



CURRICULUM FOR CANDIDATES

DA(SA)

May 2017

1.0 INTRODUCTION

The objective of the training program is to produce medical officer anaesthetists who will be able to provide safe and quality care to their patients.

- 1.1 All Domains have a similarity of approach, based upon the trainee's **Learning Objectives:**
 - 1.1.1 Knowledge
 - 1.1.2 Application of professional knowledge and skills to clinical management
 - 1.1.3 Skills (clinical and technical)
 - 1.1.4 Attitudes and behaviours

Although all four objectives are relevant to all Domains, to avoid repetition only aspects specifically important to the Domain are highlighted. Thus there is some variation in the format of each Domain.

Reading List

A general reading list is included at the end of the curriculum document. This list is, by no means, exhaustive, but is instead intended to provide the trainee with an overview. Trainees may be directed to more specific texts by their supervisors, including relevant journal publications, as and when they become available.

2.0 DOMAIN 1 – FUNDAMENTALS OF ANAESTHESIA AND PAIN MANAGEMENT

2.1 Trainee's Aims

New Trainees should familiarise themselves with the goals of the DA(SA) program, the attributes they must attain, and the Domains to be completed during Basic Training. The Domains outline the curriculum content and skills for Trainees to learn and accomplish.

In this Domain, clinical experience is gained in anaesthesia for uncomplicated elective surgery, day (ambulatory) surgery, and procedural sedation. This commonly includes anaesthesia for elective (non-major) general, orthopaedic, gynaecological, urological, and endoscopic procedures, including procedures performed outside the operating theatre suite.

- 2.2 The **overall aim of Domain 1** is for Trainees to develop a foundation of core knowledge and skills for further development as a medical officer in anaesthesia. This includes:

- 2.2.1 Conducting safe general anaesthesia and perioperative care for patients where risk is considered low.
- 2.2.2 Understanding physiology, pharmacology, clinical measurement, and monitoring as applied to anaesthesia.
- 2.2.3 Understanding the principles of acute pain management.
- 2.2.4 Conducting safe procedural sedation.
- 2.2.5 Establishing a professional team approach with patients, families, colleagues and staff.

2.3 Knowledge

2.3.1 **Basic Sciences**

Trainees are expected to apply Basic Science and other principles in clinical practice.

2.3.2 **Clinical Measurement and Monitoring**

Trainees are required to understand the principles involved in the measurement of relevant variables and the requirements of equipment and monitoring in anaesthesia. Knowledge is expected in the areas outlined below.

2.3.3 **Physics and Clinical Measurement**

Principles of Measurement as set out in the syllabus.

- 2.3.3.1 SI units
- 2.3.3.2 Humidification
- 2.3.3.3 Oximetry
- 2.3.3.4 Measurement of volumes, flows, and pressures
- 2.3.3.5 Capnography
- 2.3.3.6 Electrical safety
- 2.3.3.7 Measurement of temperature
- 2.3.3.8 Fires and explosions

- 2.3.4 **Equipment and Apparatus**
 - 2.3.4.1 Devices to maintain the airway (laryngoscopes, endotracheal tubes, tracheostomy tubes, face masks, laryngeal masks, airways)
 - 2.3.2 Gas supply in bulk and cylinders
 - 2.3.3 Anaesthesia delivery system, including pressure valves and regulators
 - 2.3.4 Vaporisers
 - 2.3.5 Breathing systems

- 2.3.5 **Monitoring**
 - 2.3.5.1 Anaesthesia record keeping
 - 2.3.5.2 Additional monitoring when appropriate (including central venous pressure, temperature, coagulation, blood loss, blood sugar)
 - 2.3.5.3 Minimum monitoring standards

2.4 **Clinical Management**

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

2.4.1 **Operating Theatre Suite Environment**

- 2.4.1.1 Informed consent
- 2.4.1.2 Infection control in theatre
- 2.4.1.3 Services and equipment in operating rooms and post-anaesthesia recovery room
- 2.4.1.4 Requirements of other anaesthesia environments outside operating rooms
- 2.4.1.5 Dealing with an intra-operative death or mishap
- 2.4.1.6 Relevant SASA professional documents

2.4.2 **Day Surgery Environment**

- 2.4.2.1 Types of day surgery e.g. ambulatory surgery, same-day surgery, office-based surgery, remote location eg radiology suite
- 2.4.2.2 Services and equipment in a day surgery suite
- 2.4.2.3 Requirements of a day surgery facility
- 2.4.2.4 Relevant SASA professional documents

2.4.3 **Professional Practice**

- 2.4.3.1 Policies, recommendations and guidelines in professional practice as contained in professional documents.

2.4.4 **Preoperative Assessment**

- 2.4.4.1 Pre-anaesthesia evaluation
- 2.4.4.2 Communication and consultation skills face-to-face, by phone and in writing
- 2.4.4.3 Appropriate history taking
- 2.4.4.4 Physical examination including airway assessment, respiratory, cardiovascular and neurological examinations
- 2.4.4.5 Pulmonary function tests
- 2.4.4.6 Measurement of cardiovascular function
- 2.4.4.7 Referral to specialist or for higher care when necessary
- 2.4.4.8 Interpretation of common radiology and imaging scans and investigations
- 2.4.4.9 Establishment of a rapport with the patient to provide reassurance, disclosure of risk, information, and discussions on complementary medicine and informed consent
- 2.4.4.10 Other investigations as appropriate

2.4.5 **Conducting Anaesthesia**

- 2.4.5.1 Applied physiology
- 2.4.5.2 Application and interpretation of monitored variables and neuromuscular blockade
- 2.4.5.3 Use of muscle relaxants
- 2.4.5.4 Applied pharmacology and variability in drug response
- 2.4.5.5 Application of mechanical ventilation
- 2.4.5.6 Management of the airway and intraoperative complications outlined in "Drills" below
- 2.4.5.7 Selection and planning of the anaesthesia technique

- 2.4.5.8. Common regional anaesthesia techniques (eg epidural and spinal anaesthesia and limb blocks)
- 2.4.5.9 Decision-making relating to postponement or cancellation of surgery
- 2.4.5.10 Routine inhalation and intravenous inductions
- 2.4.5.11 Maintenance of anaesthesia
- 2.4.5.12 Maintenance of accurate records
- 2.4.5.13 Correct use of anaesthesia delivery systems

2.4.6

Postoperative Care

- 2.4.6.1 Safe recovery transport and handover in the post-anaesthesia recovery room
- 2.4.6.2 Management of postoperative pain, fluid requirements, and nausea and vomiting
- 2.4.6.3 Scoring systems to assess readiness for discharge from recovery room
- 2.4.6.4 Post-operative consultations

2.5 Skills

2.5.1

Clinical Skills

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

- 2.5.1.1 In providing anaesthesia care, Trainees should be competent in certain technical skills, such as the following.
 - 2.5.1.1.1 Maintenance of an adequate airway
 - 2.5.1.1.2 Central venous cannulation
 - 2.5.1.1.3 Rapid sequence induction
 - 2.5.1.1.4 ECG recording and interpretation
 - 2.5.1.1.5 Advanced Life Support
 - 2.5.1.1.6 Lumbar puncture
 - 2.5.1.1.7 Aseptic techniques
 - 2.5.1.1.8 Venous access
 - 2.5.1.1.9 Emergency management of a pneumothorax
 - 2.5.1.1.10 Arterial blood gas collection
 - 2.5.1.1.11 Arterial cannulation
- 2.5.1.2 Trainees should be familiar with clinical protocols (drills) in the delivery of safe anaesthesia care, and be able to respond accordingly for crisis management. These include the following:
 - 2.5.1.2.1 Checking of the anaesthesia delivery system
 - 2.5.1.2.2 Airway assessment
 - 2.5.1.2.3 Identification and management of the following problems, which are commonly acute and may be life- threatening:
 - Inadequate airway; failed intubation, obstructed airway, oesophageal intubation, endobronchial intubation, and unplanned extubation
 - Laryngospasm
 - Bronchospasm
 - Hypertension
 - Hypotension
 - Arrhythmias
 - Myocardial ischaemia
 - Hypoxia
 - Hypocarbia
 - Hypercarbia
 - Hypoventilation
 - Hyperventilation
 - Hypothermia
 - Hyperthermia
 - Malignant hyperthermia
 - Anaphylaxis

- Residual neuromuscular blockade
- Inadequate neuraxial blockade
- Seizures
- Gas embolism
- High ventilator peak inspiratory pressures
- Pulmonary aspiration
- Pneumothorax

2.6 Professionalism

Trainees are expected to develop the professionalism required for medical practice as outlined:

2.6.1 Professional

- 2.6.1.1 To practise good communication with colleagues, patients and others
- 2.6.1.2 To work as a member of a team, but to assume responsibilities and/or delegate duties as a team leader when necessary
- 2.6.1.3 To commit to, and believe in, a culture of safety and ethical, high quality care
- 2.6.1.4 To accept that medical knowledge and skills are not the only requirements of practice
- 2.6.1.5 To be aware of medico-legal obligations relating to medical practice
- 2.6.1.6 To have insight into one's own limitations, abilities and areas of expertise
- 2.6.1.7 To commit to lifelong continuing professional development

2.6.2 Professionalism and Ethics

To commit to, and believe in the ethical and professional principles of:

- 2.6.2.1 Altruism: the best care for the patient must be the principal driving force of practice
- 2.6.2.2 Patient autonomy: patients' ability to determine their treatment
- 2.6.2.3 Beneficence: the principle of "doing good" to patients
- 2.6.2.4 Non-maleficence: the principle of not doing harm to patients
- 2.6.2.5 Fidelity: faithfulness to one's duties and obligations. This principle underlies excellence in patient care, confidentiality, telling the truth, a commitment to continuing professional development and lifelong learning, and not neglecting patient care
- 2.6.2.6 Social justice: the right of all patients to be fairly treated
- 2.6.2.7 Utility: the principle of doing the most good for the greatest number of people
- 2.6.2.8 Duty to oneself in terms of personal health, and maintenance of competence to practise
- 2.6.2.8 Accountability: the anaesthetist is responsible for his/her actions
- 2.6.2.9 Honour and integrity in all conduct, including the generation and use of resources
- 2.6.2.10 Respect for others, including a commitment to teamwork and conflict resolution
- 2.6.2.11 Appropriate response to clinical error

2.6.3 Patient Considerations

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

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

3.0 DOMAIN 2 – ANAESTHESIA FOR MAJOR AND TRAUMA SURGERY

3.1 Trainee's Aims

This Domain relates to clinical experience in anaesthesia for elective, emergency and trauma surgery, including gastrointestinal, laparoscopic surgery and the perioperative care of trauma patients.

The **aim of Domain 2** is for Trainees to acquire clinical abilities and skills in managing simple surgery, and injured patients, and those with co-existing medical conditions that are relevant to anaesthesia, and to build on what they learned in Domain 1. This includes learning to integrate and apply knowledge and skills in clinical management.

3.2 Knowledge

3.2.1 Basic Sciences

Trainees are required to review and build on the relevant subjects in the Basic Sciences and to apply Basic Science principles in clinical practice.

3.2.2 Clinical Management

Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anaesthesia management of patients for general and trauma surgery:

3.2.3 Specific Professional Practice & Ethical Considerations

- 3.2.3.1 Consent for the incompetent patient
- 3.2.3.2 Relevant statutory regulations relating to surrogate consent
- 3.2.3.3 South African Acts of Parliament related to child protection
- 3.2.3.4 Ethical, professional and legal issues surrounding the "Good Samaritan"
- 3.2.3.5 Ethical issues surrounding triage and resource management

3.2.4 Anaesthesia Major Elective and Emergency Surgery

- 3.2.4.1 Preoperative evaluation and resuscitation
- 3.2.4.2 ASA grading system and outcomes
- 3.2.4.3 Regional anaesthesia including anatomy, and physiological and pharmacological aspects
- 3.2.4.4 Postoperative care
- 3.2.4.5 Thromboembolism prophylaxis
- 3.2.4.6 Informed consent and consent for incompetent patients
- 3.2.4.7 Perioperative and prophylactic antibiotics
- 3.2.4.8 Management of postoperative pain and pain from injury
- 3.2.4.9 Management of coagulopathies

3.2.5 Anaesthesia for Trauma Surgery

- 3.2.5.1 Principles of Triage, assessment and immediate care; primary and secondary survey
- 3.2.5.2 Emergency airway management
- 3.2.5.3 Establishing intravenous access
- 3.2.5.4 Priorities of resuscitation, investigations, and surgical procedures
- 3.2.5.5 Concept, definition and role of damage control surgery
- 3.2.5.6 Physiological & biochemical effects of trauma
- 3.2.5.7 Thermoregulation
- 3.2.5.8 Managing facial, head and cervical and spine injuries
- 3.2.5.9 Glasgow Coma Scale and other scores of consciousness
- 3.2.5.10 Pathophysiology of head injury including changes in cerebral blood flow, cerebral metabolism and intracranial pressure
- 3.2.5.11 Pathophysiology and management of shock
- 3.2.5.12 Pathophysiology of blood loss and massive blood transfusion
- 3.2.5.13 Volume replacement
- 3.2.5.14 Managing abdominal and chest injuries
- 3.2.5.15 Management of burns procedures, including:
 - Anaesthesia for debridement and skin grafting
 - Anaesthesia for change of dressing

- 3.2.5.16 Managing coagulopathies & blood conservation strategies
- 3.2.5.17 Importance of early ICU referral and consultation, knowledge of local ICU admission criteria
- 3.2.5.18 Transport of ventilated or injured patients including portable ventilators and monitoring systems:
- 3.2.5.19 From scene to hospital
 - To theatre
 - Theatre to ICU

3.3 Skills

3.3.1

Clinical Skills

In this Domain, Trainees will provide safe anaesthesia for:

- 3.3.1.1 Open abdominal surgery
- 3.3.1.2 Laparoscopic surgery
- 3.3.1.3 Trauma surgery
- 3.3.1.4 Burns

Trainees will revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations) to assess the patient's status.

3.3.2

Trainees are required to be competent in the following technical skills.

- 3.3.2.1 Skills learned in Domain 1, especially securing an airway, arterial and central venous cannulation, and rapid sequence induction
- 3.3.2.2 Cricothyroidotomy
- 3.3.2.3 Cannulation of major vessels for volume resuscitation
- 3.3.2.4 Epidural and spinal anaesthesia
- 3.3.2.5 Blood conservation
- 3.3.2.6 Regional nerve blocks for abdominal and limb surgery
- 3.3.2.7 Chest drain insertion
- 3.3.2.8 Immobilisation and care of cervical spine injuries

3.3.3

Trainees should be familiar with clinical drills for crises management. These include:

- 3.3.3.1 Drills in Domain 1, especially for airway emergencies eg, "cannot intubate, cannot ventilate", difficult airway, hypoxia and abnormal end-tidal CO₂ levels
- 3.3.3.2 Drill for the primary and secondary survey
- 3.3.3.3 Drill for raised intracranial pressure
- 3.3.3.4 Drill for tension pneumothorax
- 3.3.3.5 Drill for managing severe haemorrhage
- 3.3.3.6 Drill for managing cardiac arrest (ACLS Algorithm)
- 3.3.3.7 Drill for managing malignant hyperthermia

4.0 DOMAIN 3 – OBSTETRIC ANAESTHESIA AND ANALGESIA

4.1 Trainee's Aims

In Domain 3 clinical experience is gained from anaesthesia for procedures in pregnant patients. The **aim of Domain 3** is for trainees to acquire clinical abilities and skills in obstetric anaesthesia, in particular:

- 4.1.1 Apply knowledge of physiology, pharmacology, clinical measurement and monitoring
- 4.1.2 Provide safe general and regional anaesthesia and perioperative care for obstetric patients
- 4.1.3 Use technical and anaesthesia skills and carry out established clinical drills and protocols relevant to obstetric anaesthesia
- 4.1.4 Establish a professional team approach with obstetricians and midwives

4.2 Learning Objectives

These are:

- 4.2.1 Acquisition of relevant knowledge
- 4.2.2 The development of clinical and technical skills
- 4.2.3 The harnessing of this knowledge and skills to patient management
- 4.2.4 The development of professional attitudes and appropriate behaviour in the obstetric environment

4.3 Knowledge

4.3.1 Basic Sciences

Trainees are required to have a good knowledge of the physiology and pharmacology relevant to pregnancy.

4.3.2 Clinical Management

Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in obstetric anaesthesia. These include the following:

4.3.2.1 Specific Professional Practice & Ethical Considerations

4.3.2.1.1 Local requirements for notification of maternal mortality

4.3.2.1.2 Ethical and legal considerations relating to termination of pregnancy

4.3.2.1.3 Legal considerations relating to consent for surgical procedures especially pertaining to the Children's Act.

4.3.2.2 Professional Documents and study references

4.3.2.2.1 The Obstetrics section in the candidate's chosen general textbook of anaesthesia

4.3.2.2.2 Recent journal and/or refresher course reviews

- NCCEMD Guidelines for Maternity Care in South Africa: Anaesthesia for Caesarean Section
- ESMOE guidelines
- SASA guidelines: Section VI: Major Regional Anaesthesia

4.3.3 Principles of Obstetrics

4.3.3.1 Relevant anatomy

4.3.3.2 Pharmacology:

4.3.3.3 Uterotonic drugs

4.3.3.4 Antenatal care only as far as it is relevant to anaesthesia

4.3.3.5 Simple principles of labour and delivery

4.3.3.6 Maternal monitoring

4.3.3.7 Caesarean section; indications and levels of urgency

4.3.4 Anaesthesia for caesarean section

4.3.4.1 Spinal anaesthesia

4.3.4.2 Epidural

4.3.4.3 General anaesthesia

4.3.4.4 All complications of regional and general anaesthesia

4.3.5 Anaesthesia management of high-risk obstetrics and gynaecology

4.3.5.1 Trainees should recognise the following as high risk patients and refer to higher centres.

4.3.5.2 morbid obesity, difficult airway, thromboembolic disease, bleeding disorders, hypertension, sepsis, respiratory disease, diabetes, thyroid disease, intracranial pathology, coagulation abnormalities, renal disease, and neuromuscular disease

4.3.5.3 Diseases common in South Africa: HIV/AIDS, tuberculosis.

4.3.5.4 Preeclampsia and its complications

4.3.5.5 Obstetric haemorrhage

4.3.5.6 Amniotic fluid embolism

4.3.5.7 An approach to cardiovascular collapse in the parturient

4.3.5.8 Septic abortion

4.3.5.9 Molar pregnancy

4.3.6 Anaesthesia for non-obstetric disease in pregnancy

4.3.7 Neonatal Considerations

4.3.7.1 Neonatal resuscitation

4.4 Skills

4.4.1 Clinical Skills

In this Domain, trainees will provide safe anaesthesia for pregnant patients. Trainees will revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations).

4.4.1.1 Technical skills in which trainees are required to be competent include the following:

- All aspects of airway management
- Implementing spinal and epidural anaesthesia
- The management of the complications of regional anaesthesia
- Implementation of general anaesthesia
- Resuscitation in obstetric haemorrhage and complicated preeclampsia
- Resuscitation in all causes of maternal cardiovascular collapse
- Failure to intubate / Failure to ventilate algorithm in obstetrics
- Advanced Life Support in the obstetric patient

4.4.1.2 Trainees should be familiar with clinical drills for crises management. These include:

- Resuscitation of the neonate
- Management of pulmonary aspiration during general anaesthesia.

5.0 DOMAIN 4: ANAESTHESIA FOR PATIENTS WITH CARDIOVASCULAR DISEASE

5.1 Trainee's Aims

In Domain 4 clinical experience is gained from anaesthesia for patients with cardiovascular disease. The **aim of Domain 4** is for Trainees to acquire a series of clinical abilities and skills and knowledge in the perioperative care of such patients undergoing surgery. These include conducting or assisting in anaesthesia and perioperative care for:

- 5.1.1 High risk patients for non-cardiac surgery
- 5.1.2 Risk assessment
- 5.1.3 The vasculopath for non-vascular surgery especially limb amputations

5.2 Learning Objectives

These are what the Trainee needs to learn. They are presented as:

- 5.2.1 Knowledge
- 5.2.2 Clinical management that applies knowledge and clinical skills to manage the patient
- 5.2.3 Skills (clinical and technical)
- 5.2.4 Attitudes and behaviours

5.3 Knowledge

5.3.1 Basic Sciences

Trainees are required to revise the relevant subjects in the Basic Sciences and to apply Basic Science principles in clinical practice.

5.3.2 Clinical Management

Trainees are expected to understand relevant principles, apply knowledge in practice, and demonstrate abilities in anaesthesia for patients with vascular disease. These include the following:

5.3.3 Cardiac Evaluation

5.3.3.1 Assessment for non- cardiac surgery (including scoring systems and guidelines)

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

- Hypertension
- Peripheral vascular disease
- Patients at risk for ischaemic heart disease
- Cardiac arrhythmias

- 5.3.3.3 Able to identify and refer patients with:
- Ischaemic heart disease and associated perioperative risk factors
 - Decompensated cardiac failure
 - Congenital heart disease
 - Valvular heart disease
 - High risk cardiac arrhythmias
 - Other acquired diseases, eg, myxoma (cardiac tumours), cardiomyopathy, pericarditis

5.3.4 **Anaesthesia and Perioperative Care for Patients with Cardiovascular Disease for Non-cardiac Surgery**

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

- 5.3.4.1 Hypertensive disease
5.3.4.2 Intra-operative onset of cardiac arrhythmias
5.3.4.3 Cerebrovascular disease
5.3.4.4 Peripheral vascular disease
5.3.4.5 HIV vasculopathies.

5.3.5 **Anaesthesia for Patients with Pulmonary Disease**

Reviewing and integrating with patient care:

- 5.3.5.1 Respiratory physiology
5.3.5.2 Chronic respiratory disease pathophysiology, diagnosis and management
5.3.5.3 Preoperative evaluation of patients with respiratory diseases
5.3.5.4 Lung function tests

5.4 **Skills**

5.4.1 **Clinical Skills**

In this Domain, Trainees will provide safe anaesthesia for patients with cardiovascular disease. Trainees will revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations) to assess patient status.

5.4.1.1 Technical skills in which Trainees should be competent include the following.

5.4.1.1.1 Skills learned in Domains 1 and 2

- Placement and use of vascular monitoring lines (arterial, central venous and femoral and neck vessels)
- DC defibrillation and cardioversion
- Use of cardiac pacemakers
- Interpretation of ECGs and ECG monitoring
- Interpretation of chest x-rays

5.4.2 **Attitudes**

5.4.2.1 Communication with patients and family to convey, information, risk and get informed consent

5.4.2.2 Teamwork approach with all role players (patient, surgeon, anaesthesiologist, nursing personnel, allied health personnel)

6.0 DOMAIN 5: ANAESTHESIA FOR NEUROSURGERY

6.1 **Trainee's Aims**

The aim of this clinical domain is for the DA trainee to gain an understanding of neuro-protective strategies and to apply them in providing anaesthesia for the patient with underlying neurological compromise. The **aim of Domain 5** is for Trainees to acquire a series of clinical abilities and skills in the perioperative care of patients undergoing surgery while having an underlying head injury or raised intracranial pressure. These include conducting or assisting in anaesthesia and perioperative care for:

- 6.1.1 Trauma surgery in a patient with a head- or spinal cord injury
6.1.2 Spinal surgery
6.1.3 Head injuries
6.1.4 Intra-cranial abscesses

6.2 Knowledge

6.2.1 Basic Sciences

Basic science subjects relevant to this Domain include:

6.2.1.1 Neuro anatomy

- 6.2.1.1.1 Central nervous system
- 6.2.1.1.2 Spinal cord and meninges
- 6.2.1.1.3 Ventricular system and flow of CSF
- 6.2.1.1.4 Blood supply to brain and spinal cord

6.2.1.2 Neurophysiology:

- 6.2.1.2.1 Supply-Demand relationship
- 6.2.1.2.2 6 remove 6.2.1.2.2
- 6.2.1.2.3 Cerebral blood flow
 - Determinants of cerebral blood flow
- 6.2.1.2.4 Cerebral perfusion pressure
 - Auto-regulation
- 6.2.1.2.5 Cerebral blood volume
 - Munro-Kelly doctrine
- 6.2.1.2.6 Cerebral metabolism
 - Effect of temperature
 - Effect of seizure activity
 - Effect of certain anaesthetic drugs
- 6.2.1.2.7 Intracranial pressure
- 6.2.1.2.8 Blood-brain barrier
- 6.2.1.2.9 Physiological and metabolic effects of anaesthesia on brain and spinal cord
- 6.2.1.2.10 Pituitary physiology

6.2.1.3 Pharmacology relevant to neuroanaesthesia:

- 6.2.1.3.1 Sedatives
- 6.2.1.3.2 Anticonvulsants
- 6.2.1.3.3 Hypnotics
- 6.2.1.3.4 Analgesics
- 6.2.1.3.5 Inhalation agents
- 6.2.1.3.6 Neuromuscular blocking drugs
- 6.2.1.3.7 Diuretics
- 6.2.1.3.8 Hypotensive agents
- 6.2.1.3.9 Vasopressors

6.2.2 Clinical Measurement and Monitoring

Trainees are required to understand the principles of clinical measurement and monitoring in neuroanaesthesia.

6.2.3 Clinical Management

Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anaesthesia management of patients with underlying neurological compromise. These include:

6.2.4 Professional Practice

- 6.2.4.1 Understanding principles of:
 - 6.2.4.1.1 Neuroprotection
 - 6.2.4.1..2 Referral to appropriate centre for neurosurgical care

6.2.5 Interventions to Minimise Cerebral Damage

- 6.2.5.1 Principles of cerebral protection
- 6.2.5.2 Haemodynamic stability
- 6.2.5.3 Fluid and osmotic therapy
- 6.2.5.4 Management of intracranial hypertension
- 6.2.5.5 Sedation and ventilatory support

6.2.6 **Anaesthesia for Neurosurgery**

Understanding the underlying pathology and pathophysiology, assessment, anaesthesia and perioperative care of patients for:

- 6.2.6.1 Trauma surgery where patient also has underlying head injury
- 6.2.6.2 Surgery in any patient with raised intracranial pressure for whatever reason
- 6.2.6.3 Surgery in a patient with acute spinal cord injury
- 6.2.6.4 Surgery in a patient with previous spinal cord injury and paralysis

6.2.7 Principles, role and management of procedures, problems, or events associated with anaesthesia for a patient with neurological compromise:

- 6.2.7.1 Hypothermia
- 6.2.7.2 Epilepsy and other neurological disorders
- 6.2.7.3 Management of fluid and electrolyte balance in patients with neurological compromise

6.3 **Skills**

6.3.1

Clinical Skills

In this Domain, Trainees will provide safe anaesthesia for patients with neurological compromise. Trainees will revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations) to assess the patient's status. Technical skills in which Trainees are required to be competent include:

- 6.3.1.1 Pre-anaesthesia preparation for neuroanaesthesia
- 6.3.1.2 Post-anaesthesia care
- 6.3.1.3 Protocols and drills for:
 - 6.3.1.3.1 Failed airway intubation
 - 6.3.1.3.2 Reducing raised ICP
 - 6.3.1.3.3 Suspected cervical spine injury
 - 6.3.1.3.4 Initial management of a head injury

7.0 **DOMAIN 6: ANAESTHESIA FOR ENT, EYE, DENTAL, HEAD AND NECK SURGERY**

This Domain includes anaesthesia for ear-nose-throat (ENT), eye, dental and head and neck procedures.

7.1 **Trainee's Aims**

In Domain 6 clinical experience is gained from anaesthesia for above-mentioned surgical sub-specialties. The **aim of Domain 6** is for Trainees to acquire a series of clinical abilities and skills in the perioperative care of patients undergoing such surgery. The subspecialties in this Domain have a number of common considerations in anaesthesia care, such as comorbidities and an increased need for preoperative airway assessment, an airway shared with the surgeon, high risks for airway obstruction intra and post operatively, mix of adult and paediatric patients and acute post-operative care problems.

7.2 **Knowledge**

7.2.1 Trainees are required to revise the relevant subjects in the Basic Sciences. Trainees are expected to apply Basic Science principles in clinical practice. Basic science, clinical measurement and other subjects relevant to this Domain include the following.

- 7.2.1.1 Professional documents and guidelines such as SASA airway management guidelines
- 7.2.1.2 Pharmacology of local anaesthetic
- 7.2.1.3 Pharmacology of local vasoconstrictors
- 7.2.1.4 Anatomy of the head and neck
- 7.2.1.5 Anatomy of the airway, nasal passages, larynx and pharynx
- 7.2.1.6 Effects of surgery on the airway
- 7.2.1.7 Monitoring during anaesthesia
- 7.2.1.8 Airway devices
 - 7.2.1.8.1 types of tracheal tubes, eg RAE devices
 - 7.2.1.8.2 types of supraglottic airway devices
- 7.2.1.9 Equipment for difficult tracheal intubation
- 7.2.1.10 Difficult airway algorithm

7.3 Clinical Management

7.4 Anaesthesia for ENT Surgery

7.4.1 Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anaesthesia management of ENT surgery. These include the following.

- 7.4.1.1 Pre-operative airway assessment
- 7.4.1.2 Examination under anaesthesia
- 7.4.1.3 Removal of foreign body from ear, nose, esophagus
- 7.4.1.4 Tonsillectomy and adenoidectomy and postoperative bleeding
- 7.4.1.5 Myringoplasty
- 7.4.1.6 Managing partial airway obstruction including:
 - 7.4.1.6.1 Epiglottitis
 - 7.4.1.6.2 Foreign bodies
 - 7.4.1.6.3 Laryngeal papillomas
- 7.4.1.7 Complications of endotracheal intubation
- 7.4.1.8 Elective and emergency tracheostomy
- 7.4.1.9 Post-operative care

7.5 Anaesthesia for Dental Surgery

7.5.1 Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anaesthesia management of dental surgery. These include the following.

- 7.5.1.1 Outpatient dental procedures
- 7.5.1.2 Inpatient dental surgery
- 7.5.1.3 Dental procedures on the mentally handicapped
- 7.5.1.4 Dental procedures on patients with bleeding disorders
- 7.5.1.5 Dental sepsis

7.6 Anaesthesia for Eye Surgery

Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anaesthesia management of eye surgery. These include the following.

7.6.1 **Understanding:**

- 7.6.1.1 Physiology of intraocular pressure and the effects of anaesthesia on this pressure
- 7.6.1.2 Eye reflexes (oculocardiac, oculo-respiratory, oculoemetic)
- 7.6.1.3 Other drugs for eye surgery, eg, topical agents, vasoconstrictors, mydriatics, miotics, and agents to reduce intraocular pressure and the systemic effects of these drugs.

7.6.2 **General anaesthesia for eye surgery including:**

- 7.6.2.1 Examination under anaesthesia
- 7.6.2.2 Intraocular surgery
- 7.6.2.3 Extraocular surgery
- 7.6.2.4 Surgery to the eye lids
- 7.6.2.5 Emergency eye surgery and use of suxamethonium in penetrating eye injury

7.6.3 **Monitoring**

7.6.4 **Postoperative care, management of nausea and vomiting**

7.7 Anaesthesia for head and neck surgery

Trainees are expected to understand relevant principles, apply knowledge in practice, and to demonstrate abilities in the anaesthesia management of head and neck surgery. These include the following.

- 7.7.1 Pre-operative airway assessment including assessment for mask ventilation, intubation and surgical airway access
- 7.7.2 Management of thyroid surgery, including:
 - 7.7.2.1 Anaesthesia for thyroid and parathyroid surgery
 - 7.7.2.2 Understand the complications associated with a retrosternal thyroid and how to detect it so that it can be referred to a centre of excellence
 - 7.7.2.3 Stabilisation of thyroid and parathyroid disorders preoperatively
 - 7.7.2.4 Postoperative complications of thyroid and parathyroid surgery and the management thereof
 - 7.7.2.5 Drill for managing post thyroidectomy bleeding
 - 7.7.2.6 Drill for managing a “thyroid storm”
- 7.7.3 Post-operative care

7.8 Skills

7.8.1 Clinical Skills

Trainees will revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory, endocrine and neurological examinations) to assess the patient’s status. Technical skills common to all procedures that Trainees are required to be competent in include the following.

- 7.8.1.1 Tracheal intubation
- 7.8.1.2 Nasal intubation
- 7.8.1.3 Laryngeal mask airway intubation
- 7.8.1.4 Placement and removal of packs
- 7.8.1.5 Applying topical local anaesthesia to the airway
- 7.8.1.6 Securing the difficult airway
- 7.8.1.7 Recognising the high-risk airway
 - 7.8.1.7.1 Use of stylets and bougies
 - 7.8.1.7.2 Failed intubation or ventilation drill
 - 7.8.1.7.3 Cricothyroidotomy
 - 7.8.1.7.4 Transtracheal ventilation
 - 7.8.1.7.5 Managing the airway in trauma and burns
- 7.8.1.8 Have an understanding of new difficult airway equipment and their specific indications of use
- 7.8.1.9 Upper airway obstruction drill, including laryngospasm
- 7.8.1.10 Criteria for extubation
- 7.8.1.11 Post extubation of difficult airway drill
- 7.8.1.12 Spontaneous gaseous induction for airway obstruction
- 7.8.1.13 Management of postoperative nausea and vomiting in head and neck surgery
- 7.8.1.14 Management of postoperative facial and airway swelling

8.0 DOMAIN 7: PAEDIATRIC ANAESTHESIA

8.1 Trainee’s Aims

In Domain 7 clinical experience is gained from participating in anaesthesia for paediatric patients. The **aim of Domain 7** is for Trainees to acquire knowledge and a series of clinical abilities and skills in the perioperative and peri-anaesthetic care of paediatric patients. These include:

- 8.1.1 Conducting or assisting in anaesthesia and peri-operative/ peri-anaesthetic care for emergency and elective anaesthesia for patients in paediatric age >2 years, including adolescents
- 8.1.2 Recognising the skills and facilities required for various procedures in children of various ages and with various medical conditions
- 8.1.3 Demonstrating paediatric and neonatal resuscitation skills

8.2 Knowledge

8.2.1 Basic Sciences

Trainees are required to revise the relevant subjects in the Basic Sciences. Trainees are expected to apply Basic Science principles in clinical practice. Basic Science subjects relevant to children include the following.

8.2.1.1 Anatomy relevant to airway management and breathing, circulation and regional anaesthesia

8.2.1.2 The physiology of respiration, circulation, fluid balance and thermoregulation

8.2.1.3 The relevance of surface area of children of various ages

8.2.2 Considerations for Paediatric Anaesthesia

8.2.2.1 General principles of perioperative management relevant to children, emphasising:

8.2.2.1.1 Common childhood illnesses and their influence on anaesthesia and surgery

8.2.2.1.2 Fasting guidelines

8.2.2.1.3 Fluid and electrolyte replacement

8.2.2.1.4 Temperature control

8.2.2.1.5 Perioperative monitoring

8.2.2.1.6 Dosage and administration of emergency drugs

8.2.2.1.7 Drug dosing and relevant pharmacology

8.2.2.1.8 Recognition of postoperative problems (PONV, Emergence delirium, post-extubation stridor, hypothermia)

8.2.2.1.9 Acute and persistent pain management

8.2.2.1.10 Paediatric day case surgery

8.2.2.2 Relevant features of important childhood conditions, particularly:

8.2.2.2.1 Respiratory infections including PTB, bronchiolitis

8.2.2.2.2 Asthma

8.2.2.2.3 Other childhood emergencies; especially inhaled/ingested foreign bodies, fractures, head injuries and burns

8.2.2.2.4 Cerebral palsy and seizures

8.2.2.2.5 Muscular and neuromuscular diseases incl. malignant hyperthermia

8.2.2.2.6 General principles of paediatric emergency medicine, including resuscitation of the neonate, infant and child.

8.2.3 Clinical Management

Trainees are expected to understand relevant principles, apply knowledge in practice and to demonstrate abilities in paediatric anaesthesia care. These include the following.

8.2.3.1 Applying principles of paediatric anaesthesia for the following surgical sub-specialties:

8.2.3.1.1 Ophthalmology

8.2.3.1.2 Dental surgery

8.2.3.1.3 Minor urology surgery and procedures/investigations

8.2.3.1.4 Orthopaedic Surgery

8.2.3.1.5 Otorhinolaryngology

8.2.3.1.6 General surgery

8.2.3.1.7 Trauma and Burns

8.2.3.2 Preoperative evaluation and premedication

8.2.3.3 Postoperative recovery room management and the initial stabilization of vital parameters

- 8.2.3.4 Management of airway and breathing problems such as:
 - 8.2.3.4.1 Cannot ventilate, cannot intubate,
 - 8.2.3.4.2 Hypoxia,
 - 8.2.3.4.3 Hypercarbia,
 - 8.2.3.4.4 Bronchospasm,
 - 8.2.3.4.5 Upper airway obstruction,
 - 8.2.3.4.6 Upper airway infections,
 - 8.2.3.4.7 Inhaled foreign body,
 - 8.2.3.4.8 Laryngospasm,
 - 8.2.3.4.9 Stridor,
 - 8.2.3.4.10 Aspiration of gastric contents
- 8.2.3.5 Principles and management of the child at risk for regurgitation
- 8.2.3.6 Management of difficult venous access
- 8.2.3.7 Managing fluid and blood therapy in paediatric patients
- 8.2.3.8 Post-operative anaesthetic complications eg laryngospasm, emergence delirium
- 8.2.3.9 Recognising and managing paediatric emergencies including basic and advanced life support

8.2.4 Skills

8.2.4.1

Clinical Skills

In this Domain, Trainees will provide safe anaesthesia for healthy paediatric patients

- 8.2.4.1.1 Trainees will revise pre-assessment skills, including taking an appropriate history and performing an appropriate physical examination (including airway assessment, cardiovascular, respiratory and neurological examinations) to assess the patient's status.
- 8.2.4.1.2 Trainees will demonstrate decision-making and clinical skills, and perform drills such as paediatric advanced life support, to manage emergencies and conditions including the following.
 - 8.2.4.1.2.1 Hypoxia
 - 8.2.4.1.2.2 Bronchospasm
 - 8.2.4.1.2.3 Apnoea
 - 8.2.4.1.2.4 Upper airway obstruction including upper airway infection
 - 8.2.4.1.2.5 Bradycardia (and other arrhythmias)
 - 8.2.4.1.2.6 Cardiac arrest
 - 8.2.4.1.2.7 Hypovolaemia
 - 8.2.4.1.2.8 Neurological compromise
 - 8.2.4.1.2.9 Laryngospasm
 - 8.2.4.1.2.10 Masseter spasm
 - 8.2.4.1.2.11 Postoperative stridor
 - 8.2.4.1.2.12 Aspiration of gastric contents
 - 8.2.4.1.2.13 Skills learned in Domains 1 and 2 should be reviewed
- 8.2.4.1.3 Technical skills, such as airway management (including ventilation, laryngeal mask and intubation), vascular cannulation, including intraosseous access and regional anaesthesia should be demonstrated for paediatric patients
- 8.2.4.1.4 Interpersonal skills in dealing with paediatric patients and their carers should be demonstrated

8.2.4.2

Attitudes and behaviours

8.2.4.3

Paediatric Considerations

- 8.2.4.3.1 The following attitudinal considerations are important in caring for children:
- 8.2.4.3.2 Varied individual needs of hospitalised children
- 8.2.4.3.3 Communication with children and their carers
- 8.2.4.3.4 Interaction with children that is appropriate to their developmental age
- 8.2.4.3.5 Psychosocial aspects, especially the stress of separation experienced by children and their carers alike

- 8.2.4.3.6 Strategies to provide informed consent for procedures and disclosure of risk when consulting with children and carers
- 8.2.4.3.7 Planning of post-operative management, particularly of pain, stress and post-operative nausea and vomiting
- 8.2.4.3.8 Follow-up after anaesthesia complications

9.0 DOMAIN 8: INTENSIVE CARE MEDICINE

9.1 Trainee's Aims

In this Domain, clinical experience is gained in the transport of the critically ill patient to and from Intensive Care Unit (ICU) and the basic management of the critically ill patient. Trainees will acquire basic knowledge in the management of critically ill patients together with the relevant practical skills.

The **aim of Domain 8** is for Trainees to learn a series of clinical abilities and skills in managing critically ill patients. The level of expertise to acquire is that required for a medical officer to manage ICU patients for surgical procedures or to support the specialist intensivist in an ICU. This includes understanding general basic principles of conditions that are normally managed by specialist intensivists. An understanding of medical disorders in this Domain is also required knowledge for the practice of a medical.

9.1.1 Trainees need to achieve these aims:

- 9.1.1.1 Develop rapid and appropriate responses to life-threatening problems, including priorities of management

9.2 Knowledge

9.2.1 Supportive Care of the Critically Ill Patient

Trainees are expected to understand the following:

9.2.1.1 Transport of the Critically ill Patient

9.2.1.2 Sedation and Analgesia

9.2.1.2.1 The appropriate use of sedative and analgesic agents

9.2.1.2.2 The assessment of sedation and analgesia

9.2.1.3 Principles of Antibiotic Use

9.2.1.3.1 Indications and mechanism of action

9.2.1.3.2 Antibiotic stewardship and resistance

9.2.1.3.3 The implications of organ dysfunction/failure for antibiotic prescribing and efficacy

9.2.1.4 Inotropic Support

9.2.1.4.1 Indications for inotropic support

9.2.1.4.2 Preparing infusions and dosing of infusions

9.2.1.4.3 Effects and endpoints for the use of inotropic and vasopressor agents

9.2.1.5 Nutrition, Fluid and Electrolyte Support

9.2.1.5.1 Principles of fluid management

9.2.1.5.2 Appropriate use of blood and blood products

9.2.1.5.3 Principles of enteral and parenteral nutrition

9.2.1.5.4 Glycaemic control in the critically ill

9.2.1.6 Prevention of complications including:

9.2.1.6.1 Nosocomial infection and the appropriate use of infection control measures

9.2.1.6.2 Ventilator-induced lung injury

9.2.1.6.3 Thromboembolic disease

9.2.1.6.4 Stress ulceration

9.3 Specific Disorders

Trainees are expected to understand the following:

9.3.1 Acute Circulatory Failure

9.3.1.1 Classification, causes and sequelae of shock

9.3.1.2 Principles of management of all forms of shock

9.3.1.3 Monitoring in the management of shock

9.3.1.4 Causes of cardiorespiratory arrest

9.3.1.5 Cardiopulmonary resuscitation and external defibrillators

9.3.2.../

- 9.3.2 **Common cardiac dysrhythmias and their current therapies**
- 9.3.3 **Hypertension**
- 9.3.4 **Pulmonary embolism**
- 9.3.5 **Anaphylaxis**
- 9.3.6 **Ischaemic Heart Disease and Myocardial Infarction**
 - 9.3.6.1 Factors involved in the balance of oxygen supply and demand to the heart
 - 9.3.6.2 Signs and symptoms of ischaemic heart disease
 - 9.3.6.3 Signs and symptoms of myocardial infarction
 - 9.3.6.4 Principles of the management of acute myocardial infarction
 - 9.3.6.5 Medical management of NSTEMI
- 9.3.7 **Respiratory disease processes and respiratory failure:**
 - 9.3.7.1 Causes and pathogenesis of respiratory failure
 - 9.3.7.2 Appropriate use and interpretation of pulmonary function tests and arterial blood gasses
 - 9.3.7.3 Oxygen therapy and mechanical ventilatory support
 - 9.3.7.4 Pneumothorax
 - 9.3.7.5 Aspiration syndromes
 - 9.3.7.6 Fat embolism
 - 9.3.7.7 Pneumonia (community and hospital acquired)
 - 9.3.7.8 Status asthmaticus
- 9.3.8 **Renal Failure**
 - 9.3.8.1 Definitions of acute and chronic renal failure
 - 9.3.8.2 Causes and pathogenesis of renal failure particularly in the perioperative setting
 - 9.3.8.3 Acute renal failure
 - 9.3.8.4 Consequences for drug pharmacokinetics
 - 9.3.8.5 Renal replacement therapy and its emergency indications
- 9.3.9 **Neurological Failure**
 - 9.3.9.1 Treatment of cerebral oedema and raised intracranial pressure
 - 9.3.9.2 Treatment of status epilepticus
 - 9.3.9.3 Glasgow Coma Scale
 - 9.3.9.4 Principles of neuro-protection in the management of head injury
 - 9.3.9.5 Meningitis
 - 9.3.9.6 Encephalitis
- 9.3.10 **Severe Trauma**
 - 9.3.10.1 Effects of severe trauma on organs and organ systems
 - 9.3.10.2 The principles of resuscitation and damage control in the management of severe trauma
 - 9.3.10.3 Principles of the safe transfer of injured children and adults and portable monitoring systems
- 9.3.11 **Sepsis**
 - 9.3.11.1 Definition of SIRS, sepsis, septic shock and multi-organ failures
 - 9.3.11.2 Infection control measures in ICU and operating suites
- 9.3.12 **Other Systems — Representative conditions:**
 - 9.3.12.1 **Endocrine Crises**
 - 9.3.12.1.1 Diabetic keto-acidosis
 - 9.3.12.1.2 Hyperosmolar non-ketotic coma
 - 9.3.12.1.3 Thyroid storm
 - 9.3.12.1.4 Addisonian crisis
 - 9.3.12.2 **Metabolic Disorders**
 - 9.3.12.2.1 Electrolyte and acid-base disorders
 - 9.3.12.2.2 Lactic acidosis
 - 9.3.12.3 **Haematology**
 - 9.3.12.3.1 Defects in haemostasis eg thrombocytopaenia, DIC, hypercoagulable states
 - 9.3.12.3.2 Anaemia
 - 9.3.12.3.3 Blood transfusion and transfusion triggers

- 9.3.12.4 **Immunology**
 - 9.3.12.4.1 Anaphylactic reactions
- 9.3.12.5 **Gastrointestinal disorders**
 - 9.3.12.5.1 GIT bleeding
 - 9.3.12.5.2 Acute liver failure

9.4 **Clinical Management**

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

9.5 **Professional Practice**

- 9.5.1 Comply with the relevant policies, recommendations, and guidelines in professional practice

9.6 **Immediate Patient Assessment and Resuscitation**

- 9.6.1 Assess life-threatening problems accurately and quickly in a critically ill patient
- 9.6.2 Judge the priorities of immediate resuscitation
- 9.6.3 Undertake emergency management including basic and advanced life support
- 9.6.4 Provide immediate life-supporting therapy
- 9.6.5 Perform primary and secondary surveys

9.7 **Communication**

- 9.7.1 Document patient information clearly, presenting problems and progress
- 9.7.2 Generate a list of differential diagnoses and priorities in investigations
- 9.7.3 Counsel patients and relatives as appropriate, including end of life care issues
- 9.7.4 Consult and collaborate effectively
- 9.7.5 Conduct appropriate handover to other colleagues, eg, before or after surgery or on discharge to the ward

9.8 **Supportive Care of Critically Ill Patients**

9.8.1 **Inotropic Therapy**

- 9.8.1.1 Recognise when to use inotropic or vasopressor therapy
- 9.8.1.2 Use of appropriate agent, dose, clinical endpoint, and route of administration
- 9.8.1.3 Review the efficacy of inotropic therapy at regular intervals

9.8.2 **Nutritional Support**

- 9.8.2.1 Provide appropriate nutritional support in consultation with a dietician

9.8.3 **General Care**

- 9.8.3.1 Institute an appropriate plan for the general care of the critically ill patient, including care of bowels, skin, mouth, eyes and maintenance of mobility and muscle strength

9.8.4 **Monitoring of the Critically Ill Patient**

- 9.8.4.1 Principles of monitoring, systems available, complications
- 9.8.4.2 Monitoring of the cardiovascular, respiratory, renal and central nervous systems

9.8.5 **Specific Disorders**

9.8.5.1 **Acute Circulatory Failure**

- 9.8.5.1.1 Recognise and assess severity of shock and manage the condition
- 9.8.5.1.2 Manage cardiorespiratory arrest using accepted international protocols
- 9.8.5.1.3 Recognition and management of arrhythmias

9.8.6 **Respiratory Failure**

- 9.8.6.1 Recognise and manage respiratory failure

9.8.7 **Haemorrhage**

- 9.8.7.1 Control bleeding
- 9.8.7.2 Use blood components appropriately
- 9.8.7.3 Manage coagulopathies

- 9.8.8 **Renal Failure**
 - 9.8.8.1 Identify patients at risk of developing renal failure
 - 9.8.8.2 Apply general principles in the management of a patient with renal failure
- 9.8.9 **Neurological Failure**
 - 9.8.9.1 Manage an unconscious patient
- 9.8.10 **Severe Trauma**
 - 9.8.10.1 Use a systematic, priority-orientated approach in resuscitation, assessment, investigation and emergency management
- 9.8.11 **Sepsis**
 - 9.8.11.1 Resuscitate a patient with septic shock, using appropriate monitoring, fluid therapy and vasoactive agents
 - 9.8.11.2 Collect appropriate specimens for laboratory examination
 - 9.8.11.3 Recognise the need for surgical intervention and consult appropriately

9.9 Skills

Specific clinical and technical skills in which Trainees are required to be competent include the following.

9.9.1 Cardiovascular

- 9.9.1.1 Choosing and using inotropic agents, vasodilators, and vasoconstrictors
- 9.9.1.2 Managing dysrhythmias
- 9.9.1.3 Cardioversion and defibrillation
- 9.9.1.4 Advanced life support
- 9.9.1.5 The management and performance of central venous access

9.9.2 Respiratory

- 9.9.2.1 Oxygen therapy and humidification
- 9.9.2.2 Mechanical ventilation, including modes of ventilation
- 9.9.2.3 Weaning and extubation

9.9.3 Renal Failure

- 9.9.3.1 Insertion of venous access catheters for hemodialysis

9.9.4 Neurological Failure

- 9.9.4.1 Maintaining cerebral perfusion pressures and intracranial pressures

9.9.5 Gastro-intestinal

- 9.9.5.1 Insertion of naso- or orogastric tube and ability to confirm position

10.0 DOMAIN 9: PAIN MEDICINE

10.1 Trainee's Aims

This Domain builds on clinical experience in pain management learned during Basic Training. The **aim of Domain 9** is for Trainees to acquire clinical abilities and skills in managing peri-operative pain. This includes learning to integrate and apply knowledge and skills in clinical management, such as in:

- 10.1.1 Assessing pain
- 10.1.2 Taking a "pain history" and examination
- 10.1.3 Providing perioperative and other acute pain relief

10.2 Knowledge

10.2.1 Basic Sciences

Trainees are required to revise the relevant subjects in the Basic Sciences. Trainees are expected to apply Basic Science principles in clinical practice. Basic science subjects relevant to this Domain include the following:

10.2.2 Pharmacology of Analgesic Agents including mechanism of action, drug interactions, and side effects.

10.2.2.1 Knowledge of the pharmacology of:

- 10.2.2.1.1 Opioids and Tramadol
- 10.2.2.1.2 Paracetamol
- 10.2.2.1.3 Non-specific Non-steroidal anti-inflammatory agents (NSAIDs)
- 10.2.2.1.4 NMDA-receptor antagonists eg Ketamine
- 10.2.2.1.5 Local anaesthetics

10.2.2.2 **Knowledge of different routes of analgesic drug delivery.**

- 10.2.2.2.1 Oral
- 10.2.2.2.2 Intramuscular
- 10.2.2.2.3 Subcutaneous
- 10.2.2.2.4 Intravenous (including continuous infusion)
- 10.2.2.2.5 Patient-controlled analgesia (PCA)
- 10.2.2.2.6 Neuraxial
- 10.2.2.2.7 Regional nerve blocks
- 10.2.2.2.8 Other; topical, transdermal, rectal, transmucosal (intranasal, inhalational and sublingual / buccal), Intra-articular, Incisional

10.2.3 **Substance Abuse**

- 10.2.3.1 Concepts of tolerance, physical dependence, addiction
- 10.2.3.2 Common licit and illicit drugs of abuse
- 10.2.3.3 The importance of a multidisciplinary approach to pain management in patients with a history of substance abuse (including monitoring, drug therapy, rehabilitation)

10.3 **Clinical Management**

10.3.1 **Professional Practice**

- 10.3.1.1 Comply with relevant policies, recommendations, and guidelines for practice.
 - 10.3.1.1.1 SASA Acute pain guidelines

10.3.2 **Pain Assessment and Measurement**

- 10.3.2.1 Assess pain and outcome of pain treatment using history, clinical examination and pain measurement tools
- 10.3.2.2 Recognise the limitations of pain measurement techniques, particularly in some patient groups (eg, persistent pain, children, those with cognitive impairment)

10.3.3 **Acute Pain**

10.3.3.1 General Principles

- 10.3.3.1.1 Consequences of poorly controlled pain
- 10.3.3.1.2 Importance of aggressive multimodal pain control

10.3.3.2 Choice of the most appropriate technique of acute pain management:

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

10.4 **Clinical**

In this Domain, Trainees will provide, or assist with, appropriate pain management in peri-operative patients

10.5 **Clinical Evaluation**

Trainees will demonstrate skills in the clinical evaluation of patients with acute pain by:

- 10.5.1 Obtaining a specific pain history
 - 10.5.1.1 Onset, location, nature, duration, intensity, aggravating and relieving factors
 - 10.5.1.2 Physical, psychological and social consequences of the patient's pain
 - 10.5.1.3 Formulating a management plan and evaluating outcome

10.6 **Technical**

Trainees need to understand the anatomy, technique, indications, contraindications, complications and management of and obtain competency in:

- 10.6.1 Central neuraxial blocks
- 10.6.2 Regional techniques (including knowledge of anatomy, technique, indications, contraindications, complications and their management) including:
 - 10.6.2.1 Peripheral and plexus blocks of the upper and lower limb
 - 10.6.2.2 Truncal blocks

11.0 DOMAIN 10: ANAESTHESIA IN REMOTE LOCATIONS AND PROCEDURAL SEDATION

This Domain includes anaesthesia for procedures outside of the operating theatre. These include (but are not limited to) radiological procedures, endoscopy, dentistry, ECT and any other procedures requiring anaesthetic care in the form of sedation, regional and general anaesthesia. Neuroradiological procedures are covered in Domain 5.

11.1 Trainee's Aims

In Domain 10 clinical experience is gained from sedation and anaesthesia for procedures outside of the operating room as delineated above. The **aim of Domain 10** is for Trainees to acquire a series of clinical abilities and skills in the perioperative care of patients undergoing such procedures, which share the common consideration of being performed away from the mainstream operating theatre environment. This includes adult and paediatric patients, with requirements for specialised equipment (for example the MRI compatible anaesthesia workstation), distant airway and vascular access, difficult monitoring, in facilities where maintaining patients' homeostasis may not be ideal.

11.2 Knowledge

Apart from knowledge, skills and attitudes required for anaesthesia practice as defined in both general and specific domains previously, the trainees are expected to have additional specific knowledge in:

- 11.2.1 Procedures requiring anaesthetic management outside the OR, eg, radiology, endoscopy, dentistry, ECT.
- 11.2.2 Appropriate anaesthetic techniques for patients managed outside the OR: sedation (monitored anaesthesia care), general anaesthesia, regional anaesthesia
- 11.2.3 Pharmacology of anaesthetic agents suitable for short procedures (rapidly acting agents, including opioids, sedative-hypnotics, volatile anaesthetics and muscle relaxants)
- 11.2.4 Safety standards required for practice of anaesthesia in remote locations
- 11.2.5 Safety standards required for transport of patients to and from remote locations
- 11.2.6 Typical clinical and organizational problems associated with anaesthesia outside the OR: distant airway and vascular access, precarious monitoring, distant help
- 11.2.7 Specific complications associated with sedation (airway obstruction, apnoea)
- 11.2.8 Principles of safety during x-ray, and MRI procedures

11.3 Skills

11.3.1

Organization skills

- 11.3.1.1 Organization of the remote locations to have the standards that adhere to operating room, including appropriate human resource
- 11.3.1.1.2 Organization and management of a location for post anaesthesia surveillance and monitoring

11.3.2

Technical skills

- 11.3.2.1 Preanaesthetic preparation of the equipment in remote site (anaesthesia machine, disposable material, drugs)
- 11.3.2.2 Challenges of anaesthesia in remote locations:
 - 11.3.2.2.1 Vascular access with specific consideration for potential distant access
 - 11.3.2.2.2 Airway management with specific consideration for potential difficult airway access

11.3.3

Clinical and case management skills

- 11.3.3.1 Appropriate patient evaluation and selection for anaesthesia
- 11.3.3.2 Safe transport of the patient to and from the remote location
- 11.3.3.3 Appropriate monitoring of the patient with specific consideration for potential distant monitoring
- 11.3.3.4 Detection and treatment of potential anaesthetic complications, in particular those associated with sedation (airway obstruction, apnoea)

- 11.3.3.5 Anaesthetic practice in a variety of remote locations:
 - 11.3.3.5.1 Radiology : CT, MRI
 - 11.3.3.5.2 Endoscopy : upper gastro-intestinal endoscopy, colonoscopy
 - 11.3.3.5.3 Dentistry : dental care under general anaesthesia
 - 11.3.3.5.4 ECT (electroconvulsive therapy)
 - 11.3.3.5.5 Emergency room
- 11.3.3.6 Self protection (x-ray and MRI procedures)
- 11.3.4 **Specific attitudes**
 - 11.3.4.1 Organizational aspects and logistics in remote location or an ambulatory practice
 - 11.3.4.2 Multidisciplinary team work and effective communication

11.4 RECOMMENDED READING LIST

- 11.4.1 Morgan GE, Mikhail MS, Murray MJ . Clinical anesthesiology . 5th ed . MacGraw Hill Companies . 2013
- 11.4.2 Saving Mothers Caesarean section monograph.
<http://www.hst.org.za/publications/saving-mothers-caesarean-section-monograph-2013>
- 11.4.3 ESMOE guidelines