DRAFT Medical Coverage Policy | Remote Intraoperative Neurophysiologic (IONP) Monitoring

EFFECTIVE DATE: 06|01|2024
POLICY LAST REVIEWED: 02|07|2024

OVERVIEW

Intraoperative neurophysiologic (IONP) monitoring or Intraoperative Neurophysiological Monitoring (IOMN), collectively referred to as IONP in this policy, describes a variety of procedures used to monitor the integrity of neural pathways during high-risk neurosurgical, orthopedic, and vascular surgeries. It involves the detection of electrical signals produced by the nervous system in response to sensory or electrical stimuli to provide information about the functional integrity of neuronal structures.

Remote IONP monitoring is when IONP monitoring is provided from outside the operating room (remote or nearby) of either one case or more than one case at a time.

This policy addresses remote IONP monitoring services only.

MEDICAL CRITERIA

Not applicable

PRIOR AUTHORIZATION

Not applicable.

POLICY STATEMENT

Remote IONP monitoring, which may include somatosensory-evoked potentials, motor evoked potentials using transcranial electrical stimulation, brainstem auditory-evoked potentials, electromyography (EMG) of cranial nerves, electroencephalography (EEG), and electrocorticography (ECoG), may be considered medically necessary in individuals undergoing spinal, intracranial or vascular procedures with significant risk for nerve injury in the following circumstances:

1. Monitoring is being conducted in real-time and interpretation is continuously communicated to surgical team; **and**,
2. The monitoring is ordered by the operating surgeon; **and**,
3. The monitoring is set up and performed in the operating room by an independent technologist present and in continuous attendance in the operating room whose sole function is monitoring and transmission of data for a single case; **and**,
4. The monitoring is performed by a qualified neurologist who is **not** a member of the surgical team and whose sole function is interpretation of real time monitored data; **and**,
5. The surgical team (surgeon, anesthesiologist) and the monitoring team (technician, physician [qualified neurologist]) have a direct, real-time communication regarding the individual's status based on data interpretation; **and**,
6. The monitoring physician (qualified neurologist) may work from a remote site only when an independent technologist is in continuous attendance in the operating room and has the capability for real-time communication with the supervising monitoring physician; **and**,
7. The number of individuals monitored by the physician (qualified neurologist) at one time does not exceed one; **and**,
8. The individual is having the following nerves monitored for one or more of the indicated clinical scenarios, below:

Cranial Nerve

- Spinal, intracranial, vascular procedures
    - Head and neck surgery (e.g., resection of skull base tumor, resection of tumor involving a cranial nerve, cavernous sinus tumor, neck dissection, epileptogenic brain tumor/tissue resection).

Facial Nerve

- Head and/or neck procedures (e.g., acoustic neuroma, microvascular decompression of the facial nerve for hemifacial spasm, parotid tumor resection, cochlear implantation, middle ear, and mastoid surgery and other neurotologic/otologic surgical procedures).

Recurrent Laryngeal Nerve

- **High-risk thyroid or parathyroid surgery**, including:
    - Total thyroidectomy (e.g., complete resection of a lobe of the thyroid, removal of the entire gland or following a prior thyroid surgery where there is scar tissue surrounding the laryngeal nerve) or hemithyroidectomy
    - Repeat thyroid or parathyroid surgery
    - Surgery for cancer
    - Thyrotoxicosis
    - Retrosternal or giant goiter
    - Thyroiditis.

- **Anterior cervical spine surgery** associated with any of the following increased risk situations when monitoring of the laryngeal nerve is necessary:
    - Prior anterior cervical surgery, particularly revision anterior cervical discectomy and fusion, revision surgery through a scarred surgical field, reoperation for pseudarthrosis or revision for failed fusion
    - Multilevel anterior cervical discectomy and fusion
    - Preexisting recurrent laryngeal nerve pathology when there is residual function of the recurrent laryngeal nerve.

- **Other Nerves**
    - **High risk vascular procedures** when there is risk for cerebral ischemia (e.g., surgery of the aortic arch, thoracic aorta, internal carotid artery endarterectomy, intracranial arteriovenous malformation, bronchial artery arteriovenous malformation or tumor, cerebral aneurysm)
    - **Brachial or lumbar plexus surgery**
    - **Spinal procedures with high risk of cord injury** (e.g., spinal cord tumor, spinal fracture with cord compression, mechanical spinal distraction, correction of scoliosis surgery)
    - **Other procedures with a high risk of potential injury to essential nervous system structures** (e.g., Interventional neuroradiology, neuroma of peripheral nerve, leg lengthening procedure when there is traction on the sciatic nerve).

Remote IONP monitoring is not covered for Medicare Advantage Plans and not medically necessary for Commercial Products for the following indications as the evidence is insufficient to determine the effects of the technology on health outcomes:

- Remote IONP monitoring when the guidelines above are not met.
- During surgery of the cervical spine not meeting the guidelines above (e.g. standard anterior cervical discectomy and fusion, cervical disc arthroplasty).
- During surgery of the lumbar spine not meeting the guidelines above (e.g. lumbar fusion, laminectomy, discectomy).
- Remote IONP monitoring of the recurrent laryngeal nerve during anterior cervical spine surgery not meeting the guidelines above or during esophageal surgeries.

- For any other indication not listed in the guidelines above, including the following (not an all-inclusive list):
    - Monitoring of epidural injections
    - Monitoring during radiofrequency ablation/denervation procedures
    - Monitoring during placement of spinal cord stimulator or an intrathecal pain pump.
    - Intraoperative BAER during stapedectomy, tympanoplasty and ossicle reconstruction;
    - Intraoperative MEP during implantation of a spinal cord stimulator;
    - Carpal tunnel release;
    - Cervical lymphadenectomy (modified radical neck
    - dissection);
    - Craniotomy repair of cerebrospinal fluid leak;
    - Femur, tibia/fibula osteotomy and ankle arthrodesis;
    - Femoroacetabular surgery;
    - Implantation, removal, and adjustment of vertical expandable prosthetic titanium rib (VEPTR);
    - Lymph node biopsy;
    - Removal of spinal cord stimulator;
    - Resection of a middle ear mass;
    - Rib resection;
    - Rotator cuff repair;
    - Sacretomy;
    - Sacroiliac joint fusion;
    - Scalenectomy;
    - Sciatic nerve biopsy;
    - Sciatic nerve tumor removal;
    - Shoulder surgery;
    - Spinal cord stimulator placement and removal;
    - Stapedectomy/ossicular chain reconstruction;
    - Surgery for the correction of thoracic outlet syndrome;
    - Surgery for the treatment of priformis syndrome;
    - Thoracotomy for resection of mediastinal mass (unless the mass is around the spinal cord or it involves the aorta or the radicular arteries branching off the aorta);
    - Thyroidectomy and thyroid re-operations;
    - Total knee arthroplasty;
    - Total hip replacement;
    - Intraoperative neuromonitoring during Zenkers diverticulectomy;
    - Intraoperative neuromuscular junction testing in member with anoxic brain injury;
    - Intraoperative saphenous nerve somatosensory evoked potential for monitoring the femoral nerve during transpoas lumbar lateral interbody fusion;

Additional Services that May Be Performed as Part of Remote IONP Monitoring

Additional services that may be performed as part of remote IONP monitoring (eg, somatosensory-evoked potentials, motor evoked potentials using transcranial electrical stimulation, brainstem auditory-evoked potentials, electromyography (EMG) of cranial nerves, electroencephalography (EEG), and electrocorticography (ECoG)) are covered when remote IONP monitoring is medically necessary. Refer to Coding section.

Additional services that may be performed as part of remote IONP monitoring (see above) are not covered for Medicare Advantage Plans and not medically necessary for Commercial Products when remote IONP monitoring is not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes. Refer to Coding section.

Member's medical records must document that services are medically necessary for the care provided. Blue Cross Blue Shield of Rhode Island (BCBSRI) maintains the right to audit the services provided to our members, regardless of the participation status of the provider. All documentation must be available to BCBSRI upon request. Failure to produce the requested information may result in denial or retraction of payment.

COVERAGE

Benefits may vary between groups and contracts. Please refer to the appropriate Benefit Booklet, Evidence of Coverage or Subscriber Agreement for not medically necessary/not covered benefits/coverage.

BACKGROUND

Remote Intraoperative Neurophysiologic (IONP) Monitoring or Intraoperative neurophysiological monitoring (IONM)

The principal goal of IONP monitoring is the identification of nervous system impairment on the assumption that prompt intervention will prevent permanent deficits. Correctable factors at surgery include circulatory disturbance, excess compression from retraction, bony structures, hematomas, or mechanical stretching. The technology is continuously evolving with refinements in equipment and analytic techniques, including recording, with several patients monitored under the supervision of a physician who is outside the operating room. The different methodologies of monitoring are described below. Remote IONP monitoring is when IONP monitoring is provided from outside the operating room (remote or nearby) of either one case at a time or more than one case at a time while in the operating room.

Sensory-Evoked Potentials

Sensory-evoked potentials describe the responses of the sensory pathways to sensory or electrical stimuli. Intraoperative monitoring of sensory-evoked potentials is used to assess the functional integrity of central nervous system pathways during surgeries that put the spinal cord or brain at risk for significant ischemia or traumatic injury. The basic principles of sensory-evoked potential monitoring involve identification of a neurologic region at risk, selection and stimulation of a nerve that carries a signal through the at-risk region and recording and interpreting the signal at certain standardized points along the pathway. Monitoring of sensory-evoked potentials is commonly used in the following procedures: carotid endarterectomy, brain surgery involving vasculature, surgery with distraction compression or ischemia of the spinal cord and brainstem, and acoustic neuroma surgery. Sensory-evoked potentials can be further categorized by type of stimulation used.

Somatosensory-Evoked Potentials

Somatosensory-evoked potentials are cortical responses elicited by peripheral nerve stimulations. Peripheral nerves, such as the median, ulnar, or tibial nerves, are typically stimulated, but in some situations, the spinal cord may be stimulated directly. The recording is done either cortically or at the level of the spinal cord above the surgical procedure. Intraoperative monitoring of somatosensory-evoked potentials is most commonly used during orthopedic or neurologic surgery to prompt intervention to reduce surgically induced morbidity and/or to monitor the level of anesthesia. One of the most common indications for somatosensory-evoked potential monitoring is in patients undergoing corrective surgery for scoliosis. In this setting, somatosensory-evoked potential monitors the status of the posterior column pathways and thus does not reflect ischemia in the anterior (motor) pathways. Several different techniques are commonly used, including stimulation of a relevant peripheral nerve with monitoring from the scalp, from interspinous ligament needle electrodes, or from catheter electrodes in the epidural space.

Brainstem Auditory-Evoked Potentials

Brainstem auditory-evoked potentials are generated in response to auditory clicks and can define the functional status of the auditory nerve. Surgical resection of a cerebellopontine angle tumor, such as an acoustic neuroma, places the auditory nerves at risk, and brainstem auditory-evoked potentials have been extensively used to monitor auditory function during these procedures.

Visual-Evoked Potentials
Visual-evoked potentials (VEPs) with light flashes are used to track visual signals from the retina to the occipital cortex. Visual-evoked potential (VEP) monitoring has been used for surgery on lesions near the optic chiasm. However, VEPs are very difficult to interpret due to their sensitivity to anesthesia, temperature, and blood pressure.

Motor-Evoked Potentials
Motor-evoked potentials are recorded from muscles following direct or transcranial electrical stimulation of motor cortex or pulsed magnetic stimulation provided using a coil placed over the head. Peripheral motor responses (muscle activity) are recorded by electrodes placed on the skin at prescribed points along the motor pathways. Motor-evoked potentials, especially when induced by magnetic stimulation, can be affected by anesthesia. The Digitimer electrical cortical stimulator received U.S. Food and Drug Administration (FDA) premarket approval in 2002. Devices for transcranial magnetic stimulation have not been approved by the FDA for this use.

Multimodal IONP monitoring, in which more than 1 technique is used, most commonly with somatosensory-evoked potentials and motor-evoked potentials, has also been described.

Electromyogram Monitoring and Nerve Conduction Velocity Measurements
Electromyogram (EMG) monitoring and nerve conduction velocity measurements can be performed in the operating room and may be used to assess the status of the cranial or peripheral nerves (eg, to identify the extent of nerve damage before nerve grafting or during resection of tumors). For procedures with a risk of vocal cord paralysis due to damage to the recurrent laryngeal nerve (ie, during carotid artery, thyroid, parathyroid, goiter, or anterior cervical spine procedures), monitoring of the vocal cords or vocal cord muscles has been performed. These techniques may also be used during procedures proximal to the nerve roots and peripheral nerves to assess the presence of excessive traction or other impairment. Surgery in the region of cranial nerves can be monitored by electrically stimulating the proximal (brain) end of the nerve and recording via EMG activity in the facial or neck muscles. Thus, monitoring is done in the direction opposite that of sensory-evoked potentials but the purpose is similar, to verify that the neural pathway is intact.

Electroencephalogram Monitoring
Spontaneous electroencephalogram (EEG) monitoring can also be used during surgery and can be subdivided as follows:

- EEG monitoring has been widely used to monitor cerebral ischemia secondary to carotid crossclamping during a carotid endarterectomy. EEG monitoring may identify those patients who would benefit from the use of a vascular shunt during the procedure to restore adequate cerebral perfusion. Conversely, shunts, which have an associated risk of iatrogenic complications, may be avoided in those patients with a normal EEG activity. Carotid endarterectomy may be done with the patient under local anesthesia so that monitoring of cortical function can be directly assessed.
- Electrocorticography is the recording of EEG activity directly from a surgically exposed cerebral cortex. Electrocorticography is typically used to define the sensory cortex and map the critical limits of a surgical resection. Electrocorticography recordings have been most frequently used to identify epileptogenic regions for resection. In these applications, electrocorticography does not constitute monitoring, per se.

Remote IONP monitoring, including somatosensory-evoked potentials and motorevoked potentials using transcranial electrical stimulation, brainstem auditory-evoked potentials, EMG of cranial nerves, EEG, and electrocorticography, has broad acceptance, particularly for spine surgery and open abdominal aorta aneurysm repairs. These indications have long been considered the standard of care, as evidenced by numerous society guidelines, including those from the American Academy of Neurology, American Clinical Neurophysiology Society, American Association of Neurological Surgeons, Congress of Neurologic Surgeons, and American Association of Neuromuscular & Electrodiagnostic Medicine. Therefore, this evidence review focuses on

monitoring of the recurrent laryngeal nerve during neck and esophageal surgeries and monitoring of peripheral nerves.

For individuals who are undergoing thyroid or parathyroid surgery and are at high risk of injury to the recurrent laryngeal nerve who receive IONP monitoring, the evidence includes a large randomized controlled trial (RCT) and systematic reviews. Relevant outcomes are morbid events, functional outcomes, and quality of life. The strongest evidence on neurophysiologic monitoring derives from a RCT of 1000 patients undergoing thyroid surgery. This RCT found a significant reduction in recurrent laryngeal nerve injury in patients at high-risk for injury. High-risk in this trial was defined as surgery for cancer, thyrotoxicosis, retrosternal or giant goiter, or thyroiditis. The high-risk category may also include patients with prior thyroid or parathyroid surgery or total thyroidectomy. A low volume of surgeries might also contribute to a higher risk for recurrent laryngeal nerve injury. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are undergoing anterior cervical spine surgery and are at high-risk of injury to the recurrent laryngeal nerve who receive IONP monitoring, the evidence includes 3 systematic reviews of case series and cohort studies. Relevant outcomes are morbid events, functional outcomes, and quality of life. Two of the 3 analyses compared the risk of nerve injury using IONP monitoring with no IONP monitoring and found no statistically significant difference. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are undergoing esophageal surgery who receive IONP monitoring, the evidence includes a systematic review of mainly nonrandomized comparative studies. Relevant outcomes are morbid events, functional outcomes, and quality of life. The systematic review found less recurrent laryngeal nerve palsy with IONP monitoring, but conclusions are limited by the design of the included studies. Current evidence is not sufficiently robust to determine whether neurophysiologic monitoring reduces recurrent laryngeal nerve injury in patients undergoing esophageal surgery for esophageal cancer. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are undergoing surgery proximal to a peripheral nerve who receive IONP monitoring, the evidence includes case series and a controlled cohort study. Relevant outcomes are morbid events, functional outcomes, and quality of life. Surgical guidance with peripheral IONP monitoring and the predictive ability of monitoring of peripheral nerves have been reported. No prospective comparative studies were identified that assessed whether outcomes are improved with neurophysiologic monitoring. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who are undergoing spinal instrumentation requiring screws or distraction who receive IONP monitoring, the evidence includes systematic reviews of nonrandomized studies. Relevant outcomes are morbid events, functional outcomes, and quality of life. The available evidence suggests that IONP monitoring has high sensitivity and specificity for detecting neurologic deficits. The evidence is sufficient to determine that the technology results in an improvement in the net health outcome.

The Centers for Medicare & Medicaid Services Physician Fee Schedule Final Rule (2013) discussed payment of neurophysiologic monitoring. The rule states that CPT code 95940, which is reported when a physician monitors a patient directly, is payable by Medicare. CPT code 95941, which is used for remote monitoring, was made invalid for submission to Medicare. In the Final Rule, the Centers established a HCPCS G code for reporting physician monitoring performed from outside of the operating room (nearby or remotely). HCPCS code G0453 may be billed only for undivided attention by the monitoring physician to a single beneficiary [1:1 technologist to oversight physician billing], and not for simultaneous attention by the monitoring physician to more than one patient.

CODING

Remote Intraoperative Neurophysiologic Monitoring (IONP)

The following HCPCS code(s) are medically necessary when performed for one of the covered procedures found in the Covered Procedures attachment, below:

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)

Covered Procedures.xlsx

The following CPT code(s) are not covered for Medicare Advantage Plans and not medically necessary for Commercial Products:

95941 Continuous intraoperative neurophysiology monitoring, from outside the operating room (remote or nearby) or for monitoring of more than one case while in the operating room, per hour (List separately in addition to code for primary procedure)

Additional Services Performed as Part of Remote IONP

The following CPT code(s) are covered when remote IONP monitoring (HCPCS code G0453) is medically necessary:

Note: To ensure proper claim filing, when any of the CPT codes below are filed**,** the following modifier must be appended to the CPT code(s):

26 Professional component

51785 Needle electromyography studies (EMG) of anal or urethral sphincter, any technique
92653 Auditory evoked potentials; neurodiagnostic, with interpretation and report
95822 Electroencephalogram (EEG); recording in coma or sleep only
95812 Electroencephalogram (EEG) extended monitoring; 41-60 minutes
95813 Electroencephalogram (EEG) extended monitoring; 61-119 minutes
95861 Needle electromyography; 2 extremities with or without related paraspinal areas
95863 Needle electromyography; 3 extremities with or without related paraspinal areas
95864 Needle electromyography; 4 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
95886 Needle electromyography, each extremity, with related paraspinal areas, when performed, done with nerve conduction, amplitude and latency/velocity study; complete, five or more muscles studied, innervated by three or more nerves or four or more spinal levels (List separately in addition to code for primary procedure)
95907 Nerve conduction studies; 1-2 studies
95908 Nerve conduction studies; 3-4 studies
95909 Nerve conduction studies; 5-6 studies
95910 Nerve conduction studies; 7-8 studies
95911 Nerve conduction studies; 9-10 studies
95912 Nerve conduction studies; 11-12 studies
95913 Nerve conduction studies; 13 or more studies
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
95937 Neuromuscular junction testing (repetitive stimulation, paired stimuli), each nerve, any 1method
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
95955 Electroencephalogram (EEG) during nonintracranial surgery (eg, carotid surgery)
95999 Unlisted neurological or neuromuscular diagnostic procedure

RELATED POLICIES

Non Reimbursable Health Services
Out-of-Network Services Requests

PUBLISHED

Provider Update, April 2024

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