# ANESTHESIA RESIDENCY: OBJECTIVES OF TRAINING

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* For further PGE policies and procedure, please refer to the Schulich School of Medicine and Dentistry Resident/Fellow Handbook, available online at:
OVERALL GOALS AND OBJECTIVES OF THE ANESTHESIA TRAINING PROGRAM

The Department of Anesthesia & Perioperative Medicine

MISSION

First and foremost our mission is to train residents to become highly skilled and knowledgeable anesthesiologists. The program will adhere to the CanMEDS competencies which are expanded upon below. In addition to outstanding clinical competency, the training will focus on giving the trainee the skills and opportunities to excel in research, quality assurance, teaching, and leadership.

The objectives for any specific rotation will be described in a document specific for that rotation.

Medical Expert/Clinical Decision Maker

The role of medical expert is the base that all other CanMEDS roles are supported upon. The anesthesia training program at Western University expects that the acquisition of the medical knowledge and skills of a specialist will gradually progress as a trainee moves through the program.

PGY-1:
The aim of the PGY-1 year is for the trainee to gain a wide exposure to many fields of medicine. The goal is to allow the resident to gather a variety of information and skills and become a well-rounded physician.

PGY-2 and PGY-3:
Junior residents will continue to build upon the clinical exposure they gained in PGY-1. The Introduction to Anesthesia rotation will continue from PGY-1 into PGY-2, allowing the resident to gain the basic skills and knowledge expected of an anesthesiologist. In addition, a wide variety of subspecialty anesthesia rotations will be undertaken after the Introduction to Anesthesia rotation is complete. This will allow the resident to further understand and gain experience with the depth and breadth of anesthesia practice. Internal medicine and critical care rotations will begin to help fulfill the requirements of an anesthesiologist to provide advanced perioperative medical intervention to patients. Overall the residents should have a working knowledge of anatomy, pharmacology, physics, pathology, and physiology as it pertains to anesthesia.

PGY-4 and PGY-5:
Senior residents will continue to engage in a variety of subspecialty rotations and round out their internal medicine and critical care rotations. It is expected by the end of PGY-4 that residents will have an in-depth understanding of the scope of anesthesia practice. PGY-5
(consolidation) will focus on areas that may require additional work or exposure. In addition, residents will be expected to have the clinical responsibilities (with appropriate back-up) of a junior consultant and be able to apply knowledge of anatomy, pharmacology, physics, pathology, and physiology in daily practice without excessive guidance. PGY-5 procedures should for, the most part, be performed at the level of expertise of a junior consultant.

**Communicator**

**PGY-1:**
Residents will gain experience communicating as a physician. The skills involved with history taking and documentation will also be stressed. Being able to gain skills delivering, either written or verbally, a patient’s history, physical, investigations, and management plan will be stressed in the varied clinical rotations.

**PGY-2 and PGY-3:**
Residents will continue to build on the skills mentioned in PGY-1. Clear communication with the perioperative team (anesthesiologist, surgeon, nurses) will also be stressed. Complete and adequate documentation in the form of the anesthesia chart will be an expectation.

**PGY-4 and PGY-5:**
Residents will be expected to communicate as leaders in the perioperative setting. In particular, sound communication during emergencies will be an objective of training.

**Collaborator**

**PGY-1:**
As residents are rotating through a wide variety of clinical environments they should gain an appreciation of the varied and important roles of the allied health care professionals and be exposed to the concept of a multidisciplinary team.

**PGY-2 and PGY-3:**
Residents should be able to utilize the knowledge and skills of members of the multidisciplinary team both inside and outside of the operating room. Interaction with the perioperative team, supervisors, peers, patients, families, and allied health care should at all times be collaborative and for the benefit of the patient.

**PGY-4 and PGY-5:**
Residents should demonstrate the ability to lead members of a multidisciplinary team during emergent and non-emergent situations.

**Manager**

**PGY-1:**
Residents will learn how to manage the balance between being a learner, and a physician with patient care responsibly.
PGY-2 and PGY-3:
Residents should begin to appreciate the unique aspects of the manager role as an anesthesiologist. This includes, but is not limited to, on call urgent/emergent case prioritization, OR call schedules, hospital systems to care for patients before, during, and after a procedure, and the anesthesiologist’s role in equipment/medication acquisition.

PGY-4 and PGY-5:
Residents should be able to independently demonstrate the ability to prioritize cases and the distribution of anesthesia resources (human and equipment). At this stage all anesthesia residents will have been expected to have organized and administered call schedules.

Health Advocate
PGY-1:
As residents rotate through multiple clinical rotations they should gain appreciation of the importance of patient safety in the hospital environment. The concept of preventative medicine should also be understood and implemented when appropriate.

PGY-2 and PGY-3:
Residents will be able to describe, identify, and implement preoperative optimization. The resident will also learn to provide care in the safest manner possible by minimizing risk and discomfort for patients. Residents will be able to implement appropriate pain control measures perioperatively, particularly for the patient with chronic pain issues.

PGY-4 and PGY-5:
The senior resident should build upon and carry out, with minimal supervision, the health advocacy objectives mentioned in PGY-2 and PGY-3. Residents will also be able to assess and arrange the safest postoperative location for any individual patient.

Scholar
PGY-1:
Residents will learn to apply evidence based medicine to the care of patients.

PGY 2 and PGY-3:
Residents will learn how to develop a scholarly project, and undertake to present this academic endeavor as a poster, abstract, or manuscript. Residents will also endeavor to improve their ability to critically appraise medical literature.

PGY-4 and PGY-5:
Residents will be expected to teach and mentor more junior trainees in anesthesia, internal medicine, and critical care rotations. This progression should have begun as a junior resident.
**Professional**

Throughout their residency, residents are expected to fulfill the obligations of an anesthesia resident. In particular the CanMEDS Portfolio, Resident Log Book, safe patient care, documentation practices, careful tracking of narcotics, completion of required evaluations, attendance at academic rounds, and the completion of a scholarly project.

**PGY-1:**
Residents will begin to appreciate professional obligations of being a physician in Canada.

**PGY-2 and PGY-3:**
Residents will continue to develop the duties expected of a medical professional, including leadership, patient safety, promotion of the specialty of anesthesia, and the advancement of health care locally and Canada-wide.

**PGY-4 and PGY-5:**
Residents will consolidate their role as a leader for a given patient’s care, and on a wider scope solidify their professional obligations as an educator, scientist, clinician, and administrator.

Reviewed: June 2013, Dr. Granton
GRADED RESPONSIBILITY FOR ANESTHESIA RESIDENTS

The Department of Anesthesia & Perioperative Medicine

As residents progress through their training it is expected that they should gradually have a greater degree of independence. The graded responsibility is a balance between ensuring patient safety and allowing the resident to gain confidence with independent practice. Residents that are PGY-3 or higher are expected to supervise and educate more junior trainees, including medical students. In the final year of training (PGY-5) it is expected the resident should be able to function independently, with faculty back-up.

DEFINITIONS OF LEVELS OF SUPERVISION

Close:
- Supervisor attends induction, emergence and any significant intraoperative event
- Supervisor is immediately available

Intermediate:
- Supervisor in close proximity, but not necessarily in room
- Plans for induction, maintenance and emergence need to be discussed

Independent:
- Supervisor in hospital and aware case or cases are progressing
- Supervisor is available to consult with trainee and attend OR if urgently needed
- In all independent cases, supervisor should be made aware if there are significant anesthesia related concerns prior to induction
- Independent epidural insertion only allowable after site coordinator satisfied that resident has achieved appropriate level of skill.

<table>
<thead>
<tr>
<th>TRAINING YEAR</th>
<th>ADULT CASES</th>
<th>OBSTETRIC CASES</th>
<th>PEDIATRIC CASES</th>
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<tr>
<td>PGY-1</td>
<td>Close</td>
<td>C-section - Close Epidural - Independent</td>
<td>Close</td>
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<tr>
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<td>ASA 1 or 2 = intermediate ASA 3 or greater = close</td>
<td>C-section - Close Epidural - Independent</td>
<td>ASA 1 or 2 = intermediate ASA 3 or greater = close</td>
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<td>C-section intermediate Epidural - Independent</td>
<td>ASA 1 or 2 = intermediate ASA 3 or greater = close</td>
</tr>
<tr>
<td>PGY-4</td>
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<td>ASA 1 or 2 = independent ASA 3 or greater = intermediate</td>
<td>ASA 1 or 2 = independent ASA 3 or greater = intermediate</td>
</tr>
<tr>
<td>PGY-5</td>
<td>Independent</td>
<td>Independent</td>
<td>Independent</td>
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</tbody>
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Reviewed: June 2013, Dr. Granton
OBJECTIVES FOR THE PGY-1 YEAR

The practice of anesthesia requires knowledge and skills from several disciplines. The PGY-1 year has been designed to provide a broad understanding of medicine and to facilitate success on the LMCC Part II Examination, a current requirement of all Canadian Licensing authorities.

Residents not entering anesthesia residency immediately following medical school are advised to apply for credit for the PGY-1 year promptly upon acceptance to the program. For basic clinical training, the RCPSC Credential Committee will accept: rotating, transitional, mixed or straight internships; residency training in family medicine; and/or basic clinical training that is integrated into specialty residency programs.
OVERALL GOALS
The goal of the Emergency Medicine rotation for trainees in anesthesia is consolidation of the trainee’s knowledge of acute medical and surgical illnesses. In addition, development of an approach to the assessment and management of the trauma victim and critically ill patient (eg. evolving myocardial infarction, status asthmaticus, severe pulmonary embolism, etc.) will be emphasized.

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

Medical Expert/Clinical Decision Maker

Specific Knowledge Requirements
The resident will be able to:

- List the common acute and chronic disease processes presenting in the emergency department.
- Describe the pathophysiology of these diseases.
- Describe the usual therapeutic measures used to treat these diseases.
- Recognize disease processes that require urgent/emergent medical or surgical intervention.
- Be able to describe the ACLS and ATLS protocols for patient intervention.

Specific Skill Requirements
The resident will be able to:

- Complete a history and physical assessment of the patient presenting in the emergency room with special emphasis on the presenting complaint.
- Request and interpret appropriate investigations required to assess the patient’s complaint.
- Present a stratified differential diagnosis of the patient’s illness.
- Prescribe initial management of the patient’s condition, including resuscitation of the acutely ill patient.
• Demonstrate basic technical skills such as skin suturing, fracture casting, etc.
• Demonstrate an understanding of the approach to and rationale for arterial and central line insertion and intubation.
• Understand the ACLS approach to assessment and resuscitation of the patient with a critical cardiac illness where appropriate.
• Understand the ATLS approach to assessment and resuscitation of the trauma victim.

Communicator
The resident will be able to:
• Obtain and document the relevant medical history and physical examination thoroughly and efficiently.
• Develop communication skills with other members of the health care team to benefit the patient.
• Describe patient information and outline management plans to the attending emergency consultant in a professional and intelligent manner.
• Explain care management plans for discharge to patients in a clear, concise, easy to understand manner.

Collaborator
The resident will be able to:
• Describe the importance of the role of each of the members of the emergency department team, and support them in fulfilling their roles.
• Describe emergency room conditions warranting consultation with other health care providers (i.e. general surgeon, internist, cardiologist, etc.).
• Review management plans and courses of action with the attending emergency department consultant.

Manager
The resident will be able to:
• Consider health care resources when determining the patient’s emergency department management plan.
• Acknowledge the difficulties and decision-making involved in utilization and allocation of finite health care resources.
• Become proactive in ensuring appropriate discharge from emergency department, or referral for consideration of admission to hospital for their patients.
Health Advocate

The resident will be able to:

- Understand the complex emotional effects of the illness on the patient and their family.
- Provide appropriate education to ensure patients are well informed and well prepared for discharge from the emergency department, or possible admission to hospital.
- Encourage patients to optimize their health status.

Professional

The resident will be able to:

- Demonstrate integrity and honesty when interacting with patients, families, and other health care professionals.
- Be punctual, efficient, and respectful at all times.

Reviewed: June 2012, Dr. Granton
CARDIOLOGY (PGY-1 OR PGY-2 TO 5)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

Anesthesia residents may undertake at an elective rotation in in-patient Cardiology at University Hospital.

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

The resident is expected to:

- Demonstrate knowledge of cardiovascular physiology, anatomy and pharmacology.
- Demonstrate ability to diagnose and manage myocardial ischemia and/or infarction.
- Demonstrate appropriate ability to order and interpret investigations common to cardiac patients including, electrocardiograms, cardiac enzymes, echocardiogram and angiogram findings.
- Demonstrate an ability to recognize and manage cardiac arrhythmias, in particular those with hemodynamic instability.

Communicator

The resident will be able to:

- Communicate with Cardiology team (physicians, nurses) effectively in a written and verbal manner.
- Communicate effectively with patients and families.

Collaborator

The resident will be able to:

- Demonstrates ability to work well as a member of a multidisciplinary health care team.

Manager

The resident will:

- Demonstrates leadership skills in emergency situations. In particular with hypoxia, shock and advanced cardiac life support (ACLS).
Health Advocate

The resident will:

- Understand lifestyle and socioeconomic issues that contribute to heart disease. Advocate for patients to modify these factors if possible.

Professional

The resident will:

- Be punctual and have an appropriate attendance record.
- Attend and present at teaching rounds when required.
- Be respectful to fellow health care members, patients and families.

Reviewed: September 2012, Dr. Granton
GENERAL INTERNAL MEDICINE ROTATION (PGY-1)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

The following are the rotation specific goals and objectives for trainees during their General Internal Medicine (GIM) experience. These have been formulated to guide the provision of an educational experience which will encourage and allow the trainee to develop the knowledge, skills and attitudes of a specialist in Internal Medicine.

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision Maker

During the rotation, the resident will demonstrate proficiency in:

- Assessment of patients presenting with undifferentiated medical complaints/problems including eliciting a relevant history, performance of the appropriate physical examination and evidence-based use of diagnostic testing.
- Evidence-based management of common medical illnesses as well as less common but remediable conditions.
- Effective, integrated management of multiple medical problems in patients with complex illnesses.
- Performance of common procedures used in diagnosis and management of medical patients including ECG interpretation.

Communicator

During the rotation, the resident will demonstrate proficiency in:

- Obtaining a thorough and relevant medical history.
- Bedside presentation of patient problems.
- Discussion of diagnoses, investigations and management options with patients and their families.
- Obtaining informed consent for medical procedures and treatments.
- Communication with members of the health care team.
- Communication with referring and/or family physicians.
Collaborator

During the rotation, the resident will:
- Demonstrate proficiency in working effectively within the health care team.
- Demonstrate appropriate use of consultative services.
- Recognize and respect the roles of other physicians, nursing staff, physiotherapists, occupational therapists, nutritionists, pharmacists, social workers, secretarial and support staff, and community care agencies in provision of optimal patient care.

Manager

During the rotation, the resident will:
- Oversee provision of care and implementation of decisions regarding patient care, including effective delegation of care roles.
- Understand the principles and practical application of health care economics and ethics of resource allocation.
- Utilize health care resources in a scientifically, ethically and economically defensible manner.
- Demonstrate effective time management to achieve balance between career and personal responsibilities.

Health Advocate

On completion of the rotation, the trainee will:
- Understand important determinants of health including psychosocial, economic and biologic.
- Recognize situations where advocacy for patients, the profession or society are appropriate and be aware of strategies for effective advocacy at local, regional and national levels.

Scholar

During the rotation, the resident will:
- Develop and document an effective, long-term personal learning strategy.
- Demonstrate the ability to generate clinical questions related to patient care and utilize and analyze available resources to develop and implement evidence-based solutions to such questions.

Professional

During the rotation, the resident will:
- Demonstrate integrity, honesty and compassion in delivery of the highest quality of care.
- Demonstrate appropriate personal and interpersonal professional behaviors.

Reviewed: 2012, Dr. Granton
GENERAL SURGERY (PGY-1)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

Medical Expert/Clinical Decision-Maker

Residents are expected to:
- Become familiar with common general surgical clinical problems both in the Emergency Department and on the ward. Specifically, they are to become familiar with common perioperative management issues, especially as they relate to preoperative and postoperative surgical care.
- Have the opportunity to follow patients assessed in the Emergency Department and admitted to hospital through their urgent and emergent surgical care. This experience dealing with continuity of care for patients will allow for a better appreciation of the issues faced by General Surgeons and General Surgical residents as they apply to Anesthesia.
- Have the opportunity to increase expertise with technical skills such as suturing, Foley catheter insertion, and minor surgical procedures such as incision and drainage of abscesses and assisting at surgery.

Communicator

Residents are expected to:
- Establish therapeutic relationships with patients and their families.
- Obtain and synthesize a relevant history from patients, families, and referring physicians and to be an effective listener.
- Residents are expected to discuss appropriate information with patients and families and other members of the health care team. They are also expected to communicate effectively with referring services.

Collaborator

Residents are expected to:
- Consult effectively with other physicians and health care professionals and to contribute effectively to interdisciplinary team activities such as discharge planning and placement of patients.
Manager
Residents are expected to:
- Utilize resources effectively to balance patient care, learning needs and outside activities.
- Allocate finite health care resources wisely.
- Work effectively and efficiently in health care organization.
- Utilize information technology to optimize patient care, life-long learning and other activities.

Health Advocate
Residents are expected to:
- Identify the important determinants of health effecting surgical patients.
- To contribute effectively to improve health of patients and communities.
- To recognize and respond to those issues where advocacy is appropriate.

Scholar
Residents are expected to:
- Develop and implement personal and continued learning strategy.
- To critically appraise medical information and to facilitate learning of patients, house staff, students, and other health professionals.
- To contribute to the development of new knowledge.
- While on this rotation, residents will be excused to attend ½ academic day sessions each week.
- Residents are expected to read about cases in advance of surgery.
- Residents are expected to teach medical students and other health care professionals.

Professional
Residents are expected to:
- Deliver the highest quality of care with integrity, honesty and compassion.
- Exhibit appropriate personal and professional behaviors.
- Practice medicine ethically consistent with obligations of a physician.
- Residents are expected to function in a way that creates a working environment for the team that is positive and free of harassment and intimidation of any kind.
- To adhere to the rules governing credentialing at the hospital.
- To follow the code of conduct as set forth by the Schulich School of Medicine and Dentistry.
• Professionalism will be assessed by interaction with colleagues, health care professionals, patients, and in your day to day interaction as you practice medicine on the surgical teams.

Reviewed: June 2012, Dr. Granton
OBSTETRICS & GYNECOLOGY ROTATION (PGY-1)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
The goal of the Obstetrics & Gynecology rotation for PGY-1 trainees in anesthesia is the development of an understanding of the needs and expectations of the anesthesiologist from the obstetrician/gynecologist’s perspective, for the purpose of the trainee’s future career development.

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

Medical Expert/Clinical Decision Maker

Specific Knowledge Requirements
The resident will be able to:

- Describe the anatomic and physiologic changes of pregnancy and the peripartum period.
- Describe fetal-placental anatomy and physiology.
- Describe the various positions of the fetus in presentation for delivery.
- List the indications for operative delivery including forceps and Cesarean section.
- Describe the pathophysiology of common complications of pregnancy including pregnancy induced hypertension, gestational diabetes, placental insufficiency, placenta previa, and immune interactions between parturient and fetus (esp. Rh incompatibility).
- Describe the appearance of normal and abnormal fetal heart rate tracings.
- Describe the normal components of a fetal biophysical profile.

Specific Skill Requirements
The resident will be able to:

- Complete a physical assessment of the pregnant patient.
- Assess fetal well-being.
- Provide suitable initial management for common complications of the postpartum period (i.e. postpartum hemorrhage, uterine atony, etc.).
Communicator

The resident will be able to:

- Obtain and document the relevant medical history thoroughly and efficiently.
- Develop communication skills with other members of the health care team to benefit the patient.
- Explain obstetrical procedures (fetal heart rate tracings, fetal biophysical profiles, etc.) in a clear and compassionate manner.
- Describe patient information and outline obstetrical management plan to the attending obstetrical resident or obstetrician in a professional and intelligent manner.
- Discuss special needs (birthing plans, etc.) with nurses and other health care team members in a respectful manner.

Collaborator

The resident will be able to:

- Describe the importance of the role of each of the members of the birthing team and support them in fulfilling their duties.
- Describe maternal or fetal conditions warranting antepartum consultation with other team members (i.e. anesthesiologist, internist, neonatologist, etc.).
- Review management plans and courses of action with the obstetrical resident or obstetrician at all times.

Health Advocate

The resident will be able to:

- Understand the complex emotional atmosphere surrounding delivery of a newborn and be able to act as an advocate for the family in the medical environment.
- Encourage patients to optimize their health status throughout pregnancy.

Professional

The resident will be able to:

- Demonstrate integrity and honesty when interacting with patients, families, and other health care professionals.
- Be punctual, efficient, and respectful at all times.

Evaluation

An end-of-rotation evaluation will be discussed with the trainee.

Reviewed: March 2012, Dr. Granton
OTOLARYNGOLOGY (PGY-1)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

In addition to the goals and objectives defined by the Department of Surgery for rotating residents, the following goals and objectives should be acquired by residents in Anesthesiology, during the Otolaryngology rotation.

ROTATION OBJECTIVES

Medical Expert/Clinical Decision-Maker

The anesthesiology resident should understand the following clinical topics during the Otolaryngology rotation:

- The spectrum of disease processes involved in otolaryngology from pediatric issues to those of the elderly.
- Structural anatomy and function of upper and lower airways:
  - Nose, mouth, teeth, tongue
  - Nasopharynx, oropharynx, pharynx
  - Epiglottis, larynx, glottis, vocal cords, valleculae
  - Cartilages
  - Sensory and motor innervation
  - Conducting and respiratory airways: trachea, bronchi, bronchioles, alveoli
- Gain an appreciation of the following disease processes and the implications they have on airway anatomy and respiratory physiology
  - Tumours and mass effects
  - Post surgical or irradiation scarring
  - Congenital deformities
  - Foreign bodies
  - Trauma
  - Infections, abscesses
  - Vocal cord lesions
- Develop a differential diagnosis, investigation and treatment plan for the following common presenting complaints:
  - Hoarseness, stridor, hemoptysis
  - Foreign body aspiration
  - Airway trauma
  - Papillomatosis
  - Tumours
• Epistaxis
• Subglotic Stenosis
• Adenoid/Tonsillar Hypertrophy and obstructive sleep apnea in the pediatric and adult patient
• Acute Epiglottitis
• Hearing Loss
• Vertigo

- Understand in the pathologic processes and indications for both emergent and elective tracheotomy
  1. Emergent tracheotomy for airway obstruction
     • Epiglottitis
     • Upper airway tumours
  2. Elective tracheostomy
     • For pulmonary toilet
     • Prolonged orotracheal intubation
     • During major head and neck cancer surgery
     • Chronic ventilatory failure

- Learn how to manage a patient with an existing tracheal stoma
- Understand major patient comorbidities associated with patients requiring major Head and Neck Surgery.
  • Smoking, COPD, alcohol
  • Elderly, malnutrition
  • Cardiovascular disease
  • Prior irradiation, chemotherapy

- The management of common postoperative complications, including acute airway obstruction, post tonsillectomy hemorrhage including ensuing hypovolemia and hemorrhagic shock.
- Indications for utilizing heliox.
- The diagnosis and management of supraglottic respiratory failure.
- Indications for and complications of nasopharyngoscopy.
- Innervation of the oropharynx, larynx and trachea, as it applies to anesthesia for bronchoscopy.
- Use of the bronchoscope/nasopharyngoscope, including topical anesthesia, the skill of bronchoscopy/nasopharyngoscopy to assess vocal cord function and laryngeal pathology.

Medical Expert

- Exhibits compassion and support for patients and their families during the perioperative period.
Establishes a trusting professional relationship with patients and their families.

- Produces effective oral and written problem oriented presentations of patient condition and management.
- Encourages patient and family input into critical decision making.

**Collaborator**

- Collaborates and effectively communicates with other members of the health care team to ensure optimal patient management.
- Treats all members of the health care team in a respectful manner.
- Accepts appropriate share of work assignments.
- Obtains consultation appropriately, with a clear understanding of the role and expectations of the consultant.

**Manager**

- Understands the logistics of operating room booking and the flow of patients from the decision to carry out surgery to their discharge.
- Effectively coordinates preparation of patients for the OR and their disposition postoperatively.

**Health Advocate**

- Ensures effective preoperative optimization.
- Ensures appropriate postoperative management, including transfer of high risk patients to monitored care, discharge planning and the provision of appropriate follow up after surgery.

**Scholar**

- Attends all educational events, including the anesthesia half-day.
- Shows evidence of preparation for elective cases.
- Demonstrate effective use of information technology.

**Professional**

- Respects diversity of age, culture, religion, gender and socioeconomic status.
- Understands the legal requirements regarding informed consent, disclosure of harm and patient confidentiality.

Reviewed: June 2015, Dr. Arif Al-Areibi
PEDIATRIC EMERGENCY MEDICINE (PGY-1)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

Specific Knowledge Requirements

- Differentiation of the well child from the acutely ill child in order to build a base for the pre-anesthetic assessment.
- Initial ABC management of a sick child including basic airway management with oxygen delivery, positioning, bag-valve-mask ventilation, and fluid resuscitation.
- Approach to fever in neonates, infants, and children.
- Airway ABC’s – asthma, bronchiolitis, croup, foreign bodies – their diagnosis and management.
- Fluid management and assessment of dehydration along with rehydration techniques.
- Rapid sequence intubation – technique, indications and contraindications.
- Procedural sedation – indications and contraindications.
- Knowledge of pediatric pain management.
- Management of otitis media, urinary tract infections, pneumonia, and gastroenteritis.
- Approach to fracture management including Salter-Harris classification.
- Diagnosis and management of common surgical emergencies – appendicitis, pyloric stenosis, intussusception, volvulus, hernia.
- Knowledge of drug dosing for common drugs – epinephrine, antibiotics, antiepileptics, bronchodilators, antihistamines, steroids, and analgesics.
- Knowledge of common overdoses and poisonings.

Methods to Achieve Competencies

- Formal and informal teaching sessions in the ED.
- Provision of both PALS and APLS courses to interested first-year residents.
- Provision of PEM library resources and selected landmark studies.
Specific Skill Requirements

- Bag-valve mask ventilation, orotracheal intubation, splinting, suturing, casting, lumbar punctures, local anesthesia, intravenous placement, chest and abdominal radiograph interpretation

  Methods to Achieve Competencies
  - Demonstration of technical procedures in the ED.
  - Supervised procedures in the ED with immediate feedback.

Communicator

The resident will be able to:

- Obtain a relevant history from patient, parents, and caregivers.
- Communicate with the child’s family management plans to inform them and allay undue anxieties.

  Methods to Achieve Competencies
  - Observed history-taking and physical examination skills.
  - Observed management plans communicated to patient and family/caregiver.

Collaborator

The resident will be able to:

- Consult with other physicians and members of the health care team effectively.
- Understand the roles of the interdisciplinary team.

  Methods to Achieve Competencies
  - Observation of interaction with nurses, respiratory therapists, and x-ray technicians.

Manager

The resident will be able to:

- Utilize resources efficiently to manage patient care effectively.
- Work effectively and efficiently in a health care organization.

  Methods to Achieve Competencies
  - Residents with appropriate staff supervision will decide which patients require discharge, observation, or admission.
Health Advocate
The resident will be able to:

- Contribute effectively to improved health of patients and their communities.
- Consider anticipatory guidance with each patient encounter.

Methods to Achieve Competencies
- Discussion of illness and injury prevention when appropriate.

Scholar
The resident will be able to:

- Provide evidence-based medical practice via frequent critical appraisal of the literature.

Methods to Achieve Competencies
- Attendance at Pediatric Emergency Rounds.
- Presentation of Pediatric Emergency Rounds.

Professional
The resident will be able to:

- Appreciate the complex emotional effects that an acute illness has upon a family.
- Practice ethically according to professional standards with patients, families, and health-care teams.

Methods to Achieve Competencies
- Close supervision of resident assessments with families and staff.

Reviewed: September 2012, Dr. Granton
INTRODUCTION TO ANESTHESIA ROTATION (PGY-1 & 2)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA

Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

During the Introduction to Anesthesia Rotation, the resident will be expected to develop an understanding of the fundamentals of anesthesia practice and the basic skills needed to support this understanding.

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

Medical Expert/Clinical Decision Maker

- The resident will be able to describe and implement clinical preoperative assessment, including risk assessment and comprehensive anesthetic planning.
- The resident will demonstrate an understanding of the physical principles relating to anesthesia equipment and the safety aspects pertaining to this equipment, including equipment checking.
- The resident will be able to apply their knowledge of the physical principles of monitoring systems to the clinical practice of anesthesia with particular reference to common monitoring devices (EKG, pulse oximetry, non-invasive and invasive blood pressure monitoring, gas analysis, temperature monitoring, and peripheral nerve stimulation).
- The resident will be proficient at airway management, demonstrating competence with mask ventilation, airway insertion, direct laryngoscopy, and the use of Glidescope®, and laryngeal mask airway devices.
- The resident will be able to describe the basic components of anesthesia (analgesia, amnesia, areflexia, unconsciousness, and muscle relaxation/immobility) and the appropriate clinical application of these modalities.
- The resident will demonstrate ability to assess and manage, with appropriate intervention, the respiratory and hemodynamic status of the patient during the perioperative period.
- The resident should be proficient at securing peripheral intravenous access, and be familiar with techniques of arterial and central venous cannulation.
The resident should be capable of performing spinal anesthesia, and be familiar with epidural techniques, as well as having a good understanding of the equipment, indications, limitations, and contraindications for regional anesthesia.

The resident will be familiar with the pharmacology of commonly used drugs in the perioperative period, as well as drugs used during resuscitation, and in the management of patients with common comorbidities. They will be aware of common drug interactions.

The resident will be capable of providing anesthesia for ASA 1 and 2 patients undergoing uncomplicated surgery with minimal supervision.

For those rotating at:

**Victoria Hospital:**
- Assessment for and provision of epidural insertion for labour and delivery should become an acquired skill.
- Residents should gain basics of anatomy, physiology, pharmacology, and psychology for pediatric patients.

**University Hospital:**
- Residents should begin to appreciate some anesthetic considerations for neurosurgical cases and physiology and pharmacology as it applies to intracranial pressure.

**St. Joseph’s Health Care:**
- Residents will be able to identify and predict issues that are specific to ambulatory surgical cases including pain control, nausea and vomiting, and rapid turnover discharge criteria.

**Communicator**

- The resident will be able to effectively communicate with patients and/or their families for the purpose of eliciting an appropriate history.
- The resident will effectively communicate the risks and benefits of the anesthetic options available for the patient’s surgery for the purpose of informing the patient and including them in the decision making process.
- The resident will be able to effectively communicate with all colleagues and members of the team involved in caring for the patient. They will be able to protect the patient’s interests, and be confident to address concerns in an assertive but non-confrontational manner.
Collaborator

- The resident will be a team player and be able to appropriately consult other physicians for advice and further management of the patient.
- The resident will cooperate with colleagues to ensure patient care and safety.
- The resident will recognize the key interactions between members of the operating room team and strive to facilitate optimal patient care.

Manager

- The resident will learn by observation and begin to be able to apply the principles of effective operating list management through planning and preparation.

Health Advocate

- The resident will continue to promote the health of their patient and will develop a responsible attitude towards the utilization of finite healthcare resources.

Scholar

- The resident will be self-directed and focused on their career learning objectives.
- The resident will seek to apply the principles of evidence-based practice and continually try to justify clinical decision making processes.
- The resident should make a reasonable effort to prepare by prior reading or enquiry for each day’s work.
- The resident should attend and participate in the formal teaching opportunities offered within the department and develop an awareness of research activities within their environment.

Professional

- The resident will demonstrate professional behavior towards senior and junior colleagues, patients, and allied healthcare workers.
- The resident will demonstrate a mature work ethic in keeping with the privilege of practicing medicine.
- The resident will accept advice and constructive feedback from their supervisors at times of formal assessment.

Reviewed: June 2013, Dr. Granton
OVERALL GOALS
This rotation is a unique combination of the Pre-Admission Clinic at Victoria Hospital, the Acute Pain Service, and provision of anesthesia services outside of the operating room. The objectives for the Pre-Admission portion are the same as those for University Hospital and are included below. The objectives for the Acute Pain Service and out of OR anesthesia follow.

The Pre-Admission Clinic is a rotation that will occur at either University Hospital or Victoria Hospital over a four week period. The resident will spend the majority of time in the preoperative clinic of either hospital. Residents will be expected to complete an appropriate history and physical on each patient seen in the clinic. The resident will then present a plan for further investigation, optimization, and perioperative management of the patients seen. Written or dictated documentation of the consultations is expected.

ROTATION OBJECTIVES (PRE-ADMISSION CLINIC)
At the completion of the Pre-Admission portion of training, the resident will have acquired the following competencies and will function effectively as:

Medical Expert/Clinical Decision-Maker

General Requirements
The resident will be able to:
- Demonstrate appropriate and anesthesia specific history and physical skills, including assessment of the airway.

Specific Knowledge Requirements
The resident will be able to:
- Demonstrate internal medicine knowledge base as it applies to the etiology, natural history, and management of the following disease states that are common reasons for pre-admission clinic referral: coronary artery disease, chronic obstruction pulmonary disease, advance kidney failure, advanced liver failure, cerebral vascular disease, typical congenital disease states, obstructive sleep apnea, obesity, rheumatoid arthritis, ankylosing spondylitis, and chronic pain.
• Demonstrate a working knowledge of indications and recommendations for ordering of invasive and non-invasive investigations preoperatively, including: ECG, pulmonary function testing, chest radiograph, investigations of underlying coronary artery disease, and investigations for cerebral vascular disease.

• Demonstrate the ability to synthesize a reasonable optimization/investigation anesthetic management plan based on nature and urgency of surgery, history, physical, and available investigations.

Communicator

The resident will be able to:

• Communicate well with patients and families in the Pre-Admission Clinic, with a good bedside manner.

• Verbally explain findings of history and physical with anesthesia faculty supervisor and provide a reasonable management plan.

• Provide a concise dictated note regarding patient assessment and plan.

Collaborator

The resident will be able to:

• Interact well with the multi-disciplinary team in the Pre-Admission Clinic.

• Work well with other physicians in the Pre-Admission Clinic including internal medicine and surgery.

• Consult other specialties (internal medicine) when required for patient care.

Health Advocate

The resident will:

• Understand the anesthesiologist’s role in optimization of the patient preoperatively.

• Take steps to improve perioperative safety of patients (aspiration prophylaxis, post-operative Critical Care admission, etc.).

• If appropriate, demonstrate willingness to communicate to the surgeon the anesthesia team’s concerns regarding timing, scope, and appropriateness of proposed surgery.

• Understand the anesthesiologist’s role in patient education preoperatively, including smoking cessation.

• Be able to provide risks and benefits of possible postoperative pain control options.

• Understand the anesthesiologist’s role in blood conservation and should be able to describe the pros and cons of a variety of blood conservation strategies.
Professional

The resident will:

- Display professional behavior and attitude while dealing with patients, families, and staff.

READING LIST

Required Reading:

Suggested Readings:
ROTATION OBJECTIVES (ACUTE PAIN SERVICE)

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

Medical Expert/Clinical Decision Maker

The resident will:
- Demonstrate the ability to assess patient and surgery specific needs and options for perioperative pain control.
- Have working knowledge of indications, contra-indications, and complications of narcotics, anti-inflammatory medications, antidepressants, sedatives, intrathecal medications, and epidural analgesia as they pertain to perioperative pain control.
- Understand the rational and is able to deliver multimodal perioperative analgesia.
- Demonstrate the ability to assess and provide management for a patient with non-surgical acute pain issues.
- Demonstrate the ability to assess and modify acute analgesia management plan for patients with chronic pain disorders.

Communicator

The resident will be able to:
- Elicit appropriate input from patient or parents regarding effectiveness and concerns about perioperative pain control.
- Demonstrate effective and accurate written and verbal communication with nurses and surgical team regarding pain control.

Collaborator

The resident will be able to:
- Work well with the Acute Pain Service team and respects the roles of team members, including consultants and nurses with advanced training.

Manager

The resident will be able to:
- Efficiently participate or run acute pain service rounds on a high volume of patients.

Health Advocate

The resident will:
- Demonstrate an understanding of the unique patient safety issues and complications that can arise with perioperative pain control strategies including nausea, vomiting, constipation, respiratory depression, delirium, hypotension, and neurological injury.
- Be able to counsel patients or parents on a variety of pain control options and describe the risks and benefits of each.
Professional

The resident will:

- Display professional behavior and attitude while dealing with patients, families, and staff.

READING LIST

Suggested Readings:

4. Excellent link to LHSC APS teaching site: http://www.lhsc.on.ca/priv/pain/ioa.htm

ROTATION OBJECTIVES (OUT OF OR ANESTHESIA)

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

Medical Expert/Clinical Decision Maker

The resident will be able to:

- Demonstrate location, patient, and procedure specific knowledge of unique anesthesia considerations when providing anesthesia services outside of the operating room including:
  - Available personnel with skills required to help anesthesiologist
  - Timely availability of back-up in case of an emergency
  - Location and acceptability of resuscitation equipment
  - Transport of patients to Post Anesthetic Care Unit after procedure
  - Pros and cons of sedation versus general anesthesia for procedures

Communicator

The resident will be able to:

- Clearly communicate anesthesia specific requests and concerns to staff that may not be familiar with the anesthesia teams’ needs.
Health Advocate

The resident will:

- Ensure proper equipment and personnel are available prior to starting the provision of anesthesia services.
- Understand the principles of and complies with radiation safety for the patient, staff, and personally.

Professional

The resident will:

- Display professional behaviors and attitudes while dealing with patients, families, and staff.

READING LIST

Suggested Readings:

1. Miller’s Anesthesia 7th ed. Chapter 79. Anesthesia at remote locations

Reviewed: June 2013, Dr. Granton
AIRWAY BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

General Requirements

The resident is expected to:

- Demonstrate working knowledge of oral, pharyngeal, laryngeal, and tracheal anatomy.
- Understand and have clinical suspicion of acute and chronic pathology that can increase complexity of airway management.
- Demonstrate knowledge of airway assessment and prediction of the difficult airway (including elements of history, physical exam, and investigations).
- Demonstrate working knowledge of the indications, contra-indications, advantages, and disadvantages of a wide variety of airway management techniques.
- Have an approach to the unexpected difficult airway (including a working knowledge of the ASA Difficult Airway Algorithm).

Specific Knowledge Requirements

The resident will:

- Demonstrate competence in the use of the following airway devices or management techniques: bag mask ventilation, oral and/or nasal airways, direct laryngoscopy, Glidescope®, Laryngeal Mask Airway (LMA), lighted stylet, fiberoptic bronchoscope, nasal intubation, airway topicalization, awake intubation, and in-line cervical spine stabilization.

Communicator

The resident will be able to:

- Communicate aspects of airway assessment to supervising anesthesiologist, patient, and perioperative team.
- Effectively communicate plan of airway management to supervising anesthesiologist, patient and perioperative team (particularly during the preoperative team debriefing—often referred to as the surgical pause—when there are specific airway concerns).
• Properly and accurately document airway assessment and management techniques used on anesthetic record.

Collaborator

The resident will be able to:
• Work effectively with members of multi-disciplinary team specific to airway management (including registered respiratory therapists, nurses, surgeons, and anesthesiologists).

Manager

The resident will:
• Efficiently and fairly manage resident duty/call schedules if assigned as senior resident during airway rotation.
• Use time of airway rotation to maximize exposure to challenging airway management cases.

Health Advocate

The resident will:
• Provide patients and other health care professionals with information regarding difficult airway management in order to improve patient safety in the future.

Professional

The resident will:
• Demonstrate ethical behavior in interactions with patients, families, supervisors, other health care professionals, and peers.
• Demonstrate knowledge of the need for and technique of disclosure of potential and realized complications of airway management.
• Demonstrate punctuality and adherence to proper operating room attire.
• Adhere to hospital and departmental procedures and policies for the care of patients and code of conduct for professional interactions.

SUGGESTED READING LIST


Updated: June 2011, Dr. Granton & Dr. Turkstra
CARDIAC ANESTHESIA BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
Residents completing the cardiac subspecialty rotations should achieve competence in the management of routine anesthetic management of coronary bypass graft patients, valve replacement and/or repair (aortic, mitral), and aortic valve procedures. In addition, they should gain familiarity with complex cardiac cases involving patients with multiple comorbidities.

Clinical Faculty: Cardiac Anesthesiologists & Cardiac Surgeons.

Teaching Techniques: Teaching will be through direct clinical experience with consultant guidance during clinical workload. Residents are also invited to attend morning TEE rounds.

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

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 to:
  - Describe the normal coronary anatomy and variants, normal cardiac physiology, and the effects of disease states on the normal physiology.
  - 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.
  - Describe the normal conduction pathways of the heart and its clinical significance in disease.
  - Describe the embryologic circulation, development of the heart, and fetal physiology as it applies to adult congenital heart disease.
  - Describe the altered respiratory physiology of the immediately postoperative ventilated patient with significant surgical incisions and pain (sternotomy, large abdominal incision).
1. Describe common physiological changes occurring in the postoperative period and the impact these have on end organ function (neurologic, renal, cardiac, hepatic, gastro-intestinal).

2. **Pharmacology**
   - The resident should know:
     - Commonly prescribed medications for cardiac surgical patients, the implications for disease, and the impact on anesthetic management.
     - Commonly used cardiac anesthetics and dosages.
     - Heparin, antiplatelet agents, and anesthetic implications.
     - Protamine for heparin reversal, along with side effects and complications.
     - Antifibrinolytic agents, mechanisms of action, and indications.
     - The use of blood products (PRBC, FFP, platelets, cryoprecipitate) and blood alternatives (albumin, starch) as well as transfusion reactions and complications.
     - Coagulation drugs currently available (DDAVP, activated factor 7a) their indications, contraindications, dosages, and complications.
     - Commonly used vasodilators, vasoconstrictors, inotropic agents, and their indications, dosages, and side effects.
     - The appropriate use of pain medications, non-steroidal anti-inflammatory drugs and regional anesthetic techniques in cardiac surgical patients.
     - Pharmacology of perioperative risk reduction strategies (lipid lowering agents, β-blockers, aspirin).

3. **Monitoring**
   - The resident will:
     - Be able to interpret ECG for ischemia, infarction, arrhythmias, and paced rhythms. They will recognize the limitations and the sensitivity/specificity of ECG as an ischemia monitor.
     - Demonstrate principals of non-invasive and invasive BP monitoring and its pitfalls.
     - Acquire skills of arterial and central venous cannulation (with ultrasound), peripheral venous cannulation, and pulmonary artery catheterization. Interpret CVP and data from PA catheter (PAP, PCWP, Cardiac output) and know its indications, complications, and management.
     - Know basics of introductory TEE, including techniques of probe insertion and several basic views, and its implication and application to the critical care patient.
THE DEPARTMENT OF ANESTHESIA & PERIOPERATIVE MEDICINE | WESTERN UNIVERSITY
2015 - 2016 ANESTHESIA RESIDENCY - OBJECTIVES OF TRAINING

D. Clinical Assessment & Management

The resident will:

- Be able to complete a detailed history, physical exam, order appropriate laboratory and ancillary investigations, and provide a management plan for a cardiac surgical patient.
- Know current indications and recommendations for SBE prophylaxis.
- Be able to manage medical bleeding.
- Be able to correct common derangements in metabolic and electrolyte disturbances in the intraoperative period.
- Know the basic principles of cardiac support devices including IABP and extracorporeal membrane oxygenation.
- 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 lusiotropes
  - Emergencies requiring ACLS
- Cardiac tamponade, constrictive pericarditis
- Dilated, restrictive and obstructive cardiomyopathy (IHSS), CHF, and diastolic dysfunction
- Aberrant conduction, dysrhythmia, sudden acute and sub-acute 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

**Communicator**

*The resident will:*
- Demonstrate effective communication with patients and families (description of procedures, informed consent, anesthetic options and risks).
- Demonstrate effective communication with OR team (cardiac surgeons, nurses and perfusionists) and postoperative team (CSRU). Particularly during the initiation conduct and removal of cardiopulmonary bypass.
- Provide clear and concise written consultation and anesthetic records.

**Collaborator**

*The resident will:*
- Recognize the need to utilize other specialists for the care and management of the critical patient.
- Foster healthy team relationships.

**Manager**

*The resident will:*
- Manage OR time by efficiently conducting the anesthetic, continuing education, and personal activities.
- Make effective use of health care resources.
**Health Advocate**

*The resident will:*
- Demonstrate the use of risk reduction strategies, including use of ultrasound and sterile technique for invasive lines.

**Scholar**

*The resident will:*
- Demonstrate commitment to continuing personal education including use of information technology.
- Be able to critically review cardiac anesthesia literature and describe the principles of research relevant to this population.
- Assist in education of other members of the OR team.

**Professional**

*Residents must:*
- Always demonstrate respectful and compassionate behavior toward patients, their families, and other health care providers.
- Demonstrate an appropriate sense of responsibility to themselves and their patients.
- Remain calm and organized in stressful or emergency situations.
- Demonstrate appropriate interactions with colleagues and staff.

**Evaluation**

There will be an individual interview with the block coordinator at the end of the rotation. Resident feedback is used to improve teaching techniques and rotation specific objectives.

**READING LIST**

**Textbooks:**

**Systematic Reviews:**


Updated: June 2013, Dr. Granton
CARDIAC SURGERY RECOVERY UNIT (CSRU)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

Residents completing the Cardiac surgery recovery Unit (CSRU) should achieve competence in the management of routine postoperative care for Coronary Bypass Graft patients and valve replacement and/or repair (aortic, mitral). In addition, they should gain familiarity with complex cardiac cases involving patients with multiple comorbidities.

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

Medical Expert/Clinical Decision-Maker

- The resident will demonstrate knowledge of the basic sciences as applied to the critical postoperative period following cardiac surgery:

  A. Physiology and Anatomy

  The resident is expected to:
  - Describe the normal coronary anatomy and variants, and normal cardiac physiology and the effects of disease states on the normal physiology.
  - Describe the anatomy and physiology of cardiac valves, left ventricle, right ventricle, atria, major cardiac vessels, and circulatory system.
  - Describe the normal conduction pathways of the heart and its clinical significance in disease.
  - Describe the altered respiratory physiology of the immediately postoperative ventilated patient with significant surgical incisions and pain (sternotomy, large abdominal incision).
  - 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:
  - Heparin, antiplatelet agents dosages and anesthetic implications.
  - Protamine for heparin reversal, along with side effects and complications.
  - Anti-fibrinolytic agents, mechanisms of action and indications.
- The use of blood products (PRBC, FFP, platelets, cryoprecipitate) and blood alternatives (albumin, starch) as well as transfusion reactions and complications.
- Coagulation drugs currently available (DDAVP, activated factor 7a) their indications, contraindications, dosages and complications.
- Commonly used vasodilators, vasoconstrictors, and their indications, dosages, and side effects.
- Anti-arrhythmic agents for prophylaxis and treatment of post-operative atrial fibrillation, SVT and ventricular arrhythmias.
- Pharmacology of perioperative risk reduction strategies (lipid lowering agents, B-blocker’s, aspirin).

C. Monitoring

The resident will:
- Be able to interpret EKG for ischemia, infarction, arrhythmias and paced rhythms. They will recognize the limitations, and the sensitivity/specificity of EKG as an ischemia monitor.
- Be able to acquire skills of arterial and central venous cannulation, peripheral venous cannulation, rewiring central venous access, PA catheterization; interpret CVP and data from PA catheter (PAP, PCWP, Cardiac output) and know its indications, complications and management.
- Make use of laboratory monitoring of the coagulation system (PTT, INR, Fibrinogen) as applied to the postoperative cardiac patient.
- Have the ability to assess the adequacy of mechanical ventilation using clinical parameters (pt size & weight, peak & plateau ventilatory pressures, mode of ventilation in conjunction with patient LOC, tidal volume, rate) and laboratory arterial blood gas analysis including the determination of patients ability to wean from mechanical ventilation.
- Be able to recognize the parameters used to assess postoperative blood loss, and options to treat blood loss including medical and surgical alternatives.
- Know the significance of temperature management in the postoperative period.
- Appreciate the indicators of volume status in the special circumstances of postoperative cardiac patients including the findings from invasive monitors, TEE and clinical indicators (urine volume).
D. Clinical Assessment & Management

The resident will:

- Be able to complete a detailed history, physical exam, order appropriate laboratory and ancillary investigations and provide a management plan for a patient admitted to the CSRU.
- Be able to manage the medical and the first stages of surgical postoperative bleeding.
- Be able to identify criteria for intubation, extubation. Be able to wean patients from the ventilator adjusting the modes of ventilatory support.
- Be able to correct common derangements in metabolic and electrolyte disturbances in the postoperative cardiac patient.
- Know the basic principles of cardiac support devices including IABP and extracorporeal membrane oxygenation.
- Know the common pathophysiology and management of patients admitted to a cardiac critical care setting 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
  - Shock and the use of volume resuscitation, vasodilators/constrictors, ionotropes
  - Emergencies requiring ACLS
  - Cardiac tamponade
  - Aberrant conduction, dysrhythmia, sudden acute and sub-acute ventricular and supra-ventricular arrhythmia
  - Pacemakers & the indications for and applications of the various modes of temporary pacing
  - Pneumo/hemothorax
  - Pulmonary edema, Pneumonia, CHF
  - COPD, asthma, sleep apnea in the ventilated patient
  - Heparin induced thrombocytopenia and heparin resistance
  - Neurologic sequelae post CPB procedures
  - Gastrointestinal complications
  - Renal failure and its management
  - Diabetes and endocrine control
Communicator

The resident will be able to:

- Obtain accurate and relevant history and perform a detailed physical examination using effective listening skills.
- Explain the status of the patient and expected progress to his/her family.
- Communicate patient information and outline a management plan to the attending in a professional manner.
- Communicate management plan effectively in both routine and emergency situations to critical care team (ICU nurse, RT).
- Discuss management issues of patients and planned treatment course during morning hand over rounds with other residents and fellows.

Collaborator

The resident will:

- Recognize the need to utilize other specialists for the care and management of the critical patient.
- Collaborate with surgical team in the shared management of patients.
- Respect roles and input of allied health care members.
- Work effectively as member of CSRU team.

Manager

The resident will be able to:

- Manage the CSRU to improve patient flow and safety.

Health Advocate

The resident will:

- Provide care that minimizes risk of perioperative complications to patients (DVT prophylaxis, ASA, sterile procedure, etc.).

Professional

Residents must:

- Always demonstrate respectful and compassionate behavior toward patients and their families.
- Remain calm and organized in stressful or emergency situations.
- Demonstrate professional interactions with colleges, consultants, allied health care and surgical teams.
- Be punctual and prepared each day.
Evaluation

There will be an individual interview with the block coordinator at the end of the rotation. Resident feedback is used to improve teaching techniques and rotation specific objectives.

Reviewed: June 2012, Dr. Granton
CHRONIC PAIN BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
The Chronic Pain Management rotation provides the anesthesia resident with an opportunity to further develop diagnostic and therapeutic expertise in a variety of analgesic modalities to improve patients’ quality of life, including but not limited to regional anesthesia techniques. The basic goals of this one-month rotation are:

1. To develop knowledge of the types of chronic pain syndromes that present to a tertiary pain clinic.
2. To gain familiarity with the variety of pharmacologic, non-pharmacologic and surgical modalities available.
3. To gain an understanding of the impact of chronic pain on patients’ lives and work and that of their families.

Further expertise will require additional elective rotations.

There is an Interdisciplinary Pain Program at Western University directed by an endowed chair in Pain Management (the Earl Russell Chair). The vision of the Program is that the treatment and study of pain is a priority that bridges academic disciplines. Integrating the fields of acute and chronic pain in the training of the anesthesiologist will especially encourage the development of new paradigms for the prevention and treatment of chronic pain.

There is one tertiary Pain Clinic in London. St. Joseph’s Health Care is establishing a multidisciplinary model with an affiliated psychologist, a dedicated RN as well as three physiatrists, one neurologist, and four anesthesiologists (Dr. Geoff Bellingham, Dr. Kate Ower, Dr. Jim Watson, and Dr. Pat Morley-Forster). Dr. Rob Banner provides complementary and alternative medicine treatments at his private clinic. A schedule of these clinics is attached. By the end of the rotation the resident will be expected to have attended the five anesthesia-run clinics at least once. There is some scheduling flexibility depending on an individual’s interest and needs. Residents from Family Medicine, Internal Medicine, Neurology, as well as an Anesthesia Fellow, may also be doing rotations in that particular month.

Your schedule and objectives will be emailed to you one week prior to the start of your rotation.
### CLINIC SCHEDULE FOR ST. JOSEPH’S PAIN CLINIC

Hours: (generally) 0800 - 1600

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<tr>
<th>Monday</th>
<th>Dr. Bellingham</th>
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<td>Dr. Morley-Forster</td>
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<td>Tuesday</td>
<td>Dr. Bellingham</td>
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<td></td>
<td>Every other Tuesday in fluoroscopy, please call clinic (519-646-6100 Ext. 66019) for schedule</td>
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<td>Wednesday</td>
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### CLINIC SCHEDULE FOR DR. BANNER

Location: 620 Richmond, Unit I next to the Running Room

Hours: Tuesday, Wednesday, and Friday 0900 - 1700

Phone number: 519-850-6575. **Please call in advance if you wish to attend.**
ROTTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

General Requirements

Residents will:

- Demonstrate knowledge of anatomy and physiology of pain pathways in the peripheral and central nervous system.
- Understand the role of psychological factors, particularly anxiety and depression, on pain perception and disability.
- Obtain a complete pain history and perform a relevant physical examination.
- Formulate a differential diagnosis and treatment plan which incorporates pharmacologic and non-pharmacologic modalities of treatment.
- Demonstrate knowledge of specific diagnostic/treatment modalities (indications, contra-indications, complications and technique).
- Demonstrate knowledge of chronic pain medication (opioids, anti-inflammatories, anticonvulsants, anti-depressants).
- Be aware of national practice guidelines for chronic pain management.
- 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.
- Be aware of effective use of consultation services in chronic pain management.
- Demonstrate knowledge of basic legal, social, and bioethical issues encountered in chronic pain management, including informed consent.

Specific Knowledge Requirements

- At the completion of the chronic pain clinic rotation, the resident will 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, post-herpetic neuralgia), central pain syndromes, intractable anginal pain, visceral pain, pelvic pain, headaches, pain related to peripheral vascular insufficiency, role of personality disorders, anxiety states, and depression, and compensation and disability.
Communicator

Residents will:
- Establish a professional relationship with patients and families.
- Obtain and collate relevant history from patients and families.
- Listen effectively.
- Demonstrate appropriate oral and written communication skills in inpatient, outpatient, and operating room environments.

Collaborator

Residents will:
- Consult effectively with other physicians and health care professionals.
- Demonstrate an understanding of the respective abilities of all team members.

Manager

Residents will:
- Demonstrate basic knowledge of the management of an ambulatory care pain clinic.
- Utilize information technology to optimize patient care and life-long learning.
- Demonstrate knowledge of quality assurance to outcomes in a chronic pain clinic.
- Demonstrate effective time management skills.

Health Advocate

Residents will:
- Identify the important determinants of health affecting chronic pain patients.
- Recognize opportunities for anesthesiologists to advocate for resources for chronic pain management.
- Educate both patients and families about their pain conditions, as well as other members of the health care team.

Scholar

Residents will:
- Critically appraise sources of information in the pain management literature.
- Be able to judge whether a research project is properly designed using critical appraisal methods.

Professional

Residents will:
- Deliver the highest quality of care with integrity, honesty, and compassion.
- Exhibit appropriate personal and interpersonal professional behaviors.
- Practice medicine ethically, consistent with the obligations of a physician.
• Include the patient in discussions concerning appropriate diagnostic and management procedures.
• 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.
• Establish a pattern of continuing development of personal clinical skills and knowledge through medical education.
• Recognize and have an approach to ethical issues in pain medicine.

READING LIST

Standard Texts:

Specialty Texts*:

Other References:
7. A folder of Pain Management articles is available in the LHSC-UH library.

*Residents should read through at least one of these texts to understand the subspecialty of Chronic Pain Management.

Updated: August 2011, Dr. Granton & Dr. Ower
GENERAL ANESTHESIA BLOCK (PGY-3 & 4)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
During a general anesthesia rotation, the resident will be expected to display an understanding of advanced anesthesia practice and apply this knowledge for the management of patients. The overall goal of this rotation is to allow the resident to gain further experience in a variety of anesthesia management situations, elective, emergent and consultative.

ROTATION OBJECTIVES
At the completion of the General Anesthesia rotation, the resident should exhibit the following knowledge, skills and attitudes:

Medical Expert/Clinical Decision-Maker
- The resident will be able to describe and implement clinical preoperative assessment, including risk assessment, and comprehensive anesthetic planning.
- The resident will demonstrate an understanding of the physical principles relating to anesthesia equipment, as well as the safety aspects pertaining to this equipment, including equipment checking.
- The resident will be able to apply their knowledge of the physical principles of monitoring systems to the clinical practice of anesthesia, with particular reference to common monitoring devices – EKG, Pulse Oximetry, Non Invasive and Invasive Blood Pressure Monitoring, Gas Analysis, Temperature Monitoring, Peripheral Nerve Stimulation.
- The resident will be proficient at airway management, demonstrating competence with mask ventilation, airway insertion, direct laryngoscopy, and the use of Glydescope, Laryngeal Mask Airway devices and bronchoscope.
- The resident should be proficient at securing peripheral intravenous access, and be skilled with techniques of arterial and central venous cannulation.
- The resident should be capable of performing spinal anesthesia, and be skilled with epidural techniques, as well as having good comprehension of the equipment, indications, limitations and contraindications for regional anesthesia.
- The resident will be familiar with the pharmacology of commonly used drugs in the perioperative period, as well as drugs used during resuscitation, and in the
management of patients with common co morbidities. They will be aware of common drug interactions.

- The resident will be capable of providing anesthesia for ASA 3 and 4 patients undergoing complicated surgery with some supervision
- For those rotating at:

  **Victoria Hospital:**
  - Supervised provision of advanced obstetrical anesthesia
  - Resident should understand the anatomy, physiology, pharmacology and psychology for pediatric patients

  **University Hospital:**
  - Resident should provide care for advanced neurosurgical cases and manipulate physiology and pharmacology as it applies to intracranial pressure.
  - Resident should provide anesthetic management for transplantation cases.

  **St. Joseph’s Health Care:**
  - Residents will be able to identify and predict issues that are specific to ambulatory surgical cases, including, pain control, nausea and vomiting, rapid turnover discharge criteria.

**Communicator**

- The resident will be able to effectively communicate with patients and/or their families for the purpose of eliciting an appropriate history.
- The resident will effectively communicate the risks and benefits of the anesthetic options available for the patient’s surgery for the purpose of informing the patient and including them in the decision making process.
- The resident will be able to effectively communicate with all colleagues and members of the team involved in caring for the patient.
- The resident will communicate anesthetic concerns to supervising anesthesiologist during care of patients.

**Collaborator**

- The resident will cooperate with colleagues to ensure patient care and safety.
- The resident will recognize the key interactions between members of the operating room team, and strive to facilitate optimal patient care.
Manager

- The resident will be able to describe or apply the principles of effective operating list management, through planning and preparation.

Health Advocate

- The resident will continue to promote the health of their patient, and will develop a responsible attitude towards the utilization of finite healthcare resources.

Scholar

- The resident will be self-directed, and focused on their career learning objectives.
- The resident will seek to apply the principles of evidence-based practice, and continually try to justify clinical decision making processes.
- The resident should make a reasonable effort to prepare by prior reading or enquiry for each day’s work.
- The resident should attend and participate in the formal teaching opportunities offered within the department, and develop an awareness of research activities within their environment.

Professional

- The resident will demonstrate professional behavior towards senior and junior colleagues, patients and allied healthcare workers.
- The resident will demonstrate a mature work ethic, in keeping with the privilege of practicing medicine.
- The resident will accept advice and constructive feedback from their supervisors at times of formal assessment.

Reviewed: June 2012, Dr. Granton
NEUROANESTHESIA BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS

Two separate one-month rotations in neuroanesthesia will provide the resident with a theoretical basis and clinical experience in the anesthetic management of adults undergoing surgical treatment of diseases of the CNS and spine. This clinical experience is supplemented by a formal series of seminars in neuroanesthesia in the core curriculum and informal lectures within the OR setting.

Guided independent study is also encouraged with the provision of a Manual of Neuroanesthesia and compilation of SNACC-recommended peer-reviewed articles located in the Anesthesia Library at LHSC-UH, B3-222.

Upon completion of the neuroanesthesia rotation, residents should have demonstrated proficiency in caring for patients with neurologic disease in a compassionate manner. This includes the preoperative evaluation, intraoperative management, and postoperative care utilizing the most current medical/anesthetic knowledge pertinent to each case. Residents are expected to become proficient at using online medical information, communicating with patients and working effectively with patient care team, demonstrating ethical practices, and practicing cost-effective yet quality health care. The clinical experience will provide exposure to a variety of basic and complex procedures in patients with neurologic disease with graded independence and responsibility.

ROTATION OBJECTIVES

At the completion of the neuroanesthesia rotation, the resident should exhibit the following knowledge, skills and attitudes:

Medical Expert/Clinical Decision-Maker

The resident will be able to:

- Demonstrate knowledge of basic sciences as applicable to neuroanesthesia, including: neuroanatomy, neurophysiology, and neuropharmacology.
- Demonstrate basic understanding of the impact of commonly performed neurosurgical procedures on anesthetic management.
- Demonstrate clinical knowledge and skills necessary for the practice of neuroanesthesia including:
Objectives of Training

- Preoperative neurological assessment (using Glasgow Coma Scale, Hunt-Hess 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.
- Demonstrate competence in all technical procedures commonly employed in neuroanesthesia practice – including airway management (basic and difficult), cardiovascular and neuro-resuscitation, invasive monitoring (arterial line, central line and LP Drain placement).
- 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 and MRI)
  - Spine surgery

Communicator

The resident will be able to:
- Establish a therapeutic relationship with patients and their families in the limited time available.
- Obtain and collate relevant history from patients and families.
- Listen effectively.
• Demonstrate empathy, consideration and compassion in communicating with patients and families.
• Communicate effectively with medical/surgical colleagues, nurses, and paramedical personnel regarding the anesthetic management of the patient.
• Demonstrate appropriate written communication skills through accurate, legible, and complete documentation of the anesthetic record, patient chart and in consultation.

**Collaborator**

*The resident will be able to:*

• Demonstrate the ability to function in the clinical environment using the full abilities of all team members (surgical, nursing, ICU, etc.).
• Develop their anesthetic plan for their patients in consultation and in concert with surgery, nursing and ICU (if necessary) for more complicated neurosurgical patients.
• When time permits, residents are encouraged to attend multidisciplinary Neurosciences and Epilepsy Rounds. These experiences should permit the resident to:
  o Understand and value the skills of other specialists and health care professionals.
  o Understand the limits of their knowledge and skills.
  o Be able to understand, accept and respect the opinions of others on the neuro team.

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

**Manager**

*The resident will:*

• Demonstrate the ability to manage their operating room:
  o Ensuring necessary equipment, monitoring, and medications are available for each case.
  o Making preparations to deal with anticipated complications.
  o All these activities should be conducted in an effective and efficient timely manner in order to avoid OR delays.

• Utilize personal resources effectively in order to balance patient care, continuing education and personal activities.
• Utilize information technology to optimize patient care and lifelong learning.
Health Advocate

The resident will:

- Begin to recognize the opportunities for anesthesiologist to advocate for neurosurgical patients. In particular with regards to patient safety.
- Begin to adopt a leadership role in the postoperative care of their patients by anticipating and arranging for either PACU, ICU, or Neuro-Observation Unit care.

Scholar

The resident will:

- Be responsible for developing, implementing and regularly re-evaluating a personal continuing education strategy.
- Contribute to the development of new knowledge through facilitation/participation in ongoing departmental research activities.
- Be required to prepare in advance for the O.R. cases scheduled through additional reading, patient chart review/assessment.

Professional

The resident will:

- Demonstrate a commitment to executing, professional responsibilities with integrity, honesty and compassion.
- Demonstrate appropriate personal and interpersonal professional behaviors and boundaries.
- Recognize limits of personal skill and knowledge by appropriately consulting other physicians when caring for the patient.

Revised: April 2011, Dr. Granton
OVERALL GOALS
Residents in the Western University Anesthesia Training Program will be involved in the care of Obstetrical patients throughout their residency. Residents are expected to be familiar with the objectives outlined in this document and are invited to discuss any questions or concerns with their supervisors.

By completion of residency training the resident is expected to:

- Demonstrate diagnostic and therapeutic skills for effective and ethical patient care.
- Access and apply relevant information to clinical practice.
- Demonstrate effective consultation services with respect to patient care, education, and legal opinions.

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

**Medical Expert/Clinical Decision-Maker**

**Diagnostic and Therapeutic Skills**

**PGY-1 to 3**

**A. Physiology/Pathophysiology of Pregnancy**

The resident will:

- Be able to describe the physiologic changes of normal pregnancy and their relevance to anesthetic management of the pregnant patient
- Know relevant fetal physiology, potential fetal effects of anesthesia for labour and delivery, and basic principles of FHR monitoring
- Be able to describe normal uteroplacental blood flow and placental drug transfer mechanisms
- Understand pain pathways involved in labour and delivery
- Be able to describe the pathophysiologic changes accompanying common medical complications of pregnancy including, but not limited to:
  - Diabetes
  - Infection (maternal, fetal)
Be able to describe specific obstetric complications and their anesthetic implications:

- Antenatal and postpartum hemorrhage
- Malpresentation
- Placental abruption
- Placenta previa, placenta accrete
- Ectopic pregnancy
- Preterm labour
- Uterine atony
- Uterine laceration/perforation
- Inverted uterus
- Multiple gestation
- Amniotic fluid embolism

B. Anesthesia and Analgesia for the Pregnant Patient

The resident will:

- Be familiar with the indications, contraindications, and management of anesthetic techniques for regional and general anesthesia in the parturient.
  - Anesthesia during pregnancy for non-obstetrical surgery
  - Options for analgesia during labour and delivery (pharmacologic and non-pharmacologic)
  - Anesthesia for “double set up” and caesarean section (elective/urgent/emergent)
  - Anesthesia for management of postpartum hemorrhage
- Become competent in the provision of epidural analgesia for labour and delivery, and in the provision of either regional or general anesthesia for c-section.
- Be able to manage complications of labour analgesia (hypotension, toxic reactions to local anesthetics, dural puncture / PDPH, inadequate block).

PGY-4 to 5

A. Physiology / Pathophysiology of Pregnancy

The resident will:

- Further enhance his/her knowledge of the topics listed in the PGY-1 to 3 objectives.
• Be able to describe the anesthetic considerations and management of patients with uncommon medical and obstetrical conditions including:
  o Valvular heart disease
  o Congenital heart disease (corrected/uncorrected)
  o Cardiomyopathy
  o Neurologic disease and pregnancy
  o Endocrine disease and pregnancy
  o Musculoskeletal disease and pregnancy
  o Substance abuse
  o Hematologic disease and pregnancy
  o Hepatorenal disease and pregnancy
  o Morbid obesity

B. Anesthesia and Analgesia for the Pregnant Patient

The resident will:

• Gain further experience/development of expertise in techniques of regional and general anesthesia for the pregnant patient.
  o Epidural analgesia and anesthesia
  o Combined spinal – epidural
  o Spinal anesthesia
  o General anesthesia, including management of the difficult airway
  o Epidural blood patch

Communicator

The resident will:

• Demonstrate the ability to communicate with patients and their families, and other members of the health care team regarding anesthetic care and management plans.
• The resident will encourage the participation of patients and their families while obtaining informed consent for procedures.

Collaborator

The resident will demonstrate the ability to:

• Function as a member of a team in caring of the parturient during the antenatal, intrapartum and postpartum periods.
• Understand the indications for appropriate consultation with other physicians or allied health care professionals.

Manager

The resident will demonstrate the ability to:
Utilize time and resources effectively in balancing patient care and associated activities.

Understand the guidelines for establishment and administration of an obstetrical anesthesia service in a community hospital.

Utilize information technology to optimize patient care and continuing education.

Health Advocate

*The resident will:*

- Follow the practice guidelines of the Canadian Society of Anesthesiologists.
- Recognize issues where it is appropriate to act as a patient advocate, and perform this role effectively.

Scholar

*The resident will:*

- Be able to critically assess the obstetrical anesthesia literature and other sources of medical information.
- Attend rounds and teaching seminars as scheduled.
- Contribute to the education of other individuals in the obstetrics unit (medical students/patients/other healthcare providers).

Professional

*The resident will:*

- Practice in an ethically responsible and professionally appropriate manner displaying integrity, honesty, and compassion.

Reviewed: 2012, Dr. Granton
OVERALL GOALS

Given a pediatric patient presenting for any type of surgery, the resident will outline a plan of management and institute a safe anesthetic for that patient. The plan should encompass the unique physiology of the pediatric patient and also awareness of the psychological impact of the experience for the child and its family.

ROTATION OBJECTIVES

Medical Expert/Clinical Decision-Maker

- The resident will be required to outline the important differences between adult, pediatric, neonate, and premature infant anatomy and physiology, concentrating on those that affect the conduct of anesthesia.
- The resident will be able to perform an appropriate pre-operative evaluation of a pediatric patient using relevant historical, physical and laboratory information.
- The resident will know currently acceptable criteria for accepting a child for anesthesia as well as guidelines for outpatient anesthesia and pre-operative fasting.
- The resident will be able to describe the differences in the adult and pediatric airway. The resident’s goal is to become proficient in the assessment of the pediatric airway and in the management of the difficult airway, including the selection of appropriate equipment.
- Residents will be able to institute appropriate fluid and electrolytes and temperature management in the perioperative period for surgical pediatric patients.
- The resident will demonstrate an appropriate approach to and management of common postoperative issues, including postoperative pain, agitation, nausea, and vomiting, PACU discharge criteria and criteria for unplanned admission.
- The resident will describe the special considerations of the premature infant coming for surgery and also will understand the longer term problems of providing anesthetic care to patients who were born prematurely but present for surgery at a later date.
- The resident will describe the anesthetic management and potential complications of patients presenting for common procedures in the following areas: ophthalmology, dental surgery, elective ENT procedures, and kyphoscoliosis.
- The resident will describe the anesthetic implications of the following disorders: hematologic disorders including anemia, sickle cell states, thalassemia, ITP,
hemophilia; atypical plasma cholinesterases; diabetes mellitus; non-cardiac surgery in children with congenital heart diseases; Down’s syndrome; malignant hyperpyrexia; cystic fibrosis; renal insufficiency or failure.

- The resident will describe the anesthetic management of patients presenting for common neurosurgical procedures, including: hydrocephalus; increased intra-cranial pressure; intracranial hematoma; craniosynostosis; myelomeningocele; encephalocele; spinal cord tumour; intracranial tumour; common neuron-radiologic techniques.

- The resident will be familiar with the perioperative management of children with common pediatric cardiovascular anomalies including: Tetralogy of Fallot; patent ductus arteriosus; aortic coarctation; atrial septal defects; ventricular septal defects.

- The resident will describe the anesthetic management of common congenital defects that may require surgery during the neonatal period. As a minimum the resident will describe the management of the following: congenital lobar emphysema; congenital diaphragmatic hernia; tracheoesophageal fistula and esophageal atresia; congenital hypertrophic pyloric stenosis; omphalocele and gastroschisis; biliary atresia.

- The resident will discuss, diagnose, and treat the more common forms of pediatric lung disease. In the newborn, the resident will discuss the importance of pulmonary surfactant; respiratory distress syndrome of the newborn and abnormal breathing patterns. In the older child, the resident will diagnose and treat croup, bronchitis, cystic fibrosis, and epiglottitis. The resident will describe in detail the anesthetic management of upper airway obstruction in a child.

- The resident will utilize the appropriate regional anesthetic techniques in pediatric anesthesia and pediatric analgesia.

- The resident will be familiar with the practical aspects of providing anesthesia for children outside of the operating room including anesthesia for MRI, CT scan, and other investigative procedures.

**Communicator**

- The resident will be able to use a variety of approaches in dealing with children of all ages in their preparation for anesthesia and surgery.
- The resident will recognize the psychological impact of hospitalization, anesthesia and surgery on both the patient and their family.
- The resident will provide accurate, appropriate information in a timely fashion to the family.
- The resident will ensure that informed consent is obtained prior to undertaking invasive procedures.
• The resident will effectively communicate with all members of the treatment team using effective verbal communication skills.
• The resident’s written communication, including charting of the perioperative events, will consist of concise and clear documentation.

**Collaborator**

• The resident will demonstrate the capacity to consult effectively with the neo and perinatologist, the pediatricians and the surgeons to assure optimal management of patients.
• The resident will work effectively as an integral member of the perioperative team. This will include the ability to resolve conflicts, provide feedback and assume a leadership role where appropriate.

**Manager**

• The resident will utilize resources effectively to provide anesthesia services to the pediatric patient.
• The resident will practice according to national standards and provincial guidelines for the management of pediatric patients.

**Health Advocate**

• The resident will demonstrate increasing expertise and leadership in maintaining and improving the standards of pediatric anesthesia practice and patient care.

**Scholar**

• The resident should have the ability to critically review the literature and understand and evaluate new information and research.
• The resident should contribute to the learning of others.
• The resident should contribute to the development of new knowledge when possible.

**Professional**

• The resident should demonstrate an increasing sense of responsibility and “case ownership”
• The resident should deliver the highest quality of care with integrity, honesty and compassion.
• The resident should demonstrate appropriate respect of the opinion of patients and team members in the provision of quality pediatric care.

Reviewed: April 2012, Dr. Granton
PRE-ADMISSION CLINIC BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
Pre-admission clinic is a rotation that will occur at either University Hospital or Victoria Hospital over four weeks. The resident will spend the majority of time in the preoperative clinic of either hospital. Residents will be expected to complete an appropriate history and physical on each patient seen in the clinic. The resident will then present a plan for further investigation, optimization and perioperative management of the patients seen. Written or dictated documentation of the consultations is expected.

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

Medical Expert/Clinical Decision Maker

The resident will:

- Demonstrate appropriate and anesthesia specific history and physical skills, including assessment of the airway.
- Demonstrate internal medicine knowledge base as it applies to etiology, natural history and management of the following disease states that are common reasons for pre-admit clinic referral: coronary artery disease, Chronic Obstruction Pulmonary Disease, advance kidney failure, advanced liver failure, cerebral vascular disease, typical congenital disease states, obstructive sleep apnea, obesity, rheumatoid arthritis, ankylosing spondylitis, chronic pain.
- Demonstrate working knowledge of indications and recommendations for ordering of invasive and non-invasive investigations preoperatively, including: ECG, pulmonary function testing, chest radiograph, investigations of underlying coronary artery disease, investigations for cerebral vascular disease.
- Demonstrate ability to synthesize a reasonable optimization, investigation anesthetic management plan based on nature and urgency of surgery, history, physical and available investigations.
Communicator

The resident will be able to:

- Communicate well with patient and families in the Pre-admission Clinic, with a good bedside manner.
- Verbally explain findings of history and physical with anesthesia faculty supervisor and provide a reasonable management plan.
- Provide a concise dictated note regarding patient assessment and plan.

Collaborator

The resident will be able to:

- Interact well with multi-disciplinary team in the Pre-admission Clinic.
- Work well with other physicians in the Pre-admission Clinic, including internal medicine and surgery.

Health Advocate

The resident will be able to:

- Understand the anesthesiologist’s role in optimization of the patient preoperatively.
  Takes steps to improve perioperative safety of patients (aspiration prophylaxis, Critical Care admission post-operatively, etc.).
- If appropriate, demonstrates willingness to communicate with surgeon the anesthesia team’s concerns regarding timing, scope and appropriateness of proposed surgery.
- Understand the anesthesiologist’s role in patient education preoperatively, including smoking cessation.
- Provide options and risks and benefits of possible postoperative pain control options.
- Understand the anesthesiologist’s role in blood conservation and should be able to describe the pros and cons of a variety of blood conservation strategies.

Professional

The resident will:

- Display professional behavior and attitude while dealing with patients, families and staff.

READING LIST

Required Reading:

1. Barash, Clinical Anesthesia, Chapter 26: 569-579 Preoperative Patient Assessment and Management
2. Miller’s Anesthesia, Chapter 33: 969-999 Risk of Anesthesia
3. Miller’s Anesthesia, Chapter 34: 1001-1066 Preoperative Evaluation
4. Miller’s Anesthesia, Chapter 35: 1067-1150 Anesthetic Implications of Concurrent Diseases

Suggested Reading:


7. BJA. 2011; 107 (1): 83-96 Preoperative Cardiac Management of the Patient for Non-Cardiac Surgery: An Individual and Evidence Based Approach


Reviewed: April 2012, Dr. Granton
REGIONAL ANESTHESIA BLOCK (ST. JOSEPH’S)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision Maker

The resident will demonstrate knowledge acquisition in the following areas:

- Anatomy related to specific regional anesthesia (RA) technique including: surface landmarks, perineural structure, ultra sound anatomy, sensory inervation, motor inervation, and components and details of brachial plexus, lumbar plexus, and sacral plexus.
- Physiology related to specific RA techniques and disease processes, including: nerve transmission/blockade, physiologic response to acute pain, and the patient with chronic pain at the site of surgery.
- Pharmacology of local anesthetics, adjuvants (epinephrine, opioids, HCO3, etc.), chronic opioid use in the patient presenting for surgery.
- Regional anesthesia equipment including: needles, peripheral nerve stimulator, ultrasound, catheters, and stimulating catheters
- 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).
- Contraindications related to specific RA techniques including infection, anticoagulation, pre-existing neural injury, increased ICP, and pulmonary disease.
- Various RA techniques including IV regional anesthesia, peripheral nerve blockade (single shot, continuous technique, rescue), and neuraxial blockade.

Communicator

The resident will:

- Demonstrate abilities in effective communication with patients and family, other physicians and ancillary personnel via:
  - Written (charting complete & legible, consultation).
  - Verbal (anesthesia and analgesia options for various procedures, case presentations, personal discussion).
The resident will demonstrate abilities in the following areas:

- A good relationship with the perioperative team, essential to provide exemplary care to the patient, including the anesthesiology team, the surgical team, and the nursing staff of the Block Room, OR and PACU.

Manager

As Manager of the block room the resident will demonstrate an understanding of the Block Room/OR patient flow dynamics. This will include:

- Coordination of patient flow perioperatively.
- Appropriate patient selection.
- Appropriate timing/calling for the patient (i.e. which patient to attend to first given limited resources).

Scholar

The resident will demonstrate the ability to:

- Implement continuing education strategies.
- Apply the principles of critical appraisal.
- Teach other residents, medical students or other personnel.

Health Advocate

The resident will demonstrate an ability to:

- Provide appropriate information to the patient 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 their intra & post-op analgesia.
  - Dealing with adverse outcomes.

Professional

The resident will:

- Demonstrate appropriate behaviors and attitude towards patients, his/her family and all personnel involved in the care of that patient, the anesthesiology team, surgical team, and nursing staff.

Reviewed: July 2012, Dr. Granton
REGIONAL ANESTHESIA BLOCK (UH)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

It should be noted that the University Hospital Regional Anesthesia Block will typically be a supplemental rotation after completion of the St. Joseph’s Health Care Regional Rotation. Given the reduced regional volume at University Hospital versus St. Joseph’s Health Care, the resident may be required to participate on the Acute Pain Service or within the general operating room assignments to maintain optimal clinical exposure and education.

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision Maker

The resident will demonstrate knowledge acquisition in the following areas:

- Anatomy related to specific regional anesthesia (RA) technique including: surface landmarks, perineural structure, ultra sound anatomy, sensory inervation, motor inervation, and components and details of brachial plexus, lumbar plexus, and sacral plexus.
- Physiology related to specific RA techniques and disease processes, including: nerve transmission/blockade, physiologic response to acute pain, and the patient with chronic pain at the site of surgery.
- Pharmacology of local anesthetics, adjuvants (epinephrine, opioids, HCO3, etc.), chronic opioid use in the patient presenting for surgery.
- Regional anesthesia equipment including: needles, peripheral nerve stimulator, ultrasound, catheters, and stimulating catheters
- 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).
- Contraindications related to specific RA techniques including infection, anticoagulation, pre-existing neural injury, increased ICP, and pulmonary disease.
- Various RA techniques including IV regional anesthesia, peripheral nerve blockade (single shot, continuous technique, rescue), and neuraxial blockade.
Communicator

*The resident will:*  
- Demonstrate abilities in effective communication to patients and family, other physicians and ancillary personnel via:  
  - Written (charting complete & legible, consultation).  
  - Verbal (anesthesia and analgesia options for various procedures, case presentations, personal discussion).  
  - Listening (effectively listen and assimilate information important for patient care and for personal growth).

Collaborator

*The resident will demonstrate abilities in the following areas:*  
- A good relationship with the perioperative team, essential to provide exemplary care to the patient, including the anesthesiology team, the surgical team, and the nursing staff of the Block Room, OR and PACU.

Manager

*As Manager of the block room the resident will demonstrate an understanding of the Block Room/OR patient flow dynamics. This will include:*  
- Coordination of patient flow perioperatively.  
- Appropriate patient selection.  
- Appropriate timing/calling for the patient (i.e. which patient to attend to first given limited resources).

Health Advocate

*The resident will demonstrate an ability to:*  
- Provide appropriate information to the patient 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 their intra & post-op analgesia.  
  - Dealing with adverse outcomes.

Professional

*The resident will:*  
- Demonstrate appropriate behaviors and attitude towards patients, his/her family and all personnel involved in the care of that patient, the anesthesiology team, surgical team, and nursing staff.

Updated: July 2012, Dr. Granton
RURAL REGIONAL COMMUNITY ANESTHESIA ROTATION

Distributed Education Network (DEN) and the Department of Anesthesia & Perioperative Medicine

Specific Objectives in CanMEDS Format

OVERALL GOALS

Within Western University and the Schulich School of Medicine & Dentistry, the Distributed Education Network (DEN) provides opportunities for residents to participate in electives throughout southwestern Ontario; a recognition by the RCPSC of the importance of integrating electives in community based medicine into training programs.

Electives in Community Anesthesia are offered at various sites throughout Southwestern Ontario. The elective is 4 weeks in duration. Rotations are offered in Windsor, St. Thomas, Sarnia, Chatham, Stratford, and Owen Sound. Other sites may also be arranged.

This rotation allows residents to experience anesthesia as it is practiced outside of a major teaching hospital. Anesthesia services are provided to the community in a number of settings. A small but efficient suite of operating theatres offers the resident an opportunity to participate in the anesthetic management of patients undergoing a variety of common surgical procedures. Orthopedics, ENT, General Surgery, Ophthalmology, OB-Gyn and Urology form the basis of a typical community case mix comprising patients from a complete spectrum of ages and ASA status.

Opportunities to develop special areas of expertise are presented by a large volume of oral and maxillofacial hypotensive cases and less so with a limited volume of thoracic anesthesia. Pre-operative consultations are done as part of an outpatient clinic. The obstetrical experience will include OB analgesia for labor and delivery, including combined spinal epidural and continuous epidural infusions. Involvement in an informal acute pain service for post-surgical and trauma patients rounds out the continuum of anesthetic care provided and includes the supervision of perioperative neuraxial and peripheral regional anesthesia as well as PCA.

The Department of Anesthesia is actively involved in all ventilated patients in the critical care unit.

Opportunity exists to participate in a chronic pain clinic under the direction of a board certified pain specialist including the assessment and treatment of various somatic and neuropathic pain states. Techniques employed include: analgesic infusions, acupuncture, trigger point injections, nerve blocks, stellate ganglion blocks, epidural steroid injections, facet injections, and regional bretylium blocks. Ultrasound is utilized when image guidance is required.
Residents self-assign to work with any of the consultant staff representing varied interests, backgrounds and experience, including a mixture of FRCPC, board eligible and CCFP Anesthesia.

The rotation follows the local practice pattern:
- Call is 1 in 5 in house with the next day off, or
- 1 in 5 from home with the expectation of working the following day.

**These rotations are available to PGY1 - 5 residents. This is a highly rated elective experience** which enables residents at all levels of training to explore an exciting alternative to academic anesthesia practice. Please feel free to contact the DEN office for more information about Rotations in Anesthesia.

**Distributed Education Network (DEN)**
100 Collip Circle, Suite 225  
Schulich School of Medicine & Dentistry  
Western University  
London, Ontario, Canada, N6G 4X8  
Tel: (519) 661-2111 ext.87487  
Email: distributed.education@schulich.uwo.ca  
[www.swomen.ca](http://www.swomen.ca)

Please refer to the following links for further information regarding this opportunity:

**DEN Core Electives & Accommodation Policy**  
[http://www.schulich.uwo.ca/swomen/coreelectivestravelpolicy](http://www.schulich.uwo.ca/swomen/coreelectivestravelpolicy)

**Core and Electives PGE Expense Form**  

**DEN Conference Funding for Trainees**  
[http://www.schulich.uwo.ca/swomen/confunding4trainees/](http://www.schulich.uwo.ca/swomen/confunding4trainees/)

**DEN Windsor Anesthesia Rotation**  
[http://www.schulich.uwo.ca/swomen/windsoranesthesia](http://www.schulich.uwo.ca/swomen/windsoranesthesia)
Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

The resident will be able to:

- Demonstrate ability to carry out a directed history and physical as it pertains to anesthesia care.
- Demonstrate knowledge of anatomy, pharmacology and physiology appropriate for training level.
- Demonstrate knowledge of diseases and chronic conditions that may impact anesthesia care.
- Demonstrate skill in airway management and other procedural skills as they may arrive in a given community (such as i.v. access, central lines, arterial lines, spinals and epidurals).

Communicator

The resident will be able to:

- Establish therapeutic relationship with patients and their family.
- Complete timely, accurate and legible documentation.
- Communicate patient summaries concisely to the consultant physician.

Collaborator

The resident will be able to:

- Contribute to the multidisciplinary team in perioperative medicine.

Manager

The resident will be able to:

- Recognize the position of the Anesthesiologist as a resource to a community hospital and anesthesia department.
- Recognize the limits of clinical care which can be provided in the community setting.
Health Advocate

The resident will be able to:

- Understand the differences between academic and community anesthesia practice. Appreciate how these impact the patient and the anesthesiologist.
- Identify areas of challenges in the clinical setting, compare and contrast these between academic and community based practice.

Professional

The resident will be able to:

- Demonstrate honesty and integrity.
- Demonstrate respect for diversity.
- Demonstrate respect for the dignity of patients and fellow health-care workers.
- Demonstrate punctuality and consistent attendance.

Reviewed: June 2015, Dr. Al-Areibi
THORACIC ANESTHESIA BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

General Requirements

The resident will:

- 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.
- Demonstrate knowledge of the principles and practice of anesthesia as they apply to patient support during thoracic surgery.
- Demonstrate competence in BCLS, ACLS and ATLS.

Specific Knowledge Requirements

The resident will demonstrate knowledge and competence in the following:

- Anatomy/Physiology (Thoracic cavity, Airway, Mediastinum, Pulmonary vasculature, Bronchial vessels, Lymphatic system, Work of breathing, Physiology of lung collapse, Cough reflex)
- Preoperative evaluation of the patient undergoing thoracic surgery, including:
  - History (Dyspnea, Cough, Cigarette smoking, Exercise tolerance, Risks factors for acute lung injury: Preoperative alcohol abuse, Pneumonectomy, Intraoperative high ventilatory pressures and excessive amounts of fluid administration).
  - Physical examination (Respiratory pattern, Respiratory rate and pattern, Breath sounds).
  - Diagnostic studies (EKG, CXR, ABG).
  - 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).
- Concomitant medical conditions, including:
- Cardiovascular disease – cardiac complications represent the second most common cause of perioperative M&M in the thoracic surgical population (Ischemia, Arrhythmia).
- Age – rate of respiratory complications are double and cardiac complications are triple in elderly patients undergoing thoracotomy, when compared to younger patients.
- Renal dysfunction after pulmonary resection is associated with a perioperative mortality rate of 19%.
- COPD (Respiratory drive – elevated PaCO2 at rest, Nocturnal hypoxemia, Right ventricular dysfunction, Bullae, Flow limitation, Auto-peep).
- Restrictive pulmonary disease.
- Primary thoracic tumors (Tobacco smoke is responsible for 90% of all lung cancers).
  - Non-small cell lung cancer (Squamous cell carcinoma, Adenocarcinoma, Large cell undifferentiated carcinoma)
  - Small cell lung cancer
  - Carcinoid tumors
  - Pleural 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).
  - Neurovascular injuries, physiologic changes in ventilation and perfusion.
- Physiology of One - Lung Ventilation.
  - Lateral position, awake, breathing spontaneously, chest closed.
  - Lateral position, awake, breathing spontaneously, chest open.
  - Lateral position, anesthetized, breathing spontaneously, chest closed.
  - Lateral position, anesthetized, breathing spontaneously, chest open.
- Lateral position, anesthetized, paralyzed, chest open.
- Lateral position, OLV, anesthetized, paralyzed, chest open.

- 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.
    - FiO2 of 1.0, Ventilate with a TV of 6-8ml/kg, Plateau airway pressure < 25cm H2O, verification of tube position, optimize hemodynamics, maintenance of normocapnia, recruitment maneuver of ventilated lung to eliminate atelectasis, dependent-lung PEEP, selective nondependent-lung CPAP, differential PEEP/CPAP, intermittent two lung ventilation, TIVA, selective nondependent-lung high-frequency ventilation, clamping the PA of non-ventilated lung.

- 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, complications, postoperative concerns.

- Anesthesia for Patients undergoing Bronchoalveolar Lavage
  - Treatment for symptomatic pulmonary alveolar proteinosis, intraoperative management.

- Anesthesia for Patients with Bronchopleural Fistula and Empyema (etiology, surgical management, ventilation, anesthetic management).

- Anesthetic Implications of Spontaneous Pneumothorax Anesthesia for Patients undergoing Bullectomy and Volume Reduction Pneumoplasty.
  - Surgery, anesthetic considerations, postoperative ventilation.

- Anesthesia for Patients undergoing Decortication and Pleurodesis Procedures.
  - Clinical features, anesthesia management.

- Anesthesia for Patients Undergoing Esophageal Surgery.
  - Esophagoscopy, Zenker's Diverticulum, Achalasia, Hiatus Hernia, Esophagectomy.
- Anesthesia for Patients Undergoing Laser Surgery of the Airway.
  o Physics of lasers, laser surgery of the airway, intraoperative considerations, complications.
- Anesthesia for Patients Undergoing Lung Transplantation.
- Anesthesia for Patients with Mediastinal Masses.
  o 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
  o Clinical features, medical therapy, anesthetic considerations, postoperative concerns and respiratory failure.
- Myasthenic Syndrome.
- Anesthesia for Patients undergoing Tracheal Resection and Tracheobronchial Reconstruction.
  o Surgical considerations, perioperative management issues, modes of ventilation.
- Anesthesia for Patients undergoing Urgent Surgery.
  o 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.
  o 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.
  o Systemic analgesia (PCA – Opioids, NSAIDS, Ketamine, Dexmedetomidine, Pregabalin/gabapentin), local anesthetics/nerve blocks (Intercostal nerve blocks, Intrapleural analgesia, Thoracic paravertebral block, Epidural analgesia), shoulder pain, post-thoracotomy neuralgia and chronic incisional pain, management of opioid tolerant patients (Multimodal analgesia).
- 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.

Communicator

The resident will:
- demonstrate effective communication with patients and families of description of procedures, informed consent and anesthetic options and risks.
- demonstrate effective communication with OR team (thoracic surgeons, nurses and other members of the health care team) and postoperative team (ICU, PACU).
- provide clear and concise written consultation and anesthetic records.

Collaborator

The resident will:
- seek perioperative consultation with colleagues when required.
- contribute effectively to other interdisciplinary team activities.
- demonstrate ability to function in the clinical environment using the full abilities of all team members.

Manager

The resident will be able to:
- manage OR time by efficiently conducting the anesthetic, continuing education and personal activities.
- utilize information technology to optimize patient care and lifelong learning.

Health Advocate

The resident will be able to:
- provide patient advocacy for various perioperative issues (i.e., patient safety, analgesia, postoperative monitoring).

Scholar

The resident will:
- demonstrate commitment to continuing personal education.
- be able to critically review thoracic anesthesia literature and describe the principles of research relevant to this population.
- assist in education of other members of the OR team.
Professional

The resident will:

- demonstrate a sense of responsibility, integrity, honesty and compassion when caring for patients.
- demonstrate respect for patients and colleagues.
- deliver highest quality care to patients.
- practice medicine ethically consistent with the obligations of a physician.
- 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.
- show recognition of limits of personal skill and knowledge by appropriate consulting other physicians and paramedical personnel when caring for the patient.

READING LIST

Recommended Material:

4. Respiratory Physiology; Chapter 15; p. 361-392; Miller’s Anesthesia (7th Edition); 2010.
5. Pulmonary Pharmacology; Chapter 22; p. 561-594; Miller’s Anesthesia (7th Edition); 2010.
6. Nitric Oxide and Inhaled Pulmonary Vasodilators; Chapter 31; p. 941-956; Miller’s Anesthesia (7th Edition); 2010.
7. Anesthesia for Thoracic Surgery; Chapter 59; p. 1819-1887; Miller’s Anesthesia (7th Edition); 2010.
8. Respiratory Care; Chapter 93; p. 2879-2898. Miller’s Anesthesia (7th Edition); 2010.
10. Seminars in Cardiothoracic and Vascular Anesthesia.
11. Anesthesiology Clinics; Volume 26, Issue 2, Pages 241-398 (June 2008); Thoracic Anesthesia; Edited by Peter Slinger.

Updated: August 2011, Dr. Granton & Dr. Nicolaou
TRANSESOPHAGEAL ECHOCARDIOGRAPHY ROTATION

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
Residents completing a one block elective in Transesophageal Echocardiography (TEE) will gain a basic understanding of the role of echocardiography in perioperative patient assessment and its integration as a monitor during cardiac surgery. In addition, the core focus will be on performing a complete perioperative examination.

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

Medical Expert

A. Physiology and Anatomy
   The resident is expected to:
   o Describe detailed cardiac anatomy, physiology and its relationship to images obtained during a TEE exam.
   o Know important aspects of the anatomy and physiology of cardiac valves, left ventricle, right ventricle, left and right atria, coronary sinus, SVC, IVC and aorta.

B. Monitoring
   The resident will be able to:
   o Describe the advantages and limitations of TEE as a cardiac monitor.
   o Understand the concepts of wall motion analysis and wall motion scores and the effect of ischemia and other disease processes on this score.
   o Describe ways of monitoring the cardiac ejection fraction.
   o Performance of a complete examination to obtain standard views.
   o Demonstrate the role of TEE in the perioperative setting including advantages for its use as well as limitations and contraindications.

C. Clinical Management
   Clinical management will be limited as the scope of the rotation will not allow complex echocardiographic interpretation. Any management issues will be coordinated with the consultant anesthesiologist. However, some basic concepts will be reviewed:
   o Identify potential causes of hypotension on TEE and suggest treatment options (hypovolemia, LV failure)
Identify potential high risk stroke patients (poor aorta’s) and be aware of alternate treatment strategies for management of these patients.

Identify the use of TEE during weaning from bypass and suggest treatment options for hypotension (volume, inotropes).

Communicator

Effective communication skills will be taught and encouraged at several levels:

- Between Resident and the Cardiac Anesthesiology Attending
  - Communicate TEE findings and the implications for the current procedure or for treatment during unstable events.

- Between Resident and the Surgeon
  - To provide a brief TEE report to the surgeon to identify potential problems or abnormalities discovered during the examination and to come to an agreement on the presumed best course of action.

Collaborator

Residents are expected to learn this role in several areas and become increasingly comfortable with it in their senior years:

- Recognize their limitations and seek consultation from medical experts in other disciplines
- Learn how to advise other physicians in an oral format on cardiac issues in which the resident has developed expertise.
- Foster healthy team relationships

Professional

Residents must:

- Always demonstrate respectful, and compassionate behavior toward patients, their families and other health care providers
- Remain calm and organized in stressful, or emergency situations
- Participate through attendance, interaction and presentation at rounds including departmental, echocardiographic and cardiac didactic teaching.

READING LIST

Written material (books, lecture notes) as well as material on the web site (videotaped lectures, electronic journals) is made available to residents. There is also an extensive library of digitally archived images to review.

Reviewed: June 2012, Dr. Granton
VASCULAR ANESTHESIA BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

The resident will be able 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.
- Demonstrate knowledge of the principles and practice of anesthesia as they apply to patient support during vascular surgery.
- Demonstrate competence in BCLS, ACLS and ATLS.
- Demonstrate knowledge and competence in the following:
  - Anatomy, physiology, and pathophysiology of the peripheral circulation.
  - Vascular disease: epidemiologic, medical, and surgical aspects (pathophysiology of atherosclerosis, natural history of patients with peripheral vascular disease, medical therapy of atherosclerosis, the role of statins in perioperative outcomes).
  - 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 (hypertension, 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
  - 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)

- Perioperative Myocardial Ischemia:
  - Etiology and prevention
  - Perioperative stress response and risk of myocardial ischemia
  - Perioperative medical management of coronary artery disease: nitrates, \( \beta \)-adrenergic blockade (\( \alpha \)-agonists, calcium channel blockers, statins, ACE Inhibitors).

- Perioperative Renal Protection (cardiac performance and perfusion pressure, fluid management, mannitol, N-acetylcysteine, fenoldopam)

- Hematologic Considerations 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)

- Monitoring During Vascular Anesthesia

- 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).

- Clamp Level: infrarenal, suprarenal, supraceliac
- Anesthetic Management: autologous blood procurement, anesthetic drugs and techniques, thoracic epidural.

**Thoracoabdominal Aortic Aneurysm Surgery**

- Etiology
- Preoperative Preparation and Monitoring
- Crawford 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: limitation of cross-clamp duration, reattachment of critical intercostal arteries, maintenance of proximal blood pressure, avoid hyperglycemia, CSF drainage, hypothermia, evoked potentials, naloxone infusion, left atrial-to-distal aortic bypass with retrograde perfusion, avoid postoperative hypotension.
- Renal ischemia and protection
- Coagulation and metabolic management
- One lung ventilation
- Anesthetic management

**Endovascular Aortic Repair**

- Stent – Graft Devices and Approval
- Patient Selection
- Preoperative Diagnostic Imaging of Aneurysm, Surrounding Anatomy and Device Sizing
- Endovascular Technique for EVAR and TEVAR
- Adjunctive Debranching Surgical Procedures when coverage of LSCA or LCA is necessary to provide an adequate proximal fixation site for the stent
- Anesthetic Management – Regional vs. General
- Indications for CSF Drainage in TEVAR
- Complications (damage to access vessels, endoleaks, graft migration, renal ischemia, paraplegia, stroke, aorto - esophageal fistula, conversion to open)
- Lifelong Radiological Surveillance and Costs
- Patient Outcomes – OPEN vs. ENDOVASCULAR
  - 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
- Carotid Endarterectomy
  - Surgical indications
  - Perioperative Cardiovascular Morbidity and Mortality
  - Preoperative Evaluation
  - Anesthetic Management
    - General vs. Regional vs. Local
    - Advantages and disadvantages of each
    - Superficial and Deep cervical plexus block
    - Carbon dioxide and glucose management
  - Neurologic Monitoring and Cerebral Perfusion
    - Neurologic assessment of awake patient
    - Assessment of cerebral blood flow
      - Stump pressures
      - $^{133}$Xe washout
      - Transcranial Doppler (middle cerebral artery flow)
    - Cerebral electrical activity
      - electroencephalography ± computer processing
    - SSEPs
    - Cerebral oxygenation
    - Jugular venous oxygen saturation
    - Cerebral oximetry
Postoperative Considerations
  o Neurologic injury
  o Postoperative hyperperfusion syndrome
  o Blood pressure liability
  o Cranial nerve and carotid body dysfunction
  o Airway and ventilation problems
  o Cardiac ischemia/MI

Endovascular Treatment of Carotid Disease: Carotid Angioplasty and Stenting
  o Postoperative Management of Vascular Patients
    ▪ Postoperative Pain Management (Preemptive analgesia, PCA, Epidural, Nerve blocks)
    ▪ Mechanical ventilation and invasive monitoring in ICU for some patients
    ▪ Complications, including: complications of invasive monitoring, complications of surgical procedure (stroke following CEA, Hemodynamic instability following CEA, Cranial nerve injury following CEA, Spinal cord injury, Acute renal failure, Sexual dysfunction, Bleeding, Low cardiac output syndrome, Sepsis), respiratory complications (Risk factors, Pulmonary disease, Cardiac disease, Emergency surgery)
  o 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, one-lung ventilation and insertion of spinal drains and CSF monitoring for thoracic aneurysm repair
    ▪ Be skilled in starting large bore intravenous infusions, arterial lines, CVP and PA lines in vascular surgical patients

Communicator

The resident will be able to:
  • demonstrate effective communication with patients and families of description of procedures, informed consent and anesthetic options and risks
  • demonstrate effective communication with OR team (vascular surgeons, nurses and other members of the health care team) and postoperative team (ICU, PACU)
  • provide clear and concise written consultation and anesthetic records
Collaborator

The resident will be able to:

- seek perioperative consultation with colleagues when required
- contribute effectively to other interdisciplinary team activities
- demonstrate ability to function in the clinical environment using the full abilities of all team members

Manager

The resident will be able to:

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

Health Advocate

The resident will be able to:

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

Scholar

The resident will be able 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
- assist in education of other members of the OR team

Professional

The resident will be able to:

- demonstrate a sense of responsibility, integrity, honesty and compassion when caring for patients
- demonstrate respect for patients and colleagues
- deliver highest quality care to patients
- practice medicine ethically consistent with the obligations of a physician
- 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
- show recognition of limits of personal skill and knowledge by appropriate consulting other physicians and paramedical personnel when caring for the patient
READING LIST

Recommended Material:

1. Cardiac Physiology; p.393 – 410; Miller’s Anesthesia (7th Edition).
2. Cardiovascular Pharmacology; p.595 – 632; Miller’s Anesthesia (7th Edition).
3. Cardiovascular Monitoring; p.1267-1328; Miller’s Anesthesia (7th Edition).
5. Cardiovascular Anatomy and Physiology; p. 209 – 232; Clinical Anesthesia (6th Edition);
   Edited by Barash, Cullen, Stoelting, Cahalan, Stock; 2009.
6. Anesthesia for Vascular Surgery; p. 1108-1136; Clinical Anesthesia (6th Edition); Edited
   by Barash, Cullen, Stoelting, Cahalan, Stock; 2009.

Updated: July 2011, Dr. Granton & Dr. Nicolaou
CONSOLIDATION ANESTHESIA BLOCK

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
During the Consolidation Anesthesia Rotation, the resident will be expected to display an understanding of the advanced anesthesia practice and apply this knowledge for the relatively independent management of patients.

ROTATION OBJECTIVES

Medical Expert

- The resident will be able to describe and implement clinical preoperative assessment, including risk assessment, and comprehensive anesthetic planning.
- The resident will demonstrate an understanding of the physical principles relating to anesthesia equipment, as well as the safety aspects pertaining to this equipment, including equipment checking.
- The resident will be able to apply their knowledge of the physical principles of monitoring systems to the clinical practice of anesthesia, with particular reference to common monitoring devices – EKG, Pulse Oximetry, Non Invasive and Invasive Blood Pressure Monitoring, Gas Analysis, Temperature Monitoring, Peripheral Nerve Stimulation.
- The resident will be proficient at airway management, demonstrating competence with mask ventilation, airway insertion, direct laryngoscopy, and the use of Glydescope, Laryngeal Mask Airway devices and bronchoscope.
- The resident should be proficient at securing peripheral intravenous access, and be skilled with techniques of arterial and central venous cannulation.
- The resident should be capable of performing spinal anesthesia, and be skilled with epidural techniques, as well as having good comprehension of the equipment, indications, limitations and contraindications for regional anesthesia.
- The resident will be familiar with the pharmacology of commonly used drugs in the perioperative period, as well as drugs used during resuscitation, and in the management of patients with common co morbidities. They will be aware of common drug interactions.
- The resident will be capable of providing anesthesia for ASA 3 and 4 patients undergoing complicated surgery with minimal supervision.
- For those rotating at:
Victoria Hospital:
- Independent provision of advanced obstetrical anesthesia.
- Resident should understand the anatomy, physiology, pharmacology and psychology for pediatric patients.

University Hospital:
- Resident should provide care for advanced neurosurgical cases and manipulate physiology and pharmacology as it applies to intracranial pressure.
- Resident should be able to provide anesthesia care for emergent cardiac surgical patients.
- Resident should provide anesthetic management for transplantation cases.

St Joseph’s Health Centre:
- Residents will be able to identify and predict issues that are specific to ambulatory surgical cases, including, pain control, nausea and vomiting, rapid turnover discharge criteria.

Communicator
- The resident will be able to effectively communicate with patients and/or their families for the purpose of eliciting an appropriate history.
- The resident will effectively communicate the risks and benefits of the anesthetic options available for the patient’s surgery for the purpose of informing the patient and including them in the decision making process.
- The resident will be able to effectively communicate with all colleagues and members of the team involved in caring for the patient.
- Resident will communicate anesthetic concerns to supervising anesthesiologist during care of patients.

Collaborator
- The resident will cooperate with colleagues to ensure patient care and safety.
- The resident will recognize the key interactions between members of the operating room team, and strive to facilitate optimal patient care.
Manager

- The resident will be able to describe or apply the principles of effective operating list management, through planning and preparation.

Health Advocate

- The Resident will continue to promote the health of their patient, and will develop a responsible attitude towards the utilization of finite healthcare resources.

Scholar

- The resident will be self-directed, and focused on their career learning objectives.
- The resident will seek to apply the principles of evidence-based practice, and continually try to justify clinical decision making processes.
- The resident should make a reasonable effort to prepare by prior reading or enquiry for each day's work.
- The resident should attend and participate in the formal teaching opportunities offered within the department, and develop an awareness of research activities within their environment.

Professional

- The resident will demonstrate professional behavior towards senior and junior colleagues, patients and allied healthcare workers.
- The resident will demonstrate a mature work ethic, in keeping with the privilege of practicing medicine.
- The resident will accept advice and constructive feedback from their supervisors at times of formal assessment.

Reviewed: June 2012, Dr. Granton
OFF-SERVICE ROTATION OBJECTIVES
CARDIAC CARE UNIT (PGY-2 TO 5)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

All anesthesia residents will undertake at least a one block rotation in the Cardiac Care Unit (CCU) either at Victoria Hospital or University Hospital.

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision Maker

The resident will be able to:

- Demonstrate knowledge of cardiovascular physiology, anatomy and pharmacology.
- Demonstrate ability to diagnose and manage myocardial ischemia and/or infarction.
- Demonstrate ability to diagnose and manage acutely decompensated heart failure and cardiogenic shock.
- Demonstrate appropriate ability to order and interpret investigations common to cardiac patients including, electrocardiograms, cardiac enzymes, echocardiogram and angiogram findings.
- Demonstrate an ability to recognize and manage cardiac arrhythmias, in particular those with hemodynamic instability.

Communicator

The resident will be able to:

- Communicate with CCU team (physicians, nurses) effectively in a written and verbal manner.
- Communicate effectively with patients and families.

Collaborator

The resident will be able to:

- Demonstrate the ability to work well as a member of a multidisciplinary health care team.
Manager
The resident will:
- Demonstrate leadership skills in emergency situations. In particular with hypoxia, shock and advanced cardiac life support (ACLS).

Health Advocate
The resident will:
- Understand lifestyle and socioeconomic issues that contribute to heart disease. Advocate for patients to modify these factors if possible.

Professional
The resident will:
- Be punctual and have an appropriate attendance record.
- Attend and present at teaching rounds when required.
- Be respectful to fellow health care members, patients, and families.

Reviewed: August 2012, Dr. Granton
CARDIAC ELECTROPHYSIOLOGY (PGY-2 TO 4)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision Maker

Specific Knowledge Requirements

The resident will be able to:

- Demonstrate diagnostic and therapeutic skills for ethical and effective patient care.
- Access and apply relevant information to clinical practice.
- Demonstrate effective consultation services with respect to patient care, and education.

Specific Skill Requirements

A. Clinical Skills

The resident must be able to:

- Obtain an accurate patient history and perform an appropriate physical examination.
- Develop a weighted differential diagnosis.
- Develop an appropriate plan of care and interpret electrocardiographic, laboratory and radiological investigations.
- Recommend an appropriate therapeutic plan taking into account such matters as age, general health, risk/benefit ratio, and prognosis.

EP Specific

- Develop a logical and systematic approach to interpretation of ECGs with regard to bradycardia, tachycardia, and pacing.
- Gain a detailed understanding of the pathophysiology of common cardiac arrhythmias (AF, A flutter, SVT, VT, bradycardia), their investigation and treatment.
- Understand of the pharmacology and clinical use of antiarrhythmic medications.
- Be proficient at assessment of the patient with bradycardia, tachycardia, palpitations, syncope, cardiac arrest, and high risk of arrhythmia.
o Gain a detailed understanding of the pathophysiology of the common cardiac arrhythmias, their investigation and treatment (medication, ablation, pacing therapy or surgery).
o Develop an understanding of the role in synchronization pacing in patients with heart failure.

B. Technical Skills

The resident will:

**EP Specific**

o Gain knowledge of indications for implantation of temporary and permanent pacemakers, and an understanding of the role of biventricular pacing for heart failure management.
o Gain knowledge of indications, both primary and secondary, for implantation of ICDs.
o Gain knowledge of indications for EP study and ablation.
o Gain knowledge of indications for laser lead extraction.
o Gain experience interpreting ECGs, holter monitors and event recorder tracings.
o Become familiar with preparation, risks and perioperative issues regarding device implant, EP study, and lead extraction.
o Develop an awareness of the technical approaches to pacemaker and ICD implantation. This includes implantation of single and dual lead devices, as well as programming and troubleshooting.
o Gain exposure to lead extraction in terms of indications, techniques, preoperative and postoperative management of extraction patients.

**Communicator**

*General Requirements*

The resident will be able to:

- Establish therapeutic relationships with patients / families.
- Obtain and synthesize relevant information from patients/families/communities.
- Listen effectively.
- Discuss appropriate information with patients/families and the health care team.

*Specific Knowledge Requirements*

The resident must be able to:

- Communicate with the patients and be sensitive to the patients' emotional status surrounding illness.
• Describe the dynamics of the traumatized family.
• Discuss the concerns patients have of loss of control, self-worth, and personal dignity.
• Describe the need for effective use of language.
• Discuss the need to explain medical matters in simple terms.
• Describe the role of interpreters in dealing with some patient groups (cultural, deaf).
• Appreciate how differences in race, gender and ethnicity affect patient/families responses to therapeutic suggestions and diagnosis.

**Specific Skill Requirements**

The resident must able to:

• Address patients concerns with empathy and respect in every encounter.
• Explain details of medical conditions and therapy in understandable terms.
• Include all members of the health care team in discussions of therapeutic plan when appropriate.
• Communicate with medical colleagues, health team personnel, patients, and families in a professional, timely, accurate, informative and, compassionate manner, at all times.

  **EP Specific**
  
  o Independently perform full history and directed physical exam on patients referred for arrhythmia assessment
  o Present a clear, concise history and physical exam pertaining to arrhythmia inpatients and outpatients, with a logical plan for investigation and therapy
  o Actively participate in patient education discussions regarding risks and benefits of implant, extraction, and ablation procedures

**Collaborator**

**General Requirements**

The resident will be able to:

• Consult effectively with other physicians and health care professionals.
• Contribute effectively to interdisciplinary team activities.

**Specific Knowledge Requirements**

The resident must be able to:

• Describe the roles of the health care professionals in a team.
• Describe the unique aspects of care provided by nursing, physiotherapy, and health care technologists.
Specific Skill Requirements

The resident must able to:

- Seek the advice of other members of the health care team.
- Effectively participate in team meetings to discuss problems in investigation and therapy.
- Consult with other physicians.

EP Specific

- Actively participate in a multidisciplinary approach to the arrhythmia patient.

Manager

General Requirements

The resident will be able to:

- Utilize resources effectively to balance patient care, learning needs, and outside activities.
- Allocate finite health care resources wisely.
- Work effectively and efficiently in a health care organization.
- Utilize information technology to optimize patient care, life-long learning and other activities.

Specific Knowledge Requirements

The resident must be able to:

- Describe the essential aspects of health care funding and the different models of health care delivery.

Specific Skill Requirements

The resident must able to:

- Undertake quality assurance and quality delivery analyses.
- Develop plans more effective use of resources for health care programs.
- Apply technology effectively to patient care.
- Contribute effectively in strategic planning.

EP Specific

- Gain understanding of resource utilization in arrhythmia management, in terms of cost-effective investigation and therapy for the arrhythmia patient.
Health Advocate

General Requirements
The resident will be able to:
- Identify the important determinants of health affecting patients.
- Contribute effectively to improved health of patients and communities.
- Recognize and respond to those issues where advocacy is appropriate.

Specific Knowledge Requirements
The resident must be able to:
- Describe the epidemiology of cardiac arrhythmias.
- Discuss the importance of preventive medicine for cardiac diseases.
- Describe methods of patient education and preventive medicine intervention for cardiac diseases.

Specific Skill Requirements
The resident must able to:
- Participate in patient education.
- Assist patients in the acquisition and interpretation of health care information.

EP Specific
- Advise families of the role of genetics in the genesis of arrhythmia.
- Understand arrhythmia therapy options and alternatives, including the risks and benefits of interventional procedures.

Scholar

General Requirements
The resident will be able to:
- Develop, implement and monitor a personal continuing education strategy.
- Critically appraise and apply sources of medical information.
- Facilitate the learning of patients, house staff, students and other health professionals.
- Contribute to development of new medical knowledge.

Specific Knowledge Requirements
The resident must be able to:
- Describe the important role of clinical and basic research in arrhythmia practice.
- Describe the scientific method and of outcome based research.
- Discuss the application of statistical methods to critical appraisal.
- Discuss the importance of continuing medical education (CME) for arrhythmia specialists.
• Describe where information on medical matters is reliably obtained.

**Specific Skill Requirements**

The resident must able to:

• Question current practice.
• Apply outcome-based methodology to interpretation of clinical information.
• Critically appraise the current literature.
• Develop a plan for continuing personal professional development that includes but is not limited to CME meetings.
• Appraise the relevant medical literature on a regular basis.

  *EP Specific*
  
  o Teach other health care professionals about arrhythmia related topics.
  o Gain knowledge of important clinical trials and other manuscripts which have guided modern arrhythmia management.
  o Actively search peer-reviewed literature to answer management questions pertaining to patients seen in clinic and on the ward.

**Professional**

**General Requirements**

The resident will be able to:

• Deliver highest quality care with integrity, honesty and compassion.
• Exhibit appropriate personal and interpersonal professional behaviour.
• Practice medicine ethically consistent with the obligations of a physician.

**Specific Knowledge Requirements**

The resident must be able to:

• Discuss the professional and ethical responsibilities of a specialist.
• Describe the requirements of patient confidentiality.

**Specific Skill Requirements**

The resident must able to:

• Demonstrate personal and professional attitudes consistent with a specialist.
• Display sensitivity to patient needs even when they conflict with best medical care.
• Maintain patient confidentiality.
• Practice in an ethical, honest, and forthright manner.
• Respond to conflict and abuse constructively.

  *EP Specific*
o Actively participate in ongoing management of arrhythmia inpatients and consults
o Attend outpatient clinic at least 1 day per week, seeing patients independently and presenting the case and proposed management to attending physician
o Attend and participate in arrhythmia service rounds on Wednesday and Friday 8-9am
o Inform the service of expected absences or leave prior to beginning rotation, to allow for appropriate patient and physician scheduling

Revised: April 2011, Dr. Granton
CONSULT MEDICINE ROTATION

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
Anesthesia resident can complete a one or two block rotation in Consult Medicine. This rotation may be done in any of the teaching hospitals and will be a mix of inpatient and outpatient internal medicine. The anesthesia resident should use this rotation to improve their understanding and ability to optimize a patient preoperatively and care for patients in the perioperative setting.

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

Medical Expert/Clinical Decision Maker
During the rotation, the resident will demonstrate proficiency in:
- The assessment of patients presenting with undifferentiated medical complaints/problems including eliciting a relevant history, performance of the appropriate physical examination and evidence-based use of diagnostic testing.
- Evidence-based management of common medical illnesses as well as less common but remediable conditions.
- Effective, integrated management of multiple medical problems in patients with complex illnesses.
- Performance of common procedures used in diagnosis and management of medical patients including ECG interpretation.

Communicator
The resident will be able to:
- Obtain a thorough and relevant medical history.
- Complete a bedside presentation of patient problems.
- Discuss diagnoses, investigations and management options with patients and their families.
- Obtain informed consent for medical procedures and treatments.
- Communicate with members of the health care team.
- Communicate with referring and/or family physicians.
Collaborator

The resident will:
- Demonstrate proficiency in working effectively within the health care team.
- Demonstrate appropriate use of consultative services.
- Recognize and respect the roles of other physicians, nursing staff, physiotherapists, occupational therapists, nutritionists, pharmacists, social workers, secretarial and support staff, and community care agencies in provision of optimal patient care.

Manager

During the rotation, the resident will:
- Oversee provision of care and implementation of decisions regarding patient care, including effective delegation of care roles.
- Understand the principles and practical application of health care economics and ethics of resource allocation.
- Utilize health care resources in a scientifically, ethically and economically defensible manner.
- Demonstrate effective time management to achieve balance between career and personal responsibilities.

Health Advocate

On completion of the rotation, the trainee will:
- Understand important determinants of health including psychosocial, economic and biologic.
- Demonstrate the ability to adapt patient assessment and management based on health determinants.
- Recognize situations where advocacy for patients, the profession or society are appropriate and be aware of strategies for effective advocacy at local, regional and national levels.

Scholar

During the rotation, the resident will:
- Demonstrate ability to use library and electronic resources to obtain information required for patient care and further their own education.
Professional

During the rotation, the resident will:

- Demonstrate integrity, honesty and compassion in delivery of the highest quality of care.
- Demonstrate appropriate personal and interpersonal professional behaviors.
- Demonstrate awareness of the role and responsibilities of the profession within society.
- Develop and demonstrate use of a framework for recognizing and dealing with ethical issues in clinical and/or research practice including truth-telling, consent, conflict of interest, resource allocation and end-of-life care.

Reviewed: July 2012, Dr. Granton
CRITICAL CARE MEDICINE

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

Critical Care Medicine is a multidisciplinary field concerned with patients who have sustained, or are at risk of sustaining life threatening, single or multiple organ system failure due to disease or injury. Critical Care Medicine seeks to provide for the needs of these patients through immediate and continuous observation and intervention so as to restore health and prevent complications.

Training will be primarily based on encounters with patients presenting with a variety of medical and surgical illnesses to the two multidisciplinary intensive care units of the London Health Sciences Centre (LHSC), under the supervision of faculty and senior residents/fellows. Faculty and senior residents/fellows will provide teaching by role modeling, bedside teaching and provision of constructive feedback. Patient care rounds, teaching rounds and clinical conferences will supplement patient encounters.

EXPECTATIONS

The Critical Care rotation is offered to residents of many different home programs and level of residency. In all cases, the goal of this limited experience is to provide an overview of the assessment and management of critically ill patients, and to promote the acquisition of the basic knowledge, skills and attitude related to Critical Care.

Over the 1 to 3 block training period, it is expected that residents will demonstrate ongoing development in each of the CanMEDS roles (as outlined below). The objectives are generic and will apply to all junior residents, from any home program (surgery, medicine, anesthesia, etc.) rotating in one of the two multidisciplinary intensive care units of the LHSC.

The acquisition of competencies will be documented using a Critical Care specific in-training evaluation report (ITER) at the end of rotation. Feedback from faculty, senior residents/fellows, nursing and allied health (multisource feedback) will be considered in the final rotation evaluation.

OVERALL GOALS

By the end of the rotation the resident will have acquired some basic knowledge, skills and attitudes necessary to initiate the assessment and management of a patient presenting with a critical illness, and understood the importance of multidisciplinary contribution in the optimal management of the critically ill.
ROTATION OBJECTIVES

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

**Medical Expert/Clinical Decision Maker**

By the end of the rotation, the resident will have:

- Demonstrated the ability to perform a complete and thorough history and physical examination of the critically ill patient, allowing for a proper differential diagnosis and management.
- Demonstrated an appropriate level of knowledge allowing for the clinical assessment, diagnosis and initial management of a critically ill patient with the following conditions: Hemodynamic instability, Respiratory failure, Hemorrhage (including massive transfusion), Altered level of consciousness, Delirium, Nutritional support needs, End-of-life issues
- Demonstrated proper skills in initiating promptly a plan for the appropriate management of the above conditions.
- Developed skills for a timely response and organized approach to emergencies situations in Critical Care: Remaining calm, Prioritizing appropriately, Displaying leadership
- Understood the basics of continuous monitoring (invasive BP monitoring, CVP, ICP, outputs, etc.) and its importance in the close follow-up and management of the critically ill patient.

**Specific Procedural / Technical Skills**

By the end of the rotation, the resident will have:

- Demonstrated an understanding of the indications, risks and different steps involved in the performance of the procedures mentioned below.
- Demonstrated appropriate skills in the preparation (gathering equipment, assistance, etc.) and performance of the named procedures, particularly relating to infection control and use of protective equipment.
- Demonstrated the technical skills necessary to perform the following procedure(s): Central access - internal jugular central catheter insertion (or femoral-subclavian access when appropriate), Arterial catheter insertion, Intubation
- Acquired consistency in properly documenting the procedures performed (successful or not).

**Communicator**

*By the end of the rotation, the resident will have demonstrated:*
- The ability to provide a concise prioritized patient presentation during rounds.
• The ability to provide patients and their families with information that is clear and encourages discussion / participation in decision-making.
• The ability to listen and communicate clearly with the ICU team (nurses, allied health, senior residents and consultants) and other services, regarding patient status and management plan.
• The ability to write or dictate clear, concise and up-to-date daily progress notes, discharge summaries and consultation notes.

Collaborator

During the rotation, the resident will have demonstrated:
• Recognition and respect of the roles of the ICU team members (residents, nurses, respiratory therapists, allied health, etc.) AND of the other consulting services in the ICU.
• The ability to deal effectively and constructively with differences in opinion and conflict situations arising in the interdisciplinary ICU environment.

Manager

During the rotation, the resident will have demonstrated:
• Effective organizational and time management skills.
• Leadership skills within the team.

Health Advocate

On completion of the rotation, the resident will have:
• Identified opportunities for advocacy and disease prevention, and prevention of complications in individual patients.
• Practiced preventative care including, for example, use of protective equipment when indicated and sterile technique for catheter insertion.

Scholar

By the end of the rotation, the resident will have:
• Attended and participated in scheduled seminars and journal clubs.
• Demonstrated initiative in learning about their assigned patient’s illnesses, even if not directly relevant to their specialty.
• Show initiative in teaching members of the ICU team (nurses, other residents, etc.) through discussions or presentation.

Professional

During the rotation, the resident will have:
• Demonstrated integrity, honesty and compassion.
• Demonstrated respect for privacy and confidentiality.
• Displayed reliability and conscientiousness in monitoring and follow-up of patients' issues.
• Demonstrated good insight into own performance (aware of own limitations), seek advice appropriately, and take feedback graciously.
• The ability to be prompt and on time for scheduled rounds and seminar.

Approved: June 2013
CRITICAL CARE ULTRASOUND

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS

This elective is one block in duration. It is open to one critical care resident on a first come-first served basis that is negotiated with Dr. Arntfield. Learning objectives will focus on the skills of acquisition and interpretation of point of care ultrasound images in critically ill patients.

Supervisor: Dr. Robert Arntfield (rarntfi@uwo.ca)

Site: Critical Care Trauma Centre, Medical Surgical ICU, Victoria Hospital ED

Responsibilities

The resident(s) carrying out their critical care ultrasound elective are responsible for providing point of care ultrasound services in the CCTC and, when possible, to other critically ill patients at Victoria Hospital during weekday hours. There are no nighttime or weekend call responsibilities. Given there is no known harm from ultrasound technology, ultrasound exams may be carried out liberally for both educational and diagnostic/therapeutic and procedural (when indicated) purposes. Patient selection for ultrasound may be driven by either a CCTC team member request or be self-initiated by the resident on service. If ultrasound exams are elective and educational in nature, they are not to delay or interfere with any aspects of care (nursing, medical, family) for the patient.

Ultrasound images obtained must all be archived appropriately using methods well described in tutorials made available to the resident. Further, meticulous organization of these studies within Qpath is expected in order to facilitate Dr. Arntfield’s oversight as well as to track the number of studies being acquired by the resident across each indication. Benchmarks for each indication will be determined at the beginning of each rotation for each resident.

Upon completion of a non-educational ultrasound examination, the resident must communicate the findings to the medical team directly. Review of images with Dr. Arntfield may occur first if required. Direct image review is encouraged between the resident and the CCTC team member. A hand written or type written report must also be inserted in to the patient chart.

The resident will be responsible for completing a 5 hour critical care echocardiography curriculum prior to starting their rotation. An additional 9 hours of content must be reviewed by the resident in the first 2 weeks of the rotation.
At regular intervals, in person image review and hands on training with the rotation supervisor (Dr. Arntfield) will occur. This will supplement the wireless oversight of images being acquired via the hospital-based point of care ultrasound management software (Qpath).

At the conclusion of the rotation, the resident will be expected to contribute two small projects. Firstly, a case write up and accompanying images for the “case of the month” on the point of care ultrasound webpage “uwosono.ca”. The second will be to lead a lunchtime image review session for CCTC residents and staff, highlighting interesting cases and learning points from the past month.

**ROTATION OBJECTIVES**

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

**Medical Expert/Clinical Decision Maker**

**General Requirements**

Residents will:

- Learn and apply basic ultrasound physics, machine controls and transducers in acquiring ultrasound images in critically ill patients.
- Appreciate the clinical syndromes where general critical care ultrasound and critical care echocardiography may play a pivotal role in guiding diagnosis and management.
- Achieve comfort in generating quality ultrasound images across different organ systems in a critically ill patient.
- Understand the limitations of ultrasound technology, its user-dependence as well as common imaging artifacts and imaging pitfalls.
- Learn how to integrate point of care ultrasound findings in to the care trajectory of the critically ill patient.
- Achieve comfort in a teaching role with junior residents in demonstrating some fundamental ultrasound teaching, especially as it relates to procedural guidance for vascular access.
- Learn to identify the role of cleaning and proper storage of point of care ultrasound machines as part of their upkeep and preservation in a busy ICU environment.
- Appreciate the importance of a quality assurance program as part of patient safety and proper training for point of care ultrasound and other user-dependent methods of patient care.
- Identify the role for diagnostic studies from other consultant imaging specialists for more complex clinical questions or when point of care imaging is unable to answer the clinical questions at hand.
Specific Knowledge Requirements

The resident is expected to describe:

- Factors influencing image acquisition quality when imaging critically ill patients
- Causes and ultrasound findings in circulatory failure due to various causes including:
  - Left ventricular failure
  - Hypovolemia
  - Acute right sided heart failure (cor pulmonale)
  - Cardiac tamponade
  - Acute massive left sided valvular regurgitation
  - Circulatory arrest
- Causes and ultrasound findings in respiratory failure due to various causes including:
  - Pleural effusion
  - Pneumothorax
  - Alveolar-interstitial syndrome (CHF, ARDS)
  - Normal aeration pattern (PE, obstructive lung disease)
  - Lobar collapse
- Requirements for acceptable cardiac ultrasound images and anatomic structures seen when images are obtained from the parasternal, apical and subcostal positions
- Knowledge of ultrasound artifacts, including mirror image, enhancement, edge, side lobe, ring down and reverberation artifacts
- Understanding of potential mimics, artifactual or anatomic, of common pathology (false positives) in both cardiac and general critical care ultrasound applications
- Understanding the difference between volume status and volume responsiveness
- Knowledge of the requirements for positive, negative and indeterminate ultrasound studies when assessing for binary clinical questions such as pleural fluid, pericardial fluid, pneumothorax
- Knowledge of qualitative and quantitative approaches to evaluating volume responsiveness, cardiac output, left ventricular function, pericardial fluid, pleural effusion, pneumothorax
- Understanding of the physics of Doppler, the distinction between continuous wave (CW) and pulse wave (PW) Doppler, aliasing, pulse repetition frequency and the Nyquist limit.
- Knowledge on how to use Qpath to generate reports and review feedback.
- Identify suitable critical care patients for point of care transesophageal echocardiography
- Identify patients where clinical questions require escalation to diagnostic imaging specialists
Specific Skill Requirements

The resident is able to:

- Generate interpretable general critical care ultrasound images in the assessment for pneumothorax, pleural effusion, ascites.
- Generate interpretable basic critical care echocardiography images from multiple transthoracic windows, including the parasternal, apical and subcostal points of view.
- Accurately recognize (interpret) the ultrasound findings consistent with pneumothorax, pleural effusion and ascites.
- Accurately recognize (interpret) the echocardiographic findings consistent with pericardial effusion, various states of LV function, cor pulmonale, massive valvular pathology and a volume responsive IVC.
- Defer making interpretations on ultrasound images that are either of suboptimal quality or fall outside of the capabilities or scope of the resident’s training and experience.
- Propose and discuss (with the patient’s care team) appropriate clinical management plans in response to findings on point of care ultrasound.
- Landmark safe and high yield locations for chest drainage or abdominal drainage procedures using ultrasound.
- Demonstrate competence in cannulating various vessels (central veins, peripheral veins, peripheral arteries) with ultrasound guidance and sterile technique.
- Use echocardiography to assist in the resuscitation and prognosis of patients in cardiac arrest.

Communicator

The resident will be able to:

- Verbal communication of ultrasound findings to care team, including nurse and resident.
- Document all ultrasound findings in patient chart either by hand-written note or through a Qpath generated report (preferred).
- Provide point of care ultrasound support to ward patients on the CCOT service who may benefit from point of care assessment of circulatory or respiratory failure.

Collaborator

The resident will:

- Establishes trusting relationships with the nursing staff, residents and the patients.
- Liaise professionally and respectfully with all consultant services.
Health Advocate

On completion of the rotation, the trainee will:

- Recognizes that ultrasound is one of many tools to guide diagnostics and therapeutics in an ICU setting.
- Appreciates that patient positioning and patient exposure for ultrasound exams may be stressful or disruptive for patients.
- Patient safety: Thoroughly clean the machine and transducers after each use, using cavi-wipes.

Evaluation

The trainee will be evaluated with a number of tools.

Qualitatively:
A majority of individual ultrasound scans will be evaluated either in person or by using the electronic quality assurance software (Qpath) whereby reports on quality are emailed to the rotator. At the end of each week, an in person review session will occur, reviewing the week’s work and focusing on bridging gaps in ultrasound image generation, interpretation or clinical integration.

Quantitatively:
At the beginning of each block, the resident and Dr. Arntfield will decide on an appropriate number of studies within each indication to be completed. In general, these will correspond to 40 cardiac studies and 25 each of thoracic and pleural studies. Studies will be tracked automatically by the image archiving software (Qpath). Some variation may occur if holidays or conference time is taken by the rotator. Failure to achieve these targets will result in a non-satisfactory evaluation.

Summary feedback will be provided at the end of the block along with an exit interview and practical hands-on evaluation. The In-Training Evaluation Report (ITER) will be reviewed with the trainee, signed, and forwarded to the office of the Critical Care Program Director.

Reviewed: August 2012, Dr. Granton
NEONATAL INTENSIVE CARE UNIT

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
The goal of the NICU rotation for trainees in anesthesia is development of an understanding of the common neonatal illnesses, their treatment, and their implications for anesthetic management or perioperative care. In addition, there will be a focus on newborn assessment and resuscitation.

It will be helpful is residents have completed the Neonatal Resuscitation Program (NRP) prior to the rotation.

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

Medical Expert/Clinical Decision Maker

Specific Knowledge Requirements
The resident will be able to:

- Identify neonates requiring resuscitation.
- Recognize common neonatal surgical emergencies.
- Identify common neonatal critical care problems (e.g., temperature control, respiratory compromise, fluid and electrolyte disturbances, glucose management and circulatory problems).
- Propose appropriate management plans in both the NICU and the OR for these common neonatal critical care problems.
- Have working knowledge of Neonatal Resuscitation (Neonatal Resuscitation Program, NRP).

Specific Skills Requirements
The resident will be able to:

- Complete a history and physical assessment pertinent to the neonate requiring critical care intervention.
- Present a stratified differential diagnosis of the neonate’s illness.
- Prescribe initial management of the neonate’s critical condition.
- Provide neonatal resuscitation as member of resuscitation team.
• Interpret common laboratory evaluations in neonatal critical care medicine including umbilical cord blood gases, complete blood count and differential, chest x-ray, etc.

Communicator
The resident will be able to:
• Obtain and document the relevant medical history and physical exam thoroughly and efficiently.
• Develop communication skills with other members of the health care team to benefit the patient.

Collaborator
The resident will be able to:
• Be aware of the role of the neonatology consultant in peripartum management of the neonate.
• Be aware of the role of the neonatology consultant in perioperative management of the neonate.
• Participate in team neonatal resuscitation.
• Describe the importance of the role of each of the members of the neonatal resuscitation team and support them in fulfilling their duties.

Health Advocate
The resident will be able to:
• Understand the complex emotional atmosphere surrounding delivery of a newborn and impact of a critically ill child on parents/caregivers.

Scholar
The resident will:
• Attend and participate teaching rounds.

Professional
The resident will be able to:
• Demonstrate integrity and honesty when interacting with neonates, families, and other health care professionals.
• Be punctual, efficient, and respectful at all times.

READING LIST
Suggested Readings:

Reviewed: 2012, Dr. Granton
OVERALL GOALS
Anesthesia residents may complete a rotation(s) in palliative medicine during their residency which will allow for a broad exposure to the care of terminally ill patients along with the numerous and often-times challenging problems. Residents will be exposed to numerous ethical issues that will require careful attention and skill in order to manage these issues effectively. They will recognize, as with all areas of medicine, the delivery of compassionate care is tantamount however during the terminal phase of illness these skills are of particular importance. Anesthesiologists are often identified as pain and symptom control physicians. Their expertise may be requested to assist with patients dying in their community with controlled symptoms, even if they do not practice palliative medicine. Many patients admitted to ICU do not survive, requiring delivery of palliative care principles in the ICU setting. Due to the nature palliative care work, the resident will find many of the skills required to perform effectively during this rotation are very well represented in the goals and objectives associated with the CanMeds roles as established by the Royal College of Physicians and Surgeons of Canada.

ROTATION OBJECTIVES
Medical Expert/Clinical Decision Maker
The specialist trainee must be able to:
- Demonstrate diagnostic and therapeutic skills for ethical and effective patient care.
- Access and apply relevant information to clinical practice.
- Demonstrate effective consultation services with respect to patient care, education and legal opinions.
- Understand ethics, law, and policy governing palliative care delivery in Canada.
- Understand symptom management (Education will be based on clinical situations that present during the rotation).

A. Pain
The resident will:
- Be able to assess and treat different types of pain and pain syndromes.
- Know the pharmacology of NSAIDs, opioids, and adjuvant drugs.
- Know about opioid tolerance, physical dependence, and addiction.
o Know routes of administration of opioids, i.e. morphine, hydromorphone and fentanyl.
o Have knowledge of non-pharmacologic approaches to pain management.

B. Dyspnea, delirium, nausea and vomiting, constipation, bowel obstruction, decubitus ulcers, anxiety, depression, etc.

The resident will be able to:
o Discuss the pathophysiology and treatment of these different symptoms as they arise in the patients being treated during their rotation.

C. Emergencies
o Residents will be involved in the assessment and management of palliative emergencies as they arise in the patients during the rotation which may include: hypercalcemia, severe dyspnea, severe pain, spinal cord compression, SVC syndrome, pathologic fractures, seizures and hemorrhage in the palliative setting.

Communicator

The resident will be able to:
- Establish therapeutic relationships with patients/families.
- Obtain and synthesize relevant history from patients/families/communities.
- Listen effectively.
- Discuss appropriate information with patients/families and the health care team.
- Use different techniques and approaches for communicating distressing information to patients/families.
- Work with patients and families to determine appropriate goals of treatment for stage of disease.
- Recognize personal limitations and ask for assistance when exposed to new situations or information, whether it be ethical, clinical, investigational, or management strategies.

Collaborator

The resident will be able to:
- Consult effectively with other physicians and health care professionals.
- Demonstrate timely and appropriate consultation skills directed towards various medical specialties contributing to the patients care.
Manager

The resident will:

- Allocate finite health care resources wisely.
- Work effectively in health care organization.
- Use information technology to optimize patient care, and life-long learning.

Health Advocate

The resident will be able to:

- Identify the important determinants of health affecting patients.
- Recognize and respond to those issues where advocacy is appropriate.
- Understand through observation the important role of health advocacy for patients that the physician plays at various levels of hospital administration and government.

Scholar

The resident will be able to:

- Critically appraise sources of medical information.
- Facilitate learning of patients, house staff/students, and other health care professionals.
- Demonstrate effective skills and techniques necessary to acquire information for patient care from various sources: i.e. the library and internet based searches.
- The resident may have the opportunity to present in an informal setting a topic of interest that is relevant to the delivery of palliative care.

Professional

The resident will:

- Deliver the highest quality of care with integrity, honesty and compassion.
- Exhibit appropriate personal and interpersonal professional behaviours.
- Practice medicine ethically, consistent with the obligations of a physician.

Evaluation

Residents/fellows will be evaluated on their assessment and care of the patients, relationships with patients, families and interdisciplinary team members. The trainee often is invited to present in an informal setting a topic of interest that is relevant to delivery of palliative care.

Reviewed: April 2012, Dr. Granton
PEDIATRIC CRITICAL CARE

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

ROTATION OBJECTIVES

Medical Expert/Clinical Decision Maker

Specific Knowledge Requirements

The anesthesia resident will be able to:

- The anesthesia resident will be able to identify children requiring resuscitation and describe standards for pediatric and neonatal resuscitation
- The resident will be able to recognize common pediatric surgical emergencies, their epidemiology and presentation and will be able to propose appropriate management
- The resident will be able to identify common pediatric critical care problems (respiratory, fluid and electrolyte, circulatory, trauma and metabolic problems). The resident will be able to propose management plans in both the PCCU and the OR. Recognition of possible complications associated with management and underlying patient conditions should also occur.
- The resident will be able to describe the pathophysiology of common causes of critical illness in children
- The resident should be able to understand different modes of ventilation in critically ill pediatric patients

Specific Skill Requirements

The resident will be able to:

- The resident will acquire technical skills in the following procedures:
  - Peripheral intravenous access
  - Pediatric airway management
  - Resuscitation of critically ill child
- The resident will be able to provide pediatric resuscitation

Communicator

The resident will be able to:

- Establish a therapeutic relationship with the patient and families
- Effectively obtain relevant information from all sources and communicates to the team
- Be aware of the unique stressful environment of the Pediatric Critical Care Unit
- Establish good relationships with peers and other health care professionals
Collaborator

The resident will be able to:
- Communicate effectively with all health care professionals including allied health professionals
- Recognizes and acknowledges the roles of different health care providers
- Should be able to manage conflict well
- Contributes productively to interdisciplinary activities

Manager

The resident will be able to:
- Understands and makes effective use of information technology such as methods for searching medical databases
- Makes cost-effective use of health care resources based on sound judgment

Health Advocate

The resident will be able to recognize and respond to situations where patient advocacy is needed, such as:
- Be able to recognize preventive measures in status asthmaticus patients
- Advocate for organ donation, etc.

Scholar

The resident will be able to:
- Partake in the assigned academic activities in the PCCU
- May be expected to teach airway management skills to the junior house-staff

Professional

The resident will be able to:
- Demonstrate integrity, compassion and respect for diversity
- Fulfills medical, legal and professional obligations of the specialist
- Demonstrate reliability and conscientiousness

Reviewed: 2012, Dr. Granton
RESPIROLOGY ROTATION (PGY-2 TO 5)

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS
The goal of the Respirology rotation for trainees in anesthesia is the development of an understanding of the common respiratory diseases, their treatment, and their implications for anesthetic management.

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

Medical Expert/Clinical Decision Maker

Specific Knowledge Requirements
The resident will be able to:
- Describe the pathophysiology of respiratory diseases including reactive airways disease, restrictive lung disease, pulmonary malignancy, tuberculosis, cystic fibrosis and other infectious and occupational lung diseases.
- Describe the natural history and complications of these respiratory diseases.
- Describe the symptoms and physical findings associated with the diseases.
- Describe the usual acute and long term management and therapeutic measures used to treat these diseases.
- Describe the laboratory tests used in evaluating pulmonary disease, along with their indications, interpretations and limitations.
- Describe the perioperative risk factors for patients with respiratory diseases undergoing surgery.
- Describe the necessary preparation and premedications for patients with respiratory diseases undergoing surgery.

Specific Skill Requirements
The resident will be able to:
- Complete a history and physical assessment pertinent to the respiratory system.
- Present a stratified differential diagnosis of the patient’s illness.
- Prescribe initial management of the patient’s condition.
Interpret common laboratory evaluations in respiratory medicine, including chest x-ray, arterial blood gases, pulmonary function tests and nuclear medicine imaging of the pulmonary system.

**Communicator**

The resident will be able to:

- Obtain and document the relevant medical history thoroughly and efficiently.
- Develop communication skills with other members of the health care team to benefit the patient.

**Collaborator**

The resident will:

- Be aware of the role of the respirology consultant in perioperative management of the surgical patient.

**Health Advocate**

The resident will:

- Understand the complex emotional effects of the illness on the patient and their family.
- Encourage patients to optimize their health status.

**Professional**

The resident will:

- Demonstrate integrity and honesty when interacting with patients, families, and other health care professionals.
- Be punctual, efficient, and respectful at all times.

Reviewed: June 2012, Dr. Granton
OVERALL GOALS
The goal of the Transfusion Medicine rotation for trainees in anesthesia is development of an understanding of the common anemias and coagulopathies, their treatment, and their implications for anesthetic management. In addition, experience in hematologic laboratory testing methods and interpretation will be stressed.

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

Medical Expert/Clinical Decision Maker

Specific Knowledge Requirements
The resident will be able to:
- Describe the physiology of oxygen carrying by the blood.
- Describe the physiology of inadequate oxygen delivery by the blood and the treatment of this.
- List the various types of anemia, along with their etiology, and describe their pathophysiology.
- Describe the usual acute and long term management and therapeutic measures (including blood transfusion) used to treat these anemias.
- Describe the coagulation pathway.
- List the disorders of hemostasis and describe their pathophysiology and treatment.
- Describe the laboratory tests used in evaluating anemia and coagulopathy, along with their indications, interpretations and limitations.
- List the indications for transfusions of the various available blood products, and in conjunction with this, describe the physiologic effects of transfusions of the various blood products, including their side effects and the management of these.
- Describe the perioperative risk factors for patients with hematologic diseases undergoing surgery.
- Describe the necessary preparation and premedications for patients with hematologic diseases undergoing surgery.
Specific Skill Requirements
The resident will:

- Have sufficient working knowledge of the following laboratory tests in order to be able to describe how they are performed and interpret the results. The resident will be expected to perform some tests in those categories marked with an asterisk (*).
  - Tests of hemostasis* and thrombosis (including coagulation screening, DIC fibrinolysis tests and platelet disorders).
  - Automated hematology tests (CBC/differential) and basic blood morphology.
  - Special hematology tests* (eg. hemoglobin, electrophoresis/sickledex, tests for hemolysis).
  - Immunohematology tests* (eg. blood typing, antibody investigation).
- Have a working knowledge and have participated in the collection of blood for transfusion purposes, the separation of the various blood products from the collected whole blood sample, and the preparation and storage of the individual blood products.

Communicator
The resident will be able to:

- Develop communication skills with other members of the health care team to benefit the patient.
- Describe the social concerns regarding blood transfusion including:
  - Autologous donation
  - Directed donation by family members
  - Review of Jehovah’s Witnesses
- Discuss the changing views in society regarding the safety of blood products.

Collaborator
The resident will be able to:

- Describe the roles of the people participating in the donation and collection of blood for transfusion and its storage and delivery to recipients.
- Be aware of the role of the hematology consultant in perioperative management of the surgical patient.

Manager
The resident will be able to:

- Consider health care resources when determining the transfusion management plan.
- Acknowledge the difficulties and decision-making involved in utilization and allocation of finite health care resources.

Health Advocate
The resident will be able to:
• Provide appropriate education to ensure patients are well informed and well prepared.
• Encourage patients to optimize their health status.

Scholar

The resident will be able to:
• Teach medical students, under supervision of staff, about clinical problems.
• Demonstrate critical enquiry of a clinical question that they have raised or that has appeared during teaching discussions.

Professional

The resident will be able to:
• Demonstrate integrity and honesty when interacting with patients, families, and other health care professionals.
• Be punctual, efficient, and respectful at all times.

Evaluation

The resident will receive daily feedback from clinical preceptors. The resident will be expected to complete a rounds presentation once per rotation. An end-of-rotation written evaluation will be completed by both the resident and clinical preceptor. The resident evaluation will be discussed with the resident and signed by both the resident and the preceptor.

Reviewed: July 2012, Dr. Granton
RESEARCH ROTATION

THE ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
Objectives of Training and Specialty Training Requirements in Anesthesia

Specific Objectives in CanMEDS Format

OVERALL GOALS

1. Residents will meaningfully participate in the design & execution of a research or Quality Improvement project or education project. Ideally, such participation should be from beginning to end of the project (skills & knowledge).
2. Residents will be advocates for the importance of research in clinical practice (attitudes).
3. Residents will continue to engage in research or QI initiatives as clinicians (sustainability).

ROTATION OBJECTIVES

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

Medical Expert/Clinical Decision-Maker

Residents will:

- Be able to execute an effective search strategy, retrieve references, manage information in reference management software, and cite sources.
- Prepare a research proposal, quality improvement plan or education project.

Communicator

General Requirements

- Dissemination of research plan & results.
- Ability to discuss research, quality improvement or education project in a sophisticated manner.

Specific Requirements

Residents will:

- To the extent possible, prepare a manuscript or abstract to report the results of their research project that conforms to the publication guidelines of an appropriate academic journal.
- Present the results of their ongoing or completed project at the Mac/Western Research Day or another appropriate scientific meeting.
Additional points:
In lieu of a manuscript submitted to an academic journal, the resident may disseminate the results of the research or quality improvement project in another suitable fashion, such as a professional meeting or academic conference.

**Collaborator**

*General Requirements*
- To demonstrate inter- and intra-professional collaboration during the conduct of the research, quality improvement project or education project.

*Specific Requirements*
Residents will:
- Work with other health professionals as necessary to ensure each step of the research, quality improvement project or education project is executed effectively, and with efficient use of resources.
- Cooperate with the Research/Project Supervisor in the timely submission of the project idea, literature review, protocol, and applications for ethics approval.
- Ensure open communication during the Informed Consent process, respecting the patient and their family as valuable partners in the research endeavor.

**Manager**

*General Requirements*
- Data collection and analysis.
- Timely completion of research tasks.

*Specific Requirements*
Residents will:
- Organize research rotation time appropriately and meet submission deadlines in a timely fashion.
- Maintain clear records of research data.
Health Advocate

General Requirements

- To influence patient-centered outcomes through asking critical research questions and addressing quality improvement or education issues that will have a direct benefit to patients, communities, and health systems.

Specific Requirements

Residents will:
- Demonstrate a clear understanding of the benefits their research, quality improvement project or education project may have on patients, communities, and health systems.
- Be able to identify whether ethical approval is necessary for their research project and make application to the appropriate Research Ethics Board, if necessary.

Scholar

General Requirements

- To understand the process and steps of scientific research, quality improvement or education.
- To demonstrate critical thinking.

Specific Requirements

Residents will:
- Formulate a viable research question or project.
- With assistance, residents will identify the components required to design a research, quality improvement or education project to answer their question or clinical problem.
- With assistance, residents will prepare a proposal that addresses rationale for the project, the research hypothesis, methods, data analysis, expected outcomes, and a plan for dissemination of the results.

Professional

General Requirements

- Demonstrate commitment to the health and well-being of individual patients and populations.
- Respect the obligations of the research rotation.

Specific Requirements

Residents will:
- Respect patient confidentiality and autonomy.
- Ensure secure research data if appropriate.
• Respect deadlines for project completion set forth by supervisor and department.

Reviewed: 2012, Dr. Granton
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
Objectives of Training in the Specialty of Anesthesiology

2.1.1.5.1.5. Thermodynamics
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

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
Objectives of Training in the Specialty of Anesthesiology

2.1.1.6.1.3. Aseptic technique
2.1.1.6.1.4. Management of needle stick injuries
2.1.1.6.1.5. 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
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
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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. 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
2.1.8.1.2.9. Placement of double lumen tube
2.1.8.1.2.3. Complications of airway management
2.1.8.1.2.4. Prevention and management of pulmonary aspiration of gastric contents
2.1.8.1.2.5. Management of extubation
2.1.8.1.3. 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
   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
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
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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

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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
5.2.4. Peripheral nerve blockade
5.2.5. Resuscitation techniques
   5.2.5.1. Basic Cardiac Life Support
   5.2.5.2. Advanced Cardiac Life Support
   5.2.5.3. 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. Fulfill the regulatory and legal obligations required of current practice
   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

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VERSION 1.0

These training requirements apply to those who begin training on or after July 1st, 2014.

MINIMUM TRAINING REQUIREMENTS

Five (5) years of approved residency training
1. One (1) year of basic clinical training, which must include:
   1.1. A minimum of one (1) month and not more than four (4) months in each of the following rotations:
       1.1.1. Internal Medicine and/or its subspecialties
       1.1.2. A surgical specialty
       1.1.3. Pediatrics
       1.1.4. Obstetrics and Gynecology
   1.2. No more than four (4) months of Anesthesiology. Anesthesiology training in the basic clinical year can only be credited in section 1

2. Four (4) years of Anesthesiology
   2.1. Two (2) years of approved residency in clinical Anesthesiology
       2.1.1. Eighteen (18) months, or longitudinal equivalent, of adult Anesthesiology, which must include general and regional anesthetic experience in:
           2.1.1.1. Outpatient surgical management
           2.1.1.2. Recognized general and subspecialty surgical procedures
           2.1.1.3. Associated emergency conditions
       2.1.2. Three (3) months or longitudinal equivalent of pediatric Anesthesiology
       2.1.3. Two (2) months or longitudinal equivalent of obstetrical Anesthesiology
       2.1.4. One (1) month or longitudinal equivalent of chronic pain management, which must include long-term ambulatory patient management
2.2. One (1) year of approved residency, at the R2 level or above, to be undertaken preferably after a year of clinical training in Anesthesiology
2.2.1. One (1) month of Cardiology or coronary care
2.2.2. One (1) month of Respirology
2.2.3. Three (3) months of adult Critical Care Medicine
2.2.4. Seven (7) months selected from:
2.2.4.1. Two (2) or more of the following, with a maximum of two (2) months in any one area:
   2.2.4.1.1. Clinical Pharmacology and Toxicology
   2.2.4.1.2. Diagnostic Radiology
   2.2.4.1.3. Gastroenterology
   2.2.4.1.4. General Internal Medicine
   2.2.4.1.5. Hematology
   2.2.4.1.6. Infectious Diseases
   2.2.4.1.7. Internal Medicine
   2.2.4.1.8. Medical Oncology
   2.2.4.1.9. Nephrology
   2.2.4.1.10. Neurology
   2.2.4.1.11. Palliative Medicine
   2.2.4.1.12. Respirology
   2.2.4.1.13. Rheumatology
   2.2.4.1.14. Other Royal College-recognized specialties and subspecialties approved by the program director
2.2.4.2. Additional critical care experience, not to exceed four (4) months in total, with a maximum of two (2) months in any of the following:
   2.2.4.2.1. Adult Critical Care Medicine
   2.2.4.2.2. Cardiovascular surgery intensive care
   2.2.4.2.3. Coronary care
   2.2.4.2.4. Emergency Medicine
   2.2.4.2.5. Neonatology
   2.2.4.2.6. Pediatric Critical Care Medicine
2.3. One (1) year selected from one or more of the following:
Specialty Training Requirements in Anesthesiology

2.3.1. Anesthesiology  
2.3.2. Clinician Educator Program  
2.3.3. Clinician Investigator Program  
2.3.4. Clinical Pharmacology and Toxicology  
2.3.5. Critical Care Medicine  
2.3.6. Pain Medicine  
2.3.7. Palliative Medicine  
2.3.8. Graduate level program relevant to Anesthesiology  
2.3.9. Research experience in a clinical or basic science program  
2.3.10. Up to six (6) months of elective, with approval of the program director

**NOTES:**

*Note: This section should outline any exceptional or extraordinary clauses to the training requirements (e.g., other training options, agreements with American Certification Boards, discretion of a Program Director to extend length of training, etc.).*

Royal College certification in Anesthesiology requires all of the following:

1. Successful completion of a 5-year Royal College accredited program in Anesthesiology;  
2. Successful completion of the certification examination in Anesthesiology; and  
3. Participation in a scholarly project related to Anesthesiology, as attested by the program director.

The program outlined above is to be regarded as the minimum training requirement. Additional training may be required by the program director to ensure that clinical competence has been achieved.

Those who have completed four (4) years’ residency in a non-Royal College anesthesiology program, within a jurisdiction acceptable to the Royal College and within acceptable time frames, **and** have been in a continuous practice of anesthesiology for one or more years post-certification and maintained continuous enrolment with their certifying authority, may fulfil the requirements for section 2.2 with one of the following options:

- Additional Critical Care Medicine training, to a maximum of twelve (12) months;
- Acceptable training in Pediatrics at a senior level, to a maximum of six (6) months’ credit;
- One (1) year of other postgraduate clinical training (as outlined in the section on Other acceptable postgraduate clinical training in the Royal College’s Policies and Procedures for Certification and Fellowship) in Anesthesiology; or
- An additional year of acceptable anesthesiology specialty practice, which must be completed in an accredited, university-affiliated, academic department. The department head of that institution must be asked to complete a Final In-Training Evaluation Report (FITER) as a reference for the candidate.
OVERLAP TRAINING

Anesthesiology training may overlap and allow for credit in the following: Clinician Investigator Program, Clinician Educator Program, master’s programs, Clinical Pharmacology and Toxicology, Critical Care Medicine, Palliative Medicine, and Pain Medicine.

There is considerable leeway (up to one (1) year) within the minimum training requirements for trainees to pursue avenues of training that may qualify for overlap training or training that will broaden their experience as clinical Anesthesiologists, enriching the specialty. This will require planning by the trainee. Active involvement of the program director of the overlap discipline is strongly encouraged. Training for the purpose of overlap training must be approved by the program director. Overlap training is supported and encouraged for the trainee who is making satisfactory progress in the primary discipline of Anesthesiology and who can satisfy the service requirements of the trainee position.

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