

Effective for residents who enter training on or after July 1, 2019.

DEFINITION

Neurosurgery is the specialty of surgery dedicated to the diagnosis, surgical and non-surgical management of congenital abnormalities, trauma, and diseases affecting the nervous system, its blood supply, and supporting structures, in both adults and children.

NEUROSURGERY PRACTICE

Neurosurgery is the surgical specialty that enhances survival and improves the quality of life of patients with disorders of the central and peripheral nervous system. This includes conditions affecting the brain, skull, spinal cord, spinal discs, vertebrae, cranial, cervical and spinal blood vessels, nerves, ligaments, and the protective coverings that offer support to the nervous tissues.

Neurosurgeons are involved in the care of patients with neurosurgical emergencies and patients referred for suspected neurosurgical conditions. Neurosurgeons select investigations and synthesize the results to determine the indications for medical or surgical treatment, and/or further consultation. When surgery is indicated, neurosurgeons optimize patients for surgery and perform the appropriate procedures. They provide neuro-critical care for patients with neurosurgical emergencies as well as those for whom it is part of post-operative management. Post-operative recovery may lead to transition of care back to the patient's primary care provider, another specialty service, or referral to rehabilitation services. Neurosurgeons provide long-term follow-up or surveillance for a limited number of conditions.

Patients with neurosurgical emergencies require immediate clinical assessment along with neuroimaging to identify opportunities for intervention and to optimize neurologic outcomes. This need for immediate consultant level care and access to neuroimaging delineates the practice locations of Neurosurgeons, requiring that they primarily practice in institutions with advanced imaging services, in either academic or larger community based settings.

The practice of Neurosurgery interconnects with other disciplines in the neurosciences for the care of mutual patients. In addition, neurosurgeons may work in intraprofessional teams with interventional radiologists or neuroradiologists for the care of patients with cerebrovascular disease, with orthopedic surgeons for the care of patients with spinal conditions, and with medical or radiation oncologists for the care of patients with cancer affecting the central and peripheral nervous system.

The breadth of Neurosurgery, and the available treatment options, has led to the delineation of distinct clinical areas of the specialty: functional neurosurgery, surgical neuro-oncology, peripheral nerve repair, spinal neurosurgery, vascular and endovascular neurosurgery, radiosurgery, skull base neurosurgery, pediatric neurosurgery, neuro-trauma and neuro-critical care. Some neurosurgeons undertake advanced training and/or focus their practice in one or more of these areas.

NEUROSURGERY COMPETENCIES

Medical Expert

Definition:

As *Medical Experts*, Neurosurgeons integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional values in their provision of high-quality and safe patient-centred care. Medical Expert is the central physician Role in the CanMEDS Framework and defines the physician's clinical scope of practice.

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

1. Practise medicine within their defined scope of practice and expertise

- 1.1. Demonstrate a commitment to high-quality care of their patients
- 1.2. Integrate the CanMEDS Intrinsic Roles into their practice of Neurosurgery
- 1.3. Demonstrate the competencies of Surgical Foundations
- 1.4. Apply knowledge of the clinical and biomedical sciences relevant to Neurosurgery
 - 1.4.1. Embryology of the nervous system and the pathogenesis of congenital anomalies
 - 1.4.2. Anatomy and physiology of the nervous system
 - 1.4.2.1. Cerebral cortex, subcortical regions, basal ganglia, thalamus, brain stem, cerebellum and cranial nerves
 - 1.4.2.2. Pituitary gland and neuroendocrine function
 - 1.4.2.3. Meninges
 - 1.4.2.4. Spinal cord
 - 1.4.2.5. Spine and skull
 - 1.4.2.6. Cerebral and spinal vessels
 - 1.4.2.7. Nerve roots, peripheral nerves and associated muscles
 - 1.4.2.8. Neurotransmission
 - 1.4.2.9. Formation, circulation and absorption of cerebrospinal fluid (CSF)
 - 1.4.2.10. Autonomic nervous system
 - 1.4.2.11. Motor and sensory systems
 - 1.4.2.12. Special senses

- 1.4.2.13. Consciousness, sleep and mechanisms of wakefulness
- 1.4.2.14. Speech, memory, learning and behaviour
- 1.4.2.15. Pain

- 1.4.3. Fundamentals of clinical neuroendocrinology
- 1.4.4. Gross and microscopic pathology of neurosurgical conditions
- 1.4.5. Clinical and molecular genetics of neurosurgical conditions
- 1.4.6. Microbiology and pathology of infectious diseases of the nervous system
- 1.4.7. Clinical epidemiology of neurosurgical conditions
- 1.4.8. Clinical features, including symptoms, signs, natural history, and prognosis, of neurosurgical conditions in the following categories:
 - 1.4.8.1. Neurosurgical emergencies
 - 1.4.8.2. Trauma
 - 1.4.8.3. Infection and inflammation
 - 1.4.8.4. CSF disorders
 - 1.4.8.5. Pediatric and congenital
 - 1.4.8.6. Neuro-oncology
 - 1.4.8.7. Cerebrovascular
 - 1.4.8.8. Functional neurosurgery
 - 1.4.8.9. Peripheral nerve
 - 1.4.8.10. Spinal neurosurgery

- 1.4.9. Common neurological conditions, with particular emphasis on those neurological entities which have important differential diagnostic considerations with respect to neurosurgical care
- 1.4.10. Principles of neuro-ophthalmology and neuro-otology
- 1.4.11. Principles of neuropsychology relevant to Neurosurgery
- 1.4.12. Fundamental principles of neuroanesthesia
- 1.4.13. Principles of neuro-critical care
- 1.4.14. Clinical pharmacology: the indications for, mechanism(s) of action of, side effects of, and dosages of drugs and agents used in neurosurgical therapeutics
- 1.4.15. Principles of radiation safety and protection
- 1.4.16. Fundamental knowledge of imaging modalities, techniques, and contrast agents, including benefits and risks, for care of neurosurgical patients
- 1.4.17. Therapeutic and toxic effects of radiation therapy on the nervous system and supporting structures

1.4.18. Principles of, and procedures for, surgical management of functional neurosurgical conditions

1.4.18.1. Epilepsy

1.4.18.2. Pain and spasticity

1.4.18.3. Movement disorders

1.4.19. Principles of physical medicine and rehabilitation in the treatment of neurosurgical patients

1.4.20. Pathophysiology and principles of the declaration of neurologically determined death

1.5. Perform appropriately timed clinical assessments with recommendations that are presented in an organized manner

1.6. Carry out professional duties in the face of multiple, competing demands

1.7. Recognize and respond to the complexity, uncertainty, and ambiguity inherent in Neurosurgery practice

2. Perform a patient-centred clinical assessment and establish a management plan

2.1. Prioritize issues to be addressed in a patient encounter

2.1.1. Identify patients at risk of clinical deterioration

2.1.2. Triage patients based on clinical presentation and medical imaging to determine priorities and the appropriate setting of care

2.2. Elicit a history, perform a physical exam, select appropriate investigations, and interpret their results for the purpose of diagnosis and management, disease prevention, and health promotion

2.2.1. Identify and interpret the clinical significance of the findings of a neurological examination

2.2.2. Assess patients preoperatively and determine the significance of pre-existing medical conditions, and their impact on perioperative risk

2.2.3. Select and interpret general diagnostic tests for the management of neurosurgical patients

2.2.4. Select and interpret neuroimaging investigations

2.2.4.1. Radiography

2.2.4.2. Computerized tomography

2.2.4.3. Magnetic resonance imaging

2.2.4.4. Angiography

- 2.2.5. Select specific diagnostic investigations for the management of neurosurgical patients and interpret their reports
 - 2.2.5.1. Cerebrospinal fluid studies
 - 2.2.5.2. Clinical electrophysiology
 - 2.2.5.2.1. Electroencephalography
 - 2.2.5.2.2. Electrocorticography
 - 2.2.5.2.3. Evoked potentials
 - 2.2.5.2.4. Electromyography
 - 2.2.5.2.5. Nerve conduction studies
 - 2.2.5.3. Ultrasonography
 - 2.2.5.4. Advanced neuroimaging techniques
 - 2.2.5.4.1. Positron emission tomography (PET)
 - 2.2.5.4.2. Single-photon emission computed tomography (SPECT)
 - 2.2.5.4.3. Functional magnetic resonance imaging (fMRI)
 - 2.2.5.4.4. Magnetic resonance (MR) spectroscopy
 - 2.2.5.4.5. Perfusion imaging
- 2.2.6. Synthesize clinical information and diagnostic investigations to determine the appropriateness of surgical intervention, and to plan perioperative management and risk mitigation
- 2.3. Establish goals of care in collaboration with patients and their families¹, which may include slowing disease progression, treating symptoms, achieving cure, improving function, and palliation
 - 2.3.1. Recognize and respond to changes in patient status that indicate a need to reassess goals of care
- 2.4. Establish a patient-centred management plan
 - 2.4.1. Determine the appropriate setting of care for the patient's clinical status, and arrange admission or transfer to alternative levels of care, as appropriate
 - 2.4.2. Provide initial and definitive management for patients with cranial emergencies
 - 2.4.3. Provide initial and definitive management for patients with spinal emergencies

¹ Throughout this document, phrases such as "patients and their families" are intended to include all those who are personally significant to the patient and are concerned with his or her care, including, according to the patient's circumstances, family members, partners, caregivers, legal guardian, and substitute decision-makers.

- 2.4.4. Provide neuro-critical care
 - 2.4.4.1. Medical stabilization of patients, including airway management, ventilation and spinal precautions
 - 2.4.4.2. Prevention and/or treatment of increased intracranial pressure
 - 2.4.4.3. Prevention and/or treatment of cerebral vasospasm
- 2.4.5. Recommend surgical or non-surgical approaches
- 2.4.6. Recommend neuroradiological interventions
- 2.4.7. Provide supportive and/or postoperative management in the critical care setting and on the inpatient ward
- 2.4.8. Provide appropriate follow-up care, including evaluations for rehabilitation

3. Plan and perform procedures and therapies for the purpose of assessment and/or management

- 3.1. Determine the most appropriate procedures or therapies
 - 3.1.1. Fluids for correction of metabolic abnormalities, volume management and resuscitation
 - 3.1.2. Blood products, recombinant factors, and anticoagulants
 - 3.1.3. Medications and relevant therapeutics
 - 3.1.4. Tissue sampling for pathological diagnosis
 - 3.1.5. Injection of therapeutic substances
 - 3.1.6. Neurointerventional procedures
 - 3.1.7. Radiosurgery
 - 3.1.8. Surgical intervention
 - 3.1.9. Rehabilitation
- 3.2. Obtain and document informed consent, explaining the risks and benefits of, and the rationale for, a proposed procedure or therapy
 - 3.2.1. Demonstrate comprehensive knowledge of the indications for and contraindications of neurosurgical procedures
- 3.3. Prioritize procedures or therapies, taking into account clinical urgency and available resources

3.4. Perform procedures in a skilful and safe manner, adapting to unanticipated findings or changing clinical circumstances

General:

- 3.4.1. Utilization of image guidance technology
- 3.4.2. Utilization of intraoperative monitoring
- 3.4.3. Utilization of intracranial pressure monitoring
- 3.4.4. Fine needle aspiration and tissue biopsies and resections
- 3.4.5. Treatment of simple and compound depressed skull fractures
- 3.4.6. Drainage of epidural, subdural and intraparenchymal abscesses
- 3.4.7. Evacuation of epidural, subdural and intraparenchymal hematomas
- 3.4.8. Decompressive craniectomy
- 3.4.9. Cerebrospinal fluid management:
 - 3.4.9.1. CSF sampling
 - 3.4.9.2. Placement of external ventricular drains and lumbar drains; tapping of reservoir systems
 - 3.4.9.3. Placement of ventricular/cyst/spinal shunts
 - 3.4.9.4. Endoscopic third ventriculostomy
 - 3.4.9.5. Cyst fenestration
 - 3.4.9.6. Repair of cerebrospinal fluid leak repair
- 3.4.10. Surgical treatment of Chiari malformations
- 3.4.11. Cranioplasty

Functional:

- 3.4.12. Application of a stereotactic frame
- 3.4.13. Cranial nerve microvascular decompression
- 3.4.14. Percutaneous techniques for trigeminal neuralgia
- 3.4.15. Troubleshoot/maintain neuromodulation devices

Spinal:

- 3.4.16. Application of Gardner–Wells tongs or halo ring for traction, closed reduction, and intraoperative reduction of spinal deformity
- 3.4.17. Application of a halo ring and vest
- 3.4.18. Bone harvesting
- 3.4.19. Cervical decompression

- 3.4.20. Thoracic decompression
- 3.4.21. Lumbar decompression
- 3.4.22. Spinal instrumentation
 - 3.4.22.1. Occipito-cervical
 - 3.4.22.2. Anterior cervical
 - 3.4.22.3. Posterior cervical
 - 3.4.22.4. Posterior thoraco-lumbar
- 3.4.23. Surgical management of intradural lesions

Peripheral nerve:

- 3.4.24. Carpal tunnel decompression
- 3.4.25. Ulnar nerve decompression and transposition
- 3.4.26. Nerve and muscle biopsy
- 3.4.27. Sural nerve harvest
- 3.4.28. Resection of simple nerve tumours

Neuro-oncology:

- 3.4.29. Open biopsy
- 3.4.30. Stereotactic biopsy
- 3.4.31. Endoscopic biopsy
- 3.4.32. Intra-axial tumour removal
- 3.4.33. Extra-axial tumour removal
- 3.4.34. Transsphenoidal removal of pituitary tumours

Vascular:

- 3.4.35. Surgical clipping of cerebral aneurysms
- 3.4.36. Surgical management of intracranial vascular malformations
- 3.4.37. Carotid endarterectomy

Pediatric:

- 3.4.38. Surgical treatment of spinal dysraphism
- 3.4.39. Surgical treatment of craniosynostosis

4. Establish plans for ongoing care and, when appropriate, timely consultation

- 4.1. Implement a patient-centred care plan that supports ongoing care, follow-up on investigations, response to treatment, and further consultation
 - 4.1.1. Recognize and manage complications of neurosurgical conditions, interventions and treatments
 - 4.1.1.1. Bleeding
 - 4.1.1.2. Neurologic deficits
 - 4.1.1.3. Endocrine and metabolic disturbances
 - 4.1.1.4. Infection
 - 4.1.1.5. Vasospasm
 - 4.1.2. Identify indications for consultation with other health care professionals
 - 4.1.2.1. Provide referral for advanced neurosurgical procedures
 - 4.1.2.2. Identify indications for and timing of consultation with medical and/or radiation oncologists
 - 4.1.2.3. Identify indications for and timing of intraoperative pathology consultation
 - 4.1.3. Provide follow-up on results of investigations and response to treatment
 - 4.1.4. Provide management and/or referral for end-of-life care

5. Actively contribute, as an individual and as a member of a team providing care, to the continuous improvement of health care quality and patient safety

- 5.1. Recognize and respond to harm from health care delivery, including patient safety incidents
- 5.2. Adopt strategies that promote patient safety and address human and system factors

Communicator

Definition:

As *Communicators*, Neurosurgeons form relationships with patients and their families that facilitate the gathering and sharing of essential information for effective health care.

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

1. Establish professional therapeutic relationships with patients and their families

- 1.1. Communicate using a patient-centred approach that encourages patient trust and autonomy and is characterized by empathy, respect, and compassion

- 1.2. Optimize the physical environment for patient comfort, dignity, privacy, engagement, and safety
- 1.3. Recognize when the perspectives, values, or biases of patients, physicians, or other health care professionals may have an impact on the quality of care, and modify the approach to the patient accordingly
- 1.4. Respond to a patient's non-verbal behaviours to enhance communication
- 1.5. Manage disagreements and emotionally charged conversations
- 1.6. Adapt to the unique needs and preferences of each patient and to his or her clinical condition and circumstances
 - 1.6.1. Use appropriate language and terminology to facilitate understanding and decision making

2. Elicit and synthesize accurate and relevant information, incorporating the perspectives of patients and their families

- 2.1. Use patient-centred interviewing skills to effectively gather relevant biomedical and psychosocial information
- 2.2. Provide a clear structure for and manage the flow of an entire patient encounter
- 2.3. Seek and synthesize relevant information from other sources, including the patient's family, with the patient's consent

3. Share health care information and plans with patients and their families

- 3.1. Share information and explanations that are clear, accurate, and timely, while assessing for patient and family understanding
 - 3.1.1. Deliver information about progression of disease and/or poor prognosis in an empathetic manner
- 3.2. Disclose harmful patient safety incidents to patients and their families accurately and appropriately

4. Engage patients and their families in developing plans that reflect the patient's health care needs and goals

- 4.1. Facilitate discussions with patients and their families in a way that is respectful, non-judgmental, and culturally safe
- 4.2. Assist patients and their families to identify, access, and make use of information and communication technologies to support their care and manage their health
- 4.3. Use communication skills and strategies that help patients and their families make informed decisions regarding their health

5. Document and share written and electronic information about the medical encounter to optimize clinical decision-making, patient safety, confidentiality, and privacy

- 5.1. Document clinical encounters in an accurate, complete, timely, and accessible manner, in compliance with regulatory and legal requirements
 - 5.1.1. Document discussions regarding informed consent in an accurate and complete manner
 - 5.1.2. Prepare concise, clear descriptions of surgical procedures
 - 5.1.3. Prepare consultation, discharge, progress and clinic notes that are well organized, document all relevant findings and provide a clear opinion and a plan for ongoing management
- 5.2. Communicate effectively using a written health record, electronic medical record, or other digital technology
- 5.3. Share information with patients and others in a manner that respects patient privacy and confidentiality, and enhances understanding

Collaborator

Definition:

As *Collaborators*, Neurosurgeons work effectively with other health care professionals to provide safe, high-quality patient-centred care.

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

1. Work effectively with physicians and other colleagues in the health care professions

- 1.1. Establish and maintain positive relationships with physicians and other colleagues in the health care professions to support relationship-centred collaborative care
- 1.2. Negotiate overlapping and shared responsibilities with physicians and other colleagues in the health care professions in episodic and ongoing care
 - 1.2.1. Consult with other specialists, colleagues and health professionals with regard to patients' medical, surgical, psychosocial, and rehabilitative issues
- 1.3. Engage in respectful shared decision-making with physicians and other colleagues in the health care professions
 - 1.3.1. Convey patient information to a group of peers or other health care professionals in a clear and understandable manner
 - 1.3.2. Contribute neurosurgical expertise to team decisions regarding patient care

2. Work with physicians and other colleagues in the health care professions to promote understanding, manage differences, and resolve conflicts

- 2.1. Show respect toward collaborators
- 2.2. Implement strategies to promote understanding, manage differences, and resolve conflict in a manner that supports a collaborative culture

3. Hand over the care of a patient to another health care professional to facilitate continuity of safe patient care

- 3.1. Determine when care should be transferred to another physician or health care professional
- 3.2. Demonstrate safe handover of care, using both verbal and written communication, during a patient transition to a different health care professional, setting, or stage of care
 - 3.2.1. Summarize the patient's issues for the receiving care provider, including plans to deal with ongoing issues as well as anticipated changes in the clinical course

Leader

Definition:

As *Leaders*, Neurosurgeons engage with others to contribute to a vision of a high-quality health care system and take responsibility for the delivery of excellent patient care through their activities as clinicians, administrators, scholars, or teachers.

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

1. Contribute to the improvement of health care delivery in teams, organizations, and systems

- 1.1. Apply the science of quality improvement to contribute to improving systems of patient care
 - 1.1.1. Identify potential improvement opportunities arising from the review of patient outcomes
 - 1.1.2. Participate in quality improvement initiatives
- 1.2. Contribute to a culture that promotes patient safety
- 1.3. Analyze patient safety incidents to enhance systems of care
- 1.4. Use health informatics to improve the quality of patient care and optimize patient safety

2. Engage in the stewardship of health care resources

- 2.1. Allocate health care resources for optimal patient care
 - 2.1.1. Determine priorities of surgical cases based on clinical urgency and available resources
- 2.2. Apply evidence and management processes to achieve cost-appropriate care
 - 2.2.1. Incorporate considerations of resource stewardship into decisions regarding the timing and frequency of use of medical imaging and operating room resources

3. Demonstrate leadership in health care systems

- 3.1. Demonstrate leadership skills to enhance health care
 - 3.1.1. Contribute administrative skills to the physician team, including leadership of committees and teams
- 3.2. Facilitate change in health care to enhance services and outcomes

4. Manage career planning, finances, and health human resources in personal practice(s)

- 4.1. Set priorities and manage time to integrate practice and personal life
- 4.2. Manage personal professional practice(s) and career
 - 4.2.1. Apply leadership skills to optimize patient care in the operating room
 - 4.2.2. Adhere to occupational safety procedures to ensure personal and team safety
- 4.3. Implement processes to ensure personal practice improvement

Health Advocate

Definition:

As *Health Advocates*, Neurosurgeons contribute their expertise and influence as they work with communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when required, and support the mobilization of resources to effect change.

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

1. Respond to an individual patient's health needs by advocating with the patient within and beyond the clinical environment

- 1.1. Work with patients to address determinants of health that affect them and their access to needed health services or resources
 - 1.1.1. Facilitate patient access to diagnostic, therapeutic and rehabilitative services and resources
- 1.2. Work with patients and their families to increase opportunities to adopt healthy behaviours
 - 1.2.1. Counsel patients regarding secondary prevention of cerebrovascular disease, including smoking cessation and blood pressure control
 - 1.2.2. Counsel patients regarding preventive strategies for trauma and head injury, including seat belt use and child restraints, helmet use, and avoidance of driving while impaired
 - 1.2.3. Counsel patients and families regarding appropriate timing of return to athletic activities following neurologic trauma
- 1.3. Incorporate disease prevention, health promotion, and health surveillance into interactions with individual patients
 - 1.3.1. Apply appropriate secondary prevention strategies for cerebrovascular disease
 - 1.3.2. Recommend screening for relatives of patients with hereditary neurosurgical conditions

2. Respond to the needs of the communities or populations they serve by advocating with them for system-level change in a socially accountable manner

- 2.1. Work with a community or population to identify the determinants of health that affect them
- 2.2. Improve clinical practice by applying a process of continuous quality improvement to disease prevention, health promotion, and health surveillance activities
- 2.3. Contribute to a process to improve health in the community or population they serve
 - 2.3.1. Work to ensure timely access to services and system of care for patients with neurosurgical emergencies, including adequate access to appropriate medical imaging, critical care, pathology, and operating room resources

Scholar

Definition:

As *Scholars*, Neurosurgeons demonstrate a lifelong commitment to excellence in practice through continuous learning, and by teaching others, evaluating evidence, and contributing to scholarship.

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

1. Engage in the continuous enhancement of their professional activities through ongoing learning

- 1.1. Develop, implement, monitor, and revise a personal learning plan to enhance professional practice
- 1.2. Identify opportunities for learning and improvement by regularly reflecting on and assessing their performance using various internal and external data sources
 - 1.2.1. Seek, maintain and regularly review performance data to continually improve performance
- 1.3. Engage in collaborative learning to continuously improve personal practice and contribute to collective improvements in practice

2. Teach students, residents, the public, and other health care professionals

- 2.1. Recognize the influence of role-modelling and the impact of the formal, informal, and hidden curriculum on learners
- 2.2. Promote a safe and respectful learning environment
- 2.3. Ensure patient safety is maintained when learners are involved
 - 2.3.1. Supervise learners to ensure they work within their limits
- 2.4. Plan and deliver learning activities
- 2.5. Provide feedback to enhance learning and performance
- 2.6. Assess and evaluate learners, teachers, and programs in an educationally appropriate manner

3. Integrate best available evidence into practice

- 3.1. Recognize practice uncertainty and knowledge gaps in clinical and other professional encounters and generate focused questions that can address them
- 3.2. Identify, select, and navigate pre-appraised resources
- 3.3. Critically evaluate the integrity, reliability, and applicability of health-related research and literature
- 3.4. Integrate evidence into decision-making in their practice

4. Contribute to the creation and dissemination of knowledge and practices applicable to health

- 4.1. Demonstrate an understanding of the scientific principles of research and scholarly inquiry and the role of research evidence in health care
- 4.2. Identify ethical principles for research and incorporate them into obtaining informed consent, considering potential harms and benefits, and considering vulnerable populations
- 4.3. Contribute to the work of a research program
- 4.4. Pose questions amenable to scholarly investigation and select appropriate methods to address them
 - 4.4.1. Conduct scholarly work
- 4.5. Summarize and communicate to professional and lay audiences, including patients and their families, the findings of relevant research and scholarly inquiry

Professional

Definition:

As *Professionals*, Neurosurgeons are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, accountability to the profession and society, physician-led regulation, and maintenance of personal health.

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

1. Demonstrate a commitment to patients by applying best practices and adhering to high ethical standards

- 1.1. Exhibit appropriate professional behaviours and relationships in all aspects of practice, demonstrating honesty, integrity, humility, commitment, compassion, respect, altruism, respect for diversity, and maintenance of confidentiality
- 1.2. Demonstrate a commitment to excellence in all aspects of practice
 - 1.2.1. Maintain a log of procedures and their outcomes, for the purposes of continually improving performance
 - 1.2.2. Identify and respect limits in their expertise
- 1.3. Recognize and respond to ethical issues encountered in practice
- 1.4. Recognize and manage conflicts of interest
- 1.5. Exhibit professional behaviours in the use of technology-enabled communication
 - 1.5.1. Respect boundaries and patient privacy

2. Demonstrate a commitment to society by recognizing and responding to societal expectations in health care

- 2.1. Demonstrate accountability to patients, society, and the profession by responding to societal expectations of physicians
- 2.2. Demonstrate a commitment to patient safety and quality improvement

3. Demonstrate a commitment to the profession by adhering to standards and participating in physician-led regulation

- 3.1. Fulfil and adhere to the professional and ethical codes, standards of practice, and laws governing practice
 - 3.1.1. Apply professional standards for the determination of neurologically determined death
 - 3.1.2. Apply professional standards and laws governing capacity and competence for medical decision making
 - 3.1.3. Apply the law as well as local policies and procedures relevant to substitute decision making, and document advance directives and goals of care
 - 3.1.4. Contribute to public safety through adherence to requirements for mandatory reporting, such as driving restrictions, reportable infections and suspicious injuries
- 3.2. Recognize and respond to unprofessional and unethical behaviours in physicians and other colleagues in the health care professions
- 3.3. Participate in peer assessment and standard-setting

4. Demonstrate a commitment to physician health and well-being to foster optimal patient care

- 4.1. Exhibit self-awareness and manage influences on personal well-being and professional performance
 - 4.1.1. Develop effective strategies to monitor fatigue and mitigate its effects on clinical performance
 - 4.1.2. Demonstrate knowledge of occupational hazards in neurosurgical practice and implement measures to minimize those risks

NEUROSURGERY COMPETENCIES (2019)

- 4.2. Manage personal and professional demands for a sustainable practice throughout the physician life cycle
- 4.3. Promote a culture that recognizes, supports, and responds effectively to colleagues in need

This document is to be reviewed by the Specialty Committee in Neurosurgery by February 2020.

APPROVED – Specialty Standards Review Committee – February 2018