

Intraoperative Neurological Monitoring



INDEPENDENT CARE HEALTH PLAN

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Medical Coverage Policy

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Disclaimer

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Related Medical/Pharmacy Coverage Policies

None

Related Documents

Please refer to [CMS website](#) for the most current applicable National Coverage Determination (NCD)/Local Coverage Determination (LCD)/Local Coverage Article (LCA)/CMS Online Manual System/Transmittals.

Type	Title	ID Number	Jurisdiction Medicare Administrative Contractors (MACs)	Applicable States/Territories
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LCD (and pertinent LCA)	Intraoperative Neurophysiological Testing	L34623 A57604	J5 - Wisconsin Physicians Service Insurance Corporation	IA, KS, MO, NE
LCD (and pertinent LCA)	Intraoperative Neurophysiological Testing	L34623 A57604	J8 - Wisconsin Physicians Service Insurance Corporation	IN, MI
LCD (and pertinent LCA)	Intraoperative Neurophysiological Testing	L35003 A56722	JH - Novitas Solutions, Inc. (Part A/B MAC)	AR, CO, NM, OK, TX, LA, MS
	Neuromuscular Junction Testing	L34996		
LCD (and pertinent LCA)	Intraoperative Neurophysiological Testing	L35003 A56722	JL - Novitas Solutions, Inc. (Part A/B MAC)	DE, D.C., MD, NJ, PA
	Neuromuscular Junction Testing	L34996		

Description

This policy addresses neurological monitoring that takes place *during surgery*.

Intraoperative neurological monitoring is the recording of nerve signals and brainwaves during surgery, to monitor and thereby reduce the risk of significant nerve damage. It is most often used in surgeries that pose risk to a specific part of the nervous system, such as procedures of the brain, peripheral nerves, spine, vasculature (eg, carotid endarterectomies and thoracic abdominal aortic aneurysm repair) and some ear/nose/throat (ENT) procedures.

Intraoperative neurological monitoring may utilize the following testing methods depending on the type of surgery being performed:

- **Brain auditory evoked potential (BAEP)**, also known as auditory brainstem response, is a recording of the electrical activity from the brainstem. The test involves the use of sound to stimulate pathways in the brain and record the electrical response. It provides basic information about whether sounds are reaching the brainstem.
- **Electroencephalogram (EEG)** testing measures and records the electrical activity of the brain, by placing electrodes on the scalp/head; most commonly used when a physician is trying to establish the presence of a seizure disorder.

- **Electromyogram (EMG)** testing measures the electrical activity produced by a muscle contraction, to evaluate nerve and muscle function. It does not pertain to a nerve impulse traveling to or from the brain, but is an evaluation of the electrical activity of the muscle and the associated nerve.
- **Motor evoked potential (MEP)** monitoring is used to evaluate motor nerve pathway integrity. It is often described as the opposite of somatosensory evoked potential testing. Electrodes are placed on the arms or legs and an electrical current is used to stimulate the motor center of the brain. The length of time it takes for the signal to travel to the muscle being tested and the resulting muscle contraction is then observed and recorded.
- **Somatosensory evoked potential (SEP or SSEP)** monitoring during surgery evaluates the sensory nerve pathway from the arms and legs through the spinal cord to the brain. This is accomplished by attaching electrodes to the scalp and along the nerve pathway on the neck and shoulders. An electrical current is then sent through a probe to the skin near a nerve in the wrist or ankle. The length of time it takes the electrical signal to travel through the nerve pathway to the brain is recorded and monitored.
- **Visual evoked potentials (VEP)**, also known as visual evoked responses (VER), measure and record the function of the optic nerve or central nervous system to identify interruptions in transmission along the optic nerve pathway.

Surface electromyography (SEMG) may be performed intraoperatively using the US Food & Drug Administration (FDA) approved **EPAD 2** system. In addition, the intraoperative neurological monitoring system may record SSEPs or assess the neuromuscular junction (NMJ). SEMG is a noninvasive computer-based technique recording electrical impulses using surface electrodes and conduction gel placed on the skin overlying the nerve measuring at rest and during activity.⁵³

Coverage Determination

iCare follows the CMS requirements that only allows coverage and payment for services that are reasonable and necessary for the diagnosis and treatment of illness or injury or to improve the functioning of a malformed body member except as specifically allowed by Medicare.

In interpreting or supplementing the criteria above and in order to determine medical necessity consistently, iCare may consider the criteria contained in the following:

Intraoperative neurological monitoring (IONM [BAEP, EEG, EMG, MEP, SEP]) during spinal, neurologic, cranial or vascular procedures that may compromise neurologic function will be considered medically reasonable and necessary when all the following requirements are met:

- Monitoring is requested by the operating surgeon; **AND**
- Monitoring is performed by either a licensed physician trained in clinical neurophysiology (eg, neurologist, physiatrist) or by a trained technologist who is practicing according to licensure/certification

as defined by state law or appropriate authorities and is working under the direct supervision of a physician trained in neurophysiology; **AND**

- Monitoring is interpreted by a licensed physician trained in clinical neurophysiology, other than the operating surgeon, providing real time supervision and interventional recommendations while monitoring one on one in the operating room or remotely*; **AND**
- Monitoring period includes only intraoperative time. This time, however, may be cumulative and does not have to be continuous, for example, 30 minutes of **continuous** attendance followed by another 30 minutes of **continuous** attendance later in the procedure will constitute 1 hour of monitoring

***Physician can monitor NO more than three cases simultaneously for the covered indications listed below.**

Indications for which intraoperative monitoring **MAY** be utilized include:

- Aortic arch and the branch vessels surgical procedures, or thoracic aorta, including carotid artery surgery, when there is risk of cerebral or spinal cord ischemia; **OR**
- Arteriography during which there is a test occlusion of the carotid artery; **OR**
- Basal ganglia movement disorders; **OR**
- Brachial plexus surgery; **OR**
- Bronchial artery arteriovenous malformations or tumor embolization; **OR**
- Carotid artery revascularization procedures (eg, endarterectomy, stenting); **OR**
- Circulatory arrest with hypothermia; **OR**
- Correction of cerebral vascular aneurysms; **OR**
- Correction of intracranial or spinal arteriovenous malformations; **OR**
- Correction of scoliosis or deformity of spinal cord involving traction of the cord; **OR**
- Decompressive procedures on the spinal cord or cauda equina carried out for myelopathy or claudication where function of spinal cord or spinal nerves is at risk; **OR**
- Deep brain stimulation; **OR**
- Descending aortic open surgical and endovascular procedures (eg, thoracic or thoracoabdominal aortic aneurysm repair); **OR**

- Distal aortic procedures, where there is risk of ischemia to spinal cord; **OR**
- High risk thyroid surgery (eg, complete resection of a lobe, removal of entire gland, retrosternal approach, or reoperation to a prior surgical field where scar tissue obscures the visual path of the recurrent laryngeal nerve); **OR**
- Leg lengthening procedures involving traction on the sciatic nerve or other nerve trunks; **OR**
- Meniere disease surgical procedures (eg, endolymphatic shunt, vestibular neurectomy/vestibular section for vertigo); **OR**
- Multi-level cervical fusions with instrumentation; **OR**
- Protection of cranial nerves during the following procedures:
 - Cavernous sinus tumor removal
 - Foramen magnum surgery
 - Microvascular decompression
 - Oval or round window graft
 - Removal of tumors involving the cranial nerves (for example optic, trigeminal, facial, auditory nerves)
 - Skull base surgery in the vicinity of the cranial nerves; **OR**
- Removal of brain tissue close to the primary motor cortex and requiring brain mapping; **OR**
- Removal of epileptogenic brain tissue or tumor; **OR**
- Removal of neuromas of peripheral nerves or brachial plexus, when there is risk to major sensory or motor nerves; **OR**
- Removal of spinal tumors; **OR**
- Spinal fractures with risk of cord compression; **OR**
- Spinal instrumentation requiring pedicle screws or distraction; **OR**
- Spinal procedures that pose a risk of significant damage to an essential central nervous system structure (artificial cervical or lumbar disc replacement, removal of old hardware, reoperation); **OR**
- Surgery for intractable movement disorders; **OR**
- Tethered cord release; **OR**
- Traumatic injury to the brain or spinal cord

Intraoperative EMG monitoring used to aid in pedicle screw placement is considered integral to the primary intraoperative neurological monitoring and not separately reimbursable.

Neuromuscular blockade testing (eg, GE NMT, Train of Four testing) used to monitor the depth of pharmacologic muscle relaxation is considered integral to the primary intraoperative neurological monitoring and not separately reimbursable.

The use of the criteria in this Medicare Advantage Medical Coverage Policy provides clinical benefits highly likely to outweigh any clinical harms. Services that do not meet the criteria above are not medically necessary and thus do not provide a clinical benefit. Medically unnecessary services carry risks of adverse outcomes and may interfere with the pursuit of other treatments which have demonstrated efficacy.

Coverage Limitations

[US Government Publishing Office. Electronic code of federal regulations: part 411 – 42 CFR § 411.15 - Particular services excluded from coverage](#)

Other procedures utilizing IONM

The following procedures utilizing **intraoperative neurological monitoring** (BAEP, EEG, EMG, MEP, SEP) will not be considered medically reasonable and necessary:

- Cardiac surgery; **OR**
- Routine cervical/lumbar/thoracic fusion; **OR**
- Routine cervical/lumbar/thoracic laminectomy (eg, decompressive laminectomy for stenosis); **OR**
- Routine decompression or discectomy for disc herniation

A review of the current medical literature shows that the evidence is insufficient to determine that this service is standard medical treatment for these indications. There remains an absence of randomized blinded clinical studies examining benefit and long-term clinical outcomes establishing the value of this service in clinical management for these indications.

Summary of Evidence

The reviewed studies of IONM for lumbar spinal discectomy or discectomy and fusion provide inconclusive evidence as to whether IONM accurately detects new neurological deficits and can help to prevent nerve damage during surgery. Across the clinical validity studies, sensitivity rates were low (0% to 62%), reflecting a high false-negative rate for the detection of occurrence of new nerve damage. In the clinical utility studies, there was little evidence of the benefit of IONM. A small number of studies reported that use of IONM significantly decreased transient complications (1 study) and reduced hospital stay (1 study) relative

to no IONM. Two studies reported that multimodal IONM (EMG plus another type of monitoring) significantly reduced the incidence of new neurological deficits compared with single-modality IONM. No studies found between-group differences in rate of new neurological deficits for IONM versus standard care (i.e., no IONM). In addition, none of the studies adequately investigated the clinical significance of detected nerve deficits. However, all of the reviewed studies have individual study limitations that may have caused underestimation of the diagnostic accuracy (clinical validity) or intraoperative efficacy (clinical utility) of IONM.³⁷

Intraoperative SEMG and VEP monitoring

Intraoperative SEMG and VEP monitoring will not be considered medically reasonable and necessary.

A review of the current medical literature shows that the evidence is insufficient to determine that these services are standard medical treatment. There remains an absence of randomized, blinded clinical studies examining benefit and long-term clinical outcomes establishing the value of this service in clinical management.

Summary of Evidence

The American Society of Neurophysiological Monitoring's (ASNM) recommended standard for visual evoked potentials does not include this type of monitoring for intraoperative use.

Coding Information

Any codes listed on this policy are for informational purposes only. Do not rely on the accuracy and inclusion of specific codes. Inclusion of a code does not guarantee coverage and/or reimbursement for a service or procedure.

CPT® Code(s)	Description	Comments
92650	Auditory evoked potentials; screening of auditory potential with broadband stimuli, automated analysis	Not Covered
92651	Auditory evoked potentials; for hearing status determination, broadband stimuli, with interpretation and report	
92652	Auditory evoked potentials; for threshold estimation at multiple frequencies, with interpretation and report	
92653	Auditory evoked potentials; neurodiagnostic, with interpretation and report	
95822	Electroencephalogram (EEG); recording in coma or sleep only	
95860	Needle electromyography; 1 extremity with or without related paraspinal areas	

95861	Needle electromyography; 2 extremities with or without related paraspinal areas	
95867	Needle electromyography; cranial nerve supplied muscle(s), unilateral	
95868	Needle electromyography; cranial nerve supplied muscles, bilateral	
95870	Needle electromyography; limited study of muscles in 1 extremity or non-limb (axial) muscles (unilateral or bilateral), other than thoracic paraspinal, cranial nerve supplied muscles, or sphincters	
95925	Short-latency somatosensory evoked potential study, stimulation of any/all peripheral nerves or skin sites, recording from the central nervous system; in upper limbs	
95926	Short-latency somatosensory evoked potential study, stimulation of any/all peripheral nerves or skin sites, recording from the central nervous system; in lower limbs	
95927	Short-latency somatosensory evoked potential study, stimulation of any/all peripheral nerves or skin sites, recording from the central nervous system; in the trunk or head	
95928	Central motor evoked potential study (transcranial motor stimulation); upper limbs	
95929	Central motor evoked potential study (transcranial motor stimulation); lower limbs	
95930	Visual evoked potential (VEP) checkerboard or flash testing, central nervous system except glaucoma, with interpretation and report	
95938	Short-latency somatosensory evoked potential study, stimulation of any/all peripheral nerves or skin sites, recording from the central nervous system; in upper and lower limbs	
95939	Central motor evoked potential study (transcranial motor stimulation); in upper and lower limbs	
95940	Continuous intraoperative neurophysiology monitoring in the operating room, one on one monitoring requiring personal attendance, each 15 minutes (List separately in addition to code for primary procedure)	
95955	Electroencephalogram (EEG) during nonintracranial surgery (eg, carotid surgery)	
95999	Unlisted neurological or neuromuscular diagnostic procedure	
CPT® Category III Code(s)	Description	Comments

No code(s) identified		
HCPCS Code(s)	Description	Comments
G0453	Continuous intraoperative neurophysiology monitoring, from outside the operating room (remote or nearby), per patient, (attention directed exclusively to one patient) each 15 minutes (list in addition to primary procedure)	

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Change Summary

- 08/24/2023 New Policy.