Federal Democratic Republic of Ethiopia

OCCUPATIONAL STANDARD

ANESTHETIC NURSING

NTQF Level V

Ministry of Labor and Skills
November 2021

Introduction

Ethiopia has embarked on a process of reforming its TVET-System. Within the policies and strategies of the Ethiopian Government, technology transformation – by using international standards and international best practices as the basis, and, adopting, adapting and verifying them in the Ethiopian context – is a pivotal element. TVET is given an important role with regard to technology transfer. The new paradigm in the outcome-based TVET system is the orientation at the current and anticipated future demand of the economy and the labor market.

The Ethiopia Occupational Standards (EOS) is the core element of the Ethiopian National TVET-Strategy and an important factor within the context of the National TVET-Qualification Framework (NTQF). They are national Ethiopian standards, which define the occupational requirements and expected outcome related to a specific occupation without taking TVET delivery into account.

This document details the mandatory format, sequencing, wording and layout for the Ethiopia Occupational Standard which comprised of Units of Competence.

A Unit of Competence describes a distinct work activity. It is documented in a standard format that comprises:

- Occupational title, NTQF level
- Unit code
- Unit title
- Unit descriptor
- Elements and Performance criteria
- Variables and Range statement
- Evidence guides

Together all the parts of a Unit of Competence guide the assessor in determining whether the candidate is competent.

The ensuing sections of this EOS document comprise a description of the occupation with all the key components of a Unit of Competence:

- chart with an overview of all Units of Competence for the respective level (Unit of Competence Chart) including the Unit Codes and Unit Titles
- contents of each Unit of Competence (competence standard)

Occupational map providing the technical and vocational education and training (TVET) providers with information and important requirements to consider when designing training programs for this standard and for the individual, a career path

UNIT OF COMPETENCE CHART

Occupational Standard: Anesthetic Nursing

Occupational Code: HLT ATN

NTQF Level V

HLT ATN5 01 1121 Perform Pre-anesthetic Assessment and Optimize Patient for Surgery	HLT ATN5 02 1121 Utilize Anesthesia Machine and Equipment to Follow Anesthetized Patient	HLT ATN5 03 1121 Administer Anesthetic Drugs, Adjuvants and Fluids
HLT ATN5 04 1121 Manage Patient Airway using Different Modalities	HLT ATN5 05 1121 Provide Safe Anesthesia for Emergency and Essential Surgeries	HLT ATN6 06 1121 Provide anesthesia for obstetrics and pediatric surgery
HLT ATN5 07 1121 Provide Post Anesthesia Care for Emergency and Essential Surgeries	HLT ATN5 08 1121 Maintain infection prevention and safety standards	HLT ATN5 09 1121 Assess and Manage Pain Perioperatively
HLT ATN5 10 1121 Provide Cardiopulmonary Resuscitation (CPR) for All Age Groups	HLT ATN5 11 1121 Apply Legal and Ethical Principles in Anesthesia Practice	HLT ATN5 12 1121 Manage Anesthesia Service of a Facility

Occupational Standard: Anesthetic Nursing Level VI	
Unit Title	**Perform Pre-anesthetic Assessment and Optimize Patient for Surgery**
Unit Code	**HLT ATN5 01 1121**
Unit Descriptor	This unit describes the knowledge, skills and attitude required to perform pre-anesthetic assessment and optimize patient for surgery.

Element	Performance Criteria
1. Take appropriate pre-anesthetic history	1.1. The status of ***body systems*** are reviewed with a detailed understanding of underlying function to inform fitness to anesthesia 1.2. Patient ***chart is reviewed*** for relevant surgical and anesthetic history 1.3. Information is obtained through ***questioning*** to identify any actual or potential ***problems*** regarding medical status
2. Perform relevant physical examination	2.1. The ***structure and function*** of body systems are examined with detailed understanding of underlying working principles to determine fitness to anesthesia 2.2. Airway status is assessed and ***Mallampati*** grading determined 2.3. Information obtained through structured body system assessment following the four ***components of examination*** (Inspection, Palpation, Auscultation and Percussion)
3. Determine clinical status of patient	3.1. ***Relevant laboratory investigations*** are identified, obtained/ordered and interpreted 3.2. The functional body system ***abnormalities*** are identified 3.3. The clinical status of surgical patient is determined based on the American Society of Anesthesiologists ***(ASA) clinical status*** classification
4. Optimize patient for surgery	4.1. Anesthetic ***management plan*** is developed 4.2. Appropriate prescription and administration of preoperative ***medications*** done as necessary to the conduct of anesthesia 4.3. ***Potential causes of stress*** are recognized and managed according to acceptable management guideline to reduce or eliminate stress
5. Ask informed consent before anesthesia and surgery	5.1 **Information** about anesthesia and surgery provided 5.2 Risks and benefits of the procedure disclosed 5.3 Patient comprehension on anesthesia and surgery ensured 5.4 **Voluntary agreement** from the patient or legally authorized representative is taken

Variable	Range
Body system	May include, but not limited to: • Respiratory system • Cardiovascular system • Nervous system including EENT • Endocrine system • Gastrointestinal • Genitourinary system • Musculoskeletal system • Lymphatic/ Immune system
Reviewing patient chart	May include, but not limited to: • Medical history may include: ➢ History of any co-morbid medical illness (character, severity and duration of symptoms) ➢ History of any actual or potential problems associated with activities of daily living ➢ Past health history, including use of alcohol, tobacco and other substances • Medication history may include: ➢ Medications being taken ➢ Allergies to any of the medications • Anesthesia history may include: ➢ Previous exposure to anesthesia and surgery: includes type, any complication, when was it
Questioning	May include, but not limited to: • Past medical history, including use of drugs, alcohol, tobacco and other substances • Basic dietary information, including diet history to determine food and drink intake and NPO status • Family history of surgery and anesthesia: includes type and any complication • Client concerns and beliefs regarding their problems
Problems	May include, but not limited to: • Cardio vascular problems, such as: ➢ Hypotension/ shock ➢ Hypertension ➢ Arrhythmia (bradycardia and tachycardia) • Respiratory system problems, such as: ➢ Bronchospasm (asthma and anaphylaxis)

	➢ Upper respiratory tract infection • Digestive system problems, such as: ➢ Bowel obstruction and appendicitis ➢ Bowel perforation ➢ Gastro-intestinal bleeding ➢ Gastroenteritis ➢ Gallstones ➢ Gastroenteritis ➢ Diverticulitis • Endocrine system problems, such as: ➢ Diabetes mellitus ➢ Hypo/hyperthyroidism • Genitourinary conditions, such as: ➢ UTI ➢ Incontinence ➢ Dysuria ➢ Urethral obstruction • Integumentary system problems, such as: ➢ Burns ➢ Open wounds ➢ Wound infection • Musculoskeletal system problems, such as: ➢ Soft tissue injury ➢ Fractures • Nervous system problems, such as: ➢ Seizure ➢ Coma • Reproductive system problems, such as: ➢ Obstetric emergencies ➢ Gynecologic emergencies
Structure and function	May include, but not limited to the structure and functioning of vital body systems relevant to anesthesia: • Respiratory system • Cardiovascular system • Nervous system including EENT • Endocrine system • Gastrointestinal • Genitourinary system • Musculoskeletal system • Lymphatic/ Immune system

Mallampati	Is to refer Oropharyngeal airway grading with the following 4 classes: • Mallampati (OPV) I • Mallampati (OPV) II • Mallampati (OPV) III • Mallampati (OPV) IV
Components of examination	May include, but not limited to: • Inspection • Palpation • Percussion and • Auscultation
Relevant laboratory investigations	May include, but not limited to: • Blood film • CBC • Organ function tests and • Imaging modalities as required
Abnormalities	These include the conditions listed in the above part of this table under the "*problem*" variable.
ASA clinical status	ASA clinical status is a measurement for the medical condition of surgical patient using the classification developed by the American Society of Anesthesiologists (ASA). This classification has 5+ categories as: • ASA I • ASA II • ASA III • ASA IV • ASA V ± • ASA VI
Management plan	This management plan comprised of: • Preanesthesia optimization and preparation • Intraoperative management and • Post anesthesia management
Medications	Preoperative medications may include, but not limited to: • Anxiolytics • Antisialagogue • Antiemetics • Vasoactive drugs • Fluid • Narcotics

	• Psychotropic • Prophylactic and therapeutic Antibiotics • Antacids • Antipain • Medications for the treatment of comorbidities relevant to anesthesia management
Potential causes of stress	May include, but not limited to: • Acute stress from exposure to incidents involving – ➢ Disease, trauma, violence, injury and/or death ➢ Operation-related stress • Chronic stress
Information	Refers to: • providing advantage and disadvantage of the anesthesia procedure • Disclosure of predicted and unforeseen risks that can be sustained during anesthesia and surgery
Voluntary Agreement	This refers to • Making sure the patient understands the provided information • Patient or legally representative authority will sign signature consenting for anesthesia and surgery

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge on: • The assessment of a patient planned to undergo anesthesia/ surgery (includes taking history, performing P/E and ordering and interpreting lab investigations) • Determining fitness of a patient to anesthesia • Preparation and optimization of a patient to anesthesia and surgery • Establishing rapport and obtaining informed consent
Critical aspect of Knowledge and Attitudes	Demonstrate knowledge of: • Common and medical anatomical terminology • Concepts and underpinning of human anatomy and physiology, including: ➢ Levels of structural organization of body systems ➢ Homeostasis and the relationship between homeostatic imbalance and disease • Structure and function (Anatomy and physiology) of body systems, including: ➢ Cells, tissues and organs

	➢ Cardiovascular system ➢ Respiratory system ➢ Musculoskeletal system ➢ Endocrine system ➢ Gastrointestinal system ➢ Genitourinary system ➢ Reproductive system ➢ Integumentary system ➢ lymphatic system/ Immune system ➢ Nervous system, including sensory systems ➢ Immune system • The special senses: ➢ Smell, ➢ Taste, ➢ vision, ➢ Equilibrium and hearing • Processes of metabolism, nutrition, body temperature regulation, biological maturation, inheritance and aging • Causes of disease: ➢ Pathogens ➢ Inherited genetic conditions ➢ Trauma, toxins and other environmental hazards ➢ Nutritional factors ➢ Degenerative changes in vital organ systems ➢ The loss of normal control mechanisms such as the uncontrolled growth of cancer cells • Defense systems and immunity responses in relation to the whole body and the individual body systems. • Common disorders, problems and complaints associated with each body system and its components, especially where relevant to anesthetic management to be provided. • Potential impacts of a range of factors, both internal (such as physical, mental, emotional factors) and external (e.g. in relation to specific health interventions) in relation to identified body systems and their components • Relevant laboratory investigations and their interpretations
Underpinning Skills	Demonstrate skill to: • Take anesthetic history • Perform physical examination of all body parts • Optimize an prepare patient for surgery and anesthesia

	• Order and interpret laboratory investigations • Establish rapport and obtain informed consent • Accurately use and articulate medical and/or anesthetic terminology related to human anatomy and physiology and associated health issues in the context of providing anesthesia. • Recognize variations from normal functioning and determine an appropriate response in terms of: ➢ Referral to an appropriate medical, nursing or allied health professional • Refer to or seek assistance from an appropriate professional in relation to variations from normal functioning.
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level VI	
Unit Title	**Utilize Anesthesia Machine and Equipment to Follow Anesthetized Patient**
Unit Code	**HLT ATN5 02 1121**
Unit Descriptor	This unit of competency describes the knowledge, skills and attitude required for the identification and utilization of monitoring standards for safe conduct of anesthesia. Moreover, this unit of competency will address the required domains of learning in the safe handling of anesthetic machine and equipment needed for the provision of safe anesthesia.

Element	Performance Criteria
1. Utilize anesthesia machine safely	1.1. ***Parts of Anesthesia machine*** are checked for functionality using ***AAGBI[1] machine checklist*** and calibrated if required 1.2. ***Breathing systems*** are checked for functionality to handle both pediatric and adult patients
2. Manage medical gas supplies	2.1. ***Cylinders are handled*** in a safe manner 2.2. Cylinders are prepared before anesthesia 2.3. ***Cylinders are checked*** for integrity and pressure in accordance with the current relevant standards and procedures. 2.4. ***Cylinder contents*** are correctly identified and connected to anesthesia machine correctly. 2.5. Reserve cylinders are stored safely in accordance with organizational policies and procedures, in designated place with ***system of inventory***. 2.6. ***Pipeline systems are monitored*** for compression pressures and saturation (FiO_2). 2.7. Pipeline and ***cylinder faults*** are identified and established procedures are followed to rectify faults. 2.8. Pipeline supplies are correctly attached to anesthesia machine. 2.9. Oxygen concentrator parts, use and precautions are identified 2.10. Oxygen Concentrators are correctly attached to anesthesia machine
3. Apply standards of patient monitoring during the conduct of anesthesia	3.1. ***Oxygenation***, ***Ventilation***, ***Circulation*** and ***temperature are monitored*** continuously/ continually 3.2. ***Functionality of monitoring devices*** is checked 3.3. Obtained patient is ***data recorded*** appropriately per the standard of health facility

	3.4. Monitoring devices are ***utilized*** safely
4. Utilize anesthetic and ancillary equipment& materials	4.1. ***Equipment*** and ***materials*** are selected and prepared correctly per the type of anesthesia planned/ decided 4.2. Functionality of anesthetic equipment and materials checked and prepared for purpose 4.3. Anesthetic equipment and material are used safely 4.4. Anesthetic equipment and materials are ***cleaned/disinfected/sterilized*** 4.5. Used equipment and ***materials are returned*** to the storage place at the end of surgery/anesthesia

Variable	**Range**
Parts of anesthesia machine	May include, but not limited to: • High pressure systems may include: ➢ Hanger Yoke ➢ Cylinder Pressure Indicator (Gauge) ➢ Pressure Regulators • Intermediate pressure systems may include: ➢ Master Switch (Pneumatic Component) ➢ Pipeline Inlet Connections ➢ Pipeline Pressure Indicators ➢ Piping ➢ Oxygen Pressure Failure Devices ➢ Oxygen Failure Safety Device ➢ Oxygen Supply Failure Alarm ➢ Second-stage Pressure Regulator ➢ Oxygen Flush ➢ Flow Adjustment Control ➢ Control Knob • Low pressure systems may include: ➢ Flow-meters ➢ Hypoxia Prevention Safety Devices ➢ Pressure Relief Device ➢ CO2 absorber ➢ Common (Fresh) Gas Outlet
AAGBI machine check	Association of Anesthetists of Great Britain and Ireland (AAGBI) has developed a checklist to be used when performing routine anesthesia machine and gas supply check. This checklist has updated version of 2012 and being used internationally including Ethiopia.

Breathing systems	May include, but not limited to:
	• Mapleson breathing systems: A, B, C, D, E and F
	• Humphrey ADE breathing system
	• Circle system such as:
	  ➢ Vaporizer out of circle (VOC) or
	  ➢ Vaporizer in circle (VIC)
	• Systems may have:
	  ➢ Microbiologic filter
	  ➢ Heat and moisture exchanger

Cylinder handling	May include, but not limited to: • Handling only by trained personnel. • Valves, pressure regulators, gauges, or fittings should never come in contact with oils, greases, organic lubricants, rubber. • No part of any cylinder should ever be subjected to a temperature above 54°C (130°F) or below -7°C (20°F). • Connections to different equipment should always be kept tight to prevent leaks. • Pressure relief device or the valve outlet must not be obstructed • Adapters to change the outlet size of a cylinder valve should not be used. • The valve should be kept closed at all times except when the cylinder is in use. • No part of the cylinder or its valve should be tampered with, painted, altered, repaired, or modified by the user. • Markings, labels, or tags must not be defaced, altered, or removed. • A cylinder should not be used as a roller, support, or for any other purpose. • Cylinders not be placed or used in a manner where they can become part of an electrical circuit. • Cylinders should not be dropped, dragged, slid, or rolled, even for short • The owner of the cylinder must be notified if any damage is noticed. • Disposition of unserviceable cylinders should be done only by qualified personnel. • Cylinders should be properly secured at all times to prevent them from falling or being knocked over
Checking cylinder	May include, but not limited to: • Gas pressure and volume

	• Any leakage • Any damages part • Tag • Pin index safety system
Cylinder content	May be checked by: • Content using different methods may include: ➢ Color code and Label
System of inventory	Refers to a mechanism where full and empty cylinders are identified easily from distance. This may include the use of tags and wall posts.
Monitoring pipeline system	Refers to intermediate pressure gas (60PSI or 4 Bar pressure) supply from central source
Cylinder faults	May refer: • Leakage • Unfitting heads • Damaged • Mislabeling and tagging • Wrong content
Monitoring Oxygenation	Can be done by: • Pulse oxymetery • Clinical assessment of patient status
Monitoring Ventilation	Can be done by: • Capnography • Disconnect alarm systems • Clinical observation (chest for movement, extremity for cyanosis, ETT for fogging)
Monitoring Circulation	Can be done by: • ECG • Pulse oxymetery • Non-invasive arterial blood pressure measurement • Clinical observation
Monitoring Temperature	Can be done by temperature probe
Functionality of monitoring devices	May refer implementation of routine AAGBI device check list.
Data recording	May include, but not limited to: • Blood pressure • Pulse rate • Oxygen saturation

	• ECG trace • Capnography recording • Temperature measurement • These information shall be recorded on anesthesia recording sheet!
Utilization	May refer the use of monitoring devices continuously and continually (on regular interval) safely.
Equipment and materials	May refer: • Airway equipment may be: ➢ Endotracheal tube ➢ Laryngoscope with blades and batteries ➢ Airways – Nasopharyngeal and Oropharyngeal ➢ Laryngeal mask airway ➢ Stylet and bougie ➢ Inflating syringe ➢ Fixing tape ➢ Magill forceps ➢ Facemask ➢ Self-inflating bag • Accessory equipment may be: ➢ Suction machine with catheter ➢ Heater ➢ Nasogastric tube
Cleaning, disinfection and sterilization	May refer abiding to the facility infection prevention and patient safety (IPPS) guideline in the processing and utilization of anesthetic and ancillary equipment. This will be well addressed under the IPPS unit of competency.
Returning materials	May refer proper collection of all used portable anesthetic equipment and material and storing in safe place for the next day surgery.

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge on: • Safe utilization of anesthesia machine • Effective management of medical gas supplies • Application of standard monitoring during the conduct of anesthesia • Effective utilization of anesthetic and ancillary equipment
Required Knowledge and Attitudes	Demonstrate knowledge of: • Anesthesia machine:

	➢ Machine system: Pneumatic & electrical ➢ Machine parts ➢ Breathing system (Use, advantage, limitation) • Medical gas supplies: ➢ Cylinder parts, use & precautions ➢ Pipeline parts, use & precautions ➢ Concentrators parts, use & precautions • Monitoring systems: ➢ Standards I ➢ Standard II • Anesthetic equipments • Ancillary equipments
Required Skills	Demonstrate skills to: • Use anesthesia machine safely • Check equipment and machine functionality • Utilize standard monitoring devices during anesthesia • Use anesthetic and ancillary equipment safely • Use medical gas supplies safely and efficiently
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Administer Anesthetic Drugs, Adjuvants and Fluids**
Unit Code	**HLT ATN5 03 1121**
Unit Descriptor	This unit Competency describes the knowledge, skills and attitude required to identify, select and administer anesthetic drugs, adjuvants and fluids in the anesthetic management of essential and emergency surgical patients.

Element	Performance Criteria
1. .Administer anesthetic drugs and adjuvants	1.1. ***Anesthetic drugs and adjuvants*** are identified with a detailed understanding of specific drug ***pharmacodynamics*** and ***pharmacokinetics*** 1.2. Appropriate anesthetic drugs and adjuvants are selected based on individual ***indications and contraindications*** 1.3. Drugs for administration are ***prepared and labeled*** per the plan of anesthesia management. 1.4. Intended procedures are ***informed and explained*** to the patient in order to have cooperation and provide reassurance. 1.5. Drug is administered in accordance with the ***standard of practice*** and procedures. 1.6. Complete and accurate ***documentation*** are recorded.
2. Select and administer intravenous fluids based on calculated requirement of a patient	2.1 ***Intravenous fluids*** are identified with a detailed understanding of each ***fluid composition*** 2.2 Appropriate intravenous fluids are selected and ***calculated*** based on individual indications and contraindications 2.3 Intended procedures are informed and explained to the patient in order to have cooperation and provide reassurance. 2.4 Infusion set, connectors and/ or filters are correctly selected. 2.5 Equipment and materials are correctly assembled and primed in an aseptic manner and ready for use. 2.6 Intravenous fluid is administered in accordance with the standard of practice and procedures. 2.7 Complete and accurate documentation are recorded. 2.8 Infusion equipment and solutions are stored correctly
3. Transfuse a patient with blood and blood products	3.1 Relevant ***laboratory investigations*** are obtained to inform appropriate blood and blood product selection 3.2 ***Blood or blood products*** are identified with a detailed understanding of its components 3.3 Appropriate blood or blood product is selected and ***calculated*** based on individual indications and contraindications

	3.4 Intended procedures are informed and explained to the patient in order to have cooperation and provide reassurance. 3.5 Transfusion set, connectors and/ or filters are correctly selected and assembled. 3.6 Blood or blood products are administered in accordance with the standard of practice and procedures. 3.7 ***Adverse reactions*** are identified and managed according to management protocol 3.8 Complete and accurate documentation are recorded. 3.9 Infusion equipment and solutions are stored correctly

Variable	**Range**
Anesthetic drugs and adjuvants	May include, but not limited to: • Anesthetic drugs may include: ➢ IV anesthetics ➢ Inhalational anesthetics ➢ Sedatives and antipains ➢ Anxiolytics • Adjuvants may include: ➢ Antisialagogue ➢ Muscle relaxants ➢ Reversals ➢ Antiacids ➢ Antiemetics ➢ Prophylactic /Therapeutic Antibiotics ➢ Antihypertensive ➢ Sympathomimetic ➢ Antiarrhythmic ➢ Steroids ➢ Antihistamines ➢ Diabetic drugs
Pharmaco-dynamics	May refer what the drugs do to the body
Pharmaco-kinetics	May refer what the body do to the drugs
Indications and contraindications	May refer selection of drugs based on the individual clinical status and expected outcome.
Preparing and labeling	May refer diluting to the required concentration and tagging each syringe with a label addressing the name of the drug and concentration in it.
Informing and explaining	May refer provision of all relevant information to clients prior to preceding any intervention.

Standard of Practice	May refer in anesthesia are guidelines that provide a foundation as to how anesthetist should act and what he or she should perioperatively to provide safe anesthesia. Components of this can be found on the national perioperative guideline.
Documentation	May include, but not limited to: • Site of IV cannula • Size of IV cannula • Drug name (administered) • Concentration and total dose • Time of administration • Any reaction observed
Intravenous fluid	May include, but not limited to: • Colloids and • Crystalloids
Fluid composition	May include, but not limited to: • Electrolyte composition • Osmolarity • PH
Calculation	Is made by determining: • 4-2-1 rule which determines: ➢ Fluid deficit ➢ Maintenance fluid • Ongoing loss may be: ➢ Blood loss ➢ Third space loss
Laboratory investigations	May include, but not limited to: • Blood group • RH compatibility/ cross matching • Hematocrit and Hemoglobin • CBC
Blood or blood products	May include, but not limited to: • Whole blood • Packed RBC • Platelet • Fresh Frozen Plasma
Calculation	Blood transfusion shall be considered when the calculated loss exceeds 20% of the total blood volume. This calculation can be made by adding: • Ongoing blood loss,

	• Third space loss and • Current hematocrit and hemoglobin status of the patient

Adverse reactions	May refer early complications:
	• Hemolytic reactions may include:
	  ➢ Immediate
	  ➢ Delayed
	• Non-hemolytic febrile reactions
	• Allergic reactions to proteins, IgA
	• Transfusion-related acute lung injury
	• Reactions secondary to bacterial contamination
	• Circulatory overload
	• Air embolism
	• Thrombophlebitis
	• Hyperkalaemia
	• Citrate toxicity
	• Hypothermia
	• Clotting abnormalities (after massive transfusion) late
	• Transmission of infection may include:
	  ➢ Viral (hepatitis A, B, C, HIV, CMV)
	  ➢ Bacterial (Treponema pallidum, Salmonella)
	  ➢ Parasites (Malaria, Toxoplasma)
	• Graft-vs-host disease
	• Iron overload (after chronic transfusions)
	• Immune sensitization (Rhesus D antigen)

Evidence Guide	
Critical Aspects of Competence	Demonstrate skills and knowledge to: • Select and administer calculated doses of anesthetic and adjuvant drugs • Select and administer intravenous fluids • Transfuse blood and blood products
Required Knowledge and Attitudes	Demonstrates knowledge of: • Anesthetic drugs: indications, contraindications, mechanism of action & side effects • Adjuvants: indications, contraindications, mechanism of action & side effects • Intravenous fluid: indications, contraindications, mechanism of action & complications • Blood and blood products: indications, contraindications,

	mechanism of action and complications
Required Skills	Demonstrate skills to: • Select anesthetic and adjuvant medications • Calculate and prepare medications • Prepare infusing and transfusion sets • Secure intravenous line • Administer selected & prepared medications safely • Select appropriate intravenous fluid • Administer appropriate intravenous fluid • Obtain and confirm laboratory findings before transfusion • Transfuse blood products • Monitor patient response for medications/ fluids • Manage incidents and complications • Communicate effectively with patients and their families • Document interventions appropriately
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Manage Patient Airway using Different Modalities**
Unit Code	**HLT ATN5 04 1121**
Unit Descriptor	This unit of competency describes the knowledge, skills and attitude required for the assessment and management of patient airway using different management modalities.

Element	Performance Criteria
1. Assess patient airway using different techniques	1.1. The status of airway is reviewed with a detailed understanding of underlying ***structure*** to inform airway classification 1.2. Airway status is determined in accordance with different ***assessment techniques*** 1.3. ***Level of difficulty*** is determined based on assessed airway parameters 1.4. ***Plan*** for airway management is developed
2. Select equipment used to manage airway	2.1. Essential airway management equipment are identified with a detail understanding of their ***specifications***, ***uses/indications***, advantage and limitations. 2.2. Necessary airway equipment are selected, assembled and handled per the developed management plan
3. Manage patient airway	3.1. ***Patient is positioned*** to facilitate the management of airway. 3.2. Patient ***oxygenation*** is optimized. 3.3. Airway patency is maintained with aid of ***anatomical positioning*** 3.4. Airway is managed with the aid of ***supraglottic airway devices*** 3.5. Airway is maintained with ***endotracheal intubation*** with the aid of ***laryngoscope*** 3.6. ***Difficult airway*** is managed as per the ***DAS[2] management guideline*** 3.7. Airway management ***complications*** are managed 3.8. Extubation is performed per the recommended ***standard protocol*** 3.9. Patient's condition is observed throughout the procedure and action taken when required. 3.10. Contaminated equipment are processed and body fluids disposed safely in accordance with principles of IPPS.

Variable	Range

[2] Difficult Airway Society

Structure	May refer: • Upper airway anatomy • Lower airway anatomy
Assessment techniques	May include, but not limited to: • Mallampati (Oropharyngeal airway/ OPV) classification • Thyromental distance (TMD) • Sternomental distance (SMD) • Inter Incisor gap (IIG) • Temporomandibular joint mobility (TMJ) • Submandibular space • Cormack-Lehane
Level of difficulty	May refer: • Difficult mouth opening • Difficult mask ventilation • Difficult laryngoscopy • Difficult intubation
Plan for air way management	May include, but not limited to: • Mask ventilation with airway maneuver • Mask ventilation with supraglottic devices • Laryngeal mask airway (LMA) • Endotracheal Intubation • Nasal intubation • Surgical airway: Tracheostomy, cricothyrotomy
Specifications	May include, but not limited to: • Material where the equipment made • Type of endotracheal tube • Type of Laryngeal mask airway (LMA) • Transparency nature • Size: Internal diameter, length • Presence of special parts: Murphy eye, cuff
Uses/Indications	May refer selection of appropriate equipment based on the airway grading and planned procedure.
Patient position	Refers extension at the atlanto-occipital joint maximally to overlap the oral and pharyngeal axes.
Oxygenation	Refers administration of O_2 through mask prior to intubation for a purpose of denitrogenation.
Anatomical positioning	Refers extension at the atlanto-occipital joint maximally to overlap the oral and pharyngeal axes.
Supraglottic airway	May include, but not limited to:

devices	• Oropharyngeal airway • Nasopharyngeal airway • LMA
Endotracheal intubation	Process may include, but not limited to: • Preoxygenation • Induction and relaxation • ± Mask ventilation • Laryngoscopy • Intubation → Ventilation
Laryngoscope	May refer laryngoscope and its components: • Handle with battery • Blades: Maccintosh and Miller
Difficult airway	May refer: • Difficult mask ventilation • Difficult laryngoscopy • Difficult Intubation
DAS management guideline	Four stepwise management plans: • Plan A: Initial tracheal intubation plan. • Plan B: Secondary tracheal intubation plan, when Plan A has failed. • Plan C: Maintenance of oxygenation and ventilation, postponement of surgery, and awakening the patient, when earlier plans fail. • Plan D: Rescue techniques for 'can't Intubate, Can't Ventilate' (CICV) situation.
Complications	May include, but not limited to: • Laceration of soft tissues • Laryngospasm • Vocal cord paralysis • Dislocation of the arytenoid cartilages or mandible • Perforation of the trachea or the esophagus • Endobronchial or esophageal intubation • Dental damage • Hemorrhage • Aspiration of gastric contents or foreign bodies • Increased intracranial or intraocular pressure • Hypoxemia, hypercarbia • Fracture or dislocation of the cervical spine • Spinal cord damage

	• Trauma to the eyes
Standard protocol	Includes: • Stable hemodynamics • Able to protect airway (return of reflexes) • Return of spontaneous breathing • Response to command: Head lifting, • Return of acceptable airway parameters: TV, TLC, RR • Maintaining normal O2 concentration with air

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge to: • Assess airway using different techniques • Select equipment to manage airway • Maintain patency of patient airway
Required Knowledge and Attitudes	Demonstrate knowledge of: • Anatomy of airway: Adult and pediatrics • Airway assessment techniques • Airway management equipment • Airway management principles • Complications of airway management
Required Skills	Demonstrate skills to: • Evaluate airway status for management • Develop airway management plan • Select airway equipment • Communicate with patient and their families effectively • Maintain airway patency with positioning
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices. n
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Provide Anesthesia for Obstetrics and Pediatric Surgeries**
Unit Code	**HLT ATN5 05 1121**
Unit Descriptor	This unit describes the knowledge, skills and attitude required to Provide Anesthesia for Obstetrics and Pediatric Surgeries.

Element	Performance Criteria
1. Identify Physiological change during pregnancy	1.1. ***Main changes*** that occur in the ***cardiovascular system*** during pregnancy are explained 1.2. Different ***changes in the respiratory system*** during pregnancy are described 1.3. *Changes* in the ***gastrointestinal system*** and ***clinical implications*** are discussed 1.4. ***Changes in the renal and hepatic system*** and ***clinical implications*** are identified 1.5. ***Changes in the endocrine and nervous system*** and ***clinical implication*** are described
2. Provide Anesthesia for cesarean section	2.1 ***Anaesthetic risk in obstetric*** patients in a culturally sensitive manner is explained 2.2 The ***general approach*** to the obstetric patient is described 2.3 ***Advantages*** and ***disadvantages*** of ***spinal anesthesia for caesarian section*** was discussed 2.4 ***Precautions*** to take while using spinal anesthesia for caesarian section was described 2.5 Potential ***anesthetic problems during GA*** for caesarian section Identified 2.6 Safe general and spinal anesthesia for caesarian section was provided 2.7 Different **oxytocic agents** and use after caesarean section was identified
3. Provide Anesthesia during pregnancy for a non-obstetric procedure	3.1 ***Effects*** of ***acute and chronic exposure*** to anesthetics on pregnancy are explained 3.2 The ***effects different drugs*** on the outcome of pregnancy are discussed 3.3 ***Anesthetic considerations*** for a pregnant woman undergoing surgery are described
4. Provide Anesthesia for preeclampsia	4.1. ***Pathophysiology*** and ***maternal changes*** during eclampsia are described 4.2. The ***medical management*** of clients with pre-eclampsia are explain 4.3. Common ***complications*** of eclampsia are managed

	4.4. Potential ***anesthetic problems*** associated with eclampsia are identified 4.5. Different ***anesthetic techniques*** used in preeclampsia are described 4.6. Anaesthesia for clients with pre-eclampsia are provided
5. Provide Anesthesia for hemorrhage	5.1. ***Methods of prevention*** of obstetric hemorrhage are described 5.2. ***Signs*** of impending maternal collapse with a normal blood pressure are identified 5.3. ***Sign of life-threatening hypovolemia*** are described. 5.4. The ***steps*** in initial resuscitation and stabilization of obstetric hemorrhage are discussed 5.5. The ***4Ts***: Directed therapy and definitive treatment of obstetric hemorrhage was described 5.6. ***Drugs used*** in obstetric hemorrhage are identified 5.7. The ***techniques of blood transfusion*** for obstetric hemorrhage are described 5.8. ***Specialist techniques*** used in the management of obstetric hemorrhage are listed 5.9. ***Anaesthesia techniques*** used in obstetric was hemorrhage are described
6. Perform Neonatal resuscitation	6.1. ***Equipment and drugs*** for resuscitation of the newborn are prepared 6.2. Physiological ***principles*** of newborn resuscitation are described 6.3. Sequence of ***actions*** in newborn resuscitation are Identified 6.4. ***Initial assessment*** of the new born using the APGAR score are performed 6.5. ***ABC of neonatal resuscitation*** are described 6.6. ***Drugs*** used for neonatal resuscitation are identified 6.7. ***Time of cessation*** of resuscitation attempts described 6.8. ***Techniques*** of post resuscitation management for neonates are explained
7. Identify Anesthetic consideration for pediatric surgeries	7.1. ***Anatomic, physiologic*** and , pharmacologic differences between adults and children are described 7.2. Anesthetic implications of the differences are Identify 7.3. 7.3. safe anesthesia for pediatrics are administered

Variable	**Range**

Main changes that occur in the cardiovascular system	Cardiovascular changes during pregnancy are characterized by: • An increased vascular volume, cardiac output, and heart rate • Marked fall in vascular resistance • Cardiac output is about 40-50% higher during the third trimester • Arterial pressure drops and evokes, via the baroreceptor reflex
Changes in the respiratory system	Changes in the respiratory system refers to : • Minute ventilation is increased at term by about 50% above non-pregnant values • Increase in tidal volume (40%) and, to a • Lesser extent, an increase in the respiratory rate (15%) • Alveolar ventilation is greatly increased as the tidal volume increases without any change in the ratio of dead space to tidal volume (VD/VT)
Changes gastrointestinal system	Gastrointestinal changes refers to: • The enlarging uterus displaces and disrupts the lower esophageal sphincter • Progesterone relaxes this high pressure zone • Gastric emptying time is significantly slower during labor • Gastric volume is increased
Clinical Implication	refers to: • Progressive increase in the incidence of heartburn (up to 80% at term) • Exaggerated response to normal doses of succinylcholine • Pregnant women in labor should always be considered to have a full stomach irrespective of the time of their last meal. • General anesthesia should be avoided when possible, and routine precautions (rapid sequence induction and endotracheal intubation) should be employed when general anesthesia is unavoidable. • The routine use of non-particulate antacid is important before cesarean section and before induction of regional anesthesia.
Changes in the renal and hepatic system and clinical implications	refers to: • The glomerular filtration rate is increased during pregnancy because of increased renal plasma flow • A rise in the filtration rate decreases plasma blood urea nitrogen (BUN) and creatinine concentrations by about 40–50%, to approximately 8–9 mg/dL and 0.5–0.6 mg/Dl

	• Tubular reabsorption of sodium is increased. • Glycosuria (up to 300 mg/day) and aminoaciduria may develop in normal gestation. • The renal pelvis and ureters are dilated, and peristalsis is decreased. • Hepatic transaminases, bilirubin, and LDH are increased slightly in pregnancy • Alkaline phosphatase is markedly increased (2–4 fold) • Serum cholinesterase activity is reduced 24% before delivery and reaches a nadir (33% reduction) on the third postpartum day • Gallbladder function and emptying are impaired during pregnancy
Changes in the endocrine and nervous system and clinical implication	includes but not limited to • Thyroid-binding globulin is increased in pregnancy, but free T3 and T4 are normal. • Adrenal cortical hyperplasia leads to increases in both free and total cortisol in pregnancy. • Fasting blood sugar is lower in pregnant than non-pregnant women, but tolerance to a glucose load may be somewhat impaired due to the actions of placental lactogen, producing a mild diabetogenic state • MAC is decreased by 25–40% during pregnancy • Reduction in epidural space volume caused by an engorged epidural venous plexus due to aortocaval compression • A wider dermatomal spread of sensory anesthesia was observed in parturient following the use of epidural anesthesia as compared with non-pregnant age-matched controls • Increased sensitivity of the peripheral nervous system to anesthetics in parturients • Enhanced sensitivity of peripheral nerves to local anesthetic • Reduce the dose of anesthetics in pregnant women, at least on initial dosing • Spinal anesthetic sensitivity appears normal 24–48 h postpartum
Anesthetic risk in obstetric	The main risks of anesthesia includes but not limited to • Difficult intubation • Aspiration of acid gastric content in non-fasting patients • Depression of the fetus • The occurrence of awareness of the mother
General approach	to obstetric patients may include but not limited to

	• All patients entering the obstetric suite potentially require anesthesia, whether planned or emergent • Patients definitely requiring anesthetic care (for labor or cesarean section) should undergo a focused pre-anesthetic evaluation as early as possible ➢ This should consist of a maternal health history, anesthesia-related obstetric history, blood pressure measurement, airway assessment, and back examination for regional anesthesia • All women in true labor should be managed with intravenous fluids (usually lactated Ringer's injection with dextrose) to prevent dehydration • An 18-gauge or larger intravenous catheter is employed in case rapid transfusion should become necessary • Blood should be sent for typing and screening in patients at high risk for hemorrhage or with a borderline acceptable hematocrit • The minimum fasting period for elective cesarean section should be 6 h
Advantages and disadvantages of spinal anesthesia for caesarian section	it has the following advantages: • It gives effective pain relief very quickly with almost 100% success • There is no maternal depression of CNS. The cough reflex is intact. • There is no direct fetal depression • Only a very small dose of local anaesthetic is needed, so systemic toxicity is low • The anaesthetist is free to resuscitate the baby if necessary • There is no direct effect on uterine contractility unlike high doses of volatile agent • There is good relaxation of abdominal muscles Disadvantages • Hypoxia • Hypotension • Post spinal headache • Danger of total spinal
Precautions	Precautions to take while using spinal anesthesia for caesarian section was described to: • Pre-operative preparation as described for general anaesthetic • Take steps to prevent supine hypotensive syndrome

	• Insert a 16G needle and give at least 1 liter of Hartmann's solution before inserting the spinal • Use an appropriate dose of local anaesthetic • Don't inject the local anaesthetic while a uterine contraction is in progress • Check the blood pressure every 60 seconds for the next 15 minutes • Give the mother oxygen by mask, to breathe • Place a wedge under her right hip when she is turned to the supine position as described above
Anesthetic problems during GA	Anesthetic problems during GA includes but not limited to: • Inhalation of gastric contents • Depression of the fetus • Supine hypotensive syndrome or obstruction of the inferior vena cava • Aortic compression interfering with blood supply to the fetus • Shock • Impairment of uterine contractility due to anaesthetic agents
Oxytocic agents	Oxytocic agents includes • Oxytocin or syntocinon • Ergometrine • Prostaglandin f2 alpha
Acute and chronic exposure	Acute exposure to anesthetics : • Sedatives • Hypnotics • Narcotics • muscle relaxants • local anesthetics Chronic Exposure • Occupational exposure
Effects of different drugs	May include but not limited to: • Sedative and hypnotic agents • Narcotics • Muscle relaxants • Local anesthetics • Oxygen and carbon dioxide • Inhalational anesthetics • Nitrous oxide
Anesthetic	May include:

consideration	• Maternal safety ➢ preoperative preparation ➢ aspiration prophylaxis ➢ antibiotic prophylaxis • Fetal well-being ➢ fetal monitoring ➢ choice of anesthetic drugs • Continuation of pregnancy
Pathophysiology	May include, but not limited to • Vasoconstriction leading to hypertension and tissue hypoxia • Retention of sodium and water above that found in normal pregnancy • Localized intravascular coagulation especially in the placenta and kidneys
Maternal changes	Maternal Changes during preeclampsia/eclampsia includes but not limited to • Cardiovascular ➢ Vasoconstriction causing hypertension and hypo perfusion. ➢ Reduced blood volume (relative to normal). ➢ Edema secondary to leaky capillaries and salt retention. ➢ (usually peripherally, sometimes pulmonary edema • Renal ➢ Decreased renal blood flow ➢ Decreased urine output ➢ Protein urea • Hematological ➢ Increased fibrinogen, fibrin and platelet turnover. ➢ Platelet count may be reduced. If less than 100,000 x 109 /L check coagulation profile, i.e. INR or prothrombin time. If less than 75,000 x 109 /L it is best to avoid a spinal anaesthetic as there may be an increased risk of spinal hematoma. ➢ Platelet function may be impaired. ➢ HELLP Syndrome (Hemolysis, elevated liver enzymes, low platelets). • Neurological ➢ There is hyper-excitability and hyper-reflexia. ➢ Visual symptoms and headache suggest severe pre-eclampsia and the possibility of an impending convulsion (eclampsia). • Placenta

	➢ Decreased blood flow and possible infarcts leading to intra-uterine growth retardation and increased incidence of fetal distress.
Medical management	To control an acute hypertensive patients, the following drugs will be used to medically manage preeclamptic patients • Nifedipine • labetalol • Atenolol • Methyldopa or • Hydralazine are used • Labetalol and hydralazine can be given IV in hypertensive crises • **Seizure prophylaxis** ➢ Magnesium sulphate is the drug of choice
Complications	May include: • Toxemia • Hypertension • Seizure
Anesthetic problems	May include: • Difficult airway management • Aspiration • Status epilepticus • Uncontrolled hypertension • Imminent convulsions • Hypovolemia • Electrolyte imbalance • Pulmonary edema causing hypoxia
Anesthetic techniques	May include: • Regional Anesthesia • General Anesthesia
Methods of prevention	May include to: • Identify the patient at risk of major hemorrhage • Identify parturients with previous CS and presents with a placenta praevia in her current pregnancy.
Signs	Physical assessment of impending maternal collapse with a normal blood pressure include but not limited to: • Tachycardia > 100 bpm • Fetal distress • Skin pallor with increased capillary refill time (>2 seconds, or the time it takes to say capillary refill)

Sign of life-threatening	Sign of life-threatening hypovolemia which is greater than 50% blood volume loss include but not limited to : • Hypotension • Tachypnea • Mental clouding progressing to unconsciousness
Steps	Any resuscitation method of steps that should follow the obstetric ABC principle as follows: • Tilt-if still pregnant • 100% Oxygen • ABC with rapid initial assessment and corrections as found • Diagnosis and Definitive treatment.
4Ts	A practical, working classification of the causes of major obstetric hemorrhage is to use the classification of the 4Ts which include: • Tone • Tissue • Trauma • Thrombin
Drugs	Drugs that used in obstetric hemorrhage include but not limited to: • Oxytocin • Ergometrine • Carboprost • Misoprostal
Specialist techniques	Special techniques are if the uterus remains atonic and bleeding continues despite giving appropriate utero-tonics and removal of possible retained product which include techniques of • Balloon tamponade • B-Lynch suture • Hysterectomy also considered
Anesthesia consideration	Includes : • Individualized anesthetic management • General Anesthesia is preferred for unstable patients
Equipment and drugs	Essential equipment includes: • a source of heat e.g heater, lamp or warm, dry linen; scissors, strapping, tapes; self-inflating bag (500ml infant size); anaesthetic face masks-sizes 0 and 1. Equipment recommended as desirable includes: • Stethoscope; suction equipment (Yankauer suction and suction catheters size 6, 7, and 8): oxygen source, flow meter, oxygen tubing; syringes and needles/swabs

	• More specialist equipment includes: ➢ Oral airways size 000, 00 and 0; neonatal laryngoscope with spare batteries and bulb; tracheal tubes size 2.5, 3.0 and 3.5; umbilical catheters (or sterile size 4 nasogastric tube); • Drugs required for neonatal resuscitation includes ➢ 1:10,000 adrenaline; 4.2% sodium bicarbonate; 10% dextrose
Principles	Physiological principles of newborn resuscitation is: • The fetus that suffers prolonged hypoxia in utero will require active resuscitation at birth • Transition from the fetal to the normal newborn state requires a range of physiological changes, • Formal assessment of the newborn using the Apgar score need to be performed • Resuscitation of the baby should start immediately if required after delivery, and should not be delayed until the 1-minute score is assessed. • Simple ventilation of the lungs is sufficient in the vast majority of cases,
Actions	The sequence of actions required in caring for all newborns includes: • Drying, warmth and assessment, followed by the consideration of Airway, Breathing, Circulation and Drugs
ABC of neonatal resuscitation	Include: A – Airway which includes: • The airway should be opened by placing the baby on his back in the 'neutral' position • Avoid flexion of the neck or overextension, both of which will obstruct the airway • The airway may be cleared if necessary by gentle suction, but avoid deep suction of the pharynx • Perform Chin lift and jaw thrust B- Breathing • If the baby is not breathing effectively by 90 seconds, give 5 inflation breaths with a self-inflating bag to aerate the lungs C- Circulation • The most effective way to compress the chest in a newborn infant is to place the hands around the chest, with the fingers over the spine at the back and the 2 thumbs pressing on the lower third of the sternum

	• The chest should be compressed by approximately one third of the depth of the chest, at a compression rate of approximately 100/min and a ratio of 3 compressions to one breath
Time of cessation	Time of cessation of resuscitation attempts includes • Resuscitation should be stopped if there are no signs of life after 10 minutes of adequate and continuous resuscitation • If the Apgar score remains less than 3 after 20 minute
Techniques	Techniques of post resuscitation management for neonates includes: • All infants who have been resuscitated require careful monitoring for at least four hours after delivery • The baby should be kept warm, ideally in skin-to-skin contact with the mother • Blood glucose should be maintained in the normal range

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skill of: • Identifying physiological change during pregnancy • Providing Anesthesia for cesarean section • Providing Anesthesia during pregnancy for a non-obstetric procedure • Describing effects of acute and chronic exposure of anesthetics in a pregnant women undergoing surgery • Describing effects of different drugs • Describing anesthesia consideration • Performing spinal Anesthesia for pregnant mothers • Providing general anesthesia for pregnant mothers • Providing Anesthesia for preeclampsia • Providing Anesthesia for obstetric hemorrhage • Describing methods of prevention of obstetric hemorrhage. • Identifying signs of impending maternal collapse with a normal blood pressure • Describing sign of life-threatening hypovolemia • Discussing the steps in initial resuscitation and stabilization of obstetric hemorrhage • Describing The 4Ts: Directed therapy and definitive treatment of obstetric hemorrhage • Identifying drugs used in obstetric hemorrhage • Describing the techniques of blood transfusion for obstetric hemorrhage

	• Describing Anesthesia techniques used in obstetric hemorrhage • Identifying anesthetic implications of pediatric surgeries • Performing neonatal resuscitation
Required Knowledge and Attitudes	Demonstrate knowledge of: • Effects of different anesthetic drugs on the fetus • Drugs that have teratogenic effects • Recommended time to perform surgery in elective and semi-elective cases(decision making algorithm) • Technique of anesthesia for a pregnant woman in emergency situations • Anesthesia for preeclamptic patients • Major of obstetric hemorrhage • The early team approach to managing major hemorrhage • Early resuscitation • Early diagnosis of the cause of major hemorrhage remembered by thinking of the 4Ts • Specialist techniques of balloon tamponade or B-Lynch suture are effective in persistent uterine atony Coagulation failure occurs early in obstetric hemorrhage • Regular monitoring of heart rate, blood pressure, urine output • Identifying physiologic changes of pregnancy relevant to anesthesia • Discussing Advantages and disadvantages of spinal anesthesia for caesarian section • Identifying general approach to obstetric patients • Describing relevant oxytocic agents • Anatomical differences between the adult and child ➢ Respiratory system differences ➢ The central nervous system. • Physiologic differences ➢ Energy metabolism: The basal metabolic rate ➢ Respiratory system ➢ Cardiovascular system • Fluids and electrolytes • Pharmacologic differences • Pediatric Anaesthetic equipments (breathing systems and others) • Techniques of providing anesthesia
Required Skills	Demonstrate skill to: • Optimize and maintain normal maternal physiologic functions

	• Optimize and maintain utero placental blood flow • Avoid unwanted drug effects on the fetus • Monitor fetal well being • Use of regional anesthesia • Provide preoperative optimization and care for obstetric patients • Manage parturients with general anesthesia • Manage parturients with spinal anesthesia • Manage complication of spinal anesthesia • Mange anesthesia for preeclampsia patients using spinal and general anesthesia • Manage patients with eclampsia using ABCDE approach • Undergo Initial resuscitation and stabilization • Identify physical Signs of impending maternal collapse with a normal blood pressure • Identify physical Sign of life-threatening hypovolemia • Perform the techniques of blood transfusion for obstetric hemorrhage • Apply specialist techniques used in the management of obstetric hemorrhage • Apply anesthesia techniques used in obstetric hemorrhage • Assess neonates using APGAR score • Perform neonatal resuscitation • Perform preoperative assessment • Provide premedication • Monitor anesthesia intraoperatively
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Clinical practice and examination • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence should be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Provide Safe Anesthesia for Emergency and Essential Surgeries**
Unit Code	**HLT ATN5 06 1121**
Unit Descriptor	This unit describes the knowledge, skills and attitude required to provide safe anesthesia for emergency and essential surgeries for variety of age groups.

Element	Performance Criteria
1. Administer general anesthesia	1.1. The ***types of general anesthesia*** are reviewed with a detailed understanding of intended procedure and patient conditions 1.2. Appropriate ***monitoring devices*** are applied 1.3. Correct patient, correct procedure and correct site is ensured through the implementation of ***WHO surgical safety checklist***. 1.4. Appropriate general anesthetic is selected and ***induction*** implemented 1.5. ***Maintenance*** of general anesthesia is provided 1.6. Intraoperative ***complications and adverse events*** are managed 1.7. ***Emergence phase of anesthesia*** care is provided 1.8. Accurate and complete ***documentation*** are achieved
2. Administer regional anesthesia	2.1. Relevant body ***structure and function*** are reviewed 2.2. Relevant ***information*** is provided for patient and informed consent obtained 2.3. Appropriate monitoring devices are applied 2.4. Correct patient, correct procedure and correct site are ensured through the implementation of WHO surgical safety checklist 2.5. ***Preparation*** of patient for regional anesthesia is performed 2.6. Relevant ***regional anesthesia equipment*** are prepared 2.7. Patient ***positioned*** for planned type of regional anesthesia 2.8. Regional anesthesia is provided under strict aseptic technique 2.9. Regional anesthesia is maintained 2.10. ***Intraoperative complications*** are managed 2.11. Accurate and complete documentation are performed
3. Position patient for anesthesia and surgery	3.1. Different ***types of surgical/anesthesia positions*** and their respective indications are reviewed. 3.2. ***Physiologic changes*** associated with different positioning are verified. 3.3. ***Complications*** associated with positioning are early identified, prevented and managed if already happened. 3.4. Accurate and complete documentation are performed.
4. Provide anesthesia	4.1. ***Essential and emergency surgeries*** are identified and

for emergency and essential surgeries	prioritized in accordance with the national surgical package 4.2. Anesthesia management plan is developed 4.3. Anesthesia management plan is implemented 4.4. ***Perioperative complications*** are managed 4.5. Accurate and complete documentation are performed
5. Manage emergency & essential surgical patients with common co-existing diseases intraoperatively	5.1. ***Common comorbidities*** associated with emergency and essential surgeries are identified 5.2. ***Continuum of care*** for common comorbidities are resumed perioperatively 5.3. ***Implications*** of common comorbidities on anesthesia management are recognized

Variable	**Range**
Types of general anesthesia	May include, but not limited to: • Sedation • GA with relaxation and intubation • GA without relaxation • GA with LMA • TIVA
WHO surgical safety checklist	Refers to a 19 item tool created by WHO in association with the Harvard School of Public Health to address preventable surgical morbidity and mortality. It has 3 components: • Sign in • Time out and Sign out
Monitoring devices	Incudes: • Pulse oximetry • Capnography • ECG • Non-Invasive Arterial Blood Pressure Measure • Temperature probe
Induction	May include: • Preoxygenation • Administration of anesthetics (IV or Inhalational) • Administration of muscle relaxants • Application of cricoid pressure (Rapid sequence induction/ RSI)
Maintenance	May include, but not limited to: • Fluid and drug administration, • Ventilatory support • Monitoring,

	• Complication management,
Complications and adverse events related to General Anesthesia	Refers common adverse events include: • Pain • Nausea and vomiting • Damage to teeth • Sore throat and laryngeal damage • Anaphylaxis to anaesthetic agents • Cardiovascular collapse • Respiratory depression • Aspiration pneumonitis • Hypothermia • Hypoxic brain damage. • Nerve injury • Awareness during anaesthesia • Embolism - air, thrombus, venous or arterial • Backache • Headache • Idiosyncratic reactions related to specific agents - e.g., malignant hyperpyrexia with suxamethonium, succinylcholine-related apnea. • Iatrogenic –e.g, pneumothorax related to central line insertion • Death
Emergence phase of anesthesia	Refers to phase of anesthesia on the time of recovery and extubation.
Documentation	Shall include: • Date of surgery • Time of starting and finishing • Type of GA and surgery • Drugs used and their doses • Fluid and blood used and their doses • Size and type of airway equipment used • Intraoperative patient monitoring parameters (SPO_2, PR, $ETCO_2$, BP, T^o) • Name of anesthetist • Name of other OR team members
Structure and function	May include, but not limited to • Anatomy and physiology of nervous system: ➢ Vertebral anatomy – from skin to internal compartment ➢ Spinal cord anatomy & physiology

	➢ Spinal nerves ➢ CSF
Information	May include, but not limited to: • Advantage and disadvantages • Procedures • Potential complications
Preparation	May include, but not limited to: • Consent • Fluid preloading • Application of monitoring devices • Positioning • Equipment and drug preparation • Skin preparation
Regional anesthesia equipment	May include, but not limited to: • Full equipment for general anesthesia • Sterile towel including fenestrated drape • Sterile LP needle (25-27G) • Needle introducer • Gauze • Syringe • Adhesive tape • Antiseptic solutions • Sponge forceps • Sterile gloves • Local anesthetics may include: ➢ Lidocaine of different concentrations ➢ Bupivacaine of different concentrations
Positioning	Common positions include: • Sitting • Lateral decubitus
Intraoperative complications related to spinal anesthesia	Include: • Hypotension and bradycardia through blockade of the sympathetic nervous system • High spinal & total spinal • Respiratory arrest • Nausea and vomiting • Pain • Post-dural puncture headache from cerebrospinal fluid (CSF) leak.

	• Limb damage from sensory and motor block. • Epidural or intrathecal bleed. • Respiratory failure if block is 'too high'. • Direct nerve damage • Hypothermia. • Damage to the spinal cord • Spinal infection • Aseptic meningitis • Hematoma of the spinal cord • Anaphylaxis • Urinary retention • Spinal cord infarction • Anesthetic intoxication • Local skin irritation and rash
Purpose and Types of anesthesia/ surgical positions	Purposes of positioning includes: • Promote comfort and relaxation • Restore body function • Prevent deformity • Relieve pressure and prevent strain • Stimulate circulation Common positions include: • Supine • Prone • Trendelenburg • Reverse Trendelenburg • Knee chest • Lithotomy • Lateral • Prone jackknife
Physiological changes	May include, but not limited to: • Reduced TV • Reduced Functional Residual Capacity (FRC) • Reduced vital capacity • Hypotension • Venous pooling • Air embolism
Complications	Of all positions include: • Nerve injury • Postural hypotension

	• Air embolism • Edema of the face and tongue • Damage to the eyes or ears: • Blindness • Neck injury • Abdominal compression • Extremity injury • Tube dislodgment or kinking
Essential and emergency surgeries	May include, but not limited to: • Cesarean section • Abdominal Hysterectomy/ repair Uterine perforation and rupture, and intractable PPH • Cervical and endometrial biopsy • Tracheostomy • Burn management like escharotomy, fasciotomy • Skin graft and flap • Explorative laparotomy for trauma • Burr hole and elevation of Depressed skull fracture for head injuries • Explorative laparotomy for acute abdomen (acute appendicitis, ectopic pregnancy, ovarian torsion, perforation and trauma) • Cholecystectomy, cholelithomy, CBD exploration and T-tube insertion for Gall bladder pathologies • Repair of hernia • Fracture and dislocation (simple and closed) management • Application of external fixator, use of traction • Trauma related amputation • Tenotomy for club foot and ponseti cast for club foot • Management of septic arthritis, osteomyelitis, pyomyositis, and of hand infection
++Perioperative complications	Include: • Common complications addressed under the “complications” variable.
Common co-morbidities	May include, but not limited to: • Diabetes Mellitus (DM) • Hypertension • Anemia • Asthma • Thyroid

	• Congestive Heart Failure
Continuum of care	Refers to ensuring the continuation of medications started preoperatively to treat comorbidities. These medications are addressed under the *"*preoperative assessment and optimization UC".
Implications	May refer to: • Common respiratory system comorbidities and their special anesthetic consideration/ implications • Common cardiovascular system comorbidities and their special anesthetic consideration/ implications • Common endocrine system comorbidities and their special anesthetic consideration/ implications • Common gastrointestinal system comorbidities and their special anesthetic consideration/ implications • Common nervous system comorbidities and their special anesthetic consideration/ implications

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge to: • Administer general anesthesia • Administer regional anesthesia • Position patient for anesthesia and surgery • Provide anesthesia for emergency and essential surgeries • Manage surgical patients with common comorbidities
Required Knowledge	Demonstrate knowledge of: • Anatomy and physiology of nervous system • Types of general anesthesia (GA) • WHO surgical safety checklist • Procedures of GA • Complications and adverse events of GA • Surgical positioning types, complications, indications and purpose • Regional anatomy for regional anesthesia • Regional anesthesia types, indication, contraindication and techniques • Complication of regional anesthesia and management • Common comorbidities and their anesthetic considerations
Required Skills and Attitudes	Demonstrate skills to: • Administer general anesthesia for emergency and essential

	surgeries • Initiate and wean ventilatory support • Perform regional anesthesia for emergency and essential surgeries • Position patient for anesthesia and surgery • Maintain anesthesia (RA or GA) • Manage common comorbidities intraoperatively • Monitor patients intraoperatively • Manage intraoperative complications • Communicate with surgical team members and patient perioperatively
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Provide Post Anesthesia Care for Emergency and Essential Surgeries**
Unit Code	**HLT ATN5 07 1121**
Unit Descriptor	This unit describes the knowledge, skills and attitude required for the provision of post anesthesia care for patients undergoing emergency and essential surgery.

Element	Performance Criteria
1. Facilitate admission of a surgical patient to PACU	1.1. Complete and accurate ***information*** is provided to ***PACU*** staff during ***patient handover*** in accordance with institutional protocol 1.2. PACU ***admission criteria*** is verified in accordance with institutional guideline
2. Participate in monitoring of a patient admitted to PACU	2.1. Standards of monitoring are applied and vital ***parameters***[3] monitored 2.2. Measured parameters (patient data) are ***documented*** per the standard of facility
3. Participate in clinical care of patient admitted to PACU	3.1. Continuum of care is maintained 3.2. Postoperative ***incidents***, ***adverse events*** and ***complication*** are managed 3.3. Complete and accurate information are documented
4. Participate in discharging a patient from PACU	4.1. ***Discharge criteria*** from PACU is verified in accordance with standard protocol 4.2. Complete and accurate information are documented
5. Work as part of post-anesthesia care team	5.1. ***Responsibilities*** of anesthetist in PACU are well recognized 5.2. ***Cooperation and collaboration*** with other PACU team members are maintained

Variable	Range
Information	May include, but not limited to: • Preoperative History and Procedures may include: ➢ Medication allergies or reactions ➢ Pertinent earlier surgical procedures

[3] Oxygenation, Ventilation, circulation, temperature and pain

	➢ Underlying medical illness ➢ Chronic medications ➢ Acute problems (ischemia, acid–base status, dehydration) ➢ Premedications (antibiotics and time given, β-adrenergic blockers, antiemetics) ➢ Preoperative pain control (nerve blocks, adjunct medications, narcotics) ➢ Preoperative pain assessment (chronic and acute pain scores) ➢ NPO status • Intraoperative Factors may include: ➢ Surgical procedure ➢ Type of anesthetic ➢ Type and difficulty of airway management ➢ Relaxant and reversal status ➢ Time and amount of opioids administered ➢ Type and amount of IV fluids administered ➢ Estimated blood loss ➢ Urine output ➢ Unexpected surgical or anesthetic events ➢ Intraoperative vital sign ranges ➢ Intraoperative laboratory findings ➢ Drugs given (steroids, diuretics, antibiotics, vasoactive medications, antiemetics) • Assessment and Report of Current Status may include: ➢ Airway patency ➢ Ventilatory adequacy ➢ Level of consciousness ➢ Level of pain ➢ Heart rate and heart rhythm ➢ Endotracheal tube position ➢ Systemic pressure ➢ Intravascular volume status ➢ Function of invasive monitors ➢ Size and location of IV catheters ➢ Anesthetic equipment (epidural catheters, peripheral nerve catheters) ➢ Overall impression • Postoperative Instructions may include: ➢ Expected airway and ventilatory status ➢ Acceptable vital sign ranges ➢ Acceptable urine output and blood loss

	➢ Surgical instructions (positioning, wound care) ➢ Anticipated cardiovascular problems ➢ Orders for therapeutic interventions ➢ Diagnostic tests to be secured ➢ Therapeutic goals and end points before discharge ➢ Location of responsible physician
PACU	Refers to Post Anesthesia Care Unit
Patient handover	Refers to systematic transfer of patient information to PACU staff thereby ensuring continuum of care. The overall purpose of this handover is to confirm patient safety and quality.
Admission criteria	May include, but not limited to: • Patient recovering from monitored Anesthesia care (MAC), general of regional anesthesia • Patients requiring mechanical ventilation and/ airway protection • Patient requiring invasive hemodynamic monitoring • Patient receiving medication and/ treatment requiring continuous hemodynamic monitoring • Patients with a documented etiology for potential instability • High risk low volume patients • Immediate postoperative patients with major surgery • Patients with extensive burns
Parameters	To be monitored regularly are: • Oxygenation • Ventilation • Circulation • Temperature • Pain • Nausea and vomiting • Mental status • Urine output
Documentation	Should include: • Level of consciousness • Hemoglobin oxygen saturation and oxygen administration • Blood pressure • Respiratory frequency • Heart rate and rhythm • Pain intensity e.g. verbal rating scale (none, mild, moderate, severe) • Intravenous infusions

	• Drugs administered • Other parameters (depending on circumstances) e.g. temperature, urinary output, central venous pressure, End-Tidal CO_2($ETCO_2$), surgical drainage.

Incidents, adverse effects and complications	May include, but not limited to: • Upper airway obstruction • Aspiration • Breathing problems like – apnea, pneumothorax & flail chest • Bleeding • Hypertension • Shock • Arrhythmia • Cardiac arrest • Nausea and vomiting • Shivering and hypothermia • Pain • Agitation and confusion • Fall down injury • Urinary retention • Acute renal failure
Discharge criteria	Must include: • The patient is fully conscious without excessive stimulation, able to maintain a clear airway and exhibits protective airway reflexes. • Respiration and oxygenation are satisfactory. • The cardiovascular system is stable with no unexplained cardiac irregularity or persistent bleeding. The specific values of pulse and blood pressure should approximate to normal pre-operative values or be at an acceptable level commensurate with the planned postoperative care. Peripheral perfusion should be adequate. • Pain and emesis should be controlled and suitable analgesic and anti-emetic regimens prescribed. • Temperature should be within acceptable limits. Patients should not be returned to the ward if significant hypothermia is present. • Oxygen and intravenous therapy, if appropriate, should be prescribed.

Responsibilities of anesthetist in PACU include:	As part of PACU team, anesthetist will have a role of: • Maintaining airway • Providing ventilatory support • Leading resuscitation when required • Managing pain, nausea and vomiting
Cooperation and collaboration may refer:	Role of anesthetists in the provision of post anesthesia care as part of PACU team is performed in a cooperative and collaborative manner.

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge to: • Facilitate admission of a surgical patient to PACU • Monitor a patient in PACU • Provide clinical care for a patient admitted in PACU • Participate in discharging of a patient • Collaborate effectively in post anesthesia care provision
Required Knowledge and Attitudes	Demonstrate knowledge of: • Patient handover • Admission criteria to PACU • Complications management • Role of anesthetist in PACU • Discharge criteria to PACU • Monitoring of a patient in PACU
Underpinning Skills	Demonstrate skill to: • Transfer a patient to PACU safely • Handover a patient to PACU staff • Admit a patient to PACU • Monitor patients in PACU • Provide care to patients admitted to PACU • Manage complications and adverse events • Undertake documentation of relevant information • Discharge a patient from PACU • Demonstrate effective communication and collaboration in PACU care
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test

	• Observation/Demonstration with Oral Questioning
Context of Assessment	Competence need to assessed in the work place and in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Maintain Infection Prevention and Safety Standards**
Unit Code	**HLT ATN5 08 1121**
Unit Descriptor	This unit of competence describes the knowledge, skills and attitude required to follow organizational infection prevention and control procedures, including implementing standard and transmission-based precautions and responding to infection risks.

Element	Performance Criteria
1. Follow standard precautions for infection prevention and control	1.1. ***Hand hygiene*** practices are followed in accordance with FMOH's national FMOH's IPPS guideline 1.2. ***Hand care procedures and purposes*** are implemented and cuts/ abrasions are covered perioperatively 1.3. Organization procedures are followed for choice and use of ***Personal Protective Equipment (PPE)*** per the national FMOH's IPPS guideline 1.4. ***Respiratory hygiene*** procedures and ***cough etiquette*** are followed 1.5. ***Environmental*** (pertaining to Operation theatre) cleaning procedures are followed 1.6. Procedures for ***handling***, ***transporting*** and ***processing*** of anesthesia materials are followed in a manner that controls the spread of infection 1.7. Anesthetic equipment are ***disassembled*** and cleaned 1.8. ***Disposal*** procedures for ***contaminated waste*** is followed
2. Identify infection hazards and assess risks	2.1. Infection ***hazards*** associated with anesthesia practice are identified 2.2. ***Responsibility of anesthetist*** in infection prevention, control and patient safety is identified 2.3. ***Risk*** is assessed by determining the likelihood and severity of harm from identified hazards. 2.4. ***Perioperative anesthesia related activities and tasks*** that put surgical team and patients at risk are identified 2.5. Appropriate ***control measures*** to minimize risk are identified in accordance with facility procedures
3. Follow procedures for managing risks associated with specific hazards	3.1. ***Protocols*** for care after exposure to blood or other body fluids are followed as required 3.2. ***Appropriate signs*** are laced in Operation Room (OR) area when and where appropriate 3.3. Clean and contaminated zones are identified, separated and

	maintained using ***color codes*** per national FMOH's IPPS guideline 3.4. Records, materials and anesthetic medications are placed in a well-designated clean zone 3.5. Contaminated anesthesia instruments and equipment are placed in a well-designated contaminated zone
4. Ensure comfort and safety of a surgical patient perioperatively	4.1. Close follow-up of ***general patient condition*** is ensured during transportation 4.2. Continuous patient monitoring is ensured during transport of patients to and from OR 4.3. Safe and appropriate positioning of a surgical patient is ensured during transportation 4.4. Comfort of a patient who is under influence of anesthesia/ analgesia is ensured

Variable	**Range**
Hand hygiene	refers to: • Hand washing • Hand antisepsis • Antiseptic hand and Surgical hand rubs
Hand care procedures and purpose	May include, but not limited to: • The purpose of hand hygiene is to mechanically remove soil and debris from skin and reduce the number of transient microorganisms • Hand care techniques are performed in accordance with FMOH's national FMOH's IPPS guideline
PPE	includes: • Gloves, • Masks/Respirators, • Eyewear (face shields, goggles), • Caps, • Gowns and aprons, • Boots and other items.
Respiratory hygiene	Refers to precautions taken to prevent transmission of infectious agents that remain infectious over long distances (particles which are 5 μm or less in size and can remain in the air for several hours and be widely dispersed), including the transmission of agents that cause tuberculosis, chicken pox, COVID 19 and Measles.
Cough etiquette	might include: • Covering the mouth and nose with tissue when coughing and

	sneezing • Use the nearest waste receptacle to dispose after use • Perform hand hygiene after handling articles with respiratory secretions and contaminated objects/ materials
Environmental	Refers pertaining to Operation theatre where proper cleaning procedures are followed in order to prevent transmission of infection.
Handling, transporting and processing	Refers the way in which anesthesia equipment are handled, transported and processed in order to minimize the spread of infection. Instrument processing may refer process of: • Decontamination • Cleaning • HLD and or • Sterilization
Disassembled	Refers detaching parts of equipment in order to properly increase are of contact with when processing them
Disposal	Refers the way contaminated materials are disposed after use. • Some materials may be disposed after single use. • Reusable items may need equipment processing according to National FMOH IPPS guideline
Contaminated waste	Refers any high risk Wastes that potentially harbor infectious organisms such as blood, blood products & other body fluids or items contaminated with similar fluids.
Hazards	includes: • Physical hazards • Chemical hazards • Radiological and • Biological hazards
Responsibility of anesthetist	include: • Proper hand hygiene • PPE • Respiratory hygiene • Safe injection practice • Equipment and environmental cleaning, disinfection and sterilization • Providing training on infection prevention and standard precaution
Risk	include : • Critical: Management of items or processes that affect normally

	sterile tissues or the blood stream (highest risk of infection) • Semi critical: Management of items or processes that affect mucous membranes or small areas of no intact skin • Non critical: Management of items or processes that involve intact skin (lowest risk of infection)
Perioperative anesthesia related activities and tasks	May include, but not limited to: • IV cannulation • Medication administration (Needle stick injury) • Laryngoscopy and endotracheal intubation • Pollution • Suctioning • NG tube insertion • Extubation • Regional anesthesia • Catheterization • Surgical airway management • Needle thoracocenthesis • Blood transfusion • Ventilatory support • Handling of gas supplies (pipeline, oxygen cylinders and concentrators)
Control measures	Include: • Follow proper hand hygiene practice • Use appropriate PPE • Proper disposal and processing of instruments as per national guideline • Follow standard surgical antisepsis during invasive procedures • Implementing the WHO Surgical Safety checklist • Avoiding reuse of non reusable anesthesia equipment's and materials
Protocols	Refers guidelines of care provided for health care workers after exposure to blood or other body fluids also referred as Post Exposure Prophylaxis (PEP)
Appropriate signs	May include, but not limited to: • "No smoking" • "Gas cylinders" • "Allowed for authorized personnel only" • "Remove to a safe place in the event of fire" • "No open flames or sparks,"

	• "No combustible materials" etc.
Color codes	May refer to: • Color coding for syringes • Color coding for solutions • Color coding for floor markings • Color coding for OR attire • Color coding for identification of processed equipment from non-processed
General patient condition	includes: • Ensuring patency of airways • Ensuring adequate breathing • Ensuring adequate circulation • Ensuring safe positioning and • Maintaining patient comfort • Prevention of fall down injury

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge to: • Follow standard precautions for infection prevention and control • Identify infection hazards and risks • Follow procedure for managing risks associated with specific hazards on health work place • Ensure comfort and safety of patients perioperatively
Required Knowledge	Demonstrate knowledge of: • Established guidelines for the prevention and control of infection, including those for: ➢ Personal and hand hygiene: ✓ How to hand wash ✓ How to hand rub ✓ Pre-surgical hand preparation ✓ Clinical moments when hand hygiene should be performed with soap and water rather than alcohol-based hand rub ✓ Non-clinical moments for hand hygiene hand care, including guidelines on maintaining intact skin, fingernails and jewelry/watches ➢ Use and scope of personal protective equipment guidelines for: ✓ Glove use

	✓ Wearing gowns and waterproof aprons ✓ Wearing masks ✓ Wearing protective glasses ➢ Surface cleaning: ✓ Cleaning procedures and their specified times ✓ Routine surface cleaning ➢ Managing a blood or body fluid spill ➢ Sharps handling and disposal techniques ➢ Special consideration in anesthesia equipment sterilization and disinfection • Types of additional precautions and their relevance to anesthesia practice • Types of hazards in the work environment and associated risks and control measures • Chain of infection: ➢ Source of infectious agent ➢ Mode of transmission ➢ Susceptible host • Basis of infection, including: ➢ Bacteria and bacterial spores ➢ Difference between harmless microorganisms and pathogens ➢ Difference between colonization, infection and disease ➢ Fungi ➢ Viruses • Key modes of disease transmission – contact, airborne and droplet: ➢ Paths of transmission including direct contact, aerosols and penetrating injuries ➢ Risk of acquisition ➢ Sources of infecting microorganisms including persons who are carriers, in the incubation phase of the disease or those who are acutely ill • Factors that increase the susceptibility to infection: ➢ Immune status ➢ Wounds or devices ➢ Medications and comorbidities ➢ Age • Patient comfort measures • Care of a patient on transportation to and from operation theatre
Required Attitude and	Demonstrate skill and attitude to:

Skills	• Follow facility infection prevention and patient safety guidelines • Use PPE • Perform appropriate hand hygiene • Utilize anesthetic equipment safely • Dispose clinical and other waste materials • Clean and prepare anesthesia machine and trolley • Apply principles of instrument processing in the preparation of anesthesia equipment • Implement WHO surgical safety checklist • Provide comfort measures during transportation of a surgical patient
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence need to be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Assess and Manage Pain Perioperatively**
Unit Code	**HLT ATN5 09 1121**
Unit Descriptor	This unit of competency describes the knowledge, skills and attitude required for the assessment and management of pain perioperatively in patients undergoing emergency and essential surgery.

Element	Performance Criteria
1. Assess severity of pain perioperatively using different scales	1.1. The relevant ***structure*** of body system for the occurrence and management of pain is reviewed with a detailed understanding of underlying ***function*** 1.2. ***Pain types*** and ***pathway*** are recognized 1.3. ***Pain severity*** is determined with the aid of different pain ***assessment methods***/tools
2. Manage pain perioperatively based on WHO pain management ladder	2.1. Range of medications and complementary strategies that alleviate pain are identified 2.2. ***Principles*** of pain management are recognized 2.3. ***Pharmacologic and non-pharmacologic*** pain management modalities are administered in accordance with ***WHO pain management ladder*** 2.4. Effectiveness of pain-relieving medication and non-medication therapies are monitored 2.5. ***Complications*** of untreated pain are managed 2.6. Effectiveness of pain management strategies is ***observed and recorded***

Variable	Range
Structure and function	May include, but not limited to • Anatomy and physiology of nervous system with a special emphasis to structures involved in pain pathway.
Pain types	May include, but not limited to: • Nociceptive: ➢ Visceral ➢ Somatic • Neuropathic • Inflammatory • Acute Pain

	• Chronic Pain
Pathway	Refers to peripheral transmission of pain which consists of production of electrical signals at pain nerve endings (transduction) followed by propagation of those signals through the peripheral nervous system (transmission).
Pain severity	Refers to: • Mild • Moderate • Severe
Assessment methods	Parameters to assessed include: • Onset of pain • Temporal pattern of pain • Site of pain • Radiation of pain • Intensity (severity) of pain • Exacerbating features (what makes the pain start or get worse?) • Relieving factors (what prevents the pain or makes it better?) • Response to analgesics (including attitudes and concerns about opioids) • Response to other interventions • Associated physical symptoms • Associated psychological symptoms • Interference with activities of daily living • Pain History and physical examination • Investigation relevant to patients pain assessment finding Assessment methods include: • Verbal rating scale • Visual analogue scale • Numerical rating scale • FACES pain assessment tool
Complications	May include, but not limited to: • Cardiovascular may include: ➢ Tachycardia ➢ Hypertension ➢ Increase in cardiac work load • Pulmonary may include: ➢ Respiratory muscle spasm (splinting) ➢ Decrease in vital capacity ➢ Atelectasis

	➢ Hypoxia ➢ Increased risk of pulmonary infection • Gastrointestinal may include: ➢ Postoperative ileus • Renal may include: ➢ Increased risk of oliguria and urinary retention • Coagulation may include: ➢ Increased risk of thromboembolism • Immunologic may include: ➢ Impaired immune function • Muscular may include: ➢ Muscle weakness and fatigue ➢ Limited mobility with increased risk of thromboembolism • Psychological may include: ➢ Anxiety ➢ Fear and frustration, resulting in poor patient satisfaction
Principles	May include, but not limited to: • Preemptive analgesia • Multimodal analgesia
Pharmacologic and non-pharmacologic	May refer: • Pharmacologic: ➢ Paracetamol ➢ NSAIDs ➢ Opioids • Non-pharmacologic: ➢ Heat, Ice ➢ Massage therapy ➢ Physical therapy ➢ Acupuncture ➢ Laughter ➢ Music ➢ Self-hypnosis
WHO pain management ladder	Consist of: • Mild pain management: Paracetamol + NSAIDs + Adjuvants • Moderate pain management: Weak opioids + Paracetamol + NSAIDs + Adjuvants • Severe pain management: Strong Opioids + Nerve blocks + Weak opioids + Paracetamol + NSAIDs + Adjuvants
Observation and recording	May include, but not limited to: • Basic vital signs

	• Response to therapy • Pain severity • Complication if any

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skill to: • Assess severity of pain perioperatively • Manage pain perioperatively
Required Knowledge	Demonstrate knowledge of: • Anatomy and physiology of nervous system • Regional anatomy relevant to pain modulation and transmission • Pain pathway • Types, severity and use of pain • Pain assessment methods • Complications of pain and their respective management principles • WHO pain management ladder • Pain management principles • Complication of analgesic drugs (Opioids)
Required Skills and Attitudes	Demonstrate skill to: • Assess pain severity using different methods • Rate severity of pain • Develop pain management plan • Utilize WHO pain management ladder in the management of pain • Manage pain • Monitor patient response to pain management intervention • Manage complications of pain • Work collaboratively with surgical team in the management of pain • Document relevant information on patient chart
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence need to be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Provide Cardiopulmonary Resuscitation (CPR) for All Age Groups**
Unit Code	**HLT ATN5 10 1121**
Unit Descriptor	This unit of competency describes the knowledge, skills and attitude required for the provision of effective Cardiopulmonary Resuscitation (CPR) for a critically ill patient of all age group including newborn.

Element	Performance Criteria
1. Recognize critically ill patient through ABCDE logical and systemic review	1.1. Critically ill patients are identified using Early warning score (EWS) 1.2. Sign of life assessment using Look, Listen & Feel approach conducted 1.3. Patient assessment is conducted using systematic ***ABCDE logical approach*** 1.4. ***Life-threatening problems*** are treated before moving to the next step 1.5. Patient with a ***potential risk*** of cardiac arrest is identified using systematic logical approach and cardiac arrest is prevented 1.6. A ***cardiac arrest*** requiring CPR is identified
2. Prepare for cardiopulmonary (CPR) resuscitation	2.1. ***Scene safety*** is recognized and maintained per the facility IPPS guideline 2.2. Personal Protective Equipment (PPE) are utilized in accordance with institution IPPS guideline 2.3. Patient response after stimulation is assessed 2.4. Call for assistant is identified and acted
3. Maintain patency of airway(A)	3.1. Airway patency is maintained with the aid of ***airway maneuvers*** 3.2. Alternate ***airway equipment*** are used to alleviate airway obstruction in case maneuvers failed per the ***DAS guideline***
4. Provide breathing/ Respiratory support (B)	4.1. Ventilatory support is provided using ***different methods*** 4.2. Effective ventilatory support is ***checked and assured*** 4.3. Reversible ***life threatening breathing problems*** are intervened per the 4H 4T management protocol
5. Provide Circulatory/ Cardiac support (C)	5.1. ***Effective chest compression*** is provided per the recommended ***ratio of ventilation to compression*** in accordance with the ***AHA resuscitation guideline*** 5.2. IV access is secured and fluid administration resumed 5.3. ***Cardiac medications*** are identified and appropriate doses are

	administered per the AHA resuscitation guideline 5.4. Electrical shock is provided when indicated using ***AED*** 5.5. Patient response for resuscitation measures is assessed regularly on every 5 cycle per two minute
6. Work as part of post-resuscitation care team	6.1. Patient condition is monitored regularly following the ABCDE systematic approach per the AHA resuscitation guideline 6.2. ***Continuum of care*** is maintained 6.3. Appropriate ***documentation*** are performed per the facility standard 6.4. ***When to terminate unsuccessful resuscitation*** is decided in a team in accordance with AHA resuscitation guideline 6.5. In occasion of unresponsive cardiac arrest, ***post mortem care*** is provided per the facility standard 6.6. ***Medico-legal issues*** related to resuscitation are identified 6.7. Medico-legal issues related to resuscitation are addressed

Variable	**Range**
ABCDE logical approach	Refers to: • A - Airway • B - Breathing • C - Circulation • D - Disability • E - Exposure
Life threatening problems	May include, but not limited to the 4"H" and 4 "T" reversible causes of cardiac arrest: • Hypovolemia • Hypo/ Hyperkalemia – Metabolic disorder • Hypoxia • Hypothermia • Tension Pneumothorax • Tamponade • Thrombosis and Toxic
Potential risk	Refers to presence of either of the reversible causes of cardiac arrest causes
Cardiac arrest	Also known as cardiopulmonary arrest or circulatory arrest is a sudden stop in effective blood circulation due to the failure of the heart to contract effectively or at all.
Scene safety	Refers assessing the victim area to ensure it's free from hazard before providing support. These hazards May include, but not limited

	to: • Downed electric power line • Flaming • Hazardous chemical • Broken glasses • Toxic smokes
PPE	includes: • Gloves, • Masks/ respirators, • Eyewear (face shields, goggles), • Caps, • Gowns and aprons, • Boots and other items.
Airway maneuvers	May include, but not limited to: • Chin lift • Jaw thrust • Head tilt
Airway equipment	May include, but not limited to: • Endotracheal tube • Laryngoscope with blades and batteries • Airways – Nasopharyngeal and Oropharyngeal • Laryngeal mask airway • Stylet and bougie • Inflating syringe • Fixing tape • Magill forceps • Facemask and Self-inflating bag
DAS guideline	Refers four stepwise management plans: • Plan A: Initial tracheal intubation plan. • Plan B: Secondary tracheal intubation plan, when Plan A has failed. • Plan C: Maintenance of oxygenation and ventilation, postponement of surgery, and awakening the patient, when earlier plans fail. • Plan D: Rescue techniques for 'can't Intubate, Can't Ventilate' (CICV) situation.
Different methods	Refers: • Mouth to mouth • Mouth to mask

	• Self-inflating bag with mask • Bag with ETT and • Bag with LMA
Checking and assurance	Can be done by: • Looking chest movement • Fogging through the ETT/ mask • Improvement in condition: PR, SPO_2
Life threatening breathing problems	May include, but not limited to: • Apnea • Hypoventilation • Severe pneumonia • Respiratory failure 2^o to Hypoxemic & Hypercapnic conditions • Injury: Tension pneumothorax, Hemopneumothorax • Acute Respiratory Distress Syndrome (ARDS) • Drug overdose - E.g. Opioids and anesthetics
Effective chest compression	For adults refers: • Compression rate of at least 100 compressions per minute (FAST) • Compression depth of at least 2 inches in adults (HARD) • Allowing complete chest recoil after each compression • Switching compressors every 2 minute • Minimizing interruptions in compressions • Avoiding excessive ventilations
Ratio of ventilation to compression	This depends on the age of the patient: • Adult: 30 compressions to 2 ventilations • Child: 15 compressions to 2 ventilations • Newborns: 3 compressional to ventilation
AHA resuscitation guideline	Refers to the resuscitation guideline developed by the American Heart Association.
Cardiac medications	May include, but not limited to: • Epinephrine/ Adrenaline • Vasopressin • Amiodarone • Lidocaine • Atropine • Magnesium sulfate • Sodium bicarbonate
AED	May refer Automatic Electrical Defibrillator
Continuum of care	Refers resuming the already started systemic supports in the

	immediate post resuscitation period.
Documentation	May include, but not limited to: • Cause of arrest • Medications administered • Resuscitation procedure followed • Resuscitation period • Final outcome • Team involved
When to terminate	May include, but not limited to: • Consensus among resuscitation team to terminate CPR resuscitation • Factors which influence this decision include: ➢ Medical history and anticipated prognosis ➢ Period between cardiac arrest and CPR starting ➢ Time to defibrillation ➢ Period of ALS with continued Asystole and no reversible cause • General rule for termination is: ➢ Resuscitation should continue if VF persists ➢ Asystole for > 20mins with no reversible cause is accepted as grounds for abandoning a resuscitation attempt ➢ There are exceptions to this such as drowning, hypothermia
Unsuccessful resuscitation	Refers Absence of Return of Spontaneous Circulation and ventilation (ROSC) following resuscitation intervention for acceptable time period
Post mortem care	Refers Care of the body after death.
Medico-legal issues	May include, but not limited to: • Do Not Resuscitate (DNR) • When to abandon • When to terminate • Euthanasia

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge to: • Recognize critically ill patient • Prepare for the provision of Cardiopulmonary Resuscitation (CPR) • Maintain patency of patient airway • Provide ventilatory support • Provide cardiac support

	• Provide post resuscitation care • Comply with medico-legal principles
Required Knowledge and Attitudes	Demonstrate knowledge of: • ABCDE approach for the recognition of critically ill patient • Life threatening problems (on A, B, C, D, E) • AHA resuscitation guideline (steps) • Modalities to maintain airway patency • Options of ventilatory support • Circulatory support of a cardiac arrest patient including effective chest compression and ratio (V:C) • Cardiac medications • Post resuscitation cares • Reversible cause of cardiac arrest (4H & 4T) • Medico-legal issues associated with resuscitation
Required Skills	Demonstrate skill to: • Identify critically ill patient requiring immediate intervention • Maintain scene and personal safety first • Maintain patency of patient airway • Provide effective ventilatory support • Provide effective chest compressions • Administer cardiac medications • Apply shock using AED • Monitor patient condition regularly during resuscitation • Provide post-resuscitation care • Handle medico-legal issues associated with CPR • Work collaboratively with resuscitation team • Document required interventions & other information on patient chart
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Apply Ethical and Legal Principles in Anesthesia Practice**
Unit Code	**HLT ATN5 11 1121**
Unit Descriptor	This unit of competency describes the knowledge, skills and attitude required to apply and monitor compliance with ethical and legal principles relevant to the practice of anesthesia and critical care.

Element	Performance Criteria
1. Apply ethical concepts to clinical practice	1.1. ***Concept and principles*** of medical ethics and its place in anesthesia practice are recognized. 1.2. Ethical anesthesia practice is demonstrated during interactions with patients and their family/ attendants and colleagues. 1.3. ***Potential ethical issues*** are identified, documented and reported in accordance with organization policies and procedures. 1.4. Strategies to resolve ethical issues within anesthesia practice are developed and implemented in accordance with ethical principles.
2. Apply knowledge of the legal framework to anesthesia practice	2.1 Relevant knowledge on ***law***, including ***legal processes***, ***principles and penalties*** in medical practice is demonstrated. 2.2 Concepts of ***negligence***, ***duty of care*** and vicarious ***liability to anesthesia practice*** are applied 2.3 Required ***informed consent*** to anesthesia and or surgery from each patient before any ***procedure*** is obtained. 2.4 Patient's ***privacy*** and ***confidentiality*** requirements are maintained perioperatively in accordance with organization policy and procedures
3. Perform within scope of Anesthesia practice	3.1. Implications of malpractice are recognized per the ***national code of conduct and ethics for Ethiopian registered anesthetists*** 3.2. Codes of ethics and conduct in the practice of anesthesia are applied per the ***national guideline*** 3.3. Nurse anesthetist is practiced within the defined scope of professional requirements per the ***FMOH standard***. 3.4. All documentation is completed in accordance with institutional organization policy and procedures.
4. Support the rights, interests and needs of patients and their family	4.1. Legal ***responsibilities*** and ***duty of care*** requirements in all anesthesia practice including interactions with patients, their family and attendants are complied. 4.2. ***Patient's rights***, interests and decisions are supported. 4.3. Patients are encouraged to exercise their right to make ***informed decisions*** about planned anesthetic care.

	4.4. Respect and support for the dignity of patients and their family members are demonstrated.

Variable	Range
Law	Refers to a rule of conduct or procedure recognized by a community as binding or enforceable by authority. It is an act passed by a legislature or similar body.
Legal processes	Refers are the proceedings in any civil lawsuit or criminal prosecution and, particularly describes the formal notice or writ used by a court to exercise jurisdiction over a person or a property.
Principles	Are basic ideas that are starting points for understanding and working through a problem
Penalties	Refers a legal or official punishment for committing a crime or other offence, e.g. a fine or imprisonment or
Negligence	Refers to the failure to provide the same care that the person with similar training would provide. It is deviation from the accepted standard of anesthesia care that may result in further injury to the patient.
Duty of care	Refers acting reasonably with the standard of own anesthesia training
Liability to anesthesia practice	Refers to: • Obligation under the law. • Legal responsibility for something especially costs or damages.
Informed consent	Refers: • A process by which patients are informed of the possible outcomes, alternatives and risks of treatments and are required to give their consent freely. • It assures the legal protection of a patient's right to personal autonomy in regard to specific treatments and procedures
Procedure	Refers any surgical or anesthesia related intervention performed on patient.
Privacy	Refers freedom from the observation, intrusion, or attention of others and it is also the state of being kept secret. There are three forms of privacy of patients and these are : • Bodily privacy • Decisional and Informational privacy
Confidentiality	Refers confidentiality is non-disclosure of private or secret information with which one is entrusted
Concept and principles	Refers: • Ethical basic ideas that are starting points for understanding and

	working through a problem. • Ethical principles presuppose health workers should respect the value and uniqueness of persons and consider others to be worthy of high regard. • The major principles of health care ethics are: ➢ The principle of autonomy – individuals have a right to be self-governing ➢ The principle of non-maleficence – the patient should not be harmed ➢ The principle of beneficence – the benefit of the patient should be promoted ➢ The principle of justice – equals should be considered equally
Potential ethical issues	Ethical issues related to patients' rights are issues related with one or more of the following ethical principles: • Autonomy • Beneficence • Non-maleficence and Justice
National code of conduct for anesthetists	May include, but not limited to: • Code of ethics is formal statement of a group's ideas and values that serve as a standards and guidelines for the groups' professional actions and informs the public of its commitment. • Codes of ethics are usually higher than legal standards, and they can never be less than legal standards of the profession. • Ethiopian Association of Anesthetists (EAA) has published its 1st version code of ethics and conduct document to be used for this purpose.
National guideline	Refers the code of conduct for anesthesia professionals developed by EAA.
FMOH standard	Refers Federal Ministry of Health's scope of practice document published in the official website of the authority.
Responsibility	May refer: • Criminal responsibility for causing death • Civil responsibility: ➢ Remoteness of damage ➢ Novus actus interveniens ➢ Duty of care ➢ Res ipsa loquitur and Evidence
Patient right	Patient's bill of rights with the expectation that observance of these rights will contribute to more effective patient care and greater satisfaction for the patients, and the hospital organization.

Informed decisions refers:	The definition provided under the “informed consent” variable.

Evidence Guide	
Critical Aspects of Competence	Demonstrate skill and knowledge to: • Apply principles of legal framework to anesthesia practice • Apply concepts of ethical clinical practice to anesthesia • Practice within the scope of level VI anesthesia • Support the rights, interests and need of patients and their families
Required Knowledge	Demonstrate knowledge of: • “Law specific professional malpractice” • Legal process • Medico-legal issues in anesthesia • Medico-legal principles • Code of conduct for anesthetists • Patient bill of right
Required Skills and Attitudes	Demonstrate skill to: • Apply principles of medical ethics to anesthesia practice • Practice within the boundaries of level VI anesthesia scope • Abide with facility rules and regulations • Respect patient bill of right
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence need to be assessed in the work place or in a simulated work place setting.

Occupational Standard: Anesthetic Nursing Level V	
Unit Title	**Manage Anesthesia Service of a Facility**
Unit Code	**HLT ATN5 12 1121**
Unit Descriptor	This unit of competency describes the knowledge, skills and attitude required for the effective and efficient management of anesthesia service in a facility.

Element	Performance Criteria
1. Check functioning and conduct routine end user maintenance	1.1. Availability of ***minimum equipment requirements*** is checked as per the national FMOH perioperative guideline 1.2. ***Safety*** of the operation room for the conduct of anesthesia is checked regularly 1.3. ***Functioning*** of anesthetic equipment is checked correctly and any routine problems are rectified per the AAGBI checklist 1.4. Equipment are stored clean and safely 1.5. Hazardous, damaged or faulty equipment are reported and repairs arranged 1.6. ***Disposable***/single use items are disposed
2. Maintain adequate stock levels of consumable anesthesia items	2.1. ***Stock levels*** are checked and action taken to maintain anesthetic supply 2.2. ***Unavailability*** of stock is reported to relevant personnel timely 2.3. ***Expired anesthetic stock*** are safely disposed in accordance with facility guideline
3. Implement planned maintenance	3.1. Maintenance procedures and appropriate documentation are identified 3.2. Anesthetic and monitoring equipment are maintained regularly per the recommendation of the manufacturer 3.3. ***User level regular servicing*** to anesthesia equipment is conducted 3.4. Maintenance records are produced and updated
4. Arrange maintenance of anesthesia equipment	4.1. ***Faulty anesthetic equipment*** requiring ***biomedical professional*** intervention are identified 4.2. Consultation for the maintenance of faulty equipment is requested by biomedical professionals
5. Orient multidisciplinary team on anesthesia and monitoring equipment	5.1. Instruction on anesthesia equipment are provided to other members of the ***multidisciplinary team*** 5.2. In-service training on anesthesia equipment are provided to other members of the multidisciplinary team
6. Develop overall	6.1. Anesthesia service is planned as part of facility health care

anesthesia activity plan in a facility	system. 6.2. ***Short and long-term plans*** are prioritized for the service in consultation with multidisciplinary team members 6.3. Work plans are prepared to address identified practice priorities.
7. Implement planned activities	7.1. ***Principles of effective leadership and management*** are placed 7.2. Overall anesthesia ***service is managed*** as per the facility guideline 7.3. ***Holistic*** and ***culturally sensitive*** anesthesia service is issued
8. Monitor and evaluate anesthesia service	8.1. Ongoing anesthesia service is monitored and evaluated periodically as per the facility ***M&E tool*** derived from the plan 8.2. Anesthetic service is ensured accordingly 8.3. Resource utilization is monitored as per the plan and organizational policy 8.4. Appropriate and corrective measures are taken to solve the problems encountered

Variable	**Range**
Minimum equipment requirements	Refers the national standard set by Federal Ministry of Health per each table of OR theatre in order to provide safe anesthesia. This standard is titled as "Perioperative guideline".
Safety	Refers creating error free surgical environment. Errors arise from: • Wrong medication • Wrong medication dose • Wrong patient surgery • Wrong side surgery • Wrong level surgery
Functioning	Shall be followed by: • Identifying • Labeling and Storing
Disposable	Refers a single use (use and throw) material
Stock levels	Refers availability of anesthesia equipment, material and drugs in store.
Unavailability	Refers absence (scarcity) of stock
Expired anesthetic stock	Refers outdated anesthetics
User level regular servicing	Refers servicing of machine and equipment provided by anesthetists without the need of biomedical engineering professionals.
Faulty anesthetic equipment	Refers those anesthesia equipment which are identified as non-functional by anesthetists and requires maintenance by biomedical

	professionals
Biomedical professional	Refers professionals who are trained on the maintenance of anesthesia/medical equipment
Multidisciplinary team	May include, but not limited to: • Anesthesia providers • Surgeons/ Gynecologists • OR nurses • PACU nurses • Support staff including: Cleaners, Porters, CSR staffs and assistants. • Biomedical professional • Allied health staff including, radiographers and physiotherapists
Short and long-term	can be: • Strategic planning or Long range planning Iis a document outlining the general direction an organization is intending to follow in broad terms • Operational planning /short term plan that guide day-to-day work.
Principles of effective leadership and management	May include, but not limited to: • Being an active learner and foster learning in others • Sharing a clear and comparing visions • Prioritizing activity based on actual context • Leading with integrity, honesty and consistency • Develop leadership capacity at all levels of the facility
Service management	Refers the process of planning, organizing, leading, and controlling the efforts of facility members by using all available facility resources to attain set objectives
Holistic	Refers the provision of a comprehensive anesthesia service addressing social, cultural, spiritual and physical values of patients
Culturally sensitive	May mean being aware that cultural differences and similarities between people exist without assigning them a value (positive or negative, better or worse, right or wrong)
M&E tool	Refers plan derived tools to be used for determination of performance

Evidence Guide	
Critical Aspects of Competence	Demonstrate knowledge and skill to: • Check functionality of anesthetic and accessory equipment • Conduct routine maintenance of anesthetic equipment • Maintain adequate stock levels of consumable anesthesia items

Evidence Guide	
	• Orient multidisciplinary team on anesthesia and monitoring equipment • Develop, implement and evaluate anesthesia activity plan of anesthesia department in a facility
Required Knowledge	Demonstrate knowledge of: • AAGBI machine checklist • User level troubleshooting on a malfunctioned machine/ apparatus • Stock levels • Interdisciplinary communications skills • Planning, implementation and evaluation
Required Skills	Demonstrate skill to: • Perform routine anesthesia machine & accessory equipment functionality check • Identify and correct common causes of machine malfunction • Maintain adequate levels of anesthetic stocks • Develop anesthetic service plans (short and long-term) • Implement developed departmental plans • Evaluate plans
Resources Implication	Access is required to real or appropriately simulated situations, including work areas, materials and equipment, and to information on workplace practices and OHS practices.
Methods of Assessment	Competence may be assessed through: • Interview/Written Test • Observation/Demonstration with Oral Questioning
Context of Assessment	Competence may be assessed in the work place or in a simulated work place setting.

Sector: Health

Level V

Anesthetic Nursing

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