LETTER TO THE EDITOR

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Launch of the Canadian Neurosurgery Research Collaborative

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Evidence-based medicine is at the core of modern clinical decision making. Neurosurgery faces a unique combination of challenges in generating strong clinical evidence, including the rarity and heterogeneity of neurosurgical disease, the complexity of neurosurgical procedures, the high cost involved and difficulty in measuring clinically meaningful outcomes, and the relative lack of long-term outcome assessment. As a result, while Canadian neurosurgical research compares favourably with international efforts, neurosurgery as a field lags behind most other medical specialties in the number of published high-quality randomized controlled trials.

Many research networks have been established to facilitate multicentre neurosurgical studies, and they have demonstrated the feasibility and utility of collaboration. These include the International Gamma Knife Research Foundation, the Canadian Spine Outcomes and Research Network, the Spine Oncology Study Group, the Hydrocephalus Clinical Research Network, the Rick Hansen Spinal Cord Injury Registry and the Canadian Critical Care Trials Group. These subspecialty-focused networks provide the infrastructure for a variety of study designs (e.g., retrospective, prospective, observational and interventional), aiming to answer important research questions relevant to their fields.

Canadian neurosurgery residents are highly interested in research. A recent survey performed by our group showed that 75% would like to incorporate research as part of their future practice and that 78% would like to work in an academic centre. Moreover, 58% plan on completing an additional research degree (M.Sc. or Ph.D.) during training. Therefore, most Canadian neurosurgery residents retain a significant interest in research and the search for opportunities to build their research portfolio.

In the United Kingdom (UK), trainee-led research collaboratives have been established to tackle this problem. The West Midlands Research Collaborative (WMRC) was the first of its kind in the UK to successfully complete and publish a clinical trial of 760 patients recruited from 21 centres looking at the impact of wound edge protection devices on surgical site infection after laparotomy. To date, at least 27 collaboratives have been established in the UK, with the evidence suggesting that these geographically distant groups working in collaboration not only facilitate the completion of large-scale research studies but also enhance the research skills of their participants.

Given the evidence favouring the role of trainee-led research collaboratives in facilitating high-quality multicentre studies, we launched the Canadian Neurosurgery Research Collaborative (CNRC) in December of 2015 (www.neuronetwork.ca). The objectives of the CNRC are as follows:

- To facilitate the implementation of multicentre studies by:
  - ensuring the membership of at least one resident per Canadian neurosurgical residency program who can act as a site coordinator for CNRC studies;
  - providing a centralized data-collection and management infrastructure.
- To facilitate recruitment of large numbers of study participants by providing a stable, coordinated network of multiple high-volume academic centres across Canada.
- To foster a culture of collaboration in research among Canadian neurosurgical trainees.

The CNRC steering committee consists of neurosurgery residents representing each of the Canadian neurosurgery residency programs in addition to attending neurosurgeons as faculty advisors. Recruitment of residents forming the steering committee was based on references from program directors or neurosurgery attendings, with 13 neurosurgery residency programs currently represented in the CNRC. Future representatives will be elected by their peers. Executive positions on the steering committee include a president, vice-president and secretary, who are elected for one-year terms by committee members. The steering committee meets quarterly and oversees all CNRC activities, including study selection, protocol development, trial implementation, study conduct, analysis and reporting, as well as infrastructure development and funding.

The CNRC has developed a process for research protocol development, review and production. Research protocols submitted to the CNRC are reviewed by the steering committee within two weeks and assessed for feasibility, quality and relevance to the field. Thereafter, the steering committee conducts a meeting to anonymously vote for and confirm interest in a study protocol. A project manager is assigned by the steering committee and charged with the task of overseeing development of the research protocol, submitting the final version to the steering committee for approval prior to submission to the local research ethics board. Once the study is approved, the protocol is disseminated to ethics boards from all the participating centres.

The CNRC steering committee has developed authorship guidelines in order to clarify the attribution of “author” and “contributor” credentials. Three criteria are prerequisites for authorship:

- substantial contributions to conception and design of the work, or the acquisition, analysis and interpretation of data;
- drafting the work or revising it critically for important intellectual content or final approval of the manuscript before its publication;
- statistical analysis, obtaining funding or logistic and technical support or supervision.

Authors are determined by consensus and ordered based on the amount of time invested in the study. All papers benefiting from the CNRC infrastructure should list the CNRC as the last author. Individuals who contributed to the work but do not meet all three criteria are acknowledged. This policy is in accordance with the “Recommendations for the Conduct, Reporting, Editing and Publication of Scholarly Work in Medical Journals,” published by the International Committee of Medical Journal Editors (www.icmje.org).
Since its launch, eight research protocol abstracts have been reviewed by the steering committee, and two studies have been conducted:

- A cross-sectional study of the Canadian neurosurgery operative demographic landscape has been completed, and the manuscript is currently being drafted. 8
- A Canadian neurosurgery resident survey aiming to evaluate the educational and academic experience of neurosurgery residents across the country, where the study is completed, and the manuscript is being drafted. 3

Currently, the CNRC is preparing to conduct a multicentre prospective study entitled “A Nationwide Prospective Observational Study of External Ventricular Drainage Catheter Complications and Assessment of Their Potential Risk Factors,” with its research protocol being submitted to local research ethics boards.

Trainee-led research networks have been shown to be successful. The CNRC aims to facilitate multicentre neurosurgical research and cultivate a culture of collaboration among Canadian residents. We encourage trainees in other surgical subspecialties to follow suit in order to facilitate collaboration and provide the ability to ask and possibly answer controversial surgical questions to ensure a bright future for Canadian evidence-based surgical practice.

**DISCLOSURES**

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**STATEMENT OF AUTHORSHIP**

AY, MT and CIM wrote the manuscript. All authors contributed significantly to the foundation of the CNRC and critically reviewed the manuscript.

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