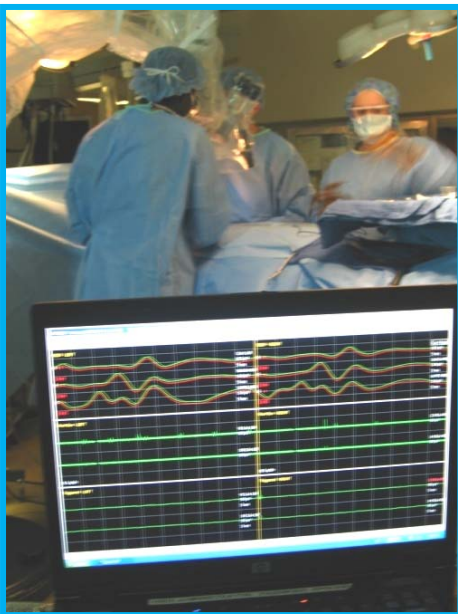


How to Protect Your Nervous System During Surgery

Surgical Neurophysiology is the most advanced and rapidly evolving technique to monitor your nervous system (brain, spinal cord and nerve roots) during a wide array of surgical procedures. Wilder Penfield, M.D. is one of the earliest pioneers documented to perform surgical neurophysiology in the 1920's. Penfield mapped the exposed motor and speech cortex of the brain by electrical stimulation. Since that time, surgical neurophysiology has seen much advancement and has become a standard of care in many types of surgeries here in our community.

What is surgical neurophysiology?

Surgical neurophysiology, often referred to as intraoperative neurophysiologic monitoring (IONM), involves recording the electrical activity from the brain, brainstem, spinal cord, and peripheral nerves during surgical procedures where there is specific risk to some part of the nervous system.



"Intraoperative Neurophysiologic testing may be used to identify/prevent complications during surgery on the nervous system, its blood supply, or adjacent tissue. Monitoring can identify new neurologic impairment, identify or separate nervous system structures (e.g., around or in a tumor), and can demonstrate which tracts or nerves are still functional. Intraoperative Neurophysiological testing may provide relative reassurance to the surgeon that no identifiable complication has been detected up to a certain point, allowing the surgeon to proceed further and provide a more thorough or careful surgical intervention than would have been provided in the absence of monitoring." - CMS/Medicare Medical Policy Bulletin

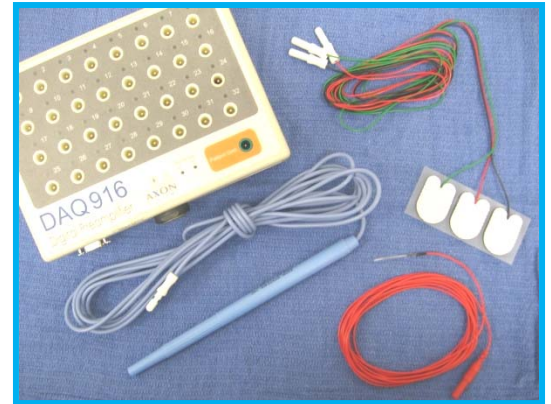
Some of the most commonly monitored procedures include spine surgery (such as cervical, thoracic, and lumbar), certain types of brain surgeries (such as tumor, aneurysm, and hemorrhage), Ear Nose & Throat procedures (such as thyroid, mastoid and parotidectomies), peripheral nerve surgery, and cardiovascular surgeries.

What tests are performed during IONM?

The IONM testing is determined by the surgical procedure performed. Keeping in mind, the intent of IONM is to monitor the part of the nervous system that is at risk during the surgical procedure. IONM tests that are performed include:

- SSEP (Somatosensory Evoked Potentials) – a response recorded from the brain, or spinal cord to electrical stimulation of a peripheral nerve. Used most commonly during brain and spinal surgeries.
- TcMEP (Transcranial Electrical Motor Evoked Potentials) – a response recorded at the limb muscles from an electrical stimulus applied to the motor part of the brain. Used most commonly during brain and spinal surgeries.

- BAEP (Brainstem Auditory Evoked Potential) – a response originating in the brainstem, to an auditory stimulus using sound delivered through special ear inserts. Used most commonly during brain surgeries.
- EMG (Electromyography) – a response recorded from a muscle following stimulation to a cranial or spinal nerve. Used most commonly during brain, spinal, and peripheral nerve surgeries.
- EMG/Pedicle Screw Stimulation – a response potentially recorded from a muscle following stimulation by a probe to a pedicle screw. Used most commonly during spinal fusions.
- EEG (Electroencephalogram) – spontaneous brain activity is recorded to monitor functional integrity of the brain. Used most commonly during brain and vascular surgeries.
- Direct Cortical Stimulation – a response recorded from the speech and motor areas of the brain to surface stimulation. Used during brain surgeries involving the speech and motor areas of the brain.



Who are the technologists performing IONM?

The current ASET (American Society of Electroneurodiagnostic Technologists) guidelines state that any individual entering the IONM profession must have earned an associate degree or higher and have successfully completed a program reviewed by the Joint Review Committee on Education in Electroneurodiagnostic Technology and accredited by the Commission on Accreditation of Allied Health Education Programs. Within two years of graduation, individuals are strongly encouraged to take and pass a recognized, national examination for professional credentials in an area of electroneurodiagnostic specialty. Certification in Neurophysiologic Intraoperative Monitoring (CNIM) is obtained through ABRET (American Board of Registered Electroneurodiagnostic Technologists).

How do I know if I need IONM?

ASK! When you make the list of questions of what you want to “remember to ask the doctor”, one of the most important questions could possibly be, “will this surgery put my nervous system at risk, and do I need IONM to help protect it?”

Authors Tami D. Flynn, CST, CNIM and Darla Schwertfeger RN, CNIM are employed by Midwest Neuromonitoring, Inc. Midwest Neuromonitoring has been providing IONM in this community since 1995 at the two local hospitals, and surrounding communities. Midwest Neuromonitoring currently employs 6 technologists who all have a degree in the sciences, and are board certified to perform IONM.

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The Central Illinois Neuroscience Foundation (CINF) is a non-profit organization dedicated to the advancement of neurological healthcare through education and research.