

MONITORING THE SPINAL CORD DURING SURGERY

This fact sheet may help you understand the usefulness of spinal cord monitoring during surgery. This sheet is a service of the American Academy of Neurology (AAN) and the American Clinical Neurophysiology Society.

Neurologists from the AAN are doctors who identify and treat diseases of the brain and nervous system. The following evidence-based information* is provided by experts who carefully reviewed all available scientific studies on spinal cord monitoring.

Some surgeries pose serious risks to the spinal cord. These include spinal surgery and certain chest surgeries. The risks include paralysis, or loss of muscle function or muscle weakness. Spinal cord monitoring during surgery can warn the surgeon before damage occurs. The surgeon can find the problem and address it. This may prevent paralysis as a result of the surgery.

What is spinal cord monitoring?

Spinal cord monitoring is a procedure used during some surgeries. It involves watching for possible damage to the spinal cord during surgery. It also is known as intraoperative monitoring, or IOM. A doctor trained in the procedure usually performs the monitoring. Often this is a neurologist.

In spinal cord monitoring, the patient is hooked up to a computer. Wires from the computer connect to electrodes that attach to the skin and muscle. The computer can detect changes in the nervous system which may point to a problem. The doctor watches the computer for these changes. The computer also may be used to trigger a response in the patient's nervous system. This also can warn of possible damage that may be occurring. The doctor doing the monitoring alerts the surgical team to any problems. Some problems are related to anesthesia use or the stage of surgery. Others stem from changes in tissue temperature or stresses to tissue.

What can be done if the doctor finds a problem?

When problems are seen on the computer, the surgery can be modified. The surgeon or anesthesiologist can take actions such as:

- Reducing the tension placed on the spine
- Adjusting or removing clamps or other equipment
- Inserting grafts or other equipment

- Increasing blood pressure to improve blood flow
- Ending the surgery sooner than usual
- Checking the patient's responses with a "wake-up" test

These actions may help to prevent serious damage related to surgery, such as paralysis. Talk with your doctor to learn more about how problems during surgery are addressed.

I am scheduled to have spinal surgery. I am afraid complications may occur. How well does spinal cord monitoring work?

Strong evidence shows spinal cord monitoring may help prevent paralysis related to some surgeries. These include spinal surgeries. Some chest surgeries also are affected, such as those that repair narrowing of the walls of the aorta. Twelve studies support these findings. In those studies, monitoring was supervised by a doctor trained in the procedure. Several patients had problems during surgery that were found from monitoring. Of those who had paralysis, all had problems during the surgery that were found from monitoring. In comparison, of those who had no monitoring problems during surgery, none had paralysis.

Neurologists try to prevent paralysis related to the types of surgeries discussed here. Spinal cord monitoring supervised by a neurologist may help meet this goal. The best way to treat paralysis is to prevent it in the first place.

Based on an AAN guideline endorsed by the American Association for Neuromuscular and Electrodiagnostic Medicine

This statement is provided as an educational service of the American Academy of Neurology. It is based on an assessment of current scientific and clinical information. It is not intended to include all possible proper methods of care for a particular neurologic problem or all legitimate criteria for choosing to use a specific procedure. Neither is it intended to exclude any reasonable alternative methodologies. The AAN recognizes that specific patient care decisions are the prerogative of the patient and the physician caring for the patient, based on all of the circumstances involved.

*After the experts review all of the published research studies, they describe the strength of the evidence supporting each recommendation:

Strong evidence = more than one high-quality scientific study

Moderate evidence = at least one high-quality scientific study or two or more studies of a lesser quality

Weak evidence = the studies, while supportive, are weak in design or strength of the findings

Not enough evidence = either different studies have come to conflicting results or there are no studies of reasonable quality



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