

**SUBSPECIALITY TRAINING PROGRAMME
MINISTRY OF HEALTH**

ANAESTHESIOLOGY

Bahagian Perkembangan Perubatan
Kementerian Kesihatan Malaysia
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Training Requirement

Anaesthesiology Subspecialty Training Programme,

Ministry of Health Malaysia

General Introduction

1. The Ministry of Health introduced the Anaesthesiology Subspecialty Training Program in the year 2000 in order to have a more structured and systematic training of subspecialists.
2. The objective of the training program is to provide training and experience in the various subspecialties in anaesthesia at a sufficient level for the trainee to acquire the competency to function as an independent specialist in the field.
3. The Anaesthesiology Subspecialty Training Program is managed by the Anaesthesiology Subspecialty Committee (known henceforth as The Committee).
4. Areas of subspecialisation that have been identified for anaesthesiologist are:
 - a. Cardiothoracic Anaesthesia and Perfusion
 - b. Paediatric Anaesthesia and Intensive Care
 - c. Neuroanaesthesia and Neurointensive Care
 - d. Pain Medicine
 - e. Adult Intensive Care
 - f. Obstetric Anaesthesia
 - g. Liver Transplant Anaesthesia (when the need arises)
5. In addition, consideration will be given by the Committee for recommendation for training in other subspecialty areas where appropriate.
6. All candidates are subject to the requirements in the Ministry of Health Circular, "Tawaran Program Subkepakaran Tahun 2013" which can be downloaded from http://medicaldev.moh.gov.my/v2/uploads/prof/prog_subkepakaran.pdf

Entry Requirements

1. Gazettement as a specialist anaesthesiologist in the Ministry of Health.
2. 2 years post-gazettement as a specialist. However, consideration will be given to candidates with less than 2 years post-gazettement if there is an urgent need for more subspecialists in that particular subspecialty.
3. Report from 2 supervisors (one of whom will be the Head of Department) pertaining to the suitability of the candidate in terms of knowledge, attitude and skills.

Duration of Training

The total duration of training is 3 years. Depending on the subspecialty, 2 years of supervised training can be either 2 years in local centres or 1 year local and 1 year abroad. The third year of training may be under distant supervision. The 3 years training cannot be undertaken in a single centre.

Application procedure

- a. Fill the form (BORANG PERMOHONAN PROGRAM SUBKEPAKARAN DALAM DAN LUAR NEGARA KKM) which can be downloaded from http://medicaldev.moh.gov.my/v2/uploads/prof/borang_permohonan.pdf
- b. Submit the form to Bahagian Pengurusan Latihan (BPL) KKM through Hospital Director and State Health Director with a copy to the Urusetia, Program Subkepakaran, Peringkat Kementerian, Cawangan Pembangunan Profesyen Perubatan, Bahagian Perkembangan Perubatan, KKM
- c. A photostat copy of the above form should be sent to the Anaesthesiology Subspecialty Committee at the Department of Anaesthesiology, Hospital Kuala Lumpur, Jalan Pahang, 50586 Kuala Lumpur.
- d. Selection of the candidate will be done by the Committee, who will then make recommendations to the Cawangan Pembangunan Profesyen Perubatan, Bahagian Perkembangan Perubatan, KKM.
- e. Successful candidates will be required to sign a contract agreement issued by Bahagian Pengurusan Latihan (BPL)
- f. Each candidate will be given a training plan by their respective subspecialty head through Cawangan Pembangunan Profesyen Perubatan, Bahagian Perkembangan Perubatan, KKM. This will include the place of posting after

completion of training.

Training Requirements and Gazettement

Candidates who have been accepted into the training program must adhere to the following;

1. Maintain a log book in the required format.
2. Submit 6 monthly completed supervisor assessment forms to the Committee.
3. Report to BPL, Cawangan Pembangunan Profesyen Perubatan, Bahagian Perkembangan Perubatan, KKM and the subspecialty committee upon completion of training.
4. On completion of training, the candidates have to submit the following;
 - Log book
 - Supervisors' reports
 - Formal project in the form of either a case report, poster presentation, free paper presentation or publication.
5. An exit viva is required for certain subspecialties.
6. A certificate of completion of training will be issued by Cawangan Pembangunan Profesyen Perubatan, Bahagian Perkembangan Perubatan, Kementerian Kesihatan Malaysia on the recommendation of The Committee when the above items 4 and 5 have been fulfilled.
7. The final place of posting after completion of training is dependent on service requirements at that time.
8. The candidate must apply for subspecialty gazettelement with the Ministry of Health within 6 months of completion of training.

TRAINING IN CARDIOTHORACIC ANAESTHESIA AND PERFUSION

Objectives:

1. To provide in-depth and comprehensive training for the anaesthesiologist to acquire knowledge and competency in the field of cardiothoracic anaesthesia and perfusion.
2. To equip the anaesthesiologist with an in-depth understanding of the principle, techniques and physiology of cardiopulmonary bypass (CPB), techniques of myocardial preservation and cardiothoracic surgical techniques.
3. To achieve competency in the use of newer monitoring techniques in cardiac anaesthesia e.g. Transoesophageal Echocardiography (TOE).
4. To achieve competency in the anaesthetic management of patients in cardiothoracic related surgeries i.e. anaesthesia for carotid artery, aortic, pericardial, lung and mediastinal surgeries.
5. To train the anaesthesiologist to be competent in the management of patients in cardiothoracic intensive care unit (CICU).
6. To accrue knowledge in recent advances and technological developments in cardiothoracic anaesthesia and perfusion for excellence in practice as well as to provide leadership in the training other anaesthesiologists in this subspeciality.

Training Structure

- The total duration of training is 36 months. The first 24 months must be fully supervised and the final 12 months may be under distant supervision.
- The 24 months of supervised training, includes at least 9 months of overseas training.
- The 36 months training cannot be undertaken in a single centre.

Training Centres (local):

For recognition as a training centre in cardiac anaesthesia and perfusion, the centre should meet the following criteria:

1. A workload of 250 cardiac operations per year inclusive of off-pump coronary artery bypasses (OPCAB).
2. The centre must have an anaesthesiologist trained in cardiothoracic anaesthesia and perfusion.
3. The centre must provide hands on experience in the conduct of cardiopulmonary bypass.
4. The centre must have the support of a well organized cardiothoracic intensive care unit.
5. For local centres recognized for training in lieu of overseas centre, the annual case volume and types/mix (complexities, paediatric, thoracic) must be sufficient to ensure a comparable overseas exposure.

Recognised local training centres are:

1. Hospital Pulau Pinang
2. Hospital Serdang
3. Hospital Sultanah Aminah, Johor Baru
4. Pusat Jantung Hospital Umum Sarawak, Kuching

Certification:

On completion of training, the candidates have to submit the following;

- Log book
- Supervisors' reports
- Formal project in the form of either a case report, poster presentation, free paper presentation or publication

Training Requirements

1. Contents of training in cardiac anaesthesia:

Part I. Anaesthetic Pharmacology

- i. Effect of inhalation anaesthetics on systemic haemodynamics and the coronary circulation.
- ii. Pharmacokinetics in the cardiac patient.
- iii. Opioid analgesics in cardiac anaesthesia.
- iv. Muscle relaxants and the cardiovascular system.
- v. Interpretation of cardiac catheterization, echocardiography (transthoracic echocardiograph (TTE) and transoesophageal echocardiograph (TOE)).

Part II. Monitoring

- i. Haemodynamic monitoring.
- ii. Intraoperative echocardiography.
- iii. Central nervous system monitoring.

Part III. Preoperative Management

- i. Preoperative assessment.
- ii. Etiology and treatment of perioperative cardiac dysrhythmias.
- iii. Antianginal drug therapy.
- iv. Antihypertensive therapy.

Part IV. Anaesthesia for Cardiac Surgery

- i. Anaesthesia for Myocardial Revascularization (conventional and OPCAB)
- ii. Valvular Heart Disease.
- iii. Anaesthesia for Treatment of Congenital Heart Disease.
- iv. Thoracic Aortic Disease.
- v. Anaesthesia for Electrophysiologic Procedures.

- vi. Management of Emergency Revascularization or Cardiac Reoperations.
- vii. Anaesthesia for Carotid Endarterectomy
- viii. Anaesthesia for Lungs and Mediastinum surgery
- ix. Pacemakers and Electro-Cardioversion.
- x. Cardiac Transplantation.

Part V. Postoperative Care

- i. Management of ventilation.
- ii. Postoperative circulatory control.
- iii. Nutrition and Cardiac Function.
- iv. Complications of Cardiac Surgery.
- v. Pain Management (e.g. Thoracic Epidural).

2. Contents of training in Cardiopulmonary Bypass:

Part I. Equipment

- i. Blood Pumps.
- ii. Principles of Oxygenator Function: Gas Exchange, Heat Transfer, and Operation.
- iii. Circuitry and Cannulation techniques.
- iv. Cardiotomy Suction and Venting.
- v. Hemofiltration , Dialysis, and Blood Salvage Techniques during Cardiopulmonary Bypass.
- vi. Circulatory Assist Devices: Intra-Aortic Balloon Pump (IABP).

Part II. Physiology and Pathology

- i. Blood-Surface Interface.
- ii. Pulsatile Cardiopulmonary Bypass.
- iii. Hemodilution and Priming Solutions

- iv. Hypothermia: Physiology and Clinical Use.
- v. Surgical Myocardial Protection.
- vi. Changes in the Pharmacokinetics and Pharmacodynamics of Drugs administered During Cardiopulmonary Bypass.
- vii. Immune and Inflammatory Responses after Cardiopulmonary Bypass.
- viii. Embolic Events.
- ix. Endocrine, Metabolic, and Electrolyte Responses.
- x. Cardiopulmonary Bypass and the Lung.
- xi. Cardiopulmonary Bypass and the kidney.
- xii. Splanchnic, Hepatic, and Visceral Effects.
- xiii. Neurological Effects.

Part III. Hematology

- i. Anticoagulation for Cardiopulmonary Bypass.
- ii. Heparin Neutralization.
- iii. Hematologic Effects of Cardiopulmonary Bypass.
- iv. Management of Coagulopathy Associated with Cardiopulmonary Bypass.
- v. Blood Transfusion and Blood Conservation.

Part IV. Clinical Applications

- i. Conduct of Cardiopulmonary Bypass.
- ii. Management of Unusual Problems Encountered in Initiating and Maintaining Cardiopulmonary Bypass.
- iii. Termination of Cardiopulmonary Bypass.
- iv. Cardiopulmonary Bypass in Infants and Children.
- v. Extracorporeal Membrane Oxygenation for Respiratory or Cardiac Support.
- vi. Perfusion for thoracic Aortic Surgery.

3. Skills

To be conversant with the indications, contraindications, complications and limitations of the following procedures and to acquire the technical skills necessary to perform the following:

I. Circulation

- i. Cardiac output determinations using thermodilution technique and other non-invasive techniques.
- ii. IABP insertion and management.
- iii. Temporary pacemaker.

II. Conduct of Cardiopulmonary Bypass (CPB)

- i. Able to assemble the CPB circuit until ready to go on bypass.
- ii. Able to run the CPB machine for any type of cardiac surgery.
- iii. Able to do ACT (Activated Clotting Time), ABG, BUSE, HCT and interpret the results with specific managements.
- iv. Familiarity with various cardioplegia techniques.
- v. Circulatory arrest.
- vi. Cerebral protection techniques.

III. Transoesophageal Echocardiography (TOE)

- i. Insertion of the TOE probe
- ii. Evaluation and interpretation of the results
- iii. Appropriate management of findings
- iv. Written report on formatted TEE forms
- v. Cleaning of TOE probe

TRAINING IN NEURO-ANESTHESIA

Objectives:

1. To provide comprehensive training and in-depth experience for the trainee to acquire knowledge and skills in the field of anaesthesia for patients undergoing neurosurgery or interventional neuro-radiological procedures.
2. To develop skills and clinical knowledge and in managing adult neurosurgical and neuro-medical patients in the intensive care unit.
3. To acquire knowledge in recent advances in research and technological developments in the above fields for the purposes of developing better neuro-anaesthetic and neuro-intensive care practices in the country as well as training other anaesthetic specialists in this area of sub-speciality.

Training Structure

- The total duration of training is 36 months.
- The first 12 months must be fully supervised training in a centre that provides tertiary neurosurgical services. The trainee must also be involved in the intensive care management of the neurosurgical patient.
- The second 12 months of training must be done in an overseas centre that offers advanced neuro-anaesthesia services and training facilities
- The third 12 months of training will be carried out in a locally and may be under distant supervision.

Training Centres:

For the local centre to be recognized for training in neuro-anaesthesia, the centre should meet the following criteria:

1. The hospital should be a centre for neurosurgery services with at least two trained neurosurgeons.
2. Workload of at least 1,000 neurosurgical or neuro-spine surgery cases per year.
3. The centre must have an anaesthesiologist trained in neuro-anaesthesia.
4. The centre should preferably provide interventional neuro-radiological services.

The current recognised local training centres are:

- I. Hospital Kuala Lumpur
- II. Hospital Sungai Buloh
- III. Hospital Sultanah Aminah, Johor Bahru
- IV. Hospital Pulau Pinang

Certification:

On completion of training, the candidates have to submit the following;

- Log book
- Supervisors' reports
- Formal project in the form of either a case report, poster presentation, free paper presentation or publication

Training Requirements

1. Contents of training:

- Applied neuro-physiology
- Preoperative evaluation of the neurosurgical patient
- Positioning in neuro-anaesthesia
- Principles of neuro-anesthesia
- Intracranial pressure monitoring
- Peri-operative management of patients with brain tumours
- Awake craniotomy
- Traumatic brain injury and brain protection
- Spinal surgery
- Cerebrovascular surgery
- Aneurysms, AVM, carotid disease
- Critical care monitoring of the central nervous system
- Management of neuro-endocrine diseases

- Fluid management in neurosurgery
- Functional neurosurgery-Parkinson's Disease
- Posterior fossa surgery
- Management of venous Air embolism.

A completion of Neuro anaesthesia subspecialty requires the trainee to be proficient with the following-

Basic Sciences:

Anatomy

- Basic anatomy of the Central nervous system including that of the spinal cord and meninges.
- Vascular supply to the spinal cord
- Cellular anatomy of the blood brain barrier

Physiology

- Cerebral blood flow and metabolism
- Determines of Cerebral Perfusion Pressure
- Cerebral pressure auto regulation
- Carbon dioxide reactivity
- Response to hypoxia
- Flow metabolism coupling
- Production, flow and re-absorption of cerebral spinal fluid
- Effects of hypo and hyperthermia

Pharmacology

- Direct and indirect effects of intravenous and inhalational anaesthetics agents on cerebral physiology
- Basic principles of neuro protection and resuscitation.

- Mechanism of action of osmotic diuretics
- Prevention and treatment of vasospasm
- Anticonvulsants

Patho-physiology of neurological diseases

- Brain Tumours:
 - Supra-tentorial, intra-tentorial and tumours at the spinal cord.
- Traumatic neurological diseases
 - Traumatic Brain Injury
 - Spinal Cord injury
- Cerebrovascular diseases
 - Carotid Artery stenosis
 - Haemorrhagic and Ischaemic Stroke
 - Intracranial aneurysms
 - Arteriovenous malformations
- Neurological disorders
 - Parkinson's disease
- Neuro-endocrine Disorders
 - Pituitary gland diseases
 - SIADH
 - Cerebral salt wasting
- Non-Traumatic Disorders of the spine
 - Disc herniation
 - Spinal Stenosis
 - Spondylolisthesis

Anaesthesia for Neurosurgical procedures

- Intracranial Masses
 - Supratentorial tumour resection
 - Awake craniotomy
 - Posterior fossa Surgery
- Traumatic Brain Injury
 - Evacuation of subdural hematoma, acute vs. chronic
 - Evacuation epidural hematoma
 - Evacuation of Intracranial hemarhoge
 - Decompressive craniotomy
- Intra and Intracranial Vascular disease
 - Intracranial aneurysm clipping/
 - Intracranial arteriovenous malformation resection
 - Carotid endarterectomy
- Hydrocephalus
 - Ventriculoperitoneal shunt
 - Atrial shunt placement
 - External ventricular drain placement
- Epilepsy
 - Awake craniotomy for epilepsy surgery
- Interventional neuro radiology
 - Intracranial aneurysm coiling
 - Arteriovenous malformation embolization
 - Carotid artery stenting
- Surgery of the spine

Laminectomy/discectomy/decompression

Spinal instrumentation/fusion

Spinal cord tumour resection

- Paediatric neurosurgery
- Perioperative management
- Management of fluid therapy in the neurosurgical patient
- Somatosensory evoke potential
- Motor evoke potential
- Management of neurosurgical anaesthesia emergencies

Acute increase in intracranial pressure

Venous air embolism

Intraoperative aneurysm rupture

Peri-operative seizures

TRAINING IN PAEDIATRIC ANESTHESIA

Objectives:

1. To train anaesthesiologists to appreciate the differences in the physiology, anatomy and pharmacology of neonates, infants and children. Children are not "small adults".
2. To train anaesthesiologists to be competent in the administration of general and regional anaesthesia in neonates, infants and children.
3. To inculcate the understanding of physiology of pain in neonates, infants and children and to acquire skills in the management of acute and chronic pain.
4. To provide expert care of children with potentially life threatening illness in the intensive care.
5. To foster professional excellence through educational programs and goal directed performances.
6. To provide leadership in the areas of research in paediatric anaesthesia and intensive care.

Training Structure

- The total duration of training is 36 months. The first 24 months must be fully supervised and the final 12 months may be under distant supervision.
- The 24 months of supervised training, includes at least 9 months of overseas training and 3 months of Paediatric Intensive Care. There is also an option of doing 24 months locally in the recognized training centres (multicentres)
- The 36 months training cannot be undertaken in a single centre.

Training Centres (local):

For recognition as a training centre in Paediatric anaesthesia the centre should meet the following criteria:

1. A workload of 3000 paediatric operations per year inclusive of general surgery, plastic, ENT, urology, ophthalmology, orthopaedic, neurosurgery and offsite anaesthesia.
2. The centre must have a dedicated pain management service for children and a total care approach to children.
3. A level 3 paediatric intensive care managing 250 intubated patients per year.
4. Trained paediatric surgeons, paediatric anaesthetist and intensive care specialist in attendance.

Recognised local training centres are:

1. Kuala Lumpur Hospital
2. Women and Children's Hospital, Likas, Sabah (6 months)

Certification:

On completion of training, the trainees have to submit the following;

- Log book
- Supervisors' reports
- Formal project in the form of either a case report, poster presentation, free paper presentation or publication

Competency assessment:

A trainee is required to undertake a competency assessment in the format of written and/or viva voce during the final 36-months or following completion of 36-months of training.

Training Requirements

During their training, the trainee should be exposed to all subspecialty areas including pain management, cardiac, craniofacial, neurosurgical, transplantation, and offsite anaesthesia. In the intensive care the trainee must acquire sufficient levels of competence in the care of the critically ill children. During the training program the trainee is required to assume direct patient care.

During the programme, the trainee would be required to complete a further one month attachment doing transthoracic/ transoesophageal echocardiography and a one month attachment for cardiac anaesthesia locally. If this is not completed during the period of the training, the trainee will be required to fulfil this training after the overseas posting.

A. Knowledge

a) Basic principles in Paediatric anaesthesia

Anatomy and Physiology in relation to Paediatric anaesthesia

1. Fundamental differences in airway of infants and children.
2. Respiratory physiology of infants and children.
3. Cardiovascular physiology:
 - 3.1 Fetal circulation and transitional circulation
 - 3.2 Basic principles of fetal and neonatal cardiac function
 - 3.3 Effects of anaesthesia on the cardiovascular system
4. Regulation of fluids and electrolytes in infants and children
 - 4.1 Renal physiology
 - 4.2 Dehydration assessment and treatment
 - 4.3 Treatment of electrolyte imbalances
5. Thermal regulation
 - 5.1 Physiology and perioperative management in infants and children
6. Pharmacology of paediatric anaesthesia
7. Psychological effects of hospital stay

b) General Paediatric Anaesthesia

Preoperative preparation

1. Anaesthesia Equipment and Monitoring
2. Induction of Anaesthesia and Endotracheal Intubation
3. Intraoperative and postoperative management
4. Blood conservation techniques
5. Pain management in infants and children
 - 5.1 Theories of pain
 - 5.2 Development considerations in pain management of neonates, infants and children
 - 5.3 Measurement of pain in children
 - 5.4 Non-pharmacological approaches to pain management
 - 5.5 Pharmacological interventions
 - 5.6 Pain control techniques
 - 5.7 Common pain syndromes in children
 - 5.8 Painful medical procedures in children and management
6. Regional anaesthesia and analgesia
 - 6.1 Indications and advantages
 - 6.2 Peripheral nerve blockade
 - 6.3 Spinal anaesthesia in neonates
 - 6.4 Epidural anaesthesia
 - 6.5 Treatment of chronic pain

c) Clinical management of special surgical problems

1. Anaesthesia for neonatal and premature infants including emergency surgery
2. Anaesthesia for cardiovascular surgery
 - 2.1 Unique aspects of paediatric cardiac anaesthesia
 - 2.2 Anaesthesia for interventional cardiac procedures
 - 2.3 Anaesthesia for noncardiac surgery in patients with congenital heart disease
3. Anaesthesia for neurosurgery
 - 3.1 Principles of paediatric neuroanaesthesia
 - 3.2 Anaesthetic management for neurosurgical procedures
4. Anaesthesia for general surgery, urology and plastic surgery including laparoscopic surgery
5. Anaesthesia for orthopaedic surgery
6. Anaesthesia for Ear, Nose and Throat surgery
 - 6.1 Anaesthesia for a child with difficult airway
 - 6.2 Acute airway obstruction with special emphasis on epiglottitis and croup
 - 6.3 Pediatric endoscopy and bronchoscopy for foreign body ingestion/inhalation
 - 6.4 Anaesthesia for laser surgery
7. Anaesthesia for dental procedures
8. Anaesthesia for ophthalmic surgery
9. Anaesthesia and sedation for procedures outside the operating room
10. Day Care anaesthesia
11. Paediatric organ transplant

11.1 Donor management

11.2 Living-related transplantation

11.3 Liver transplantation

11.4 Kidney transplantation

11.5 Immunosuppression

11.6 Bone marrow transplantation

12. Anaesthesia for children with burns

13. Anaesthesia and management of multiple trauma in children

d) Associated problems in Paediatric anaesthesia

1. Malignant hyperthermia

2. Systemic disorders in paediatric anaesthesia

3. Safety, outcome, medicolegal and ethical aspects of paediatric anaesthesia

4. Understanding various syndromes and their anaesthetic implications

B. Skills

To be conversant in a wide scope of surgical procedures in children and their anaesthetic management. To give a safe anaesthesia to neonates, infants and children for all procedures

1. Airway

- Maintenance of airway
- Endotracheal intubation via nasal and oral route
- Breathing and Ventilation
- Ventilation by bag and mask

- Setting of mechanical ventilator
- Emergency Management of difficult airway
- Fibreoptic bronchoscopy

2. Circulation

- Arterial line insertion
- Central line insertion
- Cardiopulmonary resuscitation of infants and children (PALS/ APLS certification)

3. Regional anaesthesia

- To be able to perform thoracic, lumbar and caudal epidural
- Spinal anaesthesia in neonates
- Penile block
- Ilioinguinal/hypogastric nerve block
- Peripheral nerve blockades

Paediatric Intensive Care

A. Knowledge

1. Respiratory pathophysiology and therapy

- 1.1 Chronic lung disease in infancy
- 1.2 Principles of Respiratory support, mechanical ventilation, advance mechanical ventilation, non-invasive ventilation, high frequency ventilation and use of nitric oxide
- 1.3 Respiratory failure
- 1.4 Upper airway disease
- 1.5 Lower airway disease
- 1.6 Status asthmaticus
- 1.7 Oxygen therapy

- 1.8 Criteria for weaning
- 1.9 Interpretation of arterial and venous blood gases
- 1.10 Burns, inhalational injury and electrical injury

2. Cardiovascular pathophysiology and therapy

- 2.1 Shock and resuscitation
- 2.2 Dysrhythmias and their management
- 2.3 Myocardial ischaemia and pulmonary oedema
- 2.4 Perioperative management of patient undergoing cardiovascular surgery
- 2.5 Use of inotropes and vasoactive therapies: indications, dosing and complications
- 2.6 Hemodynamic monitoring in the critically ill

3. Neurophysiology, pathophysiology and therapy

- 3.1 Monitoring the central nervous system
- 3.2 Theories of brain resuscitation
- 3.3 Management of status epilepticus
- 3.4 Meningitis, encephalitis and other CNS infections
- 3.5 Reye syndrome and metabolic encephalopathies
- 3.6 Head and spinal cord injury management
- 3.7 Cerebrovascular diseases and vascular anomalies
- 3.8 Neuromuscular diseases and respiratory failure
- 3.9 Near-drowning

- 3.10 Brain death in children
- 3.11 Principles of organ donation and care of potential organ donors

- 4. Renal, Endocrine and Metabolic disorders
 - 4.1 Renal, endocrine and metabolic failure and its management
 - 4.2 Poisoning in children and its management

- 5. Nutrition and gastrointestinal emergencies and its management
 - 5.1 Nutrition and metabolism in the critically ill children
 - 5.2 Hepatic failure

- 6. Infectious disease physiology, pathophysiology and therapy
 - 6.1 Sepsis
 - 6.2 Nosocomial infections
 - 6.3 Primary and secondary immunodeficiencies
 - 6.4 Use of antimicrobial agents: indications, dosing, adverse effects and monitoring levels

- 7. Hematologic and oncologic conditions
 - 7.1 Management of children with malignant disease
 - 7.2 Management of children with haematological disorders

- 8. Transportation of the critically ill
 - 8.1 Stabilisation of the critically ill child for transport
 - 8.2 Use of portable monitoring equipment

- 9. Management of trauma in paediatric patients
 - 9.1 Resuscitation and management of multiple trauma

10. Psychological, legal and ethical aspects of intensive care

10.1 Communicating with parents, other family members and staff

10.2 The role of parents in decision making

10.3 Bereavement care

10.4 Care of the child after non-accidental injury

B. Skills

- Managing acute airway obstruction
- Intubation and care of the airway of the unconscious child
- Insertion of arterial line, central venous line and pulmonary artery catheter
- Insertion of intraosseous line
- Insertion of chest tubes and aspiration of pleural effusion
- Insertion of lines for haemodialysis
- Fibreoptic Bronchoscopy

TRAINING IN ADULT INTENSIVE CARE

Objectives:

1. To provide comprehensive and in-depth experience for the trainee to acquire sufficient levels of competence as an intensive care specialist, and proficiency in the supervision of intensive care units.
2. To inculcate a total care approach in the management of patients with acute life-threatening conditions and multiple organ failure in a “closed” system intensive care unit.
3. To inculcate critical thinking, self-learning, enthusiasm for research, and a commitment to continuing medical education.

Entry requirement:

The trainee must be a gazetted specialist with a recognised degree in Anaesthesiology, Internal Medicine or other disciplines.

Pre-requisite:

1. For trainees whose base specialty is not Anaesthesiology, a minimum of 3 months training in anaesthesiology is required before commencement of intensive care training.
2. For trainees whose base specialty is not Internal Medicine, a minimum of 3 months training in internal medicine is required before commencement of intensive care training.
3. For trainees whose base specialty is neither Anaesthesiology nor Internal Medicine, a minimum of 3 months of training in anaesthesiology and 3 months in internal medicine is required before commencement of intensive care training.

Note: Please refer to Academy of Medicine’s website for additional requirement for registration as an intensivist in the National Specialist Registry.

Training Structure

- The total duration of training is 36 months and must be spent full-time in Intensive Care. The first 24 months of training must be fully supervised and

the final 12 months may be under distant supervision.

- The 36 months training cannot be undertaken in a single centre.

Training centres:

For recognition as a training centre in adult intensive care, the centre should meet the following criteria:

1. Workload of at least 1000 admissions per year
2. Presence of a full-time intensivist

Recognised local training centres are:

A. 1 year duration

1. Hospital Kuala Lumpur
2. Hospital Pulau Pinang
3. Hospital Sultanah Aminah, Johor Bahru

B. 6 months duration

1. Hospital Sultanah Bahiyah, Alor Setar
2. Hospital Sg. Buloh
5. Hospital Raja Perempuan Zainab II, Kota Bharu
6. Hospital Sultanah Nur Zahirah, Kuala Terengganu
7. Hospital Queen Elizabeth, Kota Kinabalu
8. Hospital Selayang

Competency assessment:

A trainee is required to undertake a competency assessment in the format of written and/or viva voce during the final 36-months or following completion of 36-months of training.

Syllabus

(A) Knowledge

1. Cardiovascular physiology, pathology, pathophysiology, and therapy

- 1.1 Shock, including hypovolaemic, cardiogenic, distributive and obstructive shock.
 - 1.2 Myocardial infarction and its complications.
 - 1.3 Cardiac arrhythmias and conduction disturbances; indications for, complications, and types of pacemakers.
 - 1.4 Pulmonary embolism.
 - 1.5 Cardiogenic and noncardiogenic pulmonary oedema.
 - 1.6 Cardiac tamponade and other pericardial diseases.
 - 1.7 Acute valvular disorders.
 - 1.8 Acute aortic and/or peripheral vascular disorders.
 - 1.9 Acute complications of cardiomyopathies and myocarditis.
 - 1.10 Hypertensive emergencies.
 - 1.11 Perioperative management of patient undergoing cardiovascular surgery.
 - 1.12 Complications of angioplasty and other coronary interventional procedures.
 - 1.13 Haemodynamic effects of mechanical ventilation.
 - 1.14 Use of thrombolytic therapy: Indications in diseases involving different systems, monitoring, and complications.
 - 1.15 Use of vasoactive and inotropic therapies: Indications and physiologic effects, titration, dosing and complications.
-
2. Respiratory physiology, pathology, pathophysiology and therapy
 - 2.1 Acute hypoxaemic and hypercapnoeic respiratory failure.

- 2.2 Status asthmaticus.
- 2.3 Smoke inhalation, airway burns.
- 2.4 Aspiration and chemical pneumonitis.
- 2.5 Bronchopulmonary infections.
- 2.6 Upper airway obstruction.
- 2.7 Drowning.
- 2.8 Oxygen therapy.
- 2.9 Interpretation of arterial and venous blood gases.
- 2.10 Physiologic principles of non-invasive positive and negative pressure ventilation.
- 2.11 Physiologic principles related to mechanical ventilation, including pressure-and volume-cycled ventilation, intermittent mandatory ventilation, pressure support ventilation, positive end-expiratory pressure, continuous positive airway pressure, high frequency ventilation, inverse ratio ventilation, and differential lung ventilation.
- 2.12 Indications and complications of non-invasive ventilation.
- 2.13 Indications for and hazards of mechanical ventilation, including barotrauma and volutrauma.
- 2.14 Criteria for weaning and weaning techniques.
- 2.15 Risks and benefits of long-term intubation vs tracheostomy.
- 2.16 Respiratory muscle physiology, pathophysiology and therapy.
- 2.17 Perioperative management.

3. Renal physiology, pathology, pathophysiology and therapy

- 3.1 Renal failure: prerenal, renal and postrenal.
- 3.2 Acid-base and fluid and electrolyte physiology, pathophysiology and therapy.
- 3.3 Principles of renal replacement therapy.
- 3.4 Evaluation of oliguria.
- 3.5 Interpretation of urine electrolytes.

4. Neurophysiology, pathology, pathophysiology and therapy

- 4.1 Differential diagnoses and acute management of coma.
- 4.2 Diagnosis and acute management of stroke.
- 4.3 Drug overdose including barbiturates, narcotics, tranquilizers, organophosphates, salicylates, acetaminophen, alcohols, cocaine, heavy metals, petroleum distillates, and industrial products.
- 4.4 Brain death evaluation and certification.
- 4.5 Diagnosis and management of persistent vegetative states.
- 4.6 Perioperative management of patient undergoing neurosurgery.
- 4.7 Management of status epilepticus.
- 4.8 Diagnosis and management of bulbar and respiratory muscle paralysis including Guillain-Barre syndrome and myasthenia gravis.

5. Endocrine and metabolic physiology, pathology, pathophysiology and therapy

5.1 Disorders of thyroid function: Thyroid storm, myxoedema, and the sick euthyroid syndrome.

5.2 Adrenal crisis.

5.3 Disorders of antidiuretic hormone.

5.4 Diabetic ketoacidosis, hyperosmolar coma, and hypoglycaemia.

5.5 Pheochromocytoma.

5.6 Insulinoma.

5.7 Disorders of calcium, magnesium and other electrolyte balance.

6. Infectious disease physiology, pathology, pathophysiology and therapy

6.1 Systemic sepsis.

6.2 Tetanus.

6.3 Hospital acquired infections in the critically ill.

6.4 Opportunistic infection in the immunocompromised patient.

6.5 Infection control in critical care units.

6.6 Use of antimicrobial agents: indications, dosing, adverse effects, and interpretation of antibiotic levels and sensitivities.

7. Haematologic disorders secondary to acute illness

7.1 Management of haemostatic defects including disseminated intravascular coagulation.

- 7.2 Management of massive transfusion and principles of blood component therapy, including transfusion of packed red blood cells, platelets, fresh frozen plasma, albumin, cryoprecipitate, and coagulation factor concentrates.
- 7.3 Acute haemolytic disorders.
- 7.4 Acute haematologic disorders of immunosuppressed patients.
- 7.5 Oncologic emergencies.
- 7.6 Indications and principles of therapeutic apheresis.

8. Acute gastrointestinal disorders

- 8.1 Severe acute pancreatitis
- 8.2 Gastrointestinal bleeding including variceal bleeding.
- 8.3 Acute and fulminant hepatic failure.
- 8.4 Acute perforations of gastrointestinal tract.
- 8.5 Ruptured oesophagus.
- 8.6 Acute inflammatory diseases of the intestine.
- 8.7 Acute vascular disorders of the intestine including mesenteric infarction.
- 8.8 Stress ulcer prophylaxis.
- 8.9 Perioperative management.

9. Immunology and transplantation.

- 9.1 Principles of organ transplantation, including organ donation, procurement, preservation, transportation, implantation.

- 9.2 Immunosuppression.
- 9.3 Specific organ transplantation: indications and postoperative care.

- 10. Monitoring and medical instrumentation.
 - 10.1 Calculation of prognostic and therapeutic intervention scores.
 - 10.2 Assessment of cardiac function and derived haemodynamic parameters.
 - 10.3 Monitoring of respiratory and metabolic parameters, including airway pressures, compliance and resistance, tidal volume, pulse oximetry, capnography, pneumotachnography, dead space-tidal volume ratio, oxygen consumption, carbon dioxide production and respiratory quotient.
 - 10.4 Calculation of oxygen content, intrapulmonary shunt, and alveolar-arterial gradients.
 - 10.5 Brain monitoring (intracranial pressure, electroencephalogram).
 - 10.6 Thermoregulation.

Pharmacokinetics and pharmacodynamics of drugs in critical illness.

Nutritional effect of critical illness and nutritional therapy via enteral and parenteral alimentation.

Management of anaphylaxis and acute allergic reactions.

Principles and management of trauma.

Critical obstetric and gynaecologic disorders including toxæmia of pregnancy and amniotic fluid embolism.

Ethical, economic, and legal aspects of critical illness, including withholding and withdrawal of treatment.

Psychosocial and emotional effects of critical illness.

Administrative and technical organization of critical care units.

(B) Skills

To be conversant with the indications, contraindications, complications, and limitations of the following procedures and to acquire the technical skills necessary to perform the following.

1. Airway

- 1.1 Maintenance of airway in non-intubated, unconscious, paralyzed patients.
- 1.2 Endotracheal intubation via oral and nasal routes.
- 1.3 Percutaneous tracheostomy

2. Breathing & ventilation

- 2.1 Ventilation by bag and mask.
- 2.2 Mechanical ventilation, including pressure-cycled, volume-cycled, and time-cycled mechanical ventilators, Ventilation modes including inverse-ratio ventilation and pressure-support ventilation.
- 2.3 Use of nasal continuous positive airway pressure mask to deliver positive pressure ventilation.
- 2.4 Use of reservoir masks and positive end-expiratory masks for delivery of supplemental oxygen, humidifiers, nebulizers, incentive spirometry.
- 2.5 Management of pneumothorax using transthoracic needle drainage, chest tube insertion and thoracostomy drainage systems.

- 2.6 Fiberoptic bronchoscopy.
 - 2.7 Use of non-invasive negative pressure ventilation
 - 2.8 Use high-frequency mechanical ventilation (Preferable).
3. Circulation
 - 3.1 Arterial puncture and bleeding sampling.
 - 3.2 Insertion of central venous, arterial, and pulmonary artery catheters; management of venous air embolism.
 - 3.3 Cardiac output determinations using thermodilution technique and non-invasive techniques.
 - 3.4 Cardioversion.
 - 3.5 Transvenous pacemaker insertion.
 - 3.6 Transcutaneous pacing. .
 - 3.7 Application of intra-aortic assist devices (Preferable)
 4. Cardiopulmonary resuscitation.
 5. Parenteral nutrition.
 6. Pericardiocentesis (Preferable)
 7. Peritoneal lavage (Preferable).
 8. Insertion of haemodialysis catheters.
 9. Continuous renal replacement therapy
 10. Therapeutic plasmapheresis (Preferable).
 11. Ultrasonography for vascular access, abdomen, chest
 12. Transthoracic echocardiography

TRAINING IN PAIN MEDICINE

Objectives

1. To provide training and in-depth knowledge and experience in the field of pain medicine.
2. To acquire an in-depth understanding of the pathophysiology of acute, chronic and cancer pain and the pharmacology of analgesics and adjuvant drugs used in the management of pain.
3. To acquire knowledge and experience in the detailed assessment of patients with pain, especially those with chronic cancer and non-cancer pain.
4. To acquire knowledge and experience regarding the multidisciplinary management of patients with acute, chronic and cancer pain, including management with appropriate medications, and the role of interventions, physical therapy and psychological techniques in pain management, and the evidence for the various treatment approaches for different types of pain.
5. To carry out clinical research in the field of pain medicine.

Training Structure

The total duration of training is 36 months. The first 24 months must be fully supervised and the final 12 months may be under distant supervision.

During the 24 months, at least 9 months must be overseas and at least 1 month in palliative medicine; additional 1 month attachments may also be done in rehabilitation medicine and psychiatry.

The 3 years training cannot be undertaken in a single centre.

Training Centers

For recognition as a training centre in Pain Medicine, the centre should meet the following criteria:

1. At least one anaesthesiologist gazzetted as a specialist in Pain Medicine.
2. At least two pain clinic sessions per week and one session for pain interventions (in the operating theater) per week.

3. A Pain management clinic which is run as a multidisciplinary clinic with regular input from allied health professionals including clinical psychologists or psychiatrists, physiotherapists, occupational therapists, pharmacists and social workers.
4. It is desirable that the hospital has a palliative care unit where patients with cancer pain are managed by a dedicated team of palliative medicine specialist(s) and medical officers.
5. Workload:
 - a. For 1 year training: At least 1000 acute pain patients, 100 new chronic non-cancer pain patients and 50 new cancer pain patients per year.
 - b. For 6 months training: At least 600 acute pain patients, 60 new chronic non-cancer pain patients and 30 new cancer pain patients per year.

Recognised local training centres are:

- A. *Recognised for 1 year training*
 1. Hospital Selayang
 2. Hospital Raja Permaisuri Bainun Ipoh
- B. *Recognised for 6 months training*
 1. Hospital Raja Perempuan Zainab II, Kota Bharu
 2. Hospital Sultan Ismail, Johor Bahru
 3. Hospital Pulau Pinang

Candidates who are trained in all hospitals other than Selayang hospital are required to spend at least two weeks in Selayang hospital during the multidisciplinary cognitive behaviour therapy based pain management program for patients. This should be done during the trainee's first year of training.

Certification:

On completion of training, candidates have to submit the following;

- Log book
- Supervisors' reports
- Formal project in the form of either a case report, poster presentation, free paper presentation or publication

Competency assessment:

Trainees are required to undertake a competency assessment in the format of written and/or viva voce before completion of 36-months training. The trainee is eligible to sit for the competency assessment only after completing a minimum of 25 months of training.

Additional

All trainees are encouraged to work towards obtaining a Post-graduate certification in Pain Management, including (but not limited to) the following:

- Masters in Pain Medicine (University of Sydney or University of Santo Tomas, Philippines)
- Fellowship of Interventional Pain Physicians (FIPP)
- Fellowship of the Faculty of Pain Medicine, ANZCA (FFPANZCA) **.

**Trainees who have passed the FFPMANZCA examination will be exempted from the competency assessment.

Syllabus

(A) Knowledge

Part I: General

1. Anatomy and Physiology
2. Pharmacology of Pain Transmission and Modulation
3. Ethical Standards in Pain Management and Research

Part II: Assessment and Psychology of Pain

4. Pain Measurement in Humans
5. Placebo and Pain
6. Clinical Nerve Function Studies and Imaging
7. Epidemiology of pain including the types of chronic and cancer pain problems in the Malaysian population.
8. Psychosocial and Cultural Aspects of Pain
9. Sex and Gender Issues in Pain

Part III: Treatment of Pain

A. Pharmacology

- 10. Opioids
- 11. Antipyretic Analgesics: Nonsteroidals, Acetaminophen, and Phenazone Derivatives
- 12. Antidepressants and Anticonvulsants
- 13. Miscellaneous Agents

B. Other Methods

- 14. Psychological Treatments (Cognitive-Behavioral and Behavioral Interventions)
- 15. Psychiatric Treatment
- 16. Stimulation-Produced Analgesia
- 17. Interventional Pain Management Including Nerve Blocks and Lesioning
- 18. Surgical Pain Management
- 19. Physical Medicine and Rehabilitation
- 20. Work Rehabilitation
- 21. Complementary Therapies

Part IV. Clinical States

A. Taxonomy

- 22. Taxonomy of Pain Systems

B. Tissue Pain

- 23. Acute Pain
- 24. Cancer Pain
- 25. Cervical Radicular Pain
- 26. Neck Pain
- 27. Lumbar Radicular Pain
- 28. Low Back Pain
- 29. Musculoskeletal Pain
- 30. Muscle and Myofascial Pain

C. Visceral Pain

- 31. Visceral Pain
- 32. Chronic Urogenital Pain
- 33. Pain in Pregnancy and Labor

D. Headache and Facial Pain

- 34. Headache
- 35. Orofacial Pain

E. Nerve Damage

- 36. Neuropathic Pain
- 37. Complex Regional Pain Syndromes

F. Special Cases

- 38. Pain in Infants, Children, and Adolescents
- 39. Pain in Older Adults
- 40. Pain Issues in Individuals with Limited Ability to Communicate Due to Cognitive Impairment
- 41. Pain Relief in Substance Abusers

(B) Skills

A Acute Pain Management

1. Assessment of patients with acute pain (including postoperative pain, acute post trauma pain and acute medical pain).
2. Setting up and running an Acute Pain Service at hospital level:
3. Techniques used for acute pain management and management of associated complications in adults and in children, including Patient controlled analgesia (PCA), epidural and intrathecal opioid analgesia and continuous nerve/plexus blocks.
4. Training of nurses, doctors and other paramedics about pain assessment (including Pain as the 5th Vital Sign).
5. Training of nurses, doctors and other paramedics in acute pain management.
6. Audit and QA of APS.

B. Cancer Pain Management

6. Comprehensive assessment of patients with cancer pain.
7. Management of cancer pain following the WHO step ladder
8. Parenteral administration of opioid analgesics and adjuvants.
9. Invasive techniques for cancer pain management including epidural/intrathecal catheters, celiac plexus block, saddle block and neurolytic blocks.

10. Psychosocial aspects of cancer pain management.

C. Chronic (non cancer) Pain Management

11. Comprehensive assessment of patients with chronic non-cancer pain within a multidisciplinary team set-up including medical, physical and psychological assessment.

12. Diagnosis and management of different types of chronic pain syndromes.

13. Multidisciplinary management of chronic pain patients including the role of the different modalities (pain medications, interventions, physical and occupational therapy, complementary therapy, psychological therapy).

14. Safe performance of pain interventions including (but not limited to):

- a. Epidural blocks, epidural steroids and epidurolysis,
- b. Spinals (including continuous spinal with temporary or implantable catheters/ports),
- c. Peripheral nerve blocks and plexus blocks, including using catheter techniques for continuous infusion
- d. Medial branch blocks / facet joint blocks (lumbar, thoracic and cervical)
- e. Sacroiliac joint injections
- f. Piriformis block
- g. Radiofrequency lesions
- h. Sympathetic blocks (local anaesthetic and neurolytic), including stellate ganglion block, lumbar sympathetic block and celiac plexus block
- i. Spinal cord stimulators
- j. Acupuncture / dry needling
- k. ketamine and lignocaine infusions

15. Indications for performing the above interventions, selection, assessment and follow-up of patients undergoing interventions.

16. Pain Management Programmes (cognitive- behaviour therapy (CBT) based programmes), principles of CBT and how to run such a programme.

17. Rehabilitation of the chronic pain patient

18. Setting up and running a multidisciplinary pain clinic, including audit and quality assurance.

TRAINING IN OBSTETRIC ANAESTHESIA AND ANALGESIA

Objectives

1. To produce anaesthesiologists with in-depth knowledge and skills in;
 - a. obstetric anaesthesia and analgesia
 - b. perioperative care for gynaecological procedures and reproductive medicine.
 - c. management of high risk pregnancies and high risk women for gynaecological procedures.
 - d. management of obstetric emergencies.
2. To acquire knowledge in current advances and technological developments in the field of obstetric anaesthesia and analgesia.
3. To inculcate self learning, enthusiasm for research and a commitment for continuing medical education.
4. To inculcate good team-work culture with obstetricians and gynaecologists and other related specialities.
5. To produce anaesthesiologists who are able to train other candidates in this field upon completion of their training.
6. To produce anaesthesiologists who are able to enhance the development of this subspecialty.
7. To produce anaesthesiologists who are capable of initiating and managing an obstetric anaesthesia and analgesia unit and related services.

Training Structure

- The total duration of training is 36 months. The first 24 months must be fully supervised and the final 12 months may be under distant supervision.
- The 24 months of supervised training, includes at least 9 months of overseas training.
- The 36 months training cannot be undertaken in a single centre.

Training Centre

Criteria For Local Centre

1. Centre with a trained anaesthetist who had completed the obstetric anaesthesia subspecialty programme.
2. Centre with more than 7000 deliveries per year.
3. Centre which provides 24 hour labour analgesia services
4. Centre which has Continuing Medical Education activities including Mortality and Morbidity discussions
5. Centre with resources to facilitate research which include library with on-line journal facilities.

At present the recognised centres are;

Hospital Kuala Lumpur (HKL) – 1 year

Hospital Tengku Ampuan Rahimah, Klang – 6 months

Hospital Selayang – 6 months

Candidates who are trained in HTAR and Hospital Selayang will be required to complete the remaining 6 months in HKL

Criteria For An Overseas Training Centre

1. Centre with minimum of 2 Consultant Obstetric Anaesthetist providing on-site clinical duties during working hours.
2. Centre with a Consultant Obstetric Anaesthetist available for consultation after office hours
3. Centre with more than 4000 deliveries per year
4. Centre which provides 24 hours labour analgesia services
5. Centre which has Continuing Medical Education activities including Mortality and Morbidity discussions
6. Centre with resources to facilitate research which include library with on-line journal facilities.

Certification

At the conclusion of the training, the following must be submitted;

- i. log book
- ii. supervisor's six-monthly report,
- iii. a formal project in the form of a case report, audit, research (must be presented at a scientific meeting) or contribution in a book or manual.

Training Requirements

1. Basic Sciences

Trainees are required to revise the relevant subjects and are expected to apply basic science principles in their clinical practice.

Physiology

- Maternal physiology
- Process of labour and delivery
- Fetal and neonatal physiology
- Placental physiology

Pharmacology

- Obstetric and post partum pharmacology
- Endocrine pharmacology
- Pharmacology of placental drug transfer

2. Clinical Management

Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in obstetric anaesthesia and analgesia care.

- i. Principles of Obstetrics

- Anatomy - airway, spine, pelvis, birth canal, gravid uterus, and nerve and blood supply in pregnancy
- Drugs used for fertility support and IVF
- Oxytocics and tocolytics
- Principles of in-vitro fertilisation
- Antenatal care
- Labour and delivery
- Maternal monitoring during labour
- Caesarean section; indications and levels of urgency
- Conduct of Major Regional Analgesia in Obstetrics
- Abortions and septic abortions
- Postpartum period

ii. High-risk Obstetrics

- Poor medical, obstetric, or anaesthesia history
- Pre-existing disease in pregnancy
- Substance abuse during pregnancy
- Pre eclampsia and eclampsia, pathophysiology and management
- Obstetric complications eg abnormal placentation
- Obstetric interventions; indications and anticipation of anaesthesia and analgesia
- Amniotic fluid, air and pulmonary embolism, pathophysiology and management
- Obstetric haemorrhage, antepartum, peripartum and postpartum

iii. Anaesthesia Management

- a. Pre-anaesthesia assessment of the pregnant patient and identification of high risk patients eg:

- 1.1. Risk factors in anaesthesia
- 1.2. Pre-existing diseases eg cardiac disease, hypertension, respiratory disease, diabetes, thyroid disease, intracranial disease, bleeding disorders, renal disease, and neuro-muscular disease
- 1.3. Adolescent or elderly primigravid pregnancy
- 1.4. Morbid obesity
- 1.5. Thromboembolic disease
- b. Anaesthesia for non-obstetric surgery in the pregnant patient
- c. Anaesthesia for elective obstetric procedures
- d. Anaesthesia for emergency obstetric procedures
- e. Anaesthesia for Caesarean section
- f. Pain management in obstetrics
- g. Complications of general anaesthesia
 - 7.1. Difficult airway management
 - 7.2. Pulmonary aspiration
 - 7.3. Awareness during general anaesthesia
 - 7.4. Complications of regional analgesia and anaesthesia eg high block, local anaesthetic toxicity, neurological sequelae
 - 7.5. Management of inadequate or failed regional anaesthesia and analgesia
- h. Management of severe haemorrhage; surgical, antepartum, and postpartum
- i. Maternal morbidity and mortality; incidence and legal and ethical issues
- j. Cultural considerations; relevance of patient, family, and staff with different ethnic backgrounds
- k. Organisation of an obstetric anaesthesia and analgesia service
- l. Complementary and alternative medicine; significance in obstetric practice and anaesthesia care
- m. Anaesthesia for reproductive medicine procedures

n. Anaesthesia for major gynaecology surgery

Supervisor's report for subspecialty training

Subspecialty:	
Trainee:	
Training period:	Place of training:

The above trainee has completed a unit of training that provided necessary instruction to gain the skills, attitudes and behaviour, and in addition to achieve the workplace training objectives as they are set out and required Anaesthetists. The anaesthetist in training has been:

Workplace Training Objectives	YES/NO	Date	Signature	Hospital
Direct Observation on wards (pre-op visiting).				
Direct Observation in theatre (the ability to organise and anaesthetise a neuro list, with consultant support.				
Direct observation in critical care areas.				
Comments from patients.				

Inspection of Logbook summaries	YES/NO	Date	Signature	Hospital
Attainment of required skills				
Direct involvement in sufficient clinical cases				
<i>Details of case numbers can be recorded on the back of this form</i>				

1. SATISFACTORY

Signed: _____
Lead Trainer

Signed: _____
Head of Subspecialty

2. NOT SATISFACTORY

Signed: _____
Lead Trainer

Signed: _____
Head of Subspecialty

If an unsatisfactory assessment is given examples of the reasons for this must be given. Explanation of an unsatisfactory grade requires the module to be repeated. Areas of concern should be documented.

The anaesthetist in training failed to perform satisfactorily in one or more of the following areas of this module:

		Please tick
a)	Knowledge	
b)	Skills	
c)	Attitudes and Behaviour	
d)	Not completed the required workplace training objectives in the time available.	

Comments:

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