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Curriculum for the Fellowship in Anaesthesiology and Critical Care Medicine

College of Anaesthesiologists for East, Central and Southern Africa

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1.0 Introduction

1.1 Background

This programme shall be called Fellowship in Anaesthesia and Critical Care Medicine (FACCM). Anaesthesia and critical care is a speciality that deals with relief of pain, provision of sedation or narcosis to patients undergoing surgery and various painful and unpleasant diagnostic procedures. Anaesthesiologists also take care of critically ill patients. To perform these, Anaesthesiologists use potent drugs that alter the patients' physiological functions. In order to monitor and correct the changing physiological functions, various equipment with different physical principles are used. This therefore requires anaesthesiologists to have adequate knowledge and the application of anatomy, physiology, pharmacology, physics and pathology.

Advancements in the field of surgery and other procedures that require anaesthesia has led to evolution of sub specialities in anaesthesia, including: neuroanaesthesia, paediatric anaesthesia, obstetric anaesthesia, cardiac anaesthesia, thoracic anaesthesia and pain medicine.

The aim of the programme is to train doctors as anaesthesia and critical care providers to safely address the human resource challenge necessary for safe surgery.

1.2 College of Anaesthesiologists for East, Central and Southern Africa.

CANECSA is the College of Anaesthesiologists for East Central and Southern Africa. Constituent member countries as of July 2017 are Kenya, Malawi, Tanzania, Uganda, Zambia and Zimbabwe.

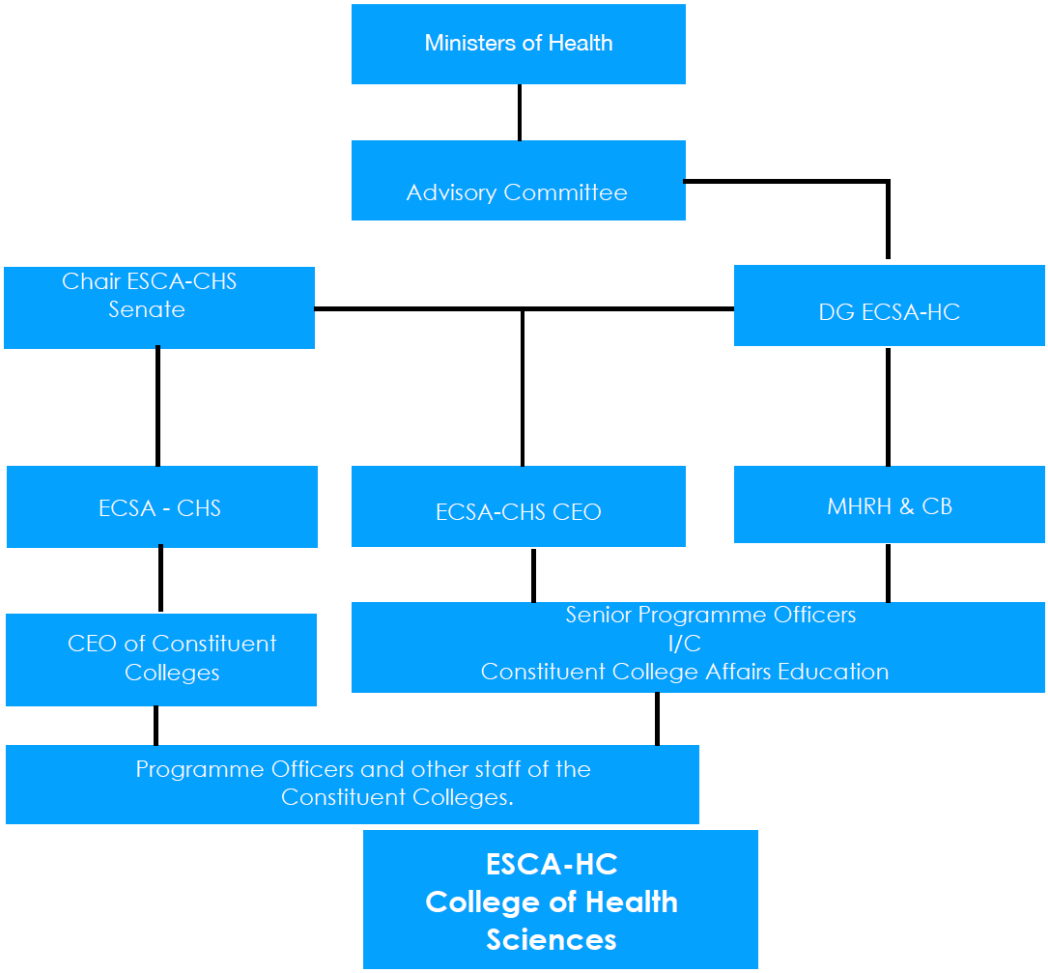
The idea of a College of Anaesthesia arising from the East, Central and Southern Africa Ministers was mooted at a meeting in Zimbabwe in 2008/2009. This was following the need to make the training in the region of good and uniform quality. It was noted that some institutions and countries were far ahead of others, while there were many who needed to be uplifted and the training and opportunities be improved. It was noted that even taking from examples in Rwanda, Zimbabwe, Kenya, Tanzania, the training systems were different and needed to be unified.

Following this, the Association of Anaesthesia of Great Britain and Ireland (AAGBI), organized the inaugural meeting in Arusha in February 2011 at which an interim committee was nominated, assignments and timelines identified.

1.2.1 CANECSA Structure

The way the college is structured including the reporting lines is a manifestation of how this strategy will be operationalized. CANECSA will therefore emphasize on aligning structure to strategy in order to deliver. CANECSA is modeled around the ECSA College of health sciences.

The CANECSA organogram



1.2.2 Vision

To be the desired international institution for training and development of anaesthesiologists for anaesthesia practice of the highest level in the region.

1.2.3 Mission

To develop a uniform training program for anaesthesia, critical care and pain medicine across the region and maintain the highest standards of practice for the safety of the patients through training (education programs), Service (Quality Patient Care), Examinations and research.

Vision and Mission statement of the college were reconfigured and refocused in view of what characterized the operating environment. Three primary strategic themes or pillars of the strategic plan are:

1) Delivery within respective legal framework;
2) Shared intellectual capacity;
3) Quality of education and practice.

The three themes strongly align the college to the corporate philosophy in the Vision and Mission statements; each theme was validated against the core values. Focus areas were identified reflecting the practical areas under which goals and objectives would be implemented to strengthen the performance of Council.

1.2.4 Core values

Professionalism

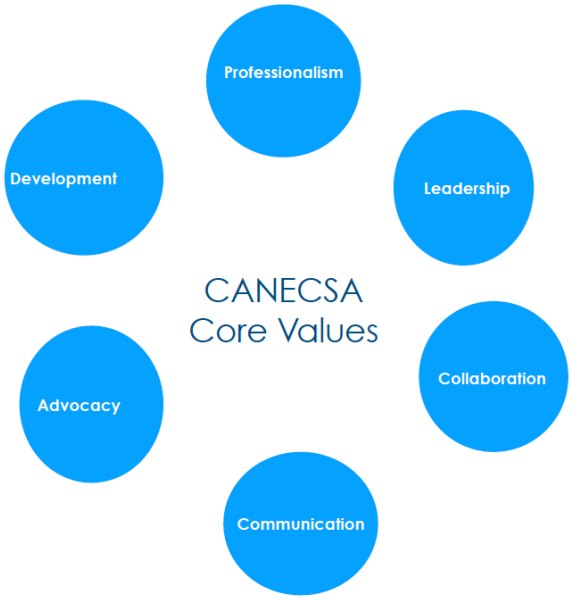
We create a system that would allow the teaching and the evaluation of professionalism in the specific context of anaesthesiology thus inculcating requisite expertise, honesty, respectfulness, patience, humility, tolerance, compassion and ethical conduct.

Leadership

Good Leadership is a fundamental aspect of CANECSA that brings about integrity, diligence and management: leading and managing continuous change; achieving success with service development.

Collaboration

We endeavour by all means to strategically indentify and partner with value adding stakeholders, various institutions, authorities and non governmental organisations, in order to increase capacity to deliver.



Communication

In order to create awareness, a common understanding of our value propositions and meeting stakeholder expectations, we will continuously engage patients, colleagues and trainees.

Advocacy

We will undertake advocacy initiatives that are geared towards representing patient needs.

Development

CANECSA will continue to uplift standards of education and the subsequent professional practice through scholarship.

1.2.5 Philosophy

To train competent and relevant anaesthesiologists for local and international labour needs in keeping with prevailing trends of the time and adhering to the highest levels of professionalism, ethics and personal integrity for both students and staff.

1.2.6 Quality Policy Statement

The college is committed to the provision of high quality Anaesthesiology and Critical Care training that meets the needs of its graduate students, patients and stakeholders through innovative quality training, research and clinical care.

1.3 Rationale of the Programme

The ECSA region's anaesthesiologist to patient population ratio falls way short of the WHO recommendation of 1:1000. The number of anaesthesiologists in the region is grossly inadequate for the provision of anaesthesia services in the ECSA region and this situation greatly limits the practice of all aspects of surgery and intensive care medicine. In addition to the specialists' shortage, there is natural attrition and emigration.

The traditional university based Masters' of Medicine (Anaesthesiology & Critical Care Medicine) programmes cannot match the current demand for anaesthesiologists. The CANECSA fellowship seeks to address this demand

through this broad based curriculum.
The curriculum incorporates opinions, ideas, contributions and inputs from stakeholders drawn from collaborating partners from the ECSA region.

1.5 Academic Regulations

1.5.1 Admission Criteria

Applicants to the programme will be required to:

a) Be holders of the MBChB / MBBS / MD degree or equivalent recognized by the regulatory authorities in ECSA member countries. .
b) Be registered or be qualified for registration as a medical practitioner by the relevant Health Professions' Council / Medical and Dental Professions Council in ECSA member countries.
c) Completed a minimum of 12 months internship/housemanship (Six months surgery and six months medicine).
d) Have a current practicing licence and be in good standing with member state regulatory authorities.

1.5.2 Course Requirements

The student will be required to meet the college admission criteria for the Fellowship in Anaesthesia and Critical Care Medicine and exhibit the professional, ethical, attitude and academic demands of the various units and pass the various assessments mounted in the course of the programme.

1.5.3 Teaching & Learning

Knowledge Acquisition

Various strategies will be employed in knowledge acquisition including the following:-

i. Self Directed Learning (SDL)
ii. Problem based learning
iii. Lectures (block release) / tutorials
iv. Apprenticeship
v. Courses/ Seminars
vi. Simulation training

Skills Acquisition

By observation, assisting and performing anaesthesia and critical care medicine procedures under supervision.

Attitude Development

Role modelling will be an important aspect of attitude development. This will be enhanced during interaction with the tutors and other personnel in the various clinical services.

1.5.4 Logbook

A logbook will be used to monitor exposure to and acquisition of clinical and technical skills. Evidence of satisfactory exposure will be a requirement for progression of the registrar.

1.5.5 Formative Assessment

This will be done continuously during clinical rotations assessing the knowledge, skills and attitudes of the registrars. Demonstration of correct professional attitude will be a requirement for progression.
The assessments shall take the form of multiple choice questions (MCQs), the objective structured clinical examinations (OSCEs) and evaluation of core competency skills.
The acquisition of core competency skills is will determine progression from the clinical rotation.

1.5.6 Summative Assessment

Summative evaluation will be at the end of the end of the two parts of programme.

1.5.11 Examination Regulations

CANECSA regulations governing fellowship studies and examinations shall apply.

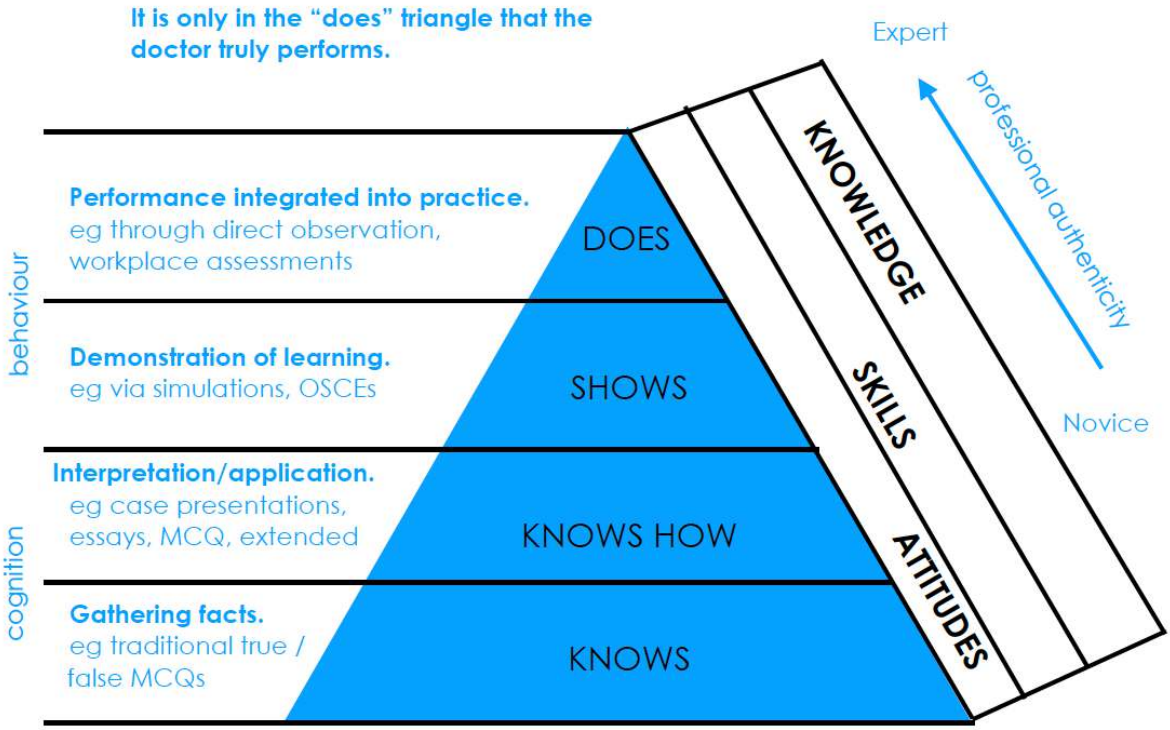
1.5.12 Title of the Programme

CANECSA Fellowship in Anaesthesiology and Critical Care Medicine.

2.0 PROGRAMME GOAL

To train a competent anaesthesiologist capable of a lifelong acquisition of knowledge and who engages in evidence based practice of anaesthesia and critical care.

The program plan blends the apprenticeship model with competency-based model. Miller's prism of clinical competence draws on multiple adult learning theories and shows how the pieces are put together. The curriculum aims to develop both technical (clinical proficiency and competence) and non-technical skills (safety, professionalism, clinical leadership, scholarship), providing a well rounded anaesthesiologist.



Miller's prism.

Fig 1.

Modern medical and health professions education emphasises learner and patient centeredness in an outcome based curriculum (see Figure 1). These are the underlying threads of this anaesthesiology training program. This CANECSA fellowship curriculum attempts to provide information on the objectives of the fellowship, course logistics, syllabus (content and topics), ongoing and exit assessment. Self directed learning is at the heart of what of what it aims to do.

Examinations are a standard way of assessing knowledge and competence to practice in anaesthesiology. The CANECSA fellowship examination is no different. Textbooks are a good starting pointing the acquisition of knowledge. The resource and materials list in the appendices at the back of this document. The list is not exhaustive. In this information age, advances in digital technology new permit sourcing of reference material remotely.

This curriculum also aims to guide tutors and fellows involved in training on suitable learning experiences, provide standardisation across the region. It enables comparison with other colleges with regards to fungibility.

3.0 Roles of the graduate

The graduates of the CANECSA Fellowship programme in Anaesthesioloy and Critical Care will be adequately prepared to undertake the following roles and functions:

i. Provide specialist anaesthesia, critical care services and pain management.
ii. Educate other health care providers about anaesthesia, critical care and pain management.
iii. Design, conduct and disseminate research findings in anaesthesia, critical care medicine and pain.
iv. Develop and maintain scholarly attributes and continuing professional development.
v. Provide leadership and effective management of resources in anaesthesia and critical care.
vi. Practice in a professional, ethical and compassionate manner.
vii. Collaborate effectively with other health care providers.
viii. Provide leadership to the various healthcare delivery members involved in the care of the critically ill and surgical patients.

4.0 Programme objectives

The course will cover the following:

i. Concepts and principles of anaesthesia and pain management.
ii. Core concepts and principles of critical care
iii. Professional ethics
iv. Knowledge and skills in research work.
v. Teaching and participating in training of other health care professionals and the community.
vi. Continuing professional development.
vii. Professional leadership skills in health management and health care delivery.

5.0 Programme outcomes

At the end of the program, the students should be able to:-

i. Determine safe and effective anaesthetic care for the surgical patient.
ii. Demonstrate safe and effective care to the critically ill patient.
iii. Conduct him/herself professionally and ethically with patients, community and colleagues.
iv. Apply research knowledge through continuing professional development.

v. Disseminate health care knowledge to the community and other health care providers
vi. Demonstrate effective team work with other health care providers
vii. Demonstrate professional leadership in health management and health care delivery.

6.0 Design and structure of the programme

6.1 Programme Design

The programme shall be competency based and Learning Outcome focused. The training will involve integration of biomedical sciences, common courses and clinical courses during the four year period.

The programme provides for graded responsibilities over the training period, with the trainee being closely supervised at the beginning and progressively demonstrating increasing ability to work without direct supervision towards the end. Training in research shall progress over the four years culminating in submission of a thesis prior to sitting the final examinations.
External faculty shall participate in training of non-clinical but core subjects mainly public health and it's applications.

6.2 Programme Structure

A gross outline of the CANECSA fellowship programme.

DURATION	• 4 years minimum • 8 years maximum	
CLINICAL DOMAINS	• **Basic(0 - 24 months)** • Anatomy • Physiology & Biochemistry • Pharmacology • Physics • Clinical measurement • Basic Statistics • Clinical anaesthesia - acquisition of foundation knowledge, skills and attitudes of an anaesthesiologist.	• **Advanced (24 - 48 months)** • Applied anatomy • Applied physiology • Applied pharmacology • Applied clinical measurement • Critical Care Medicine • Pain Management • Resuscitation • Clinical anaesthesia - higher skills and knowledge in the following : - paediatric anaesthesia - neuroanaesthesiology - cardiothoracics anaesthesia - obstetric anaesthesia
EXAMS	**MCA(ECSA)**	**FCA(ECSA)**
ASSESSMENT	• In training assessments • Progression reviews • Log book review	
BROAD AIMS	The CANECSA fellowship aims to train an anaesthesiologist for a broad range of individual specialist practice. This will be a solid foundation for more focused sub-specialty fellowship training in the following disciplines : Airway, Cardiothoracic & Vascular, Critical Care Medicine, Paediatric, Neuroanaesthesia, Obstetrical and Pain Management	

The curriculum is divided in two parts:-

Basic training: This will be covered in the first two years. Courses will comprise of common Masters in Medicine courses, biomedical sciences, clinical apprenticeship, critical care and pain management, after which the trainee is then eligible to sit for the MCA(ECSA) examinations. The principles of ethics and professionalism will be integrated into the teaching, learning and practice.

Advanced training: This will be covered in the next two academic years. This period shall include lectures, tutorials and apprenticeship in the clinical areas, following which the trainee is eligible to sit for the FCA(ECSA) examinations. Advanced Training will consist of development and consolidation of higher skills and knowledge in basic sciences and clinical anaesthesia.

Expected progress and competency levels :

0-6 months : Has knowledge of, describes…
6-12 months : Performs, manages, demonstrates under supervision
12-24 months: Performs, manages, demonstrates independently
24-48 months : Teaches or supervises others in performing, managing, demonstrating.

6.2.1 Programme Duration

The fellowship in Anaesthesia and critical care medicine programme shall take (4) years and not exceed (8) years unless the Senate approves otherwise

7.0 Management and administration of the programme

The ECSA senate will provide oversight coordination of the programme. The programme director will oversee the implementation of the programme.

8.0 Mode of delivery

This will be a face-to-face apprenticeship, small-group tutorials, grand rounds, journal clubs and e-learning modules (blended learning).

9.0 Award of the fellowship

Students shall graduate with a fellowship in Anaesthesiology and Critical Care Medicine on the successful completion of the outlined programme and duly satisfying the CANECSA Examinations Board, and the CANECSA Senate.

10.0 Quality Assurance

10.1 External Moderation of Examinations

All college exams in this programme shall be send to the Senate appointed external examiner for moderation.

10.2 Evaluation of Teaching Staff

At the end of each course, the students will evaluate the staff according to a university developed evaluation tool.

10.3 Course Evaluation

At the end of each course, the students will evaluate the course according to a university developed evaluation tool.

10.4 Programme Evaluation

At the end of each academic year and following the completion of the 4 years of training, students and staff will evaluate the programme. The curriculum review shall be held every four years.

11.0 The CANECSA Syllabus

Basic Statistics

Objectives

1. In essence, to disentangle the data received and make valid inferences that can be used to solve problems in public health.
2. Application of statistical methods to conduct research in the areas of medicine.

Outcome

Candidates will be required to demonstrate understanding of basic statistical concepts, but will not be expected to have practical experience of statistical methods. Emphasis will be placed on methods by which data may be summarised and presented, and on the selection of statistical measures for different data types. Candidates will be expected to understand the statistical background to measurement error and statistical uncertainty.

Content

Descriptive statistics

Categories of data. Statistical distributions (Gaussian, chi-squared, binomial) and their parameters. Non-parametric measures of location and variability. Graphical presentation of data

Deductive and inferential statistics

Simple probability theory. Confidence intervals. Linear regression. Linear correlation

The null hypothesis. Type I and type II errors. Probability of error occurrence, and the power of a test to detect a significant difference, Bland-Altman plot. Choice of simple statistical tests for different data types

Basic Physiology

Purpose

To enable the students to understand how the body system functions and the underlying mechanisms

Objectives

The course shall cover the following;
1. The physiology of the cell
2. Homeostatic mechanisms
3. The physiology of body systems

Outcomes

1. Discuss the physiology of the cell
2. Explain homeostatic mechanisms
3. Discuss the physiology of body systems

Content

Cell Physiology, Body and body fluids, Homeostatic mechanisms, Physiology of body systems: Respiratory system, cardiovascular system, Central Nervous system, Digestive system, Nutrition and Metabolism, Genitourinary system, Endocrine system, musculoskeletal system and reticulo-endothelial system.

Applied Physiology

Purpose
To equip the students with knowledge of physiological changes during anaesthesia and critical care

Objectives

1. The physiological changes that occur in the body during anaesthesia delivery

2. The pathophysiological changes that occur in a critically ill patient.

Outcomes
1. Demonstrate knowledge of the physiological changes in anaesthesia

2. Demonstrate knowledge of the pathophysiological changes that occur in critical illness

Content
Artificial ventilation (PEEP, IPPV) Respiratory changes with age, posture, altitude, pregnancy and disease. Changes in physiology of body systems during anaesthesia. Pain: mediators, assessment, mechanisms and pathways Effects of sectioning of different levels of the nervous system, applied electrophysiology (EEG, ECG and Nerve conduction)

Pharmacology

Purpose
To equip students with the knowledge of basic pharmacology

Objectives

1. The principles of pharmacology
2. The pharmacokinetics and pharmacodynamics of drugs used in anaesthesia and critical care

Outcomes
1. Demonstrate the principles of pharmacology
2. Demonstrate the pharmacokinetics and pharmacodynamics of drugs used in anaesthesia and critical care

Content
Applied Chemistry, including, Diffusion of molecules through membranes, Pharmacokinetics
Pharmacodynamics, Pharmacogenetics / Adverse reactions to drugs. Hypnotics, sedatives and intravenous anaesthetic agents, Simple analgesics, Opioids and other analgesics; and opioid antagonists, Non-steroidal anti-inflammatory drugs, Neuromuscular blocking agents. Drugs acting on the autonomic nervous system, Drugs acting on the heart & cardiovascular system. Drugs acting on the respiratory system, Antihypertensives, 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, Vitamins.

Applied Pharmacology

Purpose
To equip the students with the knowledge, skills and attitude in the use of pharmacological agents in anaesthesia and critical care

Objectives

1. The pharmacotherapeutics in anaesthesia practice
2. Pharmacotherapeutics in critical care

Outcome
1. Demonstrate appropriate use of pharmacotherapeutics in the practice of anaesthesia
2. Employ appropriate use of pharmacotherapeutics in critical care

Content

Drugs used in anaesthetic practice, including inhalational agent: gases, vapours. Parental agents. Opioids and non-opioids intravenous agents. Neuromuscular blockers. Hypnotics, sedatives and anticonvulsants, antidepressants. Adrenergic agonists and antagonists. Opioid and non-opioid analgesics. Local anaesthetic agents. Antiemetics. Antihypertensives. Inotropic agents. Anti-diabetics. Diuretics. Corticosteroids and other hormones. Anticoagulant. Interaction of anaesthetic agents with other drugs, including antihypertensives, antibiotics, diuretics, anticonvulsants.

ClinicalAnatomy

Purpose

To equip the students with the knowledge of the anatomy relevant to the practice of anaesthesia and critical care

Objectives

1. The anatomy of the body regions relevant in the practice of anaesthesia
2. Interpretation of radiological images of the various body structures relevant to the practice of anaesthesia

Outcomes

1. Describe the gross anatomy of the body regions
2. Describe the radiological images of the various parts/regions of the body

Content

Body Systems relevant to the practice of anaesthesia:
Respiratory system: Upper and lower airway; mouth, nose, pharynx, larynx, trachea, bronchi, lungs, lobes, segments (including fibreoptic views and radiological anatomy), Chest wall, pleura, mediastinum and its contents, Thoracic inlet and the neck structures, Muscles of respiration

Cardiovascular system: Heart, pericardium, and great vessels, Major blood vessels commonly used for venous access and arterial catheterisation

Nervous system: The brain and its subdivisions, Spinal cord and meninges, CSF and its circulation, Cranial nerves, Spinal nerves and dermatomes, Sympathetic and parasympathetic nervous system, Plexuses-brachial, cervical celiac, lumbar, sacral, Vertebral column, Peripheral nerves that are commonly blocked

Musculoskeletal system: Surface anatomy, Structures at the wrist, antecubital fossa, axilla, neck vertebral spaces, inguinal region, ankle.

Interpret the images of different parts/regions of the body, including plain films, contrast studies, ultrasound, CT scan, MRI.

Physics and Clinical Measurement I

Purpose
To equip the students with the knowledge of the principles of physics in relation to clinical measurements and their application in anaesthesia and critical care

Objectives
The course shall cover the following:
1. Principles of physics in relation to clinical measurements
2. Clinical measurements in the practice of anaesthesia and critical care

Outcomes
1. Describe the principles of physics in relation to clinical measurements in the practice of anaesthesia and critical care
2. Explain the clinical measurements used in the practice of anaesthesia and critical care

Content
Principles of physics, including: Mathematical concepts: relationships between equations and graphs. Concepts of exponential functions and logarithms: wash-in, wash-out and tear away. Basic measurement concepts: linearity, drift, hysteresis, signal-to-noise ratio, static and dynamic response, SI units: fundamental and derived units. Other systems of units which are 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: osmometry. Physics of gases and vapours. Absolute and relative pressure, the gas laws, triple point, critical temperature and pressure.

Measurement of volume and flow in gases and liquids. The pneumotachograph and other spirometers. Principles of surface tension. Basic concepts of electricity and magnetism. Capacitance, inductance and impedance. Amplifiers: bandwidth filters. Measurement and amplification of biological potentials, including ECG, EMG, EEG. Sources of electrical interference. Processing, storage and display of physiological measurements. Bridge circuits.

Physics and Clinical Measurements II

Purpose

To equip students with knowledge of the working principles of the equipment and their use in anaesthesia and critical care

Objectives

1. Understanding the working principles of the equipment used in anaesthesia and critical care
2. The safe use of the monitoring equipment used in anaesthesia and critical care

Outcomes

1. Describe the working principles of the equipment used in anaesthesia and critical care
2. Demonstrate the safe use of the monitoring equipment used in anaesthesia and critical care

Content

Utility and safety of monitoring equipment and measurement techniques, including: 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, thermos dilution. 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.

Equipment

Purpose

Anaesthesia practise is equipment intense.

Objectives

1. Integrate physics and measurement principles into clinical practice.
2. Have a good working knowledge of everyday anaesthesiology equipment

Content

Central gas supplies, anaesthetic machines and systems, ventilators, ventilation systems, scavenger systems.
Equipment for blood administration, haemodilution and blood sparing and red cell salvage techniques.
Pacemakers and defibrillators

Monitoring :

Measuring pressure, flow and volume of gases with respect to
anaesthetic apparatus. Analysis and monitoring of breathing including capnography, gas and vapour concentrations, pulse oximetry, electrocardiography, invasive pressure monitoring and haemodynamics, cardiac function, neuromuscular transmission, temperature, level of sedation, electrical safety

Clinical Anaesthesia

Purpose

To equip students with knowledge and skills to carry out preoperative assessment of patients and prescribing appropriate premedication.

Objectives

The course shall cover the following:
1. Preoperative care of a patient
2. Overall plan for anaesthesia

Outcome

1. Demonstrate the knowledge of preoperative care of a patient
2. Formulate anaesthetic plans for a patients with coexisting medical disease

Content

Principles of preoperative care, including: essence of a preoperative visit, relevance of history; current illness, past medical and surgical, family and social, history of allergies. Premedication. Assessment for post-operative care requirements. Preoperative instructions. Consent.

Appraisal of a patient for anaesthesia, including: Detailed and relevant history taking, physical examination and data interpretation including clinical, radiological and laboratory. ASA classification, anaesthetic implications of elective and emergency procedures, anaesthetic implications of common medical conditions and current drug therapy. Assessment of level of anxiety and premedication needs.
Rationale for the choice and use of premedication drugs and anaesthesia. Assessment of postoperative analgesic needs.

Effective communication with patients regarding consent, preoperative tests, preoperative medication, anaesthesia options, postoperative expectations, and pain management.

Co-Existing Medical Conditions

Purpose

To enable students to anaesthetise patients with co-morbidities

Objectives

The course shall cover the following;

1. Common co-existing medical conditions (cardiac, respiratory, metabolic)
2. Anaesthesia delivery in patients with co-morbidities.
3. Common metabolic conditions and their perioperative management

Outcome

1. Demonstrate knowledge on co-existing medical conditions
2. Demonstrate anaesthesia in patients with co-morbidities

Content

Clinical evaluation of patients in a medical setting; diagnostic options available; Management of common medical conditions: central nervous system, cardiovascular, gastrointestinal tract, renal, hepato-billiary, connective tissue, haematopoietic. Identification of patients in need of critical care; Immuno-suppression

Preoperative management and optimisation of patients with co-existing medical conditions, including hypertension, diabetes mellitus, ischemic heart disease, valvular heart lesions, bronchial asthma, chronic obstructive airway diseases, chronic diseases, acute and chronic liver disease, acute and chronic renal disease. Management of anaesthesia in patients with co-existing medical conditions.

Patient Safety

Purpose

Patient safety is about reducing the risk of unintentional but preventable harm related to health care system to an acceptable minimum.

Objectives

1. Patient consent and information given to patients / carers / guardians before anaesthesia.
2. Perioperative checks (WHO checklist / machine checks)
3. Operating theatres /ICU/HDU monitoring equipment and measurement use

Outcomes

1. Demonstrate the appropriate use of anaesthetic machines and equipment
2. Demonstrate proper management of clinical records

Content

The anaesthesia machine. Types. Design, function, service. Basic sciences as applied to anaesthesia machine. Colour coding of gas cylinders. Airways, laryngoscopes, oxygen therapy devices.

Anaesthesia system check: assemble and check breathing systems, set-up and check ventilator, disconnect alarms, tubing's. Manufacture and storage of anaesthetic gases; environmental control of the operating theatre including temperature, humidity, and scavenging systems for waste anaesthetic gases; electrical safety; sterilization and cleaning of equipment.

Monitoring requirements. Basic monitors in anaesthesia. Invasive monitoring. Risks/benefits of invasive monitoring, including: arterial, central venous, pulmonary artery wedge pressure. Intracranial/intraventricular transducers
Resuscitation equipment including: self-inflating bag, defibrillator, suction machine, laryngoscope and Ventilators.

Anaesthesia charts/records. Handling of anaesthesia records. Anaesthesia audits.

Conduct of anaesthesia

Purpose

To equip students with knowledge and skills to practice safe general anaesthesia

Objectives

1. The process of induction of anaesthesia
2. Airway management
3. Maintenance of anaesthesia and management of emergencies during anaesthesia
4. Monitoring of an anaesthetised patients

Outcomes

1. Demonstrate induction of anaesthesia
2. Practice Airway management
3. Practice maintenance of anaesthesia and management of emergencies during anaesthesia
4. Interpret the results on the monitors during anaesthesia

Content

Induction, maintenance of and emergence from anaesthesia.
Modalities of induction of anaesthesia. Intravenous induction of anaesthesia. Crush induction. Inhalational induction and adjuvant.

Airway management. Endotracheal intubation: oral, nasal. Indications and contraindications. Complications.
Emergency airway management including fibre optic intubation, cricothyroidotomy, tracheostomy. Retrograde intubation.

Provide optimal/balanced anaesthesia: narcosis, analgesia, amnesia, skeletal muscle relaxation. Emergencies including: shock, anaphylaxis, arrhythmias, asystole, malignant hyperthermia, thyroid storm, coagulopathy: diagnosis and manage

Monitoring, including basic and invasive. Intraoperative emergencies, including hypoxemia, dysrhythmias, cardiac arrest. Recognition and management of these emergencies.

Basic and advanced monitoring, including: temperature, sphygmomanometry, oximetry, capnography, intracranial pressure monitoring. Electrocardiograph, precordial stethoscope, oesophageal stethoscope and echocardiography.

Post-Operative Management

Purpose

To equip students with knowledge and skills to manage postoperative patients

Objectives

1. Reversal of patients from anaesthesia
2. Admission of patients to the recovery room staff and comprehensive handover
3. Post-operative management of patients in the Post Anaesthetic Care Unit (PACU) with appropriate documentation(clinical notes, investigations)
4. Discharge of patients from PACU

Outcomes

1. Demonstrate a safe emergence of the patient from anaesthesia
2. Prepare a comprehensive handover report and instructions to the recovery room staff
3. Practice management of patients in PACU
4. Demonstrate discharge of patients from PACU

Content

The postoperative period and postoperative care, including emergence from anaesthesia, tracheal extubation, transportation of the patient, handing over, and analgesia post operatively, recovery room complications and their treatment. Discharge from recovery room.

Reversal of anaesthetic agents, clinical assessment of adequacy of reversal. Use of a peripheral nerve stimulator. Tracheal extubation.

Safe patient transport from the operating room. Monitoring during transfer. Clear report and instructions during handing-over of patient to recovery room staff including name, age, sex, diagnosis, operation performed, drugs administered, infusions and transfusions.

Complications in the recovery room including: hypoxemia, hypothermia, hypotension, hypertension, nausea and vomiting, arrhythmias. Obtundation, confusion, delirium. Prevention and treatment of these complications. Pain assessment in the recovery room. Analgesics and their adjuvants. Nerve blocks.

Criteria for discharge from recovery room; including stabilisation of vital parameters, control of pain, nausea and vomiting. Postoperative prescription for fluids.

Cardiothoracic Anaesthesia

Purpose

To equip students with knowledge and skills to perform cardio-thoracic anaesthesia

Objectives

1. Anaesthesia for cardiac conditions: surgical and minimally invasive
2. Anaesthesia for thoracic surgical conditions
3. Management of patients with cardiac and thoracic pathologies
4. Management of cardiovascular and pulmonary emergencies

Outcomes

1. Demonstrate anaesthesia procedure for surgical cardiac conditions
2. Demonstrate anaesthesia procedure for surgical thoracic conditions
3. Practice management of patients with cardiac and thoracic pathologies
4. Practice management of cardiovascular and pulmonary emergencies

Content

Pathophysiology of cardiac diseases and anaesthesia management, including valvar diseases, TOF, ischemic/coronary insufficiency, PDAs.

Preoperative assessment, general and specialised investigations. Invasive monitoring induction, maintenance and reversal of cardiac patients. Cardiopulmonary bypass and complications. Post-operative intensive care management (analgesia, sedation, ventilation) and discharge from ICU. Pacemakers

Thoracic: Pathophysiology of thoracic diseases and anaesthesia management, including diseases of the oesophagus; strictures, varices, tumours. Diseases of the mediastinum, lung and pleura. Preoperative assessment. General and specialised investigations. Intraoperative anaesthesia management for thoracic procedures including: bronchoscopy, one lung anaesthesia, open thoracotomy, pneumonectomy.

Complications of thoracic surgery: pneumothorax, hypoxemia, chest trauma. Post-operative care of thoracic patients. Inotropes, vasoactive e.g. intraaortic balloon pumps, left ventricular assist devices, ECMO. Pacemaker interrogation. Cardio-version.
Complications including: arrhythmias, hypotension, electrolyte imbalances, post bypass heart failure.

Paediatric Anaesthesia

Purpose

To equip students with knowledge and skills to conduct safe anaesthesia for neonates, infants and children

Objectives

1. Anaesthetic considerations in neonates, infants and children
2. Anaesthesia practice for neonates, infants and children
3. Pre-operative and post-operative care of neonates, infants and children

Outcomes

1. Demonstrate knowledge of anaesthesia considerations for neonates, infants and children
2. Practice anaesthesia delivery to the neonates, infants and children
3. Practice pre-operative and post-operative care of neonates, infants and children

Content

Anatomical, physiological, psychological, and pharmacological differences of the neonate, child, and adult; Paediatric medical and surgical conditions; Preoperative assessment and optimisation; Special problems of prematurity;

Anaesthetic equipment and monitoring; induction and maintenance techniques; fluids, electrolyte, glucose and temperature maintenance intra operatively; neuronal blockade; Pain management; Recovery from anaesthesia

Resuscitation of the newborn Resuscitation and safe transport of critically ill children; paediatric intensive care.

Neuroanaesthesia & Neurosurgical intensive care

Purpose

To equip students with knowledge and skills to conduct safe anaesthesia for neurosurgical patients

Objectives

1. Principles of neuroanaesthesia and neurosurgical intensive care
2. Principles of Anaesthesia for planned and emergency neurosurgery
3. Preoperative and post-operative care of patients with head trauma and neurological disorders
4. Identify and participate in the management of traumatic brain injury.

Outcomes

1. Demonstrate knowledge of neuroanaesthesia and neurosurgical intensive care
2. Practice delivery of neuroanaesthesia and neurosurgical intensive care
5. Practice pre-operative and post- operative care of patients with head trauma and neurological disorders

Content

Neuroanatomy, including the cranium and its contents, the vertebral column and its contents. Neurophysiology, including electrical activity of the brain. CSF; formation, circulation, absorption. CBF, ICP, CMRO. Neuropharmacology; fluid and electrolyte balance

Neurological diseases; aetiology, pathophysiology, presentation, diagnosis.

Preoperative assessment and management of patients with neurological diseases. Anaesthesia for craniotomy and spinal surgery. Neurological monitoring intra and postoperatively. EEG and evoked potentials. Neuroimaging procedures.

Conservative management of head injury patients. Management of neurological diseases, including Gullian Barre syndrome, myasthenia gravis, tetanus, muscular dystrophy, paraplegia, epilepsy.

Obstetric Anaesthesia

Purpose
To equip students with knowledge and skills to conduct safe anaesthesia in obstetric patients

Objectives

1. Physiological changes in pregnancy
2. Anaesthesia in pregnancy and Caesarean Section
3. Analgesia during parturition

Outcomes
1. Demonstrate knowledge of the physiological changes in the foetus and the mother
2. Employ safe anaesthesia in pregnancy and parturition
3. Practice analgesia delivery during labour

Content
Gestational changes; including changes in the respiratory, gastrointestinal, central nervous, musculoskeletal, endocrine systems. Maternal & fetal circulation; physiological & anatomical changes during birth.

Preoperative assessment of a parturient. Anaesthesia for incidental surgery during pregnancy; Anaesthesia for operative delivery. Effects of anaesthesia on pregnancy and labour. The high risk parturient. Obstetric emergencies; Maternal and neonatal resuscitation; Maternal morbidity and mortality

Obstetric analgesia, including inhalational, intramuscular, intravenous, infiltration, local, epidural, PCA, combined spinal-epidural.

Day Care Surgery Anaesthesia

Purpose
To equip students with knowledge and skills to conduct safe anaesthesia in day care surgery

Objectives

1. Principles of anaesthesia in day care surgery
2. Anaesthesia delivery in day care surgery

Outcome

1. Demonstrate knowledge of the principles of anaesthesia in day care surgery
2. Practice delivery of anaesthesia in day care surgery
3. Appreciate the many different facets in Enhanced Recovery Programmes.

Content

Advantages of day care surgery. Anaesthetic clinics. Screening of patients suitable for day care surgery. Surgical procedures suitable for day surgery. Appropriate drugs for anaesthesia for day care surgery. Monitoring requirements for day care surgery anaesthesia.

Techniques: general anaesthesia. Regional anaesthesia. Sedation. Postoperative care; Recovery & discharge from a day care unit.

Otorhinolaryngology (ENT) Anaesthesia

Purpose

To equip students with knowledge and skills to conduct safe anaesthesia in otorhinolaryngology

Objectives

1. Anaesthetic considerations in otorhinolaryngology
2. Anaesthesia practice to patients with otorhinolaryngological conditions

Outcomes

1. Demonstrate knowledge of anaesthesia considerations in otorhinolarngology
2. Employ safe anaesthesia to patients with otorhinolaryngological conditions

Content

Anatomical changes in ENT disorders and their effects on the airway. Pathophysiology of ENT disorders. Concept of a shared airway. Difficult airway due to ENT disorders. Recovery from anaesthesia following ENT surgery; the tonsillar position.

Preoperative assessment of patients with ENT disorders. Induction, maintenance and reversal of anaesthesia after ENT surgery. Anaesthesia for major head and neck surgery; hypotensive anaesthesia. Anaesthesia for laryngoscopy, bronchoscopy and oesophagoscopy. Laser surgery and its accidents/complications. Perioperative complications; sleep apnoea and sleep disorders.

Ophthalmic Anaesthesia

Purpose

To equip students with knowledge and skills to conduct safe anaesthesia in ophthalmology

Objectives

1. Surgical disorders in ophthalmology
2. Anaesthetic considerations in ophthalmic surgery
3. Anaesthesia practice in patients with ophthalmological conditions
4. Managing pre-existing comorbidities in ophthalmology

Outcomes

1. Demonstrate knowledge of surgical disorders in ophthalmology
2. Illustrate the anaesthetic considerations in ophthalmic surgery
3. Practice delivery of anaesthesia in patients with ophthalmological patients

Content

Anatomy and physiology of the eye. Ophthalmic disorders. Pathophysiology of ophthalmic disorders and their implications on course of anaesthesia.
Raised intraocular pressure and conduct of anaesthesia. Occulocardiac reflex.

Preoperative assessment of patients with ophthalmic disorders. Anaesthesia techniques, including general, regional and local anaesthesia. Anaesthesia for ophthalmic emergencies.

Orthopaedic Anaesthesia

Purpose
To equip students with knowledge and skills to conduct safe anaesthesia in orthopaedic surgery

Objectives

1. Anaesthetic considerations in orthopaedic patients
2. Anaesthesia practice for orthopaedic patients

Outcome
1. Demonstrate knowledge of anaesthetic considerations in orthopaedic patients
2. Practice anaesthesia delivery to orthopaedic patients

Content
Preoperative assessment; Potential airway problems (in rheumatoid arthritis, diabetes mellitus, sickle cell disease, ankylosing spondylitis, cervical spinal injuries, congenital syndromes); Tourniquets, cement, positions: precautions undertaken.

Anaesthesia techniques in orthopaedic surgery, including general anaesthesia, spinal and epidural anaesthesia. Nerve blocks, including sciatic, femoral, common peroneal. Ankle and wrist blocks.

Anaesthesia for General Surgery, Gynaecology & Urology

Purpose
To equip students with knowledge and skills to conduct anaesthesia in patients with surgical, gynaecological and urological conditions

Objectives

1. Principles of anaesthesia for general surgical,
2. Principles of anaesthesia for gynaecological and urologic patients
3. Principles of anaesthesia for laparoscopic surgery

Outcomes
1. Demonstrate delivery of anaesthesia to general surgical patients,
2. Demonstrate delivery of anaesthesia to the gynaecological and urological patients
3. Practice delivery of anaesthesia for laparoscopic surgery

Content

Principles of anaesthesia for general surgery, including the breast, abdominal surgery anaesthesia, anaesthesia for thyroid, pancreatic and adrenal surgery.

Abdominal & gastrointestinal tract surgery anaesthesia; minimal invasive & robotic surgery – pneumoperitoneum and raised intra-abdominal pressure; endocrine surgery, including the thyroid, the adrenal gland and pancreatic surgery; auto-transfusion; surgical emergencies: optimisation of high risk patients.

Anaesthesia for pelvic surgery, including wide pelvic dissection. Minimal invasive & robotic surgery, including laparoscopic. Invitro fertilization, total abdominal hysterectomy, recto-vaginal fistula and vesico-vaginal fistula; myomectomy; tuboplasty. Gynaecological emergencies, including ectopic pregnancies, torsion of ovarian cysts. Optimisation of high risk patients

Anaesthesia for patients with acute and chronic renal failure. Prostatectomy; urethroplasty; kidney transplants; orchidectomy; urological emergencies; optimisation of high risk patients

Anaesthesia for laparoscopic surgery. CO_2 and anaesthesia. Increased intra-abdominal pressure. Diaphragmatic splinting.

Regional Anaesthesia

Purpose

To equip the student with the knowledge and skills to conduct safe regional analgesia and anaesthesia

Objectives

1. Principles of regional analgesia/anaesthesia
2. Indications and complications of the various regional anaesthesia techniques
3. Techniques of regional analgesia/anaesthesia

Outcome

1. Demonstrate knowledge on principle of regional analgesia/anaesthesia
2. Demonstrate the indications and complications of the various regional anaesthesia techniques
3. Practice the different techniques of regional analgesia and anaesthesia to surgical/non-surgical patients

Content

Anatomy, physiology, and pharmacology relevant to local and regional anaesthesia. Benefits, Various regional/local anaesthesia techniques used, including central neuro-axial blocks, nerve blocks, field blocks, local and systemic

Indications/contraindications of regional anaesthesia. Complications following regional anaesthesia.

Administer regional anaesthesia, including spinal, epidural, caudal, saddle blocks. Brachial plexus blocks, starlet ganglion block, lumber plexus block. Nerve blocks, including radial, median, ulnar, sciatic, and peroneal. Equipment used, including peripheral nerve stimulators, various types of spinal needles, epidural catheters and needles, ultrasonography and landmark techniques.

Trauma, Resuscitation, Stabilisation and Transfer of Patients

Purpose

To equip students with the knowledge and skills of management of severely ill patients

Objectives

1. Organization and functions of trauma and emergency services
2. Resuscitation of severely ill patients
3. Transfer of severely ill patient within and between hospitals

Outcomes

1. Demonstrate knowledge on the organisation and functions of trauma and emergency services
2. Demonstrate resuscitation of a severely ill patient
3. Practice the transfer of severely ill patients within and between hospitals.
4. Demonststrate a good working knowledge of the principles of Basic Life Support and Advanced Life Support
5. Demonstrate a good working knowledge of the principles of of Advanced Trauma Life Support ATLS®

Content

Organization and functions of a trauma and emergency team. Roles of different participants. Resources required for proper function of the team.

Advanced cardiac life support and advanced trauma life support; Primary and secondary survey, triage. Cervical spine injuries; effects of trauma on body systems; Analgesia for trauma victims.

Safe transfer of patients: protocols, different means of transportation. Effective communication with appropriate specialists.

Anaesthesia for Burns and Plastics and Reconstruction

Purpose

To enable students anaesthetise patients with complicated burn injury and those requiring reconstructive surgery.

Objectives

1. Anaesthetic considerations for burns and reconstructive surgery.
2. Anaesthesia for patients with complicated burns and reconstructive surgery.

Outcome

1. Demonstrate knowledge of anaesthetic considerations for burns and reconstructive surgery
2. Practice delivery of anaesthesia for patients with severe burns and those requiring reconstructive surgery.
3. Manage airway and inhalational burns.
4. Adequate pain management.

Content

Physical and psychological impact of disfigurement on patients. Preoperative assessment and management. Possible anaesthesia/analgesia techniques. Possibility of long operation periods. Fluid and electrolyte management. Transfusions.

Cleft lip and palate repair; free flaps and implantation, liposuction; breast augmentation; reduction mammoplasty. Burns; resuscitation, facial burns, escharotomy, release of bands. Complications, including pain, hypothermia, massive blood loss, pressure ulcers.

Maxillo-Facial/Dental Anaesthesia

Purpose

To enable students anaesthetise patients with maxillo-facial/dental conditions.

Objectives

The course shall cover the following;
1. Anaesthesia considerations for maxillo-facial and dental conditions
2. Anaesthesia for maxillo-facial and dental conditions

Outcome

1. Demonstrate knowledge of anaesthesia considerations for maxillo-facial and dental conditions
2. Practice the administration of anaesthesia in patients with maxillo-facial and dental conditions
3. Managing of the difficult airway and use of various devices to secure the difficult airway.

Content

Anaesthesia for maxillo-facial surgery. Preoperative assessment and management; hazards of the shared airway; maxillo-facial injuries.
Proficiency in the difficult airway patient.
Administer anaesthesia for maxillo-facial surgery, including hemi-mandibulectomy, and mandibulectomy. Care of 'wired jaw'. Analgesia/ anaesthesia in the dental suite.

Geriatric Anaesthesia

Purpose

To enable students anaesthetise elderly patients

Objectives

The course shall cover the following;
1. Principles of anaesthesia for the elderly
2. Anaesthesia delivery to the elderly

Outcome

1. Demonstrate knowledge on the principles of anaesthesia for the elderly
2. Practice the administration safe anaesthesia for the elderly

Content

Physiological, anatomical, and pharmacological changes associated with aging; Co-morbidities and poly pharmacy; Communication difficulties and memory impairment; Postoperative confusion. Selection and modification of anaesthesia in the elderly.

General anaesthesia for the elderly. Precautions during airway management. Regional techniques for the elderly. Care with sedation. Selection & modification of anaesthetics; gentle & compassionate care of the elderly. Post-operative care for the elderly: analgesia, fluid/electrolytes, warmth.

Anaesthesia / Sedation outside the Operating Room
(Radiology, Electroconvulsive therapy, Endoscopy)

Purpose

To enable students to conduct anaesthesia / sedation in areas other than operating room

Objectives

The course shall cover the following;
1. Principles of sedation and anaesthesia delivery in areas other than the operating room.
2. Sedation & anaesthesia delivery in areas other than the operating room.

Outcome

1. Demonstrate knowledge on sedation & anaesthesia in areas other than the operating room.
2. Practice the procedures of sedation and anaesthesia delivery in areas other than the operating room

Content

Pre-anaesthetic assessment and preparation of patients; challenges of sedation and anaesthesia outside the operating room environment (endoscopy rooms, radiology departments, emergency departments). Working in restricted and remote locations away from the theatres. Problems of the magnetic field.

Techniques of sedation/anaesthesia for CT-scanning, magnetic resonance imaging, endoscopy: including conscious sedation, inhalational anaesthesia, and general anaesthesia. Anaesthesia for electroconvulsive therapy.

Anaesthesia for Vascular Surgery

Purpose

To enable students to conduct anaesthesia for vascular surgery

Objectives

The course shall cover the following;

1. Per-operative anaesthetic management of patients with vascular disorders
2. Anaesthetic management for vascular disorders

Outcome

1. Demonstrate knowledge on peril-operative anaesthetic management of patients with vascular disorders
2. Practice anaesthesia delivery for patients with vascular disorders

Content

Preoperative assessment and optimisation of high-risk vascular patients; Anaesthesia management of major vascular surgery; carotid artery surgery, endovascular (stenting) procedures, sympathectomy, phaeochromocytoma; Massive blood loss and transfusion, coagulopathy, strategies for blood conservation; Effects of aortic cross-clamping, renal protection; Invasive monitoring techniques; Use of inotropes and vasoactive agents; Regional techniques

General and regional anaesthesia for patients with vascular disorders, including abdominal aorta, carotid artery, upper and lower limb arteries, varicose veins. Use adjuvant to anaesthetics.

Acute Pain Management

Purpose
To enable student to understand acute pain

Objectives
The course shall cover the following;
1. Applied anatomy and physiology of pain
2. Factors that influence perception of pain
3. Drugs used in pain management
4. Analgesic options in trauma

Outcomes
1. Discuss anatomy and physiology of pain
2. Explain factors that influence perception of pain
3. Discuss the pharmacology of drugs used in pain management / WHO Pain Ladder

Content
Pain receptors, classification, morphology, distribution. Pain pathways- the nerve fibres, nerves, the spinal cord, the brain.
Definition of pain. Transduction, transmission, modulation and interpretation of pain. Transmitters involved in pain transmission.

Psychological effects of acute and chronic pain. Socio-cultural aspects of pain, including attitudes towards expression of pain, pain relief seeking behaviour.

Drugs used in pain relief, including opioid agonists, agonist/ antagonists and antagonists. Non-steroidal anti-inflammatory drugs, steroids. Adjuvants to analgesics, including sedatives, anticonvulsants. Mechanisms of action of these drugs. Their side effects.

Chronic Pain Management

Purpose
To enable student to manage patients with pain

Objective
The course shall cover the following:
1. Pain assessment and measurement
2. Modalities of pain management.

Outcome

1. Discuss the methods used in pain assessment and measurement
2. Demonstrate the different methods of pain management on patients.
3. Understand the biopsychosocial model

Content

Diagnostic characteristics and treatment modalities of:

1. Headaches (migraine, tension headache, headache of cervical origin,cluster headache, atypical facial pain, trigeminal neuralgia);
2. Low back pain (anterior and posterior compartment syndrome, radicular and pseudoradicular syndrome);
3. Neuropathic pain and pain syndromes (deafferentiation pain, phantom
pain, sympathetic reflex dystrophia, neuromata, postherpetic neuralgia, central thalamic pain)

Cancer pain / palliative care
Pharmacological treatment with opioids, NSAIDs,
acetaminophen, antidepressant drugs, anticonvulsive drugs and
other mixed agents (coanalgesics);
TENS / physiotherapy / acupuncture, yoga: indications and procedures;
Case management and communication skills
Show a relevant attitude towards patients suffering from chronic.
Function of a multi disciplinary pain management team.

Critical Care Medicine I

Purpose

To enable student to understand the structural design, organization and management of an intensive care unit.

Objectives

the course shall cover the following;

1. Design of an intensive care unit
2. Organisation and management of an intensive care unit
3. Principles of intensive care medicine
4. Criteria for ICU/HDU admission

Outcomes

1. Explain the design of an intensive care unit
2. Explain organisation and management of an intensive care unit
3. Describe the principles of intensive care medicine
4. Employ the criteria for ICU/HDU admission

Content

Design of an intensive care unit: Its location in a hospital, surface area, capacity. Electrical installation, lighting, gas piping, ventilation. The clean and dirty areas.

Arrangement of beds, situation of monitoring and resuscitation equipment. Central monitoring station. Situation of stores, laboratory, workshop.
Management of ICU; Actively participate in quality assurance processes, including audits, morbidity & mortality meetings, etc.; Improve resource management and maintain or improve patient care quality;
Demonstrate initiative in analysing problems and critically evaluating current practice; Effective member and potential leader of multidisciplinary ICU team; Develop skills for teaching critical care; Support on-going basic and clinical science protocol and research; Optimally coordinate clinical care, research and teaching in the ICU; Encourage the use and regular review of evidence-based protocols, clinical practice guidelines and standards to optimise patient care; Initiate consultation with other specialist physicians and negotiate a joint clinical plan in managing complex ICU problems.

Rationale for ICU care; norms of ICU to hospital bed ratio; ventilator care; cardio-vascular support; monitoring; physiotherapy; nutritional support; sedation & analgesia; anti-coagulation prophylaxis; debriefing.

Critical Care Medicine II

Purpose

To enable students to manage critically ill patients

Objective

1. Ventilation in ICU/HDU
2. Monitoring and clinical measurements
3. Life threatening system failures
4. Infections in ICU/HDU
5. Trauma emergencies in ICU
6. Supportive care in a critically ill patient
7. Recognition and management of emergency cardiac, renal, pulmonary, airway and neurological emergencies.

Outcome

1. Demonstrate knowledge of ventilation in critically ill patients
2. Interpret readings on the different monitors and equipment in ICU/HDU
3. Practise the management of patient with multi organ failure
4. Practice management of patients with infections
5. Practice management of patients with trauma emergencies
6. Supportive care of patients in HDU/ICU

Content

Airway management; Respiratory failure; artificial ventilation; Principles of weaning from artificial ventilators; Principles of oxygen therapy; Long term or home ventilation: Rehabilitation:

Principles of monitoring and monitoring devices; Methods of measuring severity of illness (severity scoring systems); Methods for assessing sedation and pain; Proper use and maintenance of equipment; Sterilization and cleaning of equipment.
Interpretation of chest radiographs, blood gas reports & respiratory function tests.

Cardiovascular system: Cardiogenic and hypovolaemic shock; Cardiac dysrhythmias; Inotropic, chronotropic, vasodilator and vasoconstrictor drugs; invasive & non-invasive measurements. Nervous system: Causes and management of disorders of mentation; Principles of management of head injury, raised intracranial pressure; Organ donation services; Diagnosis and management of common neuromuscular conditions: guillian barre, myasthenia gravis, and tetanus.
Renal/Metabolic system: Diagnosis, prevention and management of acute renal failure; Fluid, electrolyte, and acid-base disorders; Common endocrine disorders including diabetic emergencies; Nephrotoxic drugs and drug dosage adjustment in renal impairment; Renal replacement therapies.
Acute and chronic liver failure; Acute gastrointestinal bleeding; Acute pancreatitis. Musculoskeletal/Skin systems: Multiple trauma; severe burns;. Sepsis/Infection/Haematology: Infection control; Use of antibiotics;

Common severe infections in the ICU, SIRS, RDS, MODS; Pyrexia and hypothermia; Immuno-compromised patient; Intensive care of specific infective/infectious conditions; Haemoglobinopathies; DIC and other coagulation disorders.
Obstetric: Obstetric emergencies in the ICU.

Trauma: Management of multiple injuries; Rhabdomyolysis; Near-drowning; Burns and smoke inhalation; Electrical injuries; Compartment syndrome. Perioperative care: Perioperative intensive care in elective and emergency cases.
Pre- and post-ICU care (Outreach care or Intensive care 'without walls'): Criteria for admission to and discharge from ICU and HDU: Factors predisposing patients to critical illness: Risk factors for ICU readmissions following discharge to wards: Early warning signs of impending critical illness: Quality of life after ICU discharges.

Enteral and parenteral nutrition; Stress ulcer prophylaxis ; DVT prophylaxis, Bowel care Disuse atrophy, Pressure sores. Care of the bed ridden patient.
Emergencies in endocrinological diseases

Remote and rural anaesthesia:

Purpose

The *raison d'etre* of the fellowship is to boost manpower to achieve manpower levels in the region. Anaesthesiologists are in a unique position to be advocates and champions of safe care.

Objective

It is hope that the knowledge and skills acquired during the fellowship is translates into the setting up of quality anaesthesiology services in the region. Adapt the knowledge to local environments. Much of the population in Africa has limited access to safe surgery because of distance from services, difficult to reach environments and limitations in resources for health care.
However, health professionals and service providers must be able to develop programs and plans to reach, rescue and retrieve. Form sustainable mentoring links with our non physician anaesthesiology colleagues who deliver the vast majority of anaesthetic care in our region. Devolve, empower and support rural anaesthesiology services. Set up strong telemedicine / teleconferencing networks to support remote systems in their delivery of anaesthesia care.

Outcome

1. Modify and adapt the knowledge, skills and understanding of administering general and regional anaesthesia to include a focus on the special difficulties presented by the remote and rural setting.
2. Apply will include developing knowledge, skills and experience of the managing critical care services in a multidisciplinary team setting where resource may be limited.
3. Develop an understanding of and skills in transfer medicine and resuscitation, chronic pain and palliative care suitable for a remote and rural location practice.
4. Demonstrate independence, resourcefulness, initiative and problem solving abilities in managing all clinical and management issues.
5. Deliver perioperative anaesthetic care to patients in the remote and rural setting, including resuscitation, stabilisation and transfer of patients to the referral centre (air transfer by helicopter or fixed wing, road transfer).
6. Be an effective team member for delivery of acute services within a remote and rural centre.

Recommended courses to attend before completion of FCA(ESCA) exam.

Communication Skills
Statistics and Research Methodology
Clinical Leadership and Management
Skills of Effective Teaching and Evaluating (or equivalent).

The fellowship aims to produce a well rounded clinical with solid technical and non technical skills. Courses are now available on remote learning platforms. Certificates of attendance will be required as evidence. Evidence of participation in research activities, publication of audits, critical appraisals, literature reviews and as well as keeping a record of learning and teaching, should be documented in training portfolio. A log of meetings attended, management and administrative duties performed and other positions of responsibility should be documented.

Recommended reading :

This list is not exhaustive but a fantastic guide and starting point.

Membership examination - MCA(ECSA).

Anatomy

1. Harold Ellis, Stanley Feldman, *Anatomy for Anaesthetists*, 8th Edition William Harrop-Griffiths
2. Moore, Keith l, Agur, Anne, M.R. Dalley II, Arthur, F (2013). *Clinically oriented Anatomy.* Lippincott Williams and Wilkins.

Physiology

1.Barett, Kim, E, Barman, Susan M, Scott, Boitano, Brooks, (2009). Ganong: *Review of medical physiology*.
2.Boron, Walter F and Boulpaep, Emile l (2011). *Medical physiology*. W B Saunders.
3.Hall, John E and Guyton, Arthur C (2015). *Textbook of Medical physiology*. W B Saunders.
4.Rhoades, Rodney A and Bell, David R (2012). *Medical Physiology. Principles for Clinical Medicine*. Lippincott Williams and Wilkins.

Pharmacology

1. Williams, N.E., Calvey, T. N. *Principles and Practices of Pharmacology for Anaesthetists : Publisher: Wiley-Blackwell, 2008*
2. Katzung, Bertram and Masters, Susan (2011). *Basic and Clinical Pharmacology:* McGraw-Hill-Medical.
3. Rang, Humphrey and Dale, Maureen, et-al (2011). *Rang & Dale's Pharmacology*. Churchill Livingstone.
4. Even A, Maze M, Kharasch E.D (2011) Anaesthetic Pharmacology: Basic Principles and Clinical Practice 2nd Edition Cambridge

Physics & Clinical Measurement

1. P.D. Davis G. Parbrook Gavin Kenny, *Basic Physics and Measurement in Anaesthesia* 4th Edition
2. Andrew Davey Ali Diba, *Ward's Anaesthetic Equipment*, 6th Edition
3. Baha Al-Shaikh, Simon G. Stacey, *Essentials of Anaesthetic Equipment* 4th Edition, Saunders

Statistics

1. Trisha Greenhalgh, *How to Read a Paper: The Basics of Evidence-based Medicine and Healthcare*, 6th Edition . Wiley-Blackwell.
2. B Faragher, C Marguerie, *Essential Statistics for Medical Examinations*.
3. Paul Myles, Tony Gin, *Statistical Methods for Anaesthesia and Intensive Care* :1st Edition.Butterworth-Heinemann

Clinical Anaesthesia

1. Barash, P. G., Cullen, B. F., Stoelting R. K., Cahala, M. K., Stock, M. C., & Ortega Rafael. *Clinical Anaesthesia*. 8th Ed. Philadelphia, Lippin Cott. Williams's and Wilkins (2017).
2. Aitkenhead A. R. Rowbotham, D. J., Smith, G. (2007). *Textbook of Anaesthesia*. London Churchill Livingstone.
3. Rushman G.B, Davies N.J.D, &Cashman N. (2006) .Lee Synopsis of anaesthesia.13th ed.Oxford. Butterworth Heinemann.
4. Smith, Rom, et-al (2009). *Fundamentals of anaesthesia*: Cambridge University Press.
5. John Butterworth, David Mackey , John Wasnick. *Morgan and Mikhail's Clinical Anesthesiology,* 6th edition 6th Edition

Anaesthesiology Encycopedia

1. Yentis, Hirsch, Ip. *Anaesthesia and Intensive Care A-Z ,An Encyclopedia of Principles and Practice* 5th Edition . Churchill Livingstone.

Fellowship examination - FCA(ECSA).

Applied Anatomy

1. Harold Ellis, Stanley Feldman, Anatomy for Anaesthetists, 8th Edition William Harrop-Griffiths
2. Moore, Keith l, Agur, Anne, M.R. Dalley II, Arthur, F (2013). Clinically oriented Anatomy. Lippincott Williams and Wilkins.

Applied Physiology

1. Andrew Day; Philip Mayne; Philip D. Mayne *Clinical Chemistry In Diagnosis and Treatment* by Andrew Day
2. Barett, Kim, E, Barman, Susan M, Scott, Boitano, Brooks, (2009). Ganong: *Review of medical physiology*.

3. Hall, John E and Guyton, Arthur C (2015). *Textbook of Medical physiology*. W B Saunders.

Applied Pharmacology

1. Susan Sasada, Martin, Smith , *Drugs in Anaesthesia & Intensive Care*
2. H. Paw, R. Shulman*, Handbook of Drugs in Intensive Care, An A-Z Guide, 6th edition*

Physics, Clinical Measurement & Equipment

1. P.D. Davis G. Parbrook Gavin Kenny, Basic Physics and Measurement in Anaesthesia 4th Edition
2. Andrew Davey Ali Diba, Ward's Anaesthetic Equipment, 6th Edition

Clinical Anaesthesia

1. Ronald D. Miller MD MS, Lars I. Eriksson MD PhD FRCA, et al. *Miller's Anesthesia*, 2-Volume Set

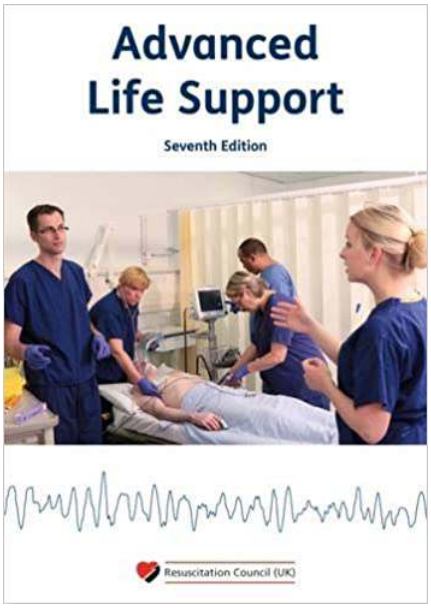
Critical Care Medicine

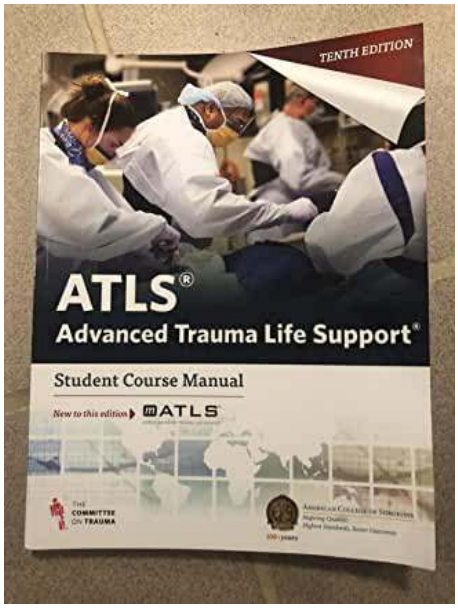
1. Andrew Bersten Jonathan Handy, *Oh's Intensive Care Manual* 8th Edition, Elsevier

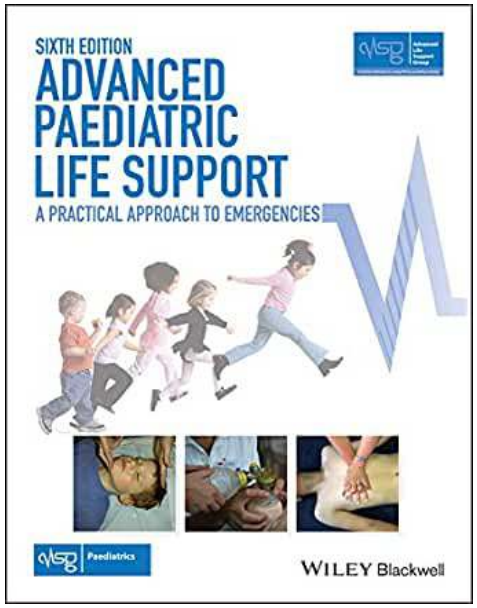
Internal Medicine

1. Douglas, Graham: Nicol, Fiona and Robertson, Colin (2013). *Macleod's Clinical examination*. Elsevier health sciences
2. Stuart Ralston Ian Penman Mark Strachan Richard Hobson, *Davidson's Principles and Practice of Medicine,* 23rd Edition, Elsevier.
3. D. Rubenstein, D. Wayne, J. Bradley *Lecture Notes on Clinical Medicine : Wiley*

Resuscitation







E-Books	**Anaesthesiology E-Books** Airway Management • Benumof and Hagberg's Airway Management 3rd ed. (2013) • Core Topics in Airway Management (2011) • Principles of Airway Management (2011) Anesthesiology • Core Clinical Competencies in Anesthesiology: A Case-based Approach (2010) • Evidence-Based Practice of Anesthesiology, 3rd ed. (2013) • Miller's Anaesthesia, 8th ed. (2015) • Morgan & Mikhail's Clinical Anesthesiology, 5th ed. (2013) • Ultrasound-Guided Regional Anaesthesia (2011) Atlases • Atlas of Regional Anaesthesia, 4th ed. (2011) • Atlas of Ultrasound-Guided Regional Anaesthesia, 2nd ed. (2013) Cardiac Anaesthesia • A Practical Approach to Cardiac Anaesthesia, 5th ed. (2013) • Core Topics in Cardiac Anaesthesia (2012) Medical Conditions • Anaesthesia and Uncommon Diseases, 6th ed. (2012) • Stoelting's Anaesthesia and Co-Existing Disease 6th ed. (2012) Neuroanesthesia • Cottrell and Young's Neuroanesthesia, 5th ed. (2010) Obstetric Anaesthesia • Anaesthetics and Obstetric Management of High-Risk Pregnancy, 3rd ed. (2004) • Chestnut's Obstetric Anaesthesia : Principles and Practice, 5th ed. (2014) • Obstetric Anaesthesia Handbook (2010) Paediatric Anaesthesia • Essentials of Paediatric Anesthesiology (2014) • Smith's Anaesthesia for Infants and Children, 8th ed. (2011) **Board Review** • Anaesthesia: A Comprehensive Review (2010) • Anaesthesia Secrets (2011) • Critical Care Secrets (2013) Pain • Bonica's Management of Pain (2010) • Evidence-based Interventional Pain Practice (2012) • Wall & Melzack's Textbook of Pain, 6th ed. (2013)

Appendix III: Faculty

1. The CANECSA programme shall be based at accredited teaching institutions and must have a minimum of two permanently employed physician anaesthesia practitioners in good standing at the medical board present at the site available for teaching and instruction of the fellows.
2. The fellowship programme must have a full time program director able to participate in coordination of educational activities; the director must be a bearer of an academic qualification equivalent or superseding the fellowship/ Masters of Medicine (Anaesthesia).
3. The programme shall have external faculty that will participate in training of both clinical and non-clinical core topics.
4. The fellowship programme envisages an external clinical rotation in centers that have highly specialized anaesthetic services, principally cardiac, paediatric, neurosurgical and transplant anaesthesia where unavailable at the training centers.
5. The accredited facilities shall create a fixed number of paid term trainee and trainer positions to ensure the sustainability and viability of the programme as well as not expand the programme beyond the centre's training capacity.
6. Every CANECSA accredited training institution shall establish an Institutional Research and Ethics Committee (IREC).

Appendix IV: Physical Facilities

1. Every accredited training facility shall have library facilities and provide unfettered access to the internet for research and training purposes to both the trainees and trainers.
2. The training facilities shall provide call rooms with ablution facilities for the trainees.
3. The facilities shall meet the established Medical Board set criteria for training facilities.