



## Survey of neuroanesthesia fellowships in Canada

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### To the Editor,

In the recent article by Kahn *et al*, we read with interest that 70% of Canadian anesthesia residents plan to pursue fellowship training.<sup>1</sup> A recent survey of the membership of the Society of Neuroanesthesia and Critical Care (SNACC) demonstrated interest in pursuing accreditation,<sup>2</sup> following which SNACC developed curriculum guidelines for neuroanesthesia fellowships.<sup>3</sup> Although neuroanesthesia fellowships are offered in Canada, the prevalence and content are unknown. Given the lack of standardization of goals or objectives for neuroanesthesia fellowships in Canada, the content and structure may vary significantly. In addition, the support for accreditation in Canada is unclear. Our objectives were to determine the prevalence and characteristics of Canadian neuroanesthesia fellowships, identify barriers to the establishment of programs, and determine the level of support for standardization and accreditation of these fellowships.

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Following approval from the University of British Columbia Behavioral Research Ethics Board (H15-01640), we conducted a cross-sectional survey of all anesthesia departments with membership in the Association of Canadian University Departments of Anesthesia. We developed a web-based survey (<http://www.simplesurvey.com/>) and e-mailed the survey link to the Neuroanesthesia Program Director identified on the respective university anesthesia department website between September 22, 2015 and November 2, 2015. If a Program Director was not identified, we instead contacted the Department Chair. We included questions about the presence and characteristics of a neuroanesthesia fellowship program, support for standardization of goals and objectives, and accreditation of neuroanesthesia fellowship programs in Canada (Appendix; available as Electronic Supplementary Material).

Of the 17 anesthesia departments contacted, ten (59%) responded, including five of the eight (63%) identified as having a neuroanesthesia fellowship on the Internet. Of note, 50% of the responding departments did not have a fellowship program. Among those with a fellowship, most had been active for more than ten years (80%,  $n = 4$ ). All of the fellowships lasted one year and typically included a mix of clinical exposure to neuroanesthesia (two to three days/week) and research/academic activities (one day/week), although the clinical exposure varied (Table 1). The programs were designed to accommodate one (60%), two (20%), or four (20%) fellows per year. Program Directors thought that the number of applicants each year was either constant ( $n = 2$ ) or increasing ( $n = 3$ ). Barriers to program development were most frequently insufficient faculty (40%), low departmental interest (30%), low clinical volume (30%), and remuneration (30%). Although 80% ( $n = 4$ ) of Fellowship Directors thought the development of

**Table 1** Content of neuroanesthesia programs in Canada

Component	Frequently	Occasionally	Never
Intracranial tumour surgery	5 (100%)	0	0
Surgery for hydrocephalus	5 (100%)	0	0
Complex spine surgery	5 (100%)	0	0
Aneurysm/AVM surgery	4 (80%)	1 (20%)	0
Functional neurosurgery	4 (80%)	1 (20%)	0
Interventional neuroradiology	4 (80%)	1 (20%)	0
Carotid endarterectomy	4 (80%)	1 (20%)	0
Basic/clinical research	4 (80%)	1 (20%)	0
Publication of article	4 (80%)	1 (20%)	0
Presentation at conference	4 (80%)	1 (20%)	0
Surgery for traumatic brain injury	3 (60%)	1 (20%)	1 (20%)
Intraoperative neuromonitoring	3 (60%)	1 (20%)	1 (20%)
Neurocritical care	2 (40%)	0	3 (60%)
Epilepsy surgery	1 (20%)	1 (20%)	3 (60%)
Transesophageal echocardiography	0	2 (40%)	3 (60%)
Pediatric neurosurgery	0	1 (20%)	4 (80%)

AVM = arteriovenous malformation.

national goals and objectives would be useful, only one supported formal accreditation.

The question of whether subspecialization in anesthesia changes outcomes remains uncertain, although a recent study suggested that appropriate subspecialty-trained clinicians improves patient outcomes.<sup>4</sup> Recently, concern has been raised about the potential variability in the quality and experience of subspecialty training.<sup>5</sup> Standardization of fellowship content could be one solution. Interestingly, the majority of neuroanesthesia fellows in Canada appear to be international graduates, possibly reflecting the low level of interest in neuroanesthesia by Canadian residents reported by Kahn *et al.*<sup>1</sup>

Our survey suggests support for the development of a standardized curriculum, although our total number of respondents was low, and we did not capture all fellowship programs in our survey. Unlike the SNACC survey, wherein 64% of respondents supported some form of accreditation,<sup>2</sup> we found little support for accreditation in Canada. Although accreditation could potentially facilitate consistency of high-quality training, disadvantages might include longer training duration and additional expense with no guarantee of improved patient outcomes.<sup>2,6</sup>

In summary, the structure of neuroanesthesia fellowships in Canada appears to be consistent, although the content varies from one institution to another. The majority of fellows are international graduates, likely reflecting low interest among Canadian anesthesia residents. Whereas we identified interest in developing national goals and objectives, there was little interest in accreditation.

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