investigator to the ethics committee
- Principles of writing a scientific paper
- Principles of oral or poster presentation of a paper

- Ethical principles
- The process of obtaining funding and writing a basic grant application

Research and Scientific Enquiry : Clinical-Skills

Post-graduates should acquire skills in scientific learning as a medical specialist

- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Applying the principles of evidence-based medicine to clinical practice
- Carrying out oral presentations and professional communication
- Presenting quality assurance exercises or projects
- Developing facilitation skills, such as tutoring in small-group learning and conducting small-group meetings
- Preparing the thesis protocol with the help of Guide, obtaining approval from Ethics committee
- Clinical application and performance of thesis/Dissertation in the prescribed period

Research and Scientific Enquiry : Attitudes

Post-graduates should develop an appreciation of and continue research and scientific

enquiry

- Valuing rigorous educational and scientific processes
- Distinguishing between practice with a sound scientific basis and that which requires

further objective assessment

- Committing to informed consent, confidentiality and all other ethical principles of research

- Committing to continuing professional development

ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY: KNOWLEDGE

- Preoperative evaluation and resuscitation
- Thromboembolism prophylaxis
- Perioperative and prophylactic antibiotics
- Management of coagulopathies

- Regional anaesthesia for abdominal, vascular, and imaging procedures including anatomy, and physiological and pharmacological aspects
- Informed consent and consent for incompetent patients
- Postoperative care, Management of postoperative pain, phantom-limb pain and pain from injury

Anaesthesia for Trauma Surgery

- Assessment and immediate care; primary and secondary survey, Trauma severity scores
- Emergency airway management
- Establishing intravenous access
- Priorities of resuscitation, investigations, and surgical procedures
- Physio-biochemical effects of trauma
- Managing facial, head and cervical spine injuries
- Glasgow Coma Scale and other scores of consciousness
- Pathophysiology of head injury including changes in cerebral blood flow, cerebral metabolism and intracranial pressure
- Pathophysiology and management of shock
- Pathophysiology of blood loss and massive blood transfusion
- Volume replacement
- Managing abdominal and chest injuries
- Management of burns procedures, including: – Understanding the pathophysiology of burns – Anaesthesia for debridement and skin grafting – Drills in burns resuscitation .
- Managing coagulopathies .
- Transport of ventilated or injured patients including portable ventilators and monitoring systems

Co-existing Medical Conditions Relevant to Anaesthesia

- Endocrine disorders including phaeochromocytoma, hyperthyroidism, hypothyroidism, and diabetes mellitus

- Disorders of the cardiovascular system
- Disorders of the respiratory system
- Disorders of the nervous system
- Disorders of the liver, biliary tract and gastrointestinal system
- Renal disorders
- Water, electrolyte and acid-base disturbances
- Haematological disorders, including coagulopathies
- Skin and musculoskeletal disorders, including rheumatoid arthritis and ankylosing spondylitis
- Psychiatric disorders and substance abuse
- Disorders associated with ageing
- Obesity

ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY:

SKILLS:

Post-graduates should provide safe anaesthesia for

- Major abdominal surgery
- Laparoscopic surgery
- Trauma surgery –post-graduates should revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination

(including airway assessment, cardiovascular, respiratory and neurological examinations)

to assess the patient' s status.

Post-graduates should become competent in the following technical skills--

- Securing an airway, arterial and central venous cannulation, and rapid sequence induction
- Cricothyroidotomy and percutaneous tracheostomy
- Cannulation of major vessels for volume resuscitation
- Awake fiberoptic intubation
- Thoracic and lumbar epidural and spinal anaesthesia
- Blood conservation strategies
- Regional nerve blocks for abdominal and lower limb surgery
- Chest drain insertion

- Immobilisation and care of cervical spine injuries
- Post-graduates should be familiar with clinical drills for crises management.
- Airway emergencies eg, “cannot intubate, cannot ventilate” , difficult airway, hypoxia and abnormal end-tidal CO2 levels

- Managing major intraoperative events in aneurysm and abdominal surgery
- Drill for the primary and secondary survey
- Drill for raised intracranial pressure
- Drill for tension pneumothorax
- Drill for managing severe haemorrhage
- Drill for managing cardiac arrest (ACLS Algorithm)
- Drill for managing malignant hyperthermia

ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery: Knowledge

- Cardiovascular, respiratory and neurological physiology
- Physiology of gases in closed body cavities
- Pharmacology of local anaesthetic agents
- Pharmacology of local vasoconstrictors
- Anatomy of the head and neck and abnormal facies
- Anatomy of the airway, nasal passages, larynx, pharynx and middle ear
- Effects of surgery and radiation on the airway
- Monitoring in anaesthesia
- Neurological monitoring
- Lasers-- types, uses in surgery, complications and precautions
- Airway devices and types of tracheal tubes, eg, Micro-laryngeal, Rae
- Equipment for difficult tracheal intubation
- Equipment for jet ventilation

Anaesthesia for ENT surgery

- Pre-operative airway assessment
- Tonsillectomy and adenoidectomy, including quinsy and postoperative bleeding
- Microlaryngoscopy
- Radical head and neck surgery
- Laryngectomy and Pharyngolaryngectomy
- Laser surgery .

- Nasal and sinus operations.
- Parotid tumor surgery .
- Myringoplasty .
- Middle ear surgery.
- Microsurgery of the ear.
- Managing partial airway obstruction including: –
- Epiglottitis
- Foreign bodies
- Laryngeal tumours
- Oropharyngeal cysts and abscesses
- Elective and emergency tracheostomy
- Paediatric problems, eg, relating to disease, airway, larynx and craniofacial disorders
- Post-operative care

Anaesthesia for Dental surgery

- Outpatient dental procedures- sedation and general anaesthesia
- Inpatient dental surgery
- Dental procedures on the mentally challenged
- Dental procedures on patients with bleeding disorders
- Oral surgery
- Fractured jaw
- Maxillary fractures according to the Le Fort classification
- Dental sepsis

Anaesthesia for Eye surgery

- Anatomy and physiology of extremes of age
- Anatomy of orbit and contents
- Physiology of intraocular pressure
- Ocular perfusion
- Eye reflexes (oculocardiac, oculo-respiratory, oculoemetic)
- Anatomy of orbit, extraocular muscles, blood vessels, lacrimal apparatus
- Local anaesthetic agents for eye surgery
- Other drugs for eye surgery, eg, topical agents, vasoconstrictors, mydriatics, miotics, and agents to reduce intraocular pressure

- General anaesthesia for eye surgery including:
- Examination under anaesthesia
- Laser eye surgery
- Intraocular surgery
- Extraocular surgery
- Retinal detachment
- Plastic and orbital surgery
- Emergency eye surgery and use of suxamethonium in penetrating eye injury
- Monitoring
- Postoperative care, management of nausea and vomiting
- Principles of regional retrobulbar and peribulbar block and choosing between

general

and regional anaesthesia techniques

- Sedation for eye procedures
- Principles of anaesthesia for day-case
- Paediatric considerations

Anaesthesia for Maxillofacial, Thyroid, and Head and Neck Surgery

- Pre-operative airway assessment
- Management of anaesthesia for major maxillofacial surgery, which may

involve

prolonged anaesthesia, major blood loss, hypothermia and multiple procedures

- Management of anaesthesia for facial trauma: emergency and semi-elective, including fractured jaw and maxilla
- Management of anaesthesia for cancer, plastic and cosmetic surgery on the

face,

head and neck, including surgery for cleft palate

- Management of thyroid surgery, including
- Anaesthesia for thyroid and parathyroid surgery
- Stabilisation of thyroid and parathyroid disorders preoperatively
- Post thyroidectomy bleeding
- Managing a "thyroid storm"
- Sedation for head and neck procedures
- Post-operative care

ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery : Skills

- Tracheal intubation
- Nasal intubation
- Use of special tubes
- Placement and removal of packs
- Applying topical local anaesthesia to the airway
- Securing the difficult airway
- Recognising the high-risk airway
- Use of stylets and bougies
- Awake intubation
- Retrograde catheter technique
- Fibreoptic intubation
- Laryngeal mask airway intubation
- Failed intubation or ventilation drill
- Cricothyroidotomy and percutaneous tracheostomy
- Transtracheal ventilation
- Managing the airway in trauma and burns
- Upper airway obstruction drill
- Post extubation drill for difficult airway
- Spontaneous gaseous induction for airway obstruction
- Regional and local anaesthesia of the head and neck
- Management of postoperative nausea and vomiting in head and neck

surgery

- Management of postoperative facial and airway swelling

Paediatric Anaesthesia: Knowledge

- Anatomy relevant to airway management and breathing
- The physiology of respiration, circulation, fluid balance and thermoregulation
- The pharmacology of anaesthetic agents, analgesics and common paediatric medications,

especially the relationship of dose to the size/maturity of child

- The relevance of surface area of children of various ages

Stages of development of the normal child and their relevance to hospitalisation

General principles of perioperative management relevant to children,

emphasising:

- common childhood illnesses and their influence on anaesthesia and surgery
- fasting guidelines
- fluid and electrolyte replacement
- temperature control
- specialised equipment for children of different sizes
- perioperative monitoring
- dosage and administration of emergency drugs
- postoperative apnoea detection and management
- acute and persistent pain management

Relevant features of important childhood conditions: respiratory infections, asthma

- prematurity and its complications
- facial anomalies affecting the airway

Neonatal emergencies

- respiratory distress,
- tracheoesophageal fistula,
- congenital diaphragmatic hernia,
- necrotising enterocolitis,
- abdominal wall defects

other childhood emergencies- inhaled/ingested foreign bodies, fractures, head injuries and

burns /Scalds

- congenital cardiac disease; especially ASD, VSD, Tetralogy of Fallot
- cerebral palsy
- chronic diseases of childhood; especially cystic fibrosis, muscular dystrophy
- congenital syndromes- Down' s, Pierre-Robin, mucopolysaccharidoses
- malignancy and the treatment of malignancy
- renal failure

Paediatric anaesthesia Knowledge-Clinical management

Applying principles of paediatric anaesthesia for the following surgical subspecialties:

- Neurosurgery
- Ophthalmology

- Dental surgery
- Plastics and reconstructive surgery
- Thoraco-abdominal surgery
- Cardiac surgery and procedures
- Urology surgery and procedures/investigations
- Orthopaedic Surgery Otolaryngology
- General surgery
- Trauma and Burns

Applying principles of paediatric anaesthesia for diagnostic procedures

- Recognising and managing the sick child
- Recognising and managing reversal to transitional fetal circulation
- Managing fluid therapy in paediatric patients
- Managing specific childhood syndromes and disorders
- Applying principles of paediatric anaesthesia for procedures outside the

operating

theatre, including patient transport

- Caring for paediatric patients undergoing imaging investigations, which may require sedation or anaesthesia

- Recognising and managing paediatric emergencies including basic and advanced

life support

- Understanding the organisation of a paediatric anaesthesia and analgesic service

Paediatric Anaesthesia: Skills

Post-graduates should demonstrate decision-making and clinical skills, and perform

- Paediatric advanced life support

Manage emergencies and conditions including

- Hypoxia
- Bronchospasm
- Apnoea
- Upper airway obstruction including upper airway infection
- Bradycardia and other arrhythmias

- Cardiac arrest
- Hypovolaemia
- Neurological compromise
- Epiglottitis and croup
- Inhaled foreign body
- Infantile airway obstruction
- Laryngospasm
- Masseter spasm
- Postoperative stridor
- Aspiration of gastric contents

Technical skills, such as airway management, vascular cannulation and regional anaesthesia should be demonstrated for paediatric patients

Interpersonal skills in dealing with paediatric patients and their parents

Intensive Care: Knowledge

Post-graduate should understand

Acute Circulatory Failure

- Classification, causes, pathogenesis and sequelae of shock
- Principles of management of all forms of shock
- Monitoring in the management of shock
- Causes of cardiorespiratory arrest and the effects on body systems
- Cardiopulmonary resuscitation and external defibrillators
- Cardiac dysrhythmias and their current therapies
- Valvular heart disease
- Endocarditis
- Pulmonary embolism
- Congestive cardiac failure
- Anaphylaxis
- Ischaemic Heart Disease and Myocardial Infarction

Factors involved in the balance of oxygen supply and demand to the heart

Aetiology of coronary artery disease and its effects

Signs and symptoms of ischaemic heart disease

Signs and symptoms of myocardial infarction

- Principles of the management of acute myocardial infarction including thrombolysis,

angioplasty and surgery

- Indications for a transvenous pacemaker
- Right heart catheterisation, angiography and echocardiography
- Long-term effects of acute myocardial infarction and late complications

Respiratory Failure

- Causes and pathogenesis of respiratory failure
- Oxygen therapy and mechanical ventilatory support (invasive and noninvasive)
- Respiratory disease processes & representative conditions
- Cardiogenic/non-cardiogenic pulmonary oedema/ARDS
- Airway obstruction
- Airway stenosis and tracheomalacia
- Bronchopleural fistula
- Pneumothorax
- Aspiration syndromes
- Fat embolism
- Pneumonia (community and nosocomial)
- Chronic airway limitation
- Asthma

Renal Failure

- Definitions of acute and chronic renal failure
- Causes and pathogenesis of renal failure
- Acute renal failure
- Principles of renal replacement therapy and their indications

Neurological Failure

- Definition and causes of coma
- Causes, pathogenesis and treatment of cerebral swelling and raised intracranial pressure
- Principles of cerebral function monitoring, especially intracranial pressure
- Principles of diagnosing brain stem death
- Representative conditions to be understood:
- Acute vascular disorders of the central nervous system
- Acute infective disorders of the central nervous system
- Cerebral oedema

- Brain stem death
- Seizures
- Hemiplegia, paraplegia, quadriplegia
- Guillain Barre syndrome
- Peripheral nerve and or muscle dysfunction associated with critical illness
- Myasthenia gravis
- Hyperthermia, hypothermia
- Tetanus
- Delirium

Severe Trauma

- Effects of severe trauma on organs and organ systems
- Principles of EMST for the management of trauma and advantages of an organized team

approach

- Technique of cricothyroidotomy/ tracheostomy/mini-tracheotomy
- Principles of the management of head injury and Glasgow Coma Scale
- Management of cervical spine injuries
- Principles of the safe transfer of injured children and adults and portable monitoring systems

Sepsis

- Definition, pathogenesis and pathophysiology of sepsis and related syndromes
- Risk factors for nosocomial infection
- Infection control measures in ICU and operating suites

Supportive Care of Critically Ill Patients

- Inotropic Therapy
- Recognise when to use inotropic or vasopressor therapy
- Choose an appropriate agent, dose, physiological endpoint, rate and route of administration
- Review the efficacy of inotropic therapy at regular intervals
- Provide appropriate nutritional support and General Care
- Appropriate plan for care of bowels, skin, mouth, eyes and maintenance of mobility and muscle strength

Intensive Care: Skills

- Cardiovascular Related
- Choosing and using inotropic agents, vasodilators, and vasoconstrictors
- Managing dysrhythmias
- Choosing and using antimicrobial agents in heart disease
- Assisting with intra-aortic balloon pumping
- Cardioversion
- Advanced life support
- Respiratory Related
- Oxygen therapy
- CPAP & Non-invasive ventilation
- Mechanical ventilation, including modes of ventilation
- Pleural drainage
- Percutaneous tracheostomy
- Fiberoptic bronchoscopy
- Renal Failure
- General care of continuous dialysis and haemofiltration techniques
- Neurological Failure
- Maintaining cerebral perfusion pressures and intracranial pressures
- Gastro-intestinal Hemorrhage management
- Assisting with placing a Sengstaken Blakemore tube

Diagnostic imaging and interventional procedures (radiology and cardiology):**Knowledge**

- Preanaesthetic preparation
- Techniques appropriate for adults and children for CT scanning, MR imaging and interventional radiology, angiography and interventional cardiology

- Post-investigation care

Diagnostic imaging and interventional procedures (radiology and cardiology): Skills

- Pre-anaesthetic preparation
- Sedation and general anaesthetic techniques for:
 - angiography and interventional procedures
 - CT scanning, adults and children
 - Magnetic resonance imaging

- Problems due to magnetic field
- Post-investigation care

Pain Medicine: Knowledge

- Neurobiology of Pain
- Overview of "Pain Pathways"
- Multi dimensional aspects of pain; role of physiological, psychological and environmental factors

- Pharmacology of Analgesic Agents
- Pharmacokinetic and pharmacodynamic principles, drug interactions, and side effects.

Knowledge of the pharmacology of:

- Opioids
- Paracetamol
- Non-steroidal anti-inflammatory agents (NSAIDs)
- Antidepressants (TCAs and SSRIs)
- Anticonvulsants
- Membrane-stabilising agents
- Alpha-2 agonists
- NMDA-receptor antagonists
- Local anaesthetics
- Anti-emetics
- Agents used to treat hypotension associated with neuraxial blockade
- Awareness of the role of the following in pain management
- Anti-migraine agents
- Steroidal anti-inflammatory agents
- Topical agents (NSAIDs, Capsaicin)
- Neurolytic agents
- Experimental agents for analgesia
- Knowledge of different routes of analgesic drug delivery, including factors governing choice of route, side effects relevant to particular route, Principles of additive and synergistic effects when agents are combined
- Oral

- Intramuscular
 - Subcutaneous (including continuous infusion)
 - Intravenous (including continuous infusion)
 - Patient-controlled analgesia (PCA) via different routes (ie intravenous, subcutaneous, intranasal, epidural, intrathecal)
- Other-methods- topical, transdermal, rectal, transmucosal (intranasal, inhalational and sublingual / buccal), intra-cerebroventricular, intraarticular, infiltration under skin

Psychological and Sociocultural Issues

The importance of psychological (emotional and cognitive), social, and other factors in the

presentation and management of pain with emphasis on:

- Factors involved in the wide variation in individual response to tissue injury
- The relationship between depression and persistent pain
- The role of anxiety and/or depression in acute pain
- Differentiation of active and passive coping strategies
- The role of illness behaviour
- The influence of the health care provider on the response to pain treatment
- The importance of an interdisciplinary approach to pain assessment and treatment

including the potential role of other members of the pain team (particularly psychiatrist, clinical psychologist, physiotherapist, nursing staff, occupational therapist, social worker)

- The placebo effect and its implications for treatment of pain

Pain Assessment and Measurement

Assess pain and outcome of pain treatment using history, clinical examination and

pain measurement tools.

Recognise the limitations of pain measurement techniques, particularly in some patient groups (eg, persistent pain, children, those with cognitive impairment)

Understanding of – Neuroendocrine and metabolic responses to surgery stressors and

impact of analgesic techniques

- Consequences of poorly controlled pain
- Current evidence for and against pre-emptive analgesia and clinical implications

implications

- Current evidence for the effect of analgesic technique on morbidity and mortality
- Importance of aggressive multimodal postoperative rehabilitation
- Relationship between acute and persistent pain including factors involved in progression from

one to the other, and potential interventions to prevent such progression

Choose the most appropriate technique of acute pain management –

- Pharmacological techniques (opioid and non-opioid) via a variety of routes
- Regional techniques including central neuraxial, plexus and peripheral nerve blockade

- Non-pharmacological techniques

Formulate a pain management plan based upon –

- Patient preference, physical and mental status, and available expertise and technology

- Special requirements in specific patient groups (eg, the elderly, children, pregnant and

postpartum patients, Obstructive sleep apnoea, concurrent hepatic or renal disease; non-

English speaking, cognitive impairment

- Special requirements in patients with opioid-tolerance and/or a substance abuse disorder

including an understanding of guidelines and regimens for analgesic drug use (equi-analgesic]

dosing for opioids; tolerance and dependence)

- Special requirements under specific clinical situations (eg, spinal injuries, burns, acute back

pain, musculoskeletal pain, acute medical pain, acute cancer pain and patients in Intensive Care

and the Emergency Department)

Include in a pain management plan

- Appropriate evaluation of the patient's pain
- Informed consent, including disclosure of risk and appropriate documentation

- Patient education about the selected technique and alternatives

Recognise common presentations of acute musculoskeletal pain (eg, rib fracture, acute back

pain) and other non-surgical acute pain syndromes (migraine, renal colic) including in the

Emergency Department and Intensive Care Unit

- Identify when to seek advice from, or refer to, a Pain Medicine Specialist

Cancer Pain

Undertake assessment of pain in patients with cancer based on –

- Understanding of the multiple potential aetiologies of pain associated with cancer

- Differentiation between somatic, visceral, and neuropathic pain

- Evaluation of psychological, social, cultural and spiritual issues

- Undertake treatment of cancer-related pain syndromes based on therapies available

(including chemotherapy, radiotherapy, surgery, invasive and non-invasive analgesic

techniques, and psychological approaches)

- Understand guidelines and regimens for analgesic drug use including equianalgesic

dosing for opioids; tolerance and dependence and their management in the patient

with cancer

- Identify when to seek advice from, or refer to, a Palliative Medicine Specialist

Neuropathic Pain

- Understand diagnostic criteria, clinical features and management of specific neuropathic pain syndromes including–

- Central pain (pain after stroke, thalamic pain, spinal cord injury pain, deafferentation pain, phantom limb pain)

- Neuralgias (trigeminal neuralgia, postherpetic neuralgia, occipital neuralgia)
- Painful peripheral neuropathy (eg, metabolic, toxic, ischaemic)
- Pain after nerve injury (eg, neuroma)
- Post-surgical pain syndromes (eg, post-thoracotomy, post-CABG pain, postmastectomy, postamputation)
- Complex regional pain syndrome types I and 2 (including the differentiation of sympathetically maintained from sympathetically independent pain)
- Recognise and understand the ways in which acute and persistent pain in children differ from pain in adults, including–
 - The effect of developmental stage on assessment and management of pain in children
 - The selection of pain assessment tools for children of different developmental stages
 - Principles of managing acute, procedural and persistent pain in children

Pain in the Elderly:

- The epidemiology of pain syndromes in the elderly
- Physiological changes associated with ageing and effects of these on pain and pain management (including changes in pharmacokinetics, pharmacodynamics, and pain biology)
- Effects of concurrent disease, and psychological, social and cognitive changes on assessment and management of pain
- Risks associated with polypharmacy in the elderly

Pain Medicine: Skills-Clinical Evaluation

- Post-graduates should demonstrate skills in the clinical evaluation of patients with acute and persistent pain by: .
 - Obtaining a specific pain history – Onset, location, nature, duration, intensity, aggravating and relieving factors

- Physical, psychological and social consequences of the patient's pain
- Current and past pain treatments and outcome
- Other relevant history (past patterns of drug use or misuse, family history, medical and surgical history)
- Treatment expectations
- Interpreting relevant investigations
- Formulating a management plan and evaluating outcome

Pain Medicine-Technical Skills

Post-graduates should become competent in-

- Central neuraxial blocks
- Regional techniques (including knowledge of anatomy, technique, indications, contraindications, complications and their management) including
 - Peripheral and plexus blocks of the upper and lower limb
 - Head and neck blocks
 - Truncal blocks including intercostal and paravertebral block

Trainees need to understand the anatomy, technique, indications, contraindications, complications and management of

- Stellate ganglion blockade
- Coeliac plexus blockade
- Lumbar sympathetic blockade
- Intrathecal drug delivery for cancer and persistent pain

III YEAR ADVANCED TRAINING

Anaesthesia and Perioperative Care (including Analgesia) for Patients with Cardiac and Vascular Disease for Non-cardiac Surgery: Knowledge

- Pathophysiology, investigation, diagnosis, anaesthesia implications, and management of:
 - Ischaemic heart disease
 - Congenital heart disease
 - Valvular heart disease
 - Hypertension
 - Cardiac arrhythmias
 - Other acquired diseases, eg, myxomas, cardiomyopathies

· Understanding the principles of anaesthesia and perioperative care for patients with:

- Recent myocardial infarction
- Ischaemic heart disease
- Cardiac valvular lesions
- Congenital heart disease, corrected and uncorrected
- Hypertensive disease
- Cardiac arrhythmias
- Other acquired diseases, eg, myxomas, cardiomyopathies
- Cerebrovascular disease
- Peripheral vascular disease

Anaesthesia for Cardiac Surgery-- Understanding the anaesthesia, complications and

perioperative care (including analgesia) of:

- Coronary revascularisation with/without cardiopulmonary bypass
- Valvular repair or replacement
- Emergency cardiac surgery
- Cardioversion
- Procedures in the cardiac catheterisation laboratory
- Electrophysiological procedures
- Congenital heart disease surgery (paediatric and adult)
- Procedures on the great vessels, eg, for aortic dissection
- Heart or heart/lung transplantation

Anaesthesia for Vascular Surgery --Understanding the anaesthesia, complications and

perioperative care (including analgesia) of:

- Surgery on the vessels supplying the head and neck
- Surgery on the abdominal vessels
- Surgery on the limb vessels
- Minimally invasive procedures on the vessels (eg, intraluminal stenting)

Understanding the principles, role, and management of procedures, problems, or events

associated with anaesthesia for cardiac and vascular surgery, including:

- Myocardial protection strategies
- Cerebral protection
- Spinal cord protection
- Blood coagulation and anticoagulation and its monitoring
- Perioperative arrhythmias
- Poor cardiac output states
- Temperature management (including deep hypothermic circulatory arrest)
- Cardiopulmonary bypass including weaning from bypass and ECMO
- Cross-clamping of the aorta

Organ Transplantation -- Anaesthesia for organ transplantation including:

- Legal and ethical considerations of organ harvesting and transplantation
- Brain death and the legal definition of death
- Physiological and pharmacological considerations

Protocols and planning Anaesthesia for Patients with Pulmonary Disease Chronic respiratory disease, pathophysiology, diagnosis

- Preoperative evaluation of patients with respiratory diseases
- Lung function tests

Thoracic trauma Anaesthesia and Perioperative Care (including Analgesia) for Thoracic

Surgery

- Preoperative assessment for fitness for lung surgery and one-lung ventilation
- Thoracotomy and – Lung resection, including pneumonectomy and lung reduction surgery
- Mediastinal mass resection
- Oesophageal surgery
- Surgery on the thoracic aorta
- One-lung anaesthesia, including management of hypoxia and ventilation
- Differential lung ventilation
- Tracheal and bronchial surgery (including use of lasers and stents)
- Thoracoscopic procedures
- Bronchoscopy, including removal of foreign body
- Mediastinoscopy
- Lung or heart/lung transplantation
- Management of problems or critical events : –

- Fluid management postpneumonectomy
- Cardiac herniation postpneumonectomy
- Bronchopleural fistula
- Lung bullae and cysts
- Tension pneumothorax
- Superior vena cava obstruction
- Empyema

Understanding the types and uses of endotracheal, double-lumen, and endobronchial tubes and bronchial blockers

Understanding chest tube drainage systems and suction

ANAESTHESIA AND PERIOPERATIVE CARE (INCLUDING ANALGESIA) FOR PATIENTS WITH CARDIAC AND VASCULAR DISEASE FOR NON-CARDIAC SURGERY: SKILLS – CLINICAL

Post-graduates should be Competent in the following

- Fibreoptic bronchoscopy
- Placement and use of vascular monitoring lines (arterial, central venous, pulmonary artery, and femoral and neck vessels)
- Basic trans-oesophageal echo examinations (subject to local practices)
- Use of cardiac pacemakers
- Placement of endobronchial tubes and blockers
- Use of bougies and tube exchangers

Post graduates should be able to perform

- Interpretation of ECGs and ECG monitoring
- Interpretation of chest x-rays and common chest CT and MRI imaging films
- Assistance with cardiopulmonary bypass
- Placement and care of chest drains and appropriate use of suction

Neuroanaesthesia: Knowledge

- Neuro anatomy -- Central nervous system, Spinal cord and meninges
- Ventricular system and flow of CSF
- Blood supply to brain and spinal cord
- Cranial vault and spinal column
- Cerebral blood flow and Cerebral blood volume
- Cerebral metabolism

- Cerebrospinal fluid dynamics and physiology
- Intracranial pressure
- Blood-brain barrier
- Physiology and metabolism of normal and abnormal brain and spinal cord
- Physiological and metabolic effects of anaesthesia on brain and spinal cord
- Abnormal water and sodium homeostasis
- Temperature and CNS function
- Pharmacology relevant to neuroanaesthesia:
 - Sedatives
 - Hypnotics
 - Analgesics
 - Inhalation agents
 - Neuromuscular blocking drugs
 - Anticholinesterases
 - Neuroprotection
 - Diuretics
 - Hypotensive agents
 - Vasopressors
 - Corticosteroids
 - Drug interactions with neuromuscular disorders
- Principles of clinical measurement and monitoring in neuroanaesthesia, including techniques and clinical importance.
 - Haemodynamic and respiratory monitoring
 - Cerebral blood flow
 - Intracranial pressure (ICP) and cerebral perfusion pressure
 - Cerebral metabolism
 - Transcranial doppler ultrasonometry
 - Electrophysiological monitoring, eg, electroencephalogram and evoked potentials
 - Electrical safety standards
- Interventions to minimise Cerebral Damage
 - Principles of cerebral protection

- Haemodynamic stability
- Fluid and osmotic therapy
- Management of intracranial hypertension
- Sedation and ventilatory support

Anaesthesia for Neurosurgery

· Understanding the assessment, anaesthesia and perioperative care of patients for:

- Intra cerebral vascular surgery
- Extra cerebral vascular surgery
- Supratentorial surgery
- Posterior fossa surgery
- Pituitary surgery
- Epilepsy surgery
- 'Awake craniotomy'
- Craniofacial and craniobasal surgery
- Spinal surgery
- Emergency spinal cord decompression
- Paediatric neurosurgery

Principles, role and management of procedures, problems, or events associated with

anaesthesia for neurosurgery: –

- Positioning for neurosurgery
- Use of inhalation or total intravenous general anaesthesia
- Induced hypotension
- Induced hypertension
- Hypothermia
- Sitting position
- Air embolism; precautions, diagnosis and management
- Injury of head, spinal column and neurological injuries
- Epilepsy and other neurological disorders
- Paediatric considerations

Neuroanaesthesia: Skills

- Pre-anaesthesia preparation for neuroanaesthesia

- Monitoring in neuroanaesthesia – setting up and calibration, placement of cannulae,

interpretation of variables

- Post-anaesthesia care and post neurosurgical care
- Protocols and drills for
- Failed airway intubation
- Reducing raised ICP
- Suspected cervical spine injury
- Intraoperative air embolism
- Initial management of a head injury
- Positioning of patients

ATTITUDES INCLUDING COMMUNICATION AND BEHAVIOUR FOR THE POSTGRADUATES:

- To learn the attributes of a
- Medical expert
- Communicator
- Collaborator
- Manager
- Teacher
- Professional
- To practise good communication with colleagues, patients and others
- To work as a member of a team, but to assume responsibilities and/or

delegate

duties as a team leader when necessary

- To commit to, and believe in, a culture of safety and ethical, high quality care
- To accept that medical knowledge and skills are not the only requirements of specialist practice
- To be aware of medicolegal obligations relating to medical practice
- To have insight into one's own limitations, abilities and areas of expertise
- To commit to continuing professional development

TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS

Students should compulsorily attend the research Methodology workshop conducted by the University within first six months of the M.D course.

Students are encouraged to attend workshops/CME's on Bioethics conducted by the

University and other reputed Institutions.

Medical ethics, bioethics, moral and legal issues, medical audit are part and parcel of the

curriculum and syllabus

Professionalism and Ethics

To commit to, and believe in the ethical and professional principles –

- The best care for the patient must be the principal driving force of practice
- *Patient autonomy*: patients' ability to determine their treatment
- *Beneficence*: the principle of "doing good" to patients
- *Non-maleficence*: the principle of not doing harm to patients
- *Fidelity*: faithfulness to one's duties and obligations. This principle underlies

excellence in patient care, confidentiality, telling the truth, a commitment to continuing

professional development and lifelong learning, and not neglecting patient care

- *Social justice*: the right of all patients to be fairly treated
- Duty to oneself in terms of personal health care, and maintenance of

competence to

practise

- *Accountability*: the anaesthetist is responsible for his/her actions
 - Honour and integrity in all conduct, including the generation and use of
- resources
- Respect for others, work as a team and practise conflict resolution
 - Appropriate response to clinical error

Patient Considerations

To commit to, and believe in, the rights of patients with respect to:

- Autonomy
- Confidentiality of the doctor-patient relationship
- Appropriate, excellent clinical care, including pre-operative assessment
- Informed consent
- Comprehension of the risks of anaesthesia techniques
- Appropriate care irrespective of race, culture, gender and socio-economic

status

- Research Considerations
- To value rigorous educational and scientific processes
- To commit to the ethical principles of research

5. **TEACHING AND LEARNING METHODS:**

- Introductory lectures
- Seminars, group discussions and symposia.
- Problem case discussion, before and after the conduct of the case
- Journal club presentation and discussion
- Presenting in Conferences and attendance in CME's & Workshops
- Training in the Operation Theatres (both elective and emergency),

Intensive Care Unit, Pre-anesthetic clinic, Pain Clinics, Peripheral areas like Radiology- including USG , CT MRI and interventional radiology, Endoscopy suite and Interventional cardiology lab.

6. **STRUCTURED TRAINING PROGRAMME**

Duration of the training 3years

Orientation-

- To the hospital, wards, operation theatres and peripheral areas
- Anaesthesiology as a subject
- Assigning Thesis guides

Objectives for 1st year

· Orientation- To the hospital, wards, operation theatres and peripheral areas and also to

Anaesthesiology as a subject

- To observe and learn assessment and management of cases in ASA I and II in the specialities

of General Surgery, Orthopaedics, Gynaecology and Recovery room. The level of supervision

is slowly graded to facilitate independent management of general and spinal anaesthesia.

- They should attend the practical guidance workshop on research methodology and should have a knowledge about basic concepts of research, biostatistics etc.

Objectives for 2nd year

- General and regional anaesthesia (including epidural, nerve and plexus blocks) for ASA

III AND IV cases in the specialities of Paediatrics, ENT, Dental, ICU, Obstetrics, Eye,

Urology, Pain, Peripheral areas and Trauma.

- Should learn BLS, ACLS, PALS and ATLS .
- The post-graduate should be able to analyse a journal article and data and able to present free papers in conferences and should attend continuous education programme & workshops.

- The post graduate should start working on the thesis/Dissertation and should complete the clinical work at the end of second year.

Objectives for 3rd year

- Post-graduates should be able to anaesthetise under supervision cardiac, neuro, paediatric and all major cases.
- They should be able to anaesthetise all other elective and emergency cases independently and manage acute pain and make decisions and know how to organize mass casualty.
- Simulation based training

First year : Basic skills and orientation to broad speciality departments

General surgery : 2 months
Orthopaedics surgery 2 months
Pre assessment clinic 1 month
ENT & Day care surgery 1month
Medicine /Toxicology 2 month
PACU/Recovery room/ casualty 1month
Emergency Anaesthesia, Trauma 2 months
Obstetric & Gynecology: 1 month

2nd year multi speciality training

Neonatology/Paediatrics/ Cardiology/pulmonology 2 weeks
Paediatric surgery OT 1 month
Ophthalmic surgery 2 weeks
Urology OT 1month
Plastic surgery OT 1month
Neuro surgery OT 1 month
Cardio thoracic surgery OT 1month
Cath lab – closed cardiac procedures 2 weeks

Radiology- USG, CT scan, MRI, IVP Radio oncology 2 weeks

Dental/ Oro Facial Maxillary surgery 1 month

ICU/IRCU/PACU/ 1 month

OBG OT (Laparoscopic surgery, Infertility & FP) 1 month

Dissertation/Thesis department postings 2 months

During IInd year, the Students are encouraged to undergo special postings for learning new advanced techniques / procedure / skills in institutions of higher repute where the requisite facilities are available without affecting the duties of the parent department.

3rd year

Dissertation/Thesis department postings 2 months

Advanced training speciality postings

Trauma/ Spine OT 1 month

Urosurgery OT 1 month

Plastic surgery OT 1 month

Transplant surgery OT 1 month

vascular OT / Endocrine/ Geriatrics 1 month

Neuro surgery OT 1 month

ENT (Endoscopic & Laser Surgery) OT 1 month

Pain Management 1 month

Critical care/ Organ transplant ICU 1 month

Advanced Orthopedics/General surgery (Key hole surgery) 1 month

Emergency Operation Theatre & Day care surgery postings on rotation

7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

8. COMPETENCY ASSESSMENT:

OVERALL:

a) Communication / commitment / Contribution / ()

Compassion towards patients and Innovation () 5 Marks

b) Implementation of newly learnt techniques/skills ()

a) Number of cases presented in Clinical Meetings/

Journal clubs/seminars - 5 marks

b) Number of Posters/Papers presented in Conferences/

Publications and Research Projects - 5 marks

c) No. of Medals / Certificates won in the conference /

Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of

study

Period Total

Max.20 marks

I year Upto Dec 10 marks Upto June 10 marks 20 Marks

II year Upto Dec 10 marks Upto June 10 marks 20 Marks

III year Upto Oct 10 marks Upto Feb 10 marks 20 Marks

AVERAGE 20 Marks

9. Dissertation and University Journal of Medical Sciences:

As per the 49th SAB Resolution under Point No. 2 and in the 52nd SAB it was reiterated regarding the topic for dissertation

The topic for the dissertation should be registered and sent to the University after Ethics Committee approval before 31st of December of the first Post Graduate Year. Only one change of topic with proper justification from the Head of the Department is permitted before 31st March of the first Post Graduate Year. The change of dissertation title will not be permitted after 31st March of the First Post Graduate Year. This modification in regulation will be scrupulously followed from the academic year 2015-16 admission onwards.

As per MCI Clause 14 (4)(a), thesis shall be submitted atleast 6 Months before the Theory and Clinical/Practical Examination.

The periodical evaluation of dissertation/log book should be done by the guide / HOD once in every six months. The HOD should ensure about the submission of dissertation within the stipulated time.

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit at-least one research paper. Case Reports are not considered as Research Paper

10. THEORY EXAMINATIONS:

Theory examination will comprise 4 papers

Paper I - Applied Basic Sciences related to Anaesthesia including Physics in Anaesthesia, History of Anaesthesia

Paper II - Medicine Applied to Anaesthesiology

Paper III - Anaesthesiology

Paper IV - Anaesthesiology including Critical Care and Recent Advances in Anaesthesiology

All the four question Papers will have following pattern

I. Elaborate on 2 x 15 = 30

II. Write note on 10 x 7 = 70

100 Marks

11. PRACTICAL EXAMINATIONS:-

Morning session

Long case-1×70

Marks

Clinical case

70 marks

40 minutes case examination and 20 minutes for discussion

Short cases-2×40

Marks

10 minutes for each case examination and

20 minutes for each case discussion **80 marks**

Total marks for morning session 150 marks (A)

Afternoon session

Ward rounds / Case Scenario -5 × 5 marks

5 mins each case discussion

25 marks (B)

OSCE 5 stations × 5 marks 25 marks (C)

VIVA - 15 mins for each station 4 stations 80 marks (D)

1. Anaesthesia Machine including Vaporisers, Circuits, Equipments, Monitors
2. CPR mannequin, Difficult airway mannequin, Defibrillator, Ventilator
3. Drugs, IV fluids, Instruments and Procedures tray
4. Investigation charts, ECG, Xray, ABG, GRAPHS, Recent advances

Log book 20 marks (E)

Aggregate Total (Clinical + Viva) 300

Minimum required marks for pass (50%) (A+B+C+D+E)

150

Thesis Approved/Not

approved

12. Log book

- A detailed log book should be maintained for the entire duration of the course. It should contain the following details.
- Procedures performed
- Journal clubs/Clinical Meetings
- Seminars/CME/Conferences
- Important cases discussed/presented
- The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.
- Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

13. VIVA including Competency Assessment :

VIVA including Competency Assessment - 80 Marks (60 + 20)

- Anaesthesia Machine, Gas cylinders, Equipments, Monitors
- Drugs, IV fluids, Instruments, Procedure Tray
- Investigation Charts, ECG, Xray, ABG, Capnograph, Ventilator Graphics, etc..
- Resuscitation mannequin, Difficult airway mannequin, Defibrillator , Ventilator

14. OSCE

Five stations – Five minutes each station 5X5 =25 marks ©

1. Equipments, monitors, circuits, Vaporiser
2. Flow volume loops/ABG/ Capnographs/ Ventilator graphs /
3. Physiology, History relevant to Anaesthesiology
4. Drug Pharmacology, invasive procedure, Nerve block
5. Communication skill assessment- high risk informed consent, Cancellation/ consent for tracheostomy due to difficult intubation, Delayed recovery, Breaking bad news,etc.

15. REFERENCE BOOKS

S.No. Name of the book Author

1. A synopsis of Anaesthesia J. Alfred Lee
2. Management of pain J.J Bonica
3. Anaesthesia for infants and children R.M Smith
4. A Practice of Anaesthesia Wylic and Churchill
- 5 Anaesthesia - Vol.I and II
Davidson
Miller
- 6 Clinical Anaesthesia Barash
7. Critical Care Joseph Civetta
- 8 Anaesthesia and neurosurgery Cottrell and Smith
- 9 Cardiac anaesthesia Kaplan
- 10 Paediatric anaesthesia Gregory
- 11 Pharmacology & Physiology in Anaesthetic practice Robert K. Stoleting
- 12 Anaesthesia for Co-existing diseases Robert K. Stoleting
- 13 Understanding Anaesthesia Equipment Dorsch and Dorsch

**** Note : The editions are as applicable and the latest editions shall be the part of the syllabi.**

16. JOURNALS

- 1.Anaesthesiology
- 2.Anesthesia Analgesia
- 3.Anaesthesia
- 4.Anesthesia Intensive Care
- 5.Canadian Journal of Anaesthesia
- 6.British Journal of Anaesthesia
- 7.Indian Journal of Anaesthesia

DIPLOMA IN ANESTHESIOLOGY

The curriculum shall train a candidate to manage anaesthesia in a competent, compassionate and caring manner.

Learning shall be self directed and essentially autonomous.

Exposure to all the sub-specialities shall be achieved

A combination of formative and summative assessments shall ensure completion of goals and training.

1. GOALS:

To produce competent and compassionate specialists who

a) shall recognize the health needs and ethically carry out the professional obligations towards the patient.

b) shall attain all the required competencies within all the sub-specialities in the speciality of anaesthesiology , enabling good practices at the secondary and tertiary levels of health care delivery.

c) Shall take effort to be aware and update knowledge about the latest advances and developments in the field.

d) shall acquire the basic skills to teach medical and para-medical professionals.

2. OBJECTIVES:(Ref: Bloom's taxonomy of learning domains)

A. Knowledge to be gained from the syllabus

B. Skills to be learned from the practical training

C. Attitudes to be developed during the training period

The curriculum shall include

a) Anatomy, physiology and biochemistry relevant to anaesthesiology.

- b) A thorough knowledge of the pharmacokinetics and pharmacodynamics of anaesthetic drugs .
- c) Knowledge of cardiovascular, respiratory, neurological, hepatobiliary, renal and endocrine homeostasis and related drugs used in patients undergoing anaesthesia.
- d) Physics and principles involved in the construction and functioning of anaesthesia machine and equipment used to provide anaesthesia and patient vital signs monitoring.
- e) Knowledge of the commonly used techniques in General, Regional and Local anaesthesia
- f) Understanding the concept of unconsciousness and its implications in anaesthesia.
- g) Knowledge and management of acute and chronic intractable pain.
- h) Knowledge of intensive care / therapy.
- i) Knowledge of medical statistics
- j) Knowledge and gain expertise in cardiopulmonary resuscitation.
- k) Knowledge of medical ethics.

The course content should stimulate the thought processes of the candidate and encourage the candidate to acquire new information from books, journals, lectures, seminars and discussions. It should stimulate reflective thinking and problem solving by critical analysis of events during anaesthesia and interpretation of the data and logical reasoning.

3. COMPONENTS OF POST-GRADUATE CURRICULUM

THEORETICAL KNOWLEDGE, PRACTICAL AND CLINICAL SKILLS

FIRST YEAR: BASIC TRAINING

Basic Sciences: Knowledge

Post-graduates should understand the principles involved in the measurement of relevant variables and the requirements of equipment and monitoring in anaesthesia. Knowledge is

expected in the areas outlined below.

Physics and Clinical Measurement Principles of Measurement .

- SI units
 - Behaviour of fluids (gases and liquids)
 - Flow of fluids
 - Measurement of volumes, flows, and pressures
 - Measurement of temperature
 - Humidification
 - Oximetry
 - Analysis of gases
 - Capnography
 - Electrical safety
 - Fires and explosions
 - Equipment and Apparatus
 - Equipment design and standards
 - Gas supply in bulk and cylinders
 - Anaesthesia delivery system, including pressure valves and regulators
 - Vaporisers
 - Breathing systems
 - Devices to maintain the airway (laryngoscopes, endotracheal tubes, tracheostomy
 - tubes, face masks, laryngeal masks, airways)
 - Information systems
 - Data storage and retrieval Monitoring
 - Anaesthesia record
 - Minimum monitoring standards
 - Additional monitoring when appropriate (including central venous pressure, pulmonary artery pressure, cardiac output, cerebral function, temperature, coagulation, blood loss, blood sugar)
- Preoperative Assessment / Pre-anaesthesia clinics**
- Appropriate history taking
 - Physical examination including airway assessment, respiratory, cardiovascular and

- neurological examinations
- Referral to other specialists when necessary
- Establishment of a rapport with the patient to provide reassurance, disclosure of risk, information, and discussions on complementary medicine and informed consent
- Communication and consultation skills face-to-face, by phone and in writing
- Pulmonary function tests
- Measurement of cardiovascular function
- Interpretation of common radiology and imaging scans and investigations
- Other investigations as appropriate

Conducting Anaesthesia

- Applied cardiac and respiratory physiology
- Applied pharmacology and variability in drug response
- Selection and planning of the anaesthesia technique
- Decision-making relating to postponement or cancellation of surgery
- Routine inhalation and intravenous inductions
- Maintenance of anaesthesia
- Correct usage of anaesthesia delivery systems
- Application and interpretation of monitored variables and neuromuscular blockade
- Use of muscle relaxants
- Application of mechanical ventilation
- Management of the airway and intraoperative complications
- Common regional anaesthesia techniques (eg, epidural and spinal anaesthesia and Regional Nerve blocks)
- Maintenance of accurate records

Postoperative Care

- Safe recovery transport and handover in the post-anaesthesia recovery room
- Post-operative consultations
- Management of postoperative pain, fluid requirements, and nausea and vomiting

Communication skills

- Call for help in Cardio Pulmonary Resuscitation, PACU, in Emergencies
- Establishment of rapport with patients, attenders , relatives of patients Especially in PACU, INTENSIVE CARE UNITS, RECOVERY UNITS to provide reassurance , disclosure of current condition & any procedural information.
- To obtain informed consent from patients or attenders /relatives
- Documentation of events correctly /properly for future verification, research activities .

Basic Sciences : Skills- Clinical skills

Post-graduates should provide safe anaesthesia care and pain management for uncomplicated patients undergoing non-major surgery.

Post-graduates should be competent in the following technical skills -

- Maintenance of an adequate airway
- Rapid sequence induction
- Basic and advanced Life Support for adult and paediatrics
- Aseptic techniques
- Venous access
- Arterial blood gas collection
- Arterial cannulation
- Central venous cannulation
- ECG recording and interpretation
- Lumbar puncture
- Blood culture collection
- Emergency management of a pneumothorax

Post-graduates should be familiar with the following clinical protocols in the delivery of safe

anaesthesia care, and be able to respond accordingly for crisis management.

- Checking of the anaesthesia delivery system
- Airway assessment and anticipation of Difficult airway and its management which may

be acute and may be life threatening

- Inadequate airway; failed intubation, obstructed airway, oesophageal intubation, endobronchial intubation, and unplanned extubation .

- Laryngospasm .
- Bronchospasm .
- Hypertension.
- Hypotension.
- Arrhythmias.
- Myocardial Ischaemia.
- Hypoxia .
- Hypercarbia.
- Hypoventilation.
- Hyperventilation.
- Hypothermia .
- Hyperthermia .
- Malignant hyperthermia.
- Anaphylaxis .
- Residual neuromuscular blockade.
- Inadequate neuraxial blockade .
- Seizures .
- Gas embolism.
- High ventilator peak inspiratory pressures.
- Pulmonary aspiration .
- Pneumothorax.
-

Basic Sciences: Skills- Educational skills

- Developing a study plan for the rest of the training period
- Reviewing study plans and correcting for deviations (eg, catching up on deficient knowledge or experience)
- Reflecting on previous learning experiences with the aid of the Learning Portfolio
- Linking basic science teaching with clinical practice & Studying effectively
- Participating in small-group learning and educational activities
- Being aware of decision-making processes
- Managing time effectively for study, work and home/leisure
- Giving and receiving feedback

- Developing insight into personal limitations
- Using the Internet including e-mail
- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Carrying out oral presentations and professional communication.

OBSTETRIC ANAESTHESIA AND ANALGESIA: KNOWLEDGE

- Maternal physiology
- Process of labour and delivery
- Foetal and neonatal physiology
- Placental physiology
- Obstetric and post partum pharmacology
- Endocrine pharmacology
- Pharmacological considerations for newborn resuscitation
- Pharmacology of placental drug transfer
- Anatomy — airway, spine, pelvis, birth canal, gravid uterus, and nerve and blood supply in pregnancy
- Drugs used for fertility support and IVF (overview only)
- Ecboolics and tocolytics
- Principles of in-vitro fertilisation
- Antenatal care
- Labour and delivery
- Maternal monitoring during labour
- Caesarean section; indications and levels of urgency
- Abortions and septic abortions
- Postpartum period
- High-risk Obstetrics- medical, obstetric or anaesthesia history
- Pre-existing disease in pregnancy
- Substance abuse during pregnancy
- Pre eclampsia and eclampsia, pathophysiology and management
- Obstetric complications, eg, breech, malpresentation, multiple pregnancy and abnormal placentation
- Obstetric interventions; indications and anticipation of anaesthesia and analgesia

- Amniotic fluid, air and pulmonary embolism, pathophysiology and management
- Obstetric haemorrhage- antepartum, peripartum and postpartum
- Foetal and Neonatal Considerations
- Foetal teratogenicity, carcinogenicity, and congenital abnormalities
- Foetal evaluation and monitoring
- Antepartum and intrapartum foetal compromise
- Foetal death in utero; pathophysiology and psychological issues
- Neonatal resuscitation
- Apgar score and neuro-adaptive scores, and their prognostic significance
- Neonatal surgery - Anaesthesia Management (overview only)
- Pre-anaesthesia assessment of the pregnant patient and identification of high risk

patients eg: Risk factors in anaesthesia such as Pre-existing diseases like cardiac disease, hypertension, respiratory disease, diabetes, thyroid disease, intracranial disease,

bleeding disorders, renal disease and neuromuscular disease

- Adolescent or elderly primigravid pregnancy
- Morbid obesity
- Thromboembolic disease
- Anaesthesia for non-obstetric surgery in the pregnant patient
- Anaesthesia for elective obstetric procedures
- Anaesthesia for emergency obstetric procedures
- Anaesthesia for Caesarean section
- Pain management in obstetrics
- Complications of General Anaesthesia like Difficult airway management, Pulmonary aspiration, Awareness during general anaesthesia
- Complications of Regional Analgesia and anaesthesia, eg, high block, local anaesthetic toxicity, neurological sequelae
- Management of inadequate or failed regional anaesthesia and analgesia
- Management of severe haemorrhage; surgical, antepartum and postpartum
- Maternal morbidity and mortality; incidence and legal and ethical issues

- Organisation of an obstetric anaesthesia and analgesia service
- Safe radiation practice during pregnancy

Obstetric anaesthesia-Skills

- Airway assessment in pregnancy
- Rapid sequence induction and Acid Aspiration prevention protocol
- Emergency airway management
- Implementing epidural, spinal, and combined spinal/epidural anaesthesia & analgesia,
- Management of local anaesthetic toxicity
- Management of high regional block
- Management of severe obstetric haemorrhage

Post-graduates should be familiar with clinical drills for crises management especially

- for airway emergencies
- Failure to intubate algorithm in obstetrics
- Advanced Life Support in the obstetric patient
- Resuscitation of the neonate
- Management of pulmonary aspiration during general anaesthesia

SECOND YEAR- ADVANCED TRAINING:

ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY: KNOWLEDGE

- Preoperative evaluation and resuscitation
- Thromboembolism prophylaxis
- Perioperative and prophylactic antibiotics
- Management of coagulopathies
- Regional anaesthesia for abdominal, vascular, and imaging procedures including anatomy, and physiological and pharmacological aspects
- Informed consent and consent for incompetent patients
- Postoperative care, Management of postoperative pain, phantom-limb pain and pain from injury

Anaesthesia for Trauma Surgery

- Assessment and immediate care; primary and secondary survey
- Trauma severity scores

- Emergency airway management
- Establishing intravenous access
- Priorities of resuscitation, investigations, and surgical procedures
- Physio-biochemical effects of trauma
- Managing facial, head and cervical spine injuries
- Glasgow Coma Scale and other scores of consciousness
- Pathophysiology of head injury including changes in cerebral blood flow, cerebral metabolism and intracranial pressure
- Pathophysiology and management of shock
- Pathophysiology of blood loss and massive blood transfusion
- Volume replacement
- Managing abdominal and chest injuries
- Management of burns procedures, including: – Understanding the pathophysiology of burns – Anaesthesia for debridement and skin grafting – Drills in burns resuscitation .
- Managing coagulopathies .
- Transport of ventilated or injured patients including portable ventilators and monitoring systems

Co-existing Medical Conditions Relevant to Anaesthesia

- Endocrine disorders including phaeochromocytoma, hyperthyroidism, hypothyroidism, and diabetes mellitus
- Disorders of the cardiovascular system
- Disorders of the respiratory system
- Disorders of the nervous system
- Disorders of the liver, biliary tract and gastrointestinal system
- Renal disorders
- Water, electrolyte and acid-base disturbances
- Haematological disorders, including coagulopathies
- Skin and musculoskeletal disorders, including rheumatoid arthritis and ankylosing

spondylitis

- Psychiatric disorders and substance abuse
- Disorders associated with ageing
- Obesity

ANAESTHESIA FOR HIGH-RISK ELECTIVE AND EMERGENCY SURGERY:

SKILLS:

Post-graduates should provide safe anaesthesia for

- Major abdominal surgery
- Laparoscopic surgery
- Trauma surgery –post-graduates should revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination

(including airway assessment, cardiovascular, respiratory and neurological examinations)

to assess the patient' s status.

- Post-graduates should become competent in the following technical skills--
Securing an airway, arterial and central venous cannulation, and rapid sequence induction

- Cricothyroidotomy and percutaneous tracheostomy
- Cannulation of major vessels for volume resuscitation
- Awake fiberoptic intubation
- Thoracic and lumbar epidural and spinal anaesthesia
- Blood conservation strategies
- Regional nerve blocks for abdominal and lower limb surgery
- Chest drain insertion
- Immobilisation and care of cervical spine injuries
- Post-graduates should be familiar with clinical drills for crises management.
- Airway emergencies eg, "cannot intubate, cannot ventilate" , difficult airway, hypoxia

and abnormal end-tidal CO₂ levels

- Managing major intraoperative events in aneurysm and abdominal surgery

Anaesthesia for Trauma Surgery - skills

- Drill for the primary and secondary survey
- Drill for raised intracranial pressure

- Drill for tension pneumothorax
- Drill for managing severe haemorrhage
- Drill for managing cardiac arrest (ACLS Algorithm)
- Drill for managing malignant hyperthermia

**ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery:
Knowledge**

- Cardiovascular, respiratory and neurological physiology
- Physiology of gases in closed body cavities
- Pharmacology of local anaesthetic agents
- Pharmacology of local vasoconstrictors
- Anatomy of the head and neck and abnormal facies
- Anatomy of the airway, nasal passages, larynx, pharynx and middle ear
- Effects of surgery and radiation on the airway
- Monitoring in anaesthesia
- Neurological monitoring
- Lasers-- types, uses in surgery, complications and precautions
- Airway devices and types of tracheal tubes, eg, Micro-laryngeal, Rae
- Equipment for difficult tracheal intubation
- Equipment for jet ventilation

Anaesthesia for ENT surgery

- Pre-operative airway assessment
- Tonsillectomy and adenoidectomy, including quinsy and postoperative bleeding
- Microlaryngoscopy
- Radical head and neck surgery
- Laryngectomy and Pharyngolaryngectomy ‰
- Laser surgery .
- Nasal and sinus operations .
- Parotid tumour surgery .
- Myringoplasty .
- Middle ear surgery .
- Microsurgery of the ear .
- Managing partial airway obstruction including: –
- Epiglottitis

- Foreign bodies
- Laryngeal tumours
- Oropharyngeal cysts and abscesses
- Elective and emergency tracheostomy
- Paediatric problems, eg, relating to disease, airway, larynx and craniofacial disorders
- Post-operative care

Anaesthesia for Dental surgery

- Outpatient dental procedures- sedation and general anaesthesia
- Inpatient dental surgery
- Dental procedures on the mentally challenged
- Dental procedures on patients with bleeding disorders
- Oral surgery
- Fractured jaw
- Maxillary fractures according to the Le Fort classification
- Dental sepsis

Anaesthesia for Eye surgery

- Anatomy and physiology of extremes of age
- Anatomy of orbit and contents
- Physiology of intraocular pressure
- Ocular perfusion
- Eye reflexes (oculocardiac, oculo-respiratory, oculoemetic)
- Anatomy of orbit, extraocular muscles, blood vessels, lacrimal apparatus
- Local anaesthetic agents for eye surgery
- Other drugs for eye surgery, eg, topical agents, vasoconstrictors, mydriatics, miotics,

and agents to reduce intraocular pressure

- General anaesthesia for eye surgery including:
- Examination under anaesthesia
- Laser eye surgery
- Intraocular surgery
- Extraocular surgery
- Retinal detachment
- Plastic and orbital surgery

- Emergency eye surgery and use of suxamethonium in penetrating eye injury
- Monitoring
- Postoperative care, management of nausea and vomiting
- Principles of regional retrobulbar and peribulbar block and choosing between

general

and regional

- anaesthesia techniques
- Sedation for eye procedures
- Principles of anaesthesia for day-case
- Paediatric considerations

Anaesthesia for Maxillofacial, Thyroid, and Head and Neck Surgery

- Pre-operative airway assessment
- Management of anaesthesia for major maxillofacial surgery, which may

involve

prolonged anaesthesia, major blood loss, hypothermia and multiple procedures

- Management of anaesthesia for facial trauma: emergency and semi-elective, including fractured jaw and maxilla
- Management of anaesthesia for cancer, plastic and cosmetic surgery on the face,

head and neck, including surgery for cleft palate

- Management of thyroid surgery, including
- Anaesthesia for thyroid and parathyroid surgery
- Stabilisation of thyroid and parathyroid disorders preoperatively
- Post thyroidectomy bleeding
- Managing a "thyroid storm"
- Sedation for head and neck procedures
- Post-operative care

ENT, Eye, Dental, Maxillofacial, and Head and Neck Surgery : Skills

- Tracheal intubation
- Nasal intubation
- Use of special tubes
- Placement and removal of packs
- Applying topical local anaesthesia to the airway
- Securing the difficult airway

- Recognising the high-risk airway
- Use of stylets and bougies
- Awake intubation
- Retrograde catheter technique
- Fibreoptic intubation
- Laryngeal mask airway intubation
- Failed intubation or ventilation drill
- Cricothyroidotomy and percutaneous tracheostomy
- Transtracheal ventilation
- Managing the airway in trauma and burns
- Upper airway obstruction drill
- Post extubation of difficult airway drill
- Spontaneous gaseous induction for airway obstruction
- Regional and local anaesthesia of the head and neck
- Management of postoperative nausea and vomiting in head and neck

surgery

- Management of postoperative facial and airway swelling

Paediatric Anaesthesia: Knowledge

- Anatomy relevant to airway management and breathing
- The physiology of respiration, circulation, fluid balance and thermoregulation
- The pharmacology of anaesthetic agents, analgesics and common paediatric medications,

especially the relationship of dose to the size/maturity of child

- The relevance of surface area of children of various ages
- Stages of development of the normal child and their relevance to

hospitalisation

- General principles of perioperative management relevant to children,

emphasising:

- common childhood illnesses and their influence on anaesthesia and surgery
- fasting guidelines
- fluid and electrolyte replacement
- temperature control
- specialised equipment for children of different sizes

- perioperative monitoring
- dosage and administration of emergency drugs
- postoperative apnoea detection and management
- acute and persistent pain management
- Relevant features of important childhood conditions: respiratory infections, asthma

- prematurity and its complications
- facial anomalies affecting the airway
- Neonatal emergencies
- respiratory distress,
- tracheoesophageal fistula,
- congenital diaphragmatic hernia,
- necrotising enterocolitis,
- abdominal wall defects
- other childhood emergencies- inhaled/ingested foreign bodies, fractures,

head injuries and

burns /Scalds

- congenital cardiac disease; especially ASD, VSD, Tetralogy of Fallot
- cerebral palsy
- chronic diseases of childhood; especially cystic fibrosis, muscular dystrophy
- congenital syndromes- Down' s, Pierre-Robin, mucopolysaccharidoses
- malignancy and the treatment of malignancy
- renal failure

Paediatric anaesthesia Knowledge-Clinical management

· Applying principles of paediatric anaesthesia for the following surgical subspecialties:

- Neurosurgery
- Ophthalmology
- Dental surgery
- Plastics and reconstructive surgery
- Thoraco-abdominal surgery
- Cardiac surgery and procedures
- Urology surgery and procedures/investigations

- Orthopaedic Surgery Otolaryngology
- General surgery
- Trauma and Burns
- Applying principles of paediatric anaesthesia for diagnostic procedures
- Recognising and managing the sick child
- Recognising and managing reversal to transitional fetal circulation
- Managing fluid therapy in paediatric patients
- Managing specific childhood syndromes and disorders
- Applying principles of paediatric anaesthesia for procedures outside the operating theatre, including patient transport
- Caring for paediatric patients undergoing imaging investigations, which may require sedation or anaesthesia
- Recognising and managing paediatric emergencies including basic and advanced life support
- Understanding the organisation of a paediatric anaesthesia and analgesic service

Paediatric Anaesthesia: Skills

Post-graduates should demonstrate decision-making and clinical skills, and perform

- Paediatric advanced life support
- Manage emergencies and conditions including
- Hypoxia
- Bronchospasm
- Apnoea
- Upper airway obstruction including upper airway infection
- Bradycardia and other arrhythmias
- Cardiac arrest
- Hypovolaemia
- Neurological compromise ‰
- Epiglottitis and croup

- Inhaled foreign body
- Infantile airway obstruction
- Laryngospasm
- Masseter spasm
- Postoperative stridor
- Aspiration of gastric contents
- Technical skills, such as airway management, vascular cannulation and regional

anaesthesia should be demonstrated for paediatric patients

- Interpersonal skills in dealing with paediatric patients and their parents

Intensive Care: Knowledge

Post-graduate should understand

Acute Circulatory Failure

- Classification, causes, pathogenesis and sequelae of shock
- Principles of management of all forms of shock
- Monitoring in the management of shock
- Causes of cardiorespiratory arrest and the effects on body systems
- Cardiopulmonary resuscitation and external defibrillators
- Cardiac dysrhythmias and their current therapies
- Valvular heart disease
- Endocarditis
- Pulmonary embolism
- Congestive cardiac failure
- Anaphylaxis
- Ischaemic Heart Disease and Myocardial Infarction
- Factors involved in the balance of oxygen supply and demand to the heart
- Aetiology of coronary artery disease and its effects
- Signs and symptoms of ischaemic heart disease
- Signs and symptoms of myocardial infarction
- Principles of the management of acute myocardial infarction including thrombolysis, angioplasty and surgery
- Indications for a transvenous pacemaker
- Right heart catheterisation, angiography and echocardiography

- Long-term effects of acute myocardial infarction and late complications

Respiratory Failure

- Causes and pathogenesis of respiratory failure
- Oxygen therapy and mechanical ventilatory support (invasive and noninvasive)
- Respiratory disease processes & representative conditions
- Cardiogenic/non-cardiogenic pulmonary oedema/ARDS
- Airway obstruction
- Airway stenosis and tracheomalacia
- Bronchopleural fistula
- Pneumothorax
- Aspiration syndromes
- Fat embolism
- Pneumonia (community and nosocomial)
- Chronic airway limitation
- Asthma

Renal Failure

- Definitions of acute and chronic renal failure
- Causes and pathogenesis of renal failure
- Acute renal failure
- Principles of renal replacement therapy and their indications

Neurological Failure

- Definition and causes of coma
- Causes, pathogenesis and treatment of cerebral swelling and raised intracranial pressure
- Principles of cerebral function monitoring, especially intracranial pressure
- Principles of diagnosing brain stem death
- Representative conditions to be understood:
- Acute vascular disorders of the central nervous system
- Acute infective disorders of the central nervous system
- Cerebral oedema
- Brain stem death
- Seizures
- Hemiplegia, paraplegia, quadriplegia

- Guillain Barre syndrome
- Peripheral nerve and or muscle dysfunction associated with critical illness
- Myasthenia gravis
- Hyperthermia, hypothermia
- Tetanus
- Delirium

Severe Trauma

- Effects of severe trauma on organs and organ systems
- Principles of EMST for the management of trauma and advantages of an organized

team approach

- Technique of cricothyroidotomy/ tracheostomy/mini-tracheotomy
- Principles of the management of head injury and Glasgow Coma Scale
- Management of cervical spine injuries
- Principles of the safe transfer of injured children and adults and portable monitoring systems

Sepsis

- Definition, pathogenesis and pathophysiology of sepsis and related syndromes
- Risk factors for nosocomial infection
- Infection control measures in ICU and operating suites

Supportive Care of Critically Ill Patients

- Inotropic Therapy
- Recognise when to use inotropic or vasopressor therapy
- Choose an appropriate agent, dose, physiological endpoint, rate and route of administration
- Review the efficacy of inotropic therapy at regular intervals
- Provide appropriate nutritional support and General Care
- Appropriate plan for care of bowels, skin, mouth, eyes and maintenance of mobility and muscle strength

Intensive Care: Skills

- Cardiovascular Related
- Choosing and using inotropic agents, vasodilators, and vasoconstrictors

- Managing dysrhythmias
- Choosing and using antimicrobial agents in heart disease
- Assisting with intra-aortic balloon pumping
- Cardioversion
- Advanced life support
- Respiratory Related
- Oxygen therapy
- CPAP & Non-invasive ventilation
- Mechanical ventilation, including modes of ventilation
- Pleural drainage
- Percutaneous tracheostomy
- Fibreoptic bronchoscopy
- Renal Failure
- General care of continuous dialysis and haemofiltration techniques
- Neurological Failure
- Maintaining cerebral perfusion pressures and intracranial pressures
- Gastro-intestinal Hemorrhage management
- Assisting with placing a Sengstaken Blakemore tube

Diagnostic imaging and interventional procedures (radiology and cardiology):

Knowledge

- Preanaesthetic preparation
- Techniques appropriate for adults and children for CT scanning, MR imaging and interventional radiology, angiography and interventional cardiology
- Post-investigation care

Diagnostic imaging and interventional procedures (radiology and cardiology): Skills

- Pre-anaesthetic preparation
- Sedation and general anaesthetic techniques for:
 - angiography and interventional procedures
 - CT scanning, adults and children
 - Magnetic resonance imaging
 - Problems due to magnetic field
 - Post-investigation care

Pain Medicine: Knowledge

- Neurobiology of Pain
- Overview of "Pain Pathways"
- Multi dimensional aspects of pain; role of physiological, psychological and environmental factors

- Pharmacology of Analgesic Agents
- Pharmacokinetic and pharmacodynamic principles, drug interactions, and side effects.

Knowledge of the pharmacology of:

- Opioids
- Paracetamol
- Non-steroidal anti-inflammatory agents (NSAIDs)
- Antidepressants (TCAs and SSRIs)
- Anticonvulsants
- Membrane-stabilising agents
- Alpha-2 agonists
- NMDA-receptor antagonists
- Local anaesthetics
- Anti-emetics
- Agents used to treat hypotension associated with neuraxial blockade
- Awareness of the role of the following in pain management
- Anti-migraine agents
- Steroidal anti-inflammatory agents
- Topical agents (NSAIDs, Capsaicin)
- Neurolytic agents
- Experimental agents for analgesia
- Knowledge of different routes of analgesic drug delivery, including factors governing choice of route, side effects relevant to particular route,
- Principles of additive and synergistic effects when agents are combined
- Oral
- Intramuscular
- Subcutaneous (including continuous infusion)

- Intravenous (including continuous infusion)
 - Patient-controlled analgesia (PCA) via different routes (ie intravenous, subcutaneous, intranasal, epidural, intrathecal)
- Other-methods- topical, transdermal, rectal, transmucosal (intranasal, inhalational and sublingual / buccal), intra-cerebroventricular, intraarticular, infiltration under skin

Psychological and Socio cultural Issues

The importance of psychological (emotional and cognitive), social, and other factors in the

presentation and management of pain with emphasis on:

- Factors involved in the wide variation in individual response to tissue injury
- The relationship between depression and persistent pain
- The role of anxiety and/or depression in acute pain
- Differentiation of active and passive coping strategies
- The role of illness behaviour
- The influence of the health care provider on the response to pain treatment
- The importance of an interdisciplinary approach to pain assessment and treatment

including the potential role of other members of the pain team (particularly psychiatrist, clinical psychologist, physiotherapist, nursing staff, occupational therapist, social worker)

- The placebo effect and its implications for treatment of pain

Pain Assessment and Measurement

- Assess pain and outcome of pain treatment using history, clinical examination and pain measurement tools

- Recognise the limitations of pain measurement techniques, particularly in some

patient groups (eg, persistent pain, children, those with cognitive impairment)

- Understanding of – Neuroendocrine and metabolic responses to surgery stressors and impact of analgesic techniques

- Consequences of poorly controlled pain
- Current evidence for and against pre-emptive analgesia and clinical implications
- Current evidence for the effect of analgesic technique on morbidity and mortality
- Importance of aggressive multimodal postoperative rehabilitation
- Relationship between acute and persistent pain including factors involved in progression from one to the other, and potential interventions to prevent such progression
- Choose the most appropriate technique of acute pain management –
 - Pharmacological techniques (opioid and non-opioid) via a variety of routes
 - Regional techniques including central neuraxial, plexus and peripheral nerve blockade
 - Non-pharmacological techniques
- Formulate a pain management plan based upon –
 - Patient preference, physical and mental status, and available expertise and technology
 - Special requirements in specific patient groups (eg, the elderly, children, pregnant and postpartum patients, Obstructive sleep apnoea, concurrent hepatic or renal disease; non-English speaking, cognitive impairment)
 - Special requirements in patients with opioid-tolerance and/or a substance abuse disorder including an understanding of guidelines and regimens for analgesic drug use (equi-analgesic dosing for opioids; tolerance and dependence)
 - Special requirements under specific clinical situations (eg, spinal injuries, burns, acute back pain, musculoskeletal pain, acute medical pain, acute cancer pain and patients in Intensive Care and the Emergency Department)
- Include in a pain management plan

- Appropriate evaluation of the patient's pain
- Informed consent, including disclosure of risk and appropriate documentation
- Patient education about the selected technique and alternatives
- Recognise common presentations of acute musculoskeletal pain (eg, rib fracture, acute back pain) and other non-surgical acute pain syndromes (migraine, renal colic) including in the Emergency Department and Intensive Care Unit
- Identify when to seek advice from, or refer to, a Pain Medicine Specialist

Cancer Pain

Undertake assessment of pain in patients with cancer based on –

- Understanding of the multiple potential aetiologies of pain associated with cancer
- Differentiation between somatic, visceral, and neuropathic pain
- Evaluation of psychological, social, cultural and spiritual issues
- Undertake treatment of cancer-related pain syndromes based on therapies available (including chemotherapy, radiotherapy, surgery, invasive and non-invasive analgesic techniques, and psychological approaches)
- Understand guidelines and regimens for analgesic drug use including equianalgesic dosing for opioids; tolerance and dependence and their management in the patient with cancer

· Identify when to seek advice from, or refer to, a Palliative Medicine Specialist

Neuropathic Pain

- Understand diagnostic criteria, clinical features and management of specific neuropathic pain syndromes including–
- Central pain (pain after stroke, thalamic pain, spinal cord injury pain, deafferentation pain, phantom limb pain)
- Neuralgias (trigeminal neuralgia, postherpetic neuralgia, occipital neuralgia)

- Painful peripheral neuropathy (eg, metabolic, toxic, ischaemic)
- Pain after nerve injury (eg, neuroma)
- Post-surgical pain syndromes (eg, post-thoracotomy, post-CABG pain, postmastectomy, postamputation)
- Complex regional pain syndrome types I and 2 (including the differentiation of Sympathetically maintained from sympathetically independent pain)
- Recognise and understand the ways in which acute and persistent pain in children differ from pain in adults, including–
 - The effect of developmental stage on assessment and management of pain in children
 - The selection of pain assessment tools for children of different developmental stages
 - Principles of managing acute, procedural and persistent pain in children

Pain in the Elderly:

- The epidemiology of pain syndromes in the elderly
- Physiological changes associated with ageing and effects of these on pain and pain management (including changes in pharmacokinetics, pharmacodynamics, and pain biology)
- Effects of concurrent disease, and psychological, social and cognitive changes on assessment and management of pain
- Risks associated with polypharmacy in the elderly

Pain Medicine: Skills-Clinical Evaluation

- Post-graduates should demonstrate skills in the clinical evaluation of patients with acute and persistent pain by: .
 - Obtaining a specific pain history – Onset, location, nature, duration, intensity, aggravating and relieving factors
 - Physical, psychological and social consequences of the patient' s pain

- Current and past pain treatments and outcome
- Other relevant history (past patterns of drug use or misuse, family history, medical and surgical history)

- Treatment expectations
- Interpreting relevant investigations
- Formulating a management plan and evaluating outcome

Pain Medicine-Technical Skills

Post-graduates should become competent in-

- Central neuraxial blocks
- Regional techniques (including knowledge of anatomy, technique, indications, contraindications, complications and their management) including

- Peripheral and plexus blocks of the upper and lower limb
- Head and neck blocks
- Truncal blocks including intercostal and paravertebral block

Trainees need to understand the anatomy, technique, indications, contraindications, complications and management of (but not necessarily be able to perform)-

- Stellate ganglion blockade
- Coeliac plexus blockade
- Lumbar sympathetic blockade
- Intrathecal drug delivery for cancer and persistent pain

Anaesthesia and Perioperative Care (including Analgesia) for Patients with Cardiac and Vascular Disease for Non-cardiac Surgery: Knowledge

- Pathophysiology, investigation, diagnosis, anaesthesia implications, and management of:

- Ischaemic heart disease
- Congenital heart disease
- Valvular heart disease
- Hypertension
- Cardiac arrhythmias
- Other acquired diseases, eg, myxomas, cardiomyopathies

- Understanding the principles of anaesthesia and perioperative care for patients with:

- Recent myocardial infarction

- Ischaemic heart disease
- Cardiac valvular lesions
- Congenital heart disease, corrected and uncorrected
- Hypertensive disease
- Cardiac arrhythmias
- Other acquired diseases, eg, myxomas, cardiomyopathies
- Cerebrovascular disease
- Peripheral vascular disease

Anaesthesia for Cardiac Surgery-- Understanding the anaesthesia, complications and

perioperative care (including analgesia) of:

- Coronary revascularisation with/without cardiopulmonary bypass
- Valvular repair or replacement
- Emergency cardiac surgery
- Cardioversion
- Procedures in the cardiac catheterisation laboratory
- Electrophysiological procedures
- Congenital heart disease surgery (paediatric and adult)
- Procedures on the great vessels, eg, for aortic dissection
- Heart or heart/lung transplantation

Anaesthesia for Vascular Surgery --Understanding the anaesthesia, complications and

perioperative care (including analgesia) of:

- Surgery on the vessels supplying the head and neck
- Surgery on the abdominal vessels
- Surgery on the limb vessels
- Minimally invasive procedures on the vessels (eg, intraluminal stenting)

Understanding the principles, role, and management of procedures, problems, or events

associated with anaesthesia for cardiac and vascular surgery, including:

- Myocardial protection
- Cerebral protection
- Spinal cord protection

- Blood coagulation and anticoagulation
- Perioperative arrhythmias
- Poor cardiac output states
- Temperature management (including deep hypothermic circulatory arrest)
- Cardiopulmonary bypass including weaning from bypass and ECMO
- Cross-clamping of the aorta

Organ Transplantation -- Anaesthesia for organ transplantation including:

- Legal and ethical considerations of organ harvesting and transplantation
- Brain death and the legal definition of death
- Physiological and pharmacological considerations

Protocols and planning Anaesthesia for Patients with Pulmonary Disease Chronic respiratory disease, pathophysiology, diagnosis

- Preoperative evaluation of patients with respiratory diseases
- Lung function tests

Thoracic trauma Anaesthesia and Perioperative Care (including Analgesia) for Thoracic Surgery

- Preoperative assessment for fitness for lung surgery and one-lung ventilation
- Thoracotomy and – Lung resection, including pneumonectomy and lung reduction surgery
- Mediastinal mass resection
- Oesophageal surgery
- Surgery on the thoracic aorta
- One-lung anaesthesia, including management of hypoxia and ventilation
- Differential lung ventilation
- Tracheal and bronchial surgery (including use of lasers and stents)
- Thoracoscopic procedures
- Bronchoscopy, including removal of foreign body
- Mediastinoscopy
- Lung or heart/lung transplantation
- Management of problems or critical events : –
- Fluid management postpneumonectomy
- Cardiac herniation postpneumonectomy
- Bronchopleural fistula
- Lung bullae and cysts

- Tension pneumothorax
- Superior vena cava obstruction
- Empyema

Understanding the types and uses of endotracheal, double-lumen, and endobronchial tubes

and bronchial blockers

Understanding chest tube drainage systems and suction

Anaesthesia and Perioperative Care (including Analgesia) for Patients with Cardiac and Vascular Disease for Non-cardiac Surgery: Skills – Clinical

Post-graduates should observe and assist in the following

- Fibreoptic bronchoscopy
- Placement and use of vascular monitoring lines (arterial, central venous, pulmonary artery, and femoral and neck vessels)

- Basic trans-oesophageal echo examinations (subject to local practices)
- Use of cardiac pacemakers
- Placement of endobronchial tubes and blockers
- Use of bougies and tube exchangers

Post graduates should be able to perform

- Interpretation of ECGs and ECG monitoring
- Interpretation of chest x-rays and common chest CT and MRI imaging films
- Assistance with cardiopulmonary bypass
- Placement and care of chest drains and appropriate use of suction

Neuroanaesthesia: Knowledge

- Neuro anatomy -- Central nervous system, Spinal cord and meninges
- Ventricular system and flow of CSF
- Blood supply to brain and spinal cord
- Cranial vault and spinal column
- Cerebral blood flow and Cerebral blood volume
- Cerebral metabolism
- Cerebrospinal fluid dynamics and physiology
- Intracranial pressure
- Blood-brain barrier
- Physiology and metabolism of normal and abnormal brain and spinal cord

- Physiological and metabolic effects of anaesthesia on brain and spinal cord
- Abnormal water and sodium homeostasis
- Temperature and CNS function
- Pharmacology relevant to neuroanaesthesia:
 - Sedatives
 - Hypnotics
 - Analgesics
 - Inhalation agents
 - Neuromuscular blocking drugs
 - Anticholinesterases
 - Neuroprotection
 - Diuretics
 - Hypotensive agents
 - Vasopressors
 - Corticosteroids
- Drug interactions with neuromuscular disorders
- Principles of clinical measurement and monitoring in neuroanaesthesia, including techniques and clinical importance.

- Haemodynamic and respiratory monitoring
- Cerebral blood flow
- Intracranial pressure (ICP) and cerebral perfusion pressure
- Cerebral metabolism
- Transcranial doppler ultrasonometry
- Electrophysiological monitoring, eg, electroencephalogram and evoked potentials

- Electrical safety standards

Interventions to minimise Cerebral Damage

- Principles of cerebral protection
- Haemodynamic stability
- Fluid and osmotic therapy
- Management of intracranial hypertension
- Sedation and ventilatory support

Anaesthesia for Neurosurgery

· Understanding the assessment, anaesthesia and perioperative care of patients for:

- Intra cerebral vascular surgery
- Extra cerebral vascular surgery
- Supratentorial surgery
- Posterior fossa surgery
- Pituitary surgery
- Epilepsy surgery
- 'Awake craniotomy'
- Craniofacial and craniobasal surgery
- Spinal surgery
- Emergency spinal cord decompression
- Paediatric neurosurgery

Principles, role and management of procedures, problems, or events associated with

anaesthesia for neurosurgery: –

- Positioning for neurosurgery
- Use of inhalation or total intravenous general anaesthesia
- Induced hypotension
- Induced hypertension
- Hypothermia
- Sitting position
- Air embolism; precautions, diagnosis and management
- Injury of head, spinal column and neurological injuries
- Epilepsy and other neurological disorders
- Paediatric considerations

Neuroanaesthesia: Skills

· Pre-anaesthesia preparation for neuroanaesthesia

· Monitoring in neuroanaesthesia – setting up and calibration, placement of cannulae,

interpretation of variables

- Post-anaesthesia care and post neurosurgical care
- Protocols and drills for

- Failed airway intubation
- Reducing raised ICP
- Suspected cervical spine injury
- Intraoperative air embolism
- Initial management of a head injury
- Positioning of patients

Research and Scientific Enquiry: Knowledge

- Proposing a hypothesis
- Information search and literature review
- Research design, bias and appropriate methods of measurement
- Data collection and storage
- Good record keeping
- Common statistical tests and application of statistics
- Interpretation of results
- Responsibilities of investigator to the ethics committee
- Principles of writing a scientific paper
- Principles of oral or poster presentation of a paper
- Ethical principles
- The process of obtaining funding and writing a basic grant application

Research and Scientific Enquiry : Clinical-Skills

Post-graduates should acquire skills in scientific learning as a medical specialist

- Conducting and appraising literature searches
- Appraising journal articles including the application of statistics
- Applying the principles of evidence-based medicine to clinical practice
- Carrying out oral presentations and professional communication
- Presenting quality assurance exercises or projects
- Developing facilitation skills, such as tutoring in small-group learning and conducting

small-group meetings

Research and Scientific Enquiry : Attitudes

Post-graduates should develop an appreciation of and continue research and scientific

enquiry

- Valuing rigorous educational and scientific processes

- Distinguishing between practice with a sound scientific basis and that which requires

further objective assessment

- Committing to informed consent, confidentiality and all other ethical principles of

research

- Committing to continuing professional development

ATTITUDES INCLUDING COMMUNICATION SKILLS:

- To learn the attributes of a

- Medical expert

- Communicator

- Collaborator

- Manager

- Teacher

- Professional

- To practise good communication with colleagues, patients and others

- To work as a member of a team, but to assume responsibilities and/or delegate

duties as a team leader when necessary

- To commit to, and believe in, a culture of safety and ethical, high quality care

- To accept that medical knowledge and skills are not the only requirements of specialist practice

- To be aware of medicolegal obligations relating to medical practice

- To have insight into one's own limitations, abilities and areas of expertise

- To commit to continuing professional development

TRAINING IN RESEARCH METHODOLOGY, MEDICAL ETHICS, BIO ETHICS AND MEDICOLEGAL ASPECTS

Students are encouraged to attend workshops/CME's on Bioethics conducted by the

University and other reputed Institutions.

Medical ethics, bioethics, moral and legal issues, medical audit are part and parcel of the

curriculum and syllabus

Professionalism and Ethics

To commit to, and believe in the ethical and professional principles –

- The best care for the patient must be the principal driving force of practice
- *Patient autonomy*: patients' ability to determine their treatment
- *Beneficence*: the principle of "doing good" to patients
- *Non-maleficence*: the principle of not doing harm to patients
- *Fidelity*: faithfulness to one's duties and obligations. This principle underlies

excellence in patient care, confidentiality, telling the truth, a commitment to continuing

professional development and lifelong learning, and not neglecting patient care

- *Social justice*: the right of all patients to be fairly treated
- Duty to oneself in terms of personal health care, and maintenance of

competence

to practise

- *Accountability*: the anaesthetist is responsible for his/her actions
 - Honour and integrity in all conduct, including the generation and use of
- resources
- Respect for others, work as a team and practise conflict resolution
 - Appropriate response to clinical error

Patient Considerations

To commit to, and believe in, the rights of patients with respect to:

- Autonomy
- Confidentiality of the doctor-patient relationship
- Appropriate, excellent clinical care, including pre-operative assessment
- Informed consent
- Comprehension of the risks of anaesthesia techniques
- Appropriate care irrespective of race, culture, gender and socio-economic

status

- Research Considerations
- To value rigorous educational and scientific processes
- To commit to the ethical principles of research

4. TEACHING AND LEARNING METHODS:

- Introductory lectures
- Seminars, group discussions and symposia.

- Problem case discussion, before and after the conduct of the case
- Journal club presentation and discussion
- Presenting in Conferences and attendance in CME 's & Workshops
- Training in the Operation Theatres (both elective and emergency), Intensive

Care

Unit , Pre-anaesthetic clinic, Pain Clinics, Peripheral areas like Radiology (including

CT MRI and interventional radiology), Endoscopy suite and Interventional cardiology lab.

5. STRUCTURED TRAINING PROGRAMME

Duration of the Training -2 years

Orientation-

- To the hospital, wards, operation theatres and peripheral areas
- Anaesthesiology as a subject

Objectives for 1st year

- Orientation- To the hospital, wards, operation theatres and peripheral areas and also to

Anaesthesiology as a subject

- To observe and learn assessment and management of cases in ASA I and II in the specialities of

General Surgery, Orthopaedics, Obstetrics & Gynaecology and Recovery room.

The level of

supervision is slowly graded to facilitate independent management of general and spinal

anaesthesia.

Objectives for 2nd year

- General and regional anaesthesia (including epidural, nerve and plexus blocks) for ASA

III AND IV cases in the specialities of Paediatrics, ENT, Dental, ICU, Obstetrics, Eye,

Urology, Pain, Peripheral areas and Trauma.

- Should learn BLS, ACLS, PALS and ATLS .

- The post-graduate should be able to analyse a journal article and data and able to present

free papers in conferences, and should attend continuous education programme & workshops.

- Post-graduates should be able to anaesthetise under supervision cardiac, neuro, paediatric and all major cases.
- They should be able to anaesthetise all other elective and emergency cases independently and manage acute pain and make decisions and know how to organize mass casualty.

- Simulation based training

First year : Basic skills and orientation to broad speciality departments

General surgery 3months

Orthopaedics surgery 3months

Pre assessment clinic 1 month

ENT & Day care surgery 2 month

PACU/Recovery room/ casualty 1month

Obstetric & Gynecology: 2 month

Emergency Operation Theatre, Minor operation Theatre & Day care surgery postings on rotation basis.

2nd year multi speciality training

Paediatric surgery OT 1 month

Ophthalmic surgery 2 weeks

Radiology- USG, CT scan,MRI, IVP Radio oncology 2 weeks

Urology OT 1month

Plastic surgery OT 1month

Neuro surgery OT 1 month

Cardio thoracic surgery OT 1month

Dental/ Oro Facial Maxillary surgery 1month

ICU/IRCU/PACU/ 1month

vascular OT / Endocrine/ Geriatrics 1month

Laparoscopic Endoscopic & Laser Surgery)OT 1month

Pain Management 1month

Trauma/ Casualty/ organ harvesting (ICU) 1month

Emergency Operation Theatre, Minor operation Theatre & Day care surgery postings on rotation basis.

7. Evaluation of the candidates in both theory and practical aspects will help the candidate in improvement of his/her knowledge, skills and attitude.

8. COMPETENCY ASSESSMENT:

- **OVERALL:**

a) **Communication / commitment / Contribution / ()**

Compassion towards patients and Innovation () - 5 Marks

b) **Implementation of newly learnt techniques/skills ()**

- Number of cases presented in Clinical Meetings/
Journal clubs/seminars - 5 marks
- Number of Posters/Papers presented in Conferences/
Publications and Research Projects - 5 marks
- No. of Medals / Certificates won in the conference /
Quiz competitions and other academic meetings with details. - 5 marks

Total 20 Marks

PG CLINICAL COURSES

VIVA including Competency Assessment - 80 Marks (60 + 20)

Log Book - 20 marks

ASSESSMENT SCHEDULE IS AS FOLLOWS

Year of

study

Period Total

Max.20 marks

I year Upto Dec 10 marks Upto June 10 marks 20 Marks

II year Upto Dec 10 marks Upto June 10 marks 20 Marks

AVERAGE 20 Marks

9.PUBLICATION IN UNIVERSITY JOURNAL OF MEDICAL SCIENCES

Regarding submission of articles to the University Journal of Medical Sciences for all the PG Degree/Diploma courses, it is mandatory that the students have to submit atleast one research paper. Case Reports are not considered as Research Paper

10.THEORY EXAMINATION

Theory examination will comprise 3 papers.

Paper I: Applied Basic Sciences related to Anaesthesia, History of Anaesthesia and Physics in Anaesthesia

Paper II: Anaesthesiology

Paper III: Anaesthesiology including Critical Care and Recent Advances in Anaesthesia

Question paper pattern: PAPER I, II & III

I. Elaborate on 2 x 15 = 30

II. Write note on 10 x 7 = 70

Total =100 marks

11. PRACTICAL EXAMINATION

Particulars. Maximum Marks.

Clinical

Long Case 1 X 80 = 80 marks

Short case 2 X 35 = 70 marks

150

OSCE – 5 stations x 5 marks 25

Ward Rounds/Case Scenario - 5 X 5 marks 25

Viva-Voce 80

Log Book 20

Total 300

Minimum for Pass 150

Type of case Duration of case

examination by student

Duration of candidate

examination by

examiner

Marks

Morning session 200 marks (A)

Long case - 01 20 min 30 min 80

Short cases - 02 Each 10 min Each 15 min 35 X02 =70

Ward rounds /

Case scenario 05

Each 05 min Each 05 min 05X05= 25

OSCE 05 Each station 05 min --- 05X05= 25

Afternoon session 100 marks (B)

VIVA VOCE 04 ----- Each station 15 min 80

Log Book ----- 20

12. Log book

- A detailed log book should be maintained for the entire duration of the course. It should contain the following details.
- Procedures performed
- Journal clubs/Clinical Meetings
- Seminars/CME/Conferences
- Important cases discussed/presented
- The Post Graduates students shall maintain a record (Log) book of the work carried out by them and the training Programme undergone during the period of training.
- Periodic review of Log book have to be done in the Department by guide/HOD once in every 6 months

13. VIVA including Competency Assessment :

VIVA including Competency Assessment - 80 Marks (60 + 20)

1. Anaesthesia Machine, Gas cylinders, Equipments, Monitors
2. Drugs, IV fluids, Instruments, Procedure Tray
3. Investigation Charts, ECG, Xray, ABG, Capnograph, Ventilator Graphics, etc..
4. Resuscitation mannequin, Difficult airway mannequin, Defibrillator , Ventilator

14. OSCE

Five stations – Five minutes each station 5X5 =25 marks

1. Equipments, monitors, circuits, Vaporiser
2. Flow volume loops/ABG/ Capnographs/ Ventilator graphs /
3. Physiology, History relevant to Anaesthesiology
4. Drug Pharmacology, invasive procedure, Nerve block
5. Communication skill assessment- high risk informed consent, Cancellation/

consent for tracheostomy due to difficult intubation, Delayed recovery, Breaking bad news, etc.

15. REFERENCE BOOKS:

S.no. Name of the book Author

1. A synopsis of Anaesthesia J. Alfred Lee
2. Management of pain J.J Bonica
3. Anaesthesia for infants and children R.M Smith
4. A Practice of Anaesthesia Wylic and Churchill Davidson
- 5 Anaesthesia - Vol.I and II Miller
- 6 Clinical Anaesthesia Barash
7. Critical Care Joseph Civetta
- 8 Anaesthesia and neurosurgery Cottrell and Smith
- 9 Cardiac anaesthesia Kaplan
- 10 Paediatric anaesthesia Gregory
- 11 Pharmacology & Physiology in Anaesthetic practice Robert K.Stocling
- 12 Understanding Anaesthesia Equipment Dorsch and Dorsch
- 13 Anaesthesia for Co-existing diseases Robert K. Stoleting

**** Note : The editions are as applicable and the latest editions shall be the part of the syllabi**

16. JOURNALS

S. n o Name of Journal

- 1 . Anaesthesiology
- 2 . Anesthesia Analgesia
- 3 . Anaesthesia
- 4 . Anesthesia Intensive Care
- 5 . Canadian Journal of Anaesthesia
- 6 . British Journal of Anaesthesia
- 7 . Indian Journal of Anaesthesia
- 8 . Journal of Anaesthesiology Clinical Pharmacology