Contents

1. Introduction

Medical education is a continuum from undergraduate through internship to postgraduate medical training which is further divided into two stages: basic and higher professional training. Bangabandhu Sheikh Mujib Medical University Residency Program in Anesthesiology is a five year programme leading to MD in anaesthesia academic degree. The degree is accredited by the authority of the university after prescribed examination schedule. A total of five years residency programme divided into phase A (two years) followed by Phase-B (Three years).

The principles of residency programme:

1. Competency based
2. Structured
3. Planned
4. Evaluated
5. Supervised
6. Has clear objectives and
7. Allows time for study.

There is certain generic professional skill that includes:

1. Attitude and behavior
2. Communication
3. Audit
4. Presentation
5. Teaching
6. Management
7. Ethics and law

2. Objectives

A. General Objectives

1. To produce Anesthesiologists who will be knowledgeable, independent and clinically competent perioperative consultant physicians.

2. To produce Anesthesiologists' who will be acknowledged as role model for others to follow.
3. To provide structured training.
4. Would be eligible to be accredited with Doctor of Medicine (MD) degree offered by Bangabandhu Sheikh Mujib Medical University through definite evaluation procedure.

B. Specific objectives related to each training year:

1. Aim is to provide strong foundation for the latest updates and evolutionary challenges regarding clinical skills and abilities in anaesthesia, intensive care, palliative care and pain management.
2. Conducting safe anesthesia and peri-operative care for patients.
3. Understanding of core knowledge involving basic sciences, clinical measurement and monitoring as appropriate for safe anesthesia.
4. Knowledge regarding principles of acute and chronic pain management.
5. Establishing a professional team approach with patients, families, colleagues and staff.
6. Appraising evidence-based approaches to clinical problems relevant to anesthesia.
7. To make accountable for personal learning and self-education skills

3. Admission Requirements:

Medical graduate will be selected by competitive admission test.

A. Pre-requisites for admission in Phase - A

a) MBBS or equivalent degree as recognized by BMDC
b) One year of internship / in-service training
c) Completion of one year after internship / in-service training
d) BMDC registration

B. The applicants should not be above 45 years of age on enrolment.
C. Candidates for residency have to sit for a written MCQ-based admission test on Basic Medical Sciences and Faculty-based Topics.

4. Phase A (Core Training):

The two year core training will provide foundation training in anaesthesia which includes components of educational and training programme in the relevant fields. This programme will focus on developing core knowledge, skills and advanced specialty-specific training.

4. 1. Expected outcomes at the completion of Phase A training programme

A. Residency Year 1

At the end of the first year residency programme, the resident will be expected to:

1. Learn basic science related to Anaesthesia, Intensive Care Medicine, Pain and Palliative care medicine
2. Understand and practice the basic principles of safe anaesthesia and perioperative medicine
3. Attend BLS and ACLS course run by the department

B. Residency Year 2

Will be continuation of year 1

At the end of the 2nd year the resident will be expected to:

1. Learn and practice the basic principles of safe anaesthesia and perioperative medicine
2. Be exposed in clinical discipline like internal medicine, cardiology, nephrology, neurology, respiratory medicine, rheumatology, endocrinology, radiology and imaging,

physical medicine, emergency medicine, neurosurgery and traumatology.

3. To rotate in ICU for 3 months and understand the basic principles of intensive care medicine
4. Acquire knowledge in basic physics and clinical measurement relevant to anaesthesia, intensive care medicine, pain and palliative medicine. The department may also arrange biostatistics that are pertaining to the resident research work.
5. At the end of second year, the residents will undergo summative assessment organized by competent authority (Central Examination Department) of Bangabandhu Sheikh Mujib Medical University for Phase A final completion

4.2. Structure of training

i. The core programme consists of two years supervised training with formative assessment and feedback.
ii. Residents should attend the mandatory courses, workshop, etc as per curriculum requirements.
iii. Exposure to various specialty services in parallel with duties in general anaesthesia should be encouraged.

4.3. Training rotations:

Operating Theatre and outside operating theatre Rotation
During the two year period, residents will be placed for block rotation. This block will be as follows:

1. Basic Anaesthesia Rotation (three months)
2. Basic Anaesthesia Rotation (three months)
3. Cardiology and other medical allied sub-specialty
   a. Cardiology two months
   b. Rheumatology15 days
   c. Physical Medicine15 days
4. Medicine sub-specialty

   a. Neurology one month
   b. Respiratory Medicine one month
   c. Nephrology 15 days
   d. Endocrinology 15 days
5. Radiology, Neurosurgery, Traumatology & Emergency Medicine
   a. Radiology and Imaging one month
   b. Neuro Surgery one month
   c. Traumatology and Emergency Medicine one month
6. Regional blocks rotation
7. ICU rotation (basic ICU training)

5. Domains of Learning

5. i. Knowledge

1. It comprises pathophysiology, pharmacology and physics related to anesthesia, intensive care, palliative care and pain management.
2. Scientific basis of anesthesia analgesia and intensive care medicine
3. Journal Club
4. Morbidity and Mortality meeting
5. Case Presentations
6. Audit Meetings
7. Research Meeting
8. Anaesthesia Quality Care Issues
9. Guest Lecture (S)

5. ii) skill development

1. Elicit medical history, obtain relevant data, conduct appropriate physical examination, arrange investigations appropriately and formulate given care plan with reasoning.
2. Appropriately prepare the patient for anaesthesia/procedure
3. Recognize and manage the critical ill patient
4. Manage specific acute medical problems

5. Communicate with patients and their families in an emergency situation.

5. iii) Attitude

1. The well-being and restoration of health is paramount all the time
2. Sympathetic communication with patient and their relatives and good verbal contact with the fellow colleagues and other staff in the working area.
3. The privacy and confidentiality of patients and sanctity of life must be respected.

6. Teaching and learning

1. The teaching and learning will be take place using range of methods from didactic lecture for broad base knowledge to planned clinical experiences
2. Self directed learning in all aspects of daily activities within the department will be highly encouraged.

7. Record of Training:

The evidence requires confirming progress through training includes:

1. Details training plan agreed with weekly timetables and duty rota, number of procedure and outcome.
2. Confirmation of attendance at events in the educational programme, at departmental and interdepartmental meetings and other educational events.
3. Confirmation (certificates) of attendance at subject-based/skill- training/instructional course.
4. Recorded attendance at conference and meetings.
5. A properly completed logbook with entries capable of testifying to the training objectives which have been attained the standard of performance achieved.

6. Supervisor's reports on Observed performance in the workplace.

7 ii. Logbook

The Residents will maintain log book in which entries of academic professional work done during the period of training should be made on a daily basis from their enrolment to finish the residency programme and dully signed by supervisor / facilitator in each block. Completed and duly certified logbook will form a part of the application for appearing in phase final examinations.

7. iii. Portfolio

This is collection of evidence documenting trainee's learning and achievements during their training. The trainee takes responsibilities for the portfolio's creation and maintenance. It will form the basis of assessment of progression.

8. Assessments

The assessment for certification of the MD degree of the University is comprehensive, integrated and phase-centered attempting to identify attributes expected of specialists of for independent practice and lifelong learning and covers cognitive, psychomotor and affective domain. It keeps strict reference to the components, the contents ,the competencies and the criteria laid down in the curriculum.

Assessment includes both Formative assessment and summative examination (Phase **A final)**

8.1. Formative Assessment:

Formative assessment will be conducted throughout training phases. It will be carried out for tracking the progress residents, providing feedback, and preparing them for final assessment

(phase completion exams). there will be continuous (day –to – day) and periodic type of formative assessment.

i) **Continuous (day–to–day) formative** assessment in classroom and work place settings provides guide to a resident's learning and a faculty's teaching / learning strategies to ensure formative lesson / training outcomes.

ii) **Periodic formative assessment** is quasi-formal and is directed to assessing the outcome of a block placement or academic module completion. It is held at the end of block placement of Academic Module

iii) **Academic Module Units of the Academic Curriculum.**

End of Block Assessment (EBA) is a periodic formative assessment and is undertaken after completion of each training block, assessing knowledge, skills and attitude of the residents. Components of EBA are written examination, Structured clinical assessment (SCA), medical record review, logbook review and portfolio assessment. Incomplete block training must be satisfactorily completed by undergoing further training for the block to be eligible for appearing in the next phase completion examination.

8.2. Summative (Phase A final) Examination:

Phase final examination will have following components:

- Written examination (SAQ /SEQ)
- Clinical examination :
  - Long case (1)
  - Short cases (4)
  - Structured Clinical Assessment (SCA-10)

9. Supervision and Training monitoring

As training progresses the resident should have the opportunity for increasing autonomy consistent with safe and effective care for the patient. Residents will at all times have a

supervisor, responsible for overseeing their education and training.

Supervisors are responsible for supervision of learning throughout the program to ensure patient safety, service delivery as well as the progress of the resident with learning and performance. They set the lesson plants based on the curriculum, undertaken appraisal, review progress against the curriculum, give feedback on both formative and summative assessments and ensures proper recording and signing of the logbook. The residents are made aware of their limitations and are encouraged to seek advice and receive help at all times.

The Course coordinator of each department coordinates all training and academic activities of the program in collaboration with the course manager(s).

The course director of each faculty directs guides and manages curriculum activities under his/her jurisdiction and is the person to be reported to for all events and performances of the residents and the supervisor.

10. Curriculum Implementation, Review and updating

Both Supervisors and residents are expected to have a good knowledge of the curriculum and should use it as a guide for their training programme. Since Anaesthesia has historically been rapidly changing specialty the need for review and up-dating of curriculum is evident. The curriculum is specifically designed to guide an educational process and will continue to be the subject of active redrafting to reflect changes in both Anaesthesia and educational theory and practice. Residents and supervisors are encouraged to discuss the curriculum and to feedback on content and issue regarding implementation with the course director.

Review will be time tabled to occur annually for any minor changes to the curriculum.

11. Syllabus

The aim of the syllabus for phase A training is to guide the residents to acquire broad based knowledge on Anaesthesia before entering the phase B specialty-specific training. Patients present themselves with problems and it is the problem that needs solving. A specialist who has broad knowledge of Anaesthesia will be able to solve the problem in a better way. So the ultimate objective of phase A training is to produce a knowledgeable, competent, altruistic specialist with up to date background knowledge. By the end of phase A training the resident should be able to :

a. Assess the patient
b. Formulate appropriate investigations and accurately interpret investigation reports
c. Communicate about the anaesthetic technique and procedure
d. Institute appropriate management recognizing indications, contraindications and side effects of common clinical conditions:

On this background it is expected that residents will be able to (i) acquire knowledge (ii) acquire skill (iii) develop attitude

11. i. Learning objectives:

A. **Clinical skills**

- Elicit the history and obtain other relevant data
- Conduct an appropriate physical examination
- Plan and arrange investigations appropriately

B. **Procedural skills**

- Prepare the patient for anaesthesia/procedure
- Competently perform the procedure /anaesthesia
- Provide care following the procedure / anaesthesia

C. **Management of Acute medical problems**

- Recognize and manage the critical ill patient
- Manage specific acute medical problems
- Communicate with patients and their families in an emergency situation.

11.ii. Outline of core syllabus:

Basic sciences

Resident are required to revise the relevant subjects in the basic sciences related to anaesthesia, intensive care and pain medicine. They are expected to apply basic science principles in clinical practice.

A. Contents Anatomy :

Anatomy related to anaesthesia, intensive care and pain management will be distributed in Phase A only.

a. Anatomical organization of human body
   Cells and tissues
b. Respiratory system: Oral cavity, nose, pharynx, larynx, tracheao-broncheal trees, Airway and respiratory tract, blood supply, innervations, Pleura, lungs and mediastinum, Diaphragm, muscle of respiration with their innervations,The thoracic inlet and 1st rib.
c. Cardiovascular system: Pericardium, heart, chambers, valves, conducting system, blood and nerve supply, Fetal and materno - fetal circulation, Great vessels, peripheral arteries and veins.
d. Nervous System: Brain and spinal cord with its covering, major ascending and descending pathways, cerebrospinal fluids and its circulation. Spinal nerves, dermatomes Cervical plexus, brachial plexus, nerves of arm, intercostals nerves, lumber plexus, nerves of the abdominal wall, sacral and coccygeal plexuses, and nerves of the lower limbs

e. **Autonomic nervous system:** Sympathetic and parasympathetic innervations, stellate ganglion, trigeminal ganglion and caeliac plexus, Cranial nerves

f. **Vertebral Column:** Cervical, Thoracic, Lumbar and Sacrum, Ligaments of vertebral column

g. **Areas of special interest:**
Base of the skull, the thoracic inlet, clavicle and first rib, Intercostals spaces, Coronary circulation,Antecubital fosse, Large veins of neck, upper arms and legs, Triangles of neck, Femoral triangle,Orbit.

h. **Surface anatomy on cadaver (skills):** Structures in antecubital fossa, Structures in axilla especially brachial plexus, Large vessels and nerves (plexus) of neck, upper arms, legs and inguinal region, Landmarks for tracheostomy and cricothyrotomy.

i. **Relevant anatomy of imaging:** The residents will be able to
1. describe the anatomy of the x- ray chest (P/A, A/P and lateral view
2. explain the anatomy of x- ray of abdomen / extremity/ skull/neck
3. understand the anatomy of echocardiogram, vascular ultrasound, angiogram, CT-scan and MRI.

Physiology and Bio-chemistry

- Physiology and Biochemistry related to anaesthesia, intensive care and pain management will be distributed in Phase A only (duration of seven blocks) and carried out by the Department of Physiology and Department of Biochemistry under the supervision of Faculty of Basic Science.

(a) Physiology

General: Organization of the human body and control of internal environment Cell membrane characteristics; receptors Body fluids and their constitution Capillary dynamics and interstitial fluid Osmolarity: osmolality, partition of fluids across membranes

Haemotology: Red blood cells: haemoglobin and its variants, Blood groups, Haemostasis and coagulation, White blood cells, Platelets and its function in haemostasis.

Muscles: Action potential generation and its transmission, neuromuscular junction and its transmission Muscle types

Heart and circulation: Cardiac muscle contraction, The cardiac cycle, pressure and volume relationships, Rhythmicity of the heart, electrocardiogram of the heart and physiology of arrhythmias, Neurological and humoral control of blood pressures, blood volume and blood flow, Peripheral circulation: capillaries, vascular endothelium and arteriolar smooth muscles, Characteristics of special circulation including pulmonary, coronary, cerebral, renal and portal, Fluid challenge and heart failure.

Renal system: Blood flow, glomerular filtration and plasma clearance,Tubular function and urine formation, Assessment of renal function, Regulation of fluid and electrolyte balance, Regulation of acid base balance, Pathophysiology of acute renal failure

Respiration: Mechanics of respiration: ventilation / perfusion abnormalities, Regulation of respiration, Gaseous exchange: O_2 and CO_2 transport, effect of altitude, hypoxia and hypercarbia, Pulmonary ventilation: volumes, flows, dead space, effect of IPPV on lung mechanics

Nervous System: Function of nerve cells and synaptic mechanisms, The brain: functional divisions – cortex, midbrain, medulla, limbic system, brain stem and cerebellum, Intracranial pressure: cerebrospinal fluid, blood flow. Maintenance of posture, Autonomic nervous system,Neurological reflexes -sleep, wakeful

and unconscious states, electroencephalogram, Motor function: spinal and peripheralPain: nociception, afferent sensory and efferent neuromodulatory pathways; peripheral and central mechanisms and response to nociception, Spinal cord: blood supply, effects of spinal cord section at different level

Liver: Metabolic functions of liver, blood supply

Gastrointestinal: Gastric function: secretions, nausea and vomiting, Digestive functions

Endocrinology: Mechanisms of hormonal control: feedback mechanisms, effects on membrane and intracellular receptors, Hypothalamic and pituitary function, Adrenocortical hormones, Adrenal medulla, Pancreas, pancreatic enzymes and hormone (Insulin), Thyroid and parathyroid hormones and calcium homeostasis

Pregnancy: Physiological changes associated with pregnancy, Functions of the placenta: dynamics of placental transfer

Topics of special interest: Stress response, Fasting volume and pH of stomach content, Postoperative nausea and vomiting, Natural sleep and arousal, consciousness, unconsciousness

(b) Biochemistry

Body fluids: Types and physicochemical properties of different body fluids, Acid base balance and buffers Ions e.g. Na+, K+, Ca++, Mg++, Cl-, HCO3-

Metabolism: Metabolic pathways and bioenergetics, enzymes, coenzymes and catalysts Nutrients: carbohydrates, fats, proteins, vitamins and minerals, Metabolic pathways, energy production and enzymes, metabolic rate, Hormonal control of metabolism: regulation of plasma glucose, response to trauma, Physiological

alterations: starvation, obesity, exercise, stress response, Body temperature and its regulation

Nutritional substances: Carbohydrates, lipid, proteins and their metabolism, intermediary metabolic pathways. Metabolism of minerals.

DNA and RNA: Nucleic acids and nucleoproteins

Hormones: Insulin, Adrenaline, noradrenalin, corticosteroids, thyroid and pituitary hormones, Prostaglandins, prostacyclines and thromboxanes. Biochemical changes in diseases, Stress response, circulatory arrest, trauma, inflammation, dehydration, near drowning, Assessment of biochemical functions. Biochemical tests to assess respiratory, circulatory, renal and liver and hormonal functions.

(c) Pathology: Pathology related to anaesthesia, intensive care and pain management will be distributed in Phase A only

1. Acute and Chronic inflammation: Acute inflammation, Chemical medications of inflammations, Outcome of acute inflammation, Morphologic pattern of acute inflammation, Chronic inflammation, Systemic effects of inflammations
2. Tissue renewal and repair; Regeneration, healing and Fibrosis: Definition, Control of normal cell proliferation, Mechanism of tissue regeneration, Extracellular matrix and cell matrix interaction, Repair by healing, scar formation and fibrosis, Cutaneous wound healing, Fibrosis
3. Haemodynamic disorder, Thromboembolic disease & Shock: Oedema, Hyperemia, congestion, haemorrhage, Haemostasis & thrombosis, Embolism, Infarction, Shock, Pathogenesis of septic shock, Porphyria
4. Environmental and Nutritional pathology: Obesity and systemic disease,

5. Acute lung injury: Pulmonary oedema, Classification, Causes: haemodynamic oedema, oedema due to alveolar injury, oedema of undetermined injury, oedema caused by micro vascular injury.
6. Acute Respiratory Distress Syndrome: Causes, Pathogenesis, Clinical Course
7. Acid aspiration syndrome: Aetiology, Causes, Clinical features
8. Liver: Drug & toxin induced liver disease, Jaundice and cholestasis, Bilirubin and bile formation, Causes of jaundice, Alcoholic liver disease
9. Heart failure & IHD: Cardiac hypertrophy and myopathy, Pathophysiology and progression of failure, Left-sided heart failure, Right-sided heart failure, Congenital heart disease, Left to right shunts, Right to left shunts, Obstructive congenital anomaly, Hypertensive heart disease, Valvular heart disease-causes, pathogenesis
10. Renal: Acute & Chronic failure, Glomerulonephritis, ATN, Nephritic syndrome

(d). Microbiology and Immunology:

Microbiology and immunology related to anaesthesia, intensive care and pain management will be distributed in Phase A only (duration of seven blocks) and carried out by the Department of Microbiology.

Infection control:

Antimicrobial therapy, Antimicrobibial resistance, Infection control and health care associated infection, Sterilization of anaesthetic equipment, Anaphylaxis

Clinical science: Structure and function of reticuloendothelial system, The complement system: structure and function, Principles of hypersensitivity, Principles of transplantation

Microbiology / Immunological investigation and its interpretations: Blood / Sputum / urine culture Fluid analysis: pleural, cerebro-spinal fluid, ascitic fluid, Urinalysis and urine microscopy, Auto-antibodies

(e). Pharmacology:

Pharmacology related to anaesthesia, intensive care and pain management will be distributed in Phase A only (duration of seven blocks) and carried out by the Department of Pharmacology under the supervision of Faculty of Basic Science.

(i) Basic pharmacology:

Types of intermolecular bonds, Laws of diffusion, diffusion of molecules through membranes, Solubility and partition coefficients, Ionization of drugs, Drug isomerism, Protein binding, Oxidation and reduction

Mode of action of drugs: Type and nature of receptor, Mechanism of action, occupancy, Dynamics of drug-receptor interaction, Agonists, antagonists, partial agonists, inverse agonists, Efficacy and potency, tolerance, Metabolic pathways, enzymes, drug- enzyme interactions, Enzyme inducers and inhibitors, Ion channels:types: relation to receptors.Gating mechanisms, Signal transduction: cell membrane/receptors/ion channels to intracellular,molecular targets, second messengers, Action of gases and vapours, Osmotic effects. pH effects. Adsorption and chelation, Mechanisms of drug interactions: Inhibition and promotion of drug uptake. Competitive protein binding. Receptor, inter-actions, Effects of metabolites and other degradation products.

Pharmacokinetics and pharmacodynamics: Drug uptake from: gastrointestinal tract, lungs, transdermal, subcutaneous, IM,IV, epidural, intrathecal routes, Bioavailability, Factors determining the distribution of drugs: perfusion, molecular size, solubility, protein binding, The influence of drug formulation on disposition, Distribution of drugs to organs and tissues: Body compartments, Influence of specialized membranes: tissue binding and solubility, Materno-fetal distribution, Distribution in CSF and extradural space, Modes of drug elimination: Direct excretion, Metabolism in organs of excretion: phase I & II mechanisms, Renal excretion and urinary pH, Non-organ breakdown of drugs, Pharmacokinetic analysis: Concept of a pharmacokinetic compartment, Apparent volume of distribution, Clearance, Clearance

concepts applied to whole body and individual organs, Simple 1 and 2 compartmental models: concepts of wash-in and wash-out, curves, Physiological models based on perfusion and partition coefficients, Effect of organ blood flow: Fick principle, Pharmacokinetic variation: influence of body size, sex, age, disease, pregnancy, anaesthesia, trauma, surgery, smoking, alcohol and other drugs, Effects of acute organ failure (liver, kidney) on drug elimination, concentration-effect relationships, hysteresis

Pharmacogenetics:
familial variation in drug response, adverse reactions to drugs: hypersensitivity, allergy, anaphylaxis, anaphylactoid reactions

(ii) Systematic Pharmacology
Anaesthetic gases and vapours, Hypnotics, sedatives and intravenous anaesthetic agents Simple analgesics, Opioids and other analgesics; and opioid antagonists, Non-steroidal anti-inflammatory drugs, Neuromuscular blocking agents and anticholinesterases, Drugs acting on the autonomic nervous system: cholinergic and adrenergic agonists and antagonists, Drugs acting on the heart & cardiovascular system (including inotropes, vasodilators, vasoconstrictors, antiarrhythmics, diuretics), Drugs acting on the respiratory system (including respiratory stimulants & bronchodilators), Antihypertensive, Anticonvulsants, Anti-diabetic agents, Diuretics, Antibiotics, Corticosteroids and other hormone preparations, Antacids. Drugs influencing gastric secretion and motility, Antiemetic agents, Local anaesthetic agents, Plasma volume expanders, Antihistamines, Antidepressants, Anticoagulants, Vitamin K, B12 and thiamine.

Clinical Training in seven blocks rotation

1. Basic Anaesthesia Rotation (Block-1 and 2)

This rotation will consist of six months duration (two blocks) and aims to give a foundation for the ongoing development of clinical skills and abilities in anaesthesia, pre and post-operative care. This provides a comprehensive description of resident's aims, learning objectives and assessment.

Aims

The overall aim of six month basic training is for residents to develop a foundation for the ongoing development of clinical skills and abilities in anaesthesia. This includes the following:

- Conducting safe general anaesthesia and perioperative care for patients where risk is considered low.
- Understanding anatomy, physiology and biochemistry, pharmacology, clinical measurement and monitoring as applied to anaesthesia.
- Understanding the principles of acute pain management.
- Establishing a professional team approach with patients, families, colleagues and staff.
- Appraising evidence-based approaches to clinical problems.

Learning objectives

These objectives are what that residents need to learn. They are presented as:

- Knowledge
- Clinical management ("knows how") that applies knowledge and clinical skills to manage the patient.
- Skills (clinical and technical).
- Attitudes and behaviour.

Knowledge-basic sciences

Basic Science class other than Biostatistics and physics and clinical measurement will be conducted by the Basic Science Faculty during the two years period. The residents are required to revise the relevant subjects in the basic sciences as core topics stated in their curriculum and expected to apply basic science principles in clinical practice.

Knowledge: Physics, Clinical measurement and monitoring Residents are required to 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

Physics

Mathematical concepts: relationships and graphs, Concepts only of exponential functions and logarithms: wash-in, wash-out and tear away, Basic measurement concepts: linearity, drift, hysteresis, signal: noise ratio,static and dynamic response, SI units: fundamental and derived units

Other systems of units where relevant to anaesthesia (e.g. mmHg, bar,atmospheres), Simple mechanics: mass, force, work and power, Heat: freezing point, melting point, latent heat, Conduction, convection, radiation, Mechanical equivalent of heat: laws of thermodynamics, Measurement of temperature and humidity, Colligative properties of fluid, Physics of gases and vapours, Absolute and relative pressure, The gas laws; triple point; critical temperature and pressure, Density and viscosity of gases, Laminar and turbulent flow; Poiseuille's equation, the Bernoulli principle, Vapour pressure: saturated vapour pressure, Measurement of volume and flow in gases and liquids, The pneumotachograph and other respirometers, Principles of surface tension

Basic concepts of electricity and magnetism, Capacitance, inductance and impedance, Amplifiers: band width, filters, Amplification of biological potentials: ECG, EMG, EEG, Sources of electrical interference, Processing, storage and display of physiological measurements, Bridge circuits,Basic principles and safety of lasers, Basic principles of ultrasound and the Doppler effect, Principles of cardiac pacemakers and defibrillators, Electrical hazards: causes and prevention, Electrocution, fires and explosions, Diathermy and its safe use, Principles of pressure transducers, Resonance and damping, frequency response, Measurement and units of pressure, Direct and indirect methods of blood pressure measurement, Principles of pulmonary artery

and wedge pressure measurement, Cardiac output: Fick principle, thermodilution, Measurement of gas and vapour concentrations, (oxygen, carbon dioxide, nitrous oxide, and volatile anaesthetic agents) using infra-red, paramagnetic, fuel cell, oxygen electrode and mass spectrometry methods, Measurement of pH, pCO2 , pO2, Measurement CO2 production/ oxygen consumption/ respiratory quotient, Simple tests of pulmonary function e.g. peak flow measurement, spirometry, Capnography, Pulse Oximetry, Measurement of neuromuscular blockade, Measurement of pain

Applied clinical measurement

- Liquid, gas and vapours
  - i. Definition
  - ii. Different forms of liquids, gases and vapours
  - iii. Difference between the states
  - iv. Gas laws
  - v. Why and how gas affects anaesthesia?
  - vi. Risks and dangers of compressed gases.
  - vii. Measurement of flow of gases and liquids
  - viii. Measurement of cardiac output (including Fick's principle)
  - ix. Manufacture of different anaesthetic gases (O_2, N_2O, CO_2 & compressed air).
  - x. Flow characteristics of

1. Gases through endotracheal and tracheostomy tubes
2. Fluids through spinal needles

Pressure

- Definition
- Role in Anaesthesiology
- Measurement of pressure, in vivo and in vitro
- Transducer (all about transducers)
- Testing the cylinders for compressed gases.

Energy

- Definition
- Forms of energy

- Electrical hazards and safety in the heater.
- Flow of electrons, measurement of electricity and use of electricity.
- Electrical circuits, grounding and neutrality, their importance, etc.
- Thermal and other forms of energy, including nuclear.
- Radiation, use of radiation in medicine, radiation safety.

Sound

- Use of sound in medicine
- Ultrasound, echo, etc

Temperature & humidity

- Units of measurement
- Definition
- Measurement of temperature
- Measurement of humidity (Absolute & relative)
- Humidifiers
- Patient cooling / warming

Units of measuremènt

- Sl units
- Other units (simplified)

Medical gas

Sources

- Compressed cylinders
- Gas pipeline

- O_2 and N_2O manufacture and storage, risk and hazards
- Compressed medical air

Ventilators:

- Basic principles
- Humidity, humidification
- Basic modes of ventilation and terminologies

Anaesthesia machines

- Basic configuration
- Flow principles
- Alarms
- Ergonomics
- Pre use anaesthesia machine check

Environment and anaesthesia

- OT pollution
  i. Types and nature of pollution
  ii. Preventing pollution
- Anaesthetic gas scavenging

Waste disposal

- Types of medical waste
- Disposal of waste
- Incineration

Breathing circuits, components of breathing circuits and their geometry, intra circuit gas mixing, CO_2 absorption.

Monitoring

- Patient monitoring: Principles, calibration of equipments, fallacies & limitations
- Equipment monitoring
- Equipment calibration and pre-use check

2. Filters in anaesthesia:

- Blood filtration: Pall, Swank, etc

- Filters in breathing circuit
- Efficiency of filters, pore size, filtration pressure, flow rates, etc.

Safety in anaesthesia
- Anaesthesia record.
- Minimum monitoring standards.

Biostatistics:

Knowledge:

Data Collection:

Simple aspects of study design, Defining the outcome measures and the uncertainty of measuring them, The basic concept of meta-analysis and evidence based medicine, Types of data and their representation. The normal distribution as an example of parametric distribution, Indices of central tendency and variability *Deductive and inferential statistics* Simple probability theory and the relation to confidence intervals, The null hypothesis, Choice of simple statistical tests for different data types, Type I and type II errors.

Knowledge

Residents are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anaesthesia management of uncomplicated patients (for example ASA 1 and 2). These include the following:

Operating theatre suite environment

1. Principles of management of an operating theatre suite.
2. Electrical safety, and infection and pollution control in operating rooms and sharps handling policies.
3. Services and equipment in operating rooms and post-anaesthesia recovery room.
4. Requirements of other anaesthesia environments outside operating rooms.

5. Principles of staffing the operating room, including assistants to anaesthetist.
6. Informed consent.
7. Regulations relating to restricted drugs as per national or state guidelines.
8. Principles of occupational health and safety such as lifting and positioning patients, infection control
9. Dealing with an intra-operative critical incident / death

Preoperative assessment

1. Appropriate history taking.
2. Pre-anaesthesia assessment
3. Physical examination including airway assessment, respiratory, cardiovascular and neurological examinations.
4. Referral to other specialists when necessary.
5. Establishment of a rapport with the patient to provide reassurance, disclosure of risk, information, and discussions on complementary medicine and informed consent
6. Communication and consultation skills
7. Pulmonary function tests
8. Measurement of cardiovascular function
9. Interpretation of common radiology and imaging scans and investigations.
10. Other investigations as appropriate.

Conducting anesthesia

1. Applied cardiac and respiratory physiology.
2. Applied pharmacology and variability in drug response.
3. Selection and planning of the anaesthesia technique.
4. Decision-making relating to postponement or cancellation of surgery.
5. Routine inhalation and intravenous inductions.
6. Maintenance of anaesthesia.
7. Correct use of anaesthesia delivery systems.

8. Application and interpretation of monitored variables and neuromuscular blockade.
9. Use of muscle relaxants.
10. Application of mechanical ventilation.
11. Management of the airway and intra-operative complications as standard algorithm
12. Common regional anaesthesia techniques (for example, epidural and spinal anaesthesia and upper limb blocks).
13. Maintenance of accurate records.

Postoperative care

1. Safe recovery transport and handover in the post-anaesthesia recovery room.
2. Postoperative consultations.
3. Management of postoperative pain, fluid requirements, nausea and vomiting.

Skills-Technical skills

Residents will provide safe anaesthesia care and pain management for uncomplicated patients undergoing non-major surgery.

In providing anaesthesia care, residents should be competent in certain technical skills, such as the following:

1. Aseptic techniques.
2. Venous access.
3. Maintenance of an adequate airway.
4. Rapid sequence induction.
5. Basic and Advanced cardiac life support. (Mandatory to submit CPR training certificate during Phase A Final Exam)
6. ECG recording and interpretation.

Resident should be familiar with clinical protocols ("drills") in the delivery of safe anaesthesia care, and be able to respond accordingly for crisis management. These include the following:

1. Checking of the anaesthesia delivery system
   a. Anaesthesia machine

   b. Manual resuscitator
2. Airway assessment
   a. Mallampati grading and other scoring systems
3. Identification and management of the following problems, which are commonly acute and may be life-threatening:
   a. Laryngospasm.
   b. Bronchospasm.
   c. Hypertension.
   d. Hypotension.
   e. Arrhythmias.
   f. Myocardial Ischaemia.
   g. Hypoxia.
   h. Hypercarbia.
   i. Hypoventilation.
   j. Hyperventilation.
   k. Anaphylaxis.
   l. Residual neuromuscular blockade.
   m. Inadequate neuraxial blockade.
   n. convulsion
4. Inadequate airway: failed intubation, obstructed airway, oesophageal intubation, endobronchial intubation, and unplanned extubation.

Attitudes and behaviors

Residents are expected to develop the attitudes and behaviours which are obligatory in specialist medical practice.

2. Composite block-1 (block-3)

In this composite block, residents are placed in Radiology and Imaging for one month, Neuro-Surgery for one month and Traumatology and Emergency Surgery for one month.

Aims

The residents will be given the opportunity to become intermediate level competent in:

a. Establishing a differential diagnosis for patients presenting with clinical features of neurological disease and trauma by appropriate use of history, clinical examination and investigations.
b. Applying knowledge derived from the appropriate basic sciences, which are relevant to Neurosurgery, Traumatology and Radiology.
c. Developing a management plan for the "whole patient" and have sound knowledge of the appropriate treatment including health promotion, disease prevention and long-term management

Objectives

At the end of the training the resident will have achieved the following

Knowledge

a. To have acquired knowledge to recognize when specialist opinion is indicated
b. To have acquired the knowledge necessary for managing patients related to the rotation.

Skills:

a. Taking proper history, perform physical examinations of patients encountered to this rotation.
b. Performing necessary investigations and its interpretation
c. Performing special procedures related to the rotation.

Attitude:

a. The resident will demonstrate a high standard of ethical and professional behaviour in their work.
b. They will have the ability to work as part of a multi-disciplinary team and to show the appropriate tact, empathy and communication skills in dealing with patients and colleagues.

Radiology and Imaging:

In this rotation, residents of phase A are placed in Radiology and Imaging Department of for a period of one month.

Contents:

A) Safety Issues/Requirements:

a. Radiation hazard and appropriate precaution
b. Dye allergies
c. Embolization
d. Examination for magnetic resonance imaging (MRI)
   i. Monitoring
   ii. Equipment options in the MRI suite
   iii. General anesthetic/sedation techniques

B) Knowledge of and indications for the following common studies and interpretation.

1. Plain radiology

a. X-ray chest
b. X-ray Spine (Cervical, Thoracic, Lumbo-sacral)
c. Skull
d. Others

2. Contrast Radiography

a. IVU
b. others

3. Computed Tomography (CT)

a. Brain, C-spine, Thoracic and lumbar spine
b. Soft tissue

4. Magnetic Resonance Imaging (MRI)

a. Brain, Spine
b. Soft tissues

5. Use of Ultrasound: basic principles

a. central venous access

b. neural blockade

6. Medical precautions in Radiology

1. Contrast and allergic reactions
2. Pregnancy and shielding
3. The unstable patient – transfer and monitoring in radiology

Traumatology and Emergency Medicine:

In station residents are placed in the Emergency Department for a period of one month.

Contents:

1. Acquire ability to evaluate & triage the trauma patient
2. Performance and interpretation of primary and secondary survey
3. Emergency airway management
   a. Non-invasive airway management
   b. Invasive airway management: Cricothyrotomy / tracheostomy /minitracheotomy
4. Establishing IV access
   a. Peripheral
   b. Central venous access
5. Central venous pressure monitoring
6. Immediate specific treatment of life-threatening illness or injury, with special reference to abdominal and thoracic trauma
7. Fluid resuscitation and blood transfusion
8. Disaster management
   a. Acquire ability to evaluate & triage the patient
   b. Performance and interpretation of primary and secondary survey
9. Recognition and management of hypovolemic shock
10. Insertion of chest drain
    a. pleural fluid
    b. pneumothorax

11. Management of cervical spine injuries
12. Principles of the safe transfer of traumatized patients

Neurosurgery Rotation:

In this rotation, residents are placed in neuro-surgery department for a period of one month.

Contents

1. History taking and physical examination (Neurological examinations)
   a. Motor and sensory
   b. Cranial nerves
   c. Fundoscopy

2. Special Neurological skill
   a. Glasgow coma scale
   b. Brain stem death
   c. Interpretation of Neurological investigations- CT, MRI, X-ray spine

3. Management of Head injury
   a. Extradural haemorrhage
   b. Sub-dural haemorrhage
   c. Intracranial haemorrhage
4. Transportation of a patient with neurological trauma / unconscious patient
5. Management of intracranial space occupying lesion, cerebral oedema and raised ICP
6. Management of Spinal cord injuries
   a. Cervical
   b. Thoracic
   c. Lumber
7. Management of unconscious patients

8. Expectation of a neurosurgeon from the Anaesthesiologist during neurosurgical operation
9. Neurological examinations of a patients with Low back pain and cervical pain
10. Ordering Neuroradiology for patient with Neurological diseases
11. Neurological monitoring used in Neuro Surgery

3. Composite Block-2 (block-4)

In this block, residents are placed in Cardiology for two months and Physical Medicine for 15days and Rheumatology for 15 days.

Cardiology

A framework for the knowledge required for specific conditions is set out below, and should continue to improve with time in line with the principles of a spiral curriculum:

1. Definition
2. Pathophysiology
3. Epidemiology
4. Features of History
5. Examination findings
6. Differential Diagnosis
7. Investigations indicated
8. Detailed initial management and principles of ongoing management (counselling, lifestyle, medical, surgical, care setting and follow up)
9. Complications
10. Prevention (where relevant to condition)

Competencies

1. Recognize when specialist Cardiology opinion is indicated
2. Outline risk factors for cardiovascular disease
3. Counsel patients on risk factors for cardiovascular disease

4. Outline methods of smoking cessation of proven efficacy (see below)

Common and / or important Cardiac Problems:

1. Arrhythmias
2. Ischaemic Heart Disease: acute coronary syndromes, stable angina, atherosclerosis
3. Heart Failure
4. Hypertension – including investigation and management of accelerated hypertension
5. Valvular Heart Disease
6. Endocarditis
7. Aortic dissection
8. Syncope
9. Dyslipidaemia

Clinical Science:

1. Anatomy and function of cardiovascular system
2. Physiological principles of cardiac cycle and cardiac conduction
3. Homeostasis of the circulation
4. Atherosclerosis
5. Pharmacology of drug: beta blockers, alpha blockers, ACE inhibitors, nitrates, anti-hypertensives
6. ARBs, anti-platelet agents, thrombolytic, inotropes, calcium channel antagonists, potassium channel activators, diuretics, anti-arrhythmic, anti-coagulants, lipid modifying drugs.

6. Composite Block-3 (block-5)

In this block, residents are placed in Nephrology for 15days, Neurology for one month, Respiratory Medicine for one month and Endocrinology for 15 days.

Nephrology:

The Phase A resident will be placed in the Nephrology Unit for a period of 15days.

Aims

The residents will be given the opportunity to become intermediate level competent in:

1. Establishing a differential diagnosis for patients presenting with clinical features of kidney disease by appropriate use of history, clinical examinations and laboratory investigations.
2. Applying knowledge derived from the appropriate basic sciences, which are relevant to nephrology.
3. Developing a management plan for the "whole patient" and have sound knowledge of the appropriate treatment including health promotion, disease prevention and long-term management

Objectives

At the end of the training the resident will have achieved the following

Knowledge

To have acquired knowledge to recognize when specialist nephrology opinion is indicated To have acquired the knowledge necessary for managing patient in perioperative period To discuss the steps of case & history taking in nephrology clinical syndromes To have acquired knowledge for managing ICU admitted patient requiring immediate nephrology care
To identify the principles of peritoneal and haemodialysis To identify the management of cases of renal transplantation To identify patients who are at high risk of renal dysfunction in event of illness or surgery, and institute preventative measures

Skills:

a. Taking proper history, perform physical examinations of patient related to kidney diseases

b. Performing peritoneal and haemodialysis
c. Differentiate pre-renal failure, renal failure and urinary obstruction

Attitude:

The resident will demonstrate a high standard of ethical and professional behaviour in their work.They will have the ability to work as part of a multi-disciplinary team and to show the appropriate tact, empathy and communication skills in dealing with patients and colleagues.

Contents:

Essential areas of training i.e. where care of patients with these conditions should occur during clinical placements (definition, pathophysiology, epidemiology, history taking, examination findings, differential diagnosis, investigations indicated, detailed initial management and principles of ongoing management (counseling, lifestyle, medical, surgical, care setting and follow up), complications and prevention.

Course Topics:

- Basic science & nephrology.
- Radiological investigation use in nephrology unit
- Acute kidney injury.
- Systemic conditions & the kidney.
- Chronic kidney diseases.
- Haemodialysis.
- Peritoneal dialysis & other modalities.
- Haemodialysis guidelines.
- Renal transplantation.
- Disturbances of potassium, acid/base, and fluid balance (and appropriate acute interventions)
- Measurement of renal functions

Respiratory Medicine

In this rotation, the Phase A resident will placed in the Respiratory Medicine Unit for a period of one month.

Aims

The residents will be given the opportunity to become intermediate level competent in:

1. Establishing a differential diagnosis for patients presenting with clinical features of respiratory disease by appropriate use of history, clinical examinations and laboratory investigations.
2. Applying knowledge derived from the appropriate basic sciences, which are relevant to respiratory medicine.
3. Developing a management plan for the "whole patient" and have sound knowledge of the appropriate treatment including health promotion, disease prevention and long-term management

Objectives

At the end of the training the resident will have achieved the following

Knowledge

To have acquired knowledge to recognize when specialist respiratory opinion is indicated To have acquired the knowledge necessary for managing patient in perioperative period To discuss the steps of case & history taking in respiratory system related clinical syndromes To have acquired knowledge for managing ICU admitted patient requiring immediate respiratory care To identify the principles of bronchoscopy and bronchial lavage To identify patients who are at high risk of respiratory dysfunction in event of illness or surgery, and institute preventative measures

Skills:

a. Taking proper history, perform physical examinations of patient related to respiratory system related diseases

b. Performing bronchoscopy and bronchial lavage Perform and interpretations of Spirometry results
c. Performing chest drain to remove pleural fluid

Attitude:

The resident will demonstrate a high standard of ethical and professional behaviour in their work.They will have the ability to work as part of a multi-disciplinary team and to show the appropriate tact, empathy and communication skills in dealing with patients and colleagues.

Contents:

1. Pulmonary rehabilitation

The resident should understand the importance of pulmonary rehabilitation and seek opportunities to gain firsthand experience in this area. Essential areas of training i.e. where care of patients with these conditions should occur during clinical placements (definition, pathophysiology, epidemiology, features of history, examination findings, differential diagnosis, investigations indicated, detailed initial management and principles of ongoing management (counseling, lifestyle, medical, surgical, care setting and follow up), complications and prevention.

a. Respiratory physiology - theory and practice
b. Respiratory radiology
c. Respiratory pharmacology : bronchodilators, inhaled corticosteroids, leukotriene receptor antagonists
d. Disorders of the pleura and mediastinum
e. Chronic obstructive pulmonary disease (including pulmonary rehabilitation)
f. Asthma (including patient education and self management)
g. Infection (including tuberculosis, opportunist infection, cystic fibrosis)
h. Respiratory failure and cor pulmonale
i. Diffuse lung disease

j. Pulmonary vascular disease
k. Occupational and environmental respiratory disease
l. Pulmonary manifestations of systemic disease
m. Cardiological aspects of respiratory disease

The Phase A resident will be placed in the Neurology Unit for a period of one month.

Aims

The residents will be given the opportunity to become intermediate level competent in:

1. Establishing a differential diagnosis for patients presenting with clinical features of neurological disease by appropriate use of history, clinical examinations and laboratory investigations.
2. Applying knowledge derived from the appropriate basic sciences, which are relevant to neurology.
3. Developing a management plan for the "whole patient" and have sound knowledge of the appropriate treatment including health promotion, disease prevention and long-term management

Objectives

At the end of the training the resident will have achieved the following

Knowledge

To have acquired knowledge to recognize when specialist neurology opinion is indicated

To have acquired the knowledge necessary for managing patient in peri-operative period

To discuss the steps of case & history taking in neurological clinical syndromes

To have acquired knowledge for managing ICU admitted patient requiring immediate neurology care

Skills:

a). Taking proper history, perform physical examinations of patient related to neurological diseases
b). Performing nerve conduction study, EMG and interpretation
c) Performing evoke potentials and its interpretations
d) Radiological investigation used in neurology unit
   - X-ray, CT, MRI

e).Lumber puncture for CSF study in neuro infection
f) Common symptoms management related to neurology

Attitude:

The resident will demonstrate a high standard of ethical and professional behaviour in their work.

They will have the ability to work as part of a multi-disciplinary team and to show the appropriate tact, empathy and communication skills in dealing with patients and colleagues.

The Content of Learning

This section lists the specific knowledge, skills, attitudes and behaviours to be attained when the residents are placed for Phase A and some of them as advanced level at Phase B.

The competencies are presented in four parts:

Endocrine Medicine

Competencies

Elucidate a full diabetic medical history

1. Recall diagnostic criteria for Diabetes Mellitus
2. Assess diabetic patient to detect long term complications
3. Formulate and appropriate management plan, including newly diagnosed and established diabetic patients to prevent short and long term complications
4. Outline common insulin regimes for type 1 diabetes
5. Outline drug management of type 2 diabetes: oral hypoglycaemics, glitazones, primary and
6. secondary vascular preventative agents
7. Recognise vital importance of patient education and a multidisciplinary approach for the
8. successful long-term care of diabetes
9. Recognise when specialist Endocrine or Diabetes opinion is indicated

Common and / or Important Diabetes Problems:

1. Diabetic ketoacidosis
2. Non-acidotic hyperosmolar coma / severe hyperglycaemia
3. Hypoglycaemia
4. Care of the acutely ill diabetic
5. Peri-operative diabetes care

Common or Important Endocrine Problems:

1. Hyper/Hypocalcaemia
2. Adrenocortical insufficiency
3. Hyper/Hyponatraemia
4. Thyroid dysfunction
5. Dyslipidaemia
6. Endocrine emergencies: myxoedema coma, thyrotoxic crisis, Addisonian crisis, hypopituitary coma, phaeochromocytoma crisis

Clinical Science:

1. Structure and function of hypothalamus, pituitary, thyroid, adrenals, gonads, parathyroids, pancreas
2. Outline the structure and function of hormones
3. Principles of hormone receptors, action, secondary messengers and feedback
4. Pharmacology of major drug classes: insulin, oral antidiabetics, thyroxine, anti-thyroid drugs, corticosteroids, sex hormones, drugs affecting bone metabolism

- 6. REGIONAL ANAESTHESIA AND ANALGESIA (block-6):
- Place of rotation: Orthopaedics, Gynaecology, Urology and Paediatric Surgery

Objectives

1. To teach anesthesia residents the art and sciences of regional anesthesia understand the anatomy, pathophysiology, and appropriate management of complications and side effects of regional anesthetic techniques, - the test doses; total spinal, subdural blocks - assessment and treatment; Risks of spinal, epidural hematoma and abscess - assessment and treatment; Postdural puncture headache - assessment and treatment; Pneumothorax- assessment and treatment; Physiologic side effects: sympathectomy, phrenic nerve block, intercostal nerve block - assessment and treatment; Peripheral nerve injury - assessment and follow up.
2. To understand general priniciples of local anesthetic pharmacology, including the pharmacodynamics and pharmacokinetics of various local anesthetics. This includes onset duration, motor/sensory differentiation, and toxicity profile of various local anesthetics and allergy its treatment:
3. To understand the principles and indications for various local anesthetic adjuvants including:

4. Epinephrine, phenylephrine, narcotics, sodium bicarbonate, carbonation, hyaluronidase, alphaagonists, anticholinesterases.
5. To be familar with the relevant anatomy for regional techniques, including: Spinal canal and its contents, neural plexuses of the limbs, major autonomic ganglia.
6. Be familiar with the physiologic changes associated with spinal and epidural anesthesia.
7. Understand the indications for and the contraindications to regional anesthetic techniques including central neuraxis blocks, peripheral nerve blocks, sympathetic nerve blocks.

Knowledge

1. Basic sciences applied to regional anaesthesia: anatomy, physiology and pharmacology
2. Advantages/disadvantages, risks/benefits and indications/contraindications
3. Assessment, preparation and management of the patient for regional anaesthesia
4. The principles of minor and major peripheral nerve blocks (including cranial nerve blocks) and central neural blocks
5. Desirable effects, possible side effects and complications of regional anaesthesia
6. Management of effects and complications
7. Clinical pharmacology: choice of local anaesthetic, additives, systemic effects and avoidance of toxicity
8. Understanding of the principles of ultra sound guided nerve blocks

Skills

1. Assessment and preparation of the patient for regional anaesthesia to include discussion of anaesthetic option (i.e. regional versus general)

2. Management of the patient receiving a regional block during surgery (whether awake or as part of a 'balanced' anaesthetic technique)
3. Management of patient receiving regional techniques in the postoperative period, including liaison with surgeons, acute pain teams, and ward staff
4. Central nerve blocks spinal anaesthesia/epidural block (lumbar and sacral), combined spinal/epidural
5. Major nerve block – able to perform at least one method for upper limb (brachial plexus – one technique) and lower limb (sciatic/femoral) surgery
6. Minor nerve block – superficial cervical plexus block/trunk (penile, intercostal and inguinal blocks)/upper limb (elbow and distal)/lower limb (ankle and distal)
7. Miscellaneous: ophthalmic blocks, topical, IVRA, infiltration and intra-articular
8. Recognition and management of the adverse effects of regional anaesthesia

Attitudes and behaviour

1. Provides explanations of regional techniques in a way that patients can understand
2. Understands patients' anxieties about regional techniques, especially the stress of undergoing surgery while conscious
3. Recognises need for communication with staff about regional block
4. Meticulous attention to safety and sterility during performance of regional blocks
5. Enlists help/advice from other professionals when appropriate

Rotation

Demonstrate ability to perform/familiarity with the following regional anesthesia techniques:
Brachial plexus blockade

Sciatic nerve block
Femoral nerve block, o or 3-in-1 block
Caudal block – adult and paediatric
Ankle block
Epidural block/Catheter
Spinal subarachnoid block
Biers block

Minimum Procedures/Cases to entered in the log book.
Regional

SAB: 30
EDB: 30 including continuous
Caudal: 10
Sciatic/Femoral: 10
Bier's Block: 5
Ankle Block: 5
Stellate Ganglion: 3
Brachial Plexus: 10
Sympathetic Block: 5
Trigger Point injection: 5
Other peripheral N. Block: 10
Ophthalmic Blocks: 5
Field Block: 5

Rotation in icu (block-7)

The residents are placed in the ICU for a period of three months in the phase A (basic level training) and three months in phase B (Advanced level training).

The **objectives** of this rotation are:

1. To learn the basics of recognizing a critically ill patient and the physiological abnormalities present. Residents will learn some of the management skills for these patients primarily through passive association, data collection and supervised

procedures. They will also learn about the clinical criteria for ICU admission, diagnostic efforts and therapeutic approaches;

2. To practice some technical skills like insertion of CVP and arterial lines, Endotracheal intubation in critically ill patient, Endotracheal suction and its problems, drawing arterial blood gas sample, etc;
3. To learn more about indications, physiological effects, management and care of patients on positive pressure ventilation;
4. To learn and practice the evaluation and certification of brain stem death;
5. Exposure to the ethical issues involved in ICU;

Duties and responsibilities

The resident will be assigned to the ICU for a period of three months. He/she will be physically present on the Unit from 08.00 am to 2.30pm hours.. During this rotation the resident will:

- Learn management skills for critically ill patients, primarily through collecting data, analyzing it, and formulating an assessment and management plan. He/she is expected to take a round of all patients before teaching round, and formally present cases on the teaching round and receive an immediate feedback. He/she should also take the round with all the primary physicians, and is required to make at least one formal case presentation each week;
- Document admission note, patient's arrival in ICU, daily progress notes and any procedures done

Learning objectives

Residents need to learn:

- Knowledge.
- Clinical management ("knows how") that applies knowledge and clinical skills to manage the patient.

- Skills (clinical and technical).
- Attitudes and behaviours.

Knowledge — supportive care of the critically ill patient

Residents are expected to understand the following:

Organization of intensive care services and standards of ICUs Transport of the critically ill patient Inotropic therapy

- Effects of critical illness and concomitant therapies on receptor function
- Effects of isotropic and vasopressor agents

Nutrition, fluid and electrolyte support

- Metabolic response to critical illness and starvation.
- Adverse consequences of malnutrition, dehydration and fluid overload.
- Principles of enteral and intravenous nutrition.

General care

- Prevention of complications including:
- Nosocomial infection.
- Ventilator-induced lung injury.
- Thromboembolic disease.
- Stress ulceration.

Knowledge — specific disorders

To practice as a specialist anaesthetist, trainees are expected to 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.

Respiratory failure

- Causes and pathogenesis of respiratory failure.
- Oxygen therapy and mechanical ventilatory support (invasive and non-invasive).
- Respiratory disease processes, representative conditions to be understood:
- 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 early management of severe trauma (EMST) for the management of trauma and advantages of an organised 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.

Other systems — representative conditions:

Endocrine disorders

- Diabetes mellitus and diabetes insipidus.
- Pituitary and hypothalamic disorders.
- Addison's disease.
- Cushing's syndrome, complications of steroid therapy.
- Conn's syndrome.
- Thyroid disorders.
- Phaeochromocytoma.

Metabolic disorders

- Metabolic response to stress, sepsis, starvation, surgery and trauma.
- Electrolyte and acid-base disorders.
- Nutrition and malnutrition.

Haematology, oncology, immunology, rheumatology

- Defects in haemostasis, for example, DIC, thrombocytopenia, hypercoagulation syndromes.
- Anaemia.
- Transfusion reactions.
- Anaphylaxis.
- Immunosuppression.

Gastrointestinal disorders

- Gastrointestinal bleeding (acute gastric erosions, peptic ulceration, oesophageal varices).
- Paralytic ileus, gastric dilatation.
- Pseudo-membranous colitis.
- Peritonitis and intraabdominal sepsis.
- Postoperative gastrointestinal problems.
- Malabsorption.
- Pancreatitis.

Infectious disorders

- Infections; bacterial, viral, fungal, rickettsial and protozoal.
- Serious community acquired infections, for example, meningococcal disease.
- Nosocomial infections, particularly with multiply resistant microorganisms, for example, MRSA.
- Sepsis, severe sepsis, septic shock and septicaemia.

Complications of pregnancy and gynaecological disorders

- Septic abortion.
- Eclampsia, pre-eclampsia.
- Amniotic fluid embolism.
- Obstetric haemorrhage.

Trauma

- Maxillofacial and airway injuries.
- Chest injuries and pneumothorax.
- Aortic injuries.
- Abdominal trauma.
- Neurotrauma/acute spinal cord injury.
- Pelvic injuries.
- Long bone trauma.

Toxic, chemical, physical agents

- Drug overdose and poisoning.
- Ingestion of corrosive.
- Burns.
- Electrocution.
- Decompression syndromes.
- Altitude sickness.
- Hyperthermia.
- Hypothermia.
- Near drowning.

Clinical management

Residents are expected to apply knowledge in practice, to understand relevant principles, and to demonstrate abilities in the ICU. These include:

Professional practice
- Immediate patient assessment and resuscitation.
- Assess life-threatening problems accurately and quickly in a critically ill patient.
- Judge whom to resuscitate (and whom not to).
- Judge the priorities of immediate resuscitation.
- Undertake emergency management including basic and advanced life support.
- Provide immediate life-supporting therapy.
- Perform primary and secondary surveys.

Communication
- Document patient information clearly, presenting problems and progress.
- Generate a list of differential diagnoses and priorities in investigations.
- Confirm or refute some early diagnoses in emergency situations before data collection is complete in order to start treatment.
- Counsel patients and relatives.
- Consult and collaborate effectively.
- Conduct appropriate handover to other colleagues, or example, before or after surgery or on discharge to the ward.

Supportive care of critically ill patients
Inotropic therapy
- Recognize when to use inotropic or vasopressin therapy.
- Choose an appropriate agent, dose, physiological endpoint, rate and route of administration.
- Review the efficacy of inotropic therapy at regular intervals.

Nutritional support
- Provide appropriate nutritional support.

General care
- Institute an appropriate plan for care of bowels, skin, mouth, eyes and maintenance of mobility and muscle strength.

Monitoring of the critically ill patient
- Principles of monitoring.
- Monitoring of the cardiovascular, respiratory, renal and central nervous systems.
- Complications of monitoring.
- Electrical safety.

Specific disorders
Acute circulatory failure
- Recognize and assess severity of shock and manage the condition.

Ischaemic heart disease and myocardial infarction
- Recognize the signs and symptoms of ischaemic heart disease.
- Recognize the complications of myocardial infarction and the need for medical and surgical intervention.

Respiratory failure
- Recognize and manage respiratory failure.
- Distinguish acute from chronic respiratory failure and the implications for management.
- Management of tracheostomy.

Haemorrhage
- Control bleeding.
- Use blood components appropriately.
- Manage coagulopathies.

Renal failure
- Identify patients at risk of developing renal failure.
- Apply general principles in the management of a patient with renal failure.

Neurological failure
- Recognize coma and assess its severity.
- Manage an unconscious patient.

Severe trauma

- Use a systematic, priority-orientated approach in resuscitation, assessment, investigation and emergency management.
- Recognize differences between management of the injured child from that of the adult.
- Effectively transfer injured adults and children within and between hospitals.
- Continue management including preventing, recognizing and managing complications.

Sepsis

- Apply the definitions of sepsis to diagnosis.
- Resuscitate a patient with septic shock, using appropriate monitoring, fluid therapy and vasoactive agents.
- Collect appropriate specimens for laboratory examination.
- Recognize the need for surgical intervention and consult appropriately.

Skills — clinical skills

In this rotation, residents will provide care for ICU patients. Specific clinical and technical skills in which trainees are required to be competent include:

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.
- Cardio version.
- Advanced life support.
- Right heart catheterization.

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

- Assisting with placing a Sengstaken-Blakemore or other balloon tamponade tube.

Skills — educational skills

Residents are expected to build on the educational skills and develop:

- A review of their personal learning plan as specified in their learning portfolio.
- Identification of the factors which lead to deviation from the original learning plan.
- A learning plan in the learning portfolio in which basic science teaching is linked to clinical practice.

The resident should acquire the following:

During basic training

- Maintaining a learning portfolio
- Developing a study plan for the rest of the training period.
- Reviewing study plans and correcting for deviations (for example, 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, home and 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.

During advanced training

- Reviewing study plans and correcting for deviations (for example, catching up on deficient knowledge or experience).
- Reflecting on previous learning experiences with the aid of the learning portfolio.
- Comprehending how decisions are made.
- Determining what information should be accepted or rejected in decision-making.
- Determining the value of information from various sources and the importance of cross validation.
- Assessing professional performance.
- 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.

Attitudes and behaviours

Residents are expected to develop the attitudes and behaviours that are obligatory in specialist medical practice.

Specialist practice

- To attain the attributes of a specialist as a:
- Medical expert.
- Communicator.
- Collaborator.
- Manager.
- Health advocate.
- Scholar and teacher.
- Professional.
- To practice 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 medico-legal obligations relating to medical practice.
- To have insight into one's own limitations, abilities and areas of expertise.
- To commit to lifelong continuing professional development.

Attitude in Intensive care unit:

Desired attitudes in intensive care include:

- Provision of support and good communication to grieving relatives.
- Influence of race, culture, gender and socio-economic status on the practice of intensive care.
- Medical ethics and personal ethical considerations, especially in end-of-life decisions. Organ harvesting, and conflicting resource needs of patient, society, and the health-care profession.
- Professionalism in the ICU.
- Awareness of personal and medical limitations.
- Importance and value of teamwork.

COMPETENCES TO BE ACQUIRED DURING PHASE A

The Content of Learning

This section lists the specific knowledge, skills, attitudes and behaviors to be attained when the residents are placed for Phase A and some of them as advanced level at Phase B.
The competencies are presented in four parts:

Symptom Competencies - define the knowledge, skills and attitudes required to basic level as wel as some advanced level appropriate for his / her level.

System specific competencies – The knowledge associated with the development would be expected to be known by all residents planning a career in Anaesthesia, Intensive Care and Pain Medicine.

Investigation competencies - lists investigations that a resident must be able to describe, order, and interpret by the end of Phase A.

Procedural competencies - lists procedures that a resident will be competent in by the end of Phase A.

Emergency airway management

Objectives:
To be able to assess, establish and maintain a patent airway, using both Basic Life Support and Advanced Life Support techniques

Knowledge	Skills	Attitudes and Behaviors	Competence level, place of training and assessment
Identification of the obstructed airway. Methods of maintaining a patent airway	Airway assessment & optimizing the patient's position for airway	Know own limitations Appreciate the urgency of providing a patient	Basic and advanced level during basic anaesthesia rotation and rotation at

AMBU ventilation Oxygen delivery systems. Tracheal intubation. Understand the principles of simple ventilators Have knowledge of monitoring techniques Failed airway drill	management. Be able to identify the difficult airway and summon expertise. Airway management with the use of oral/nasal airways, bag valve, mask and tracheal tubes. Use of gum elastic bougie / introducers. Manage tracheostomy Identifying correct placement of tube .Perform cricothyroidotomy and transtracheal ventilation	airway, and the importance of basic airway maneuver	otolaryngology, case based CbD, Mini CeX

Cardio-Respiratory Arrest

The resident will have full competence in the assessment and resuscitation of the patient who has suffered a cardio-respiratory arrest.

Knowledge	Skills	Attitudes and Behavior	Competence level, place of training and assessment
Causes of cardio-respiratory arrest (adult and	Rapidly assess the collapsed Perform basic	Recognize and intervene	Basic / dvanced level during Basic

pediatric) Recall the ACLS algorithm for adult and pediatric cardiac arrest	and advanced cardiac life support	in critical illness Participat e in BLS and ACLS course Consult senior	anaesthesia and ICU block rotation CbD and DOPS

Shocked patient

The resident will be able to identify a shocked patient, assess their clinical state, produce a list of appropriate differential diagnoses and initiate immediate management

Objectives:

To be able to recognize the shocked patient, the likely cause and to initiate treatment

Knowledge	Skills	Attitudes and Behavior	Competence level, place of training and assessment
Identify physiological state that define shock Identify types of shock	Recognize significance of major physiological changes in shock. Perform assessment, resuscitation and monitoring. Order, interpret and act on initial investigations appropriately.	Exhibit calm and methodical approach Adopt leadership role Involve senior and specialist	Basic Level / advance level during cardiology, ICU Internal Medicine, Obstetrics and Gynaecology rotation CbD, Mini CeX

	To be able to gain peripheral and central venous and arterial access.Intra-osseous and cut down techniques.		

Unconscious / coma patient

The resident will be able to promptly assess the unconscious patient to produce a differential diagnosis, establish safe monitoring, investigate appropriately and formulate an initial management plan, including recognizing situations in which emergency specialist investigation or referral is required

Knowledge	Skills	Attitudes and Behavior	Competence level, place of training and assessment
Identify the principal causes of unconsciousness List appropriate investigations for each Outline immediate management options	Make a rapid and immediate assessment including Glasgow Coma Scale Initiate appropriate management Take history from witnesses when patient has stabilized Order, interpret and act on investigations appropriately	Recognize need for immediate assessment and resuscitation Assume leadership role. Involve senior for management	Basic and advanced level during rotation at Internal Medicine, palliative care and ICU CbD, Mini CeX

Anaphylaxis

The resident will be able to identify patients with anaphylactic shock, assess their clinical state, produce a list of appropriate differential diagnoses, initiate immediate resuscitation and management and organize further investigations

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Identify physiological perturbations causing anaphylactic shock Elucidate causes of anaphylactic shock Define follow-up pathways after acute resuscitation	Recognize clinical consequences of acute anaphylaxis Perform immediate physical assessment .Institute resuscitation and arrange monitoring Order, interpret and act on initial investigations	Exhibit a calm and Methodical approach Adopt leadership role where appropriate Involve senior and specialist allergy services promptly	Basic and advanced level during basic anaesthesia rotation, internal Medicine, and ICU CbD, Mini CeX

Acute Back Pain

The resident will be able to assess a patient presenting with back pain to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behavior	Competence level, place of training and assessment
Recall the causes of acute back pain. Outline the features that raise concerns as to a sinister cause ('the red flags') and lead to	Perform examination and elicit signs of spinal cord compromise. Practice safe prescribing of analgesics /	Ask for senior help when critical abdominal pathology is suspected	advance level During rotation at pain and palliative care CbD, Mini CeX

consideration of a chronic cause ('the yellow flags') Outline indications for hospital admission	anxiolytic to provide symptomatic relief. Order, interpret and act on initial investigations		

Breathlessness

The resident will be able to assess a patient presenting with breathlessness to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Specify the common cardio respiratory conditions that present with breathlessness Explain orthopnoea and paroxysmal nocturnal dyspnoea Identify non cardio respiratory Factors that can contribute to or present with breathlessness	Interpret history and clinical signs Differential diagnoses: esp. pneumonia, asthma, COPD, PE, pulmonary oedema, pneumothorax Differentiate between stridor and wheeze Order, interpret and act on initial investigations	Consult senior when respiratory distress is evident Involve Critical Care team promptly when indicated	Basic and advanced level During rotation at Internal Medicine, Respiratory Medicine and ICU CbD, Mini CeX

Chest Pain

The resident will be able to assess a patient with chest pain to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behavior**	**Competence level, place of training and assessment**
Characterize the different types of chest pain, and outline other symptoms that may be present List the common causes for each category of chest pain and associated features:	Interpret history and clinical signs to list appropriate differential diagnoses: esp. for cardiac pain & pleuritic pain Order, interpret and act on initial investigations in the context of chest pain appropriately:	Involve senior when chest pain heralds critical illness or when cause of chest pain is unclear	Basic and advanced level during rotation at Internal Medicine, pain ,Palliative care and ICU CbD, Mini CeX

Abdominal Pain

The resident will be able to assess a patient presenting with abdominal pain to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behavior**	**Competence level, place of training and assessment**
Outline the different classes of	Elicit signs of tenderness,	Exhibit timely	Basic and advanced level

abdominal pain and how the history and clinical findings differ between them Identify the possible causes of abdominal pain	guarding, and rebound tenderness and interpret appropriately Order, interpret and act on initial investigations appropriately	intervention when abdominal pain is the manifestation of critical illness or is life threatening, in conjunction with senior specialists	During rotation at Internal Medicine, ICU CbD, Mini CeX

Cough

The resident will be able to assess a patient presenting with cough to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
List the common and serious causes of cough Identify risk factors relevant to each etiology including precipitating drugs Outline the different classes of cough. State which first line investigations are required, depending on the likely diagnoses following evaluation	Order, interpret and act on initial investigations appropriately: blood tests, chest radiograph and PFT	Exhibit non-judgmental attitudes to patients with a history of smoking Consult seniors Recognize the importance of a multi-disciplinary approach	Basic and advanced level. During rotation at Internal Medicine, respiratory medicine and ICU,CbD, Mini CeX

Fever

The resident will be able assess a patient presenting with fever to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Outline the physiology of developing a fever Recall the broad causes of fever Define Pyrexia of Unknown Origin	Order, interpret and act on initial investigations appropriately Commence appropriate empirical antibiotics	Discuss with senior colleagues and follow local guidelines in the management.	Basic and advanced level During rotation at Internal Medicine, Respiratory Medicine and ICU CbD, Mini CeX

Convulsion

The resident will be able to assess a patient presenting with a fit, stabilize promptly, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behavior**	**Competence level, place of training and assessment**
Outline the causes for seizure. Recall the common epileptic syndromes List the essential initial investigations following a 'first fit' Describe the commonly used anticonvulsants	Recognize and manage a patient presenting with status epilepticus. Promptly recognise and treat precipitating causes: metabolic, infective, malignancy	Recognize need for urgent referral in case of uncontrolled recurrent loss of consciousness or seizures. Recognize the psychological and social consequences of epilepsy	Basic and advanced level During rotation at Internal Medicine, Respiratory Medicine and ICU CbD, Mini CeX

Haematemesis & Malaena

The resident will be able to successfully assess the patient with an upper GI hemorrhage to determine significance; resuscitate appropriately; and liaise with endoscopist effectively

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Specify the causes of upper GI bleeding, with associated risk factors. Outline methods of assessing upper GI bleeding. Rock all score Outline the principles of management	Distinguish upper and lower GI bleeding. Perform assessment to postulate cause of bleeding Safely prescribe drugs indicated in event of a likely upper GI variceal bleed	Seek senior help and Endoscopy or surgical input in event of significant GI bleeding Observe safe practices in the prescription of blood products	Basic and advanced level During rotation at Internal Medicine and ICU CbD, Mini CeX

Headache

The resident will be able to assess a patient presenting with headache to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Recall the common causes of headache, and how the nature of the presentation Understand the path physiology of headache. Define clinical features of raised intra-cranial pressure	Recognize important diagnostic features in history. Perform neurological examination, Order, interpret and act on initial investigations and treatment.	Liaise with senior doctor neurosurgical & Neurology team	Basic and advanced level .During rotation at Neurology, Neurosurgery ,pain and palliative care rotation CbD, CeX

Jaundice

The resident will be able to assess a patient presenting with jaundice to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behavior**	**Competence level, place of training and assessment**
Outline the pathophysiology of jaundice. Describe the need for careful prescribing in a patient with jaundice Outline	Take a thorough history and examination Recognize chronic liver disease or fulminant liver	Consult seniors and gastroenterologists promptly when indicated. Recognize the importance of a	Basic and advanced level during rotation at Internal Medicine and ICU CbD, Mini CeX

basic investigations to establish aetiology. Describe medical, surgical and radiological treatments	failure. Interpret basic investigations Recognize complications of jaundice	multidisciplinary approach	

Poisoning

The resident will be able to assess promptly a patient presenting with deliberate or accidental poisoning, initiate urgent treatment, ensure appropriate monitoring and recognize the importance of psychiatric assessment in episodes of self harm

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Recall indications for gastric lavage, activated charcoal and whole bowel irrigation.Define parameters used to give clues to type of poisoning: pupils, pulse and respiration, blood pressure, temperature,glucose, coma, seizure, renal function,	Recognize critically ill overdose patient and resuscitate as appropriate To determine nature and effects of poisoning Commence poison-specific treatments Order, interpret and act on initial investigations	Contact senior promptly in event of critical illness Recognise the details of poisoning event , assessment and management	Basic and advanced level During rotation at Internal Medicine, Neurology and ICU CbD, Mini CeX

Vomiting and Nausea

The resident will be able to assess a patient with vomiting and nausea to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behavior**	**Competence level, place of training and assessment**
Recall the causes and pathophysiology of nausea and vomiting List commonly used antiemetic and differentiate the indications for each Outline alarm features that make a diagnosis of upper GI malignancy possibl	Elicit signs of dehydration and take steps to rectify Recognize and treat suspected GI obstruction Practice safe prescribing of anti-emetics Order, interpret and act on initial investigations	Involve surgical team promptly in event of GI obstruction Respect the impact ofnausea and vomiting in the terminally ill and involve palliative care services appropriat ely	Basic and advanced level During rotation at Internal Medicine, basic anaesthesia Neurology, Neurosurgery rotation and ICU CbD, Mini CeX

Weakness and Paralysis

The resident will be able to assess a patient presenting with motor weakness to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan.

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Outline the	Perform	Consult	Basic and

physiology and neuroanatomy of the components of the motor system. Define the clinical features of upper and lower motor neurone, neuromuscular junction and muscle lesions Stroke management and its prognosis	examination to elicit signs of systemic disease and neurological dysfunction Produce differential diagnosis .Order, interpret and act on initial investigatio ns for acute motor weakness	senior as appropriate Recognize patient of acute motor weakness. Contribute to multidisciplin ary approach	advanced level During rotation at Neurosurgery, Neurology, and ICU CbD, Mini CeX

Palpitations

The resident will be able to assess a patient presenting with palpitations to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competenc e level, place of training and assessment**
Recall basic cardiac electrophysiolog y. Define common causes of palpitations Outline the indications,	Elucidate nature of patient's complaint Order, interpret and act on initial investigations Commence initial treatment of arrhythmias	Consult senior colleague promptly	Basic level Cardiology Rotation CbD, Mini CeX

contraindications and side effects of the commonly used antiarrhythmics			

Abdominal Swelling & Constipation

The resident will be able to undertake assessment of a patient presenting with abdominal swelling or distension to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
Define the causes of swelling and associated clinical findings, common causes of constipation, including drugs Outline the pathophysiology of portal hypertension and bowel obstruction. Outline important steps in the diagnosis.	To identify the nature of the swelling, including a rectal examination, and elicit co-existing signs .Identify risk factors. Order, interpret and act on initial investigations. Perform a safe therapeutic ascetic tap	Recognize the importance of multidisciplinary approach	Basic and advanced level During rotation at Internal Medicine, pain, Palliative care and ICU CbD, Mini CeX

Abnormal Sensation (Paraesthesia and Numbness)

The resident will be able to assess a patient with abnormal sensory symptoms to arrive at a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behavior	Competence level, place of training and assessment
Broadly outline the physiology and neuroanatomy of the sensory components of the nervous system Recall the dermatome. Outline the treatments for neuropathic pain	Take a full history, including drugs, lifestyle,trauma Perform full examination including all modalities of sensation to elicit signs of nervous system dysfunction.	Recognize the chronic paraesthesia Consult senior as appropriate Contribute to multidisciplinary approach	Basic and advanced level During rotation at Neurosurgery Neuro Medicine, Regional block and ICU CbD, Mini CeX

Alcohol and Substance Dependence

The resident will be able to assess a patient seeking help for substance abuse and formulate an appropriate management plan

Knowledge	Skills	Attitudes and Behavior	Competence level, place of training and assessment
Outline the pathophysiology of withdrawal syndromes Describe alcohol and drug misuse. Recall effects of alcohol and recreational	Take a detailed medical and psychiatric history to identify physical or psychologic	Recognize the aggressive patient and manage appropriately. Seek specialist	Basic and advanced level during rotation at Basic anaesthesia, Internal Medicine, pain and Palliative care and ICU

drugs on cerebral function	al dependence Practice prescribing of sedatives for withdrawal symptoms	advice	

Anxiety / Panic disorder

To assess a patient presenting with features of an anxiety disorder and reach a differential diagnosis to guide investigation and management

Knowledge	Skills	Attitudes and Behaviors	Competence level, place of training and assessment
Recall the main features of anxiety disorder Recognise the role of depression in anxiety. Outline treatment strategies for anxiety	Assess a patient to detect organic illness Be familiar on management of anxiety	Recognise the chronicity of anxiety syndromes and the distress and disability	Basic and advanced level During rotation at Internal Medicine, pain and Palliative care and ICU

Dialysis

The resident will be aware of the principles, indications, and complications of Continuous Renal Replacement Therapy (CRRT)

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
On the methods	Order,	Iimportance of	Basic and

of RRT Elucidate the common complications haemodialysis.Recall the importance of sepsis in patients on RRT	interpret and act on initial investigations Recognizing importance of aseptic preparation.	Renal Unit in the management of patients.	advanced level During rotation at Nephrology and ICU

Haematuria

The resident will be able to assess a patient with haematuria to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
Recall the anatomy of the urinary tract Outline the causes of haematuria.	Demonstrate when a patient needs urological assessment and investigation Order, interpret and act on initial investigations	Involve renal unit	Basic and advanced level During rotation at Nephrology and ICU

Haemoptysis

The resident will be able to assess a patient presenting with haemoptysis to produce valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
Identify the common and life	Perform a history and physical	Involve seniors and respiratory	Basic and advanced level

threatening causes of haemoptysis bronchitis, pneumonia, PE and carcinoma Describe initial treatment	examination to determine appropriate differential diagnosis Chest radiograph and ECG, sputum tests Initiate treatment	physicians as appropriate	During rotation at Internal Medicine, Respiratory Medicine and ICU CbD, Mini CeX

Head Injury

The resident will be able to assess a patient with traumatic head injury, and liaise with appropriate colleagues, recognizing local and national guidelines.

Objective:

To be able to assess the head injured patient using history and examination and appropriate investigation.

Knowledge	Skills	Attitudes and Behavior	Competence level, place of training and assessment
Knowledge of the anatomy of brain. Physiology of cerebral perfusion and intracranial pressure. Recall short term complications of head injury Identify those who need neurosurgical	Initial management: cervical spine protection Assess and classify patient in terms of GCS Examination to elicit signs of head injury and focal neurological	Recognize advice provided by national guidelines on head injury Optimize joint team working .	Basic and advanced level During rotation at Neurology, Neurosurgery, traumatology and ICU

referral.	deficit Identify those patients who will need intubation and ventilation		

Hoarseness and Stridor

The resident will be able to assess a patient presenting with symptoms of upper airway pathology to produce a differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
mechanisms of hoarseness and stridor List the common and serious causes for hoarseness and stridor	Differentiate stridor, hoarseness and wheeze. Order, interpret and act on initial investigations	Involve senior promptly Involve: respiratory team, ENT or neurological team	Basic and advanced level During rotation

Involuntary Movements

The resident will be able to assess a patient presenting with involuntary movements to produce a differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
Outline the differential diagnoses of tremor and	Assess including a full neurological examination to	Recognize importance of multi-disciplinary	Basic and advanced level During rotation at Internal

other less common movement disorders and the main drug groups.	produce a differential diagnosis	approach to management	Medicine, Neurology Neurosurgery and ICU CbD, Mini CeX

Joint Swelling

The resident will be able to assess a patient presenting with joint pain or welling to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
Differentiate mono and polyarthritis.Outline treatment for chronic arthritis	Perform physical examination of the musculo-skeletal system.Order, interpret and act on initial investigations joints	Recognize importance of multidisciplinary approach to joint disease:	Basic and advanced level During rotation

Loin Pain

The resident will be able to assess a patient presenting with loin pain to produce a valid differential diagnosis, investigate appropriately, formulate an implement management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
List the causes of loin pain and renal	Examination .Order, interpret and act on initial	Involve senior renal and urology	Basic and advanced level During rotation

colic Outline other symptoms IVU	investigations Commence appropriate antibiotics	team as appropriate	

Medical Problems in Pregnancy

The resident will be competent in the assessment, investigation and management of the common and serious medical complications of pregnancy

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
Outline the normal physiological changes occurring during pregnancy List the common medical problems occurring in pregnancy	Recognise the critically ill pregnant patient, initiate resuscitation measures	Communicate with obstetric team throughout the diagnostic and management process	Basic and advanced level During basic anaesthesia rotation, and Obstetrics anaesthesia rotration

Neck pain

The resident will be able to assess a patient presenting with neck pain to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	Skills	Attitudes and Behaviour	Competence level, place of training and assessment
Outline the causes of neck pain	History, full examination to elicit signs of neck pain Order, interpret and act on initial investigations appropriately:	Consult senior colleague promptly in the event of focal neurological signs or critical illness	Basic and advanced level During rotation at Rheumatology, Physical Medicine, pain and Palliative care CbD, Mini CeX

	blood tests, plain radiographs, thyroid function		

Syncope & Pre-syncope

The resident will be able to assess a patient presenting with syncope to produce a valid differential diagnosis, investigate appropriately, formulate and implement a management plan

Knowledge	**Skills**	**Attitudes and Behaviour**	**Competence level, place of training and assessment**
Pathophysiology of syncope depending on situation Differentiate from other causes of collapse Outline the indications for cardiac monitoring	History from patient and witness. Assess patient. Perform examination to elicit signs of cardiovascular disease	Recognize impact episodes can have on lifestyle particularly in the elderly	Basic and advanced level during rotation at cardiology, neurology, neuro-surgery and ICU, CbD, Mini CeX

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