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SAUDI BOARD ANESTHESIA CURRICULUM

الهيئة السعودية للتخصصات الصحية
Saudi Commission for Health Specialties

SAUDI BOARD
ANESTHESIA CURRICULUM

2015

Preparation

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Acknowledgment

The Anesthesiology core curriculum team appreciates the valuable contributions and feedback from the members of the supervisory committee and the residents representatives, **Dr. Nada Noman** in the construction of this manual. This work could not have been accomplished without their support. We also would like to acknowledge that the CanMEDS framework is a copyright of the Royal College of Physicians and Surgeons of Canada, and many of the descriptions and Anesthesiology competencies have been acquired from their resources.

CHAPTER ONE: INTRODUCTION

INTRODUCTION

Anesthesiology as a branch of medical practice represents a unique, exciting, specialized, and challenging art and science. This manual is the third revised document aimed to reflect on recent advances in the field of practice of anesthesiology using a competency-based model. The guiding principle for this work is to graduate competent anesthesiologists who are able to practice independently upon graduation, with the ability to promote a safe and progressive work environment. A number of national and internationally adopted frameworks for postgraduate medical education were used to develop this course. These include Saudi Meds, CanMEDS, Australian Tomorrow's Doctors, and many more international standards.

In addition to previously incorporated training guidelines of the Saudi Council for Health Specialties teaching frameworks, a number of unique features were added. These include:

1. The general framework of a national lecture program.
2. A comprehensive list of mandatory workshops.
3. Formative assessments in the form of continuous evaluation for daily, rotation-based In-Training Evaluation Report (ITER), Final In-Training Evaluation Report (FITER), and workplace-based assessments (Mini-CEX, DOPS, Case-Based Discussion [CBD]).
4. Summative assessments, end-of-year, Part I and Part II written exams, and final certification examination including final oral exams and a final performance-based exam using Objective Structured Clinical Examination (OSCE) and simulation-based exams.

It is hoped that this work will be translated into a mature training program representing the basis for future improvements and upgrades.

Many thanks and appreciation to the individuals who contributed to the original document and its subsequent developments and without whose effort and dedication this work would not course to its current status.

FOREWORD

This fourth edition of Saudi Board Anesthesia Curriculum is the direct result of the work of the following individuals who throughout the past years have developed the initial training program objectives:

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CHAPTER TWO: PROGRAM STRUCTURE

ADMISSION REQUIREMENTS

To be accepted into the training program, the candidate must fulfill the following requirements:

1. A medical degree (e.g. M.B.B.S) or equivalent from a recognized university.

2. The successful completion of a 12-month rotating internship.

3. The successful completion of a pre-admission examination (Saudi Licensing Exam) .

4. The provision of a letter from a sponsoring organization giving approval for the candidate to undertake full-time training for the entire duration of the program (five years).

5. A signed agreement to abide by the rules and regulations of the training program of the Saudi Board of Anesthesiology.

6. The registration as a trainee at the Saudi Commission for Health Specialties.

1. The trainee shall abide by the training regulations and obligations as set by the Saudi Commission for Health Specialties (SCFHS).

2. Training is a full-time commitment. The trainee shall be enrolled in full-time, continuous training for the entire duration of the program.

3. Training is to be conducted in institutions accredited for training by the Saudi Board of Anesthesiology and Intensive Care.

4. The training will be comprehensive in the specialties of Anesthesiology.

5. The trainee shall be actively involved in patient care with gradual progression of responsibility.

1. This is a five-year postgraduate structured training program in Anesthesiology that consists of two parts: the junior residency (the first three years of the program) and the senior residency (the last two years of the program).

2. The junior years are designed to provide training in Core Anesthesia practice together with rotations in selected specialized fields.

3. The senior residency years (R4 and R5), undertaken after passing the Part 1 exam, provide training in various sub-specialties in Anesthesiology and Intensive Care. This is arranged in collaboration with the regional training committee.

4. The resident is required to satisfactorily complete the allocated rotations for a given year and to pass the end-of-year evaluation exam (Unified Anesthesia Examination) before enrolling the following year.

5. The sequence of the rotations will be determined by the regional training committee.

6. After the successful completion of the five-year training program and after obtaining the Final In-Training Evaluation Report (FITER) and passing the end-of-year promotion exam with the required passing mark, candidates will receive a Training Completion Certificate issued by the regional training committee. The candidates will then be eligible for the Final Certification Examination of the Saudi Commission of Anesthesiology.

7. Candidates who successfully pass the Final Certification Examination will receive the Saudi Commission Specialty Certification in Anesthesiology.

GENERAL FRAMEWORK OF THE ROTATION SCHEME

REQUIRED ROTATIONS FOR THE JUNIOR YEARS (YEARS 1–3)

- Each rotation lasts 1–3 months.
- The exact duration and sequence of rotations shall be determined by the regional training committee.
- Every new resident (R1) must start by undertaking at least 6 months of training in General Core Anesthesia.
- The resident is required to undertake on-call duties every rotation including off-service rotations, where they are required to perform 1 in 4 anesthesia on-calls.
- The resident is expected to perform 4–7 on-call duties per month.
- The annual leave follows the SCFHS rules and regulations (4 weeks + one public holiday + one academic week with approval of program coordinator) each year.
- It is not recommended to take more than 2 weeks of leave during any given rotation.

#	ROTATION NAME	TOTAL DURATION (in months)	GENERAL PRINCIPLES AND REMARKS
1.	General Core Anesthesia	18	Exposure to a sufficient number of cases in all of the following fields: - Pre-Anesthesia Clinic/Acute Pain Service - General Surgery - Orthopedics - Gynecology - Urology - Ear, Nose, Throat (ENT) - Dental - Plastic Surgery - Ophthalmology - Remote Anesthesia (e.g. Radiology) Trauma
2.	Trauma Anesthesia	3	Allocation to hospitals with a high rate of trauma cases.
3.	Obstetrics Anesthesia	6	Three months at junior level (R1–R3) and 3 months at senior level (R4–R5)
4.	Intensive Care	6	MICU: 2 months SICU: 2–3 months PICU/NICU: 1 month CCU: 0–1 month
5.	Internal Medicine	3	Cardiology: 1 month Respiratory: 1 month Elective (Nephrology, Endocrinology or Blood Bank): 1 month
6.	Elective Rotation/Research	6	Three months at junior level (R1–R3) and 3 months at senior level (R4–R5); this includes assigned rotations (e.g. transfusion medicine and vascular anesthesia).
7.	Cardiac Anesthesia	3	Allocation to cardiac anesthesia ORs, mainly in adult cases.

8.	Pediatrics Anesthesia	3–4	Allocation to ORs with pediatrics surgery cases.
9.	Pain Medicine	2–3	Pain management (acute or chronic, nociceptive or neuropathic, in inpatient or outpatient settings).
10.	Regional Anesthesia	2–3	Exposure to various regional anesthesia techniques under the supervision of qualified regional anesthesiologists.
11.	Thoracic/Vascular Anesthesia	2–3	Exposure to major thoracic pathology and comorbid diseases, and experience with lung isolation techniques and one lung ventilation, and postoperative care and pain management; residents will also be exposed to high-risk vascular surgical patients.
12.	Neuroanesthesia	2–3	Exposure to anesthetic cases of patients undergoing surgical treatment of diseases of the central nervous system and spine.

REQUIRED ROTATIONS FOR THE SENIOR YEARS (YEARS 4 AND 5)

- Each rotation lasts 3 months.
- The exact sequence of rotations shall be determined by the regional training committee.
- The resident is required to undertake on-call duties during every rotation except during elective rotations if they are allocated to non-clinical specialties or duties.
- The resident is expected to perform one of four or three on-call duties per month.
- The annual leave follows the SCFHS rules and regulations (4 weeks + one public holiday + one academic week with approval of program coordinator) each year.
- It is not recommended to take more than 2 weeks of leave during any given rotation.

CORE ANESTHESIA

Duration: A minimum of 18 months (15 months during junior residency + 3 months during senior residency)

During this rotation, the resident will be assigned to operating theater lists in the fields of General Surgery, Orthopedics, Gynecology, Urology, ENT, Dental, Vascular Surgery, Plastic Surgery, Ophthalmology, Off-Site Anesthesia (e.g. Radiology), and Accidents and Emergency Anesthesia.

The resident is assigned to operating room lists on a daily or weekly basis. The senior resident or training supervisor may produce weekly or monthly schedules.

The first 6 months of training for all R1 residents must be in Core Anesthesia. During the first month, a consultant and/or senior resident will instruct the residents on the basic anesthetic procedures in elective cases. The starting junior residents will not be given night duties during the first month of training. After formal evaluation and assessment, the resident will be assigned night duties under the direct supervision of a consultant and/or senior anesthesiologist for the remainder of the training period.

Objectives:

1. Medical Expert/Clinical Decision Maker

a) To explain the adult anatomy and physiology of the following systems and the pathophysiology of the disease states that affect them:
   - Cardiovascular
   - Upper airway and respiratory system
   - Central and peripheral nervous systems
   - Hepatic
   - Renal
   - Endocrine
   - Hematologic

b) To explain the concepts in physics, biochemistry, and pharmacology, relevant to anesthesia, as detailed in the overall program curriculum:
   - Gas delivery system
   - Anesthesia machine
   - Electricity and electrical hazards

c) To appropriately select and administer a complete spectrum of anesthetic and analgesic agents for the induction and maintenance of anesthesia, taking into account the relative advantages and disadvantages of each approach, and to tailor each approach to the specific anesthetic goals for each individual case.

d) To appropriately select and administer a complete spectrum of drugs for cardiovascular support and resuscitation during anesthesia and the perioperative period, taking into account the relative advantages and disadvantages of each approach, and to tailor each approach to the specific anesthetic goals for each individual case.

e) To independently perform specific techniques for the administration of general, local and regional anesthesia, with a sufficient spectrum of choice to meet the anesthetic goals for all patients within the scope of practice defined above.

f) To identify and manage complications as they occur in the perioperative period.

g) To identify risk factors for postoperative complications and modify anesthetic plans to minimize those complications.

h) To assess the suitability for discharge to Intensive Care Unit (ICU), intermediate care, ward and home settings.

i) To predict, identify, and contribute to the alleviation of impediments to recovery in the perioperative period, e.g.:
    - Postoperative nausea and vomiting
    - Pain
    - Functional impairment
    - Ileus
    - Malnutrition

j) To explain the principles of function of all anesthetic equipment, including the anesthetic machine, mechanical ventilator, safe delivery of anesthetic gases, and monitoring equipment.

k) To use the anesthesia machine to provide anesthesia care, including performing appropriate safety inspection.

l) To identify and correct equipment malfunction before and during anesthesia care.

m) To select, apply, and interpret information from the appropriate monitors, including invasive and noninvasive blood pressure monitors, 5-lead EKG, neuromuscular monitor, oximeter, end-tidal gas monitor, temperature, urine output, and invasive

monitors of cardiac output and filling.

n) To identify and correct sources of error in the above monitoring equipment.

o) To select and administer appropriate fluids and blood products, taking into account the indications, contraindications, and correct procedures.

p) To identify and manage complications of fluid and blood product administration in the entire perioperative period.

q) To appropriately assess the patient and the risks, and to formulate and implement an individualized plan for perioperative patient management, taking into account the underlying medical condition, surgical procedure, coexisting patient factors including other medical problems, anxiety, discomfort, culture, language, ethnicity, age, and gender.

r) To appropriately modify management in response to monitoring information, and change in patient, anesthetic, or surgical factors.

s) To provide anesthetic care with specific reference to pregnant patients for obstetric and nonobstetric procedures, patients in the geriatric age group, and ambulatory patients.

t) To initiate appropriately individualized perioperative pain management strategies.

u) To manage adult patients in a variety of settings, e.g.:
    - Elective, urgent, and emergent/trauma procedures
    - Sites distant from the operating room
    - Unforeseen emergencies (e.g. malignant hyperthermia and anaphylaxis)

v) To independently perform all technical skills necessary to manage adult patients in the perioperative period, e.g.:
    - Routine and difficult airway management
    - Techniques of monitored anesthesia care (MAC)
    - Local and regional anesthesia
    - Techniques of general anesthesia including induction, maintenance, and emergence techniques
    - Peripheral and central venous access invasive monitoring
    - Resuscitation of the critically ill adult patient (with reference to ACLS and ATLS procedures and protocols)

2. Communicator

a) To establish a therapeutic relationship with patients and/or their family by:
   - Encouraging patient participation in decision-making, and to do this in consultative, elective, and emergent situations, and in challenging situations such as patient anger, confusion, language or ethnocultural differences, or extremes of age
   - Listening to patients, answering their questions, and decreasing their anxiety
   - Demonstrating respect and empathy in relationships with patients

b) To gather sufficient information from the patient, family members, and/or medical personnel to identify factors that contribute to perioperative management problems, e.g.:
   - Medical and surgical status of the patient
   - Patient expectations, beliefs and concerns (in addition to medical history)
   - Age, gender, and ethnocultural, spiritual, and socioeconomic background

c) To impart sufficient information to patients and appropriate family members or delegates to allow a complete understanding of the implications of the planned procedure, options, risks and benefits.

d) To obtain complete informed consent for anesthetic care.

e) To be able to deliver bad news to patients and family members.

3. Collaborator

a) To demonstrate ability to work in a team in a clinical environment.

b) To coordinate care of adult patients with other members of the Operating Room (OR), Postanesthesia Care Unit, ICU, and others.

c) To manage urgent and crisis situations such as cardiac arrest, trauma, anaphylaxis, and malignant hyperthermia, as a team member or a team leader.

d) To resolve conflicts or provide feedback when appropriate.

e) To consult other physicians and allied health professionals in order to provide optimal perioperative care.

f) To communicate effectively with other team members.

4. Manager

a) To demonstrate knowledge of the management of operating rooms.

b) To demonstrate knowledge of the contributors to anesthetic expenditures.

c) To demonstrate knowledge of the national guidelines concerning anesthetic practice and equipment.

d) To record appropriate information for anesthetics and consultations provided.

e) To demonstrate principles of quality assurance, and be able to conduct morbidity and mortality reviews.

f) To use personal and outside resources effectively to balance patient care, continuing education, practice, and personal activities.

g) To manage assigned room/slate regarding maintaining the schedule, changing the schedule in response to emergencies, delays, additional cases, etc.

h) To manage after-hours scheduling of cases, including prioritization and adaptation to changes.

i) To schedule coresidents to various list assignments when responsible as senior resident.

j) To use limited health resources appropriately, e.g.:
- Time for patient assessment, OR equipment preparation, anesthesia induction and emergence, and OR changeover
- Expenses of anesthesia resources, including cost-effective drug and technique choice, equipment and invasive monitoring options

k) To participate in the assessment of outcomes of patient care and practice, including Quality Assurance (QA) methods. These include:
- Maintaining a personal record of experience and outcomes (log of experience)
- Participating in case reviews

l) To explain how an anesthetic department is structured and managed.

5. Health Advocate

a) To provide direction to health administrators regarding compliance with national practice guidelines and equipment standards for anesthesia.

b) To recognize the opportunities for anesthesiologists to advocate for resources for pain management, emerging medical technologies and new healthcare practices in general.

c) To recognize individual and systemic issues with an impact on anesthetic care and safety of the adult patient.

d) To communicate identified concerns and risks to patients, other health care professionals, and administration as applicable.

e) To intervene on behalf of individual patients and the system as a whole regarding quality of care and safety.

f) To identify and react to risks to healthcare providers specifically including, but not limited to:
   - Substance abuse among anesthesiologists and other healthcare providers
   - Hazards in workplace environment

g) To implement standards and guidelines related to anesthetic practice and equipment.

6. Scholar

a) To develop and maintain a personal learning strategy for continuing certification.

b) To seek out and critically appraise literature to support clinical care decisions and practice evidence-based application of new knowledge.

c) To contribute to the appropriate application, dissemination, and development of new knowledge.

d) To teach medical students, other residents, faculty members, other health professionals, and patients using the principles and methods of adult learning.

7. Professional

a) To deliver the highest-quality patient care with integrity, honesty, and compassion.

b) To fulfill the ethical and legal aspects of patient care.

c) To maintain patient confidentiality.

d) To demonstrate appropriate interpersonal and professional behavior.

e) To recognize personal limits through appropriate consultation (with staff supervisors, other physicians, and other health professionals) and show appropriate respect for those consulted.

f) To recognize conflict in patient care situations, professional relationships, and value systems, and demonstrate the ability to discuss and resolve differences of opinion.

g) To accept constructive feedback and criticism, and implement appropriate advice.

h) To continually review personal and professional abilities and demonstrate a pattern of continuing development skills and knowledge through education.

i) To identify problems of physical and mental health including chemical dependence, stress, depression, and ways to deal with these problems in oneself and others.

TRAUMA

Duration: Two months

The purpose of the Trauma rotation is to expose the residents to all aspects of trauma care from the earliest of resuscitative efforts, through intra-operative care and intra-hospital transport, to postoperative pain management.

Objectives:

1. Medical Expert/Clinical Decision Maker

   The resident must demonstrate an understanding of trauma, its effect on patient management from emergency room to operation theater, and postoperative management.

   a) Cognitive

   1. To understand the core principles of trauma care:
      - Trauma epidemiology, mechanisms of injury, and prehospital care
      - Initial evaluation and management, team approach, triage, surgical priorities, and mass casualty management.
      - Airway management and algorithms for emergency induction and intubation
      - Vascular cannulation
      - Shock resuscitation, fluid therapy, and damage control resuscitation
      - Blood component therapy, trauma coagulopathy, and massive transfusion protocols
      - General anesthesia for trauma
      - Regional anesthesia for trauma
      - Trauma patient monitoring
      - Ultrasound and echocardiography in trauma
      - Trauma patient postoperative care
      - Chemical and radiologic exposures in trauma

   2. To identify anesthetic considerations for patients with the following blunt or penetrating injuries:
      - Traumatic brain injury
      - Spinal cord trauma
      - Ocular and maxillofacial trauma
      - Chest trauma
      - Abdominal trauma

- Musculoskeletal trauma

3. To describe the anesthetic management for the following special populations:
   - Burn trauma patients
   - Pediatric trauma patients
   - Geriatric trauma patients
   - Pregnant trauma patients

b) Skills

1. To act as trauma anesthesia team leader under the supervision of the attending staff.

2. To completely evaluate a trauma patient preoperatively, anticipating the need for special equipment for airway and or resuscitative management.

3. To present patients in a cohesive systematic approach to an attending anesthesiologist and propose an anesthetic plan.

4. To thoroughly set up for an emergency case including anesthesia machine checkout, selection of routine and special monitoring devices, selection of appropriate airway equipment, selection of vascular access catheters and fluid delivery systems, choose appropriate anesthetic and resuscitation drugs, create an environment for temperature homeostasis.

5. To maintain a complete anesthetic record during all cases either hand written or with an automated, computerized record keeper if applicable.

6. To perform the following procedures:
   - Endotracheal intubation with and without inline cervical immobilization including, but not limited to, direct and fiberoptic techniques on both awake and unconscious patients (The procedure may be performed in the operating room, trauma resuscitation unit, or emergency department, and the resident should be able to manage the most challenging airways.)
   - Use of tracheal tube introducers, supraglottic airways, and videolaryngoscopy
   - Percutaneous cricothyroidotomy and retrograde intubation (task simulator)
   - Induction, maintenance, and emergence of general anesthesia

- Invasive monitoring
- Patient positioning for common procedures with attention to pressure points and eye protection
- Regional anesthetic blocks for extremity and other procedures for which they are indicated

7. To manage patients in the Postanesthesia Care Unit.

2. Communicator

To display effective communication skills with patients and family members, colleagues, nursing staff, respiratory therapists, administrative staff, and other support personnel.

3. Collaborator

To collaborate in a professional and competent manner when acting as a consultant, or when consulting other disciplines.

4. Manager

a) To provide consultation in the trauma resuscitation unit or emergency department timely.

b) To be aware of the monitoring requirements and the availability of resuscitative equipment and fluids.

c) To be aware of the cost of various treatment modalities and the necessity of allocating resources appropriately, particularly in internal and external disaster planning.

5. Health Advocate

To demonstrate knowledge of all guidelines concerning trauma and trauma management.

6. Scholar

To critically evaluate trauma cases for better outcome and quality management.

7. Professional

a) To behave properly with trauma patients, their family, and all personnel involved in patient care (e.g. the anesthesiology team, surgical team, and nursing staff).

b) To follow-up patients who experience complications and/or side effects.

c) To continue reading around problems and cases in order to continually improve knowledge.

OBSTETRIC ANESTHESIA

Duration: Six months (3 months during junior residency + 3 months during senior residency)

The resident will be allocated to the obstetrics operating room and to labor and delivery (L&D). The resident will be involved in epidural services at L&D and will cover elective cesarean section procedures; when on-call, residents will cover obstetric emergency cases. The resident is expected to gain experience in epidural analgesia for L&D and to be able to manage both elective and emergency cesarean section and other obstetrical procedures requiring anesthesia.

Objectives:

1. Medical Expert/Clinical Decision Maker

a) To explain the physiologic changes of normal pregnancy and labor and their anesthetic implications, including the relative importance of each change throughout gestation.

b) To explain the pharmacokinetic and pharmacodynamic changes in normal pregnancy and their anesthetic implications.

c) To administer commonly used drugs in L&D and to provide a rationale based on the indications, contraindications, relative differences, and potential drug interactions.

d) To make therapeutic decisions and to provide a rationale, taking into account the effect of pharmacologic agents and anesthetic techniques on uterine blood flow and fetal development.

e) To provide effective labor analgesia by means of:
- Nonpharmacologic analgesia (e.g. emotional support, acupuncture, and Lamaze technique)
- Pharmacologic analgesia, including parenteral opioid, patient-controlled, inhalational, and regional analgesia (e.g. epidural, spinal, or combined)

f) To formulate an individualized treatment plan, and to provide a rationale based on:
- Physiology and anatomy of labor pain
- Family involvement and patient satisfaction
- Consent issues concerning labor analgesia
- Goals of analgesia and strategies for maintenance

- Physiologic effects, contraindications, and complications of obstetric analgesia

e) To formulate and implement a plan for anesthetic management of the following situations, and to provide a rationale based on relative advantages and disadvantages, contraindications, and complications:
   - Anesthesia for instrumental vaginal delivery
   - Anesthesia for elective, urgent, and emergency cesarean section
   - Airway management in the parturient
   - Anesthetic implications of multiple gestation and malpresentations (e.g. twins, breech, and transverse lie)

f) To formulate and implement a plan for the anesthetic management of obstetric hemorrhage, and to provide a rationale that takes into account:
   - Classification and differential diagnosis
   - Maternal and fetal effects of hemorrhage
   - Anesthetic considerations
   - Commonly used obstetric drugs

g) To diagnose and direct the management of the following obstetric complications, and to provide a rationale based on the pathophysiology, pharmacological management, expected obstetric management, and anesthetic implications:
   - Pre-eclampsia/eclampsia
   - Preterm labor
   - Amniotic fluid embolism
   - Fatty liver of pregnancy
   - Chorioamnionitis
   - Fetal death
   - Prolapsed umbilical cord
   - Tetanic contractions
   - Maternal resuscitation and life support
   - Placenta previa and placental abruption

h) To identify and assess the following medical/surgical issues in the obstetric patient:
   - Diabetes
   - Hypertension
   - Heart disease (e.g. corrected congenital heart disease, valvular heart disease, coronary artery disease, shunts)
   - Hemoglobinopathy and coagulopathy (e.g. sickle cell disease, thalassemia, Von Willebrand disease)
   - Neurological diseases (e.g. raised intracranial pressure, central nervous

system diseases, peripheral nervous system diseases, muscular dystrophy, mental health)
- Trauma

i) To formulate and implement an appropriate anesthetic plan, and to provide a rationale based on the pathophysiology and anesthetic implications of the above-mentioned problems.

j) To interpret information used for assessment of fetal well-being and to identify the anesthetic implications of that information:
- Biophysical profile
- Fetal heart rate monitoring
- Scalp sampling
- Doppler blood flow

k) To formulate and implement a plan for the anesthetic management for nonobstetrical surgery in the healthy or complicated pregnant patient, and to provide a rationale that takes into account:
- Physiologic changes of pregnancy
- Fetal and maternal effects of anesthetic drugs and interventions
- Risk assessment and choice of anesthetic
- Intraoperative considerations including positioning and monitoring
- Postoperative considerations including monitoring and analgesia

l) To demonstrate the following skills:
- Spinal anesthesia
- Epidural anesthesia
- Combined Spinal and Epidural (CSE) anesthesia
- General anesthesia for cesarean section or other indication

2. Communicator

a) To gather appropriate information concerning the following issues, while demonstrating consideration of the special situation of the pregnant patient (e.g. stress, anxiety, and pain):
- Medical and surgical status of the patient and fetus
- Patient expectations, beliefs, and concerns (in addition to medical history)

b) To demonstrate respect, empathy, and confidentiality while considering the influences of age, gender, and ethnocultural, spiritual, and socioeconomic background of the patient

c) Exchange information with the patients, their family, and other healthcare team members, and to encourage patient participation in decision-making, including pregnant patients in challenging situations (e.g. pain, anxiety, fetal concerns) and obtaining the appropriate consent.

3. Collaborator

a) To identify and describe the role (expertise and limitations) of all members of the maternal/fetal interdisciplinary care team dealing with obstetric patient care.

b) To participate in patient care as a part of a multidisciplinary obstetrical care team in the obstetrical suite, recovery room, OR, ICU, ER, Preoperative Assessment Clinic, etc. whenever the resident's participation is expected or requested. Participation will include demonstrating the ability to consider and respect the opinions of other team members while personally contributing specialty specific expertise.

c) To manage urgent and crisis situations such as fetal distress, maternal hemorrhage, cardiac arrest, trauma, and anaphylaxis, as a team member or a team leader.

d) To consult with, and delegate or transfer care to, other health professionals (e.g. mother to PACU/ICU, neonate to NICU).

e) To work in a team to resolve conflicts or provide feedback when appropriate.

f) To promote cooperation and communication among health professionals involved in patient care (nurses, obstetricians, neonatologists, and anesthesiologists) regarding areas of responsibility, and consistent patient information.

4. Manager

a) To use personal and outside resources effectively to balance patient care, continuing education, practice, and personal activities.

b) To demonstrate wise use of available obstetrical care resources.

c) To discuss the administrative aspects of obstetrical anesthetic practice, including:
- Budgets including anesthetic costs
- Ordering appropriate anesthetic equipment supplies

- Quality assurance programs
- Practice and equipment guidelines
- Maintaining appropriate records

d) To manage:
   - Daily elective and emergent cases on the labor floor (including preparation, time management, facilitating completion, adjusting case order, etc.)
   - On-call experience including facilitation and prioritization of emergency cases; duties as a resident member of obstetrical anesthesia (section committee/team)

e) To discuss the principles and importance of the assessment of outcomes of patient care and practice including QA methods

f) To maintain a personal record of experience and outcomes (log of experience)

g) To participate in any scheduled obstetric case reviews

5. Health Advocate

a) To identify the determinants of health related to general, obstetric, and anesthetic care, and to advocate for improved health for individual patients and communities or groups. Examples may include:
   - Advise to pregnant women regarding pain relief for labor and delivery
   - Advise to patients regarding cessation of smoking, treatment for substance abuse, appropriate diet, exercise, and weight reduction
   - Advise to patients regarding risk reduction with associated problems (e.g. reducing aspiration risk and patients with full stomachs) by using rapid sequence induction or delay of surgery, regional vs. general anesthesia, optimization of medical problems, and timing of surgery
   - Advise to government and public regarding risk associations such as alcohol consumption during pregnancy and fetal alcohol syndrome, and cigarette smoking, multiparity, and low birth weight.

b) To adhere to nationally approved guidelines and CAS and CSA standards and guidelines related to anesthetic practice and equipment.

c) To advocate for needed resources to improve obstetrical patient care, including patient safety and pain management.

6. Scholar

a) To develop and maintain a personal strategy for continuing education and certification.

b) To demonstrate skill with critical appraisal of literature and evidence-based application of new knowledge.

c) To understand the principles and methods of adult learning and apply these appropriately when teaching medical students, other residents, faculty members, other health professionals, and patients.

7. Professional

a) To deliver the highest-quality patient care with integrity, honesty, and compassion.

b) To be aware of the ethical and legal aspects of obstetrical patient care, e.g.:
- Consent
- Fetal vs. maternal rights
- Maternal/paternal conflicts

c) To demonstrate appropriate interpersonal and professional behavior.

d) To show recognition of personal limits through appropriate consultation (with staff supervisors, other physicians, and other health professionals) and show appropriate respect for those consulted.

e) To be able to include the patient in discussions of care management.

f) To be able to recognize conflict in patient care situations, professional relationships, and value systems, and demonstrate the ability to discuss and resolve differences of opinion. Additionally, to be able to accept constructive feedback and criticism and implement appropriate advice.

PEDIATRIC ANESTHESIA

Duration: Six months (2 months during junior residency + 4 months during senior residency)

The resident should be assigned to a dedicated pediatrics surgery, operating rooms OR operating lists.
The resident is expected to be involved in pediatric cases with complicated congenital conditions and major pediatrics procedures in neonatal and pediatrics age group, and to participate in general and regional techniques.
If the weekly workload allows, the resident will be allocated to other ORs.

Objectives:

1. Medical Expert/Clinical Decision Maker

The resident will acquire an understanding of the anatomical, physiological, pharmacological, and psychological differences between the neonate, child and adolescent in relation to anesthesia practice. The resident must demonstrate knowledge concerning:

a) Respiratory system
- Anatomic differences of the neonate and pediatric airway
- Age differences in respiration control, compliance, lung volume, oxygen consumption
- Neonatal postoperative apnea

b) Cardiovascular system
- Anatomy and physiology of transitional circulation
- Maturation of the myocardium and autonomic nervous system
- Normal vital signs for ages

c) Central nervous system
- Anatomy differences (e.g. fontanels)
- Age differences (e.g. intracranial pressure and cerebral blood flow and auto-regulation)

d) Genitourinary system
- Renal maturation
- Fluids and electrolytes, maintenance requirements, and hydration

e) Gastrointestinal/hepatic system
- Feeding and fasting guidelines

- Glucose control
- Maturation of hepatic function

f) Hematological system
   - Normal values in infants and children
   - Natural history of fetal hemoglobin
   - Blood component therapy

g) Thermoregulation
   - Body surface area and heat loss
   - Differences and ability to thermoregulate
   - Heat loss and heat loss prevention

h) Psychological issues
   - Anxiety/fear at different ages
   - Separation anxiety and parental anxiety
   - Use of premeditations

i) Pharmacology
   - Pediatric induction techniques, inhalation, intravenous, and sedation
   - Ages difference in volume of distribution, pharmacokinetics, pharmacodynamics, and toxicity

j) Pain management
   - Options of regional and neuraxial analgesia, and ultrasound guidance
   - Multimodal analgesic techniques
   - Differences in performing epidural blocking in children vs. adults

k) Anesthesia equipment
   - Equipment specific to patient age and circuit ventilators
   - Mask sizes, ETT, LMA, laryngoscopy blades, bronchoscope, and GlideScope
   - Vascular access and invasive monitoring
   - Regional block equipment
   - Warming devices

The resident will acquire the knowledge and understanding of coexisting disease in pediatric patients to aid providing anesthetic care for children.

a) Full-term infants, former preterm infants and healthy children and adolescents presenting for common surgical procedures. The anesthetic management of neonates and premature infants.

b) Cardiovascular disease (ASD, VSD, PDA, TOF) and repaired simple lesions:

- Cardiomyopathy
- Heart transplant recipients
- Complex congenital heart disease (e.g. transposition of the great vessels, truncus arteriosis, single ventricle physiology, abnormal pulmonary venous return)
- Postoperative (e.g. Norwood, bicavopulmonary anastomosis, Fontan)
- Obstructive lesion and pulmonary hypertension

c) Respiratory disease

- Upper respiratory tract infections
- Asthma
- Cystic fibrosis
- Obstructive sleep apnea
- Stridor, congenital and acquired (e.g. cystic hygroma, epiglottitis, croup, retropharyngeal abscess)

d) Gastrointestinal disease

- Hepatobiliary disease
- Gastroesophageal reflux
- Feeding disorders

e) Neuromuscular disease

- Hydrocephalus
- Repaired spina bifida
- Cerebral palsy
- Muscular dystrophy
- Mytonic dystrophy
- Seizures disorders and developmental delay

f) Infections

- Hepatitis, tuberculosis, HIV

g) Endocrine and metabolic

- Diabetes
- Thyroid
- Obesity
- Mitochondrial disease, mucopolysaccharidosis, lactic acidosis

h) Hematological/malignancies

- Anemia (e.g. sickle cell disease, thalassemia)
- Bleeding disorders (e.g. hemophilia, Von Willebrand disease)

- Malignancies
- Mediastinal masses

i) Common syndromes
- Down syndrome
- Other syndromes (e.g. Pierre Robin sequence, Crouzon syndrome, Goldenhar syndrome, Treacher Collins syndrome)

j) Preterm infant and neonate
- Tracheoesophageal fistula repair, omphalocele, gastroschisis, congenital diaphragmatic hernia
- Bowel obstruction, necrotizing enterocolitis, duodenal atresia, malrotation, volvulus, imperforate anus

k) Term infant
- Hernia
- Pyloromyotomy

l) General surgery
- Appendectomy
- Cholecystectomy
- Thoracic surgery and thoracoscopy, including the need for lung isolation

m) Otolaryngology
- Tonsillectomy and adenoidectomy, including post-tonsillectomy bleed
- Myringotomy, mastoidectomy
- Thyroidectomy typmpanoplasty
- Laryngoscopy for diagnosis and treatment, airway papilloma, epiglottitis
- Bronchoscopy, removal of foreign body from the airway
- Laryngeal/tracheal reconstruction
- Neonatal airway surgery

n) Orthopedic surgery
- Fracture reduction
- Soft tissue surgery
- Club foot repair
- Congenital/acquired (e.g. cerebral palsy)
- Spinal surgery

o) Plastic surgery
- Cleft lip/palate, isolated
- Burn debridement/skin grafting

- Craniofacial reconstruction surgery

p) Neurosurgery

- V–P shunt insertion, revision
- Tumor resection
- Raised ICP
- Myelomeningocele repair
- Neonatal V–P insertion

q) Urology

- Circumcision, hypospadia
- Ureteric reimplantation
- Cystroscopy, nephrectomy
- Renal transplant vs. bladder exstrophy repair

r) Ophthalmology

- Strabismus
- Cataract
- Laser for retinopathy of prematurity

s) Cardiac procedures

- Pacemaker insertion
- Cardiac catheterization
- PDA ligation

t) Dental surgery

- Dental extraction/restoration
- Orthognathic surgery

u) Remote locations

- Radiology (MRI/CT) and angio-suite
- Cardiac catheterization
- Radiation and chemotherapy

v) Perioperative/PACU issues

- Delirium
- Postextubation stridor
- Pain
- Laryngospasm
- Nausea and vomiting

w) Regional

- Perform single shot caudal blocks, ilioinguinal and dorsal penile blocks
- Neuroaxial technique and ultrasound-guided regional blocks

2. Communicator

The provision of anesthesia in the pediatric setting is unique as the healthcare provider must be able to communicate in an appropriate and age-specific manner with the patient and their parents/legal guardians as well as other members of the healthcare team. The resident must be able:

a) To apply knowledge of age-specific psychological concerns of pediatric patients with respect to anesthesia and surgery and the ability to respond to these concerns at an age-appropriate level.

b) To establish a therapeutic relationship with both pediatric patients and parents, emphasizing understanding, trust, empathy and confidentiality.

c) To elicit and synthesize relevant information from the patient and family and be able to assess and take into account, the impact of the child's age, gender, ethno cultural background, social supports, and emotional influences on illness and preoperative clinical course.

d) To discuss appropriate information with the child, family and other healthcare provider, surgeons and nursing staff to facilitate the optimal management plan for the care of the patient. This should include discussion of anesthetic procedures, options and risk, answering questions and decreasing anxiety.

e) To communicate a succinct assessment and perioperative anesthetic management plan to the attending staff.

f) To participate in pediatric anesthesia rounds in order to continue to develop formal communication skills involved in a presentation of a topic and response to questions from peers.

3. Collaborator

The successful delivery of perioperative care requires the effective collaboration of the anesthetist, surgeon, nurses, other trainees, respiratory technicians, anesthesia adjunct personnel and aides. The resident must be able:

a) To consult with other physicians and healthcare professionals and demonstrate appropriate judgment regarding the assessment of pediatric anesthetic risk.

b) To coordinate the care of pediatric patients with other members of the OR team, especially surgeons and nurses as well as staff in the ICU, ward and PACU and in offsite locations such as radiology and the cardiac catheterization laboratory.

c) To manage urgent and crisis situations such as hemodynamic or respiratory instability and cardiac arrest as a team member or leader.

4. Manager

a) To demonstrate efficient use of time regarding, patient assessment, OR setup, anesthesia induction, transfer to PACU or ICU, and OR turnover.

b) To demonstrate the ability to make judgments regarding the cost-effective use of anesthesia resources in drug and equipment options and monitoring.

c) To demonstrate awareness of the principles and priorities for patient scheduling, OR lists (elective and emergent) and ICU/PACU/ward care postoperatively.

d) To manage assigned rooms with regards to maintaining the schedule or changing the schedule in response to emergencies and additional cases.

e) To manage after hours scheduling of cases, including prioritization and adapting to changes.

5. Scholar

a) To develop and implement a personal continuing education strategy.

b) To demonstrate the ability to critically appraise current anesthesia literature and apply new knowledge based on appropriate evidence.

c) To perform effective oral presentation of case reports, journal club, or rounds with synthesis of pertinent information.

d) To demonstrate the ability to formulate questions for ongoing appraisal.

e) To effectively teach medical students or other residents.

6. Health Advocate

a) To demonstrate knowledge and recognition of broad health and societal issues with impact on anesthetic care of the pediatric surgical patient, including severe maternal chronic disorders (e.g. maternal malnutrition, hemoglobinopathies), child abuse, maternal and adolescent drug/alcohol abuse, and safety promotion (e.g. seat belt and helmet use).

b) To demonstrate knowledge of safe anesthesia working practices such as effective anesthesia gas scavenging and appropriate handling of narcotics.

7. Professional

a) To deliver anesthesia care with integrity, honesty and compassion.

b) To demonstrate the attitude, behaviors and ethical standards expected of a practitioner of anesthesia.

c) To be aware of the ethical and legal aspects of pediatric patient care.

d) To recognize personal limits through appropriate consultation with staff, other physicians and other health professionals and show appropriate respect for those consulted.

e) To demonstrate respect for patients by including the patient and family in discussions of care management.

f) To recognize potential conflicts in patient care, professional relationships and value systems, and to demonstrate the ability to discuss and resolve differences of opinion.

g) To be able to accept constructive feedback and criticism and implement appropriate advice.

INTENSIVE CARE

Duration: Six months (2 months during junior residency + 4 months during senior residency)

The resident will be involved in patient care in a surgical, medical or multi-disciplinary intensive care unit depending on the design of the healthcare facility. The resident will be supervised by a senior physician and will be involved in the night duty schedule. The resident is expected to gain the skills involved in managing critically ill surgical and medical cases.

The resident will be able to understand the principles in basic and advanced work in the intensive care, formulate a management plan and understand the dynamics of decision making in situation where code status of patient should be decided.

According to the local hospital policy, the resident may be a member of the cardiac arrest team and a member of the trauma team.

Objectives:

1. Medical Expert

General objectives:

- To demonstrate diagnostic and therapeutic skills for ethical and effective patient care.
- To access and apply relevant information to clinical practice.
- To follow protocols implemented in the unit and adhere to established unit standards.

Specific objectives:

- To elicit, present, and document a history that is relevant, concise, accurate and appropriate to the patient's problem(s).
- To perform, interpret the findings of, present, and document a physical examination that is relevant and appropriate.
- To select medically appropriate investigative tools, interpret the results of common diagnostic tests, and demonstrate an understanding of their cost effectiveness, limitations and complications.
- To formulate a comprehensive patient problem list, synthesize an effective diagnostic and therapeutic plan, and establish an appropriate follow-up plan.

Specific ICU items:

- To recognize common rhythm disturbances.
- To interpret blood gases and assess acid–base status.

- To provide basic ventilator orders for most patients.
- To classify shock and outline hemodynamic patterns.
- To be aware of the ethical principles appropriate to critically ill patients.
- To be familiar with airway management and indications for intubation.
- To use inotropes and vasopressors appropriately.
- To interpret an electrocardiogram and recognize important life-threatening findings.

Specific skills:

- To apply basic airway management skills (bag/mask ventilation and uncomplicated intubation).
- To place central line with appropriate technique (e.g. using US guidance).
- To place arterial line with appropriate technique (e.g. using US guidance)
- To be familiar with indication and interpretation of TEE.
- To understand the principles of ACLS and to apply them in patient resuscitation.

2. Communicator

General objectives:

- To establish a professional relationship with patients and families.
- To obtain and gather relevant history from patients and families.
- To discuss appropriate information with patients and families and other members of the healthcare team.

Specific objectives:

- To demonstrate consideration and compassion in communicating with patients and families.
- To provide clear, concise and timely verbal and written communication as applied to progress notes, sign over of patient care, and discharge planning.
- To communicate with patients and families regarding informed consent, medical condition, plan of treatment, prognosis, secondary prevention, adverse events, medical uncertainty, medical errors, autopsy, and organ donation.
- To communicate with other healthcare professionals regarding all aspects of patient care.

Specific ICU items:

- To personally examine and review each of the assigned patients before morning rounds.
- To present the history and physical findings of critically ill patients to the attending physician in an organized and concise manner.

- To identify problems in a critically ill patient and generate a problem list.
- To write daily progress notes on assigned patients. The notes are expected to be clear and should identify the relevant daily events and issues for each patient.
- To outline a plan to address the problems identified for each patient.

3. Collaborator

General objectives:

- To consult effectively with other physicians and healthcare professionals.
- To contribute effectively to other interdisciplinary team activities.

Specific objectives:

- To develop an ability to work effectively and harmoniously with other healthcare workers.
- To identify and describe the role, expertise and limitations of all members of an interdisciplinary team required to optimally achieve a goal related to patient care, a research problem, an educational task, or an administrative responsibility.
- To effectively participate in interdisciplinary rounds, demonstrating the ability to accept, consider and respect the opinions of other team members, while contributing personal specialty-specific expertise.

4. Manager

General objectives:

- To use personal resources effectively in order to balance patient care, continuing education, and personal activities.
- To allocate finite healthcare resources wisely.
- To work effectively and efficiently in a healthcare organization.
- To use information technology to optimize patient care and lifelong learning.

Specific objectives:

- To use appropriate time management for effective patient care, administrative duties, and scholarly activities.
- To implement patient care practices considering available healthcare resources.
- To complete the tasks discussed on rounds in a timely manner.
- To seek help appropriately and appreciate personal limitations.

5. Health Advocate

General objectives:

- To identify the important determinants of health.
- To contribute effectively to improved health of patients and communities.
- To recognize and respond to those issues where advocacy is appropriate.

Specific objectives:

- To educate patients and families about and promote the importance of long-term healthy behaviors and preventive healthcare (e.g. smoking cessation, screening tests, vaccinations, exercise, nutrition).
- To respect and empower patient autonomy.
- To promote fair healthcare.
- To apply the principles of quality improvement and quality assurance.
- To appreciate the existence of global health advocacy and initiative for elimination of disease (tuberculosis, malaria, HIV), and the role of advocacy groups and funding agencies.

6. Scholar

General objectives:

- To develop, implement, and monitor a personal continuing education strategy.
- To critically appraise sources of medical information.
- To facilitate learning of patients, students, and other healthcare professionals.

Specific objectives:

- To read around their cases and recognize gaps in knowledge.
- To be aware of the medical literature available, and to understand how to search and critically appraise the medical literature.
- To demonstrate the ability to teach medical students, residents, patients, and other healthcare professionals.

7. Professional

General objectives:

- To deliver the highest quality care with integrity, honesty and compassion.
- To exhibit appropriate personal and interpersonal professional behaviors.

- To practice medicine ethically consistent with the obligations of a physician.

Specific objectives:

- To exhibit appropriate personal and interpersonal professional behaviors. This includes keeping attending physicians appraised of relevant events, interacting appropriately with the nursing staff, and being available to the unit when needed while on call.
- To recognize, analyze and attempt to resolve in clinical practice ethical issues such as truth telling, consent, advanced directives, confidentiality, end-of-life care, conflict of interest, resource allocation, research ethics, and interactions with the pharmaceutical industry.
- To recognize and know how to deal with unprofessional behaviors in clinical practice, taking into account local and provincial regulations.
- To evaluate one's abilities, knowledge and skills, to recognize one's limitations, and to use appropriate strategies to maintain and advance professional competence.
- To know and understand the professional, legal and ethical codes to which physicians are bound.

CARDIAC ANESTHESIA

Duration: Three months during senior residency

The Cardiac Anesthesia rotation is designed to give residents an appreciation of the issues involved in the management of anesthesia for cardiac surgery sufficient to participate in the perioperative care of these patients.

The resident is expected to become competent in the management of patients with cardiovascular diseases perioperatively during this rotation. It is not intended to produce anesthesiologists capable of independently managing anesthesia for cardiac surgery.

Objectives:

1. Medical Expert/Clinical Decision Maker

The resident will demonstrate knowledge of the basic sciences as applied to the preoperative, intraoperative, and postoperative periods of cardiac surgery.

A. Physiology and Anatomy

The resident is expected:

a) To describe the normal coronary anatomy and variants, normal cardiac physiology, and the effects of disease states on the normal physiology.

b) To describe the anatomy and physiology of cardiac valves, left ventricle, right ventricle, atrial, major cardiac vessels, and circulatory system in both normal and diseased states.

c) To describe the normal conduction pathways of the heart and its clinical significance in disease.

d) To describe the embryologic circulation, development of the heart, and fetal physiology as it applies to adult congenital heart disease.

e) To describe the altered respiratory physiology of the immediately postoperative ventilated patient with significant surgical incisions and pain (sternotomy, large abdominal incision).

f) Describe common physiological changes occurring in the postoperative period and the impact these have on end organ function (neurologic, renal, cardiac, hepatic, gastro-intestinal).

B. Pharmacology

The resident should know:

a) Commonly prescribed medications for cardiac surgical patients, the implications for disease, and the impact on anesthetic management.

b) Commonly used cardiac anesthetics and dosages.

c) Heparin, antiplatelet agents, and anesthetic implications.

d) Protamine for heparin reversal, along with side effects and complications.

e) Antifibrinolytic agents, mechanisms of action, and indications.

f) The use of blood products (PRBC, FFP, platelets, cryoprecipitate) and blood alternatives (albumin, starch) as well as transfusion reactions and complications.

g) Coagulation drugs (DDAVP, activated factor 7a), their indications, contraindications, dosages, and complications.

h) Commonly used vasodilators, vasoconstrictors, inotropic agents, and their indications, dosages, and side effects.

i) The appropriate use of pain medications, non-steroidal anti-inflammatory drugs and regional anesthetic techniques in cardiac surgical patients.

j) Pharmacology of perioperative risk reduction strategies (lipid lowering agents, β-blockers, aspirin).

C. Monitoring

The resident is expected:

a) To interpret ECG for ischemia, infarction, arrhythmias, and paced rhythms, and to recognize the limitations and the sensitivity/specificity of ECG as an ischemia monitoring tool.

b) To demonstrate the principles of noninvasive and invasive blood pressure monitoring and its pitfalls.

c) To acquire skills of arterial and central venous cannulation (with ultrasound), peripheral venous cannulation, and pulmonary artery catheterization.

d) To interpret CVP and data from PA catheter (PAP, PCWP, Cardiac output) and know it indications, complications, and management.

e) To understand the basics of introductory TEE, including techniques of probe insertion and several basic views, and its implication and application to the critically ill patient.

f) To understand laboratory monitoring of the coagulation system (PTT, INR, fibrinogen) as applied to the cardiac patient.

g) To assess the adequacy of mechanical ventilation using clinical parameters and laboratory arterial blood gas analysis.

h) To recognize the parameters used to assess intraoperative blood loss and options to treat blood loss including medical and surgical alternatives.

i) To know the significance of temperature management in the intraoperative period, including hypothermic techniques and the importance of normothermia during beating heart procedures.

j) To understand the indicators of volume status, especially when weaning from bypass, and including the findings from invasive monitors, TEE, and clinical indicators (urine volume).

i) To use appropriate intraoperative blood work for the management of patient care, and be aware of new monitoring devices (noninvasive CO, BIS) and their potential applications during cardiac surgery.

D. Clinical Assessment & Management

The resident is expected:

a) To complete a detailed history, physical exam, order appropriate laboratory and ancillary investigations, and provide a management plan for a cardiac surgical patient.

b) To know current indications and recommendations for SBE prophylaxis.
c) To manage medical bleeding.

d) To correct common derangements in metabolic and electrolyte disturbances in the intraoperative period.

e) To know the basic principles of cardiac support devices including IABP and extracorporeal membrane oxygenation.

f) To know the common pathophysiology and management of patients with complications of:

- Coronary artery disease, acute myocardial ischemia and infarction, complications of myocardial infarction and thrombolytic therapy
- Valvular heart disease and valve replacement or repair
- Aortic dissection, thoracic and thoracoabdominal aortic aneurysm
- Shock and the use of volume resuscitation, venodilators/constrictors, inotropes, and lusitropes
- Emergencies requiring ACLS
- Cardiac tamponade, constrictive pericarditis
- Dilated, restrictive and obstructive cardiomyopathy, CHF, and diastolic dysfunction
- Aberrant conduction, dysrhythmia, sudden acute and subacute ventricular and supra-ventricular arrhythmia
- Pacemakers and the indications for and applications of the various modes of temporary pacing
- Pneumohemothorax
- Pulmonary edema, pneumonia, CHF
- COPD, asthma, sleep apnea in the ventilated patient
- Heparin-induced thrombocytopenia and heparin resistance
- Neurologic risk stratification during CPB procedures
- Renal failure and its management
- Diabetes and endocrine control, and the implications of hyperglycemia

2. Communicator

a) To demonstrate effective communication with patients and families (description of procedures, informed consent, anesthetic options and risks).

b) To demonstrate effective communication with OR team (cardiac surgeons, nurses, perfusionists) and postoperative team, particularly during the initiation conduct and removal of cardiopulmonary bypass.

c) To provide clear and concise written consultation and anesthetic records.

3. Collaborator

a) To recognize the need to utilize other specialists for the care and management of the critical patient.

b) To foster healthy team relationships.

4. Manager

a) To manage OR time by efficiently conducting the anesthetic, continuing education, and personal activities.

b) To make effective use of healthcare resources.

5. Health Advocate

a) To demonstrate the use of risk reduction strategies, including use of ultrasound and sterile technique for invasive lines.

6. Scholar

a) To demonstrate commitment to continuing personal education including use of information technology.

b) To be able to critically review cardiac anesthesia literature and to describe the principles of research relevant to this population.

c) To assist in education of other members of the OR team.

7. Professional

a) To always demonstrate respectful and compassionate behavior toward patients, their families, and other healthcare providers.

b) To demonstrate an appropriate sense of responsibility to themselves and their patients.

c) To remain calm and organized in stressful or emergency situations.

d) To demonstrate appropriate interactions with colleagues and staff.

REGIONAL ANESTHESIA

Duration: 1–2 months

The aim of this rotation is to provide the resident with an extended exposure for the attainment of a higher level of competence in various regional anesthesia techniques. This rotation is intended to gain procedural mastery under the supervision of qualified regional anesthesiologists.

1. Medical Expert/Clinical Decision Maker

The resident should demonstrate the understanding of anatomy, physiology, and pharmacology. The resident should demonstrate knowledge acquisition in the following areas:

a) Anatomy related to specific regional anesthesia technique including surface landmarks, perineural structure, ultra sound anatomy, sensory innervation, motor innervation, and components and details of brachial plexus, lumbar plexus, and sacral plexus.

b) Physiology related to specific regional anesthesia techniques and disease processes, including nerve transmission/blockade, physiologic response to acute pain, and the patient with chronic pain at the site of surgery.

c) Pharmacology of local anesthetics, adjuvants (e.g. epinephrine, opioids, HCO_3), chronic opioid use in the patient presenting for surgery.

d) Regional anesthesia equipment including needles, peripheral nerve stimulator, ultrasound, catheters, and stimulating catheters.

e) Complications/side effects, including: IV toxicity and management of local anesthetic overdose, neural injury, needle trauma to surrounding tissue (i.e. hematoma, pneumothorax, dural puncture), unintended neural blockade (i.e. phrenic nerve, epidural).

f) Contraindications related to specific regional anesthesia techniques including infection, anticoagulation, pre-existing neural injury, increased ICP, and pulmonary disease.

g) To perform/assist the following procedures:
   - IV regional
   - Spinal anesthesia

- Epidural anesthesia/analgesia
  - Thoracic
  - Lumbar
  - Caudal
- Cervical plexus block
- Brachial plexus block
- Interscalene
  - Supraclavicular
  - Axillary
  - Infracalvicular block
- Intercostal, intrapleural block
- Paravertebral block, thoracic and lumbar
- Lower limb blocks
  - Femoral
  - Sciatic
  - Obturator
  - Lateral femoral cutaneous
  - Ankle block

The resident must be aware of the need to provide preoperative (ability to identify by history, physical examination and lab data the appropriateness of conduction anesthesia) and postoperative care in an objective manner. The resident will actively seek access to surgical procedures appropriate for conduction anesthesia. Assistance from the assigned anesthesiologist or a resource person should be obtained.

The minimal learning objectives include:

a) Anatomy
   - Anatomy for different blocks.

b) Physiology
   - Nerve conduction (structural classification of nerve type and relevance to local anesthetics action, generation of action potential, refractory period and recovery).
   - Neuroaxial block (differences and similarities between spinal and epidural blockade with respect to mechanism of action, effects of adjuvants and cardiorespiratory physiology, effects on cardiorespiratory system, effects on coagulation, neurohormonal stress response, effects on intraoperative blood loss, effects on postoperative respiratory).
   - Neuroendocrine stress response (systems affected by the stress response).

c) Pharmacology

- Mechanism of action of local anesthetics.
- Structure–activity relationship (e.g. describe the difference between amide and ester LA and understand the physiochemical properties of potency, protein binding, pKa and pH).
- Kinetics (e.g. describe drug, patient and technical factors contributing to accelerate recovery from local anesthetics as well as describe the determinants of serum LA concentration, its measurement and the role of protein binding).
- Adjuvants e.g epinephrine, bicarbonate, opioids and NMDA antagonists.
  List clinical indications, advantages and disadvantages of inclusion of adjuvants in spinal, epidural, regional and local infiltration.

d) Technology
   To demonstrate an understanding of the technology available for identification of nerves for performance of plexus blocks and peripheral nerve blocks as well as epidural space detections.

- Nerve stimulation
  - To describe the rationale of nerve stimulation.
  - To describe the advantages, disadvantages and limitations of nerve stimulators.
  - To know different types of needles (insulated vs. noninsulated).
  - To demonstrate how to use a nerve stimulator.

- Ultrasound
  - To describe the basic physic principles of ultrasound and their clinical relevance in locating different anatomical structures.
  - To describe the advantages, disadvantages and limitations of ultrasound in locating nerves.
  - To select appropriate ultrasound probe and machine settings to properly identify the desired structures.
  - To know different types of techniques (in-plane vs. out-of-plane).

e) Clinical Application
   To demonstrate an ability to perform the following specific objectives for all regional anesthetic techniques.

- Anesthetic planning
  - To elaborate an anesthetic plan including appropriate options, contingency plans and expansions.
  - To select regional anesthetic techniques for anesthetic care.
  - To discuss the advantages, disadvantages and physiological implications of regional anesthesia with patients.

- To discuss regional anesthesia + GA vs. GA vs. regional anesthesia.
- To know regional techniques in pediatrics.

- Nerve localization
  - To describe anatomic landmarks for performance of blocks.
  - To use a nerve stimulator or ultrasound for identification of plexuses and peripheral nerves.

f) Contraindications and complications
   - To know relative and absolute contraindications.
   - To describe guidelines for regional anesthesia for patient taking anticoagulant drugs, and to interact with surgeon and administrators to create policies governing the interaction of anticoagulant therapy and anesthetic/analgesic management.
   - To be aware of the complications of regional anesthesia.
   - To describe the complications of regional anesthesia and the risk factors, presentation, diagnosis and treatment of:
     - Failed block
     - Intravascular injection of LA
     - Systemic toxicity
     - Total spinal
     - Over dosage
     - Epidural hematoma and abscess
     - PDPH
     - Hypotension

g) Spectrum of Anesthesia

The resident should demonstrate an understanding of the spectrum of regional anesthetic techniques and the ability to perform those relevant to his/her level of training. The resident must be able to describe site-specific equipment, contraindications and to select drugs for each block.

The resident must demonstrate competency and cognitive knowledge by oral and/or written examination on the following topics:

- IV regional
- Spinal anesthesia
- Epidural anesthesia/analgesia
  - Thoracic
  - Lumbar
  - Caudal
- Cervical plexus block
- Brachial plexus block
- Interscalene

        - Supraclavicular
        - Axillary
        - Infracalvicular block
    - Intercostal, intrapleural block
    - Paravertebral block, thoracic and lumbar
    - Lower limb blocks
        - Femoral
        - Sciatic
        - Obturator
        - Lateral femoral cutaneous
        - Ankle block

2. Communicator

a) To demonstrate effective communication skills in dealing with the patient's problems.

b) To demonstrate respect and compassion, be able to communicate that the patient's problems have been understood, and describe options, side effects and complications of various anesthetic options in a manner such that the patient can make an informed decision regarding choice of anesthesia.

c) To accurately provide information to families on patient condition and treatment prognosis.

d) To make decisions when the family must be relied upon for substitute decision-making when the patient is incapable of deciding for himself or herself.

3. Collaborator

a) To demonstrate a professional attitude and competent manner when acting as a consultant as well as be able to consult other disciplines when appropriate.

b) To involve the attending anesthesiologist in the room and the surgeon in all decisions pertaining to a patient's postoperative analgesia management plans.

4. Manager

a) To demonstrate responsibility in providing consultations and interventions in a timely manner.

b) To be aware of the monitoring requirements of various regional techniques according to the standard guidelines

c) To be aware of the cost of various treatment modalities and the necessity of allocating resources appropriately.

d) To be aware of the value of quality assurance, and morbidity and mortality review.

5. Health Advocate

The resident should demonstrate an ability to provide appropriate information to the patients and/or their family so they can make an informed decision (and obtain consent) regarding regional anesthesia as:

- A primary anesthetic technique.
- A component of intra- and postoperative analgesia.
- Dealing with adverse outcomes.

6. Scholar

To critically evaluate and understand outcome studies related to the influence of regional anesthesia on outcome postoperatively.

7. Professional

a) To demonstrate appropriate behaviors and attitude towards patients, their families, and all healthcare providers (i.e. the anesthesiology team, the surgical team, the nursing staff).

b) To respond to calls from the PACU when they are needed for acute pain issues.

c) To provide appropriate handover to residents on-call at the end of the day.

PAIN MEDICINE

Although perioperative pain management is a daily task for any anesthesiologist, the resident will devote time to pain management, being acute or chronic, nociceptive or neuropathic, in inpatient or outpatient settings.

At the completion of training, the resident will have acquired the following competencies and will function effectively as:

1. Medical Expert/Clinical Decision Maker

General objectives:

a) To demonstrate knowledge of anatomy and physiology of pain pathways in the peripheral and central nervous system.

b) To understand the role of psychological factors, particularly anxiety and depression, on pain perception and disability.

c) To obtain a complete pain history and perform a relevant physical examination.

d) To formulate a differential diagnosis and treatment plan, which incorporates pharmacologic and non-pharmacologic modalities of treatment.

e) To demonstrate knowledge of specific diagnostic/treatment modalities (indications, contraindications, complications, and techniques).

f) To demonstrate knowledge of chronic pain medication (opioids, antiinflammatory drugs, anticonvulsants, antidepressants).

g) To be aware of national practice guidelines for chronic pain management, especially in relation to controlled medications.

h) To demonstrate knowledge of basic interventional techniques commonly employed in chronic pain medicine including: peripheral nerve blocks, sympathetic blockade for upper & lower extremity, trigger point injections, epidural steroid injections, blocks for diagnosis and treatment of the facet joint syndrome, and sacroiliac joint injections.

i) To be aware of effective use of consultation services in chronic pain management.

j) To demonstrate knowledge of basic legal, social, and bioethical issues encountered in chronic pain management, including informed consent.

Specific objectives:

Acute pain management:

a) To describe the physiologic changes producing and induced by perioperative pain.

b) To assess pain in the perioperative period.

c) To describe the options available for perioperative analgesia, their advantages and disadvantages, and select appropriate therapies for each individual patient.

d) To use a multimodal approach by utilizing both pharmacological and nonpharmacological modalities.

Chronic pain management:

The resident should be able to apply knowledge gained in the treatment of the following specific pain disorders:

- Complex regional pain syndrome
- Neuropathic pain syndromes (i.e. peripheral diabetic neuropathy, postherpetic neuralgia)
- Central pain syndromes
- Intractable anginal pain
- Visceral pain
- Pelvic pain
- Headaches
- Pain related to peripheral vascular insufficiency
- Role of personality disorders, anxiety states, depression, compensation and disability

2. Communicator

a) To establish a professional relationship with patients and families.

b) To obtain and collate relevant history from patients and families.

c) To listen effectively.

d) To demonstrate appropriate oral and written communication skills in inpatient, outpatient, and OR environments.

e) To inform the patient of the options available, the associated risks and benefits, as well as the expectations and progress in a manner that is understandable to the patient.

3. Collaborator

a) To consult effectively with other physicians and healthcare professionals.

b) To demonstrate an understanding of the respective abilities of all team members.

c) To be able to be team player.

4. Manager

a) To demonstrate basic knowledge of the management of an ambulatory care pain clinic.

b) To use information technology to optimize patient care and lifelong learning.

c) To demonstrate knowledge of quality assurance to outcomes in a chronic pain clinic.

d) To demonstrate effective time management skills.

e) To demonstrate understanding of:
- The structure of the pain service, and how it fits in the administrative structure of the institution.
- The advantages and disadvantages of alternative models.
- The costs incurred by pain management strategies.

5. Health Advocate

a) To identify the important determinants of health affecting pain patients.

b) To recognize opportunities for anesthesiologists to advocate for resources for pain management.

c) To educate both patients, and families about their pain conditions, as well as other members of the healthcare team.

6. Scholar

a) To critically appraise sources of information in the pain management literature.

b) To be able to judge whether a research project is properly designed using critical appraisal methods.

7. Professional

a) To deliver the highest quality of care with integrity, honesty, and compassion.

b) To exhibit appropriate personal and interpersonal professional behaviors.

c) To practice medicine ethically, consistent with the obligations of a physician.

d) To include the patient in discussions concerning appropriate diagnostic and management procedures.

e) To respect the opinions of fellow consultants and referring physicians in the management of patient problems and be willing to provide means whereby differences of opinion can be discussed and resolved.

f) To establish a pattern of continuing development of personal clinical skills and knowledge through medical education.

g) To recognize and have an approach to ethical and psychosocial issues in pain medicine.

VASCULAR ANESTHESIA

Objectives:

To allow the resident to acquire particular intellectual skills necessary to care for high-risk vascular patients.

1. Medical Expert/Clinical Decision Maker

a) To demonstrate knowledge of general internal medicine, anatomy, physiology and pharmacology with particular reference to the cardiovascular, respiratory, hepatic, renal and coagulation systems, blood transfusion, acid–base, fluid and electrolyte balance.

b) To demonstrate knowledge of the principles and practice of anesthesia as they apply to patient support during vascular surgery.

c) To demonstrate competence in BLS, ACLS and ATLS.

d) To demonstrate knowledge and competence in the anatomy, physiology, and pathophysiology of the peripheral circulation.

e) To know the epidemiologic, medical, and surgical aspects of vascular disease (pathophysiology of atherosclerosis, natural history of patients with peripheral vascular disease, medical therapy of atherosclerosis).

f) To perform the preoperative evaluation and preparation of the vascular patient:
- Clinical predictors of increased perioperative CVS risk, type of surgery, ACC/AHA guidelines on perioperative cardiovascular evaluation care of patients undergoing noncardiac surgery, assess and optimize coexisting disease (coronary artery disease, heart failure, cardiac valvular disease, diabetes mellitus, COPD and tobacco abuse, renal failure, cerebrovascular disease), coronary revascularization before noncardiac surgery risks vs. benefits, PTCA and stenting before noncardiac surgery Implications and optimal timing of noncardiac surgery after PTCA and stenting.

g) To know the pharmacological agents used in vascular patients (nitrates, β-adrenergic receptor antagonists, ACE inhibitors, angiotensin II receptor antagonists, digoxin, loop and thiazide diuretics, spironolactone, calcium channel blockers, clonidine, hydralazine, insulin and oral hypoglycemic, cholesterol lowering agents, epinephrine and norepinephrine, dopamine and dobutamine, milrinone, vasopressin, heparin, low-molecular-weight heparin, anticoagulants).

h) To know the etiology and prevention of perioperative myocardial ischemia:
- Perioperative stress response and risk of myocardial ischemia
- Perioperative medical management of coronary artery disease: nitrates, adrenergic blockade (2-agonists, calcium channel blockers, statins, ACE inhibitors)

i) To understand perioperative renal protection (cardiac performance and perfusion pressure, fluid management, mannitol, *N*-acetylcysteine, fenoldopam).

j) To consider hematologic parameters in vascular surgery (normal hemostasis, laboratory evaluation, congenital bleeding disorders, acquired bleeding disorders, platelet defects, hypercoagulable states and venous thrombosis), antithrombin III deficiency, protein C deficiency, protein S deficiency, defects in fibrinolysis, venous thrombosis, anticoagulant therapy, heparin, LMWH and heparinoids, Coumadin, platelet inhibitors, herbal therapy, thrombolytic therapy, pentoxifylline (procoagulant therapy), tranexamic acid, desmopressin (intraoperative blood loss and replacement, postoperative bleeding and reoperation).

k) To perform monitoring during vascular anesthesia electrocardiography arrhythmias, conduction defects, myocardial ischemia (three electrode system, modified three electrode system, five electrode system, pulse oximetry, capnometry, noninvasive blood pressure monitoring, body temperature, invasive hemodynamic monitoring.

l) To understand the advantages, indications, contraindications and complications of the following: arterial pressure monitoring, CVP monitoring, pulmonary artery catheterization, cardiac output, TEE.

m) To understand abdominal aortic reconstruction etiology, epidemiology and pathophysiology of AAA and aortoiliac occlusive disease, natural history and surgical mortality, pathophysiology of aortic occlusion and reperfusion (cardiovascular changes, renal hemodynamics and renal protection, humoral and coagulation profile, visceral and mesenteric ischemia, central nervous system and spinal cord ischemia and protection).

n) To demonstrate knowledge in the following topics:

Clamp level: infrarenal, suprarenal, supraceliac
- Anesthetic management: autologous blood transfusion, anesthetic drugs and techniques, thoracic epidural
- Thoracoabdominal aortic aneurysm surgery etiology and preoperative preparation and monitoring
- Classification of TAAA's

- Morbidity and mortality
- Neurologic complications: anatomy and blood supply of spinal cord, artery of Adamkiewicz, cerebrovascular accidents, spinal cord infarction, paraplegia, Crawford's classification of TAAA's and incidence of paraplegia
- Spinal cord protection
- Renal ischemia and protection
- Coagulation and metabolic management
- One lung ventilation
- Anesthetic management

Endovascular aortic repair

- Stents: graft devices and approval
- Patient selection
- Preoperative diagnostic imaging of aneurysm, surrounding anatomy and device sizing
- Endovascular technique for EVAR and TEVAR
- Anesthetic management: regional vs. GA
- Indications for CSF drainage in TEVAR
- Complications (damage to access vessels, endoleaks, graft migration, renal ischemia, paraplegia, stroke, aortoesophageal fistula, conversion to open)
- Patient outcomes: open vs. endovascular

o) To demonstrate knowledge in lower extremity revascularization epidemiology and natural history of peripheral vascular disease, pathophysiology of atherosclerosis, medical therapy for atherosclerosis and complications of medical therapy, chronic medical problems and risk prediction in peripheral vascular disease patients, acute arterial occlusion, chronic arterial occlusion, surgical management, preoperative preparation and monitoring, regional versus general anesthesia, neuraxial anesthesia and agents affecting hemostasis, risk of spinal or epidural hematoma, anesthetic management, postoperative considerations.

p) To demonstrate knowledge in carotid endarterectomy, surgical indications, perioperative cardiovascular morbidity and mortality, preoperative evaluation, anesthetic management:

- GA vs. regional anesthesia vs. local anesthesia: advantages and disadvantages of each
- Superficial and deep cervical plexus block
- Neurologic monitoring and cerebral perfusion, neurologic assessment of awake patient, assessment of cerebral blood flow, cerebral electrical activity electroencephalography ± computer processing steps, cerebral oxygenation, jugular venous oxygen saturation, cerebral oximetry postoperative considerations, neurologic injury, postoperative hyperperfusion syndrome blood pressure liability, cranial nerve and

carotid body dysfunction, airway and ventilation problems, cardiac ischemia/MI

- Endovascular treatment of carotid disease: carotid angioplasty and stenting

q) To demonstrate knowledge in postoperative management of vascular patients, including postoperative pain management:

- Mechanical ventilation and invasive monitoring in ICU complications, including: complications of invasive monitoring, complications of the surgical procedure, respiratory complications (risk factors, pulmonary disease, cardiac disease, emergency surgery)
- Technical skills
- Proficiency in the provision of thoracic epidural analgesia for upper abdominal and thoracic surgical procedures
- Airway management for bronchoscopy, one lung ventilation and insertion of spinal drains and CSF monitoring for thoracic aneurysm repair
- Starting large bore intravenous infusions, arterial lines, CVP and PA lines in vascular surgical patients

2. Communicator

a) To demonstrate effective communication with patients and families of description of procedures, informed consent and anesthetic options and risks.

b) To demonstrate effective communication with the OR team (vascular surgeons, nurses and other members of the healthcare team) and postoperative team (ICU, PACU), by providing clear and concise written consultation and anesthetic records.

3. Collaborator

a) To seek perioperative consultation with colleagues when required, and to contribute effectively with other interdisciplinary team activities by demonstrating the ability to function in the clinical environment using the full abilities of all team members.

4. Manager

To manage OR time by efficiently conducting the anesthetic, continuing education and personal activities utilize information technology to optimize patient care and lifelong learning.

5. Health Advocate

To provide patient advocacy for various perioperative issues (i.e., patient safety, analgesia, postoperative monitoring).

6. Scholar

To demonstrate commitment to continuing personal education, be able to critically review vascular anesthesia literature and describe the principles of research relevant to this population, and assist in the education of other members of the OR team.

7. Professional

a) To demonstrate a sense of responsibility, integrity, honesty and compassion when caring for patients.

b) To demonstrate respect for patients and colleagues by delivering the highest quality care to patients, practicing medicine ethically consistent with the obligations of a physician, respecting the opinions of fellow consultants and referring physicians in the management of patient problems, and be willing to provide means whereby differences of opinion can be discussed and resolved.

c) To show recognition of limits of personal skill and knowledge by appropriately consulting other physicians and paramedical personnel when caring for the patient.

NEUROANESTHESIA

Duration: Three months during Senior Residency

Rotations in Neuroanesthesia will provide the resident with a theoretical basis and clinical experience in the anesthetic management of patients undergoing surgical treatment of diseases of the CNS and spine.

This includes the preoperative evaluation, intraoperative management, and postoperative care utilizing the most current medical/anesthetic knowledge.

The clinical experience will provide exposure to a variety of basic and complex procedures in patients with neurologic disease with graded independence and responsibility.

Objectives:

At the end of the Neuroanesthesia rotation, the resident should exhibit the following knowledge, skills and attitudes:

1. Medical Expert / Clinical Decision-Maker

The resident will be able to:

a) Demonstrate knowledge of basic sciences as applicable to neuroanesthesia, including: neuroanatomy, neurophysiology and neuropharmacology.

b) To understand the pathway and physiology of CSF circulation and factors affecting it. Also it is important to know the anatomy of cerebral circulation and factors affecting it and methods for controlling intra-cranial pressure (ICP).

c) Demonstrate basic understanding of the impact of commonly performed neurosurgical procedures on anesthetic management.

d) Demonstrate clinical knowledge and skills necessary for the practice of neuroanesthesia including:

- Preoperative neurological assessment (using Glasgow Coma Scale, Classification for SAH and basic neurological exam).
- Intraoperative support including:
- Special Positioning (sitting, prone, park-bench, lateral and knee-chest).
- Understanding basic principles of neurophysiologic monitoring: EEG, evoked potential (SSEP, BAEP), transcranial Doppler, cerebral oximetry, and intracranial pressure monitoring methods available.

- Specific interventions: systemic arterial hypotension/hypertension, CSF drainage, ICP management, hypothermia and precordial Doppler monitoring for air embolus.
- Management of specific perioperative complications such as seizures, cerebral ischemia, intracranial hypertension, intraoperative aneurysm rupture, air embolism, cranial nerve dysfunction and neuroendocrine disturbance (DI, SIADH).
- Postoperative management of neurological patients in PACU, ICU and the Neuro-Observation Unit.

e) Demonstrate competence in all technical procedures commonly employed in neuroanesthesia practice, including airway management (basic and difficult), cardiovascular and neuroresuscitation, invasive monitoring (arterial line, central line and LP drain placement).

f) Develop and implement a rational anesthetic plan of management for each of the following neurosurgical procedures:
   - Craniotomy for mass lesions (tumor, abscess, hematoma)
   - Cerebrovascular procedures (aneurysm, AVM, carotid vascular disease)
   - CSF shunting procedures
   - Transsphenoidal surgery
   - Stereotactic procedures
   - Awake craniotomy
   - Neuroradiological procedures (embolization, thrombolytic, MRI)
   - Spine surgery

2. Communicator

By the end of this rotation, the resident will be able to:

a) Establish a therapeutic relationship with patients and their families in the limited time available.

b) Obtain and collate relevant history from patients and families.

c) Demonstrate empathy, consideration and compassion in communicating with patients and families.

d) Communicate effectively with medical/surgical colleagues, nurses, and paramedical personnel regarding the anesthetic management of the patient.

e) Demonstrate appropriate written communication skills through accurate, legible, and complete documentation of the anesthetic record, patient chart and in consultation.

3. Collaborator

By the end of this rotation, the resident will be able to:

a) Demonstrate the ability to function in the clinical environment using the full abilities of all team members (surgical, nursing, ICU, etc.).

b) Develop their anesthetic plan for their patients in consultation and in concert with surgery, nursing and ICU for more complicated neurosurgical patients.

c) Understand and value the skills of other specialists and healthcare professionals.

d) Understand the limits of their knowledge and skills.

e) Be able to understand, accept and respect the opinions of others on the neuroteam.

f) Function in the OR as a member of the neuroteam and work in a positive, constructive manner, respecting the importance of the roles of all team members.

4. Manager

By the end of this rotation, the resident will be able to:

a) Demonstrate the ability to manage the OR by ensuring the necessary equipment, monitoring, and medication are available, making the preparations to deal with anticipated complications, and conduct all these activities should be conducted in an effective and efficient timely manner in order to avoid OR delays.

b) Utilize personal resources effectively in order to balance patient care, continuing education and personal activities.

c) Utilize information technology to optimize patient care and lifelong learning.

5. Health Advocate

By the end of this rotation, the resident will be able to:

a) Recognize the opportunities to advocate for neurosurgical patients, in particular with regards to patient safety.

b) Adopt a leadership role in the postoperative care of their patients by anticipating and arranging for the PACU, ICU, or Neuro-Observation Unit care.

6. Scholar

By the end of this rotation, the resident will be able to:

a) Be responsible for developing, implementing and regularly re-evaluating a personal continuing education strategy.

b) Contribute to the development of new knowledge through facilitation/participation in ongoing departmental research activities.

c) Be prepared in advance for the OR cases scheduled through additional reading, patient chart review/assessment.

7. Professional

By the end of this rotation, the resident will be able to:

a) Demonstrate a commitment to executing, professional responsibilities with integrity, honesty and compassion.

b) Demonstrate appropriate personal and interpersonal professional behaviors and boundaries.

c) Recognize limits of personal skill and knowledge by appropriately consulting other physicians when caring for the patient.

THORACIC ANESTHESIA

Duration: Three months during senior residency

Residents rotating on thoracic anesthesia will have priority assignment for major thoracic procedures, giving the residents extensive exposure to thoracic pathology and comorbid diseases, experience with lung isolation techniques and one lung ventilation, and postoperative care and pain management.

Objectives:

1. Medical Expert/Clinical Decision Maker

By the end of the training in this rotation, the resident will be able to:

General objectives:

a) Demonstrate knowledge of general internal medicine with particular reference to the cardiovascular, respiratory, renal and coagulation systems, blood transfusion, fluid, electrolyte and acid–base balance

b) Demonstrate knowledge of the principles and practice of anesthesia as they apply to patient support during thoracic surgery.

c) Demonstrate competence in BCLS, ACLS and ATLS.

Specific knowledge requirements:

a) Anatomy/physiology (thoracic cavity, airway, mediastinum, pulmonary vasculature, bronchial vessels, lymphatic system, work of breathing, physiology of lung collapse, cough reflex)

b) Preoperative evaluation of the patient undergoing thoracic surgery, including: history (dyspnea, cough, cigarette smoking, exercise tolerance, risks factors for acute lung injury)

c) Preoperative alcohol abuse, pneumonectomy, Intraoperative high ventilatory pressures and excessive amounts of fluid administration)

d) Physical examination (respiratory pattern, respiratory rate and pattern, breath sounds)

e) Diagnostic studies (EKG, CXR, ABG)

f) Assessment of respiratory function (respiratory mechanics and volumes: spirometry, flow-volume loops; lung parenchymal function: diffusing capacity for carbon monoxide; cardiopulmonary interaction: maximal oxygen consumption; ventilation-perfusion scintigraphy, split-lung function studies).

Factors and medical conditions affecting the outcome including:

- Cardiovascular disease (ischemia, arrhythmia)
- Age
- Renal dysfunction
- COPD (respiratory drive, elevated $PaCO_2$ at rest, nocturnal hypoxemia, right ventricular dysfunction, bullae, flow limitation, auto-peep)

Restrictive pulmonary disease:

- Primary thoracic tumors
- Anesthetic considerations in lung cancer patients (mass effects, metabolic effects, metastases, medications, intrathoracic metastatic manifestations, extrathoracic metastatic manifestations, extrathoracic nonmetastatic manifestations)

Preoperative preparation of the patient undergoing thoracic surgery, including:

- Premedication
- Treat bronchospasm, atelectasis, infection and pulmonary edema preoperatively
- Hydration and removal of bronchial secretions, physiotherapy, smoking cessation

Monitoring during thoracic anesthesia:

- Oxygenation (pulse oximetry, ABGs), capnometry, invasive hemodynamic monitoring (arterial line, CVP, PAC, TEE, continuous spirometry)
- Positioning (lateral position).
- Physiology of one lung ventilation.
- One lung ventilation indications, methods of lung separation
- Double-lumen tubes (design, size selection, insertion methods, positioning complications, contraindications), Univent tube, bronchial blockers
- Management and strategies to improve oxygenation during one lung ventilation.
- Anesthetic management and techniques
- General anesthesia, regional anesthesia, combined epidural blockade and general anesthesia, fluid management, nitrous oxide, temperature, prevention of bronchospasm, CAD
- Hypoxic pulmonary vasoconstriction mechanisms effects of anesthetics, nitric oxide.

- Anesthetic management for common surgical procedures
- Flexible fiberoptic bronchoscopy, rigid bronchoscopy (apneic oxygenation, apnea and intermittent ventilation, Sanders injection system, mechanical ventilator, HFPPV), mediastinoscopy, VATS, thoracotomy
- Anesthesia for patients undergoing bronchoalveolar lavage
- Anesthetic implications of spontaneous pneumothorax anesthesia for patients undergoing bullectomy and volume reduction pneumoplasty
- Anesthesia for patients undergoing decortication and pleurodesis procedures
- Anesthesia for patients undergoing esophageal surgery
- Anesthesia for patients undergoing laser surgery of the airway.
- Physics of lasers, laser surgery of the airway, intraoperative considerations, complications
- Anesthesia for patients undergoing lung transplantation.
- Pathophysiology of the transplanted lung, preoperative assessment and patient selection, donor selection and procurement, preoperative preparation, postoperative analgesia, operation for single-lung transplantation, bilateral sequential single-lung versus double-lung transplantation, postoperative management
- Anesthesia for patients with mediastinal masses
- Signs and symptoms, diagnostic evaluation, anesthetic implications and management (airway obstruction, vascular/cardiac compression, superior vena cava syndrome)
- Anesthesia for patients with thoracic outlet syndrome
- Anesthesia for patients undergoing thymectomy: myasthenia gravis myasthenic syndrome
- Anesthesia for patients undergoing tracheal resection and trancheobronchial reconstruction
- Surgical considerations, perioperative management issues, modes of ventilation
- Anesthesia for patients undergoing urgent surgery
- Anesthesia for patients with massive hemoptysis, anesthesia for patients undergoing removal of foreign body from the airways, anesthesia for patients undergoing endoscopy for ingested foreign bodies
- Complications of thoracic surgery and their management strategies
    - Respiratory failure and management of postoperative mechanical ventilation, atelectasis, pneumothorax, cardiac herniation, cardiac ischemia and arrhythmias, low cardiac output syndrome, hemorrhage, nerve injuries (brachial plexus, sciatic nerve, peroneal nerve)
    - Postoperative pain management
- Systemic analgesia, local anesthetics/nerve blocks (intercostal nerve blocks, intrapleural analgesia, thoracic paravertebral block, epidural analgesia), shoulder pain, post-thoracotomy neuralgia and chronic incisional pain

Technical skills:

- Be proficient in the provision of thoracic epidural analgesia for upper abdominal and thoracic surgical procedures
- Be skilled in airway management for bronchoscopy, mediastinal masses and one-lung ventilation
- Be skilled in starting large bore intravenous infusions, arterial lines, CVP and PA lines in thoracic surgical patients.

2. Communicator

By the end of this rotation, the resident will be able to perform the following:

a) Demonstrate effective communication with patients and families of description of procedures, informed consent and anesthetic options and risks.
b) Demonstrate effective communication with OR team (thoracic surgeons, nurses and other members of the health care team) and postoperative team (ICU, PACU).
c) Provide clear and concise written consultation and anesthetic records.

3. Collaborator

By the end of this rotation, the resident will be able to perform the following:

a) To seek perioperative consultation with colleagues when required.

b) To contribute effectively to other interdisciplinary team activities.

c) To demonstrate ability to function in the clinical environment using the full abilities of all team members.

4. Manager

By the end of this rotation, the resident will be able to:

a) Manage OR time by efficiently conducting the anesthetic, continuing education and personal activities.

b) Utilize information technology to optimize patient care and lifelong learning.

5. Health Advocate

By the end of this rotation, the resident will be able to perform the following:

a) To provide patient advocacy for various perioperative issues (i.e. patient safety, analgesia, postoperative monitoring).

6. Scholar

By the end of this rotation, the resident will be able to perform the following:

a) To demonstrate commitment to continuing personal education.

b) To be able to critically review thoracic anesthesia literature and describe the principles of research relevant to this population.

c) To assist in education of other members of the OR team.

7. Professional

By the end of this rotation, the resident will be able to perform the following:

a) To demonstrate a sense of responsibility, integrity, honesty and compassion when caring for patients.

b) To demonstrate respect for patients and colleagues.

c) To deliver the highest quality care to patients.

d) To practice medicine ethically consistent with the obligations of a physician.

e) To respect the opinions of fellow consultants and referring physicians in the management of patient problems and be willing to provide means whereby differences of opinion can be discussed and resolved.

f) To show recognition of limits of personal skill and knowledge by appropriate consulting other physicians and paramedical personnel when caring for the patient.

PEDIATRIC INTENSIVE CARE UNIT (PICU)

The pediatric critical care rotation provides training in the diagnosis and treatment of critical illness in children. The resident should understand the pathophysiology and management of common serious pediatric problems. Emphasis will be placed on the ethics of pediatric critical care and the recognition and management of the psychosocial effects of serious illness on the child and the family.

1. Medical Expert

Specific knowledge:

a) To understand normal physiology and pathophysiology of major organ systems.

b) To demonstrate thorough knowledge of etiology, pathophysiology, clinical features, diagnosis, complications, management, prognosis and prevention of common PICU problems Cardiopulmonary failure and arrest
- Respiratory failure
- Shock
- Septic shock and multiple organ dysfunction syndrome (MODS)
- Nutrition: enteral and parenteral
- Renal failure, electrolytes and acid-base abnormalities
- Hematologic dysfunction and blood products replacement therapy
- Neurological emergencies: coma, status epilepticus, intracranial hypertension
- Pain, anxiety, sedation
- Brain death and organ donation
- Pharmacology and toxicology
- Polytrauma, traumatic brain injury and burns

c) To become familiar with technical procedures: non-invasive airway management and theory of rapid sequence intubation, venous or arterial access and lumbar puncture.

d) To understand the roles and implications of aggressive care, palliative care and code status decision.

Specific skills:

a) To recognize, assess and stabilize critically ill pediatric patient.

b) To demonstrate the ability to obtain and document complete and focused medical history.

c) To demonstrate the ability to perform and document complete and focused physical examination.

d) To interpret commonly employed laboratory tests (blood gas, biochemical or hematological tests), imaging, EKG and monitoring (invasive or noninvasive).

e) To integrate history physical examination and laboratory test findings into a meaningful diagnostic formulation and treatment plan in the care of critically ill pediatric patient.

f) To understand basic principles of mechanical ventilation (modes, strategies, weaning).

2. Communicator

a) To demonstrate effective tools for gathering historical information from patients and their families in the critical care settings.

b) To present efficiently patient problems, assessment and treatment plan during rounds.

c) To discuss diagnoses, investigations and management options with patients and their families.

d) To deliver understandable information to patients and their families dealing with difficult situations.

e) To communicate and support patients and families confronted with critical illness.

f) To be exposed to communication of difficult news to families of children with critical illness.

g) To effectively communicate with consultants, asking appropriate questions.

h) To recognize the unique stressful environment of the critical care environment.

3. Collaborator

a) To recognize and respect the roles of allied healthcare professionals (physicians, nursing personnel, RT, OT, PT, dieticians, pharmacists, social workers, secretaries) in the management of critically ill patients.

b) To demonstrate appropriate use of consultant services.

c) To work and communicate effectively in a team with other physicians and allied healthcare professionals to develop a care plan for the patient.

d) To contribute to productive communication and cooperation among colleagues.

4. Manager

a) To develop the ability to perform focused histories and physical examinations in the PICU.

b) To develop time management skills to balance priorities for patient care, work practice and personal life.

c) To organize and prioritize the care of many sick patients with multiple problems.

d) To rationally use healthcare resources.

5. Health Advocate

a) To identify opportunities for patient counseling and education regarding their medical condition.

b) To understand and adapt patient assessment and management based on important determinants of health (psychosocial, economic and biologic).

6. Scholar

a) To demonstrate the ability to generate clinical questions related to patient care.

b) To critically appraise the literature regarding issues in critical care medicine.

c) To utilize information technology to optimize patient care and lifelong learning.

d) To adapt teaching skills.

7. Professional

a) To demonstrate professional attitudes, altruism, honesty, integrity and respect in interactions with patients, families and other healthcare professionals or when facing ethical situations.

b) To deliver high quality care with integrity, honesty and compassion.

c) To recognize and acknowledge personal emotional reactions and limitations in one's own knowledge, skills and attitudes, and to take appropriate action about this.

d) To be sensitive to diversity through patient's management, didactic teaching sessions and self-directed learning, the resident should be able to fulfill the objectives for the rotation in PICU.

NEONATE INTENSIVE CARE UNIT (NICU)

The neonatal critical care rotation is intended to allow residents to function effectively as members of the neonatal team to feel comfortable in the recognition and management of neonatal problems, to become competent in the performance of procedures and to become able to communicate fully with families. Responsibility is gradually increased as appropriate to the resident's capability and seniority.

1. Medical Expert

General requirements:

a) Understand the physiological, anatomical and pharmacological considerations for the premature and neonate.

b) Perform a history and physical assessment of a neonate requiring admission to the NICU.

c) Be able to identify neonatal patients requiring resuscitation.

d) Understand the principles of neonatal resuscitation.

e) Gain an appreciation of the presentation, diagnosis and management of the following:

- Transient tachypnea of the newborn
- Respiratory distress syndrome
- Bronchopulmonary dysplasia
- Pulmonary interstitial emphysema
- Necrotizing enterocolitis
- Intraventricular hemorrhage
- Hyperbilirubinemia
- Neonatal asphyxia

f) Interpret laboratory results and CXR in the newborn and premature infant.

g) Assess and initiate resuscitation of the asphyxiated newborn according to NRP guidelines.

h) Gain proficiency in the following procedural skills:

- Intravenous access in the premature and newborn infant, including umbilical vein/artery catheterization
- Mask ventilation, oral intubation, and nasal intubation of the newborn infant
- Tracheal suctioning in the newborn suspected of meconium aspiration
- Initiation of controlled ventilation of the newborn and premature infant

- CPR
- Perform lumbar puncture in the septic newborn

Specific requirements:

a) Develop a management plan for the following neonatal surgical emergencies: necrotizing enterocolitis, patent ductus arteriosus, congenital diaphragmatic hernia, tracheoesophageal fistula, omphalocele, gastroschisis.

2. Communicator

General requirements:

a) Provide a clear concise summary of the newborn problems both verbally and in a written format.

b) Communicate clearly with other healthcare workers and students.

c) Explain procedures in a clear manner and obtain informed consent from the parents for invasive procedures (e.g. lumbar puncture, transfusion in the newborn).

d) Deliver bad news to parents in a compassionate, professional and caring manner.

3. Collaborator

General requirements:

a) Understand the role of the neonatologist in the peripartum management of the neonate

b) Work effectively as an integral member of the NICU team

c) Demonstrate an increasing sense of responsibility and case ownership

d) Understand the role and importance of each member in the care of the NICU patient

Specific requirements:

a) Encouraging input from the multidisciplinary team members

b) Synthesize and communicate a clear plan to the team members

4. Manager

General requirements:

a) Be able to utilize resources effectively

b) Understand the difficulties of decision making related to resource allocation

c) Practice according to national standards and provincial guidelines for the management of neonatal intensive care patients

5. Health Advocate

a) Demonstrate a commitment to patient care

b) Provide expertise and leadership in maintaining and improving the standards of neonatal intensive care

c) Be an advocate to the family and the patient in the medical environment; understand the complex emotional and ethical situations that arise in this environment

6. Scholar

a) Have the ability to critically review the literature to understand and evaluate new information and research

b) Contribute to the learning of others; teach medical students about clinical problems

7. Professional

a) Answering questions and keeping the parents updated of the infants progress in a caring, reassuring and compassionate manner

b) Honor patient confidentiality and deliver the highest quality care with integrity, honesty and compassion

CORONARY CARE UNIT (CCU)

During this rotation, the resident will assess the patient and outline a course of therapy and investigation for a patient with a cardiac problem. The resident will understand the implications of the patient's disease in relation to any intervention.

1. Medical Expert/Decision Maker

a) The resident should know the following about the normal heart and blood vessels:
- The anatomy of the heart.
- The normal physiology of the cardiovascular system.
- The generation and conduction of the electrical activity in the heart.
- The mechanism of metabolic regulation within the heart.

b) In examining the heart and the blood vessels, the resident will be able to:
- Take a complete cardiovascular history and physical examination of the heart, peripheral vasculature, precordium, and lungs.
- Interpret the resting electrocardiogram and chest x-ray.
- Assess patients with abnormal myocardial contractility, electrical or conduction abnormalities in the heart, and myocardial ischemia and infarction.

c) Disorders of the cardiovascular system:
- The resident will diagnose, investigate and manage patients with chest pain.
- The resident will describe the pathophysiology, diagnose, investigate and treat heart failure.
- The resident will discuss the pathophysiology of hypotension and shock. The resident will describe the physical findings, investigation and management of shock and acute pump failure.
- The resident will describe the pathophysiology and investigation of high output states.
- The resident will describe the disturbances of cardiac rhythm and conduction. The resident will describe and investigate mechanisms of arrhythmias and conduction abnormalities. The resident will be expected to manage all common arrhythmias and rhythm abnormalities.
- The resident will have a clear differential diagnosis and plan of management of the patient with syncope.
- The resident will describe the mechanisms of sudden death. The resident will discuss the predictors and prevention of sudden cardiac death.

- The resident will discuss the current standards of cardiopulmonary resuscitation.

d) Disease of the heart and blood vessels:
The resident will describe the history, physical findings, investigation and current management of patients with the following conditions:
    - Rheumatic fever
    - Aortic valve disease
    - Mitral valve disease
    - Tricuspid and pulmonary valve disease

e) Coronary artery disease:
    - The resident will understand the factors influencing atherogenic heart disease, cholesterol metabolism, and prevention of coronary atherosclerosis.
    - The resident will understand the pathophysiology and investigation of angina pectoris, myocardial infarction and other manifestations of myocardial ischemia.
    - The resident will discuss the diagnosis and treatment of non-atherosclerotic coronary artery disease including coronary artery spasm.

f) Systemic arterial hypertension:
    - The resident will understand the pathophysiology of hypertension.
    - The resident will describe a plan of investigation and management to the hypertensive patient.

g) Pulmonary hypertension and other cardiac disorders:
    - The resident will discuss the investigation, diagnosis and treatment of primary pulmonary hypertension, pulmonary embolism, pulmonary infarction, acute cor pulmonale and chronic cor pulmonale.
    - The resident will discuss the pathophysiology, investigation, treatment and complications of bacterial endocarditis. The resident will also be familiar with commonly used protocols for prophylaxis of bacterial endocarditis.
    - The resident will be familiar with myocardial disease. The resident will diagnose, treat and investigate cardiomyopathies.
    - The resident will diagnose, manage and treat the patient with acute and chronic pericardial disease.
    - The resident will describe the effects of trauma on the heart.
    - The resident will describe the diagnosis, investigation and treatment of patients who have peripheral vascular disease. The resident will describe

the current management of aneurysms of the aorta. The resident will describe the physical findings, investigation and treatment of patients who have peripheral venous disease.

h) The heart and other medical problems:
The resident will describe the changes found in the cardiac system with:
- Pregnancy
- Aging
- Obesity
- Chronic renal failure
- Electrolyte disturbances
- Stress

i) The resident will be familiar with the following techniques and therapeutic procedures. The resident will discuss the complications of these techniques:
- Electrocardiography
- Exercise test
- Holter monitoring
- His bundle electrocardiography
- Cardioversion
- Techniques for insertion of perivenous and epicardial pacemakers
- Echocardiography and transesophageal echocardiography (tee)
- Cardiac catheterization
- Swan-ganz catheterization
- Intra-aortic balloon augmentation of cardiac output
- Cardiopulmonary bypass
- Percutaneous transluminal coronary angioplasty

j) The resident will describe the indications for cardiac pacing. The resident will discuss the various forms of cardiac pacemakers.

k) The resident will be able to assess cardiac patients pre-operatively for non-cardiac surgery and be able to order appropriate investigations as well as optimize patients for surgery.

2. Communicator

a) The resident must be able to effectively communicate with the patient and their family regarding all aspects of their care. This includes being able to put the patient at ease as well as eliciting all necessary information from the patient.

b) The resident will be able to communicate effectively with other specialty services regarding cardiology patients.

c) The resident will be able to perform complete consultations and communicate their concerns and issues in writing as well as verbally.

d) The resident will know when consultation with other services is required and in the best interest of the patient.

e) The resident will document clearly, concisely and legibly all aspects of their involvement with the patient.

3. Collaborator

a) The resident will strive to involve other medical subspecialties when necessary, as well as other allied health professionals in order to better care for their patients.

b) The resident will interact with other physicians and health professionals in a mature, respectful and professional manner.

4. Manager

a) The resident will manage their time appropriately in order that all patients requiring attention can be seen.

b) The resident will triage and prioritize those patients requiring the most urgent care.

c) The resident will supervise junior residents and medical students appropriately, as well as seek supervision from the attending staff when needed.

d) The resident will delegate certain responsibilities to other team members when necessary and appropriate.

5. Health Advocate

- The resident must always be an advocate for the patient, especially when the patient is unable to do so for him/herself.
- The resident must always ensure that the highest standards of care are practiced, and that all guidelines and policies are adhered to.

6. Scholar
   - The resident must demonstrate continued self-directed learning in order to improve their patient care.
   - The resident must be able to critically appraise the literature in order to determine the optimal management plans for their patients, while ensuring that their practice is evidence based.
   - The resident will appropriately teach more junior members of the team, while ensuring a high standard of patient care.

7. Professional
   - The resident will demonstrate a mature sense of responsibility for his/her patients and ensure proper hand over of patients to colleagues when he/she is not available.
   - The resident will foster the physician/patient relationship and keep all information in confidence.
   - The resident will demonstrate appropriate ethical insight.
   - The resident will remain calm, confident and efficient when performing under stress.

MEDICAL ROTATION

Duration:

- At least 1 month in Cardiology
- One month in Pulmonary Medicine
- The other recognized rotations include Endocrinology, Transfusion Medicine, Nephrology, Geriatrics medicine, etc.

1. Medical Expert

At the end of the rotation, the resident will be able:

To develop an approach to and further knowledge of the clinical problems in perioperative care:

a) Identify cardiovascular risk stratification using updated risk indices.

b) Use of diagnostic tests for cardiac and pulmonary patient (e.g. echocardiogram stress test, pulmonary function test etc.) as preoperative assessment tests and implementation of guidelines.

c) Apply perioperative management of medications, anticoagulation, and steroids.

d) Practice the perioperative management of common clinical problems (e.g diabetes mellitus and hypertension).

e) Discuss perioperative management of thromboembolic disease.

f) Employ endocarditis prophylaxis.

g) Justify approach to postoperative cardiac and respiratory complications.

h) Justify approach to postoperative electrolyte abnormalities.

i) Discuss medical complications of pregnancy (diabetes mellitus, hypertension, thyroid disease, thromboembolism).

2. Communicator

- Accurately elicit and synthesize information from patients, families, colleagues, and other professionals
- Convey accurately relevant information and treatment plans to patients, families, colleagues, and other professionals

- Convey effective oral and written information about the encounter

3. Collaborator
    - Participate in an inter-professional healthcare team
    - Effectively work with other health professionals to deal with inter-professional conflict

4. Manager
    - Develop time management skills to reflect and balance priorities for patients, sustainable practice, and personal life
    - Allocate finite healthcare resources appropriately by applying evidence

5. Health Advocate
    - Identify opportunities for patient counseling and education regarding their medical conditions
    - Educate patients regarding lifestyle modifications, especially pertaining to cardiorespiratory disease

6. Scholar
    - Critically appraise literature regarding the diagnosis and treatment of issues in perioperative care
    - Demonstrate an effective lecture or presentation

7. Professional
    - Demonstrate a commitment to their patients and profession through ethical practice by exhibiting honesty, integrity, commitment, compassion, respect and altruism
    - Appropriately manage conflicts of interest

RESEARCH ROTATION

Duration: 3–6 months

Residents entering the anesthesia training program are required to identify a research mentor and a research project within the first few months of training. A list of basic science and clinical research projects prepared by faculty should be available to trainees in the beginning of the academic year. Research projects and mentors are reviewed and approved by the Research Coordinator. Residents are then asked to present their research question and/or research protocol at their respective anesthesia Departmental Grand Rounds early in the academic year. The research proposal will state the question, hypothesis, objectives, design and proposed outcome measures of the study. The nature and scope of the project should allow the trainee to generate an abstract for national or international meetings. A program research associate (with expertise in clinical epidemiology) needs to be available to provide statistical and methodological support for research projects initiated by residents. Throughout their training, residents are also encouraged to identify unique and rare clinical cases that can yield case reports and/or literature reviews for publication. Trainees are encouraged to submit their work to national (e.g. Saudi Anesthesia Society), international (e.g. American Society of Anesthesiologists) or local (e.g. Resident Research Day) meetings.

General research rotation objectives:

1. To identify an area of research interest and a mentor.
2. To review the relevant literature and to distill from it a scientific question that can be answered using facilities available in an appropriate time period.
3. To organize and conduct a series of experiments to answer the research question.
4. To analyze and interpret data.
5. To present the data in oral and written format to a group of peers. This requires both submission of an abstract to a national, international or local meeting and preparation of a manuscript suitable for journal submission.

Specific research rotation objectives:

1. Medical Expert
   a) Critically appraise the background literature of the research project.

   b) Demonstrate an understanding of the basic principles of research design, methodology, biostatistics, and clinical epidemiology.

2. Communicator
   a) Demonstrate skills in conveying and discussing scientific research to scientific communities through posters, abstracts, teaching slides manuscripts, grant applications, or other scientific communications
   b) Communicate and collaborate effectively with research team members to conduct the research.

3. Collaborator
   a) Identify, consult and collaborate with appropriate experts to conduct the research

4. Manager
   a) Independently identify an area of research interest and a research mentor in order to engage in the scholarship of scientific inquiry and dissemination.

   b) Independently utilize available resources and regularly meet with an identified research mentor.

5. Health Advocate
   a) Recognize the contributions of scientific research in improving the health of patients and communities.

6. Scholar
   a) Pose a research question (clinical, basic or population health).

   b) Develop a proposal to solve the research question:
      - Conduct an appropriate literature search based on the question.
      - Propose a methodological approach to solve the question.

   c) Carry out the research outlined in the proposal.

   d) Critically analyze and disseminate the results of the research.

   e) Identify areas for further research.

7. Professional
   a) Uphold ethical and professional expectations of research consistent with institutional review board guidelines, including maintenance of meticulous data and conduct of ethically sound human or animal research.

   b) Demonstrate personal responsibility for setting research goals and working with mentors to set and achieve research timeline objectives.

   c) Participate as possible in specialty organizations that promote scholarly activity and continuous professional development.

   d) Publish accurate and reliable research results, with attention to appropriate authorship attribution criteria.

e) Disclose potential financial conflicts of interest (including speaker fees, consultative relationships, investments, etc.) as appropriate when engaging in and disseminating research results.

During clinical rotations the resident will demonstrate clinical skills competencies throughout the training period as outlined below.

	JUNIOR YEARS (YEARS 1–3)			SENIOR YEARS (YEARS 4–5)	
Anesthesia Provision (Essential)*	• GA for adult ASA 1, II case *300 cases per year • Spinal anesthesia for ADULT ASA I case * 10 cases per year	• Epidural anesthesia for ASA I & II case *5 cases per year • Spinal anesthesia for obstetric ASA I case *10 cases per year • Epidural analgesia for labor pain *5 cases per year	• GA for Pediatric ASA I & II case *50 cases per year	• GA for adult ASA I to V case *300 cases per year • GA for Pediatric ASA III & IV case * 50 cases per year • Anesthesia for Sub-specialty case minimum of 5 cases per rotation	
Airway Skill Techniques:	Basic Skill • Mask Vent. • Adult ETT • LMA Basic • Video-Assisted Devices * 50 procedures per year	Advanced Airway Management • McCoy • Retromolar intubation • Intubating LMA • Glido Scope • NTT (Nasal Intubation) * 5 procedures per year	Advanced Airway Skill • Pediatric Intubation • Difficult A W Management • Pediatric ETT * 5 procedures per year	Fiberoptic/Awake Intubation • Fiberoptic intubation * 3 cases per year • Awake Intubation * 2 procedures per year	Lung Isolation Techniques • *Eg. Double Lumen Tube* - Bronchial Blockers * 5 cases per rotation • Neonatal intubation * 3 procedures per year
Vascular Access	• Peripheral Venous Line * 50 procedures per year	• Adult Art Line *5 cases per year • Central Line * 5 cases per year		• Neonatal/Pediatric Central Line * 5 cases per year • Neonatal/Pediatric Art Line * 3 cases per year	• Pulmonary Artery Cath. *5 procedures per year
RegionalNeuroaxial Anesthesia	• Basic Spinal • Spinal anesthesia for Adult ASA I case * 10 cases per year	• Epidural anesthesia for ASA I & II case *5 cases per year • Spinal anesthesia for obstetric ASA I case *10 cases per year • Epidural analgesia for labor pain *5 cases per year	• Pediatric Caudal *5 procedures per year	• Difficult Lumber Epidural *Eg. Morbid Obesity* • Obstetrics • Geriatric * 3 cases per year • Neonatal/Pediatric Caudal * 5 procedures per year	• Thoracic Epidural * 3 procedures per year
Peripheral Nerve Blocks (US-Guided)	• Nerve block (upper & lower) using nerve stimulator and/or ultrasound guided. *5 procedures per year			• Nerve block (upper & lower) using nerve stimulator and/or ultrasound guided. * 10 procedures per year	

The trainee will be tested throughout the program in procedural skills as outlined below

List of work based assessment of clinical competencies performed at different level of residency (DOPS; Direct Observation of Procedural Skills)

	R1	R2	R3	R4	R5
A Anesthesia Provision (Essential)*	A1.1 - GA for Adult ASA I A1.2 - Spinal Anesthesia for Adult ASA I	A2.1 - GA for Adult ASA II A2.2 - Epidural Anesthesia for ASA I & II A2.3 - Spinal Anesthesia for Obstetric ASA I A2.4 - Epidural Analgesia for Labor Pain	A3.1 - GA for Adult ASA I & II A3.2 - GA for Pediatric ASA I & II A3.3 - Epidural Anesthesia for ASA II & III A3.4 - Spinal Anesthesia for Obstetric ASA II	A4.1 - GA for Adult ASA IV & V A4.2 - GA for Obstetric ASA II & III A4.3 - GA for Pediatric ASA III & IV A4.4 - Anesthesia for Subspecialty Cases	A5.1 - GA for Adult ASA IV & V (E) A5.2 - GA for Obstetric ASA IV & V A5.3 - GA for Pediatric or Neonatal ASA III & IV A5.4 - Anesthesia for Subspecialty Cases
B Airway Management and Intubation	B1.1 - Mask Ventilation B1.2 - Adult ETT B1.3 - LMA Basic B1.4 - Video-Assisted Devices	B2.1 - McCoy B2.2 - Retromolar Intubation B2.3 - Intubating LMA B2.4 - GlidoScope B2.5 - NTT (Nasal Intubation)	B3.1 - Assembling FOB B3.2 - Pediatric Intubation B3.3 - Difficult A W Management B3.4 - Pediatric ETT	B4.1 - Fiberoptic Intubation B4.2 - Neonatal intubation B4.3 - Awake Intubation B4.4 - DLT With FOB B4.5 - Different Lung Isolation	B5.1 - Lung Isolation Techniques B5.1.1 - Double Lumen Tube B5.1.2 - Bronchial Blockers B5.2 - Neonate ETT
C Vascular Access	C1.1 - Peripheral Venous IV C1.2 - Adult Art Line	C2.1 - Adult Art Line in Difficult Patients C2.2 - Difficult Peripheral Venous access	C3.1 - Pediatric Cannulation (IJV) C3.2 - Central Venous (IJV) C3.3 - Pediatric Arterial C3.4 - CVP C3.5 - Femoral using Landmark Technique	C4.1 - Central Venous (Subclavian) C4.2 - Pediatric Femoral C4.3 - CVP (Subclavian)	C5.1 - Pulmonary Artery Catheter C5.2 - Art Line Access for Pediatric and Neonate Patients C5.3 - Central Vascular Access for Pediatric and Neonate Patients
D Regional Axial Anesthesia	D1.1 - Basic Spinal	D2.1 - Difficult Spinal D2.1.1 - Morbid Obesity D2.1.2 - Obstetric D2.2 - Adult Lumbar D2.2.1 - Epidural	D3.1 - Obstetric Lumbar Epidural D3.2 - Pediatric Caudal	D4.1 - Difficult Lumbar Epidural D4.1.1 - Morbid Obesity D4.2 - Obstetrics D4.3 - Geriatrics	D5.1 - Thoracic Epidural D5.1.1 - Mid-Thoracic D5.1.2 - High Thoracic
E Regional Peripheral Blocks (US-Guided)	E1.1 - Bier's Block	E2.1 - Adult Epidural Lumbar E2.2 - Axillary Block E2.3 - Femoral/Sciatic Block	E3.1 - Supraclavicular E3.2 - TAP Block E3.3 - Pediatric Caudal E3.4 - Basic PNB (Femoral, Sciatic, Supclavical) E3.5 - Other Brachial plexus Blocks	E4.1 - Interscalene E4.2 - Infraclavicular E4.3 - Advanced PNB (Lumbar P.B.) E4.4 - TAP Block	E5.1 - Paravertebral Block E5.2 - Spinal Pediatric Anesthesia E5.3 - Epidural Pediatric E5.4 - Adult Caudal anesthesia
F Equipment	F1.1 - Check Anesthesia Machine	F2.1 - Peripheral Nerve Stimulation F2.2 - Setup of Invasive Monitoring	F3.1 - US guidance machine check	F4.1 - Transesophageal Echocardiography (TEE)	

ACADEMIC PROGRAM

INTRODUCTION

The anesthesia core program is composed of a series of interactive talks given by faculties once every week during the academic days throughout the five years of the program. The core program is part of the many tools of education for the residents to cover and master the general objectives of the Saudi Anesthesia Program, i.e. journal clubs, workshops, and clinical rotations.

The core program is divided into two parts:
I. The year-one residents (R1) introductory course, which takes place over the first 3 months of every new training year.
II. The all-residents (R1–R5) program, which covers over two years of the program and is repeated at least once during the five-year program.

GENERAL OBJECTIVES

Upon completion of Saudi Anesthesia Program, a resident is expected to be a competent specialist anesthesiologist who has acquired a working knowledge of the theoretical basis of the specialty, including its foundations in the basic medical sciences and research.

The resident will be able to master knowledge of the basic sciences as applicable to anesthesia, including anatomy, physiology, pharmacology, physics, and measurements.

The resident will also gain applied knowledge, with particular reference to the cardiovascular, respiratory, renal, hepatic, endocrine, hematologic, and neurologic systems.

The core program also cover subjects of anesthesia services for all age groups in varied clinical situations i.e. surgery, intensive care and resuscitation, the management of acute and chronic pain, and the assessment and provision of appropriate care of the mother and neonate in obstetrics.

The talks should place great emphasis on the present and concurrent medical knowledge.

INTRODUCTORY PROGRAM (YEAR 1 RESIDENTS)

This introductory course starts at the beginning of every first training year, usually the 1st of October. On the first day of the program, it is the responsibility of the head of the local program committee to discuss the objectives of the program, highlighting the following:

- The structure of the five-year Saudi Anesthesia Program
- The objectives of the Anesthesia course, covering required knowledge, skills and attitude
- The abilities of the successful resident as a medical expert and a safe, competent, and practical anesthetist
- Policies, protocols, and guidelines of the course
- The examination structure, roles, and regulations
- The graded responsibilities and duties of the resident
- The updated version of the training manual
- Queries or questions regarding the Saudi Anesthesia Program and related issues

Specific objectives:

The introductory course aims to provide a series of talks that cover topics of:

- Basic science as applicable to anesthesia, including anatomy, physiology, pharmacology and physics.
- Introductory subjects covering general anesthesia, specialties and subspecialties.
- Introductory topics covering crisis management and professionalism.

Each topic is described by specific objectives, which should guide the speakers to meet the general/specific objectives of the course. These objectives are not to limit the discussion but rather provide minimal requirements to cover the topic.

All talks are focused on the concepts and principles of the topics of discussion and aimed to be interactive rather than didactic, whenever it is possible.

All topics should discuss essential diagrams whenever it is applicable.

Contents and Objectives

i. Introduction to Anesthesia:

By the end of the interactive lecture, the resident will be able to:

- Define anesthesia, types and basic equipment
- Know the principles and importance of monitoring during GA
- Be familiar with the classification of the common anesthesia drugs such as intravenous anesthetic drugs, inhalation agents, muscle relaxant, local anesthetics, opioids, and anesthesia emergency drugs

ii. Preoperative Assessment

By the end of the interactive lecture, the resident will be able to:

- Be familiar with the principles of preassessment of patients indicated for anesthesia e.g. medical history, physical examination, and requesting investigations
- Be familiar with assessing all major risk factors associated with anesthesia, i.e. anesthesia factors, patient factors, and surgical factors
- Recognize the role of preoperative assessments in planning and providing safe anesthesia
- Recognize the role of preoperative assessments and the outcome of the procedure

iii. Studying Techniques & Professionalism in Anesthesia

By the end of the interactive lecture, the resident will be able to:

- Recognize practical ways of focus study during anesthesia training program to prepare for written and oral examinations
- Know methods to recognize, collect, and study useful scientific materials
- Use different techniques and strategies to cope with different types of stresses that the resident might encounter during the five years of the training program
- Define the term professionalism
- Discuss effects of professionalism on patients daily care

iv. Introduction to Cardiovascular System Physiology 1 & 2

By the end of the interactive lecture, the resident will be able to:

- Describe the basic anatomy and physiology of the cardiovascular system
- Describe electrical and mechanical events during the cardiac cycle, in addition to the related essential diagrams
- Discuss factors which alter the electrical and mechanical events of the cardiac cycle
- Explain the physiology of circulation and perfusion including blood pressure and cardiac output in addition to the related essential diagrams
- Discuss the principles of left ventricle pressure and volume loop
- Explain principles of cardiac output measurements
- Discuss the physiology of special circulation (coronary, cerebral, pulmonary, renal, portal)
- Discuss essential diagrams whenever it is applicable

v. Introduction to Respiratory Physiology 1 & 2

By the end of the interactive lecture, the resident will be able to:

- Describe the structure and functions of respiratory system
- Define the various lung volumes and capacities
- Describe the clinical applications of ventilation/perfusion relationships
- Describe control of ventilation, e.g. central and peripheral control
- Discuss the lung mechanics and the principles of the pressure/volume loop
- Discuss the principles and the clinical applications of the flow/volume loop
- Describe the clinical applications of the oxyhemoglobin dissociation curve and factors affecting its shifts
- Discuss factors affecting O_2 and CO_2 transportation
- Discuss special respiratory physiology changes (during exercise, high altitude and diving)
- Discuss essential diagrams whenever it is applicable.

vi. Introduction to the Autonomic Nervous System

By the end of the interactive lecture, the resident will be able to:

- Be familiar with the anatomy and physiology of the brain and spinal cord
- Describe the structural anatomy and physiology of the autonomic nervous system in relation to anesthesia
- Be familiar with the clinical principles and systemic effects of the autonomic blockade

vii. Introduction to Regional Anesthesia

By the end of the interactive lecture, the resident will be able to:

- Describe the anatomy, physiology and general pharmacology of regional anesthesia
- Discuss clinical indications/contraindications of regional anesthesia, e.g. upper and lower extremities and paravertebral blocks
- Describe the common side effects/complications of regional anesthesia
- Discuss role of US in regional anesthesia
- Discuss the risks and benefits of regional anesthesia vs. GA

viii. Pharmacokinetics and Pharmacodynamics

By the end of the interactive lecture, the resident will be able to:

- Define pharmacokinetics and pharmacodynamics
- Be familiar with concepts and principles of applied pharmacokinetics and its use in clinical practice
- Describe factors, e.g. physiological and physicochemical properties that influence the absorption, distribution, elimination, and activity of drugs
- Be familiar with the concepts potency, efficacy and margin of safety, and its clinical applications in anesthesia

iv. Introduction to Obstetric Anesthesia

By the end of the interactive lecture, the resident will be able to:

- Discuss maternal physiological and anatomical changes during pregnancy
- Be familiar with types and indications/contraindications of anesthesia i.e. general anesthesia and regional anesthesia for cesarean sections
- Be familiar with the common obstetric anesthesia challenges, side effects and complications

x. Introduction to Pain

By the end of the interactive lecture, the resident will be able to:

- Define the term pain
- Recognize types of pain and its pathophysiology
- Recognize methods for pain assessment
- Be familiar with the pharmacology for analgesia
- Recognize the common techniques for pain control and their route of administration

xi. Introduction to Pediatric Anesthesia 1 & 2

By the end of the interactive lecture, the resident will be able to:

- Discuss anatomy and physiology relevant to pediatric anesthesia focusing on respiratory and cardiovascular systems
- Discuss pediatric airway anatomy in comparison to that of an adult
- Discuss the general principles of pediatric preoperative assessments
- Be familiar with the principles of pediatric anesthesia
- Explain principles of pediatric pharmacology
- Discuss fluid balance and thermoregulation physiology

xii. Crisis Resource Management (CRM)

By the end of the interactive lecture, the resident will be able to:

- Define an adverse event/crisis
- Discuss reasons for susceptibility of anesthesia practice to crisis
- Identify some examples of errors in OR practice
- Be introduced to the 15 elements of Anesthesia Crisis Resource Management (CRM) and their applicability

First Year (R1) Anesthesia Resident Introductory Program

Week No.	Topic	Objectives
1	Introducing the Program Introduction to Anesthesia	• Define anesthesia, types and basic equipment • Know the principles and importance of monitoring during GA • Be familiar with the classification of the common anesthesia drugs such as intravenous anesthetic drugs, inhalation agents, muscle relaxant, local anesthetics, opioids and anesthesia emergency drugs
2	Studying Techniques & Professionalism in Anesthesia	• Recognize practical ways of focus study during anesthesia training program to prepare for written and oral examinations • Know methods to recognize, collect and study useful scientific materials • Use different techniques and strategies to cope with different types of stresses that He or she might encounter during the five years training program • Define term professionalism • Discuss effects of professionalism on patients daily care
3	Introduction to CVS Physiology 1	• Describe the basic anatomy and physiology of the cardiovascular system • Describe electrical and mechanical events during the cardiac cycle, in addition to the related essential diagrams • Discuss factors which alter the electrical and mechanical events of the cardiac cycle
3*	Introduction to CVS Physiology 2	• Explain the physiology of circulation and perfusion including blood pressure and cardiac output in addition to the related essential diagrams • Discuss the principles of left ventricle pressure and volume loop • Explain principles of cardiac output measurements • Discussion of Physiology of special circulation (coronary, cerebral, pulmonary, renal, portal)

Week No.	Topic	Objectives
4	Introduction to Respiratory Physiology 1	• Describe the structure and functions of respiratory system • Define the various lung volumes and capacities • Describe the clinical applications of ventilation/perfusion relationships • Describe control of ventilation, e.g. central and peripheral control • Discuss the lung mechanics and the principles of the pressure/volume loop • Discuss the principles and the clinical applications of the flow/volume loop
4*	Introduction to Respiratory Physiology 2	• Describe the clinical applications of the oxyhemoglobin dissociation curve and factors affecting its shifts • Discuss factors affecting O_2 and CO_2 transportation • Discuss special respiratory physiology changes (during exercise, high altitude and diving)
5	Introduction to the Autonomic Nervous System	• Be familiar with anatomy and physiology of the brain and spinal cord • Describe the structural anatomy and physiology of the autonomic nervous system in relation to anesthesia • Be familiar with the clinical principles and systemic effects of the autonomic blockade
6	Introduction to Regional Anesthesia	• Describe the anatomy, physiology and general pharmacology of regional anesthesia • Discuss clinical indications/contraindications of regional anesthesia, e.g. upper and lower extremities and paravertebral blocks • Describe the common side effects/complications of regional anesthesia • Discuss the role of US in regional anesthesia • Discuss the risks and benefits of regional anesthesia vs. GA
7	Pharmacokinetics and Pharmacodynamics 1	• Define pharmacokinetics and pharmacodynamics • Describe factors, e.g. physiological and physicochemical properties that influence the absorption, distribution, elimination, and activity of drugs

Week No.	Topic	Objectives
7*	Pharmacokinetics and Pharmacodynamics 2	• Be familiar with concepts and principles of applied pharmacokinetics and its use in clinical practice. • Be familiar with the concepts potency, efficacy and margin of safety, and its clinical applications in anesthesia
8	Introduction to Obstetric Anesthesia	• Discuss maternal physiological and anatomical changes during pregnancy • Be familiar with types and indications/contraindications of anesthesia, i.e. general anesthesia and regional anesthesia for cesarean sections • Be familiar with the common obstetric anesthesia challenges, side effects and complications
9	Introduction to Pain	• Define the term pain, knows types and pathophysiology of pain • Recognize methods for pain assessments • Be familiar with the pharmacology for analgesia • Recognize the common techniques for pain control and their rout of administration
10	Introduction to Pediatric Anesthesia 1	• Discuss anatomy and physiology relevant to pediatric anesthesia, focusing on respiratory and cardiovascular systems • Discuss pediatric airway anatomy in comparison to that of an adult • Discuss the general principles of pediatric preoperative assessments
11*	Introduction to Pediatric Anesthesia 2	• Be familiar with the principles of pediatric anesthesia • Explain principles of pediatric pharmacology • Discuss fluid balance and thermoregulation physiology
12	Crisis Resource Management (CRM)	• Define an adverse event/crisis • Discuss reasons for susceptibility of anesthesia practice to crisis • Identify some examples of errors in OR practice • Be introduced to the 15 elements of Anesthesia Crisis Resource Management (CRM) and their applicability

This is the core program for all residents in the Saudi Anesthesia Program. It is covered over a period of two years and repeated once during the five-year training program.

Objectives and Contents:

The Core Program aims to provide a series of interactive talks that cover topics of general anesthesia specialty and different subspecialties including pain, pediatric anesthesia as well as regional anesthesia. It also covers topics in critical care medicine, clinical pharmacology, principles of physics, measurements, and monitoring.

Each topic is described by specific objectives that should guide the speakers to meet the general/specific objectives of the course. These objectives are not to limit the discussion but rather provide minimal requirements to cover the topic.

The talks are focused on the concepts and principles of the topics of discussion and aimed to be interactive rather than didactic, whenever it is possible.

All topics should discuss essential diagrams whenever it is applicable.

I. Physics and Measurements

By the end of the interactive lecture, the resident will be able to:

- Explain the physical principles of monitors in OR, including O_2, CO_2, inhalation agents, temperature, invasive and noninvasive blood pressure monitoring, including arterial pressure, central venous pressure and pulmonary artery pressure
- Explain the principles of electrical safety in OR and common sources of hazards, e.g. fires, burns, electrical shock, explosions, power failure
- Explain methods and types of patient protection
- Identify the main components of an anesthesia machine and check anesthetic machine functioning and common defaults
- Understand the principles of vaporizers, types, factors affecting its function, and possible hazards
- Explain the gas laws, hospital gas supplies sources and storage
- Recognize all updates in anesthesia circuits and its clinical uses
- Identify the indications for monitoring particular variables, and for the choice of particular methods
- Recognize when a change in a variable is significant
- Identify errors and describe how random and systemic errors arise

II. Pharmacology

By the end of the interactive lecture, the resident will be able to:

- Understand the principles of applied pharmacodynamics and pharmacokinetics of anesthetic drugs
- Describe indications and techniques of monitoring (clinical and nonclinical) of the following groups of drugs or topics:
  - Inhalation anesthetic agents
  - Intravenous anesthetic agents
  - Narcotics and analgesics
  - Local anesthetics
  - Neuromuscular agents
  - Cardiovascular supporting agents
  - Anesthesia drugs overdose, physiological and pathological effect
  - Genetics and drugs, physiological and pathological effect
  - TIVA, pharmacodynamics and pharmacokinetics principles, clinical effect, monitoring

III. General Anesthesia

By the end of the interactive lecture series, the resident will be able to:

- Be familiar with principles of anesthesia complications and blood disorders (e.g. hemolytic diseases, coagulation disorders)
- Apply principles of preoperative optimization methods.
- Apply pharmacological and nonpharmacological principles of common clinical conditions (e.g. diabetes mellitus, hypertension, IHD, COPD, elective and emergency cases)
- Be familiar with principles of anesthesia and allergy, diagnosis, management, investigations, and follow-up
- Describe principles of IV fluid management, electrolyte and acid–base disturbances
- Recognize the anesthetic principles of metabolic and endocrine emergencies, assessments and management
- Recognize the principles of anesthesia concerns for burn and plastic surgeries, pain, and fluids management
- Apply the principles of anesthesia for cardiac patients for noncardiac surgery, assessment, and management
- Recognize MH pathophysiology, clinical presentation, diagnosis, management

- Outline anesthesia concerns for senile patients, physiological and pathological changes and risks
- Apply principles of anesthesia for day surgery criteria of admission and discharge
- Apply the concepts, guidelines, types and concerns of conscious sedation
- Recognize the principles and managements of hypothermia, environmental hygiene and safety issues in OR
- Recognize principles of anesthesia concerns for radiology procedures & providing anesthesia in remote areas
- Perioperative stress response, hormonal and metabolic changes and its effect on patient outcome
- Recognize normal variations and patterns of pulmonary imaging (CXR, CT, V/Q scan), cardiac imaging (CXR), abdominal imaging (AXR), neuroimaging (CT scan)

IV. Anesthesia for Subspecialties

By the end of the interactive lecture, the resident will be able to:

- Apply principles and concerns of anesthesia for ENT and laser surgeries
- Recognize principles and types of anesthesia for ophthalmic surgery, anatomy, types of blocks and possible complications
- Recognize principles and common complications of anesthesia for urology patients
- Be familiar with principles and concerns of anesthesia for multitrauma patients
- Recognize principles and concerns of anesthesia for vascular surgery
- Be familiar with principles of high-risk pregnancies, physiological and pathological changes, and fetal care
- Apply principles of anesthesia management and risks of nonobstetric surgery during pregnancy

V. Intensive Care Unit

By the end of the interactive lecture, the resident will be able to:

- Apply the principles of mechanical ventilation in ICU, indications and complications
- Recognize the diagnosis and managements of common pulmonary diseases in ICU, pathophysiology and managements (e.g. asthma, COPD, bronchitis, emphysema, cystic fibrosis, pneumonia)
- Outline the principles of Total Parenteral Nutrition (TPN), indications and possible complications
- Recognize types, pathophysiology of shocks and its management

- Special respiratory system physiology to be familiar with physiological respiratory changes in special environments (e.g. diving physiology, high altitude and exercise physiology)

VI. Pediatric Anesthesia

By the end of the interactive lecture, the resident will be able to:

- Apply principles of anesthesia for neonates and premature infants surgical emergencies
- Recognize principles of anesthesia for high-risk pediatric patients, assessment and managements (e.g. history of recent upper respiratory tract infection, foreign bodies, and post-tonsillectomy bleeding)
- Be familiar with principles of fluid management in neonatal and pediatric patients
- Recognize the common childhood illnesses and their influence on anesthesia
- Be familiar principles of ventilatory support during pediatric anesthesia, mode of ventilation and possible complications

VII. Resident-Led Sessions

The objective of these sessions is to enable the resident to:

- Learn and practice how to lead group learning sessions
- Master scientific discussions and arguments with colleagues
- Collect and analyze scientific papers
- Be familiar with the concept of continuous and self-education methods

These sessions are run and supervised by a senior resident or fellow. Consultant supervision occurs only if requested by the resident's organizing committee. It includes but is not limited to:

- National and international practice guidelines discussion sessions (e.g. ASA guidelines, ESA guidelines, UK guidelines)
- Case report discussion sessions

Anesthesia Residents Core Program

No.	Topic	Objectives
1	Anesthesia for ENT & Laser Surgery	• Apply principles and concerns of anesthesia for ENT and laser surgeries
2	Anesthesia & Blood Disorders	• Be familiar with principles of anesthesia concerns and blood disorders (e.g. hemolytic diseases, coagulation disorders)
3	Pulmonary Diseases in ICU patients	• Recognize the diagnosis and management of common pulmonary diseases in ICU, pathophysiology and managements (e.g. asthma, COPD, bronchitis, emphysema, cystic fibrosis, pneumonia)
4	Pharmacological Principles of Analgesics	• Describe the principles of applied pharmacodynamics & pharmacokinetics • Describe indications & techniques of monitoring (clinical and nonclinical)
5	Anesthesia for Metabolic & Endocrine Emergencies	• Recognize the anesthetic principles of metabolic and endocrine emergencies, assessment and management
6	Anesthesia for Burn & Plastic Surgeries	• Recognize the principles of anesthesia concerns for burn and plastic surgeries, pain and fluid management
7	Principles of Anesthesia for Neonates and Premature Infants Surgical Emergencies	• Apply principles of assessment and providing anesthesia for neonatal emergencies (e.g. pyloric stenosis, necrotizing enterocolitis)
8	Pharmacology Principles of Inhalation Agents	• Describe the principles of applied pharmacodynamics and pharmacokinetics • Describe indications and techniques of monitoring (clinical and nonclinical)

No.	Topic	Objectives
9	Physical Principles of Monitors in OR 1	Explain the physical principles of monitors in OR, including: • Measuring O_2 • Measuring CO_2 • Measuring inhalation agent
9*	Physical Principles of Monitors in OR 2	Explain the physical principles of monitors in OR, including: • Measuring temperature • Invasive and noninvasive blood pressure measurement • Invasive blood pressure measurement, including arterial pressure, central venous pressure and pulmonary artery pressure
10	Principles of Electrical Safety in OR	• Explain the principles of electrical safety in OR and common sources of hazards (e.g. fires, burns, electrical shock, explosions, power failure) • Explain methods and types of patient protection
11	Pharmacology Principles of Local Anesthetics	• Describe the principles of applied pharmacodynamics and pharmacokinetics • Describe indications and techniques of monitoring (clinical and nonclinical)
12	Anesthesia & Allergy	• Apply principles of anesthesia and allergy, diagnosis, management, investigations and follow-up
13	Anesthesia of the Cardiac Patient for Non-cardiac Surgery	• Apply the principles of anesthesia for cardiac patients for non-cardiac surgery, assessment and management
14	Pharmacology Principles of Cardiovascular Agents	• Describe the principles of applied pharmacodynamics and pharmacokinetics • Describe indications and techniques of monitoring (clinical and nonclinical)
15	Perioperative Stress Response	• Hormonal and metabolic changes and its effect on outcome

No.	Topic	Objectives
16	Neuromuscular Blocking Agents & Diseases	• Describe the principles of applied pharmacodynamics and pharmacokinetics • Describe indications and techniques of monitoring (clinical and nonclinical)
17	Preoperative optimization	• Apply principles of preoperative optimization methods. • Apply pharmacological and non-pharmacological principles of common clinical conditions (e.g. DM, hypertension, IHD and COPD, for elective and emergency cases)
18	Anesthesia for Eye Surgery	• Recognize principles and types of anesthesia for ophthalmic surgery, anatomy, types of blocks and possible complications
19	Mock exam	• Formative assessment whereby ongoing revision of acquired knowledge and/or skills are assessed
20	Radiology for the Anesthetist	• To be familiar with normal variations and patterns of pulmonary imaging (CXR, CT, V/Q scan), cardiac imaging (CXR), abdominal imaging (AXR), Neuroimaging (CT scan)
21	Anesthesia Machine and Principles of Vaporizers	• Recognize the main components of the anesthesia machine and check anesthetic machines and common defaults • Be familiar with the principles of vaporizers, types factors affecting its function and possible hazards
22	Principles of Mechanical Ventilation in Critical Care	• Apply the principles and types of mechanical ventilation in critical care

23	Principles of IV Fluid Management, Electrolyte and A–B Disturbances	• Describe the principles of IV fluid management, electrolyte and acid–base disturbances
24	Gas Laws, Gas Supply & Storage	• Explains the gas laws, hospital gas supplies source and storage

No.	Topic	Objectives
1	Updates in Anesthesia Circuits	• Recognize all updates in anesthesia circuits and its clinical uses
2	Anesthesia Drugs Overdose	• Physiological and pathological effect
3	Genetics & Drugs	• Genetics and drugs, physiological and pathological effect
4	Anesthesia in Remote Areas	• Recognize principles of anesthesia concerns for radiology procedures and providing anesthesia in remote areas
5	Safety and Anesthesia	• Recognize the principles and managements of hypothermia, environmental hygiene and safety issues in the OR
6	Mock Exam	
7	Anesthesia for Senile patients	• Outline anesthesia concerns for senile patients, physiological and pathological changes and risks
8	Anesthesia for Day Surgery Cases	• Apply principles of anesthesia for day surgery cases criteria of admission and discharge

9	TIVA Concepts	• Pharmacodynamics and pharmacokinetics principles, clinical effect and monitoring
10	Concepts for Conscious Sedation	• Categorize the concepts, types and concerns of conscious sedation
11	Urology Anesthesia & Complications	• Recognize principles of anesthesia for urology surgery and common complications
12	Anesthesia for Multitrauma Patients	• Be familiar with principles and concerns of anesthesia for multitrauma patients, assessment and management

No.	Topic	Objectives
13	Vascular Anesthesia Issues	• Recognize the principles and concerns of anesthesia for vascular surgery, assessment and management
14	Obstetric Emergencies	• Be familiar with principles of high risk pregnancies, physiological and pathological changes and fetal care
15	Total Parenteral Nutrition (TPN)	• Outline the principles of Total Parenteral Nutrition (TPN), indications and possible complications
16	Shocks, types and managements	• Recognize types, pathophysiology of shocks and its managements
17	Anesthesia for High-Risk Pediatric Patients	• Recognize principles of anesthesia for high-risk pediatric patients, assessment and managements (e.g. history of recent upper respiratory tract infection, foreign bodies, and post-tonsillectomy bleeding)

18	Principles of Fluid Management in Pediatric Patients	• Be familiar with principles of fluid management in neonatal and pediatric patients
19	Ventilator Support During Pediatric Anesthesia	• Be familiar principles of ventilator support during pediatric Anesthesia, mode of ventilation and possible complications
20	Special Respiratory System Physiology	• To be familiar with physiological respiratory changes in special environment (e.g. diving physiology, high altitude, and exercise physiology)
21	Conscious Sedations	• Apply the concepts, guidelines, types and concerns of conscious sedation
22	Malignant Hyperthermia (MH)	• Recognize MH pathophysiology, clinical presentation, diagnosis, management
23	Anesthetic Management of Non-obstetric Surgery During Pregnancy	• Apply principles of anesthesia management and risks of non-obstetric surgery during pregnancy
24	Continuous Assessment Quizzes	

List of topics covered *in practice-based learning*

ACTIVITY	OBJECTIVES	CanMEDS COMPETENCIES
1. Educational Curriculum		
a. Morbidity and Mortality Report (MM)	• Identify areas of improvement for clinicians involved in the case management. • Prevent errors that lead to complications. • Modify behavior and judgment based on previous experiences. • Identify systems issues that may affect the patient care such as outdated policies and changes in patient identification procedures.	Professional Manager Medical Experts
b. Grand Rounds/ Guest Speaker Lectures.	• Increase physician's medical knowledge and skills, and ultimately, improve patient care. • Understand and apply current practice guidelines in the field of urology and its subspecialties. • Describe the latest advances in the field of urology and research. • Identify and explain areas of controversy in the field of urology.	Medical Expert Professional
c. Journal Clubs, Critical Appraisal and Evidence Based Medicine	• Promote continuing professional development. • Keeping up -to-date with the literature. • Disseminating information on and build up debate about good practice.	Medical Expert Scholar Health Advocate

	• Ensuring that professional practice is evidence based. • Learning and practicing critical appraisal skills. • Providing an enjoyable educational and social occasion.	
d. Joint specialty meetings.	• Provide the knowledge, technical skills and experience necessary for urology residents to interpret and correlate clinical finding, laboratory data such as radiological imaging with the pathological changes. • Promote effective communication and sharing of expertise with peers and colleagues. • Promote the development of investigative skills to better understand pathologic processes as they apply to both individual patients and the general patient population. • Promote the acquisition of knowledge, provide experience in laboratory direction and management, and encourage residents to assume a leadership role in the education of other physicians and allied health professionals.	Medical Expert Communicator Collaborator Manager
e. Research and Evidence Based Practice	• Develop a sound knowledge in research design including ethics, study design, abstract writing skills, and presentation skills. • Gain competence in literature review, data synthesis, data analysis and interpretation. • Develop a viable research proposal with the help of faculty mentor • Conduct a research on a topic broadly related to urology • Disseminate research findings through oral presentations, poster presentations, abstract preparation, or article publication	Scholar Professional Manager
2. Daily Clinical Responsibilities & On Call Duty Based Learning		
a. Daily Clinical	• Preoperative assessment • Anesthetic planning • Communication with senior staff • Preparation • Administration of Anesthesia • Postoperative Follow-up	Professional Medical Expert Scholar
b. On Call Requirements	• Shall take calls as indicated on the call schedule in which he/she rotating. • For off service rotations (e.g. research, chronic pain, medical rotations with no call duties), should do 1 in 4 calls in general anesthesia on-calls.	

List of suggested topics for case-based discussion

Level	Airway/Breathing	CVS/Circulation	Other
R1-5*	• Any case with Significant event or morbidity and mortality that the resident was present or part of the case and shared in the intra- or post-operative management or documentation.		
R1	• Airway options for management in patient with difficult airway • Management of case with intra op Events (Laryngospasm, Bronchospasm)	• Management of case with intra op events (hypo or hypertension) • Management of case with intra op events (Acid base monitoring & management)	• Management of case with intra op Events (ATLS) • Management of case with peri- op complication • Recovery Room Emergencies
R2	• Management of case with intra op events (hypoxia, hypotension) • Management of case with Airway laser/surgery	• Management of case with intra op Events (ACLS) • Management of case with pheochromocytoma	• Management of case with Intestinal obstruction • Management of case with special Obstetric outcome
R3	• Management of case with Foreign body aspiration • Management of case with Airway trauma	• Cardiac surgery • Implanted cardiac device	• Management of case with special pediatric disease • Management of obstetric case for non- Obstetric procedure • Critical events in ICU • Management of case with increased ICP
R4	• Management of case with ARDS ventilation management • Management of case with One lung ventilation	• Major vascular case • Major thoracic case • Solid organ Transplant surgery	• Management of case with Complicated obstetric outcome • Critical events in ICU • Management of Complicated pediatric case • Management of case with post-op acute pain • Patient with chronic pain management
R5	• Management of case with Anterior mediastinal mass • Management of case with polytrauma	• Valvular Cardiac surgery • Cardiac patient for non-cardiac surgery	• Management of case with Septic shock • Management of case with Neonatal emergency • Management of case with regional anesthesia

WORKSHOPS AND COURSES

The following courses are integral part of the program. Specialty consultants should provide these courses through a combination of more than one educational tool (e.g. didactic lectures, problem-based learning, small group exercises, task-training hands-on workshops, low- or moderate- to high-fidelity simulation training). The goal is to develop theoretical knowledge and practice skills.

JUNIOR RESIDENTS (R1–R3)

No.	Course Title		Duration
1	Basic Life Support (BLS)	Mandatory	**1 day**
2	Advance Cardiac Life Support (ACLS)	Mandatory	**3 days**
3	R1 Introductory Simulation Program	Mandatory	**1 day**
4	Research Methodology and Statistics	Recommended	**1 day**
5	Communication Skills Course	Recommended	**1 day**
6	Principles of Learning and Teaching in Health Sciences	Recommended	**1 day**
7	Professionalism and Ethics in Anesthesia	Recommended	**1 day**
8	Difficult Airway Management	Mandatory	**1 day**
9	Basics of Ultrasound and Regional Anesthesia	Recommended	**1 day**
10	Obstetric Analgesia and Anesthesia	Mandatory	**1 day**
11	Crisis Resource Management I	Mandatory	**1 day**
12	Perioperative Pain Management	Recommended	**1 day**
13	Perioperative Medicine Simulation Course	Recommended	**1 day**

SENIOR RESIDENTS (R4–R5)

No.	Course Title		Duration
1	Neonatal Resuscitation Program (NRP)	Mandatory	**1 day**
2	Pediatric Advanced Life Support (PALS)	Mandatory	**2 days**
3	Advanced Trauma Life Support (ATLS)	Recommended	**3 days**
4	Fundamental Critical Care Support (FCCS)	Recommended	**2 days**
5	Crisis Resource Management II	Mandatory	**1 day**
6	Thoracic Anesthesia Workshop	Mandatory	**1 day**
7	Advanced Regional Anesthesia Course	Recommended	**1 day**
8	Chronic Pain Management Workshop	Recommended	**1 day**
9	Basics of Echocardiogram and TEE Principles Workshop	Recommended	**1 day**
10	Crisis Resource management II	Mandatory	**1 day**
11	Anesthesia practice management	Recommended	**1 day**
12	Pediatric CRM Simulation Course	Recommended	**1 day**
13	Cardiac Anesthesia Simulation Course	Recommended	**1 day**
14	Chronic Pain Simulation Course	Recommended	**1 day**
15	Neuroanesthesia Simulation Course	Mandatory	**1 day**

MANDATORY WORKSHOPS AND COURSES OBJECTIVES

GROUP I

Group I courses will be taken during the first three years of residency (junior Residents [R1–R3]).

R1 INTRODUCTORY SIMULATION PROGRAM

This is a "bootcamp" type of introductory simulation that is now very common in Anesthesiology training programs (e.g. in the US).
Residents will be exposed to a variety of basic knowledge and skills, such as airway management, anesthesia induction and maintenance, emergence, intravenous line, central line, spinal, epidural, and OR safety, in a simulation environment.

DIFFICULT AIRWAY MANAGEMENT

- To discuss the difficult airway algorithm and the pathway used from assessment to intubation
- To practice airway management with different commercially available difficult airway tools
- To demonstrate handling and care of flexible fiberoptic/videoscopes
- To demonstrate skills for emergent invasive airway access
- To apply the algorithm to different clinical case scenarios on low- to high-fidelity simulators

OBSTETRIC ANESTHESIA WORKSHOP

This is a workshop that includes didactic and small-group interactive sessions, with specific objectives:

- To describe different modalities of labor analgesia and anesthesia and their practical applicability
- To counsel a parturient about labor analgesia options for spontaneous, instrumental, and surgical deliveries
- To demonstrate a safe approach to difficult airway management in obstetric anesthesia
- To manage a common obstetric crisis through high-fidelity simulation or interactive small-group case discussion (e.g. severe PET, PPH, cardiac arrest, high-risk pregnancy for non-obstetric procedures)

CRISIS RESOURCE MANAGEMENT IN ANESTHESIA

- To improve technical and theoretical cognitive and professional skills in the recognition and treatment of realistic and complex perioperative medical situations
- To manage hemodynamic and respiratory critical events in anesthesia with up-to-date techniques in a safe learning environment
- To reflect on their role in approaching leadership and effective communication within a highly interactive small group debriefing under strict confidentiality

GROUP II

Group II courses and workshops will be taken during the last two years of residency (senior residency [R4–R5]).

THORACIC ANESTHESIA

- To discuss ventilation parameters and management of one lung ventilation
- To apply different strategies to manage intraoperative hypoxia in a simulation scenario
- To demonstrate several methods of lung isolation on simulated mannequins with available tools (e.g. DLT, endobrochial blocker, Univent)
- To apply intraoperative flexible bronchoscopy skills on models simulating anesthetized patients and/or virtual simulators

- To review the basics of physiology and management of ICP
- To understand the importance of neuromonitoring in patient outcome
- To justify drug choices in neuroanesthesia
- To review the management of cerebral aneurysm and AVM
- To understand the role of neuroradiology
- To understand the importance of location of mass effect and anesthesia plan
- To demonstrate knowledge of neuroanesthesia in three simulation and practice oral cases as well as pre- and postcourse OSCE and short answers

CHAPTER THREE: TRAINEES DUTIES, RESPONSIBILITIES, AND ASSESSMENT

INTRODUCTION/OVERVIEW

The Saudi Anesthesia Training program has a defined curriculum with competency-based goals and objectives for each rotation/assignment at each educational level and delineation of progressive responsibilities for patient care, management and supervision. Rules and Regulations of the program follow the general SCFHS training rules and regulations.

RESPONSIBILITIES

CLINICAL RESPONSIBILITIES

1. Daily

Preoperative assessment: The resident should perform preoperative assessment of each listed patient. Inpatients scheduled the night beforehand or earlier must be assessed by the residents the night beforehand at the latest.

- Anesthetic planning: For each case, the resident should generate an anesthetic plan with a level of detail corresponding to the expected level of training.
- Communication with senior staff: It is the responsibility of the resident to ensure that this plan is discussed with and approved by the senior anesthesiologist before proceeding.
- Preparation: The resident shall arrive in the hospital with sufficient time to start the first case at the scheduled time, check and prepare all necessary equipment, and make any necessary arrangements.
- Administration of anesthesia: The resident will implement the anesthetic plan, including modification in response to evolving conditions, from preoperative assessment and optimization through to postoperative disposition, with a degree of independence corresponding to the expected level of training.

Postoperative follow-up: The resident should attend any postoperative investigation or management that derives from either the initial anesthetic plan or intraoperative events. The resident should follow-up on any complications and communicate the results of that follow-up to the reporting anesthesiologist.

2. On-Call Requirements

- The resident shall take calls as indicated on the call schedule. While on call, the resident is expected to perform all of the same functions as outlined above for an elective list, within the context of emergency care.

- For off-service rotations (e.g. research, chronic pain, medical rotations with no call duties), the resident should do 1 in 4 general anesthesia on-calls.

3. Logbook

- All trainees are required to keep a logbook where all clinical and academic activities performed during training should be recorded (electronic records are highly recommended).

- A complete logbook minimally records the completion of 2000 anesthetics. These cases need to include cases as listed in Chapter Four: Appendix *Table No. 1: Direct Observation of Procedural Skills (DOPS) Cases.*

- Candidates are also required to record a number of "Clinical Case Studies" using the Case-Based Discussion (CBD) format. During the five-year program, the resident is expected to complete a minimum of 20 clinical case studies. For details of the required case studies and the needed format please refer to Chapter Four: Appendix *Table No. 3: Suggested Case-Based Discussion Topics*.

- The completed logbook will be countersigned by the Program Director.

4. Consults

Residents should see consults in the following circumstances:

- Any listed patient
- Any outstanding consults while on-call, secondary to availability for the OR
- During days listed into the preanesthesia/anesthesia clinic
- As delegated by the senior staff

OTHER RESPONSIBILITIES

1) The resident should participate in the clinical teaching of coworking medical students, junior residents, and paramedical trainees.

2) The resident should attend all anesthesia departmental academic activities (e.g. grand rounds, journal clubs, case discussions) that occur at their site of rotation.

3) The resident must hand in one evaluation form per elective day. The resident must make reasonable attempt to obtain this evaluation from the staff. If that does not occur, a blank form must be submitted indicating the reason for non-completion.

4) The resident is required/encouraged to participate actively in research projects and studies during the training program under the guidance and supervision of his/her trainers. The specialty board recognizes research projects as a favorable activity in the evaluation process of residents.

ASSESSMENT

Residents' evaluation and assessment throughout the program is undertaken in accordance with the Commission's training and examination rules and regulations. This includes the following:

A. ANNUAL ASSESSMENT:

1. Continuous Appraisal

This assessment is conducted toward the end of each training rotation throughout the academic year and at the end of each academic year as continuous assessment in the form of formative and summative evaluation.

1.1 Formative Continuous Evaluation:

To fulfill the CanMEDS competencies based on the end of rotation evaluation, the resident's performance will be evaluated jointly by relevant staff for the following competencies:

1. Performance of the trainee during daily work. *Appendix 1*

2. Performance and participation in academic activities.
3. Performance of WBA (work based assessment) for certain clinical competencies in the different levels of residency. Table 4 *Appendix 1*
4. Performance in a 10–20-minute direct observation assessment of trainee-patient interactions. Trainers are encouraged to perform at least one assessment per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter.
5. Performance of diagnostic and therapeutic procedural skills by the trainee. Timely and specific feedback for the trainee after each procedure is mandatory.
6. The CanMEDS-based competencies end-of-rotation evaluation form must be completed within two weeks following the end of each rotation (preferably in an electronic format) and signed by at least two consultants. The program director will discuss the evaluation with the resident, as necessary. The evaluation form will be submitted to the Regional Training Supervisory Committee of the SCFHS within four weeks following the end of the rotation.
7. The academic or clinical assignments should be documented by an electronic tracking system **(e-Logbook** and **Learning Portfolio** when applicable) on an annual basis *Appendix* 2. Evaluations will be based on accomplishment of the minimum requirements of the procedures and clinical skills as determined by the program.
8. Annual promotion depends on satisfactory annual overall evaluation and passing at least 3 out of 4 rotations and the average score for all rotations will not be less than 50%.

1.2 Summative Continuous Evaluation:

This is a summative continuous evaluation report prepared for each resident at the end of each academic year, which might also involve clinical, oral examination, OSPE, and OSCE.

2. End-of-year Examination:

The end-of-year examination will be limited to R1, R2, R3 and R4. The number of exam items, eligibility, and passing score will be in accordance with the commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, *www.scfhs.org.sa*

B. PRINCIPLES OF ANESTHESIOLOGY EXAMINATION (SAUDI BOARD EXAMINATION: PART I)

This exam is conducted in the form of a written examination with a MCQ format, and it is held at least once a year. The number of exam items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, *www.scfhs.org.sa*

C. FINAL IN-TRAINING EVALUATION REPORT (FITER)/COMPREHENSIVE COMPETENCY REPORT (CCR)

In addition to the approval of completion of the clinical requirements (resident's logbook) by the local supervising committee, the FITER is also prepared by the program's directors for each resident at the end of his/her final year in residency (R5) Appendix 2. This might also involve clinical, oral exams, and completing other academic assignment(s).

D. FINAL ANESTHESIOLOGY BOARD EXAMINATION (SAUDI BOARD EXAMINATION: PART II)

The final Saudi Board Examination comprises two parts:

1. Written Examination

This examination assesses the theoretical knowledge base (including recent advances) and problem-solving capabilities of candidates in the specialty of Anesthesiology, it is delivered in a MCQ format and is held at least once a year. The number of exam items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, *www.scfhs.org.sa*

2. Clinical Examination

This examination assesses a broad range of high-level clinical skills, including data gathering, patient management, communication, and counseling skills. The examination is held at least once a year, preferably in an objective structured clinical examination (OSCE) format in the form of patient management problems (PMPs). The exam eligibility and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, *www.scfhs.org.sa*

E. CERTIFICATION:

Certificate of training completion will only be issued upon the resident's successful completion of all program requirements. Candidates passing all components of the final specialty examination are awarded the "Saudi Board of Anesthesiology" certificate.

SUGESSTED LEARNING RESOURCES

JOURNALS

CLASS (A) JOURNALS

Trainees are expected to have current knowledge in at least two of the following journals, preferably one European and one North American:

1. Anesthesiology
2. Anesthesia
3. British Journal of Anesthesia
4. Canadian Journal of Anesthesia
5. Anesthesia and Analgesia

CLASS (B) JOURNALS

Trainees are expected to have some general knowledge in one of the following journals:

1. Anesthesia and Intensive Care
2. Regional Anesthesia and Pain Medicine
3. Journal of Clinical Anesthesia
4. Der Anesthetist
5. Acta Anaesthesiologica Scandinavica
6. Pain
7. Critical Care Medicine
8. Resuscitation
9. Journal of Trauma
10. New England Journal of Medicine

TEXTBOOKS

CLASS (A) TEXTBOOKS

Residents are encouraged to have in-depth knowledge in major parts of the following books:

1. Anesthesia, Ronald D. Miller (Churchill Livingstone)
2. Clinical Anesthesia, Paul G. Barash (B. Lippincott Company)
3. Anesthesia and Co-Existing Disease, Robert K. Stoelting (Churchill Livingstone)
4. Essentials of Anesthesiology, Chung and Lam (W.B. Saunders Company) (recommended for year 1)
5. The ICU Book, Paul L. Marino (Williams & Wilkins) (recommended for ICU rotations)

CLASS (B) TEXTBOOKS

Residents are expected to use the following books as references related to anesthesia and intensive care:

1. Neural Blockade in Clinical Anesthesia & Management of Pain, Michael Cousins (B. Lippincott Company)
2. Obstetric Analgesia and Anesthesia, David Chestnut.
3. Manual of Pediatric Anesthesia, David Steward (Churchill Livingstone)
4. Synopsis of Critical Care, William J. Sibbald (Williams & Wilkins)
5. Current Therapy in Critical Care Medicine, Joseph E. Parrillo (B.C. Decker Inc.)
6. Atlas of Regional Anesthesia, Jordan Katz (Appleton-Century-Crofts)
7. Manual of Medical Procedures, Paul M. Suratt (C.V. Mosby Company)
8. Drugs and Anesthesia: Pharmacology for Anesthesiologists, Margaret Wood (Williams & Wilkins)
9. Applied Respiratory Physiology, F. Nunn (Butter Worths)
10. Review of Medical Physiology, W. F. Ganong (Appleton & Lange)
11. Clinical Application of Respiratory Care, Barry A. Shapiro (Year Book Medical Publishers, Inc.)
12. Clinical Electrocardiography: A Simplified Approach, Ary Louis Goldberger (C. V. Mosby Company)

13. Day-Case Anesthesia and Sedation, G. Whitwam (Black Scientific Publications)
14. Lecture Notes on Medical Statistics, Aviva Petrie (Black Scientific Publications)
15. Medical Statics on Personal Computers, R. A. Brown (BMJ Publishing Group)
16. Cardiac Anesthesiology Fellows Manual, Dr. Annette Vegas
17. Cardiac Anesthesia, Frederick Kaplan
18. Textbook of Thoracic Anesthesia, Alan Symor
19. Textbook of Thoracic Anesthesia, Peter Slinger
20. Textbook of Neuro-Anesthesia with Neurosurgical and Neuroscience Perspective, Maurice S. Albin
21. Intensive Care Medicine, Irwin & Rippe
22. Obstetric Anesthesia, Simpson Handbook

CHAPTER FOUR: APPENDIX

APPENDIX 1

IN-TRAINING EVALUATION

DAILY EVALUATIONS

Daily evaluations should be completed by senior anesthesiologists and discussed with the resident. The discussion should focus on strengths and areas of improvement based on daily observations. The resident must hand in one evaluation form per elective day. The resident must make reasonable attempts to obtain this evaluation from the staff. If that does not occur, a blank form must be submitted indicating the reason for non-completion. Appendix 3 Form 1 and 2

WORKPLACE-BASED ASSESSMENT (WBA)

Assessment forms to be completed by the supervising anesthesiologist as required by rotation-specific objectives are the following:

- Mini-CEX (Clinical Encounter Exercise); *see Appendix 3 Form 4*
- DOPS (Direct Observation Procedure Skills); *see Appendix 3 Form 5*
- CBD (Case-Based Discussion); *see Appendix 3 Form 3 and Table 3 for suggested topics*

THE GENERAL GUIDELINES TO COMPLETE THE FORMS ARE AS FOLLOWS:

1. The process is directed at providing residents with direct feedback during their clinical rotations. The whole process is driven by the resident. It is the resident's responsibility to make sure the forms are completed and submitted to the Program Director.
2. The forms are only completed on cases that the resident is directly involved in as part of his/her routine training.
3. Each resident should complete forms in sequence at an average rate of one form per each month of rotation. The maximum number of forms is nine; the minimum is six per year.
4. The sequence is one Mini-CEX, one DOPS, and CBD, then moving again to similar cycles.

5. Please keep a copy of this document with you when you give the forms for the trainer for easy reference and guidance during the procedure of completing the forms to ensure consistency of the process.
6. Each form need to be completed by a different certified WBA-trainer per year to maximize the resident exposure to different trainers.
7. The resident must complete the top part of the form using CAPITAL letters. The trainer, after observing the resident, must complete the rest of the form, including case information, assessment, and comments in the provided spaces. The form must be completely filled and signed by both the resident and the trainer.
8. After each form completion, a copy is given back to the resident. This copy should be kept with resident as part of his own learning portfolio file along with his cases logbook. The other two copies are given back to the RTP and regional/central training committee.
9. The completed forms are part of end-of-year completion requirements and FITER for final-year residents.

APPENDIX 2

LEARNING PORTFOLIO

- The Learning Portfolio is a detailed inventory maintained by the Trainee to record learning processes and key events, experiences and progress during the training years.
- The purpose of the Learning Portfolio is to assist Trainees and Supervisors plan and implement training and to facilitate Trainee development of critical and reflective learning and practice. Specifically it:
- Shows the Trainee's progress through the recording of Modules completed, clinical experience gained, skills learned and assessments completed.
- Allows the Trainee to establish learning plans (and revise them when necessary), time management schedules and reflective learning.
- Reminds the Trainee of the objectives of training and the attributes of a Specialist Anesthetist.
- Promotes self-directed learning.

The objectives of the learning portfolio are:

- Document the Trainee's progress through Approved Training.
- Clarify areas for improvement.
- Give greater responsibility to Trainees for their learning experience.
- Provide an opportunity for reflective learning.
- Provide additional information to Supervisors regarding Trainee progress and learning.
- Facilitate communication between Supervisors and Trainees.
- Establish (and allow for revision of) learning plans and time management schedules.
- Promote self-directed learning essential for continuing professional development, lifelong learning, adult learning and problem-based learning activities.

The Trainee is responsible for ensuring information within the Portfolio is kept up-to-date and accurate throughout their training.

The Learning Portfolio has three sections for the Trainee to enter information.

- Record of Training. The data to be kept include details on registration, training posts, Basic and Advanced Training, and assessments and examinations.
- Records of Rotations. These include clinical experience (clinical cases), Learning Plans, self-appraisals, assessments and records of completion for each Rotation.
- Records of Continuing Professional Development. These include Trainee learning experiences in clinical skills, education skills, academic activities and continuing education.
- Additional items to be included are: a duly completed logbook, completed WBA forms, other important learning evidence papers, conferences, praise cards, etc.

FINAL IN-TRAINING EVALUATION REPORT (FITER)

This is a summative evaluation prepared at the end of the residency program, which grants the resident with a full range of competencies (knowledge, skills and attitudes) required for the Anesthesia specialist, and readiness to sit the Saudi certification examinations.

It provides information that will be considered by the Saudi Examination Board during the deliberation of a candidate whose performance at the Saudi certification examination falls into the borderline category.

The FITER is requested by the Saudi Board at the end of residency training.
The FITER is completed by the resident training Program Director.

The FITER is not a composite of the regular in-training evaluations; rather it is a testimony of the evaluation of competencies at the end of a residency education program.
It will be completed as late as possible in the resident's training but no later than 2 months before the oral Exam.

The FITER of individual candidates is available only to the Chair of the Examination Committee, who must maintain confidentiality of the name of the candidate, training center and Program Director at all times.

APPENDIX 3

الهيئة السعودية للتخصصات الصحية

Saudi Commission For Health Specialties

Form 1: Anesthesia Resident Daily Evaluation

Anesthesia Resident's Daily Evaluation

Resident:	Preceptor:
Date:	Rotation/Case Type:

Overall performance today: **(circle)** **1 2 3 4 5**

1= Unsatisfactory, significant concerns

2= Borderline , some concerns

3 = Average as expected for stage of training

4 = Above average for level of training

5 = Exceptional, well above expected

1. **What did you learn during today's training that you anticipate using in your practice, that you did not know before?**

2. **What is the most valuable thing you learned today (knowledge or skill)?**

3. **Was there anything you had problem with during your practice today?**

Faculty Signature:_____

Resident Comments and Signature:

No.: الرقم :

Date : / / التاريخ :

Attach. : المرفقات :

ص.ب ٩٤٦٥٦ الرياض ١١٦١٤

تلفون : ٤٨٠٠٨٠٠ - فاكس تحويلة ٨٠٠

P.O. Box 94656 - Riyadh 11614

Telephone: 4800800 - Fax Ext. 800

E-mail: scfhs@scfhs.org - www.scfhs.org

RESIDENT IN-TRAINING EVALUATION REPORT

SCIENTIFIC BOARD OF: _____ **PROGRAM CENTER:** _____

Name: _____ SCHS Registration No.: _____

Level of Training: R1 ☐ R2 ☐ R3 ☐ R4 ☐ R5 ☐ Hospital: _____

Rotation: _____ Date: From: _____ To: _____

(TICK THE APPROPRIATE BOX: ✓)

#	Criteria	Unsatisfactory (1)	Below Average (2)	Average (3)	Above Average (4)	Outstanding (5)	Not Applicable
	(A) KNOWLEDGE						
1	Basic						
2	Clinical						
	(B) CLINICAL SKILLS						
3	History & Physical Examinations						
4	Clinical Judgment & Decision Making						
5	Consultation Skills						
6	Performance in Emergencies						
7	Appropriate Utilization of Investigation						
8	Records & Reports						
9	Participation in Scientific Activities						
	(C) OPERATIVE & INTERVENTIONAL SKILLS						
10	Indications & Judgment						
11	Technical Skills						
	(D) PERSONALITY & ETHICS						
12	Punctuality						
13	Discipline & Reliability						
14	Attitude toward Patients						
15	Attitude toward Staff						
16	Ability to Supervise						
	Total Score						

Comments :

_____

_____

_____

Name of Evaluator		Signature		Date	
Name of Evaluator		Signature		Date	
Name of Evaluator		Signature		Date	

Official Use

Percentage Scored = $\frac{\text{Total Score}}{\text{NO. OF EVALUATED ITEMS}}$ X 20 = _____ %

Name: _____ Signature: _____ Date : _____

Director of Residency Training Program

Resident's Signature (That he/she saw the evaluation form): _____ Date: _____

Saudi Commission Health Specialties
Anesthesia

Case-Based Discussion (CBD)

Please complete the questions using a cross - X

Please use black ink and CAPITAL LETTERS

Candidate First Name	
Candidate Last Name	
Candidate Number	

Department Code		Level of Candidate							
			Student	1	2	3	4	5	6
			Resident	R1	R2	R3	R4	R5	

Form 3:

WBA: Case-based Discussion Form

Clinical Setting:	Pr.C	GC	OPD	ER	DC	IP	OR	CSC	OTHER (Specify)
	☐	☐	☐	☐	☐	☐	☐	☐	☐
Clinical Problem Category:	Airway / Breathing	CVS / Circulation	Gastro	Neuro	Pain	Psych / Behavior	OTHER (Specify)		
	☐	☐	☐	☐	☐	☐	☐		
Focus of Clinical encounter	Medical Record Keeping		Clinical Assessment		Management		Professionalism		
	☐	☐	☐	☐	☐	☐	☐	☐	
Complexity of case	Low		Average		High				
	☐		☐		☐				
Assessor's Position:	☐ Professor	☐ Associate Prof.	☐ Asst. Prof.	☐ Demonstrator	☐	Other			
	☐ Consultant	☐ Senior Registrar	☐ Registrar	☐ Resident	☐	Other			
Number of previous mini-CEXs observed by assessor with any trainee:	0	1	2	3	4	5 - 9	>9		
	☐	☐	☐	☐	☐	☐	☐		

Please Grade the following areas using the scale below	Below expectations for level		Borderline for level	Meets expectations for level	Above expectations for level		U / C*
	1	2	3	4	5	6	
1. Medical Record Keeping	☐	☐	☐	☐	☐	☐	☐
2. Clinical Assessment	☐	☐	☐	☐	☐	☐	☐
3. Investigation & Referrals	☐	☐	☐	☐	☐	☐	☐

4. Treatment	☐	☐	☐	☐	☐	☐	☐
5. Follow-up & Future planning	☐	☐	☐	☐	☐	☐	☐
6. Professionalism	☐	☐	☐	☐	☐	☐	☐
7. Overall clinical judgment	☐	☐	☐	☐	☐	☐	☐

* U / C Please mark this if you have not observed the behavior and therefore feel unable to comment

Anything especially good?	0 - 8	Suggestions for development?

Agreed Action:

Have you had training in the use of this assessment tool? (For Assessor) ☐ Face-to-Face ☐ Have Read Guidelines ☐ Web / CD-ROM

Assessor's Signature:

Date (DD/MM/YY) D D M M Y Y

Time taken for Observation: In minutes

Time taken for Feedback: In minutes

Assessor's Surname:

Assessor's Code:

* If Applicable

Yellow copy (Student), Red copy (Faculty or Department), White copy (Assessment Unit)

** *Modified from* www.hcat.nhs.uk

Mini-Clinical Evaluation Exercise (Min

Please complete the questions using a cross - X

Please use black ink and CA

Candidate First Name	
Candidate Last Name	
Candidate Number	

Department Code		Level of Candidate							
			Student	1	2	3	4	5	6
			Resident	R1	R2	R3	R4	R5	

Form 4:

WBA- Min-Clinical Evaluation Exercise (mini-CEX) Form

Clinical Setting: Pr.C ☐ GC ☐ OPD ☐ ER ☐ DC ☐ IP ☐ OR ☐ CSC ☐ OTHER (Specify) ☐

Clinical Problem Category: Airway / Breathing ☐ CVS / Circulation ☐ Gastro ☐ Neuro ☐ Pain ☐ Psych / Behavior ☐ OTHER (Specify) ☐

New or Follow up: New ☐ FU ☐ Focus of Clinical encounter: History ☐ Diagnosis ☐ Management ☐ Explanation ☐

Number of times patient seen before by trainee: 0 ☐ 0 - 4 ☐ 5 - 9 ☐ >10 ☐ Complexity of case: Low ☐ Average ☐ High ☐

Assessor's Position: ☐ Professor ☐ Associate Prof. ☐ Asst. Prof. ☐ Demonstrator ☐ Other ☐
☐ Consultant ☐ Senior Registrar ☐ Registrar ☐ Resident ☐ Other ☐

Number of previous mini-CEXs observed by assessor with any trainee: 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 - 9 ☐ >9 ☐

Please Grade the following areas using the scale below	Below expectations for level		Borderline for level	Meets expectations for level	Above expectations for level		U / C*
	1	2	3	4	5	6	
1. History Taking	☐	☐	☐	☐	☐	☐	☐
2. Physical examination Skills	☐	☐	☐	☐	☐	☐	☐

3. Communication Skills	☐	☐	☐	☐	☐	☐	☐
4. Clinical judgment	☐	☐	☐	☐	☐	☐	☐
5. Professionalism	☐	☐	☐	☐	☐	☐	☐
6. Organization / Efficiency	☐	☐	☐	☐	☐	☐	☐
7. Overall clinical care	☐	☐	☐	☐	☐	☐	☐

* U / C Please mark this if you have not observed the behavior and therefore feel unable to comment

Anything especially good?	0 - 8	Suggestions for development?

Agreed Action:

Have you had training in the use of this assessment tool? (For Assessor) ☐ Face-to-Face ☐ Have Read Guidelines ☐ Web / CD-ROM

Assessor's Signature:

Date (DD/MM/YY) D D M M Y Y

Time taken for Observation: In minutes ☐☐

Time taken for Feedback: In minutes ☐☐

Assessor's Surname: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Assessor's Code: ☐☐☐☐☐☐☐☐☐☐☐

Saudi Commission Health Specialties
Anesthesia

* If Applicable
Yellow copy (Student), Red copy (Faculty or Department), White copy (Assessment Unit)

** *Modified from www.hcat.nhs.uk*

Direct Observation of Procedural Skills (DOPS)

Please complete the questions using a cross - X

Please use black ink and CAPITAL LETTERS

Candidate First Name	
Candidate Last Name	
Candidate Number	

Department Code		Level of Candidate							
			Student	1	2	3	4	5	6
			Resident	R1	R2	R3	R4	R5	

Clinical Setting: Pr.C ☐ GC ☐ OPD ☐ ER ☐ DC ☐ IP ☐ OR ☐ CSC ☐ OTHER ☐

Procedure Number ☐☐ Other ☐

Assessor's Position:
☐ Professor ☐ Associate Prof. ☐ Asst. Prof. ☐ Demonstrator ☐ Other
☐ Consultant ☐ Senior Registrar ☐ Registrar ☐ Resident ☐ Other

Number of previous DOPS observed by assessor with any trainee: 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 - 9 ☐ >9 ☐

Number of times procedure performed by trainee: 0 ☐ 1 - 4 ☐ 5 - 9 ☐ >10 ☐

Difficulty of Procedure: Low ☐ Medium ☐ High ☐

Please Grade the following areas using the scale below	Below expectations for level		Borderline for level	Meets expectations for level	Above expectations for level		U / C*
	1	2	3	4	5	6	
1. Demonstrates understanding of indications, relevant anatomy, technique of procedure	☐	☐	☐	☐	☐	☐	☐
2. Obtains informed consent	☐	☐	☐	☐	☐	☐	☐
3. Demonstrates appropriate preprocedure preparation	☐	☐	☐	☐	☐	☐	☐
4. Appropriate analgesia or preprocedure	☐	☐	☐	☐	☐	☐	☐

preparation							
5. Technical ability of safe sedation	☐	☐	☐	☐	☐	☐	☐
6. Aseptic technique	☐	☐	☐	☐	☐	☐	☐
7. Seeks help when appropriate	☐	☐	☐	☐	☐	☐	☐
8. Postprocedure management	☐	☐	☐	☐	☐	☐	☐
9. Communication skills	☐	☐	☐	☐	☐	☐	☐
10. Consideration of patient/professionalism	☐	☐	☐	☐	☐	☐	☐
11. Overall ability to perform procedure	☐	☐	☐	☐	☐	☐	☐

* U / C Please mark this if you have not observed the behavior and therefore feel unable to comment

Anything especially good?	0–4	Suggestions for development?

Agreed Action:

Have you had training in the use of this assessment tool? (For Assessor) ☐ Face-to-Face ☐ Have Read Guidelines ☐ Web / CD-ROM

Assessor's Signature:

Date (DD/MM/YY) D D M M Y Y

Time taken for Observation: In minutes ☐☐

Time taken for Feedback: In minutes ☐☐

Assessor's Surname: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Assessor's Code: ☐☐☐☐☐☐☐☐☐☐☐

* If Applicable

Yellow copy (Student), Red copy (Faculty or Department), White copy (Assessment Unit)

** *Modified from www.hcat.nhs.uk*

APPENDIX 4

OBJECTIVES OF RECOMMENDED WORKSHOPS AND COURSES

RESEARCH METHODOLOGY AND STATISTICS

This is a hands-on opportunity to acquire the necessary skills in basic research methods and biostatistics. The workshop consists of two parts, with specific objectives:

Part 1: Research methods

- To state research objective(s)
- To justify choosing a research design
- To discuss study variables and measurement issues, bias, study population, and samples
- To document all above information in a comprehensive research proposal

Part 2: Biostatistics

- To understand the basic principles of the scientific method as applied to clinical research
- To apply the necessary methodology and statistical tools and techniques in the analysis of collected data by using a standard supporting software

COMMUNICATION SKILLS COURSE

- To articulate the importance of effective communication in personal and professional applications
- To identify key verbal and nonverbal communication cues in the work place and ways to enhance their effective use
- To enhance small group dynamics for effective teamwork
- To be able to deliver bad news in an effective manner

PRINCIPLES OF LEARNING AND TEACHING IN HEALTH SCIENCES

The course consists of two parts, with specific objectives:

Part 1: Clinical Learning and Teaching

- To experience different styles of teaching by applying the adult learning theory
- As teachers, to recognize opportunities for teaching in various clinical settings
- To recognize the benefit of incidental teaching as they work with trainees
- To build confidence in sharing what they know and teach more effectively

Part 2: Teaching Skills

- To recognize opportunities for teaching practical skills in various clinical settings
- To build an organized approach to teach various clinical skills to trainees, junior colleagues or peers
- To demonstrate competency in sharing what they know in terms of skills and teach more effectively as experts through interactive small group exercises

PROFESSIONALISM AND ETHICS IN ANESTHESIA

- To recognize ethical responsibilities as per national and international guidelines governed by Islamic regulations, towards patients, colleagues, healthcare providers, the community as well as themselves
- To develop wellbeing and competence
- To obtain informed consents from adult and pediatric patients while realizing the difference between consent and assent

- To justify the use of anesthetized patients for teaching medical students and residents while keeping patient respect and safety
- To list signs of impaired competence of self and colleagues (anesthesiologists and other healthcare providers) to justify reporting threat to the patient's life
- To discuss controversies regarding providing care for do-not-resuscitate patients in the OR and ICU
- To generate an opinion of the limitations of ethics in relationship with the pharmaceutical industries
- To apply ethical principles in different case scenarios, including research

BASICS OF ULTRASOUND AND REGIONAL ANESTHESIA

This is a workshop on the basics of imaging and needling, with specific objectives:

- To review the ultrasound basics used in regional anesthesia
- To handle ultrasound machines

- To perform hit-the-target practice on phantoms
- To perform techniques of simple nerve blocks in the brachial plexus, femoral, and popliteal regions with supervised US scanning on live or phantom models

PERIOPERATIVE PAIN MANAGEMENT

- To describe the practical aspects of pain pathways
- To discuss pain-related physiological changes
- To apply variety of pain assessment tools to adults and pediatric and neonate patients, preferably through realistic simulation scenarios on live or phantom models
- To justify different perioperative multimodal pain management choices and to troubleshoot common incidents, through interactive case-based sessions, mainly intravenous PCA, neuroaxial analgesia (continuous vs. EPCA), and peripheral nerve block (continuous vs. single shot)

ADVANCED REGIONAL ANESTHESIA

This is a course on imaging and needling focusing on techniques for nerve blocks in the following regions of the body with supervised US scanning on live standardized patients and/or needling of appropriate phantom/animal models:

- Peripheral nerve blocks (e.g. ulnar, median, radial)
- Lumbosacral plexus blocks (e.g. sciatic, obturator)
- Truncal blocks (e.g. paravertebral, iliohypogastric, ilioinguinal, TAP)

CHRONIC PAIN MANAGEMENT

- To define chronic pain and understand its pathophysiology
- To identify various types of chronic pain (nociceptive and neuropathic), its clinical presentation (symptoms and signs), and different causes
- To initiate noninvasive chronic pain management as initial interventional strategy until further specific consultation
- To describe the various therapeutic modalities available for pain management, their advantages and disadvantages, adverse events, and limitations

BASICS OF ECHOCARDIOGRAM AND TEE PRINCIPLES

- To demonstrate knowledge of safety and of the indication and contraindications of TEE
- To describe basic TEE views and corresponding cardiac anatomy
- To perform basic TEE views on simulated models

- To recognize the importance of developing managerial skills for physicians
- To develop basic understanding of the OR environment and structure
- To recognize the role of the OR manager (strategies and operational responsibilities)
- To apply basic knowledge of OR slot allocation and utilization analysis through interactive exercises and realistic cases
- To advocate for OR safety through troubleshooting simulated OR-related incidents

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