

2013
VERSION 1.0

This document applies to those who begin training on or after July 1st, 2013.

DEFINITION

Anesthesiology is a medical specialty responsible for the care of patients before, during and after surgical operations, labour and delivery, and certain interventional procedures. Anesthesiologists have unique skills and knowledge to support and in appropriate circumstances lead, the provision of resuscitation, critical care medicine, palliative care and pain medicine.

GOALS

Upon completion of training a resident is expected to be a competent Anesthesiologist, capable of assuming a consultant's role in the specialty. The resident must acquire a working knowledge of the theoretical basis of the specialty, including its foundations in basic medical sciences and research. Residents must demonstrate the skills and attitudes to work efficiently within multidisciplinary and interprofessional teams.

The Anesthesiologist will demonstrate the necessary knowledge of: patient assessment, surgery, obstetrics, medical and surgical procedures, resuscitation, critical care medicine, acute and chronic pain, and the impact of medical and surgical conditions on anesthetic care to provide consultation to physicians and patients. He/she must be clinically competent in the provision of perioperative, peripartum and periprocedural anesthetic care across all age groups and all patient disease states.

Residents must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centred care and service to a diverse population. In all aspects of specialist practice, the graduate must be able to address issues of gender, sexual orientation, age, culture, ethnicity and ethics in a professional manner. Residents must acquire the skills of self-assessment required for lifelong learning.

ANESTHESIOLOGY COMPETENCIES

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

Medical Expert

Definition:

As *Medical Experts*, Anesthesiologists integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centred care. *Medical Expert* is the central physician Role in the CanMEDS framework.

Key and Enabling Competencies: Anesthesiologists are able to...

1. Function effectively as consultants, integrating all of the CanMEDS Roles to provide optimal, ethical and patient-centred medical care

- 1.1. Perform a consultation, including the presentation of well-documented assessments and recommendations in written and/or verbal form in response to a request from another health care professional
- 1.2. Demonstrate use of all CanMEDS competencies relevant to Anesthesiology
- 1.3. Identify and appropriately respond to relevant ethical issues arising in patient care
- 1.4. Demonstrate the ability to prioritize professional duties when faced with multiple patients and problems
- 1.5. Demonstrate compassionate and patient-centred care
- 1.6. Recognize and respond to the ethical dimensions in medical decision-making
- 1.7. Demonstrate medical expertise in situations other than patient care, such as providing expert legal testimony or advising governments, as needed

2. Establish and maintain clinical knowledge, skills and attitudes appropriate to Anesthesiology

Note: In the sections below *General Knowledge* indicates a level of knowledge sufficient for the clinical management of a condition. *Detailed Knowledge* refers to an in-depth understanding of an area, from basic science to clinical application, and possession of skills to manage independently a problem in the area.

- 2.1. Apply knowledge of the clinical, socio-behavioural, and fundamental biomedical sciences relevant to Anesthesiology
 - 2.1.1. Fundamentals of Anesthesiology
 - 2.1.1.1. Basic Science
 - 2.1.1.1.1. Demonstrate knowledge of genomics, proteomics and metabolomics as they apply to Anesthesiology
 - 2.1.1.1.2. Describe the theoretical and molecular basis of the action of anesthetic agents

2.1.1.2. Anatomy

2.1.1.2.1. Demonstrate detailed knowledge of:

- 2.1.1.2.1.1. Upper airway and proximal tracheobronchial tree across the age spectrum
- 2.1.1.2.1.2. Factors that predict difficult intubation
- 2.1.1.2.1.3. Impact of disease states on airway anatomy
- 2.1.1.2.1.4. Anatomy and sonoanatomy of the cardiovascular system
- 2.1.1.2.1.5. Anatomy and sonoanatomy of the neuraxial and peripheral nervous system
- 2.1.1.2.1.6. Anatomy and sonoanatomy of the respiratory system

2.1.1.2.2. Demonstrate general knowledge of the anatomy of the:

- 2.1.1.2.2.1. Central nervous system
- 2.1.1.2.2.2. Musculoskeletal system
- 2.1.1.2.2.3. Hepatobiliary and gastrointestinal systems
- 2.1.1.2.2.4. Genitourinary system
- 2.1.1.2.2.5. Endocrine system

2.1.1.3. Physiology

2.1.1.3.1. Demonstrate detailed knowledge of the physiology of the following across the age spectrum in health and disease:

- 2.1.1.3.1.1. Upper airway and proximal tracheobronchial tree
- 2.1.1.3.1.2. Respiratory system including the control of breathing
- 2.1.1.3.1.3. Cardiovascular system
- 2.1.1.3.1.4. Autonomic nervous system
- 2.1.1.3.1.5. Central and peripheral nervous systems
- 2.1.1.3.1.6. Renal system
- 2.1.1.3.1.7. Endocrine system including but not limited to the perioperative stress response
- 2.1.1.3.1.8. Hepatobiliary system
- 2.1.1.3.1.9. Hematologic system
- 2.1.1.3.1.10. Neuromuscular junction
- 2.1.1.3.1.11. Maternal changes in pregnancy
- 2.1.1.3.1.12. Transition from fetus to newborn
- 2.1.1.3.1.13. Thermoregulation
- 2.1.1.3.1.14. Allergic reactions and anaphylaxis

2.1.1.4. Pharmacology

2.1.1.4.1. Demonstrate detailed knowledge of pharmacokinetics, pharmacodynamics, mechanism of action, toxicity, routes of delivery and elimination of all common medications used for the purpose of:

- 2.1.1.4.1.1. General anesthesia
- 2.1.1.4.1.2. Local, regional and neuraxial anesthesia
- 2.1.1.4.1.3. Sedation
- 2.1.1.4.1.4. Reversal/antagonism of sedation and general anesthesia
- 2.1.1.4.1.5. Muscle relaxation (paralysis)
- 2.1.1.4.1.6. Reversal of muscle relaxation (paralysis)
- 2.1.1.4.1.7. Management of acute and chronic pain
- 2.1.1.4.1.8. Prophylaxis and treatment of anesthesia induced effects including but not limited to shivering, nausea and vomiting
- 2.1.1.4.1.9. Inotropy and acute blood pressure regulation
- 2.1.1.4.1.10. Uterine relaxation and in the management of uterine atony

2.1.1.4.2. Demonstrate general knowledge of pharmacokinetics, pharmacodynamics, mechanisms of action, routes of delivery and elimination, and adverse effects of medications with a significant impact on anesthesia care and surgery including:

- 2.1.1.4.2.1. Antibiotics
- 2.1.1.4.2.2. Medications which affect coagulation
- 2.1.1.4.2.3. Cardiovascular medications
- 2.1.1.4.2.4. Respiratory medications
- 2.1.1.4.2.5. Endocrine medications
- 2.1.1.4.2.6. Cancer chemotherapy
- 2.1.1.4.2.7. Glucocorticoid and anabolic steroids
- 2.1.1.4.2.8. Common recreational drugs
- 2.1.1.4.2.9. Herbal or over the counter products

2.1.1.4.3. Demonstrate detailed knowledge of teratogenicity and fetal effects of medications commonly used in the practice of Anesthesiology

2.1.1.5. Monitoring and Equipment

A. Monitoring

2.1.1.5.1. Demonstrate detailed knowledge of the principles and practices of measurement as they relate to:

- 2.1.1.5.1.1. Static pressure
- 2.1.1.5.1.2. Dynamic pressure
- 2.1.1.5.1.3. Signal processed pressure
- 2.1.1.5.1.4. Pressure transducers
- 2.1.1.5.1.5. Thermodilution
- 2.1.1.5.1.6. Flowmeters
- 2.1.1.5.1.7. Stethoscope
- 2.1.1.5.1.8. Ultrasound: M-mode; 2-D; Doppler; colour-flow Doppler
- 2.1.1.5.1.9. Electrical isolation in the OR
- 2.1.1.5.1.10. Passive electrical examination, including but not limited to electrocardiogram (ECG) and electroencephalogram (EEG)
- 2.1.1.5.1.11. Active electrical examination, including but not limited to somatosensory evoked potentials, motor evoked potentials and nerve stimulators used for monitoring neuromuscular junction
- 2.1.1.5.1.12. Difference between sound and electromagnetic waves
- 2.1.1.5.1.13. Beer-Lambert law
- 2.1.1.5.1.14. Raman scattering
- 2.1.1.5.1.15. Define the terms specific heat and calorie
- 2.1.1.5.1.16. Describe techniques for measuring temperature

2.1.1.5.2. Demonstrate detailed knowledge of function, sources of error and interpretation of monitors of:

- 2.1.1.5.2.1. Depth of anesthesia, including but not limited to processed EEG, and auditory evoked potentials
- 2.1.1.5.2.2. Respiratory system including but not limited to:
 - 2.1.1.5.2.2.1. Capnometry, pulse oximetry, arterial blood gases, co-oximetry, and spirometry
- 2.1.1.5.2.3. Neuromuscular Junction:
 - 2.1.1.5.2.3.1. Peripheral nerve stimulation and clinical implications of response to various stimulation patterns

2.1.1.5.2.4. Cardiovascular System:

- 2.1.1.5.2.4.1. Electrocardiography
- 2.1.1.5.2.4.2. Non-invasive arterial blood pressure measurement
- 2.1.1.5.2.4.3. Invasive arterial blood pressure measurement including but not limited to indications, contraindications, sites of cannulation, insertion techniques, complications and waveform analysis
- 2.1.1.5.2.4.4. Invasive central venous pressure measurement including but not limited to indications, contraindications, sites of cannulation, insertion techniques, complications and waveform analysis
- 2.1.1.5.2.4.5. Pulmonary artery pressure measurement

2.1.1.5.3. General knowledge of echocardiography: transthoracic (TTE) and transesophageal (TEE) including but not limited to indications, contraindications and complications

B. Equipment

2.1.1.5.4. Demonstrate a detailed knowledge of inhaled anesthetic delivery systems including safety mechanisms:

- 2.1.1.5.4.1. Physics of gas flow – gas laws
- 2.1.1.5.4.2. Storage and delivery of medical gases; air, oxygen (O₂), nitrous oxide (N₂O); helium
- 2.1.1.5.4.3. Function of a vaporizer
- 2.1.1.5.4.4. Anesthesia circuits
- 2.1.1.5.4.5. Carbon dioxide (CO₂) absorption
- 2.1.1.5.4.6. Gas scavenging
- 2.1.1.5.4.7. Perform a complete pre-use checklist
- 2.1.1.5.4.8. Troubleshoot intraoperative problems with gas machine based anesthesia delivery

2.1.1.5.5. Demonstrate general knowledge of ultrasound machines including:

- 2.1.1.5.5.1. Principles of ultrasound technology
- 2.1.1.5.5.2. Use of controls to optimize image
- 2.1.1.5.5.3. Ability to acquire image for central venous cannulation
- 2.1.1.5.5.4. Ability to acquire image for common regional anesthesia procedures

OBJECTIVES OF TRAINING IN ANESTHESIOLOGY (2013)

- 2.1.1.5.6. Demonstrate general knowledge of lasers including:
 - 2.1.1.5.6.1. Principles of the use of laser
 - 2.1.1.5.6.2. Different lasers used in areas where anesthesia care is provided
 - 2.1.1.5.6.3. Potential hazards of laser use and mitigating strategies
- 2.1.1.5.7. Demonstrate detailed knowledge of methods of cleaning and sterilization of equipment used by an Anesthesiologist
- 2.1.1.6. Infectious Diseases
 - 2.1.1.6.1. Demonstrate detailed knowledge of:
 - 2.1.1.6.1.1. Prevention of infection:
 - 2.1.1.6.1.1.1. Mechanisms of transmission of microorganisms, including but not limited to tuberculosis, methicillin resistant *Staphylococcus aureus* (MRSA), *Clostridium difficile*, viral hepatitis, human immunodeficiency virus (HIV), vancomycin resistant enterococcus (VRE)
 - 2.1.1.6.1.1.2. Isolation measures, including but not limited to universal precautions, contact precautions, droplet precautions, airborne precautions
 - 2.1.1.6.1.1.3. Aseptic technique
 - 2.1.1.6.1.1.4. Management of needle stick injuries
 - 2.1.1.6.1.1.5. Prevention and management of nosocomial infections
 - 2.1.1.6.1.2. Antibiotic prophylaxis
 - 2.1.1.6.1.3. Anesthetic implications for patients with immune deficiency syndromes
 - 2.1.1.6.2. Demonstrate a general knowledge of pathophysiology and management of patients with:
 - 2.1.1.6.2.1. Regional sepsis
 - 2.1.1.6.2.2. Systemic infection
 - 2.1.1.6.2.3. Septic shock
- 2.1.1.7. Transfusion Medicine
 - 2.1.1.7.1. Demonstrate detailed knowledge of:
 - 2.1.1.7.1.1. Physiology of oxygen delivery and consumption
 - 2.1.1.7.1.2. Abnormal hemoglobin: congenital, acquired
 - 2.1.1.7.1.3. Acute anemia: estimate of blood loss

OBJECTIVES OF TRAINING IN ANESTHESIOLOGY (2013)

- 2.1.1.7.1.4. Chronic anemia
 - 2.1.1.7.1.5. Hemolytic anemia
 - 2.1.1.7.1.6. Polycythemia
 - 2.1.1.7.1.7. Physiology of normal hemostasis:
 - 2.1.1.7.1.7.1. Role of the vasculature, platelets, coagulation factors
 - 2.1.1.7.1.7.2. Physiologic mechanisms to limit coagulation
 - 2.1.1.7.1.7.3. Laboratory assessment of coagulation system
 - 2.1.1.7.1.8. Disorders of coagulation:
 - 2.1.1.7.1.8.1. Congenital and acquired disorders resulting in an increased risk of bleeding
 - 2.1.1.7.1.8.2. Congenital and acquired disorders resulting in an increased risk of thrombosis
 - 2.1.1.7.1.9. Blood products and recombinant factors:
 - 2.1.1.7.1.9.1. Indications and risks of transfusion
 - 2.1.1.7.1.9.2. Complications and management of complications of transfusion
 - 2.1.1.7.1.9.3. Informed consent
 - 2.1.1.7.1.9.4. Identification and verification of patient and blood product
 - 2.1.1.7.1.9.5. Preparation and administration of blood product
 - 2.1.1.7.1.9.6. Transfusion compatibility in emergency situations
 - 2.1.1.7.1.10. Demonstrate general knowledge of blood banking practices
 - 2.1.1.7.1.11. Blood typing and cross match
 - 2.1.1.7.1.12. Strategies to reduce the use of homologous blood products
- 2.1.1.8. Airway management
- 2.1.1.8.1. Demonstrate detailed knowledge of:
 - 2.1.1.8.1.1. Basic airway management:
 - 2.1.1.8.1.1.1. Manoeuvres to establish airway patency
 - 2.1.1.8.1.1.2. Insertion of oropharyngeal and nasopharyngeal airways
 - 2.1.1.8.1.1.3. Bag –valve - mask ventilation

2.1.1.8.1.2. Advanced airway management:

2.1.1.8.1.2.1. Extraglottic airways including Laryngeal Mask Airway and other devices

2.1.1.8.1.2.1.1. Indications, contraindications and insertion techniques

2.1.1.8.1.2.1.2. Use as a conduit for endotracheal intubation

2.1.1.8.1.2.1.3. Use in difficult airway

2.1.1.8.1.2.2. Endotracheal intubation:

2.1.1.8.1.2.2.1. Indications for intubation

2.1.1.8.1.2.2.2. Route of intubation – nasal, oral, transtracheal

2.1.1.8.1.2.2.3. Manoeuvres to facilitate intubation, including but not limited to patient positioning and optimal external laryngeal manipulation

2.1.1.8.1.2.2.4. Blind nasotracheal intubation

2.1.1.8.1.2.2.5. Direct laryngoscopy – appropriate choice of blade for age and anatomy

2.1.1.8.1.2.2.6. Indirect laryngoscopy, including but not limited to rigid and flexible fiberoptic scopes and video laryngoscopes

2.1.1.8.1.2.2.7. Use of adjuncts to facilitate endotracheal tube placement, including but not limited to stylets and bougie

2.1.1.8.1.2.2.8. Confirmation of appropriate placement of endotracheal tube

2.1.1.8.1.2.2.9. Placement of double lumen tube

2.1.1.8.1.2.3. Complications of airway management

2.1.1.8.1.2.4. Prevention and management of pulmonary aspiration of gastric contents

2.1.1.8.1.2.5. Management of extubation

2.1.1.8.1.3. Management of the difficult airway

2.1.2. Perioperative medicine

2.1.2.1. Demonstrate detailed knowledge of:

2.1.2.1.1. Complete preoperative patient assessment

2.1.2.1.2. Risk stratification

2.1.2.1.3. Preoperative preparation of patients and strategies to optimize outcomes for surgical, obstetric, procedural and anesthesia care

OBJECTIVES OF TRAINING IN ANESTHESIOLOGY (2013)

- 2.1.2.1.4. Perianesthesia care during induction, maintenance and emergence from anesthesia
- 2.1.2.1.5. Selection of medications
- 2.1.2.1.6. Selection of equipment and monitoring techniques
- 2.1.2.1.7. Fluid management strategies
- 2.1.2.1.8. Patient positioning and risks associated with patient positioning
- 2.1.2.1.9. Common local and regional anesthesia techniques used as primary or supplementary anesthesia
- 2.1.2.1.10. Perioperative temperature regulation and management
- 2.1.2.1.11. Acute postoperative pain management
- 2.1.2.1.12. Acute postoperative care in the post-anesthetic care unit (PACU), management of common postoperative problems
- 2.1.2.1.13. Early postoperative recovery including but not limited to perioperative stress response, early mobilization, and fast track recovery programs
- 2.1.2.1.14. Prevention strategies for long-term post-surgical pain

2.1.3. Regional anesthesia

2.1.3.1. Demonstrate detailed knowledge of:

- 2.1.3.1.1. Pharmacology of common local anesthetics and adjuvant medications used for the purpose of regional anesthesia
- 2.1.3.1.2. Physiologic effects of neuraxial blockade
- 2.1.3.1.3. Indications and contraindications for regional anesthesia
- 2.1.3.1.4. Complications of regional anesthesia and management
- 2.1.3.1.5. Technology used for nerve stimulation
- 2.1.3.1.6. Technology used for ultrasound imaging
- 2.1.3.1.7. Unique considerations for pediatric regional anesthesia
- 2.1.3.1.8. Localization of plexuses and peripheral nerves by anatomic landmarks, paresthesia, nerve stimulation, and image guided techniques

2.1.3.2. Describe advantages, disadvantages and limitations of

- 2.1.3.2.1. Intravenous regional anesthesia
- 2.1.3.2.2. Spinal anesthesia
- 2.1.3.2.3. Epidural anesthesia
- 2.1.3.2.4. Major plexus blocks

2.1.4. Resuscitation and critical care medicine

2.1.4.1. Demonstrate detailed knowledge of differential diagnosis and management of:

2.1.4.1.1. Respiratory failure

2.1.4.1.1.1. Management of invasive and non invasive respiratory support including but not limited to initiation, monitoring and weaning

2.1.4.1.2. Circulatory failure

2.1.4.1.2.1. Hemodynamic management of circulatory failure including but not limited to fluids, vasopressors, inotropic therapy and mechanical therapy

2.1.4.1.3. Acute coronary syndromes

2.1.4.1.4. Arrhythmias including cardioversion and temporary pacing

2.1.4.1.4.1. Management of patients with permanent pacemaker and/or implantable cardioverter defibrillator

2.1.4.1.5. Hypertensive crises

2.1.4.1.6. Fluid, electrolyte and acid-base disorders

2.1.4.1.7. Venous thromboembolic disease

2.1.4.1.8. Acute renal failure

2.1.4.1.9. Acute and chronic hepatic failure

2.1.4.1.10. Upper and lower gastrointestinal bleeding

2.1.4.1.11. Endocrine emergencies, including but not limited to diabetic, thyroid, hypercalcemia, adrenal insufficiency, diabetes insipidus, and syndrome of inappropriate anti-diuretic hormone (SIADH)

2.1.4.1.12. Poisoning and drug related complications

2.1.4.1.13. Serotonin syndrome, malignant hyperthermia, neuroleptic malignant syndrome

2.1.4.1.14. The trauma patient:

2.1.4.1.14.1. Principles of advance trauma life support (ATLS), supportive care, evaluation and management of blunt and penetrating trauma

2.1.4.1.14.2. Evaluation and management of the patient with a thermal injury

2.1.4.1.14.3. Management of head trauma and raised intracranial pressure (ICP)

- 2.1.4.1.15. Intracranial ischemia and bleeding
- 2.1.4.1.16. Decreased level of consciousness and coma
- 2.1.4.1.17. Status epilepticus
- 2.1.4.1.18. Agitation and delirium
- 2.1.4.1.19. Principles of nutrition support for critically ill patients
- 2.1.4.1.20. Acute postoperative care after major surgery
- 2.1.4.1.21. Obstetrical critical care
- 2.1.4.1.22. Determination of brain death
- 2.1.4.1.23. Management of the organ donor
- 2.1.4.1.24. Ethical principles of critical care medicine

2.1.5. Pain Medicine

2.1.5.1. Acute pain

2.1.5.1.1. Demonstrate detailed knowledge of:

- 2.1.5.1.1.1. Anatomy and physiology of pain including but not limited to pain pathways, pain transduction, neuroendocrine stress response, and the affective and functional aspects of the pain experience
- 2.1.5.1.1.2. Assessment of acute pain
- 2.1.5.1.1.3. Pharmacology and use of analgesic agents Multimodal and regional analgesia
- 2.1.5.1.1.4. Patient controlled analgesia (PCA)
- 2.1.5.1.1.5. Non pharmacologic interventions
- 2.1.5.1.1.6. Use of analgesia to optimize postoperative outcomes
- 2.1.5.1.1.7. Addiction, tolerance and substance abuse as they relate to acute pain management

2.1.5.2. Chronic pain

2.1.5.2.1. Demonstrate general knowledge of:

- 2.1.5.2.1.1. Anatomy and physiology of pain including but not limited to pain pathways, pain transduction, neuroendocrine stress response, and the affective and functional aspects of the pain experience
- 2.1.5.2.1.2. Assessment of chronic pain
- 2.1.5.2.1.3. Nociceptive vs. neuropathic pain
- 2.1.5.2.1.4. Multidisciplinary pain management
- 2.1.5.2.1.5. Common pharmacologic strategies used in chronic pain management

- 2.1.5.2.1.6. Common non pharmacologic interventions in pain management
- 2.1.5.2.1.7. Common interventional pain management strategies and their indications

2.1.6. Obstetrics

2.1.6.1. Demonstrate detailed knowledge of:

- 2.1.6.1.1. Normal maternal physiology of pregnancy
- 2.1.6.1.2. Fetal and placental physiology
- 2.1.6.1.3. Intrapartum and postpartum neonatal resuscitation
- 2.1.6.1.4. Medical diseases during pregnancy and their peripartum management including but not limited to how the disease impacts the pregnancy, how the pregnancy impacts the disease and the obstetric implications and management of the disease
 - 2.1.6.1.4.1. Hypertensive disorders of pregnancy
 - 2.1.6.1.4.2. Respiratory disease
 - 2.1.6.1.4.3. Cardiac disease
 - 2.1.6.1.4.4. Morbid obesity
 - 2.1.6.1.4.5. Endocrine disease
 - 2.1.6.1.4.6. Hematologic and coagulation disorders
- 2.1.6.1.5. Labour analgesia including but not limited to anatomy and physiology of labour pain, and strategies for analgesia
- 2.1.6.1.6. Anesthesia for obstetric surgery:
 - 2.1.6.1.6.1. Regional anesthesia for cesarean section
 - 2.1.6.1.6.2. General anesthesia for cesarean section
 - 2.1.6.1.6.3. Other obstetric surgery
 - 2.1.6.1.6.4. Postoperative analgesia
- 2.1.6.1.7. Management of obstetrical complications
- 2.1.6.1.8. Anesthetic management of non-obstetric surgery during pregnancy
- 2.1.6.1.9. Anesthesia related morbidity and mortality in pregnant patients
- 2.1.6.1.10. Ethical principles of obstetric anesthesia

2.1.7. Specialty and subspecialty anesthesia

2.1.7.1. Demonstrate detailed knowledge and ability to provide anesthesia care for the following surgical specialties and special situations:

- 2.1.7.1.1. Ambulatory anesthesiology
- 2.1.7.1.2. Cardiovascular anesthesiology
- 2.1.7.1.3. Gastrointestinal anesthesiology
- 2.1.7.1.4. Gynecologic anesthesiology
- 2.1.7.1.5. Hepatobiliary anesthesiology
- 2.1.7.1.6. Neurosurgical anesthesiology
- 2.1.7.1.7. Ophthalmic anesthesiology
- 2.1.7.1.8. Orthopedic anesthesiology
- 2.1.7.1.9. Otolaryngology, head and neck surgery anesthesiology
- 2.1.7.1.10. Pediatric anesthesiology
- 2.1.7.1.11. Plastic surgery anesthesiology
- 2.1.7.1.12. Surgical oncology anesthesiology
- 2.1.7.1.13. Urologic anesthesiology
- 2.1.7.1.14. Thoracic anesthesiology
- 2.1.7.1.15. Transplant anesthesiology
- 2.1.7.1.16. Anesthesiology for morbidly obese patients
- 2.1.7.1.17. Anesthesiology for trauma
- 2.1.7.1.18. Geriatric anesthesiology
- 2.1.7.1.19. Anesthesiology in areas other than the operating room
 - 2.1.7.1.19.1. Interventional radiology
 - 2.1.7.1.19.2. Cardiac catheterization suite
 - 2.1.7.1.19.3. Diagnostic imaging
 - 2.1.7.1.19.4. Electroconvulsive therapy (ECT)
 - 2.1.7.1.19.5. Procedural sedation, including but not limited to; burn dressing changes, pediatric procedures
 - 2.1.7.1.19.6. Outpatient cardioversion
 - 2.1.7.1.19.7. Endoscopy

3. Perform a complete and appropriate assessment of a patient

- 3.1. Identify and explore issues to be addressed in a patient encounter effectively, including the patient's context and preferences
 - 3.1.1. Explore and incorporate pre-existing medical conditions and their impact on the anesthetic and planned procedure
 - 3.1.2. Address any patient concerns related to the planned procedure
 - 3.1.3. Explore issues relevant to perioperative acute pain management
 - 3.2. Elicit a history that is relevant, concise and accurate to context and preferences for the purposes of prevention and health promotion, diagnosis and/or management
 - 3.2.1. Review past anesthetics and any concerns
 - 3.2.2. Review family history of anesthetic complications
 - 3.2.3. History of the condition leading to the surgical, obstetric or procedural intervention
 - 3.2.4. Review of systems and past health
 - 3.3. Perform a focused physical examination that is relevant and accurate for the purposes of prevention and health promotion, diagnosis and/or management
 - 3.3.1. Evaluation of the upper airway and proximal tracheobronchial tree by physical examination, endoscopy and diagnostic imaging
 - 3.3.2. Detailed examination of the cardiovascular and respiratory systems
 - 3.3.3. Detailed examination of the neurologic system
 - 3.4. Select medically appropriate investigative methods in a resource-effective and ethical manner
 - 3.4.1. Diagnostic imaging
 - 3.4.2. Cardiac function assessment
 - 3.4.3. Respiratory function assessment
 - 3.4.4. Arterial and venous flow studies including but not limited to assessment of coronary perfusion and deep venous thrombosis
 - 3.4.5. Renal function assessment
 - 3.5. Demonstrate effective clinical problem solving and judgment to address patient problems, including interpreting available data and integrating information to generate differential diagnoses and formulate management plans for:
 - 3.5.1. Anesthesia care with rationale for choices and alternatives
 - 3.5.2. Airway management with rationale for choices and alternatives
 - 3.5.3. Postoperative pain management
 - 3.5.4. Postoperative care and disposition
-

3.5.5. Regional anesthesia with rationale for choices and alternatives

4. Use preventive and therapeutic interventions effectively

- 4.1. Implement a management plan in collaboration with a patient and the patient's family
- 4.2. Demonstrate appropriate and timely application of preventive and therapeutic interventions relevant to Anesthesiology, including but not limited to:
 - 4.2.1. Premedication
 - 4.2.2. Vascular access
 - 4.2.3. Non-invasive monitoring
 - 4.2.4. Invasive monitoring
 - 4.2.5. Prophylaxis and treatment of postoperative nausea and vomiting
 - 4.2.6. Pain management strategies
- 4.3. Demonstrate in-depth knowledge regarding the risks and benefits of these procedures and therapies
- 4.4. Ensure appropriate informed consent is obtained for procedures and therapies. Assess and manage complications of these procedures and therapies efficiently and effectively
 - 4.4.1. Local anesthetic toxicity
 - 4.4.2. Complications of regional anesthesia
- 4.5. Ensure patients receive appropriate end-of-life care

5. Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic

- 5.1. Demonstrate effective, appropriate, and timely performance of diagnostic procedures relevant to Anesthesiology including but not limited to:
 - 5.1.1. Arterial cannulation
 - 5.1.2. Central venous cannulation
 - 5.1.3. Placement of a pulmonary artery catheter
 - 5.1.4. Ultrasound guidance for vascular access and common regional blocks
 - 5.1.5. Endoscopy of the upper airway and proximal tracheobronchial tree
- 5.2. Demonstrate effective, appropriate, and timely performance of therapeutic procedures relevant to Anesthesiology, including but not limited to
 - 5.2.1. Airway management
 - 5.2.1.1. Non-invasive airway and ventilation support

- 5.2.1.2. Extraglottic airway support
- 5.2.1.3. Endotracheal intubation, with and without adjuncts including but not limited to fiberoptic bronchoscope and videolaryngoscopes
- 5.2.1.4. Appropriate use of invasive airway management including but not limited to needle cricothyrotomy, surgical airway and retrograde intubation
- 5.2.2. Vascular access
 - 5.2.2.1. Arterial catheters
 - 5.2.2.2. Central venous catheters
 - 5.2.2.3. Pulmonary artery catheters
- 5.2.3 Neuraxial anesthesia/analgesia
 - 5.2.2.4. Spinal
 - 5.2.2.5. Epidural
 - 5.2.2.6. Combined spinal epidural
- 5.2.3. Peripheral nerve blockade
- 5.2.4. Resuscitation techniques
 - 5.2.4.1. Basic Cardiac Life Support
 - 5.2.4.2. Advanced Cardiac Life Support
 - 5.2.4.3. Neonatal resuscitation
- 5.3. Ensure appropriate informed consent is obtained for anesthesia care, regional anesthesia care and procedures
- 5.4. Document and disseminate information related to procedures performed and their outcomes
- 5.5. Ensure adequate follow-up is arranged for procedures performed
- 6. Seek appropriate consultation from other health professionals, recognizing the limits of their expertise**
 - 6.1. Demonstrate insight into their own limits of expertise
 - 6.2. Demonstrate effective, appropriate, and timely consultation of another health professional as needed for optimal patient care
 - 6.3. Arrange appropriate follow-up care services for a patient and their family
 - 6.3.1. Appropriate disposition of the perioperative patient

Communicator

Definition:

As *Communicators*, Anesthesiologists effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.

Key and Enabling Competencies: Anesthesiologists are able to...

1. Develop rapport, trust, and ethical therapeutic relationships with patients and families

- 1.1. Recognize that being a good communicator is a core clinical skill for physicians, and that effective physician-patient communication can foster patient satisfaction, physician satisfaction, adherence to treatment plans and improved clinical outcomes
- 1.2. Establish positive therapeutic relationships with patients and their families that are characterized by understanding, trust, respect, honesty and empathy
- 1.3. Respect patient confidentiality, privacy and autonomy
- 1.4. Listen effectively
- 1.5. Be aware of and responsive to nonverbal cues
- 1.6. Facilitate a structured clinical encounter effectively

2. Accurately elicit and synthesize relevant information and perspectives of patients and families, colleagues, and other professionals

- 2.1. Gather information about a disease and about a patient's beliefs, concerns, expectations and illness experience
 - 2.1.1. Address and clarify any previous anesthetic problems
- 2.2. Seek out and synthesize relevant information from other sources, such as a patient's family, caregivers and other professionals

3. Convey relevant information and explanations accurately to patients and families, members of the anesthetic care team (ACT), colleagues and other professionals

- 3.1. Deliver information to a patient and family, colleagues and other professionals in a humane manner and in such a way that it is understandable, encourages discussion and participation in decision-making
 - 3.1.1. Synthesize and discuss pertinent information regarding anesthetic considerations and appropriate anesthetic plan with the ACT
 - 3.1.2. Discuss special needs, including but not limited to monitoring, with nurses, ACT members and perfusionists in a professional and respectful manner

- 3.2. Ensure adequate information has been provided to the patient prior to undertaking an anesthetic or other invasive procedure
 - 3.2.1. Provide anesthetic and postoperative analgesic options, along with their inherent risks, to the patient and their family members in clear language in order for them to make informed choices
- 3.3. Clearly state concerns in emergency situations, including but not limited to nature and severity of the problem, actions required of others and expected outcome
- 4. Develop a common understanding on issues, problems and plans with patients, families, and other professionals to develop a shared plan of care**
 - 4.1. Identify and explore problems to be addressed from a patient encounter effectively, including the patient's context, responses, concerns, and preferences
 - 4.2. Respect diversity and difference, including but not limited to the impact of gender, religion and cultural beliefs on decision-making
 - 4.3. Encourage discussion, questions, and interaction in the encounter
 - 4.4. Engage patients, families, and relevant health professionals in shared decision-making to develop a plan of care
 - 4.4.1. Demonstrate knowledge of the pre-surgical safety checklist
 - 4.4.2. Ensure clear and audible communication with surgeons, nurses and members of one's ACT to facilitate patient care, safety and prevent errors
 - 4.4.3. Delineate anesthetic concerns to the surgeon, especially if they involve a high risk patient, cancellation or postponement of the surgery pending further investigations
 - 4.5. Address challenging communication issues effectively, such as obtaining informed consent, delivering bad news, and addressing anger, confusion and misunderstanding
 - 4.5.1. Engage the patient and family in full disclosure of all anesthetic related complications
 - 4.5.2. Delineate management strategies with regard to palliative patients who do not wish to be resuscitated
- 5. Convey effective oral and written information about a medical encounter**
 - 5.1. Maintain clear, accurate, and appropriate records of clinical encounters and plans
 - 5.1.1. Ensure that anesthetic records are complete and legible
 - 5.1.2. Ensure that anesthetic consultations contain clear, concise opinions and recommendations with regard to patient optimization, investigations required and risk
 - 5.1.3. Document consent for invasive procedures where indicated

- 5.2. Present verbal reports of clinical encounters and plans
- 5.3. Present medical information to the public or media about a medical issue

Collaborator

Definition:

As Collaborators, Anesthesiologists effectively work within a health care team to achieve optimal patient care.

Key and Enabling Competencies: Anesthesiologists are able to...

1. Participate effectively and appropriately in an interprofessional health care team

- 1.1. Describe the Anesthesiologist's roles and responsibilities to other professionals
- 1.2. Describe the roles and responsibilities of other professionals within the health care team with particular reference to the operating room, intensive care unit, emergency room and the pain service
- 1.3. Recognize and respect the diversity of roles, responsibilities and competences of other professionals in relation to their own
 - 1.3.1. Leverage unique skills and competences of team members effectively to achieve optimal patient care
- 1.4. Work with others to assess, plan, provide and integrate care for individual patients (or groups of patients)
- 1.5. Work with others to assess, plan, provide and review other tasks, such as research problems, educational work, program review or administrative responsibilities
- 1.6. Participate in interprofessional team meetings and contribute unique expertise to achieve optimal patient care
- 1.7. Enter into interdependent relationships with other professions for the provision of quality care
- 1.8. Describe the principles of team dynamics and utilize them to improve interprofessional collaboration
- 1.9. Respect team ethics, including confidentiality, resource allocation and professionalism
- 1.10. Demonstrate effective leadership in a health care team, as appropriate, especially in the context of work in the operating room during scheduled and urgent surgery

2. Work with other health professionals effectively to prevent, negotiate and resolve interprofessional and multidisciplinary conflict

- 2.1. Demonstrate a respectful attitude towards other colleagues and members of an interprofessional and multidisciplinary team
- 2.2. Work with other professionals to prevent conflict
- 2.3. Employ collaborative negotiation to resolve conflict
 - 2.3.1. Demonstrate knowledge and skills in strategies to prevent and resolve conflict
- 2.4. Respect differences and address misunderstandings and limitations in other professionals
- 2.5. Recognize and address one's own differences, misunderstanding and limitations that may contribute to interprofessional tension or conflict
- 2.6. Reflect on interprofessional and multidisciplinary team function
 - 2.6.1. Contribute expertise and skills to complete team tasks

Manager

Definition:

As *Managers*, Anesthesiologists are integral participants in health care organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the health care system.

Key and Enabling Competencies: Anesthesiologists are able to...

1. Participate in activities that contribute to the effectiveness of their health care organizations and systems

- 1.1. Work collaboratively with others in their organizations
- 1.2. Participate in systemic quality process evaluation and improvement, including but not limited to patient safety initiatives
 - 1.2.1. Participate actively in the development and use of surgical safety check lists, taking a leadership role when necessary
 - 1.2.2. Apply strategies locally employed with regard to minimizing wrong sided surgery and procedures particularly when performing regional anesthesia
- 1.3. Describe the structure and function of the health care system as it relates to Anesthesiology, including the roles of physicians
 - 1.3.1. Demonstrate knowledge of the administrative structure of an operating room
- 1.4. Describe principles of health care financing, including physician remuneration, budgeting and organizational funding

2. Manage their practice and career effectively

- 2.1. Set priorities and manage time to balance patient care, practice requirements, outside activities and personal life
 - 2.1.1. Set priorities and manage time in order to accomplish his/her work efficiently in the operating room and out of the operating room including but not limited to consultations in emergency room, obstetric unit, intensive care unit and ward
 - 2.1.2. Demonstrate insight into the effectiveness and efficiency of his/her work in the operating room and assess regularly the progress of surgeries
- 2.2. Manage a practice including finances and human resources
 - 2.2.1. Demonstrate knowledge of the management of operating rooms, both the conduct of individual rooms and the overall surgical suite
 - 2.2.2. Demonstrate knowledge of the contributors to anesthetic expenditures
 - 2.2.3. Demonstrate knowledge of the guidelines concerning anesthetic practice and equipment in Canada
- 2.3. Implement processes to ensure personal practice improvement
 - 2.3.1. Conduct morbidity and mortality reviews
 - 2.3.2. Refer in a timely manner to other staff Anesthesiologists or consultants when needed
 - 2.3.3. Manage stress level in a constructive manner, especially during emergencies
 - 2.3.4. Participate in the national and regional programs for ongoing maintenance of competence and quality improvement
- 2.4. Employ information technology appropriately for patient care
 - 2.4.1. Complete documentation for a patient encounter in a timely manner
 - 2.4.2. Utilize computerized, or on-line resources to prepare for and manage patient care as needed
- 2.5. Demonstrate knowledge of occupational hazards for Anesthesiologists and implement measures to minimize those risks

3. Allocate finite health care resources appropriately

- 3.1. Recognize the importance of just allocation of health care resources, balancing effectiveness, efficiency and access with optimal patient care
 - 3.1.1. Identify surgical emergencies and allocate resources appropriately

- 3.2. Apply evidence and management processes for cost-appropriate care
 - 3.2.1. Demonstrate ability to optimize the use of the available resources in the care of each patient

4. Serve in administration and leadership roles

- 4.1. Chair or participate effectively in committees and meetings
- 4.2. Lead or implement change in health care
 - 4.2.1. Describe qualities of effective leaders
 - 4.2.2. Describe the importance and responsibility of the Anesthesiologist regarding the pivotal role in the organization of the operating room working environment
- 4.3. Plan relevant elements of health care delivery (e.g., work schedules)

Health Advocate

Definition:

As *Health Advocates*, Anesthesiologists responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.

Key and Enabling Competencies: Anesthesiologists are able to...

1. Respond to individual patient health needs and issues as part of patient care

- 1.1. Identify the perioperative period as a significant opportunity for health behavior change
- 1.2. Identify opportunities for advocacy, health promotion and disease prevention with individuals to whom they provide care:
 - 1.2.1. Advocate for and prescribe positive health behavior change, including but not limited to smoking cessation, and preoperative physical fitness, to improve post-surgical and post anesthesia outcomes
 - 1.2.2. Advocate for and prescribe pharmacologic intervention in the perioperative period, including but not limited to blood glucose management, to improve post-surgical and post anesthesia outcomes
 - 1.2.3. Discuss and implement blood conservation strategies to reduce exposure to allogeneic blood
 - 1.2.4. Identify the risks and potential benefits regarding perioperative care, post-surgical outcomes and chronic post-surgical pain with individual pain management strategies
 - 1.2.5. Advocate for resources for acute and chronic pain management, anesthesia care, surgical care, obstetric care and critical care

- 1.2.6. Champion patient safety initiatives in acute and chronic pain management, anesthesia care, surgical care, obstetric care and critical care

- 1.3. Ensure complete and appropriate follow up for patients seen in preoperative consultation including follow up of preoperative investigations and referral for care where appropriate

2. Respond to the health needs of the communities that they serve

- 2.1. Describe the practice communities that they serve
- 2.2. Identify opportunities for advocacy, health promotion and disease prevention in the communities that they serve, and respond appropriately
- 2.3. Appreciate the possibility of competing interests between the communities served and other populations
- 2.4. Advocate for access to care for patients with surgical illness, acute or chronic pain, obstetric care needs or critical care needs

3. Identify the determinants of health for the populations that they serve

- 3.1. Identify the determinants of health of the populations, including barriers to access to care and resources
- 3.2. Identify vulnerable or marginalized populations within those served and respond appropriately
 - 3.2.1. Patients with chronic pain

4. Promote the health of individual patients, communities, and populations

- 4.1. Describe an approach to implementing a change in a determinant of health of the populations they serve
- 4.2. Describe how public policy impacts on the health of the populations served
 - 4.2.1. Promote policies which create a just culture of patient safety
 - 4.2.2. Promote policies which measure and support access to surgical care
 - 4.2.3. Promote policies which benchmark patient outcomes in anesthesia, surgery, obstetrics, critical care and pain management
- 4.3. Identify points of influence in the health care system and its structure
 - 4.3.1. Provide direction to hospital administrators regarding compliance with national practice guidelines and equipment standards for anesthesiology
 - 4.3.2. Participate and provide leadership in the organization of effective and efficient service delivery models at the local, regional and provincial levels
- 4.4. Describe the ethical and professional issues inherent in health advocacy, including altruism, social justice, autonomy, integrity and idealism

- 4.5. Appreciate the possibility of conflict inherent in their role as a health advocate for a patient or community with that of manager or gatekeeper
- 4.6. Describe the role of the medical profession in advocating collectively for health and patient safety

Scholar

Definition:

As *Scholars*, Anesthesiologists demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge.

Key and Enabling Competencies: Anesthesiologists are able to...

1. Maintain and enhance professional activities through ongoing learning

- 1.1. Describe the principles of maintenance of competence
- 1.2. Describe the principles and strategies for implementing a personal knowledge management system
 - 1.2.1. Recognize the importance of continuing medical education strategies in future practice and plan its implementation in one's own practice
- 1.3. Recognize and reflect on learning issues in practice
- 1.4. Conduct personal practice audits
- 1.5. Pose an appropriate learning question and access and interpret the relevant evidence regarding the question
 - 1.5.1. Integrate and synthesize information learned and present it in an appropriate format to colleagues and other professionals
- 1.6. Integrate new learning into practice
- 1.7. Evaluate the impact of any change in practice on outcomes
- 1.8. Document the learning process

2. Critically evaluate medical information and its sources, and apply this appropriately to practice decisions

- 2.1. Describe the principles of critical appraisal
- 2.2. Critically appraise retrieved evidence in order to address a clinical question
 - 2.2.1. Participate actively in journal club on anesthesiology literature
- 2.3. Integrate critical appraisal conclusions into clinical care

3. Facilitate the learning of patients, families, students, residents, other health professionals, the public and others, as appropriate

- 3.1. Describe principles of learning relevant to medical education
- 3.2. Identify collaboratively the learning needs and desired learning outcomes of others
 - 3.2.1. Contribute to continual medical learning of other members of the anesthesia care team
- 3.3. Select effective teaching strategies and content to facilitate others' learning
- 3.4. Demonstrate an effective lecture or presentation
- 3.5. Assess and reflect on a teaching encounter
- 3.6. Provide effective feedback
- 3.7. Describe the principles of ethics with respect to teaching

4. Contribute to the development, dissemination, integration and translation of new knowledge and practices

- 4.1. Demonstrate an understanding of the importance of basic sciences and clinical sciences research to the development of contemporary anesthesia
- 4.2. Describe the principles of research and scholarly inquiry
- 4.3. Describe the principles of research ethics
- 4.4. Pose an appropriate learning or scholarly question
- 4.5. Conduct a systematic search for evidence and interpret the relevant evidence
- 4.6. Select and apply appropriate methods and document the process to address the question
- 4.7. Demonstrate an understanding of the process to disseminate the findings of a study or research
- 4.8. Critically analyze the applications of the findings to the practice of anesthesia
- 4.9. Integrate new learning into practice
- 4.10. Establish and maintain knowledge, skills and attitudes appropriate to fostering scientific inquiry
- 4.11. Complete a scholarly project acceptable to the Residency Program Committee

Professional

Definition:

As *Professionals*, Anesthesiologists are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour.

Key and Enabling Competencies: Anesthesiologists are able to...

1. Demonstrate a commitment to their patients, profession, and society through ethical practice

- 1.1. Exhibit appropriate professional behaviors in practice, including honesty, integrity, commitment, compassion, respect and altruism
- 1.2. Demonstrate a commitment to delivering the highest quality care and maintenance of competence
- 1.3. Demonstrate a commitment to ensuring continuous care to patients including during on-call hours
- 1.4. Recognize and appropriately respond to ethical issues encountered in practice
 - 1.4.1. Demonstrate knowledge of the legal and ethical rules regarding informed consent of patients including minors and patients under public guardianship
 - 1.4.2. Ensure, where possible, patients or their substitute decision makers have the opportunity for fully informed consent before every anesthetic encounter, surgical intervention or invasive technique
 - 1.4.3. Collaborate with other professionals regarding end of life care
- 1.5. Manage conflicts of interest
- 1.6. Recognize the principles and limits of patient confidentiality as defined by professional practice standards and the law
 - 1.6.1. Demonstrate competence in maintaining patient confidentiality in daily practice
- 1.7. Maintain appropriate boundaries with patients
- 1.8. Respect autonomy and dignity of patients
- 1.9. Recognize importance of disclosure of medical error and adverse events and participate in such disclosure when appropriate

2. Demonstrate a commitment to their patients, profession and society through participation in profession-led regulation

- 2.1. Demonstrate knowledge and an understanding of the professional, legal and ethical codes of practice
- 2.2. Fulfil the regulatory and legal obligations required of current practice

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- 2.3. Demonstrate accountability to professional regulatory bodies
- 2.4. Recognize and respond to others' unprofessional behaviors in practice
- 2.5. Participate in peer review

3. Demonstrate a commitment to physician health and sustainable practice

- 3.1. Balance personal and professional priorities to ensure personal health and a sustainable practice
- 3.2. Strive to heighten personal and professional awareness and insight

REVISED – Specialty Standards Review Committee – May 2013