

6th Annual CANM IOM Symposium – UPDATE

Come one, come all to the 6th Annual Canadian Association of Neurophysiological Monitoring (CANM) symposium which will be held in beautiful Ottawa, Canada, October 4th and 5th at the Fairmont Chateau Laurier Hotel. This very elegant hotel is reminiscent of a French chateau and is located in the centre of the city, close to the parliament buildings and the famous entertainment district (Byward Market).

We are happy that the CANM symposium has developed a reputation like no other intraoperative neurophysiological monitoring (IONM) meeting – high quality, highly interactive and known for its spirited learning atmosphere.



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This year's symposium will contain many "firsts" not to be missed. For example, we are fortunate to have recruited our first European Keynote speaker, the internationally renowned **Dr. Francesco Sala**. He is president-elect of the International Society of Intraoperative Neurophysiology, a neurosurgeon and very active in clinical research and evidenced-based use of IONM. For the first time our lecture presentations will be followed by detailed case studies. This will give attendees an opportunity to relate the theoretical information from the lectures with practical knowledge of performing, interpreting and troubleshooting of IONM in specific cases. Ethics in the practice of IONM, as well as deep brain stimulation, will also be presented for the first time. In response to your feedback, we have added workshops on intraoperative EEG and EMG with the very capable faculty of Dianne Dash, Sharon McDonnell-Carline, and Srini Bulusu (all registered in both EMG/EEG and IONM). The CANM education committee

has been busy developing the first national IOM program in world (soon to be launched) and at the symposium we will be providing attendees with information on the first course.

All in all, this will be a unique meeting containing many "firsts." Please visit the CANM website (www.canm.ca) to view the symposium program and register online. Take advantage of early bird rates by signing up now. You won't want to miss this memorable meeting in a magical setting.

Sincerely,

David Houlden, PhD

Chair, CANM Conference Committee
CANM Education Committee
The Ottawa Hospital
Ottawa, Ontario



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Aleksandra Krajacic – Edmonton, AB
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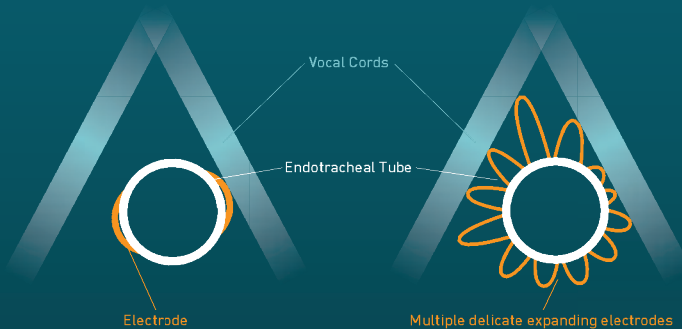


Figure A: A standard laryngeal electrode with flush mounted, static electrodes that result in very poor vocal cord contact

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CANM Education Program in IOM AN UPDATE



In the last issue of this newsletter, I introduced an ambitious new intraoperative neuromonitoring (IONM) education initiative that the CANM executive and education committee has undertaken. Introduction of a formal education program in IONM will impact our profession in a big way, making the need for transparency and clear communication important as we progress through its development. Gina Bastaldo, editor-in-chief of the CANM newsletter, has graciously invited me to provide progress reports and updates. Gina, along with her many other important roles in CANM, is a valuable member of the education committee along with me, Laura Holmes, David Houlden, Sam Strantzas, Marshall Wilkinson, and Roger Sarjeant.

The CANM education committee convened in Toronto for three days of brainstorming and problem solving this past April. At the end of our time together, we had an even better vision of our path and some concrete objectives. Gathering the committee together in one place was a very positive leap forward and necessary for maintaining the momentum that will be so critical to our success.

The first order of business was to discuss how the

education program would be structured. It was decided that the most logical and practical solution would be to offer courses through an online program. An Internet-based offering would allow individuals from across Canada to access the program equally and without geographic barriers. It would also allow CANM to offer the course on an international scale – something that could put Canada on the map as a world leader in IONM education.

The idea of formal learning taking place outside the walls of a stuffy lecture hall is somewhat foreign to many of us. And the idea of sitting alone at a computer to learn might be even farther out of our collective comfort zone. However, it does not take long to discover that online learning can be very powerful, far-reaching, and flexible. For example, course material can be delivered using a variety of formats including lecture-style presentations, webinars, video clips and online discussion groups. It is important to note that just because a course is delivered online does not mean that it is devoid of structure and human interaction. Some types of courses are led by professors or content experts and there is ample opportunity to interact with them to ask questions and share ideas. Sharing ideas with fellow students is also possible through online

forums and other communication tools. Online learning is relatively new but is rapidly gaining acceptance as a worthy and viable alternative to more traditional learning formats.

The next questions involved the material that should be covered, the time frame needed to cover this material, and the designation that the learner should receive after successfully completing the program. It should be kept in mind that the building of a formal IONM education program is a long process and it will evolve over time. The first online offerings will likely be very modest and take the form of individual courses covering different topics in IONM. As new courses are developed, they can be added and eventually assembled into a 2-year certificate in IONM. The certificate alone will not be a sufficient qualification to practice IONM. However, it might serve as a prerequisite for an IONM residency or to take the CANM national exam that is currently being developed. The courses that comprise the certificate program will also provide existing IONM practitioners with the opportunity to increase their knowledge base and improve their own clinical practice. It needs to be made clear that anyone currently working in IONM in Canada will not be mandated to participate in the courses or eventual certificate program, although it will be strongly encouraged. Beyond the scope of current Canadian IONM practitioners, it is not yet decided who will be eligible to enroll in the courses and/or certificate program in IONM or if there will be any prerequisite criteria.

Once the certificate program is rolled out, a more rigorous and comprehensive BSc or MSc degree in IONM can begin to take shape using feedback and lessons learned from the introductory IONM certificate. The end goal of a degree program is many years away, but the certificate program and its development will

serve as a valuable testing ground and solid foundation from which to build.

The practice of IONM obviously requires practical knowledge and it is not possible to achieve the necessary skills solely through online learning. Course work can go a long way toward preparing an individual to become an IONM professional but it will never replace actual hands-on experience. During the retreat, the CANM education committee had the opportunity to tour a practical lab that is used to train learners in other hands-on professions. Using a mock operating room set-up, it would be possible to provide the IONM learner with many of the practical skills necessary for professional practice, providing a natural transition to a “real life” operating room. The details of exactly how to structure the practical component of an IONM course are still being worked out. One of the obvious challenges is the introduction of geographic barriers. Online courses break them down, but the practical skill-based component will most likely re-introduce them to some degree.

As you can see, the education initiative is very much a work in progress but rest assured it is well underway. Stay tuned for more updates and, as always, the education committee invites your comments and feedback. You can contact me directly susan.morris2@iwk.nshealth.ca or send your thoughts to info@canm.ca.

Susan Morris, PhD

Chair, CANM Education Committee

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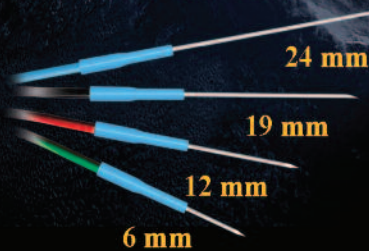
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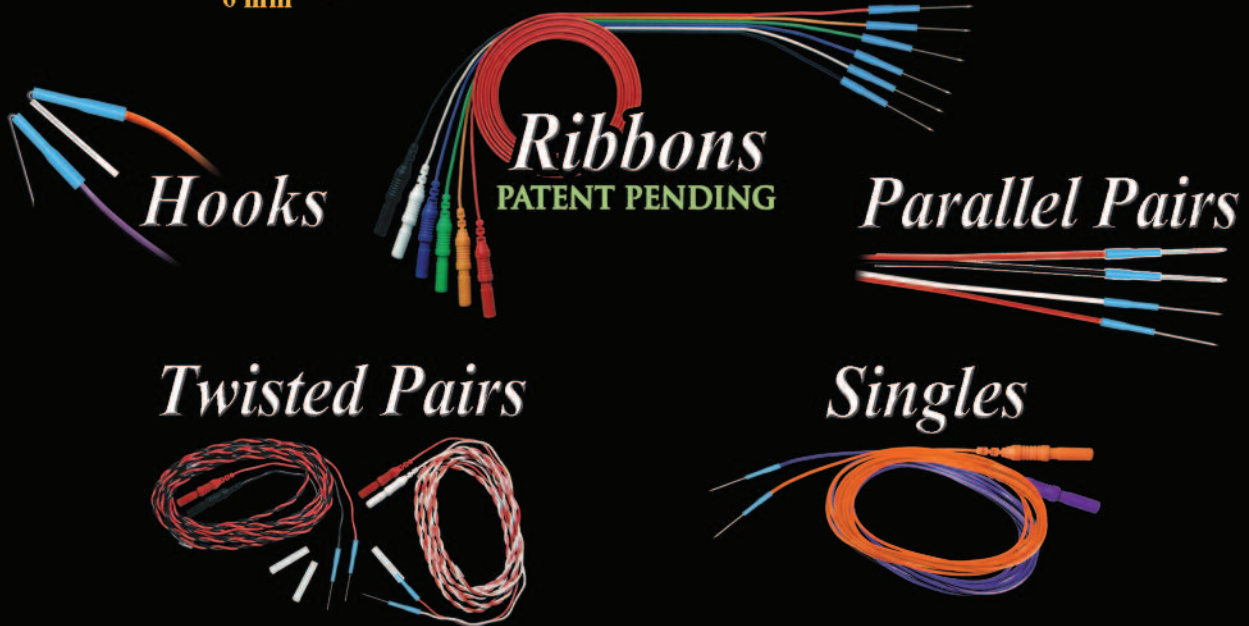
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Review: Intraoperative Motor Evoked Potentials and Anesthetic Related Issues

By Dr. Rebecca Moga, BSc, MD, FRCPC

Monitoring motor evoked potentials (MEPs) contributes to deficit prevention during spine surgery, resection of tumors adjacent to motor structures in the cerebral cortex, and in aneurysm surgery.¹ MEPs are particularly sensitive to anesthetic technique.¹⁻³ The anesthesiologist is required to alter their choice of anesthetic agents in order to accommodate MEP monitoring. Together the neurophysiologist and anesthesiologist should have a mutual understanding of each other's needs and maintain communication throughout surgery to optimize results. This brief review will point neurophysiologists to recent articles that highlight issues relevant to both anesthesiology and neurophysiology including the effect of anesthetic agents on MEPs, anesthetic fade, the effect of patient characteristics on MEPs, and bite injuries during MEP monitoring.

Effect of Anesthetic Agents

There are several review articles that highlight the effect of anesthetic agents on neuromonitoring.¹⁻³ The review article by Lotto et al. provides a description of the anesthetic and physiologic effects on MEP monitoring. This article summarizes the mechanism and effect that each anesthetic agent has on MEPs. It also details specific anesthetic considerations for different surgeries and identifies why certain drug combinations are more or less appropriate for these procedures. The review articles by Sloan and Heyer and by Pajewski et al. also provide thorough reviews on the topic.

As a general overview a balanced total intravenous anesthetic (TIVA) technique is preferred because MEPs are easily abolished by volatiles. However in some patients who have no preoperative neurological deficits and who have good baseline MEPs, using a low concentration of volatile agents (less than 0.5 MAC) may also allow for acceptable MEP measurements.¹ The effect of nitrous oxide on transcortical MEPs (TcMEP) is a controversial topic. Nitrous oxide produces a dose

dependent reduction in the amplitude of TcMEP when administered with a low dose propofol infusion.³ It is suggested to avoid the use of nitrous oxide in combination with other volatiles or with high dose propofol infusion when monitoring TcMEPs.

A balanced TIVA technique is mostly preferred and usually consists of infusions of propofol and an opioid with possible additional infusions of lidocaine or ketamine.¹ Generally IV anesthetic agents such as propofol, benzodiazepines, and barbiturates produce a dose dependent depression of MEPs. Opioids, low dose ketamine, and etomidate have a minimal effect on MEPs. The neuromuscular blocking agents are used for intubation and are then frequently discontinued, although studies demonstrate that it is still possible to monitor MEPs with partial neuromuscular blockade.¹

Anesthetic Fade

Despite maintaining constant levels of anesthetics the threshold voltage needed to obtain MEP responses has been shown to be higher at the end of surgery than it was at baseline. This concept deemed "Anesthetic Fade" is described by Lyon.⁴ Anesthetic fade is related to the length of the procedure, and happens in both normal and myelopathic individuals regardless of the use of volatile nitrous oxide or TIVA. In their review myelopathic individuals showed double the rate of fade over time compared to normal individuals, however these two groups of patients were undergoing surgery at different surgical levels.⁴

Effect of Patient Characteristics on MEP

Described above are some of the many drugs and physiological factors that anesthetists are able to manipulate to improve MEP measurements. Deiner et al. have shown that hypertension and diabetes are independent predictors of failure to obtain baseline lower extremity MEPs.⁵ This knowledge can help the anesthesiologist to tailor each anesthetic to each specific patient.

Bite Injuries

Monitoring MEPs usually involves avoidance of neuromuscular blockade after induction of anesthesia. Tamkus et al. assessed the incidence of bite injuries during the monitoring of TcMEP.⁶ This retrospective chart review of 17,273 surgical procedures in 302 different hospitals reported 111 bite injuries for a total incidence of 0.63%. Suturing of the tongue or lip was required in 25 patients, 7 required otolaryngologist consultation, and 1 patient had a delayed extubation because of tongue swelling. A volatile anesthetic technique was used in 94% of these cases, which made the authors speculate that a higher voltage was required for MEP thus putting the patients at increase risk for injury. The type of bite block was not a factor, it simply had to be big enough to avoid tongue injury and placed in the proper location between the molars while allowing the tongue to still be free in the mouth.

Summary

Neurophysiologists and anesthesiologists are both members of the intraoperative team responsible for ensuring patient safety during surgical procedures. It is essential that we understand how we impact each other in order to work together toward a common goal. This review was meant to provide a select number of articles on the topic of MEPs and anesthesia to help in this process.

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Practice Exam Session at the 6th Annual CANM IOM Symposium

In health care professions virtually everybody is required to write exams at some point in their career. For me, the next best thing to not having to write an exam is writing one that does not count. This year's CANM symposium in Ottawa has just that flavour of treat in store for our symposium attendees. We have planned a 30 minute practice session for the Canadian certification exam.

Obviously we are not asking attendees to sit for a full exam but the CANM Education Committee would love to have our members' feedback on **20 sample questions** from the Canadian certification exam that we have been preparing. It is especially important to get comments from those who have sat for certification exams in the past or are preparing to write an exam in the near future.

As part of this examination genesis I have to say that it is a challenging process! Wording of each question has to be just right so there are no ambiguities; facts have to be checked and sometimes debated. The relevance of each question must also pass the vigilant scrutiny of the CANM Education Committee. It is no secret that neuromonitoring practitioners should possess a solid

command of a broad range of topics. These include but are certainly not limited to: anatomy, neuroscience, systems physiology, pathology, pharmacology and bioinstrumentation. From such an array of disciplines, questions pertinent to our field need to be focused to an appropriate level; a process itself we have found to be open to a certain degree of interpretation.

It is because of these challenges that we felt our preparation of the Canadian certification exam would benefit from the thoughts and insights of the Ottawa symposium attendees.

We think this "exam session" will be fun and instructive. And, if anything, there is always something new to learn in the field of intraoperative neurophysiology.

So until exam day, see you all in Ottawa!

Marshall Wilkinson, BSc (Hon.), MSc, PhD

CANM Education Committee
Division of Neurosurgery, Health Science Centre
Winnipeg, Manitoba

IT'S TIME TO VOTE!

After the formation of CANM in 2008 and welcoming our inaugural membership in 2012, the time has come to vote for a new executive board! At this time, I'd like to extend a special thank you to the founding executive members, who have tirelessly devoted their time and skill to the development of CANM and its initiatives over the past 5 years. On October 5, 2013, the FULL members will elect a new board that will lead our profession during a time when many current initiatives will come to fruition. Information about the voting process and candidate

biographies will be sent to FULL members via email, so stay tuned. Don't forget – the vote will occur during the AGM in Ottawa, ON – see you there!

Laura M. Holmes, BScH, CNIM

Secretary-Treasurer, CANM
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