

INTERPRETATION OF SURGICAL NEUROMONITORING DATA IN CANADA: OUR VIEW

We read with interest the recent Discussions in Surgery article by Norton and colleagues (DOI: 10.1503/cjs.013214). We commend the authors for their efforts, as their survey highlights some important issues related to intraoperative neuromonitoring (IOM) in Canada. It is encouraging that there is increasing interest in the field. However, the authors point out the lack of trained IOM personnel to meet the needs of surgeons and the lack of consistent IOM training strategies in Canada.

The training of neuromonitoring skills is a key issue because the major thrust of the survey was the interpretation of results. We would like to offer our view on interpretation, as we see fundamental differences between the clinical neurophysiology laboratory and neuromonitoring in the operating room. As described in the paper by Norton and colleagues, the clinical neurophysiology lab typically includes certified technologists providing support for neurologists. The clinical practitioner furnishes a medical diagnosis usually based on several factors, including electrophysiological examinations. In the challenging environment of the operating room, the goal of the neuromonitorist is not diagnosis, but the evaluation of deviations from a set of baseline neurophysiological tests. It is the neuromonitorist's task to identify any deviations from the baseline data set and establish a timely liaison between relevant clinical professionals, which predominantly includes the surgeon and/or anesthesiologist. In this respect, actions taken to rectify the changes in neuromonitoring data are placed in the hands of the surgeon or anesthesiologist. Ultimately, therefore, clinical decisions are made by physician practitioners in response

to timely delivered neurophysiological data.

Perhaps the most interesting result of the survey was the preference of surgeons (cardiac surgeons excepted) for experienced doctoral-level interpreters. However, the question posed in the survey may itself be prone to misinterpretation. Reasonably, most surgeons do not want to observe raw neurophysiological data, but would prefer timely, accurate and relevant reports that they can interpret within the context of the ongoing procedure. Regardless of the messenger, we argue that the ultimate clinical interpretation would still reside with the surgeon (or anesthesiologist).

The authors acknowledge the shortage of doctoral level IOM personnel, but we believe this circumstance is unlikely to improve in view of our fiscally tight health care environment. The most reasonable solution would be to ensure a rigorous training program suitable for technologist-level neuromonitorists. In our centre, a doctoral-level neurophysiologist oversees technologists who are required to complete Certification of Neurointraoperative Monitoring. However, readers should also be aware that steps are currently being taken to confront the deficiency in neuromonitoring training in Canada. In September 2014 the Canadian Association of Neurophysiological Monitoring launched Canada's first formal training stream for intraoperative monitoring through The Michener Institute in Toronto, Ont. This course is web-based, thereby increasing access, and includes a practicum upon completion of the 2-year program.

We applaud Norton and colleagues for contributing to the much needed national dialogue on the direction of neurophysiological monitoring in Canada and look forward to continuing progress in this interesting field.

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INTERPRETATION OF SURGICAL NEUROMONITORING DATA IN CANADA: AUTHOR RESPONSE

We thank Drs. Wilkinson and Kaufmann for their interest in our study¹ and their considered response to it. We thank them for highlighting the Canadian Association of Neurophysiological Monitoring course through the Michener Institute in Toronto, and point out that a training scheme has been approved by the Alberta College of Medical Diagnostic and Therapeutic Technologists (www.acmdtt.ca) at the University of Alberta Hospital, and is also being used in Saskatoon. We agree that patient safety can be improved through the use of highly skilled, well-trained individuals in the operating room.

We differ from Wilkinson and Kaufmann with regard to the issue of interpretation, however. In our view, the IOM situation should not be different from that in the outpatient laboratory. A skilled individual performs the technical aspect of the task and provides an impression of the test. The test itself is interpreted by a clinical practitioner. The patient's physician (most responsible physician; MRP) integrates this interpretation with other clinical signs and knowledge to form a diagnosis and treatment plan. Indeed, many reports from the electroencephalography laboratory (or the radiology department, which also follows this model) end with the statement that "clinical correlation is required." In the intraoperative neuromonitoring (IOM) setting we

see this as being a Certification of Neurointraoperative Monitoring (or a Canadian equivalent when/if available) technologist placing electrodes, running the tests and providing an impression and a doctor or clinically trained doctoral-level neurophysiologist providing real-time interpretation to the surgeon (MRP). It is the surgeon's responsibility to decide what to do with the interpretation.

In our survey most surgeons did not want to provide interpretation of the data, and we believe most are not suitably trained or experienced to do so. Although our practice patterns differ from those in the United States it is worth noting that the American Medical Association (Policy H-410.957) states that IOM is the practice of medicine and that its interpretation requires a suitably trained individual (Policy H-35.971). The Canadian Medical Association does not have equivalent policies, but also does not define what is the practice of medicine.

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ENDOSCOPY TRAINING IN CANADA IN GENERAL SURGERY RESIDENCY PROGRAMS: WAYS FORWARD

As former residency directors and endoscopists interested in teaching and

quality improvement, we applaud the article written by Bradley and colleagues (DOI: 10.1503/cjs.008514) for their work on this topic. We agree that endoscopy training is an essential component of general surgical training and the challenges that they have put forward are achievable. We would like to offer potential solutions.

As noted by Bradley and colleagues, there is variability across the country in terms of resident exposure to endoscopy. Unfortunately, procedure volumes are not always recorded and quality outcome measures, such as colonoscopy completion rates and adenoma detection rates, are rarely tracked. This must change.

One method to record procedure volumes and quality outcomes data would be to use a synoptic reporting program that has been modified to account for resident involvement.

Some in the surgical community resist setting minimum endoscopy procedure volumes for trainees. A recent British study, which used a modified synoptic reporting system involving more than 36 000 patients and 297 trainees, found that only 41% of the trainees achieved a colonoscopy completion rate of 90% after 200 colonoscopies.¹ This result is consistent with the recommendation by Cancer Care Ontario of a minimum of 300 cases to achieve competency.² Given that a general surgical residency is 5 years long, we feel that this number is achievable through increased use of community surgery rotations.

Many of us were never taught how to teach flexible endoscopy aside from role modelling. To improve and standardize training, we feel that the Canadian Association of General Surgeons (CAGS)-sponsored Skills Enhancement for Endoscopy (SEE) program should be adopted. This program includes a Colonoscopy

Skills Enhancement (CSE) course and a Train the Endoscopy Trainer (TET) course.³ The CSE course improves skill in all aspects of colonoscopy. For example, in a recent randomized trial, endoscopists who took this course had a significant improvement in their adenoma detection rate.⁴ The TET course is designed to improve teaching skills for endoscopists who teach endoscopy. We have taken both courses and firmly believe that they deliver on their objectives. Ideally, all faculty members who train residents in flexible endoscopy should take the CSE course, and at least 2 faculty members from each training program should become certified trainers. In the interim, senior surgical residents should also be required to take the CSE course.

To increase our trainees' exposure to emergent and therapeutic upper gastrointestinal endoscopy, we feel that there needs to be increased collaboration with the gastroenterology specialty. In many large teaching centres, surgeons are not involved in the management of emergency cases. The result is that many trainees do not get adequate exposure to these cases. One approach to solving this problem is to have our trainees rotate through a gastroenterology consultation service with the expectation of participating in the daytime service as well as after-hours call.

It has been recognized that there is variation in the quality of endoscopy services across the country.⁵ As our patients deserve high-quality endoscopy services, CAGS must play a central role in improving the training of our residents.

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