

Neurosurgical Training in Canada: A National Exit Survey of Graduating

Thank you for participating in this study. The purpose of this survey is to evaluate the effectiveness of the existing training programs in Canada at achieving the new Objectives of Training in Neurosurgery (revised July 2010).

Several surgical organizations have recognized the need to assess the value of residency training and the preparedness for practice. To date, there has been no comprehensive study conducted among neurosurgical residency graduates regarding the quality and value of their educational and training experience in preparing them for independent practice.

As such, with the support of the Royal College Specialty Committee for Neurosurgery, our aim is to determine the thoughts and attitudes of graduating neurosurgeons and their program directors (PDs) regarding the preparedness of trainees to practice independently in the areas outlined in the Objectives for Training. This information is useful to strategic planning and educational program development of neurosurgical residency programs in the future.

It is recognized that graduate and PD opinion is only one aspect of assessing the quality of training, and that these opinions are subjective. As such, no individual or program specific data will be reported; only aggregate results to be published.

You will require approximately 20 minutes to complete the questionnaire in full. Your participation is voluntary; if you choose not to answer a question, simply close the browser and your data will not be recorded. If you have any questions or concerns, please contact the Primary Investigators.

Demographic Information

*1. Please complete the following:

Gender:	<input type="text"/>
Age:	<input type="text"/>
Residency Program Name:	<input type="text"/>
Age at start of Residency Training:	<input type="text"/>
Number of years required to complete neurosurgical residency training:	<input type="text"/>

*2. Did you complete any residency training in neurosurgery prior to your current training program?

- Yes
- No

If yes, how many years of training did you complete and in which specialty?

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***3. Did you extend your training to complete a research program/fellowship or graduate degree?**

- Yes
- No

If yes, for how long?

***4. Did you pursue an in-folded clinical fellowship?**

- Yes
- No

If yes, for how long and in which subspecialty?

***5. Did you suspend your clinical training (not including research/clinical fellowship) for any period?**

- Yes
- No

If yes, how long?

Non-Procedural Knowledge and Skills

***6. I am capable of complete the following tasks to the expected competence level of an independently practicing neurosurgeon:**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Perform a neurosurgical consultation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Identify and respond to ethical issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Prioritize professional duties when faced with multiple patients and problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrate compassionate and patient-centered care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you checked (strongly) disagree for any of the above, please indicate what factors prevented you from completing these tasks to the expected level of competence

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***7. I possess the necessary knowledge in the following clinical areas to allow me to function as an independently practicing neurosurgeon:**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Clinical, socio-behavioural, and fundamental biomedical sciences relevant to neurosurgery (e.g. common neurological conditions, neuroendocrinology, neuro-ophthalmology/otology, neuropsychology, rehabilitation, anesthesia, pharmacology, infectious diseases, genetics, radiation therapy, epidemiology)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gross and microscopic pathology of neurosurgical conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anatomy, physiology and embryology of the nervous system and associated systems relevant to neurosurgical procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Interpretation of diagnostic tests (CSF studies, electrophysiology, and neuroimaging)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you checked (strongly) disagree for any of the above, please indicate what factors have prevented you from gaining the necessary knowledge in these areas to the expected level:

Standard Procedure Knowledge/Skills

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*8. I am able to independently perform the following CRANIAL neurosurgical procedures:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Burrholes for intracranial biopsy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burrholes for evacuation of hematoma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burrholes for intracranial pressure monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craniotomy (supra/infratentorial) for evacuation of hematomas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craniotomy (supra/infratentorial) for treatment of intracranial infections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craniotomy (supra/infratentorial) for brain biopsy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Decompressive craniectomy (supra/infratentorial)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Utilization of image guidance technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The treatment of simple and compound depressed skull fractures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cranioplasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
External ventricular drainage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Endoscopic third ventriculostomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventricular shunt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventricular cyst or access device insertion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please list all procedures from the above list that you do not feel you are able to perform independently and indicate what factors have prevented you from being able to do so (inadequate exposure/case load, too complex, etc.):

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*9. I am able to independently perform the following procedures for the treatment of congenital, degenerative, neoplastic, traumatic and infectious SPINAL pathology:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Anterior cervical discectomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anterior vertebrectomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior cervical laminectomy/ foramenotomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior thoracic laminectomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterolateral thoracic decompression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior lumbar laminectomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior lumbar discectomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterolateral lumbar decompression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anterior cervical spinal arthrodesis +/- instrumentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior cranial-cervical/axial arthrodesis (occiput, C1, C2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior subaxial cervical arthrodesis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior throacolumbar arthrodesis (+/- instrumentation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Posterior lumbar arthrodesis (+/- instrumentation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Closed reduction and external immobilization of cervical spinal fractures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resection of intradural extramedullary spinal tumours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spinal CSF diversion/shunt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CSF Leak Repair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please list all procedures from the above list that you do not feel you are able to perform independently and indicate what factors have prevented you from being able to do so (inadequate exposure/case load, too complex, etc.):

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***10. I am able to independently perform the following neuro-oncological, neurovascular, pediatric, functional and peripheral nerve procedures:**

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Craniotomy (supra/infratentorial) for resection of intrinsic/extrinsic tumors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transsphenoidal removal of pituitary tumours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ventricular endoscopy for tumour biopsy or excision	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craniotomy (supra/infratentorial) for repair of cerebral aneurysms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extracranial cerebrovascular procedures (including carotid endarterectomy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Release of tethered cord	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Treatment of simple sagittal craniosynostosis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fontanelle tap	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Skull tumour biopsy/resection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Microvascular decompression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Percutaneous techniques for trigeminal neuralgia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carpal tunnel decompression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ulnar nerve decompression and transposition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nerve and muscle biopsy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sural nerve harvest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resection of simple nerve tumours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please list all procedures from the above list that you do not feel you are able to perform independently and indicate what factors have prevented you from being able to do so (inadequate exposure/case load, too complex, etc.):

Complex Procedure Knowledge

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***11. I am able to describe the nature and purpose, indications, and potential complications of the following procedures to the expected competence level of an independent neurosurgeon:**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Craniotomy (supra/infratentorial) for complex aneurysms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craniotomy (supra/infratentorial) for vascular malformations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craniotomy (supra/infratentorial) for vascular reconstruction and bypass	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Craniotomy (supra/infratentorial) for complex intrinsic and extrinsic tumours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stereotactic and functional procedures: DBS, Spinal Stimulation, Intrathecal pump inserion, DREZ	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgical reatment of epilepsy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expanded endonasal skull base approaches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stereotactic radiotherapy and radiosurgery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carotid stenting and endovascular embolization of vascular and neoplastic lesions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transoral spinal decompression	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoracic anterior transcavitary spinal decompression (discectomy/vertebrectomy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lumbosacral transabdominal or retroperitoneal spinal decompression (discectomy/vertebrectomy)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Odontoid screw fixation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
C1/C2 fixation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multilevel complex spinal reconstruction and arthrodesis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cervical-thoracic arthrodesis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thoracic arthrodesis (+/- instrumentation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vertebroplasty/Kyphoplasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Laminoplasty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgical management of spinal cord tumours and vascular malformations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgical management of complex dysraphic conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgical management of brachial plexus lesions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nerve grafting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgery for entrapment neuropathies other than CTS and ulnar nerve	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Surgical management of complex nerve tumours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sympathectomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you checked (strongly) disagree for any of the above, please indicate what factors have prevented you from gaining the necessary knowledge in these areas to the expected level:

CanMEDS Competencies

***12. I have sufficiently developed skills in the following CanMEDS roles to the expected competence level for an independent neurosurgeon:**

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Communicator: Be able to establish a therapeutic relationship, elicit, synthesize and convey relevant information, develop a shared plan of care and communicate this orally and in written form	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborator: Be able to participate effectively in an interprofessional health care team and work with others to resolve interprofessional conflict	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manager: Be able to contribute to the effectiveness of the health care organization and system, manage a practice/ career, allocate finite resources appropriately and serve in admin and leadership roles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Health Advocate: Be able to responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scholar: Demonstrate a lifelong learning, critical appraisal, and contribute to the development and dissemination of new knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Professional: Be able to demonstrate commitment to the health and well-being of individuals and society through ethical practice, profession-led regulation, and personal health and sustainable practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you checked (strongly) disagree for any of the above, please indicate what factors have prevented you from developing the above CanMEDS competencies to the expected level:

Concluding Remarks

13. Please provide any additional comments regarding your residency training and its preparation of you for independent practice below: