Anesthesiology Residency Program
PGY 3-5 Adult Anesthesia
Goals and Objectives

Rotation Description
During these blocks the residents will move toward independent practitioners by demonstrating competence in the management of a wide variety of cases. The residents will independently assess the patients, develop comprehensive anesthesia plans and execute them safely under the guidance of the attending staff, earning increasing independence as they progress. They should be facile with all common anesthesia procedures and explore integrating new techniques in an evidence based fashion. In addition, the resident will begin to work through the various core topics (listed below) independently and collaboratively with the staff they are assigned to.

In addition to ensuring completion of all competencies identified in the PGY-1 and 2 Adult Anesthesia Goals and Objectives the PGY3-5 Resident will:

MEDICAL EXPERT

Preoperative Period
1) Perform a comprehensive anesthetic history and physical examination, review and order laboratory investigations, eliciting relevant information and then develop and present a complete anesthetic plan.
2) Identify patients who require further preoperative optimization and the factors that influence delaying or cancelling surgery.
   a) Independently formulate an appropriate optimization strategy, considering national guidelines and discuss it with the appropriate faculty.
   b) Identify patients who are not optimized for surgery and make appropriate decisions regarding continuing, delaying or cancelling the case with increasing independence.

Intra-operative
3) Demonstrate an appropriate anesthesia plan taking into consideration the physiologic alterations expected with the use of general, neuraxial and regional anesthesia and the patients comorbid conditions.
4) List the indications and contraindications of general, neuraxial and regional anesthesia and integrate them appropriately given the patient assessment.
5) Safely perform lumbar and thoracic neuraxial anesthesia and regional anesthesia independently including insertion, drug management and monitoring.
6) Independently set up invasive monitoring equipment including arterial, central venous and pulmonary artery catheterization. Safely insert these monitors in multiple sites and accurately interpret the data including hemodynamic profiles, acid base, oxygen delivery and consumption (NC 4.1).
7) In addition to the PGY 1 and 2 G&O, Demonstrate an understanding of the complications associated with anesthesia (NC 5) specifically:
   i) Intraoperative fires/burns
   ii) Venous Air Embolism (positioning)
   iii) Potential occupational risks to the OR personnel (NC 5.11)

Postoperative Phase
8) Develop and Implement an appropriate postoperative analgesia, fluids and monitoring plan for all patients including outpatient surgery, ICU patients and those requiring further follow up.

ENT Surgery Additional Objectives (NC 7)
9) **Demonstrate** understanding of the anesthetic concerns and goals for endoscopy, with proficient evaluation and management of the patient. The resident must also be able to **manage** patients presenting with acute infections that threaten airway patency, including epiglottitis and abscesses taking into consideration:
   a) Presenting complaints (eg hoarseness, stridor, FB aspiration, trauma, tumor)
   b) Procedural considerations (bleeding, positioning, lasers, difficult A/W, jet ventilation, rigid bronch)

10) **Demonstrate** advanced knowledge and practical skills in dealing with laser surgery cases including (NC 7.4):
   a) Basic laser science
   b) Safety considerations
   c) ETT modifications and airway fire management

11) **Demonstrate** an understanding of the anesthetic considerations of major head and neck surgery, with appropriate expertise to manage these cases (NC 7.6), specifically:
   a) Assessing the patient’s condition/comorbidities and planning optimization
   b) Airway patency or compromise (Tumor mass effects, FO assessment, symptoms)
   c) Intra-operative management
      i) Consideration for awake tracheotomy
      ii) Monitoring (including hemodynamic, surgical nerve identification, temperature, blood loss etc)

12) **Demonstrate** an understanding of the pathological processes necessitating tracheotomy, and provide expert anesthetic management of the patient with or undergoing tracheotomy including (NC 7.7):
   a) Indications for:
   b) Anesthetic options for emergency tracheostomy
   c) Trans-tracheal intubation

**Hepatobiliary (NC 12)**

13) Demonstrate knowledge of the pathophysiology and a perioperative management approach to the following (NC 12.3):
   a) Postoperative hepatic dysfunction:
   b) Pre-, intra-, and post-hepatic dysfunction.
   c) Halothane hepatitis
   d) Viral Hepatitis (including types, transmission, course, prevention)
   e) Other forms of hepatitis and the implications thereof (autoimmune, alcoholic etc):
   f) Liver failure/ End stage liver disease specifically:
      i) Etiologies
      ii) Child’s classification for preoperative prediction of surgical risk
      iii) Complications (systemic review)
      iv) Anesthetic management
   g) Anesthetic management for a patient with a previous liver transplant

14) **Demonstrate** understanding of the considerations of, and to independently provide anesthetic care for patients presenting for the following procedures (NC 12.4):
   a) Endoscopic biliary tract procedures
   b) Pancreatic resection
   c) Biliary duct reconstruction
   d) Whipples’ procedure
   e) Liver resections
   f) Liver donation
   g) T.I.P.S. procedure
   h) Liver transplant

**Immunology and Rheumatology (NC 13)**

15) **Discuss** the basic physiology of the immune system, including the following (NC 13.1):
a) Cellular immunity
b) Cell-mediated immunity, its role in rejection of transplanted organs
c) Autoimmune diseases
d) Humoral immunity
e) The complement system
f) The four types of hypersensitivity (allergic) responses

16) In collaboration with the appropriate consultant, demonstrate an ability to manage the patient with the following disorders presenting for surgical or obstetric management (NC 13.2):
   a) Hereditary angioedema in C1 esterase inhibitor protein deficiency
   b) Congenital and acquired immunodeficiency states (HIV/AIDS)
   c) Selective IgA deficiency and anaphylaxis associated with blood transfusions
   d) Cold autoimmune diseases: (eg. cryoglobulinemia, cold Hemaglutinin disease, paroxysmal cold hemoglobinuria)
   e) Amyloidosis

17) Demonstrate an ability to manage the patient with the following autoimmune disorders presenting for surgical or obstetric management. Discuss the anesthetic considerations of the individual autoimmune diseases (NC 13.3)
   a) Organ-specific autoimmune disease
      i) Type 1 diabetes mellitus
      ii) Myasthenia gravis
      iii) Grave’s disease
      iv) Addison’s disease
      v) Autoimmune haemolytic anemia
   b) Systemic autoimmune diseases
      i) Rheumatoid arthritis
      ii) Rheumatic fever
      iii) Ankylosing spondylitis
      iv) Systemic lupus erythematosus
      v) Scleroderma
      vi) IgA deficiency
      vii) Sarcoidosis

18) For the following conditions demonstrate an understanding of the pathophysiology, clinical manifestations, investigation and management:
   a) Protamine allergy
   b) Latex allergy
   c) Metabisulfite allergy
   d) Volatile agent allergic hepatitis
   e) Transfusion reaction
   f) Intravenous contrast media allergy
   g) Food allergies associated with drug or medical substance allergies
   h) Drug reactions (Anaphylaxis, Drug-induced release of histamine (anaphylactoid), Activation of the complement system)

19) Demonstrate an understanding of the SIRS and its role in multi-organ failure in the critically-ill patient and the perioperative management of these patients (NC 13.6).

20) Demonstrate knowledge of the pathophysiology, clinical presentation, natural history, treatment modalities and multisystemic implications of the connective tissue disorders.
    Demonstrate an understanding of the anesthetic considerations of the following diseases (NC 13.7):
    a) Epidermolysis bullosa
    b) Scleroderma
    c) Systemic lupus erythematosus
    d) Rheumatoid arthritis
    e) Ankylosing spondylitis
f) Marfan syndrome

**Endocrinology (NC 8)**

21) **Demonstrate** knowledge regarding the pathophysiology and clinical manifestations of hyper- and hypo-thyroidism and the effects on anesthetic management (NC 8.2) including:
   a) An approach to evaluation and management of the patient with thyroid dysfunction including effects of therapy.
   b) Assessment and management of acute thyroid problems such as thyroid storm and myxedema coma, describing their clinical manifestations and the treatment modalities

22) **Demonstrate** knowledge with respect to hypo- and hyperparathyroidism (NC 8.3) including:
   a) The evaluation of parathyroid gland function
   b) Parathyroid function and calcium metabolism, demonstrating knowledge of the treatment modalities used to ensure normocalcemia
   c) The anesthetic considerations of patients with parathyroid dysfunction

23) **Describe** the pathophysiology of hyper- and hypocalcemic states, their clinical manifestations and the treatment of these conditions.

24) **Demonstrate** an understanding of the physiology of the adrenal cortex and medulla and the implications of acute and chronic adrenal dysfunction in the perioperative period as manifested by (NC 8.4):
   a) Pheochromocytoma
   b) Cushing syndrome
   c) Adrenal insufficiency
   d) Acute adrenal crisis

25) **Demonstrate** an understanding of the management of the patient receiving corticosteroid therapy presenting for anesthesia and surgery.

26) **Demonstrate** knowledge of the normal pituitary function and evaluation of the patient with Posterior pituitary dysfunction including the pathophysiology, differential diagnosis, treatment, and anesthetic considerations of SIADH and diabetes insipidus (NC 8.5)

27) **Demonstrate** knowledge of the pathophysiology, clinical manifestations and treatment of acute and chronic panhypopituitarism and acromegaly (NC8.6).

28) **List** the clinical manifestations of carcinoid syndrome and the anesthetic considerations arising from them (NC 8.7).

**Ophthalmology (NC 19)**

29) **Describe** the relevant anatomy and physiology of the eye including (NC 19.1)
   a) the anatomy of the eye including chambers, relevant blood supply and innervation
      i) Occulo-cardiac reflex
   b) the determinants of IOP and factors that influence it
   c) the pathophysiology of glaucoma

30) **Demonstrate** an ability to independently provide anesthesia for patients undergoing ophthalmic surgery with respect to (NC 19.2):
   a) Preoperative Evaluation
   b) Pharmacologic Interventions
      i) drugs commonly used in ophthalmologic patients including mydriatics, miotics, and topical and systemic drugs used to decrease IOP
      ii) Describe the systemic effects of the aforementioned medications
      iii) Describe the ocular effects of systemic medications
   c) effects of Anesthesia on IOP or Retinal Perfusion
   d) Anesthetic Technique
      i) Sedation
      ii) Topical anesthesia
      iii) Regional anesthesia (retro and peri bulbar blocks)
      iv) General anesthesia
   e) Post Operative Nausea and Vomiting Prophylaxis
31) **Demonstrate** an understanding of the concerns for specific surgical procedures and an ability to provide anesthetic management for:
   a) Open eye injury / ruptured globe
   b) Strabismus repair
   c) Retinal detachment surgery
   d) Retinal surgery for vitreous hemorrhage
   e) Cataract surgery
   f) Oculoplastics (Blepharoplasty, DCR, Ptosis repair, Orbital reconstruction)
   g) Corneal transplant
   h) Removal of foreign body
   i) Conjunctival – pterygium
   j) Laser surgery
   k) Enucleation of the eye

**Orthopedic Surgery (NC 20)**

32) **Demonstrate** an understanding of the concerns related to pelvic surgery with respect to (NC 20.6):
   a) Urgent vs. Emergent
   b) Major trauma and associated injuries
   c) Blood loss
   d) Prolonged procedure

**Plastic Surgery (NC 24)**

33) **Demonstrate** an understanding of the pathophysiology of burns and the relevance to anesthetic management (NC 24.1)
   a) Describe the types of burns including thermal, chemical and electrical burns
   b) Describe the initial assessment and resuscitation of the burn patient
   c) Describe the anesthetic considerations of the burn patient presenting for plastic procedures (flaps, grafts and dressing changes)
   d) Describe the use of hyperbaric oxygen in the treatment of burns and carbon monoxide poisoning

34) **Demonstrate** an understanding of the pathophysiology of cold injuries and their relevance to anesthesia including (NC 24.1) frostbite and the role of hyperbaric oxygen

35) **Demonstrate** an understanding of the concerns related to limb reimplantation with respect to (NC 24.2):
   a) The general and regional anesthetic options for limb reimplantation
   b) Manoeuvres used to increase digital blood flow

36) With respect to free flap and pedicle flap surgery, the resident must **demonstrate** an understanding of:
   a) General and regional anesthetic options for free flap and pedical flap surgery
   b) The factors that influence flap perfusion including fluids/temperature/vasoactive substances
   c) Common co-morbidities of patients presenting for flap surgery (Cancer, Infection, Paraplegia, Quadriplegia)
   d) The indications for hyperbaric oxygen therapy for flap preservation
   e) The post operative complications of surgery (Flap necrosis, Infection/sepsis)

37) **Demonstrate** an understanding of the anesthetic concerns for adult patients undergoing craniofacial surgery including (NC 24.6):
   a) Facial reconstructive surgery
   b) Maxillo-facial trauma

**Remote Locations (NC 28)**

   c) See PGY 2 G&O
**Renal / Urologic (NC 29)**

38) **Discuss** how alterations in renal function effect the excretion of drugs administered during and after surgery.

39) **Demonstrate** understanding of the considerations of, and to independently provide anesthetic care for patients presenting for the following procedures (NC 29.4):
   a) Transurethral Resection of the Prostate
   b) Prostatectomy: Open and Laparoscopic
   c) Lithotripsy
   d) Endourologic Procedures
   e) **Nephrectomy**
   f) **Renal Transplant**

**Transplantation (NC 33)**

40) **Demonstrate** the knowledge and ability to assess and manage the organ donor including (NC 33.1)
   a) Multi-organ brain dead donors
   b) Living related donors for kidney & liver

41) **Describe** the considerations and management of the Organ Recipient (NC 33.2) including:
   a) Anesthesia management
   b) basic principles of Immunosuppression and graft rejection
   c) Reperfusion injury
   d) Management of Hyperkalemia
   e) Understand post transplant complications including rejection, infection, Immunosuppression and be able to conduct anesthesia for surgical procedures in patients after organ transplantation
   f) Transfusion medicine and coagulation management: See Hematology 11.6
   g) Invasive monitoring

42) **Demonstrate** an understanding of the management of a patient undergoing liver transplantation (NC 33.5) including:
   a) The pharmacology of various drugs in patients with end stage liver disease
   b) Hepatic physiology
   c) Physiology and monitoring of Coagulation system
   d) Stages of liver transplantation
   e) Veno-venous bypass
   f) Immunosuppression and graft rejection
   g) Causes of liver dysfunction, scoring systems, indications and contraindications for transplant

**Thermoregulation (NC 32)**

43) See PGY 1 G&O

**Neuromuscular Junction Physiology and Blocking Agents (NC 17)**

44) See PGY 1 G&O

**Prevention of Infection (NC 14)**

45) See PGY 1 G&O

**Geriatric Anesthesia (NC 10)**

46) See PGY 1 and 2 G&O

**Ambulatory Anesthesia (NC 2)**

47) See PGY 1 G&O

**COMMUNICATOR**
48) **Develop** rapport, trust, and ethical therapeutic relationships with patients and families (Draft OTR 1)
   a) Be aware of and responsive to nonverbal cues (1.5)
   b) Facilitate a structured clinical encounter effectively (1.6)

49) **Demonstrate** an ability to elicit and synthesize relevant information and perspectives of patients and families, colleagues, and other professionals (Draft OTR 2)

50) **Convey** relevant information and explanations accurately to patients and families, members of your anesthetic care team (ACT), colleagues and other professionals (Draft OTR 3)

51) **Demonstrate** an ability to come to a common understanding on issues, problems and plans with patients, families, and other professionals to develop a shared plan of care (Draft OTR 4.1 - 4.4) including:
   a) **Identify** and **explore** problems to be addressed from a patient encounter effectively, including the patient’s context, responses, concerns, and preferences
   b) **Respect** diversity and difference, including but not limited to the impact of gender, religion and cultural beliefs on decision-making
   c) **Encourage** discussion, questions, and interaction in the encounter
   d) **Engage** patients, families, and relevant health professionals in shared decision-making to develop a plan of care
      i) **Participate** actively in the Pre-Surgical Safety Checklist (if and where endorsed by your hospital or provincial health authority) taking a leadership role when necessary.
      ii) **Ensure** clear and audible communication with surgeons, nurses and members of one’s ACT to facilitate patient care, safety and prevent errors.
      iii) **Concisely delineate** anesthetic concerns to the surgeon, especially if it involves a high risk patient, cancellation or postponement of the surgery pending further investigations.

52) **Convey** effective oral and written information about a medical encounter (Draft OTR 5)
   a) Maintain clear, accurate, and appropriate records of clinical encounters and plans (5.1)
      i) Ensure that anesthetic records are complete and legible (5.1.1)
      ii) Document consent for invasive procedures where indicated. (5.1.2)
      iii) Comply with strategies employed in one’s hospital with regard to minimizing wrong sided surgery and procedures particularly when performing regional anesthesia. (5.1.4)
   b) Present verbal reports of clinical encounters and plans (5.2)

**COLLABORATOR**

53) **Participate** effectively and appropriately in an interprofessional health care team (Draft OTR 1)
   a) Describe the Anesthesiologist’s roles and responsibilities to other professionals (1.1)
   b) Describe the roles and responsibilities of other professionals within the health care team with particular reference to the OR and the pain service (1.2)
   c) Describe the principles of team dynamics and utilize them to improve interprofessional collaboration
   d) Respect team ethics, including confidentiality, resource allocation and professionalism (1.9)

54) **Work with** other health professionals effectively to prevent, negotiate and resolve interprofessional conflict (Draft OTR 2)
   a) Demonstrate a respectful attitude towards other colleagues and members of an interprofessional team (2.1)
   b) Respect differences and address misunderstandings and limitations in other professionals (2.4)
   c) Recognize and address one’s own differences, misunderstandings and limitations that may contribute to interprofessional tension or conflict (2.5)
   d) Reflect on interprofessional team function (2.6)
HEALTH ADVOCATE

55) **Identify** the perioperative period as a significant opportunity for health behavior change (Draft OTR 1.1.1)

56) **Identify** opportunities for advocacy, health promotion and disease prevention with individuals to whom they provide care, including the following (1.1.2):
   a) Advocating and prescribing positive health behavior change (e.g. smoking cessation) to improve post surgical and post anesthesia outcomes
   b) Advocating and prescribing pharmacologic intervention in the perioperative period (e.g. blood glucose management) to improve past surgical and post anesthesia outcomes
   c) Discussing and implementing blood conservation strategies to reduce exposure to allogeneic blood
   d) Engaging in an informed discussion regarding perioperative and postoperative pain management. Identify the risks and potential benefits regarding intraoperative and postoperative care, post surgical outcomes and chronic post surgical pain with individual pain management strategies

PROFESSIONAL

57) **Demonstrate** a commitment to their patients, profession, and society through ethical practice (Draft OTR 1)
   a) Exhibit appropriate professional behaviors in practice, including honesty, integrity, commitment, compassion, respect and altruism (1.1)
   b) Demonstrate a commitment to delivering the highest quality care and maintenance of competence (1.2)
   c) Demonstrate a commitment to ensuring continuous care to patients including during on-call hours (1.3)
   d) Maintain appropriate relations with patients (1.7)
   e) Respect autonomy and dignity of patients (1.8)
   f) Recognize importance of disclosure of medical error and adverse events and participate in such disclosure when appropriate (1.9)

58) **Demonstrate** a commitment to physician health and sustainable practice (3)
   a) Balance personal and professional priorities to ensure personal health and a sustainable practice (3.1)