INSTRUCTIONS FOR USE
The following Coverage Policy applies to health benefit plans administered by Cigna Companies. Certain Cigna Companies and/or lines of business only provide utilization review services to clients and do not make coverage determinations. References to standard benefit plan language and coverage determinations do not apply to those clients. Coverage Policies are intended to provide guidance in interpreting certain standard benefit plans administered by Cigna Companies. Please note, the terms of a customer’s particular benefit plan document [Group Service Agreement, Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a customer’s benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a customer’s benefit plan document always supersedes the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations.

Coverage Policy

Continuous Intraoperative Monitoring (CPT Codes: 95940, 95941; HCPCS Code G0453)

Continuous intraoperative neurophysiologic monitoring (IOM) is considered medically necessary when ALL of the following criteria are met:

- IOM is performed by either a licensed physician trained in clinical neurophysiology (e.g., neurologist, physiatrist) or a trained technologist who is practicing within the scope of his/her license/certification as defined by state law or appropriate authorities and is working under the direct supervision of a physician trained in neurophysiology, and is not the operating surgeon or anesthesiologist.
- IOM is interpreted by a licensed physician trained in clinical neurophysiology, other than the operating surgeon or anesthesiologist, who is either physically in attendance in the operating suite or present by means of a real-time remote mechanism for all electroneurodiagnostic (END) monitoring situations and is immediately available to interpret the recording and advise the surgeon.
- Monitoring is conducted and interpreted real-time (either on-site or at a remote location) and continuously communicated to the surgical team.
- There is significant risk of nerve or spinal cord injury during a surgical procedure, such as the following (this list may not be all inclusive):
  - monitoring of a cranial nerve during head and/or 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)
- monitoring of cranial nerve function during high-risk thyroid surgery (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)
- 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)
- monitoring of facial nerve function during surgery (e.g., acoustic neuroma, microvascular decompression of the facial nerve for hemifacial spasm, parotid tumor resection, neurotologic/otologic procedures)
- monitoring of spinal cord function during a spinal procedure when there is risk of cord compression, mechanical spinal distraction, correction of scoliosis surgery, spinal cord tumor, or spinal fracture
- brachial or lumbar plexus surgery
- the planned surgery poses a potential risk of significant damage to an essential nervous system structure (e.g., neuroma of peripheral nerve, leg lengthening procedure when there is traction on the sciatic nerve)

Please note: When performed to determine the depth of anesthesia, intraoperative monitoring is considered integral to the administration of anesthesia. Similarly, stimulus-triggered EMG is considered integral to the baseline surgical procedure when performed to aid placement of pedicle screws.

The following are each considered experimental, investigational, or unproven:

- intraoperative neurophysiologic monitoring of visual evoked potentials
- intraoperative neurophysiologic monitoring of motor evoked potentials using transcranial magnetic stimulation

Intraoperative neurophysiologic monitoring (IOM) of somatosensory and/or motor evoked potentials during lumbar surgery performed below spinal cord level L1 - L2 is considered not medically necessary.

Intraoperative neurophysiologic monitoring (IOM) is considered not medically necessary for ANY other indication.

Baseline Electrodiagnostic Studies

Baseline electrodiagnostic studies prior to surgery are separately reportable, however each baseline study is limited to once per operative session. The necessary baseline electrodiagnostic testing modality is determined by the location and type of surgery and may include any of the following modalities, alone or in combination, (this list may not be all-inclusive):

- Somatosensory evoked potentials (SSEP)
- Auditory brainstem evoked responses (ABR)/Brainstem auditory evoked potentials (BAEP)
- Transcranial electrical motor evoked potentials (tcMEP)
- Free running electromyography (EMG)
- Electroencephalography (EEG)

The above electrodiagnostic studies, performed alone or in combination, are considered medically necessary for the pre-operative evaluation of neural integrity when medical necessity criteria have been met for continuous intraoperative neurophysiologic monitoring.

Electrodiagnostic studies for preoperative evaluation of neural integrity is considered not medically necessary when medical necessity criteria for continuous intraoperative neurophysiologic monitoring have not been met.
This Coverage Policy addresses the performance of intraoperative monitoring (IOM). Intraoperative monitoring (IOM) is an umbrella term used to describe a variety of electrodiagnostic tests used to monitor the integrity of neural pathways during surgical procedures when there may be risk of damage to the brain, spinal cord or nerve.

## General Background

Intraoperative monitoring (IOM) employs the use of electrodiagnostic modalities to record electrical signals produced by the nervous system in response to a stimulus; the intraoperative monitoring reflects the time spent during ongoing, concurrent, real time electrodiagnostic testing performed throughout the surgery. The goal of intraoperative monitoring is to detect response changes due to surgery, to diminish the risk of neurologic injury, improve patient safety and subsequent surgical outcomes.

### Intraoperative Monitoring Modalities

Intraoperative monitoring modalities may include, but are not limited to the following neurophysiological techniques, alone or in combination:

- Sensory Evoked potentials (i.e., somatosensory [SSEP], auditory brainstem evoked responses [ABR], visual evoked potentials [VEP])
- Motor evoked potentials (MEP)
- Electromyography (EMG), free-running or stimulus-triggered
- Electroencephalogram (EEG)

Multiple modalities are typically used for IOM to overcome the limitations of individual monitoring. Selection of the approach used is dependent upon the type of surgery and the degree of risk.

#### Somatosensory Evoked Potentials (SSEP):
SSEPs are electrical waves generated by the response of sensory neurons to stimuli, evaluate primarily posterior spinal cord function, and are a standard technique for IOM. SSEPs are generally combined with EMG monitoring to allow for an intraoperative evaluation that is both sensitive to damage and specific with regards to predicting outcome. SSEPs have low sensitivity to predict damage but high specificity whereas EMG has high sensitivity to nerve root function but low specificity in terms of predicting a persistent neurological deficit (Gunnarsson, et al., 2004). IOM of the cervical spinal cord involves stimulation of the ulnar or median nerve, IOM of the thoracolumbar spinal cord involves stimulation of the posterior tibial or common peroneal nerve (American Clinical Neurophysiology Society [ACS], 2009).

#### Auditory Brainstem Evoked Responses (ABR):
ABR monitoring, also referred to as brainstem auditory evoked potentials (BAEP) measures brainwave activity and is recorded in response to an auditory stimulus from electrodes placed on the scalp. The electrodes pick up the brain’s responses to the sounds and record them.

#### Visual-Evoked Potentials (VEPs):
Visual-evoked potentials (VEPs) are used to track visual stimuli from the retina to the occipital cortex and have been indicated during surgical procedures involving lesions near the optic nerve, however this technique is still being investigated and clinical utility has not been established. Variables such as type of patterned stimuli, temperature, and anesthesia effects cannot be controlled in the operative setting.

#### Motor Evoked Potentials (MEP):
MEPs are recorded over muscles or the spinal cord, and evaluate anterior spinal cord and motor pathways. The technique involves stimulation to the motor cortex using electromagnetic energy by way either trans-cranial electrical stimulation or pulsed magnetic stimulation via a coil placed over the head to stimulate motor neurons. SSEP and transcranial electrical MEPs are often performed in combination throughout surgery and are considered complimentary multimodal procedures; MEPs in combination with SSEPs appear to improve the accuracy of spinal cord monitoring (Liem, 2016). While transcranial electrical stimulation devices have been approved by the FDA devices for transcranial magnetic stimulation are not yet FDA approved.

#### Electromyography (EMG):
EMG evaluation during surgery may be performed as free-run monitoring of EMG activity or as a stimulus-triggered EMG from anatomically appropriate muscles in order to detect injury to nerve
roots during surgery. Free-run EMG is defined as continuous monitoring performed throughout the surgery. Stimulus-triggered EMG is frequently used to aid placement of pedicle screws and involves the use of a handheld monopolar probe controlled by the surgeon (Seubert, Mahla, 2009), and while sensitive is not as specific. Stimulus-triggered EMG assesses only pedicle integrity (i.e., if a screw has breached the pedicle wall posing a risk to the nerve root) and is not a strong predictor of neurological injury. Although both techniques can be used to monitor lumbar, thoracic and cervical fusion procedures, in addition to cranial nerve function to detect nerve root injury, stimulus- triggered EMG does not meet the criteria of concurrent, ongoing intraoperative neurophysiologic monitoring and when performed by the surgeon is incidental to the surgical procedure.

**Electromyography (EMG) Monitoring and Nerve Conduction Testing:** Electromyogram monitoring and nerve conduction velocity testing is often performed in the operating room to assess the status of the cranial or peripheral nerves (e.g., to identify the extent of nerve damage prior to nerve grafting or during resection of tumors). In addition, these techniques may be used during procedures around the nerve roots and around 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 in the facial or neck muscles. Thus monitoring is done in the direction opposite that of sensory-evoked potentials, but the intent is similar which is to verify that the neural pathway is intact.

**Electroencephalogram (EEG):** EEG monitoring is performed using scalp electrodes. IOM of EEG activity is performed to assess for cerebral ischemia, such as during carotid endarterectomy. Electrocorticography (ECog), or intracranial EEG (iEEG), is the recording of EEG impulses directly from an exposed cerebral cortex is used to identify epileptogenic regions for resection, and in general does not constitute intraoperative monitoring.

**Monitoring of Neuromuscular Blockade:** While under anesthesia, various tests may be performed to assess neuromuscular blockade (i.e., depth of anesthesia). One method commonly used, train of four testing, is a test of neuromuscular function performed with a peripheral nerve stimulator. Four stimuli are administered over a period of two seconds with comparison of responses to determine the depth of anesthesia. While train of four monitoring of neuromuscular function is commonly performed periodically during surgical procedures, it is considered integral to the anesthesia.

**Monitoring**

The AANEM and the AAN published guidance for intraoperative monitoring. Baseline studies are obtained prior to the procedure. Monitoring should continue until closing of the surgical procedure, but may be terminated earlier upon discretion of the surgeon. A logbook should be completed for each patient and include the time of the procedure, the time of each surgical manipulation of the central or peripheral nervous system, and the name, dose and times of anesthetics administered which may affect the central or peripheral nervous system or muscle.

The intraoperative monitoring team should consist of surgeons who have a fundamental background in neurophysiology, a monitoring team with a fundamental background in intraoperative monitoring, and anesthesiologists. In addition, according to the AANEM (2008), the IOM team must include a trained clinical neurophysiologist (MD or DO).

Monitoring must be performed by qualified personnel acting within the scope of his/her license/certification as defined by state law or appropriate authorities. According to a guideline by the AAN (2008), it is expected that a specifically trained technologist or non-physician monitorist, preferably with credentials from the American Board of Neurophysiologic Monitoring or the American Board of Registration of Electrodiagnostic Technologists (ABRET), will be in continuous attendance in the operating room, with either the physical or electronic capacity for real-time communication with the supervising physician. Although credentialing varies among professional organizations, the AANEM and AAN both provide guidance that the monitoring technologist should be under the direct supervision of a clinical neurophysiologist (AAN, 2008; AANEM, 2008).

Typically, the physician acts as a remote backup, with the actual intra-operative monitoring being performed in the operating room by a technologist. Some operating rooms have a central physician monitoring room, where a physician may simultaneously monitor cases. The number of procedures being monitored by the clinical neurophysiologist physician is determined by the nature of the surgical procedure. The severity of the case being
monitored may determine the location of the neurophysiologist; they may be located in the operating room, in the same building, monitoring real-time recordings from a remote location, or at a location from which the operating room is accessible within minutes to view the recording procedure.

When performing intraoperative monitoring, the electroneurodiagnostic technologist should monitor only one surgical procedure at a time; multiple monitoring could result in restricted surgical efficiency, prolonged anesthesia, and possible compromise of judgment (American Society of Electroneurodiagnostic Technologists [ASET], 2005).

Real-time monitoring allows timely intervention to prevent risk of damage. Consequently, it is imperative that either the physical (on-site) or electronic capacity (off-site, remote location) for real-time communication exists between the monitoring team and surgeon.

**Baseline Studies**
According to a position statement by the AANEM (2008) regarding the role of the intraoperative monitoring team, during intraoperative monitoring baseline tracings should be obtained prior to the surgical intervention. Pre-procedural baseline studies are performed immediately prior to the proposed surgery for comparison with the studies performed during surgery. Intraoperative monitoring however does not include the time spent in activities performing or interpreting baseline studies. According to the American Academy of Neurology, each baseline study should be reported only once per operative session (American Academy of Neurology [AAN], 2012).

**IOM Indications**
Intraoperative monitoring allows for immediate intervention thus preventing or minimizing postoperative neurological deficits although there is no clear consensus as to which patients should undergo IOM, other than for individuals at greater risk of nerve injury. According to the AAN (2012), there is no need for IOM in situations where historical data and current practices reveal no potential for neural damage.

Intraoperative monitoring of ABRs are performed to monitor auditory nerve function during surgeries that include but are not limited to resection of acoustic neuromas or brainstem tumor resections.

Electroencephalogram (EEG) monitoring is often performed to assess for cerebral ischemia, such as with carotid endarterectomy procedures.

Intraoperative free-running EMG responses are recommended for patients undergoing surgical procedures that result in significant risk of damage to nerve structures that may be associated with the following types of surgery (this list may not be all inclusive):

- surgeries that place the facial nerve at risk for injury (e.g., acoustic neuroma, microvascular decompression of the facial nerve for hemifacial spasm, parotid tumor resection, neurotologic/otologic procedures)
- head and/or neck surgery that places the cranial nerves at risk for injury (e.g., resection of skull base tumors, thyroid tumor surgery, neck dissections)
- brachial or lumbar plexus surgery
- spinal surgery, for nerve root or spinal cord monitoring (e.g., complex instrumentation, mechanical spinal distraction)

Surgery where SSEP monitoring has been recommended for monitoring of the posterior cord includes the following procedures (American Society of Neurophysiological Monitoring [ASNM], 2005, updated 2010; Mahla, et al., 2005; Aminoff, 2003; Linden, et al., 1997):

- aortic and thoracic aneurysm repair
- aortic cross-clamping
- arteriovenous malformation of the spinal cord
- brachial plexus surgery/ brachial plexus exploration after injury to the brachial plexus
• brain (e.g., craniotomy for tumor removal, craniotomy for aneurysm repair, carotid endarterectomy, and localization of cortex during craniotomy)
• cerebrovascular surgery
• clipping of intracranial aneurysms
• interventional neuroradiology
• assessment of nerve root function (e.g., pedicle screw instrumentation, cauda equina tumor removal, release of tethered cord, spina bifida)
• pelvic fracture surgery
• peripheral nerve and plexus (e.g., peripheral nerve repair, position-related ulnar nerve and brachial plexus dysfunction, avoidance of neuropraxia during shoulder arthroscopy, and protection of sciatic nerve function during hip surgery)
• repair of coarctation of the aorta
• resection of fourth ventricular cyst
• resection of intracranial vascular lesions involving the sensory cortex
• resection of spinal cord tumor, cyst, or vascular lesion
• resection of thalamic tumor
• scoliosis correction with instrumentation
• spinal cord decompression and stabilization after acute spinal cord injury
• spinal cord, including cervical, thoracic, and thoraco-lumbar (e.g., anterior and posterior cervical spinal fusions, scoliosis/kyphosis correction, abdominal aortic aneurysm, removal of spinal cord tumor, spinal fracture repair, and arteriovenous malformation repair)
• correction of surgical spondylosis
• stereotactic surgery of the brain stem, thalamus, and cerebral cortex
• surgical correction after spine fractures
• thalamotomy
• thalamus and brain stem (e.g., craniotomy for removal of C-P angle tumor, thalamotomy)
• thyroid surgery

**IOM Limitations**

Hayes published a Technology Directory Report evaluating multimodal intraoperative monitoring (MIOM) during cervical spine surgery (Hayes, 2016, annual review 2017). Within this report Hayes reviewed nine studies that met inclusion criteria, all of which assessed the diagnostic accuracy of MIOM for detecting neurological deficits among subjects undergoing cervical spine surgery (1 prospective and two retrospective cohorts with historical controls, one prospective uncontrolled cohort and five retrospective uncontrolled cohort studies). Hayes concluded "there is low-quality evidence suggesting that MIOM during cervical spinal surgery accurately monitors the neurological status of the patient, identifying patients at risk of postoperative neurological damage. Only very-low-quality evidence exists to suggest that monitoring has clinical utility in terms of patient management and outcomes; however, clinical utility might be inferred given the associated intervention that occurs once a warning alert has been triggered." MIOM for cervical spinal surgery has potential but unproven benefit. In a similar-type report evaluating MIOM during corrective surgery for spinal deformity Hayes concluded there is moderate-quality evidence suggesting that MIOM during corrective surgery for scoliosis and other spinal deformities accurately monitors the neurological status of the patient, identifying patients with neurological degradation and triggering an intervention to prevent postoperative damage (Hayes, 2016, annual review 2017b).

Intraoperative neurophysiologic monitoring is being performed as part of numerous surgical procedures when there is presumed potential for nerve injury, such as for joint arthroscopy/arthroplasty procedures, interventional pain injections (e.g. epidural steroid injections) and during implantation of spinal cord stimulators. Nonetheless, evidence in the published medical literature evaluating the use of intraoperative monitoring for these procedures is insufficient to demonstrate monitoring reduces the occurrence of neurological injury and improves net health outcomes.

IOM of SSEPs/MEPs for evaluation of nerve injury when performed for spine surgery is performed cephalad to (above) the termination of the cord (Jameson, et al., 2007). The spinal cord ends between spinal level L1 and L2; there is no clinical utility for IOM of SSEPs or MEPs for surgical procedures below spinal level L1-L2.
Intraoperative SSEP monitoring is not indicated for routine lumbar or cervical root decompression (AANEM, 2004) or for routine cervical or lumbar laminectomy or fusion ((AANEM, 1999a).

The American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) supports that intraoperative SSEP monitoring may be indicated for select spine surgeries in which there is a risk of nerve root or spinal cord injury. According to the AANEM indications for SSEP intraoperative monitoring may include, but are not limited to, complex, extensive, or lengthy procedures, and when mandated by hospital policy.

Performance of IOM during pedicle screw placement and other instrumented spinal procedures has been evaluated by several author groups (Bose, et al., 2002; Raynor, et al., 2007; Alemo, et al., 2010; Wang, et al., 2010; Eager, et al., 2010; Parker, et al., 2011), however a majority of the published studies are retrospective, lack control groups, and have mixed results regarding sensitivity, specificity, threshold levels for determining a breach and improved surgical outcomes. One systematic review by Fehling et al. (2010), which included a review of 32 published articles, suggested that there is a high level of evidence that multimodal IOM is sensitive and specific for detecting intraoperative neurologic injury during spine surgery although a low level of evidence that IOM reduces the rate of new or worsened perioperative neurologic deficits. The level of evidence that an intraoperative response to a neuromonitoring alert reduced the rate of perioperative neurologic deterioration was very low. In addition, it has been suggested that imaging based modalities are more reliable for assessing pedicle screw breaches (Alemo, et al., 2010; Wang, et al., 2010) and that triggered EMG should be used as an adjunct technique for alerting potential nerve injury (Raynor; et al., 2007).

Regarding spine surgery specifically, IOM is indicated in select spine surgeries when there is risk for additional spinal cord injury. Intraoperative monitoring of SSEPs has not been shown to be of clinical benefit for routine lumbar or cervical nerve root decompression (AANEM, 2004), routine lumbar or cervical laminectomy or fusion (AANEM, 1999a). Resnick et al. (2005) reported in guidelines for the performance of fusion procedures for degenerative disease of the lumbar spine that based on the medical literature reviewed by the authors there does not appear to be support for the hypothesis that any form of intraoperative monitoring improves patient outcomes following lumbar decompression or fusion procedures for degenerative spinal disease. Changes to DSEP and SSEP monitoring appear to be sensitive to nerve root injury, however there is a high false-positive rate and changes are frequently not related to nerve injury. In 2014 an update to the 2005 guideline was published (Sharan, et al., 2014). The authors again reviewed the literature to determine if the use of IOM during lumbar or lumbosacral fusion was able to prevent nerve root injury and influence patient outcomes. Based on the results of their review, which included three new publications evaluating IOM of lumbar surgery since the 2005 review by Resnick et al., there is no evidence to support IOM during lumbar fusion impacts surgical outcomes (Sharan, et al., 2014). The evidence suggesting a correlation between SSEP signals and nerve root injury during lumbar surgery was graded as low quality; however, the authors found no evidence to support intraoperative maneuvers lead to recovery of nerve function once a change occurred (Sharan, et al., 2014).

Nuwer et al. (2012) published an evidence-based guideline update evaluating SSEPs and tcMEPs as part of intraoperative spinal monitoring (endorsed by the AANEM and the AAN, 2012). The authors reviewed four Class I (prospective cohort study) and eight Class II studies (case-control study with retrospective collection of data) which met inclusion criteria for analysis. All subjects within the studies had IOM although it was not clear which spinal level surgery was performed on. The outcomes of patients with evoked potential (EP) changes were compared with outcomes of patients without EP changes. Four class I diagnostic studies demonstrated that 16% to 40% of subjects who had an EP change during IOM had paraparesis, paraplegia, or quadriplegia while the subjects without an EP change had no adverse events. The authors concluded that IOM is established as effective to predict an increased risk of the adverse outcomes of paraparesis, paraplegia, or quadriplegia in spinal surgery.

The American Association of Neurological Surgeons/Congress of Neurological Surgeons (AANS/CNS) published an updated position statement for intraoperative electrophysiological monitoring (AANS/CNS, 2014). Within this document, the AANS/CNS states, “IOM during spinal surgery may assist in diagnosing neurological injury. However, there currently exists no evidence such monitoring either reduces the incidence of neurological injury, or mitigates the severity of it. IOM should be performed in procedures when the operating surgeon feels that the diagnostic information is of value, such as deformity correction, spinal instability, spinal cord compression, intradural spinal cord lesions and when in proximity to peripheral nerves or roots. Spontaneous and evoked
Electromyography is recommended for minimally invasive lateral retroperitoneal transpsoas approaches to the lumbar spine, and may also be of utility during pedicle screw insertion."

**U.S. Food and Drug Administration (FDA):** Intraoperative monitoring is a procedure and is not subject to FDA regulation. Evoked stimulator electrical devices used to apply an electrical stimulus through use of skin electrodes, to measure evoked potentials are regulated by the FDA as Class II devices and are approved through the 510(k) process. Several evoked stimulator electrical devices have been approved by the FDA.

**Use Outside of United States:** The National Institute for Health and Care Excellence (NICE) has issued procedural guidance for intraoperative nerve monitoring during thyroid surgery. Within this guidance NICE reports that “evidence on intraoperative nerve monitoring (IONM) during thyroid surgery raises no major safety concerns. In terms of efficacy, some surgeons find IONM helpful in performing more complex operations such as reoperative surgery and operations on large thyroid glands. Therefore, it may be used with normal arrangements for consent, audit and clinical governance” (NICE).

**Coding/Billing Information**

**Note:**
1) This list of codes may not be all-inclusive.
2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement.

**Continuous Intraoperative Monitoring**

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

<table>
<thead>
<tr>
<th>CPT® Codes</th>
<th>Description</th>
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<tbody>
<tr>
<td>95940</td>
<td>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)</td>
</tr>
<tr>
<td>95941</td>
<td>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)</td>
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<tr>
<th>HCPCS Codes</th>
<th>Description</th>
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<tbody>
<tr>
<td>G0453</td>
<td>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)</td>
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**Pre-Procedural Baseline Electrodiagnostic Studies**

Considered Medically Necessary when criteria in the applicable policy statements listed above are met:

**Electroencephalogram (EEG)**

<table>
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<th>CPT® Codes</th>
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<tbody>
<tr>
<td>95822</td>
<td>Electroencephalogram (EEG); recording in coma or sleep only</td>
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<tr>
<td>95955</td>
<td>Electroencephalogram (EEG) during nonintracranial surgery (eg, carotid surgery)</td>
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**Somatosensory Evoked Potential (SSEP)**
<table>
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<th>CPT® Codes</th>
<th>Description</th>
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<tbody>
<tr>
<td>95925</td>
<td>Short-latency somatosensory evoked potential study, stimulation of any/all peripheral nerves or skin sites, recording from the central nervous system; in upper limbs</td>
</tr>
<tr>
<td>95926</td>
<td>Short-latency somatosensory evoked potential study, stimulation of any/all peripheral nerves or skin sites, recording from the central nervous system; in lower limbs</td>
</tr>
<tr>
<td>95927</td>
<td>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</td>
</tr>
<tr>
<td>95938</td>
<td>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</td>
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**Motor Evoked Potential (MEP)**

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<th>CPT® Codes</th>
<th>Description</th>
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<tbody>
<tr>
<td>95928</td>
<td>Central motor evoked potential study (transcranial motor stimulation); upper limbs</td>
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<tr>
<td>95929</td>
<td>Central motor evoked potential study (transcranial motor stimulation); lower limbs</td>
</tr>
<tr>
<td>95939</td>
<td>Central motor evoked potential study (transcranial motor stimulation); in upper and lower limbs</td>
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**Transcranial Electrical Motor Evoked Potential (tcMEP)**

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<th>CPT® Codes</th>
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<tr>
<td>95870</td>
<td>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</td>
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</table>

**Auditory Brainstem Evoked Potential/Brainstem Auditory Evoked Potential (ABR/BAEP)**

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<th>CPT® Codes</th>
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<tbody>
<tr>
<td>92585</td>
<td>Auditory evoked potentials for evoked response audiometry and/or testing of the central nervous system; comprehensive</td>
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**Peripheral Nerve Stimulation (use only one code with IOM codes)**

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<tr>
<th>CPT® Codes</th>
<th>Description</th>
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<tbody>
<tr>
<td>95907</td>
<td>Nerve conduction studies; 1-2 studies</td>
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<tr>
<td>95908</td>
<td>Nerve conduction studies; 3-4 studies</td>
</tr>
<tr>
<td>95909</td>
<td>Nerve conduction studies; 5-6 studies</td>
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<tr>
<td>95910</td>
<td>Nerve conduction studies; 7-8 studies</td>
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<tr>
<td>95911</td>
<td>Nerve conduction studies; 9-10 studies</td>
</tr>
<tr>
<td>95912</td>
<td>Nerve conduction studies; 11-12 studies</td>
</tr>
<tr>
<td>95913</td>
<td>Nerve conduction studies; 13 or more studies</td>
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**Oculomotor, Facial, Trigeminal and Lower Cranial Nerve Monitoring:**

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<tr>
<th>CPT® Codes</th>
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<tbody>
<tr>
<td>95867</td>
<td>Needle electromyography; cranial nerve supplied muscle(s), unilateral</td>
</tr>
<tr>
<td>95868</td>
<td>Needle electromyography; cranial nerve supplied muscles, bilateral</td>
</tr>
<tr>
<td>95933</td>
<td>Orbicularis oculi (blink) reflex, by electrodiagnostic testing</td>
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Free-Running Electromyography (EMG)

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<tr>
<td>95860</td>
<td>Needle electromyography; 1 extremity with or without related paraspinal areas</td>
</tr>
<tr>
<td>95861</td>
<td>Needle electromyography; 2 extremities with or without related paraspinal areas</td>
</tr>
<tr>
<td>95870</td>
<td>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</td>
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Visual Evoked potential (VEP)

Not covered when used in combination with intraoperative monitoring:

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<thead>
<tr>
<th>CPT® Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>95930</td>
<td>Visual evoked potential (VEP) testing central nervous system, checkerboard or flash</td>
</tr>
</tbody>
</table>

Neuromuscular Blockade Testing (including but not limited to Train of Four testing)

Not separately reimbursed when used to monitor the depth of anesthesia during surgery:

<table>
<thead>
<tr>
<th>CPT® Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>95937</td>
<td>Neuromuscular junction testing (repetitive stimulation, paired stimuli), each nerve, any 1 method</td>
</tr>
<tr>
<td>95999</td>
<td>Unlisted neurological or neuromuscular diagnostic procedure</td>
</tr>
</tbody>
</table>


References


