2024

Ethiopian Health Professionals Licensing Examination (EHPLE)

INFORMATION

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MINISTRY OF HEALTH-ETHIOPIA
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Message From the State Minister, Ministry of Health -Ethiopia

Mrs. Frehiwot Abebe

Improving healthcare quality is a global priority for sustainable development, with high quality healthcare being a key component of universal health coverage. One strategy to maintain health care standards is through provision of health professional competency assessment. Consequently, in 2019, the Ministry of Health Ethiopia, initiated the Ethiopian Health Professionals Licensing Examination (EHPLE) for undergraduates in seven health disciplines, which has since expanded to include 13 health disciplines.

The main goal of this competency assessment is to identify health professionals with minimal competencies necessary to perform their duties safely and competently, thus enhancing the quality of health care services. This initiative is overseen by a dedicated Health and Health Related Institutions and Professionals' Regulatory Lead Executive Office (LEO), comprising four desks, which plays a pivotal role in strengthening the system and enabling the LEO to conduct the competency exam more extensively and with improved organization and quality.

It is important to note that this competency assessment differs significantly from traditional academic or employment examinations. Hence, this information booklet has been created to address the informational needs of both examinees and teaching faculty regarding the Ethiopian Health Professionals' Licensing Examination. Additionally, it aims to facilitate the assessment process, while promoting transparency and ensuring the sustainability of the program.

The preparation of this guideline involved the collaboration of esteemed experts from various higher education institutions, AAU-IER, the Ministry of Health, JHPIEGO-Ethiopia, Amref/HWIP, Health Professionals' Associations, and the Ministry of Education. Their invaluable contributions are acknowledged with sincere gratitude, alongside appreciation for the Ministry of Health staff for their unwavering commitment and hard work throughout the project.

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This Information Booklet for Ethiopian Health Professional's Licensing Examinations is a contribution from several educators, researchers, students and concerned individuals with a genuine interest to propel Ethiopia's medical and health sciences education forward.

The Ministry of Health is grateful for the contribution of many individuals and institutions in realizing this endeavor. Among these are Professional Associations, Student Association, Higher Education Institutions (both public and private), JHPIEGO-Ethiopia, AMREF/HWIP, MOE (Ethernet), UNFPA, AAU-IER and all HHRIPR LEOs staff.

Acronyms and Abbreviations

EHPLE	Ethiopian Health Professionals Licensing Examination
ETA	Educational and Training Authority
HEIs	Higher Education Institutions
HHrIPR-LEO	Health and Health-related Institutions and Professionals Regulatory Lead Executive Office
HSTP-II	Health Sector Transformational Plan-II
MCQ	Multiple Choice Question
MOH	Ministry of Health
WHO	World Health Organization

Purpose of the Information Booklet

The Ethiopian Health Professionals' Licensing Examination (EHPLE) Information Booklet serves as a comprehensive guide for those individuals seeking information about the exam. It typically outlines basic information for candidate registration, exam development and administration processes and procedures, result notification, and the licensing process. It also includes information on the exam framework, i.e., the exam domain, sub-domain, content, process, and task, with sample exam items specific to each profession.

The publication of this Booklet is crucial for the following reasons:

- Clarity and guidance: It provides clear information about the exam by ensuring candidates understand the necessary information to prepare them.
- Accessibility: It serves as a readily accessible resource for individuals pursuing to take the exam, consolidating essential information in one document and facilitating easy access to necessary details. It also helps other stakeholders who might be interested in such resources.
- Transparency: It promotes transparency in the examination process and fosters trust among stakeholders about the exam.

In summary, the publication of this Booklet is essential for creating a transparent, standardized, and accessible framework that guides candidates through the EHPLE process.

Contents

Definition of terms

- **Domain:** a broad category or area of knowledge or skills of a profession
- **Sub-domain:** a subset of a broader domain that focuses on knowledge or skills related to the overarching domain
- **Content:** a more specific subcategory, which is a breakdown of the sub-domain
- **Task:** the responsibility, knowledge, skill, and attitude of a junior undergraduate professional in an actual work environment
- **Process:** a systematic sequence of steps or actions designed to achieve a specific outcome
- **Learning outcome**: a clear and measurable statement that describes what the examinee is expected to know or be able to do
- **Relative emphasis:** the proportional importance or weight assigned to different content areas or categories within the assessment
- **Item:** a particular multiple-choice question
- **Item developer:** a subject matter expert responsible for writing test items or questions that make up the examination
- **Item reviewer:** a subject matter expert responsible for reviewing and refining the test items or questions that make up the examination
- **Standard setting:** a process of determining a cut-off point or passing score for an exam
- **Item difficulty index:** a statistical measure that indicates the proportion of examinees who answered a particular test item correctly
- **Discrimination index:** a statistical measure that evaluates how well a particular test item differentiates between high-performing and low-performing examinees
- **Admission paper:** a printout paper generated by the system after completing registration that contains the examinee's photo, QR code, and necessary information

1. Introduction

1.1. Background

Competency assessment is one of the strategies for controlling the standard of healthcare services provided in healthcare facilities. The World Health Organization (WHO) recommends all healthcare professionals to have necessary competencies. In Ethiopia, the Health Sector Transformational Plan-II (HSTP-II) states competency assessment of all graduates before joining the health workforce as one of the strategic initiatives.

The Ministry of Health (MOH) launched the Ethiopian Health Professionals Licensing Examination (EHPLE) for undergraduates in 2019. The Health and Health-related Institutions and Professionals Regulatory Lead Executive Office (HHrIPR-LEO) of the Ministry of Health is given a mission to implement the Ministry's objective to achieve competency-related goals. It has the responsibility to ensure that the EHPLE meets technical, professional, and legal standards, and to protect the health, safety, and welfare of the public by assessing candidates' abilities to practice competently.

Currently, the exam is given for 13 health professions (Medicine, Nursing, Public Health, Pharmacy, Medical Laboratory Science, Anesthesia, Midwifery, Dental Medicine, Medical Radiology Technology, Environmental Health, Psychiatric Nursing, Pediatric and Child Health Nursing, and Emergency and Critical Care Nursing). Since its introduction until February 2024, a total of 166,293 examinees took the exam in 14 rounds.

1.2. The Rationale of EHPLE

One of the critical functions of the MOH is to guarantee the efficiency, quality, and equity of healthcare delivery and to protect the public from any undesirable consequences in healthcare delivery practices. As professionals' competence is a significant determinant of the quality of health, evaluation of health professionals' competence has now been given due attention. The licensing examination for health professionals serves as a crucial step to ensure that individuals entering the field meet specific competency standards. The sole aim of the competency assessment is to safeguard public health by verifying that health professionals have the minimal basic knowledge, attitude, and skill required to provide safe and effective care.

Licensing exams act as a preventive measure, ensuring that only competent professionals join the health workforce, which, in turn, contributes to reducing the occurrence of medical errors and enhancing overall patient safety. By setting standards through examinations, regulatory bodies strive to minimize the risk of medical errors caused by incompetence.

2. Key processes of EHPLE

EHPLE involves several key processes to ensure the quality and reliability of the examination.

2.1. Registration of candidates

EHPLE has a mandatory online registration system for both new and repeat candidates, which can be found at www.hple.moh.gov.et

Please note these important notes during registration.

New Test Takers:

- The list of eligible candidates from governmental and private Higher Education Institutions (HEIs) will be sent from Ministry of Education (MOE) to MOH and uploaded to the online registration system by MOH.
- Once the name of the candidate is uploaded to the system and registration has opened for the current exam round, the candidate must register at **www.hple.moh.gov.et** by uploading the necessary documents listed below.
  - ✓ a scanned original or temporary degree
  - ✓ a scanned government-issued ID, passport, driving license, or any other legal ID
  - ✓ a passport-size photo of the candidate
  - ✓ For international candidates:
    - Equivalence document from ETA
    - Completing an externship attachment according to assignment by the regulatory body
    - Externship attachment completion letter

Repeat Test Takers:

- Since the information about re-exam candidates already exists in the system, the candidate should register by directly going to **www.hple.moh.gov.et**. There is no need for re-exam candidates to upload their documents.

Both new and repeat candidates:

- After completing the registration, the candidate must download and print the admission paper by logging into his/her account using his/her email address and password
- The candidate can change the exam center by logging into his/her account only during the registration period
- Once examinee has selected his/her exam center during the registration period, an application for center change will not be allowed

2.2. Task Analysis

The first step of exam development involves conducting a comprehensive task analysis study, which identifies the tasks, knowledge, skills, and abilities required from a junior undergraduate professional in the specific profession. The analysis is typically done through surveys, interviews, or observations of practitioners in the actual work environment, as well as through the Delphi method with subject matter experts.

2.3. Exam Blueprint

Based on the task analysis findings, a test blueprint is created that outlines the content areas to be covered in the examination and the weight or emphasis given to each area. This ensures that the exam reflects the key competencies and knowledge needed for competent practice in that specific profession. Blueprint or test specification is the matrix or chart that shows the number and type of test questions represented across the topics in the content area, consistent with the learning outcome and relative weight of the test given to each content area. The blueprint also identifies the percentage weighting of cognitive dimensions as the level of competence tested in each knowledge domain.

Key components of a blueprint are:

- Domain
- Sub-domain
- Content
- Task
- Process
- Learning outcome
- Assessment methods
- Assessment tools/instrument (test format)
- Relative emphasis (in percentage)

2.4. Item Development

The items are developed following specific guidelines to ensure clarity, relevance, and fairness. Subject matter experts with experience in the field are selected from HEIs to develop test questions (items) that align with the test blueprint. The exam questions focus mainly on “knows how” according to the competency level of the Miller's pyramid. The items are produced in a secure location on designated computers that are free from internet connectivity. The items are scenario-based and constructed with stem, lead-in, and four options/alternatives. All items will have a single-best-answer type of Multiple-Choice Question (MCQ) that addresses the learning outcome defined in each content area. Standard text books, updated guidelines, and standards are used as reference materials.

2.5. Item Review

Once developed, the items undergo a rigorous review process by item reviewers. The main purpose of the exam review process is to evaluate content relevance, technical accuracy, clarity, and sensitivity related to culture and religion. More experienced subject matter experts as well as psychometric experts will do the review to ensure the items meet psychometric standards. Subject matter experts shall review the items to confirm that they are accurate, clearly stated, and correctly keyed using the checklist. Psychometric experts shall review the items to ensure that

they are not technically flawed. They also work on editorial review to check grammar, punctuation, and spelling errors. This helps ensure the reliability and validity of the items.

2.6. Standard setting method

The standard setting or cut-off point of the EHPLE is determined using the Modified-Angoff method, which is one of the most widely used and legally defensible standard setting approaches to set a cut-off point for high-stake competency examinations.

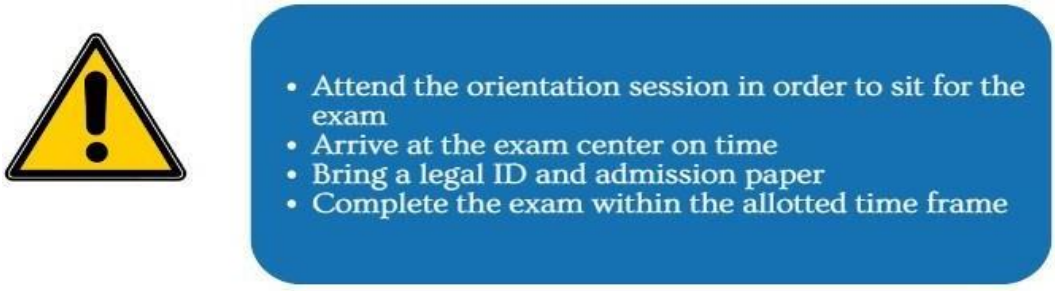
The method involves a panel of subject matter experts who evaluate each test question and then estimate the probability that a minimally competent examinee would answer each test item correctly. The average of the experts' predictions for a test question becomes its predicted difficulty. The average of the predicted difficulty values across all items on a test is the recommended cut-off point. This point indicates the minimum level of knowledge and skill required to pass.

2.7. Exam Administration

The EHPLE is administered following established protocols and guidelines. Proper test administration procedures, appropriate security measures, and appropriate consideration for test-takers who need special support will be applied during exam administration at exam centers. The exam is administered in selected HEIs nationally, where candidates can choose based on their convenience at the time of registration. The exam schedule will be posted ahead of time on the MOH website and official Facebook page. Examinees who have a valid admission paper are eligible to sit for the exam. The mode of exam administration is computer-based testing.

CAUTIONS

- Candidates are allowed



- Candidates are **NOT** allowed

- To bring reference materials, blank paper, or notes into the exam center
- To smoke, eat, or drink in the exam room
- To bring mobile phones, tablets, smart watches, camera devices, eyeglasses, calculators or any type of electronic device into the exam center
- To bring their personal belongings to the exam center
- To bring weapons and sharp materials into the exam center
- To give or receive assistance to or from other candidates during the examination

2.8. Scoring and post exam analysis

Once the exam is completed, the scoring process begins. The exam scoring process involves computerized scoring using software.

Post-exam analysis is the process of analyzing examinees' responses to individual test items in order to assess the quality of the items and the exam as a whole. This phase helps to identify any poorly performing items that may need revision or removal from the exam. The item difficulty index, discrimination index, and reliability coefficient are elements of exam analysis.

2.9. Result notification and appeal management

After scoring and analysis, individual score reports are generated and provided to examinees through the website *www.hple.moh.gov.et*. After result notification, examinees can submit their appeal through phone or email within 10 working days after result notification.

2.10. Licensing

The list of examinees who passed the exam will be sent to regional and city administration regulatory bodies. A license is obtained from the regional/zonal health bodies where he/she permanently lives.

Requirements for professional licensing are:

- Passing the EHPLE
- Original or temporary degree
- Educational documents (10th and 12th certificates)
- Medical certificate
- Government issued ID
- Additional prerequisites based on the requirements of regional regulatory bodies

3. Exam Framework

The key broader professional roles, also known as domains or main knowledge areas serve as a building framework for the licensing examination content for Anesthesia professionals. The domains are further divided into discrete professional attributes that constitute sub-units (also referred to as sub-domains) defining the professional identity of Anesthesia professionals Tasks specifying the performance level of each sub-domain serve as the final characteristic of the professional duties on which the licensing exam focuses.

The contents of the licensing examination are presented below, structured into key roles (domains), sub-units (sub-domains), and tasks. The examination emphasis for each domain and sub-domain, out of the total 100% questions, is indicated in brackets.

Key professional roles/ domains

- ❑ Patient Care (78.0%)
- ❑ Scholar (7.0%)
- ❑ Professionalism (6.0%)
- ❑ Leadership and management (5.0%)
- ❑ Health promotion and disease prevention (4.0%)

Key role/ domain *1*: Patient Care *(78.0%)*

Description: This domain encompasses the professional roles of anesthetists in the provision of high-quality, safe, and patient-centered perioperative anesthetic care for ASA I and ASA II patients undergoing anesthesia for emergencies or elective procedures. The provision of this care requires the application of integrated knowledge of biomedical, clinical, and behavioral sciences within their scope of practice. As patient care providers, anesthetists shall assess, optimize, and prepare patients for surgery and anesthesia; utilize anesthesia machines, equipment, supplies, and monitoring devices properly; and provide safe intraoperative and postoperative anesthetic care. To demonstrate competence in this domain candidate shall apply the integrated knowledge in the following sub-areas:

- ❑ Obstetrics Anesthesia (14.0%)
- ❑ General Surgery Anesthesia (18.0%)
- ❑ Pediatrics Anesthesia (8.0%)
- ❑ Trauma & Orthopedic Anesthesia (10.0%)
- ❑ Geriatrics Anesthesia (5.0%)
- ❑ Thoracic Anesthesia (5.0%)
- ❑ Neurosurgery Anesthesia (6.0%)
- ❑ EENT Anesthesia (6.0%)
- ❑ Emergency and Critical Care (6.0%)

Key role/ domain 2: Scholar (7.0%)

Description: This domain encompasses the professional roles of Anesthesia professionals in generating and utilizing scientific data to improve the health and well-being of the community and broaden their scientific knowledge within the healthcare system and community setting. Providing this service requires the application of integrated knowledge in research methods, measurements of health and disease, biostatistics, epidemiology, clinical audit, evidence-based practice, and research ethics. To demonstrate competence in this domain, candidates must possess applied knowledge in planning, problem identification, data collection, analysis, interpretation, report write-up, and dissemination of research outputs.

Key role/ domain 3: Professionalism (6.0%)

Description: This domain encompasses the professional commitment of Anesthesia professionals to promoting the health and well-being of individuals and society through adhering to ethical standards, maintaining personal integrity, and upholding high standards of competence in all areas of practice. To exhibit competence in this domain, candidates must possess applied knowledge of ethical principles, medicolegal practices, effective communication, accountability to the profession and society, maintenance of professional excellence and personal health, and professional values such as compassion, respect, integrity, honesty, altruism, and humility.

Key role/ domain 4: Leadership and management (5.0%)

Description: This domain encompasses the professional roles of Anesthesia professionals in envisioning a high-quality healthcare system through self-awareness, active participation in healthcare teams, leading teams, and managing health systems. Providing this service requires the application of integrated knowledge in continuous quality improvement, effective health system leadership, management, and healthcare ethics. To demonstrate competence in this domain candidate shall possess applied knowledge to plan, organize, staff, lead, execute, monitor, and control healthcare resources and activities.

Key role/ domain 5: Health promotion and disease prevention (4.0%)

Description: This domain encompasses the professional roles of Anesthesia professionals in enhancing the health and well-being of patients, communities, and the larger populations they serve through health advocacy, disease prevention, health promotion, and the promotion of health equity. Providing this service takes an integrated understanding of determinants of health, health informatics, epidemiology, and communicable disease control and health education.

Table: *Exam Content for Anesthesia Profession*

Domain 1: Patient care
Sub-domain 1.1: Obstetric anesthesia
Tasks
Manage labor pain using different management modalities
Assess, optimize, and prepare gynecologic patients for surgery and anesthesia
Assess, optimize, and prepare obstetric clients for surgery and anesthesia
Assess, optimize, and prepare complicated obstetric clients (e.g., hemorrhage, hypertensive, diabetic, etc.) for surgery and anesthesia
Provide safe intraoperative anesthetic care for elective ASA I and ASA II obstetric clients
Manage anesthesia for pregnant mothers with hypertensive disorders (eclampsia, preeclampsia, hypertension, etc.)
Manage anesthesia for pregnant mothers with obstetric hemorrhage (APH, PPH & ectopic pregnancy).
Manage anesthesia for pregnant mothers with common coexisting disorders (diabetes mellitus, heart disease)
Manage anesthesia for pregnant mothers undergoing non-obstetric surgery
Manage anesthesia for gynecologic surgical patients
Perform newborn resuscitation
Administer and manage spinal anesthesia for obstetric and non-obstetric clients
Handover patients to post-anesthesia care team and engage in provision of post-operative care for obstetrics and gynecologic clients
Sub-domain 1.2: Thoracic anesthesia
Tasks
Assess, optimize, and prepare thoracic emergency surgical patients for surgery and anesthesia
Apply and utilize standard patient monitoring and interpret findings (ECG, pulse-oxymeter, airway pressure and capnography)
Manage anesthesia and one lung ventilation for thoracic emergency surgical patients.
Manage intraoperative complications associated with respiratory diseases (asthma and COPD)
Handover patients to post-anesthesia care team and engage in provision of post-operative care for patients who undergo emergency thoracic surgery
Sub-domain 1.3: General surgery anesthesia
Tasks
Manage common fluid and electrolyte disturbances (sodium, potassium, and calcium)
Apply standard safety measures to manage perioperative hazards
Prepare and utilize anesthesia machines safely
Check & prepare airway equipment
Utilize ancillary anesthetic equipment & materials
Assess, optimize, and prepare general surgical patients for surgery and anesthesia (gastrointestinal, genitourinary, and endocrine).
Manage patients' airways using basic airway management techniques
Manage patients' airways using advanced airway management modalities
Manage anesthesia for general surgical patients (gastrointestinal, genitourinary, and endocrine)
Manage anesthesia for general surgical patients with common coexisting disorders (liver disease, renal failure, epilepsy, obesity)
Manage anesthesia for general surgical patients with common infections disorders (HIV/ AIDS, malaria, TB)

Perform abdominal field blocks (TAP and rectus sheath blocks)
Handover general surgical patients to post-anesthesia care team and engage in provision of post-operative care
Sub-domain 1.4: Neurosurgery anesthesia
Tasks
Assess, optimize, and prepare general neurosurgical patients for surgery and anesthesia (head injury and other common neurosurgical causes)
Manage anesthesia and intracranial pressure for neurosurgical patients
Manage anesthesia for surgical patients with seizure disorders
Handover neurosurgical patients to post-anesthesia care team and engage in provision of post-operative care
Sub-domain 1.5: EENT anesthesia
Tasks
Assess, optimize, and prepare ophthalmic surgical patients for surgery and anesthesia
Assess, optimize, and prepare adeno-tonsillar and mastoid surgical patients for surgery and anesthesia
Manage anesthesia and intraocular pressure for ophthalmic surgical patients
Manage anesthesia for shared airway procedures including foreign body removal in airway or esophageal trees
Manage anesthesia and common intraoperative complications for nasal and adeno-tonsillar surgeries
Handover neurosurgical patients to post-anesthesia care team and manage common post-operative complications related to EENT surgeries
Sub-domain 1.6: Geriatrics anesthesia
Tasks
Assess, optimize, and prepare geriatric surgical patients for surgery and anesthesia
Manage anesthesia for geriatrics surgical patients
Manage anesthesia for geriatrics surgical patients with common coexisting disorders (hypertension, diabetes mellitus, psychotic disorders, schizophrenia, depression, Parkinson's disease)
Handover neurosurgical patients to post-anesthesia care team and manage common post-operative complications related to geriatrics surgeries (delirium, hypertension, swinging glucose level).
Sub-domain 1.7: Pediatrics anesthesia
Tasks
Assess (including malnutrition, hydration status, congenital anomalies), optimize, and prepare pediatric surgical patients for surgery and anesthesia
Select and prepare appropriate airway, breathing system and other equipment for pediatric patients
Manage anesthesia for common pediatric surgical patients (IHPS, intussusception, cleft lip and palate) and intraoperative complications (hypothermia, hypoglycemia)
Manage anesthesia for pediatric surgical patients with common coexisting disorders (URTI, acute airway)
Handover pediatric patients to post-anesthesia care team and manage common post-operative complications (bronchospasm, laryngospasm, hypoxia, hypoglycemia)
Perform pediatric basic and advanced cardiac life support
Sub-domain 1.8: Trauma and orthopedic anesthesia
Tasks
Perform primary and secondary surveys
Assess, characterize, and manage fluid and electrolyte on trauma patients, including burn (including blood transfusion)
Assess, optimize, and prepare trauma and orthopedic patients for surgery and anesthesia

Manage anesthesia for common trauma and orthopedic surgeries and intraoperative complications (effect of tourniquet, DVT, embolism)
Assess severity and manage pain applying multimodal and preemptive analgesia principles, including the use of common peripheral nerve blocks (axillary, digital)
Handover trauma and orthopedic patients to post-anesthesia care team and manage common post-operative complications (DVT, VTE)
Sub-domain 1.9: Critical care
Tasks
Assess emergency and critically ill patients who need immediate attention
Assess, characterize, and manage common CVS, neuromuscular and poising disorders (different types of shock, GBS, organophosphate and carbon monoxide poisoning).
Engage in initiating, maintaining, and weaning of ventilator support (different modes) for critically ill patients (including ABG analysis)
Troubleshoot common mechanical ventilator malfunctions and manage complications associated to its use
Provide basic and advanced cardiac life support for critically ill adults, including for special population
Domain 2: Scholar
Sub-domain: research and evidence based practice
Content
Problem identification
Types of research
Objective setting
Study Variables
Population
Study design
Sampling technique
Sample size determination
Assessment Objectives (AO)
Critical appraisal
Method of data collection techniques
Ethical consideration
Data presentation and summarization
Assessment Objectives (AO)
Confidence interval and Hypothesis Testing

Domain 3: Health promotion and disease prevention
Content
Community health assessment
Community health intervention

Domain 4: PROFESSIONALISM
Sub-domain: Professional ethics and medico-legal practice
Content
Ethical principles/dilemmas
Factors that influence patient decision making
Standards of practice
Legal liability/legal frameworks
Accountability (responsibility)
Excellence (lifelong learning)
Altruism (selflessness behavior)
Effective communication with client's/ client's family /therapeutic communication
Inter- professional communication
Recording and documentation
Respectful communication in health care team
Domain 5: Leadership and management
Content
Manage health care system (planning, organizing, staffing, directing, evaluation and controlling)

Sample questions

1. A 31-year-old male patient was undergoing inguinal hernia repair. The patient has history of recent upper airway infection of three weeks duration. After smooth induction, anesthesia was maintained by 1.5% Halothane with oxygen and Pancuronium for muscle relaxation. After the conclusion of the surgery and reliable signs of reversal, the neuromuscular blockade was reversed and ET tube removed. Afterwards, he has inadequate strenuous respiration and expiratory stridor with SPO_2 reading from 98% to 89% with facemask oxygen supplement.

   What is the most likely cause of this clinical finding?

   (A) Low supplemental oxygen
   (B) Residual effect of muscle relaxant
   (C) Bronchospasm from light anesthesia
   (D) Laryngospasm from airway reaction

Answer key: The answer is **D**

Explanation: The patient has symptoms of air-way obstruction including inadequate strenuous respiration and expiratory stridor after extubation with SPO_2 reading from 98% to 89%. This indicates Laryngospasm. Laryngospasm is a forceful involuntary spasm of the laryngeal musculature caused by sensory stimulation of the superior laryngeal nerve. Triggering stimuli include pharyngeal secretions or passing an ETT through the larynx during extubation. Low supplemental oxygen (option A) is unlikely to be the correct answer because O_2 was supplemented with face mask. Similarly, option B, cannot be the answer because residual effect of muscle relaxant is less likely to cause desaturation since reliable signs for reversal were noted and the patient was reversed. Likewise, option C, Bronchospasm from light Anesthesia is more related to a serious condition such as anaphylaxis and common during intraoperative phase.

2. A 10-year-old male patient underwent appendectomy under general anesthesia. He was not fully recovered from the anesthesia. Following transfer to a recovery room, he exhibited paradoxical breathing with retraction of the sternal notch, exaggerated abdominal muscle activity and desaturation on pulse oxymetry despite oxygen administration by nasal prong.

   What is the most appropriate immediate management for this patient?

   (A) Insert oral airways
   (B) Jaw trust and Chin lift
   (C) Endotracheal-Intubation
   (D) Positive Pressure Ventilation

Answer key: The answer is **B**

Explanation: In this scenario, the patient is not fully recovered from anesthesia. Paradoxical breathing with retraction of the sternal notch, exaggerated abdominal muscle activity and desaturation are suggestive of an air way obstruction. The immediate management of airway obstruction is jaw thrust and chin lift maneuver. When this is not sufficient to relieve the obstruction, CPAP (option D) can be applied via face mask. If necessary, this can be followed by

placement of nasal and oral air ways (Option A), and in extreme cases laryngeal mask airway or end tracheal tube placement (Option C) can be used.

3. A 26-year-old mother came to a clinic for emergency cesarean section for an indication of non-reassuring fetal heart rate pattern. She had no history of chronic illnesses. Physical examination findings showed blood pressure of 130/85mmHg, pulse rate of 85/min and respiratory rate of 25/min. All laboratory investigation findings are within the normal rage. After administration of general anesthesia, intubation failed despite two attempts. Then, her oxygen saturation dropped to 78%.

   What is the most likely cause of rapid desaturation in this case?
   (A) Decreased vital capacity
   (B) Decreased closing capacity
   (C) Decreased total lung capacity
   (D) Decreased functional residual capacity

Answer key: The answer is **D**
Explanation: Given the mother who had no history of chronic illnesses was to undergo emergency for cesarean section, normal range vital signs and laboratory investigations results, and failed intubation; decreased functional residual capacity is the most likely cause of rapid desaturation for the mother. More specifically, her preoperative evaluation and laboratory investigation results show that she has no systemic or obstetrics related health problem. However, her oxygen saturation dropped to 78% after failed intubation of two attempts which is most likely due to decreased functional residual capacity (FRC). As a result of physiological change in the third trimester, FRC (Option D) decreases up to 20% at term which results short apnea time and desaturation of oxygen. On the other hand, the physiological changes on vital capacity (option A), closing capacity (Option B) and total lung capacity (option C) are minimally affected. Therefore, they are less likely to cause oxygen desaturation.

4. A parturient with BMI of $32m^2$/kg, receding mandible, facial edema, large breast, and Mallampati class-III has received general anesthesia with endotracheal tube. The anesthetist used short laryngoscope handle for intubation.

   What is the most likely reason behind the choice of this handle?
   (A) Large breast
   (B) Facial edema
   (C) Mallampati class III
   (D) Receding mandible

Answer key: The answer is **A**
Explanation: The explanation for selecting short Laryngoscope handle is large breasts (Option A) because it can obstruct the handling of the laryngoscope in patients with short necks.

Mallampati class-III (option C), facial edema (Option B), receding mandible (Option D) are useful predictors of difficult intubation; however, none of them are requirements for the selection of short laryngoscope handle for intubation.

5. A six-week-old male infant was admitted in a pediatric ward with the diagnosis of infantile hypertrophic pyloric stenosis. He has repeated vomiting of ingested matter. Laboratory findings showed low level of potassium and chloride.

   What type of primary acid-base imbalance is expected from the infant's condition?
   (A) Metabolic acidosis
   (B) Metabolic alkalosis
   (C) Respiratory acidosis
   (D) Respiratory alkalosis

Answer key: The answer is **B**
Explanation: This infant is diagnosed with infantile hypertrophic pyloric stenosis (IHPS) with cardinal features of repeated vomiting of ingested matter with low level of potassium and chloride, which suggest Metabolic Alkalosis (Option B). In pyloric stenosis, persistent vomiting results in loss of gastric juices, which is rich in hydrogen and chloride ions, and to a lesser extent of sodium and potassium ions. Because the obstruction is at the level of the pylorus, the vomit does not contain the usual alkaline secretion of small intestine. As a result, the patient develops a metabolic alkalosis not metabolic Acidosis (Option A). Potassium loss is further exacerbated by potassium being exchanged in the tubule for hydrogen in an effort to maintain normal plasma PH. Respiratory acidosis (Option C) and respiratory alkalosis (Option D) are associated with respiratory problem.

6. A 25-year-old female patient came to an operation room for explorative surgery after stab injury of the right chest and abdomen. On arrival, she was restless and in respiratory distress. On physical examination, there was reduced chest movement, reduced breath sounds, and a resonant percussion note on the affected side. Examination findings also revealed a blood pressure of 70/40 mmHg, pulse rate of 112/min, and respiratory rate of 22/min and SPO_2 of 78%. The anesthetist wanted to convert the injury to a less severe simple pneumothorax.

   What is the most appropriate initial treatment plan for this patient?
   (A) Needle pericardiocentesis
   (B) Urgent thoracotomy on the affected side
   (C) Thoracostomy in the 5^{th} intercostals space
   (D) Needle decompression at 2^{nd} intercostals space

Answer key: The answer is **D**
Explanation: The finding from the primary assessment for the patient includes restlessness, respiratory distress, reduced chest movement, reduced breath sounds, and resonant percussion

note on the affected side, along with the vital signs call for a treatment plan of immediate decompression with a needle at 2nd intercostals space in the midclavicular line. This is temporizing maneuver converting the injury to a less severe simple pneumothorax. On the other hand, definitive treatment thoracostomy should be performed on the 5th intercostals space (Option C) just anterior to the midaxillary line on the affected side. Urgent thoracotomy on the affected side (Option B) may be required if the symptoms are not relieved with the above interventions. Needle pericardiocentesis (Option A) is definitive treatment of tamponade evacuation of the pericardial blood which is different from tension pneumothorax.

7. Two graduate class anesthesia students are arguing on the appropriate positioning of patients during Lumbar Puncture for spinal anesthesia. One of the students said "sitting position is better because it is commonly used and I do not see any difficulty with this position". The other student said "No! Lateral position is superior because the intervertebral space becomes wider, so that it will be easy to puncture". Their instructor was listening to their discussion and told them that both of them are correct.

   What determinant of human health behavior is most likely explained in their discussion?

   (A) Knowledge
   (B) Belief
   (C) Attitude
   (D) Values

Answer key: The answer is **A**

Explanation: The students have different, and yet correct outlooks on the appropriate positioning of patients during Lumbar Puncture for spinal anesthesia. Their difference was based on their experience of knowing things, objects, events, persons, situations and everything in the universe. Their discussion suggests that knowledge is the determinant of human health behaviors. On the other hand, belief (Option B) cannot be a determinant of human health behaviors as usually people do not know whether their belief is true or false. **Equally,** attitude (Option C) is evaluative feeling and reflects someone's likes and dislikes; and values (Option D) are broad ideas and widely held assumptions regarding what are desirable, correct and good that most members of a society share and cannot be determinants of human health behaviors.

8. A 61-year-old patient was appointed for pre-anesthetic workup to undergo lobectomy surgery. During preoperative visit, the patient complained frequent urination, heavy consumption of water and fatigability with extreme weight loss. The anesthetist suspected that the patient may have diabetes mellitus.

   What is the most appropriate diagnostic modality for this patient?
   (A) Hemoglobin A1c < 6.5%
   (B) **Fasting Blood Sugar >126 mg/dl**
   (C) Random Blood Sugar >126 mg/dl
   (D) Two-hour Plasma glucose >126 mg/dl

Answer key: The answer is **B**
Explanation: In this scenario, the suspected health problem is diabetes mellitus. To diagnose it, the first method is based on fasting plasma glucose level greater than 126 mg/dL which makes (Option B) correct. The glycated hemoglobin (HbA1c) is the other diagnostic method and its value of 6.5% or greater helps to diagnose it and this makes Option-A incorrect. Random blood sugar is another diagnostic option and its value greater than 200mg/dl with the poly-symptoms helps to make the diagnosis and this makes (Option C) incorrect. Additionally, a-2-hour plasma glucose level greater than 200 mg/dL during an oral glucose tolerance test helps to make the diagnosis and this makes (Option D) incorrect.

9. A 56-year-old man with body mass index of 28 kg/m^2 was scheduled for right nephrectomy for the management of renal cell carcinoma. Pre-anesthetic assessment revealed productive cough for the past three consecutive years which lasts for more than two months. He has cyanotic appearance and his pulmonary function test showed low FEV1/FVC ratio.

   What is the most likely diagnosis for this patient?
   (A) Emphysema
   (B) Chronic bronchitis
   (C) Diffuse lung fibrosis
   (D) Interstitial disease of the lung

Answer key: The answer is **B**
Explanation: In this scenario, the patient has productive cough, cyanosis and low FEV1/FVC ratio. The low FEV1/FVC ratio mostly indicates chronic obstructive pulmonary disease (COPD) while the characteristics of cough and the cyanotic appearance helps to identify chronic bronchitis (Option B) to be the correct answer. Even though emphysema (Option A) is categorized under COPD, its presentation includes thin, dyspnea, and pink appearance, which help to rule out it as an incorrect answer. Diffuse lung fibrosis (Option C) and interstitial disease of the lung (Option D) have dry cough and are categorized under restrictive lung disease due to normal FEV1/FVC ratio and this helps to rule out them as incorrect answers.

10. After sustaining a traumatic brain injury, a 60-year-old male patient was admitted to an emergency department. On examination, the patient opens his eye when asked, confused while responding verbally and has a localized pain.

    What is the Glasgow Coma Scale (GCS) level of this patient?
    (A) 8 (B) 10 (C) 12 (D) 14

Answer key: The answer is **C**
Explanation: In this scenario, the patient has sustained traumatic brain injury and it is important to determine his neurologic status. One of the useful measures for this is the Glasgow Coma Scale (GCS). It is a simple tool that guides the management decision and is important in indicating prognosis. GCS has three parameters: eye opening, vocal response, and motor response measured out of 4, 5, and 6, respectively, and the total score is out of 15. The patient in this case opens his eyes when asked (3 out of 4), has a confused vocal response (4 out of 5) and localizes pain (5 out of 6). Therefore, his total score is 12.

11. A four-year-old, 16kg child was brought to a hospital with a diagnosis of cataract and scheduled for intraocular lens implantation. Preoperatively, the child was taking 50mcg (5%) epinephrine eye ointment for glaucoma treatment. The cardiovascular examination revealed that the child has arrhythmia. The planned anesthesia technique is general anesthesia.

    What is the most likely inhalational anesthetic agent that has to be avoided for this child?
    (A) Sevoflorane (C) Isoflorane
    (B) Desflorane (D) Halothane

Answer key: The answer is **D**
Explanation: In this scenario, the child is taking 50 mcg (5%) epinephrine eye-drop and is having cardiac-arrhythmias. Most inhalational agents have potential to increase cardiac-arrhythmia associated with administered catecholamine (in dose dependent manner). Halothane dose of catecholamine > 1.5mcg/kg, desflurane (Option B) and isoflurane dose of catecholamine > 4.5mcg/kg can exacerbate the heart problem for arrhythmia. However, sevoflurane (Option A) has no interaction with catecholamine, which makes it the safest drug to be used. Therefore, it is better to avoid Halothane (Option D) for this case because the patient is taking more than 1.5mcg/kg epinephrine. Other inhalational agents (Option B and C) are safe to be used in this case as the dose of the eye-ointment is insufficient to cause arrhythmia in association with them.

12. A 39-year-old female patient, who is admitted in ICU, suddenly collapsed. Hence, she is not breathing and has no central pulse. The anesthetist immediately started CPR. ECG monitoring shows a ventricular tachycardia (VT) and shock is administered. After the shock, there is a return of spontaneous circulation but still the ECG shows VT with stable hemodynamic.

    What is the most appropriate medication in the management of this patient??
    (A) Atropine
    (B) Adenosine
    (C) Adrenaline
    (D) Amiodarone

Answer key: The answer is **D**
Explanation: In this case scenario, the patient went under cardiac arrest due to ventricular tachycardia and was reversed by defibrillation. Even if there is return of spontaneous circulation, the ventricular tachycardia persisted with stable hemodynamic status (i.e., ventricular tachycardia with pulse). From the listed options, Amiodarone (Option D) is the drug of choice in this type of rhythm disturbance. Atropine (Option A) and adrenaline (Option C) are mostly administered for brady-arrhythmias and asystole respectively; whereas Adenosine (Option B) is the drug of choice in the case of supra-ventricular tachycardia.

13. A 29-year-old Para-I mother was scheduled for cesarean section. On preoperative evaluation, she had history of cesarean section under spinal anesthesia two years back. She had severe headache after the operation for which she was informed that the headache was related to the anesthesia. And she insisted on to take general anesthesia instead of spinal anesthesia after understanding all the risks and benefits of both types. However, the anesthetist enforced her to take spinal anesthesia and she agreed as she has no other option.

    What aspect of respectful care did the anesthetist violate in this case?
    (A) Confidentiality
    (B) Autonomy
    (C) Caring
    (D) Justice

Answer key: The answer is **B**
Explanation: One of the critical aspects of respectful care is abiding to ethical principles. In this case, the anesthetist insisted the client to receive local anesthesia while she was strongly asking for general anesthesia. This means the anesthetist worked against the patient's interest and self-determination of permitting or omitting what has to be done. It shows clear violation of patient's autonomy. The principles of confidentiality, caring, and justice are less addressed in this particular case.

14. According to a new organizational structure, the department of anesthesia is compartmentalized into obstetric unit, general surgery unit, and emergency unit. The head of the department assigned all staffs within the department to these units based on their experience and competence.

    What organizing principle is best addressed in the above case?

    (A) Hierarchy of authority
    (B) Chain of command
    (C) Division of labor
    (D) Span of control

Answer key: The answer is **C**

Explanation*:* Every organization has four important components (i.e. Division of labor, hierarchy of authority, chain of command or coordination and span of management control) and managers use these components as organizing principles. Division of work is allocating work into manageable units and it upholds the concept of departmentalization. It is assigning related activities and tasks to individual employees who are grouped together in specialized departments. This may include different outpatient departments or dividing staff activities into specified units. And it follows different steps like division of work into individual jobs, grouping similar jobs into sections, combine related sections into divisions, assemble correlated or functional divisions into departments, and assign head to each department to supervise and control the various activities of each department.

15. A researcher decided to conduct a study on determinants of birth asphyxia among new-borns as the problem is widespread and severely affected those new-borns in a district.

    What is the most likely problem prioritization criterion used by the research in this case?

    (A) Feasibility
    (B) Relevance
    (C) Ethical acceptability
    (D) Urgency of data needed

Answer key: The answer is **B**

Explanation: Relevance is one of the criteria to select the research problem which ensures that a study adds to the existing body of knowledge, bridges current gaps and is useful in policy formulation. Relevance can answer such questions as: how large or widespread is the problem? who is affected by the problem? and how severe is the problem? However, Option A considers the complexity of the problem and the resources required to carry out the study; Option C is about how the research can affect the study population; and Option D is about urgency of the results needed for decision making.

Sample References

- Williams, E. S., & Goerge, W. (2016). Basic Anesthesiology Examination Review. Oxford University Press.
- Morgan, M., & Mikhail, M. (Eds.). (2018). Clinical Anesthesiology (6th ed.). McGraw Hill / Medical.
- Miller, R. D., & Sdrales, L. M. (2013). Miller's Anesthesia Review (2nd ed.). Saunders, an imprint of Elsevier.
- Pardo, M. C., & Miller, R. D. (2017). Basics of Anesthesia (7th ed.). Elsevier.
- Barash, P. G. (2017). Clinical Anesthesia (8th ed.). Wolters Kluwer Health.
- Peter J. Davis, Franklyn P. Cladis, & Etsuro K. Motoyama. (2011). Smith's Anesthesia for Infants and Children (8th ed.). Mosby.
- Smith, C. E. (2015). Trauma Anesthesia (2nd ed.). Cambridge University Press.
- Stoelting, R. K., & Marschall, K. E. (2015). Stoelting's Anesthesia & Co-Existing Disease (5th ed.). (p. 368). Saunders.
- Rhee, Amanda J. (2009). Core Topics in Thoracic Anesthesia. Cambridge University Press.
- Gwinnutt, M. (2019). Lecture Notes Clinical Anesthesia (5th ed.). (p. 156). Wiley-Blackwell.
- (2017). CRC Participant Manual. Ministry of Health, Ethiopia.
- Jirra, C., Feleke, A., & Mitike, G. (2004). Health Planning and Management for Health Extension Trainees in Ethiopia. Jima University, Gondar University, & Addis Ababa University.
- Getu, D., & Tegbar, Y. (2006). Research methodology lecture notes for health science

Contact

Ministry of Health – Ethiopia
Street Address: - **1234 Sudan Street, Addis Ababa – Ethiopia**
Telephone: **+251-118275936**
Hotline service: - **952**
Website: **https://www.moh.gov.et**

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