## Title

# Sensory Evoked Potentials, Somatosensory, Visual, and Auditory Evoked Potentials and Intra-operative Neurophysiologic Monitoring

## When services may be considered medically necessary (covered) for commercial products and for Medicare HMO Blue and Medicare PPO Blue[i]

Sensory evoked potentials may be considered medically necessary (covered) for the following circumstances:

**Visual evoked potentials**:[1]

- diagnosis and monitoring of multiple sclerosis (acute or chronic phases)[1,7]
- localizing the cause of a visual field defect not explained by lesions seen on CT or MRI, metabolic disorders, or infectious diseases[1]; optic neuritis[8]
- infants, unresponsive, and non-verbal patients.[4]

**Auditory evoked potentials**:[1]

- evaluate brainstem function in acquired metabolic disorders[1]
- assess recovery of brainstem function after a lesion compressing the brainstem has been surgically removed[1]
- localizing the cause of a neurologic deficit seen on exam, not explained by lesions seen on CT or MRI[1]
- diagnosis and monitoring of demyelinating and degenerative diseases affecting the brain stem (multiple sclerosis, central pontine myelinolysis, olivopontocerebellar degeneration, and others)[1]
- diagnosis of lesions in the auditory system[1]
- evaluation of the irreversibility of coma or brain death, along with an EEG[1]
- for children under age 5, to determine the type and degree of hearing problems or to determine the developed status of nerves[1]
- Auditory Evoked Potentials or Auditory Brainstem Response (ABR) as specialized audiology tests in adults with difficult-to-test patients, neurologic assessment or retrocochlear pathology (e.g., acoustic neuromas or other lesions) and, as part of audiology standard battery tests for infants.[9]
- For all other indications that are considered appropriate based on the attending or treating physician's clinical judgment.

**Somatosensory evoked potentials**:[1,6]

- to assess any decline which may warrant emergent surgery in unconscious spinal cord injury patients who show specific structural damage to the somatosensory system, and who are candidates for emergency spinal cord surgery[1]
- multiple sclerosis[4, 7]
- to evaluate patients with suspected brain death[4]
- unexplained myelopathy[4]
- localizing the cause of a neurologic deficit seen on exam, not explained by lesions seen on CT or MRI.[5]

- For all other indications that are considered appropriate based on the attending or treating physician's clinical judgment.

**Intra-operative Neurophysiologic Monitoring (sensory-evoked potentials, motor-evoked potentials, EEG monitoring)**

- Intraoperative monitoring, which includes somatosensory-evoked potentials, motor-evoked potentials using transcranial electrical stimulation, brainstem auditory-evoked potentials, EMG of cranial nerves, EEG, and electrocorticography (ECoG), may be considered medically necessary (covered) during spinal, intracranial, or vascular procedures.
- Intra-operative somatosensory-evoked potentials may also be considered medically necessary (covered) for the diagnosis and management of specific neurologic diseases which involve the somatosensory system, such as multiple sclerosis and Pelizaeus-Merzbacher disease.

## When services are investigational (not covered) for commercial products and for Medicare HMO Blue and Medicare PPO Blue[i]

**Intraoperative monitoring of visual-evoked potentials**[2,3] is considered investigational (not covered) as it has not been proven to change the management of a patient undergoing an operation and because it does not meet the Blue Cross Blue Shield of Massachusetts Medical Technology Assessment Guidelines, #350.

**Intraoperative monitoring of motor-evoked potentials** using transcranial magnetic stimulation is considered investigational (not covered) as it is not FDA approved and because it does not meet the Blue Cross Blue Shield of Massachusetts Medical Technology Assessment Guidelines, #350.

**Auditory evoked potentials** to determine gestational age are considered investigational (not covered) since this test in inadequate for this purpose and because it does not meet the Blue Cross Blue Shield of Massachusetts Medical Technology Assessment Guidelines, #350.[1]

**Somatosensory evoked potentials** for the diagnosis or management of metabolic disorders are considered investigational (not covered) since these recordings are not likely to change patient management and because it does not meet the Blue Cross Blue Shield of Massachusetts Medical Technology Assessment Guidelines, #350.[1, 6]

## When services are not medically necessary (not covered) for commercial products

Following the Medical Policy Administration review process, Blue Cross Blue Shield of Massachusetts has determined that **intraoperative EMG and nerve conduction velocity monitoring** during surgery on the peripheral nerves is considered not medically necessary (not covered), as defined in the Blue Cross Blue Shield of Massachusetts subscriber certificate filed with the state Division of Insurance.

## When services are not covered for Medicare HMO Blue and Medicare PPO Blue[1]

**Intraoperative EMG and nerve conduction velocity monitoring** during surgery on the peripheral nerves is not covered.

## Individual consideration (Clinical Exceptions)

All our medical policies are written for the majority of people with a given condition. Each policy is based on medical science. For many of our medical policies, each individual's unique clinical circumstances may be considered in light of current scientific literature. For consideration of an individual patient, physicians may send relevant clinical information to:

| For services already billed | Prior to performance of service |
|---|---|
| Blue Cross Blue Shield of Massachusetts<br>Provider Appeals<br>PO Box 986065<br>Boston, MA 02298 | Blue Cross Blue Shield of Massachusetts<br>Case Creation/Medical Policy<br>One Enterprise Drive<br>Quincy, MA 02171<br>Tel: 1-800-327-6716<br>Fax: 1-888-282-0780 |

## Authorization Information

**For Managed Care members:**

- **No authorizations are required for these services;** see **Managed Care Guidelines** for additional requirements.

**For Indemnity and PPO members:**

- **No authorizations are required for these services;** see **Indemnity and PPO Guidelines** for additional requirements.

## Managed care guidelines

**All authorization requirements are determined by the individual's subscriber certificate, explanation of coverage, or summary plan description; however,**

**For Medicare HMO Blue members:**

- The service must meet the criteria for coverage noted in this policy, be medically necessary, prescribed by a plan physician and provided by a network provider.
- Referrals are required for all visits to a specialist.

**For all other Managed Care plans:**

- Any specialist visit requires a referral, except for visits performed by OB/GYN specialists.
- Authorization is required for an inpatient admission.

## Indemnity guidelines

**All authorization requirements are determined by the individual's subscriber certificate, explanation of coverage, or summary plan description, however;**

- Authorization is required for an inpatient admission.
- Authorizations are not required for most outpatient services as determined by the individual's subscriber certificate.
- Referrals to a specialist are not required.

## Other information

For our Medical Technology Assessment Guidelines, see document #350.

## Coding information

*Procedure codes are from current CPT, HCPCS Level II, Revenue Code, and/or ICD-9-CM manuals, as recommended by the American Medical Association, Centers for Medicare and Medicaid Services and American Hospital Associations. Blue Cross Blue Shield Association national codes may be developed when appropriate. A draft of future ICD-10 Coding related to this document, as it might look today, is included below for your reference.*

*The following codes are included below for informational purposes. Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member's contract*

*benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.*

**CPT Codes**

| CPT Code | Description |
|---|---|
| 92585 | Auditory evoked potentials for evoked response audiometry and/or testing of the central nervous system; comprehensive |
| 92586 | Auditory evoked potentials for evoked response audiometry and/or testing of the central nervous system; limited |
| 95829 | Electrocorticogram at surgery (separate procedure) |
| 95867 | Needle electromyography; cranial nerve supplied muscle(s), unilateral |
| 95868 | Needle electromyography; cranial nerve supplied muscles, bilateral |
| 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 |
| 95930 | Visual evoked potential (VEP) testing central nervous system, checkerboard or flash |
| 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) |
| 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) |
| 95955 | Electroencephalogram (EEG) during nonintracranial surgery (eg, carotid surgery) |

**HCPCS Codes**

| HCPCS Codes | Description |
|---|---|
| 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) |

**ICD-9 Procedure Codes**

| ICD-9 Procedure Code | Description |
|---|---|
| 89.14 | Electroencephalogram |
| 89.15 | Other nonoperative neurologic function tests |
| 93.08 | Electromyography |

**ICD-10 Procedure Codes**

| ICD-10-PCS procedure codes: | Code Description |
|---|---|
| 4A0004Z | Measurement of Central Nervous Electrical Activity, Open Approach |
| 4A0002Z | Measurement of Central Nervous Conductivity, Open Approach |

| | |
|---|---|
| 4A00X2Z | Measurement of Central Nervous Conductivity, External Approach |
| 4A00X4Z | Measurement of Central Nervous Electrical Activity, External Approach |
| 4A01329 | Measurement of Peripheral Nervous Conductivity, Sensory, Percutaneous Approach |
| 4A0132B | Measurement of Peripheral Nervous Conductivity, Motor, Percutaneous Approach |
| 4A01X29 | Measurement of Peripheral Nervous Conductivity, Sensory, External Approach |
| 4A01X2B | Measurement of Peripheral Nervous Conductivity, Motor, External Approach |
| 4A1002Z | Monitoring of Central Nervous Conductivity, Open Approach |
| 4A1004Z | Monitoring of Central Nervous Electrical Activity, Open Approach |
| 4A10X2Z | Monitoring of Central Nervous Conductivity, External Approach |
| 4A10X4Z | Monitoring of Central Nervous Electrical Activity, External Approach |
| 4A1104Z | Monitoring of Peripheral Nervous Electrical Activity, Open Approach |
| 4A11329 | Monitoring of Peripheral Nervous Conductivity, Sensory, Percutaneous Approach |
| 4A1132B | Monitoring of Peripheral Nervous Conductivity, Motor, Percutaneous Approach |
| 4A1134Z | Monitoring of Peripheral Nervous Electrical Activity, Percutaneous Approach |
| 4A11X29 | Monitoring of Peripheral Nervous Conductivity, Sensory, External Approach |
| 4A11X2B | Monitoring of Peripheral Nervous Conductivity, Motor, External Approach |
| 4A11X4Z | Monitoring of Peripheral Nervous Electrical Activity, External Approach |
| 4B00XVZ | Measurement of Central Nervous Stimulator, External Approach |
| 4B01XVZ | Measurement of Peripheral Nervous Stimulator, External Approach |
| 4B0FXVZ | Measurement of Musculoskeletal Stimulator, External Approach |
| F01Z77Z | Facial Nerve Function Assessment using Electrophysiologic Equipment |
| F01Z9JZ | Somatosensory Evoked Potentials Assessment using Somatosensory Equipment |
| F13ZL7Z | Auditory Evoked Potentials Assessment using Electrophysiologic Equipment |
| F13ZLZZ | Auditory Evoked Potentials Assessment |

## Policy update history

Policy on sensory evoked response studies issued 3/91, policy on intraoperative monitoring issued 8/94. Policies were merged 12/96, and exclusion of coverage for ALS was added. Updated 4/97 after a literature review; no changes were made to coverage. Updated 1/98 to include coverage for intra-op somatosensory-evoked potentials or brainstem auditory-evoked potentials, during spinal, intra-cranial, or vascular procedures. Updated 2/98 to exclude coverage for intraoperative motor-evoked potentials. Reviewed 1/99; no changes in coverage were made. Updated 1/2000 to include coverage for visual evoked potentials for infants, unresponsive, and non-verbal patients; somatosensory evoked potentials for multiple sclerosis, to evaluate patients with suspected brain death, unexplained myelopathy, and for localizing the cause of a neurologic deficit seen on exam, not explained by lesions seen on CT or MRI. Updated 1/01 to include individual consideration guidelines for SEPs to rule out ALS. Reviewed 1/02, no changes in coverage were made. Reviewed 1/03 MPG Neurology, no changes in coverage were made. Reviewed 3/03, MPG ENT, no changes in coverage were made. Reviewed 1/04 MPG neurology, no changes were made. Updated 2/04 MPG Psychiatry, Ophthalmology and Endocrinology, to include coverage for visual evoked potentials for optic neuritis; effective immediately. Reviewed 3/04 MPG Pulmonology, Allergy and ENT/Otolaryngology, no changes in coverage were made. Reviewed 1/05 MPG neurology, no changes in coverage were made. Reviewed 3/05 MPG Pulmonology, Allergy and ENT/Otolaryngology, no changes in coverage were made. Updated 4/05 to clarify the coverage guidelines to include the following statement: For all other indications that are considered appropriate based on the attending or treating physician's clinical judgment. Reviewed 1/06 MPG-Neurology, no changes in coverage were made. Reviewed 2/06 MPG- Psychiatry, Ophthalmology and Endocrinology, no changes in coverage were made. Reviewed 3/06 MPG-Pulmonology, Allergy, ENT/Otolaryngology, no changes in coverage were made. Reviewed 1/07 MPG Neurology, no changes in coverage were made. Reviewed 2/07 MPG-Psychiatry, Ophthalmology and Endocrinology, no changes in coverage were made. Reviewed 3/07 MPG- Pulmonology, Allergy and ENT/Otolaryngology, no changes in coverage were made. Reviewed 1/08 MPG-Neurology, no changes in coverage were made. Reviewed 2/08 MPG-Psychiatry, Ophthalmology and Endocrinology, no changes in coverage were made. Reviewed 3/08

MPG- Pulmonology, Allergy and ENT/Otolaryngology, no changes in coverage were made. Reviewed 1/09 MPG – Neurology and Neurosurgery, no changes in coverage were made. Reviewed 2/09 MPG – Psychiatry, Ophthalmology and Endocrinology, no changes in coverage were made. Reviewed 3/09 MPG – Pulmonology, Allergy/Asthma/Immunology and ENT/Otolaryngology, no changes in coverage were made. Reviewed 1/2010 MPG – Neurology and Neurosurgery, no changes in coverage were made. Reviewed 2/2010 MPG Psychiatry, Ophthalmology, and Endocrinology, no changes in coverage were made. Reviewed 3/2010 MPG – Pulmonology, Allergy/Asthma/Immunology, ENT and Otolaryngology, no changes in coverage were made. Updated 1/2011 MPG – Neurology and Neurosurgery, no changes in coverage were made. Reviewed 2/2011 MPG – Psychiatry and Ophthalmology, no changes in coverage were made. Reviewed 3/2011 MPG – Allergy/Asthma/Immunology and ENT/Otolaryngology, no changes in coverage were made. Updated 12/1/2011- Medically necessary (covered), investigational (not covered) and not medically necessary (not covered) criteria updated for Intra-operative neurophysiologic monitoring along with the coding information and the title of the policy renamed accordingly based on BCBSA national policy; effective 12/1/2011. Reviewed 1/2012 MPG – Neurology and Neurosurgery, no changes in coverage were made. Reviewed 2/2012 MPG Psychiatry and Ophthalmology, no changes in coverage were made. Reviewed 3/2012 MPG – Allergy, Asthma, Immunology and ENT/Otolaryngology, no changes in coverage were made. Updated 12/2012 to add new CPT codes 95940 and 94941 effective 1/1/2013. Updated to add new HCPCS code G0453 effective 1/1/2013. 6/2014 Updated Coding section with ICD10 procedure and diagnosis codes, effective 10/2015. 07/2014 Coding information clarified.

## References


[1] Based upon a 1988 TEC (Technology Evaluation Center) assessment of sensory evoked potentials (SEP) for various conditions.

[2] Based upon a 1988 TEC (Technology Evaluation Center) assessment of sensory evoked potentials (SEP) Intra-operatively.

[3] See national BCBSA policy on intra-operative neurophysiologic monitoring. Following a literature review up to 5/97, including:

- American Academy of Neurology. Therapeutics and technology assessment subcommittee: Intra-operative neurophysiology. Neurology 1990: 40:1644-46
- Intra-operative monitoring by evoked potentials for spinal cord surgery: The cons. by Aminoff MJ, Electroenceph Clin Neurophys 1989; 73:378-80.
- Intra-operative monitoring by evoked potentials for spinal cord surgery: the pros. by Daube JR (as above, pp. 374-44).
- Somatosensory-evoked potentials during carotid artery surgery: Experience in 400 operations by Schweigger, et al, Surgery 1991; 109:602-9.

[4] Based upon the 1998 AAEM (American Association of Electrodiagnostic Medicine) monograph #19 on Somatosensory Evoked Potentials. Authors: Michael J. Aminoff, MD, F.R.C.P, Department of Neurology, University of California, San Francisco; Andrew A. Eisen, MD, Department of Medicine, University of Medicine, University of British Columbia. Also, recommendations from Drs. Weinberg and Rizzoli, President and Vice President of the Massachusetts Neurologic Association.

[5] Based on recommendations from Dr. Frank Drislane, Harvard Medical School, on Electric Blue Review, and Drs. Weinberg and Rizzoli, President and Vice President of the Massachusetts Neurologic Association.

[6] See the 1997 Report of the American Academy of Neurology Therapeutics and Technology Assessment Subcommittee on Dermatomal somatosensory evoked potentials (DSEPs). See also Neurology 1997;49:1127-1130.

[7] See the 2000 Report of the Quality Standards Subcommittee of the American Academy of Neurology on: The usefulness of evoked potentials in identifying clinically silent lesions in patients with suspected MS. See also Neurology 2000;54:1720-1725.

[8] Recommended by Dr. Michael Price, Massachusetts Society of Eye Surgeons and Physicians. [9] Based upon the 2003 Blue Cross Blue Shield Association national policy 9.01.02, Evaluation of Hearing Impairment following a literature review up to 5/03, including:

- American Academy of Pediatrics. Year 2000 position statement: principles and guidelines for early hearing detection and intervention programs. Pediatrics 2000; 106(4):798-817.
- Bamiou DE, Musiek FE, Luxon LM. Aetiology and clinical presentations of auditory processing disorders – a review. Arch Dis Child 2001; 85(5):361-5.
- Amos NE, Humes LE. SCAN test-retest reliability for first and third grade children. J Speech Lang Hear Res 1998; 41(4):834-45.
- Domitz DM, Schow RL. A new CAPD battery – multiple processing assessment: factor analysis and comparisons with SCAN. Am J Audiol 2000; 9(2):101-11.
- Task Force on Central Auditory Processing Consensus Development. American Speech-Language-Hearing Association. Central auditory processing: Current status of research and implications for clinical practice. Am J Audiol 1996; 5:41-54.
- Jerger J, Musiek F. Report of the Consensus Conference on the Diagnosis of Auditory Processing Disorders in School-Aged Children. J Am Acad Audiol 2000; 11(9):467-74.



**Foot Notes**

[i] Based on BCBSA National policy 7.01.58, Intra-operative Neurophysiologic Monitoring (sensory-evoked potentials, motor-evoked potentials, EEG monitoring), reviewed March 2011.