



المجلس العماني للإختصاصات الطبية
OMAN MEDICAL SPECIALTY BOARD

OMAN MEDICAL SPECIALTY BOARD



ANESTHESIOLOGY

AND

CRITICAL CARE

RESIDENCY TRAINING PROGRAM

2007

CERTIFICATION

Candidates passing the final specialty examination and successfully completing five years of training will awarded the Oman Specialty Certificate of Anesthesiology and Critical Care.

SPECIALTY EXAMINATION

The Board Evaluation consists of two parts:

Primary Specialty Board Examination (Part I OMSB)

The Primary Examination will be held once a year. It consists of:

Multiple Choice Questions (MCQ) paper

OSCE (Objective Structures Clinical Examination)

Two Oral Examinations

The examination will focus on applied anatomy, physiology, clinical biochemistry, physics, clinical measurement, pharmacology and basic principles of anesthesiology. Candidates are allowed to sit the Primary examination for a maximum of three attempts.

Final Specialty Board Examination (Part II OMSB)

The examination is given to candidates after the successful completion of training, as evidenced by an acceptable final in-training evaluation. Examinations will be held once per annum. Candidates are allowed a total of four attempts to pass the examination after completion of training.

The examination consists of:

Written part (MCQ's and Short answer paper)

Two Oral examinations

Clinical examination / Case scenarios

The written part is designed to evaluate clinical knowledge, clinical judgment and basic sciences.

Oral and Clinical part is designed to test the trainee's skills and abilities to interpret various clinical conditions describing the proper and accurate anesthetic and/or critical care management. The candidates will also be tested on the use of different equipments/instruments and procedures in the operating room, critical care situations and pain management.

OMAN MEDICAL SPECIALTY BOARD (OMSB)

RESIDENCY PROGRAMS IN ANESTHESIOLOGY AND CRITICAL CARE

A specialty committee representing the Department of Anesthesiology and Critical Care was established under Oman Medical Specialty Board on 6th of February 2007 to devise a plan for an organization with the specific purpose of educating and training residents practicing in the field of anesthesiology and critical care. The formation of the Oman Medical Specialty Board of Anesthesiology and Critical Care, an affiliate of The Oman Medical Specialty Board was completed on _____ as a separate primary Board with the formation of the Scientific Committee.

VACATION, HOLIDAYS and ON-CALL

1. Residents are entitled for four (4) weeks vacation annually.
2. Sick and maternity leaves will be compensated for, during or at the end of training

On call duty will be an average of one call every five nights (minimum of five calls per months) of 24 hours per call. Until the Initial Assessment of Competency has been proved (end of 6 months), trainees will be taking on call duties under direct supervision – along with another doctor on duty. The candidate is expected to perform the pre-operative clinical assessment of patients listed for operation the following day and report to the concerned consultants or consultant on call.

ASSESSMENT

Throughout the anesthetic training program all trainees undergo summative assessments designed to assess whether they have reached specified standards in the training program, to quantify experience, and to estimate the individual trainee's eligibility to progress to further stages of training, or to a career post.

Initial Assessment of Competency

Before any trainee can work without direct supervision they must pass the Initial Assessment Competency

End of Rotation Evaluation

At the end of each training rotation, the supervising consultant team shall provide the Training Committee with a completed evaluation of the resident's performance during that period of rotation. The candidate's must be made aware of the evaluation report.

Annual Review and Promotion

Evidence of the quality, quantity and variety of work will be reviewed annually and a decision regarding further progress and training needs will be made. This will be done by the Specialty Training Committee.

Promotion to Advanced Level of Training (Senior Residency) depends on satisfactory annual overall evaluation and passing the Primary Specialty Examination (Part I OMSB).

SI units; Other system of units if applicable (e.g. mmHg, Bar, Atmosphere)

Mass, Force, Work, Power

Heat: freezing point, melting point, latent heat

Conduction, convection, radiation

Mechanical equivalent of heat

Measurement of temperature and humidity

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 pneumatacograph and other respirometers

Principles of surface tension

Basic concepts of electricity and magnetism

Capacitance, inductance and impedance

Amplifiers: bandwidth, filters

Amplification of biologic potentials: ECG, EEG, EMG

Processing, storing and display of physiological measurements

Bridge circuits

Basic principles and safety of lasers

Ultrasound and Doppler effect

Cardiac pacemakers and Defibrillators

Electrocution, Fire and Explosions

Diathermy and its safe use

Principles of pressure transducers

Resonance and damping, frequency response

Measurement and units of pressure

**OMSB
Anesthesiology and Critical Care
Residency Program Curriculum**

Table of Contents

Title	Page #
Introduction	4
Underlying Principles	
Definition	
Objectives	5
General Objectives	
Specific Objectives	
Admission Requirements	6
Training Requirements	6
Structure of Training Program	
Duration of the Program	7-10
Basic Level Training (Junior Residency)	
Advanced Level Training (Senior Residency)	
Higher Specialty Training (Fellowship)	
Responsibilities	10
Contents of the Training	11
Residency Program Syllabus	12-26
Vacation, Holidays and On-Call	27
Assessment	27
Specialty Examination	28
Part I OMSB (Primary)	
Part II OMSB (Final)	
Certification	28
Logbook	29-33
Evaluation Forms	34-36
Resident Monthly Evaluation	
Consultant/Staff Evaluation	
6 months Rotation Evaluation Form	

INTRODUCTION

UNDERLYING PRINCIPLES

The principles of the OMSB Anesthesiology and Critical Care training program are that it:

- is competency based
- is planned
- is evaluated
- has clear objectives
- is supervised
- allows time for study
- accommodates the specific career needs of individuals.

There are certain generic professional skills, essential to the training of all specialists that should be covered. These include:

- attitude and behaviour
- communication
- presentation
- audit
- teaching, ethics and law
- Management

DEFINITION

'Anesthesiology' is a medical specialty which includes patient assessment and provision of life support, amnesia, and analgesia for both surgical procedures and childbirth; assessment and management of critically ill patients; and the assessment and management of patients with acute and chronic pain.

A 'Board Certified Anesthesiologist' is a physician who provides medical management and consultation during the perioperative period, in pain medicine and in critical care medicine.

Tissue binding and solubility

Materno-fetal distribution

Modes of drug elimination: direct excretion, phase I and II mechanisms, renal excretion and urinary pH, Hoffman's elimination

Pharmacokinetics: pharmacokinetic compartments, apparent volume of distribution, clearance concepts, effect of organ blood flow, Fick principle

Pharmacodynamics: concentration-effect relationships

Pharmacogenetics

Adverse reactions to drugs: hypersensitivity, allergy, anaphylaxis, anaphylactoid

Systematic Pharmacology

Anesthetic gases and vapours

Hypnotic, sedatives and intravenous anesthetic 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

Cardiovascular drugs: inotropes, vasodilators, vasoconstrictors, antiarrhythmics

Drugs acting on respiratory system: respiratory stimulants and bronchodilators

Anti-hypertensives; Anti-diabetics; Anticonvulsants; Diuretics; Antibiotics; Antacids; Antiemetic agents; Steroids; Antihistamines; Antidepressants; Anticoagulants; Local Anesthetic agents; Plasma volume expanders, Vitamins

31. Physics and Clinical Measurement

Concepts only of exponential functions: wash-in, wash-out

Basic measurement concepts: linearity, drift, hysteresis, signal, noise ratio

30. Pharmacology

Applied chemistry

Laws of diffusion

Solubility and partition coefficients

Ionisation of drugs

Drug isomerism

Protein binding

Oxidation, reduction, hydroxylation

Mode of Action of Drugs

Dynamics of drug-receptor interaction

Agonist, antagonist, partial agonists, inverse agonists

Efficacy and potency, tolerance

Receptor function and regulation

Metabolic pathways, drug: enzyme interactions, Michaelis-Menten equation

Enzyme inducers and inhibitors

Mechanisms of drug action

Ion channels, types, Gating mechanisms

Signal transduction

Action of gases and vapours

Osmotic effects, pH effects. Adsorption and chelation

Mechanisms of drug interactions

Pharmacokinetics and pharmacodynamics

Drug uptake from: GIT, lungs, transdermal, subcutaneous, I/M, I/V, epidural

Bioavailability

Factors affecting the distribution of drugs: perfusion, molecular size, solubility, protein binding

Distribution of drugs in body compartments

GENERAL OBJECTIVES

To enhance the recruitment of Omani graduates into the specialty of anesthesia and critical care.

To train the graduates in the areas of knowledge, skills and attitude specific to anesthesiology, critical care medicine and pain management to current international standards.

Upon completion of training, a resident is expected to be a competent specialist anesthesiologist, capable of functioning independently.

SPECIFIC OBJECTIVES

Upon successful completion of the training program (Board Certified), a resident is expected to have the following capabilities and skills:

Possess a sound knowledge of the basic sciences as applicable to anesthesia, critical care and pain management including anatomy, physiology, pharmacology, biochemistry, clinical measurements and physics.

Demonstrate knowledge of age related variables in medicine as they apply to neonatal, pediatric, adult, and geriatric patient care.

Establish a professional relationship with the patients and families; discuss appropriate information with them, and other members of the health care team.

Able to undertake pre-operative assessment, obtain consent for anesthetic procedure and prescribe proper premedication.

Adequate knowledge to use anesthetic equipment in a safe manner, and understand the interpretation and limitations of monitoring equipment.

Be able to undertake routine induction, maintenance and recovery from general anesthesia and the safe discharge of the patient from the recovery room.

Recognize ASA III, IV, V patients, the potential for difficult intubation and the timing and need for assistance and consultation.

Be able to assess, resuscitate and manage trauma/burn patients, and stabilize them and prepare for transfer if indicated.

Sound knowledge of resuscitation of patients following respiratory or cardiac arrests.

Possess theoretical knowledge and clinical skills to establish and manage different regional anesthetic techniques.

Assessment and provision of appropriate care of the mother and neonate in obstetrics.

Able to diagnose and manage critically ill patients and perform practical invasive procedures.

Possess the necessary knowledge, skills and attitudes relevant to acute and chronic pain management.

Be able to understand the statistical fundamentals upon which most clinical research is based.

Possess high ethical and moral standards.

Nervous System

Functions of neurons: actions potentials, conduction, synaptic transmission

Intracranial pressure: CSF and blood flow

Autonomic nervous system

Neurological reflexes

Motor function: spinal and peripheral

Pain: receptors, pathways (periphery to central), visceral pain

Spinal cord: functional anatomy, blood supply, transaction

Gastrointestinal

Gastric function: secretions, nausea, vomiting

Gut motility, sphincters and reflex control

Digestion function

Metabolism

Metabolic pathways, energy production

Body temperature and its regulation

Endocrinology

Hypothalamic and pituitary function

Adrenocortical hormones

Adrenal medulla

Pancreas: insulin, glucagon

Thyroid and Parathyroid hormones

Pregnancy

Physiological changes associated with pregnancy

Heart and Circulation

Cardiac muscle contraction

The cardiac cycle

Regulation of cardiac function

Control of cardiac out put (including the Starling relationship)

Fluid challenge and Heart failure

Electrocardiogram and Arrhythmias

Control of systemic blood pressure (rest, exercise, hypovolemia, Valsalva manoeuvre)

Peripheral circulation

Special circulations: pulmonary, coronary, cerebral, renal, portal, foetal

Renal System

Blood flow, GFR, 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

Gaseous exchange: O₂ and CO₂ transport, hypoxia, hyper and hypocapnia, hyper and hypobaric pressures

Haemoglobin: O₂ carriage and acid-base equilibrium

Pulmonary ventilation: volumes, flows, dead space

Effect of IPPV on lungs

Ventilation perfusion abnormalities

Control of breathing

Non-respiratory functions of lungs

SPECIAL ADMISSION REQUIREMENTS

A medical degree (MD/MBBS) or equivalent

Successful completion of rotating internship for 12 months

Passing an admission examination/interview

Provision of names of two consultant physicians as referees

Provision of a letter from a sponsoring organization giving approval of the candidate to join full time training, for the whole period of the program (4 years)

Signature of an obligation to abide by the rules and regulations of the training program of Oman Medical Specialty Board

TRAINING REQUIREMENTS

Training is a full time commitment. Residents shall be enrolled in full time, continuous training for the whole period of the program.

Training is to be conducted in institutions accredited for training by the Oman Medical Specialty Board of Anesthesiology and Critical Care.

The training will be comprehensive in the specialties of Anesthesiology.

Trainees shall be actively involved in patient care with gradual progression of responsibility.

Trainees shall abide by the training regulations and obligations set by the Oman Medical Specialty Board of Anesthesiology and Critical Care.

STRUCTURE OF TRAINING PROGRAM

DURATION OF THE PROGRAM

The training program will be of 5 years duration with an option of additional one year higher specialty training (Fellowship) after completion of Board Certification.

The duration of training is divided into two parts:

- First 24 months will be known as the **Basic Level Training (Junior Residency)**
- Final 36 months will be the **Advances Training (Senior Residency)**.

Each Residency year of training will be represented with the letter **R** followed by the number of year: **R1, R2, R3, R4** and **R5**.

Basic Level Training – Junior Residency (24 months – R1, R2)

The normal duration of basic level training will be 2 years of which 21 months must be in Anesthesia and 3 months in Critical Care Medicine. Of 21 months of anesthesia, 18 months will be training in Core Anesthesia and 3 months in Obstetric Anesthesia.

Core Anesthesia includes General and Regional anesthesia for General Surgery, Urology, Gynecology, Orthopedics and Trauma, Plastic, ENT, Ophthalmology, Maxillofacial and Dental surgeries.

The First 6 Months

After 6 months of training, residents must pass an initial assessment of competency comprising of:

- Preoperative assessment
- General anesthesia for ASA I or II patients (including equipment and anesthetic machine checks)
- Rapid sequence induction
- CPR skills
- Clinical judgment, attitude and behavior.

29. Physiology and Biochemistry

General

Function of cells, genes and their expression

Cell membrane characteristics, receptors

Biochemistry

Acid base balance and buffers

Electrolytes

Cellular metabolism, Enzymes

Body Fluids and their Functions

Capillary dynamics and interstitial fluid

Osmolarity, osmolality, partition of fluids across membranes

Lymphatic system

Special fluids especially CSF, pleural fluid and peritoneal fluid

Hematology

Red blood cells: hemoglobin and its variants

Blood groups

Haemostasis and coagulation

WBC, Inflammatory response

Muscle

Action potential generation and transmission

Neuromuscular junction and transmission

Muscle types

Motor unit

Skeletal muscle contraction

Smooth muscle contraction

Nervous System

Brain and its subdivisions

Spinal cord, meninges, subarachnoid and epidural space, contents

CSF and its circulation

Spinal nerves, dermatomes

Brachial plexus, nerves of arm

Intercostal nerves

Nerves of abdominal wall

Nerves of leg and foot

Autonomic nervous system

Stellate ganglion

Cranial nerves, base of skull, Trigeminal ganglion

Innervation of the larynx

Eye and orbit

Vertebral Column

Cervical, thoracic, and lumbar vertebrae

Sacrum and sacral hiatus

Ligaments of vertebral column

Surface Anatomy

Structures in antecubital fossa

Structures in axilla; identifying the brachial plexus

Large veins and anterior triangle of neck

Large veins of leg and femoral triangle

Arteries of arm and leg

Landmarks of tracheostomy, cricothyrotomy

Until this initial assessment of competency is passed, trainees cannot practice anesthesia without immediate supervision.

During the first six months, trainees should learn the basic principles of safe and effective anesthesia, resuscitation, and both the treatment and prevention of pain. Emphasis should be placed on the role of the anesthesiologist in the peri-operative care of the surgical patient. Thus a guided introduction to the pre-operative assessment and post-operative care is just as important as the practice of anesthesia

Training in the Next 18 Months

The following areas of basic training should be covered during this period:

Obstetric analgesia and anesthesia

The upper airway and its problems

Peri-operative care of the patient for major surgery

Anesthesia for day case surgery

Specific medical problems and anesthesia

Pediatric anesthesia (age 2 years and above)

Anesthesia in the elderly

Critical care medicine (2 months in general ICU plus 1 month in surgical HDU/ICU)

In this period, trainees will widen their experience to become eligible to sit for the Primary Specialty Examination (Part I OMSB) and proceed to Advanced Training (Senior Residency). By the end of this stage, trainees should be able to:

Undertake the anesthetic care of most routine cases

Assist in the anesthetic care for routine obstetric practice

Provide anesthetic care for routine obstetric practice

Organize with the surgical team, an emergency list; identify potential problems and seek appropriate help

Understand the principles underlying the care of patients in critical care and high dependency units

Understand the principles of acute pain management

Participate in audit

Pass the Primary Specialty Examination (Part I OMSB)

The Junior Residency period will be composed of 8 rotations each of which is 3 months (8 x 3 = 24 months). The Program Director may determine the sequencing of these rotations. The resident will be evaluated following each rotation, and the written evaluations should be maintained in each resident's file.

Advanced Level Training – Senior Residency (36 months – R3, R4, R5)

The aim of advanced level training undertaken during years 3, 4, and 5 is to prepare trainees for independent professional practice. These final 3 years will seek to develop:

The transition from basic competency to become skilled in specific aspects of anesthesia

The ability to manage patients with significant co-morbidities

Organizational skills so that their contribution to an operating list (as part of a team) ensures continuity and smooth running of cases by anticipating problems and planning ahead.

The program allows for trainees to become skilled at a higher level in particular aspects of anesthetic practice. The candidates must complete the Advanced training (Senior Residency) period of 36 months, as detailed below:

- 3 months Pediatric Anesthesia
- 3 months Cardiovascular and Thoracic Anesthesia
- 6 months Critical Care Medicine
- 3 months Neurosurgical Anesthesia
- 3 months Acute and Chronic Pain Management
- 3 months Medical Specialties – 2 months
(Cardiology, Respiratory medicine, Radiology)
- Diagnostic imaging, anesthesia and sedation – 1 month
- 6 months Core Anesthesia
- 3 months Obstetric Anesthesia
- 6 months Elective rotation / Research

26. Diagnostic Imaging, Interventional Radiology: Anesthesia / Sedation

Problems of remote area

Pre-anesthetic preparation

Sedation and GA techniques for pediatric and adults: angiography, interventional procedures, CT scanning

Magnetic resonance imaging: problems of isolated patient, magnetic field, monitoring

Hypothermia

Postoperative care

27. Miscellaneous

Cardiac catheterization: Pediatrics and adults

ERCO

Lithotripsy

Radiotherapy

Electro convulsive therapy

Stereotactic surgeries

28. Anatomy

Respiratory System

Mouth, nose, pharynx, larynx, tracheo bronchial tree, lungs; also blood supply and innervation of these structures

Pleura, mediastinum and its contents

Diaphragm, other muscles of respiration, innervation

The thoracic inlet and 1st rib

Interpretation of a normal chest X-ray

Cardiovascular System

Heart, chambers, conducting system, blood and nerve supply

Pericardium

Great vessels, main peripheral arteries and veins

Fetal and feto-maternal circulation

Arrhythmias
Convulsions
Regurgitation / aspiration
Laryngospasm, Bronchospasms
Tension pneumothorax
Gas / Fat / Pulmonary embolus
Adverse drug reactions
Anaphylaxis
Transfusion of mismatched blood or blood products

24. Anesthesia and the Elderly

Physiological changes with age
Altered pharmacological response
Erosion of physiological response
Frequent co-morbidities
Positioning difficulties
Communication difficulties (eye sight, hearing, CVA's)
Causes of postoperative confusion

25. Management of Respiratory and Cardiac Arrest

Patient assessment: diagnosis of causes of cardio-respiratory arrest
Causes of cardio-respiratory arrest during induction, maintenance and recovery from anesthesia
Importance of non-cardiac causes of cardio-respiratory arrest
Methods of airway management (mouth to mouth/nose, bag mask, LMA, intubation)
Recognition and management of life threatening of arrhythmias including defibrillation and drug therapy
Knowledge of specific problems of pediatric resuscitation
Ethical aspects of resuscitation

The Advanced Level (Senior Residency) period is composed of 6 rotations each of which is 3 months (6 x 3 = 18 months) and 3 rotations of 6 months each (3 x 6 = 18 months). The exact timing and sequence of the rotations will be worked out by the Program Director according to the total number of trainees and available rotations at each training center.

After two years of advanced training (end of 4 years), candidates are allowed to proceed to Final Specialty Board Examination (Part II OMBS). The Board Certification in the Specialty of Anesthesia and Critical Care will be awarded after the successful completion of the final year (5th year) of training even though the trainees might have cleared their Part II OMSB a year earlier.

Higher Specialty Training - Fellowship (Optional)

Some trainees will want to gain advanced training in specific special interest areas of anesthesia and critical care medicine. In the era of specialization, interested candidates will be encouraged to undergo additional training in areas like Cardio thoracic anesthesia, Neuro anesthesia, Pediatric anesthesia, Critical care medicine and Pain management. For these special interests a period of training at least 6 months and up to 12 months can be followed which will allow the trainee to become expert in that particular field and consequently be able to apply for a post with a significant clinical commitment in the special interest. The details of this will be charted out in due course.

Responsibilities

1. The trainee shall be responsible for proper and logical peri-operative anesthetic management according to his/her level of training.
2. The trainee shall attend anesthetic out-patients clinics and day surgery, according to the planned rotation, in order to gain experience in each field.
3. Trainees shall attend, participate and perform anesthetic procedures for various surgical procedures and will be responsible for the well being of their patients in the recovery area as well.
4. Trainees shall attend and participate under supervision, in the active management of patients in the critical care units.
5. Trainees shall maintain patient confidentiality and ethics of the profession.

Trainees shall abide by the policies and procedures of the department and hospital.

CONTENTS OF THE TRAINING

Academic and Clinical Activities

Candidates are expected to attend didactic lectures provided by the program and participate actively in departmental presentations, symposia, conferences, workshops, training courses, etc.

Candidates are expected to attend regularly and punctually to their clinical duties in operating theatres, intensive care, or any other assigned clinical rotation.

Procedure and Skills in Anesthesiology

Each candidate must complete sixteen hundred (1,600) cases in different fields of Anesthesiology and Critical care management which he/she has performed during the training period. The total number of cases achieved by the trainee is divided into nine hundred (900) anesthetic procedures cases in his/her Junior residency training period and seven hundred (700) cases during the Senior residency training period.

Logbook

All trainees are required to maintain a log book to record all activities of training. This is mandatory. The activities must be dated and categorized to the period/rotation of the training and whether it was performed by the trainee, or as an assistant or an active participant. Each activity registered in the logbook must be countersigned by the trainer. An evaluation of the rotation is to be countersigned by the Program Director when it is deemed complete. A total of 1,600 anesthetic procedures must be completed.

Cardiopulmonary resuscitation

Management of immunocompromised and HIV patients

Brain death: brain stem function assessment

Transport of the critically ill

22. Pain Management, Acute & Chronic

Anatomy, physiology, pharmacology relevant to pain management

Mechanisms of pain: somatic, visceral and neuropathic pain

Assessment and measurement of pain

Techniques for control of acute pain in all age groups

Non-pharmacological methods of pain relief

Pharmacology of opioids, NSAID's

The analgesic ladder

Principles of neural blockade for pain relief

Local anesthetic agents: drugs and mechanisms

Organization and objectives of an acute pain service

23. Critical Incidents

Principles of the causes, detection and management of:

Cardiac and respiratory arrest

Unexpected hypoxia with or without cyanosis

Unexpected increase in peak airway pressure

Progressive fall in minute volume during spontaneous respiration or IPPV

Fall in end tidal CO₂

Rise in end tidal CO₂

Rise in inspired CO₂

Unexpected hypotension

Unexpected hypertension

Sinus tachycardia

21. Critical Care Medicine

Understanding the potential benefits of critical care
Common causes/indications of admission to HDU/ICU
Methods of examination of the unconscious patient
Monitoring in ICU: invasive and non-invasive
Understanding sepsis, septic shock and multi-organ failure (MOF)
Common causes of cardiac and respiratory arrest
Pathophysiology of cardiogenic and hypovolemic shock
Acute coronary syndrome, cardiac failure
Pulmonary embolism
Management of acute and chronic respiratory failure
Mechanical ventilation: non-invasive and invasive
Management of tracheostomy and decannulation
Management of severe asthma, COPD
Traumatic and non-traumatic coma, CNS infection, encephalopathies, status epilepticus, acute polyneuropathy, stroke
Diagnosis, prevention and management of acute renal failure
Renal supportive measures: HD, CVVH
Fluids and electrolyte balance
Acid base management
Nutrition
Microbiology, infection, antibiotics
Hematological disorders: coagulopathies, hemolysis, blood transfusion
Gastrointestinal disorders: acute liver failure, acute pancreatitis, gut bleeding
Pharmacology of cardiovascular drugs, sedatives, muscle relaxants: indications
Management of acute poisoning
ICU record, scoring systems and Audit
Ethics, end of life care
Communication skills with patients, their relatives and staff

Contents of the logbook include:

1. Anesthetic procedures and technical skills acquired during the training period.
2. Major invasive and non-invasive diagnostic monitoring procedures performed or learned, such as insertion of vascular lines, bronchoscopy, fibreoptic laryngoscopy, percutaneous tracheostomy, diagnostic and therapeutic pain management interventions, obstetric analgesia, various critical care unit procedures etc. Records of complications and other critical incidents are also equally important.

Auditing and Research Activity

Research is regarded by the Specialty Board as being integral to the development of anesthesia, critical care and pain management. Every trainee should be able to evaluate new developments in their specialty. To achieve this, trainees require experience in research methods so they can:

learn to pose relevant questions, formulate hypotheses, design simple research projects, understand the statistical evaluation of such projects, and know how to draw valid conclusions;

develop and maintain a system of continuous learning in order to keep abreast of major clinical and research developments; and

in the context of training, learn to apply audit principles to their own work, and to clinical practice.

RESIDENCY PROGRAM SYLLABUS 2007

1. Preoperative Assessment

The ASA classification and GCS

The interpretation of relevant preoperative investigations

Restriction of food and fluid by mouth, cessation of smoking, correction of dehydration

Assessment of difficulties in airway management and the importance of 'shared airway'

Implications for anesthesia of common medical conditions (ischemic heart disease, hypertension, bronchial asthma, diabetes, rheumatoid arthritis, etc.)

Anesthetic implications of current drug therapy and whether it should be continued, stopped or modified peri-operatively

Need for and methods of pre-operative DVT prophylaxis

The importance of anesthetic and genetic disease history with respect to suxamethonium apnoea, anaphylaxis, and malignant hyperthermia

Post-operative analgesic needs

Assessment of whether post-operative ICU or HDU care is required

Importance of consent

Dangers of repeat anesthesia

2. Premedication

Rationale use for premedicant drugs

Choice of drugs, advantages and disadvantages

Rationale for antacid and prokinetic premedication

Rationale for DVT prophylaxis

Understanding of causes of delayed gastric emptying

3. Anesthesia, HDU and ICU Equipment; Monitoring and Safety

Physical principles underlying the function of the anesthetic machine, pressure regulators, flowmeters, vaporizers, breathing systems

Chemistry of absorption of carbon dioxide

Anesthesia for dental extractions (include sedation and analgesic techniques)

Pediatric anesthesia

Assessment and management of the difficult airway including the perioperative management of the fractured jaw and other major facial injuries

Postoperative management

19. Plastic and Burns

Preoperative assessment with particular reference to difficult airway

Pediatric cases: cleft lip and palate

Physiology of tissue blood flow

Benefits and risks of hypotensive anesthesia

Pathophysiology of the patient with burns

Assessment and resuscitation of patient with burns: fluid management

Heat and smoke inhalation injury: management

20. Orthopedic Anesthesia

Preoperative assessment – pediatrics, elderly, congenital syndromes, rheumatoid arthritis of vertebral fractures

Problems of cervical spine injury

Emergency anesthesia for fractures

Routine anesthesia for joint replacement surgery, arthroscopy, fractures bones, dislocations, tendon repair

Problems of use of tourniquets, cement, prone position

Anesthesia for spinal surgery including scoliosis

Prevention, diagnosis and management

16. Ear, Nose and Throat (Otorhinolaryngology)

Preoperative assessment – prediction of difficult intubation
Management of patients of all ages
Local techniques and surface analgesia
Acute ENT emergencies (bleeding tonsils, croup, epiglottitis, foreign bodies)
Laryngoscopy and bronchoscopy
Knowledge of special tubes, gags and equipment for microlaryngeal surgery, laser surgery and bronchoscopy (venture devices, ventilating bronchoscope)
Emergency airway management including tracheostomy, use of Helium
Postoperative management

17. Ophthalmic Anesthesia

Preoperative assessment with particularity of those with comorbidities
Choice of local or general anesthetic techniques in relation to the patient and surgery with particular reference to:
Strabismus surgery, cataract surgery, detached retina
Penetrating eye injury
Control of intra ocular pressure
Action of anesthetic drugs on the eye
Anatomy relevant to LA blocks
Local anesthetic techniques
Problems of glaucoma surgery
Postoperative care

18. Maxillo-Facial and Dental Anesthesia

Preoperative assessment
Day case/impatient requirements
Resuscitation facilities

Principles of lung ventilators, disconnection monitors

Manufacture and storage of oxygen, nitrous oxide, carbon dioxide, compressed air, gas cylinders

Pipeline and suction systems

Basis of pre-use check of anesthetic machines, breathing circuits and monitors

Airways, tracheal tubes, tracheostomy tubes, emergency airways, laryngeal masks, oxygen therapy equipments, self-inflating bags

The content of an anesthetic record

Function and use of resuscitation equipment, transfusion devices

Humidification devices

Anesthetic gas scavenging systems, humidity

Sterilization and cleaning of equipment

Electrical safety

Characteristics of intravenous cannulae, spinal and epidural needles

4. Induction of General Anesthesia

Intravenous and inhalational induction – advantages and disadvantages

Indications of tracheal intubation

Selection of tube type (oral, nasal, armoured etc), diameter and length

Management of difficult intubation and failed intubation

Methods of confirming endotracheal tube placement; oesophageal and endobronchial intubation, complications

Insertion and use of oral airways, face masks and laryngeal mask airway

Causes of regurgitation and vomiting during induction, prevention and management of pulmonary aspiration

Cricoid pressure

Induction of anesthesia in special circumstances (head injury, full stomach, upper airway obstruction, shock)

Drugs: pharmacology and dosages of induction agents, relaxants, analgesics and inhalation agents

Side effects of drug used and their interactions

Monitoring during induction

Recognition and management of anaphylactic and anaphylactoid reactions including follow-up and patient information

Management of intra-arterial injection of harmful substances (antibiotics, thiopentone etc.)

Management of asthma, COPD, hypertension, IHD, rheumatoid arthritis

Problems of the obese patient

5. Intraoperative Care including Sedation

Techniques of maintenance of general anesthesia involving both spontaneous and controlled ventilation

Definition and methods of sedation

Management of the shared airway

Effects and hazards of induced pneumoperitoneum for laparoscopy

Pharmacology of drugs used for maintenance: analgesics, relaxants, inhalational agents

Methods of producing muscle relaxation

Choice of spontaneous and controlled ventilation and monitoring them

Minimum monitoring standards

Additional monitoring for sick patients (CVP, urine flow)

Detection and prevention of awareness

Management of important critical incidents during anesthesia

Diagnosis and treatment of pneumothorax

Principles of fluid balance

Blood and blood products, synthetic colloids, crystalloids

Management of massive haemorrhage

Intraoperative positioning, nerve injuries, prevention

Neurological monitoring

Guillain-Barre Syndrome

Myasthenia gravis, Thymectomy

Dystrophia myotonica, Muscular dystrophy, Parkinsonism

Paraplegia and long-term spinal cord damage

Control of convulsions including status epilepticus

Tetanus

14. Vascular Anesthesia

Management of the patient for major vascular surgery

Management of carotid artery surgery

Management of pheochromocytoma

Postoperative management and critical care of vascular patients including postoperative analgesia

Anesthesia for non-cardiac surgery in patients with cardiac disease

Massive blood transfusion

Aortic cross-clamping and renal protection

15. Day Surgery

Pre-anesthetic Assessment Clinic (PAC)

Instructions to patients

Regional anesthesia appropriate to day cases

General anesthesia appropriate to day cases

Drugs for day cases

Recovery assessment

Postoperative analgesia

Urology

Anatomy of the renal tract
Blood flow, GFR, plasma clearance
Tubular function, urine formation, and micturition
Assessment of renal function
Disturbances of fluid balance, oedema and dehydration
Acid-base abnormalities
Renal failure and its management
Plasma electrolyte disturbances
Anesthesia on spinal injury patients for urology procedures
TUR syndrome

Transplantation

Principles and complications of immunosuppression
Specific anesthetic problems associated with renal transplantation
Anesthetic management of patients with transplanted organs

13. Neuroanesthesia

Preoperative assessment and management of patients with neurological diseases
Anesthesia for imaging relevant to the CNS
Anesthesia for MRI including problems of magnetic fields
Anatomy, physiological control and effect of drugs on CBF, ICP and CMRO₂
Principles of anesthesia for craniotomy – vascular disease, cerebral tumours and posterior fossa lesions
Anesthetic implications of pituitary disease and trans-sphenoidal surgery
Anesthesia for spinal column surgery and anesthetic implications of spinal cord trauma
Principles of immediate post-operative management including pain relief and special considerations with narcotics

Management of asthma, COPD, hypertension, IHD, jaundice, steroid therapy, diabetes, rheumatoid arthritis

Modification of technique in repeat anesthesia

Understanding basic surgical operations

6. Postoperative and Recovery Care

Causes and treatment of failure to breathe at end of operation

Distinguishing between opiate excess, continued anesthetic effect and/or residual paralysis

Care of the unconscious patient

Monitoring the patient in the recovery

Interpretation of nerve stimulator patterns

Oxygen therapy, indications and techniques

Management of cyanosis, hypotension and hypertension, shivering and stridor

Postoperative fluid balance and prescribing

Assessment of pain and methods of pain management

Methods of treating of post operative nausea and vomiting

Causes and management of post operative confusion

Management of the obese patient

Management of asthma, IHD, COPD, steroid therapy

Recovery room equipment

Prevention, diagnosis and management of postoperative pulmonary atelectasis, deep vein thrombosis and pulmonary embolus

Criteria for discharge of day-stay patients

7. Regional Anesthesia

Pharmacology of local anesthetics and spinal opioids

Anatomy of spine, nerve roots, cauda equine, intercostal nerves, brachial plexus, femoral nerve, inguinal canal, nerves at wrist and ankle, nerve supply of larynx

Dermatomes and levels for common operations (e.g. Inguinal hernia, haemorrhoids)

Technique of spinal and epidural (including caudal) anesthesia: single shot and catheter techniques

Management of the complications of spinal and epidural/caudal analgesia (associated hypotension, shivering, nausea and anxiety)

Management of accidental total spinal blockade

Management of dural tap

Techniques and complications of intravenous regional anesthesia (IVRA)

Toxicity of local anesthetics and its management

Management of failed/deteriorating regional block

Methods of sedation

Absolute and relative contraindications of regional blockade

8. Management of Trauma

Performance and interpretation of primary and secondary survey

Emergency airway management

Anatomy and technique of cricothyrotomy/tracheostomy/mini-tracheotomy

Establishing IV access: interosseous cannulation

Immediate specific treatment of life-threatening illness or injury, with special reference to abdominal and thoracic trauma

Recognition and management of hypovolemic shock

Effects of trauma on gastric emptying

Central venous access: anatomy and techniques

Central venous pressure monitoring

Arterial pressure monitoring

Pleural drain monitoring

Peritoneal lavage

Principles of the management of head injury

Methods of preventing the 'second insult' to the brain

Principles of anesthesia in the presence of a recent head injury

Management of cervical spine injuries

Thoracic Anesthesia

Preoperative pulmonary function tests

Local and general anesthesia for bronchoscopy including techniques of ventilation

Understanding of fiberoptic bronchoscopic techniques for airway management

Principles of one lung anesthesia

Anesthetic management of tracheo-esophageal fistula

Principles of underwater seals and chest drains

Postoperative care and analgesia after thoracic surgery

12. General Surgery, Gynaecology, Urology, Transplantation

General Surgery

Relevant anatomy and physiology of common surgical procedures

Anesthesia for complex GI surgery including intrathoracic procedures

Emergency anesthesia for general surgery

Diseases relevant to hepatobiliary, pancreatic, splenic surgery

Management of thyroid (and parathyroid) surgery

Starvation / obesity

Gynaecology

Relevant anatomy and physiology

Preoperative assessment

Laparoscopic surgery

Gynecological procedures during surgery

Modification of drug dosages

Analgesia for children

Premedication, including local anesthesia for venepuncture

Calculation of tube sizes, selection of masks and airways

Upper respiratory tract infections and when to cancel cases

Anesthetic problems and management of important congenital anomalies including those requiring surgical correction in the neonatal period (tracheoesophageal fistula, diaphragmatic hernia, exomphalos, gastroschisis, intestinal obstruction, pyloric stenosis)

Resuscitation of the newborn

Management of acute airway obstruction including croup and epiglottitis

11. Cardiac/Thoracic Anesthesia

Cardiac

Preoperative assessment and perioperative care of patients with cardiac disease

Induction and maintenance of anesthesia for high risk cardiac procedures

Antibiotic prophylaxis against subacute bacterial endocarditis

Problems of cardio pulmonary bypass, myocardial protection and the weaning of patients from CPB

Management of cardiac tamponade

Interpretation of ECG and chest X-ray

Interpretation of non-invasive and invasive cardiovascular monitoring

Cardiac pacing models/different pacemakers

Intra-aortic balloon counter pulsation

Postoperative cardiac critical care

Principles of the safe transfer of patients

Understanding portable monitoring systems

Factors affecting intra ocular pressure

9. Obstetric Anesthesia and Analgesia

Physiological changes associated with a normal pregnancy

Functions of the placenta: placental transfer: fetomaternal circulation

Pain pathways relevant to labour

Effect Gastrointestinal physiology and acid aspiration prophylaxis

Methods of analgesia during labour: indications and contraindications

Effect of pregnancy on the technique of general and regional anesthesia

Emergencies in obstetric anesthesia: pre-eclampsia, eclampsia, major haemorrhage, maternal resuscitation, amniotic fluid embolus, total spinal

Management of difficult or failed intubation

Maternal and neonatal resuscitation

DVT prophylaxis

Use of Magnesium sulphate

Principles of anesthesia for incidental surgery during pregnancy

Maternal morbidity and mortality

10. Pediatric Anesthesia

Anatomical differences in the airway, head and spinal cord from the adult

Physiological differences from the adult

Starvation and hypoglycemia

Preoperative assessment and psychological preparation

Anesthetic equipment and the difference from adult practice

Estimation of blood volume and replacement of fluid loss