SENSORY EVOKED POTENTIALS

- Diagnostic Monitoring
- Intraoperative Monitoring

Coverage for services, procedures, medical devices and drugs are dependent upon benefit eligibility as outlined in the member's specific benefit plan. This Medical Coverage Guideline must be read in its entirety to determine coverage eligibility, if any.

This Medical Coverage Guideline provides information related to coverage determinations only and does not imply that a service or treatment is clinically appropriate or inappropriate. The provider and the member are responsible for all decisions regarding the appropriateness of care. Providers should provide BCBSAZ complete medical rationale when requesting any exceptions to these guidelines.

The section identified as "Description" defines or describes a service, procedure, medical device or drug and is in no way intended as a statement of medical necessity and/or coverage.

The section identified as "Criteria" defines criteria to determine whether a service, procedure, medical device or drug is considered medically necessary or experimental or investigational.

State or federal mandates, e.g., FEP program, may dictate that any drug, device or biological product approved by the U.S. Food and Drug Administration (FDA) may not be considered experimental or investigational and thus the drug, device or biological product may be assessed only on the basis of medical necessity.

Medical Coverage Guidelines are subject to change as new information becomes available.

For purposes of this Medical Coverage Guideline, the terms "experimental" and "investigational" are considered to be interchangeable.

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Description:

When the body is exposed to light, sound or touch, the brain responds by producing certain types of brain waves called evoked potentials (EP) or sensory evoked potentials (SEP). Wires attached to the skin pick up the waves. The brain waves are assessed by a computer and interpreted by a physician.

Diagnostic Monitoring of EP:
Diagnostic monitoring of EP can be used to verify the diagnosis of certain neuropathologic states and to provide information for treatment.
SENSORY EVOKED POTENTIALS (cont.)

**Description**: (cont.)

**Intraoperative Monitoring of EP**:  
Intraoperative monitoring of EP, also referred to as intraoperative evoked potentials (IEP), can be used during surgical procedures to identify nervous system impairment. Prompt intervention of nervous system impairment may prevent permanent deficits.

**Brainstem Auditory Evoked Potentials (BAEP)**:  
BAEP are generated in response to sounds, i.e., auditory clicks, and can determine the functional status of the auditory nerve. BAEP may also be referred to as Brainstem Auditory Evoked Response (BAER) or Auditory Brainstem Response (ABR).

**Motor Evoked Potentials (MEP)**:  
MEP are recorded from muscles following direct or transcranial electrical stimulation of the motor cortex or by pulsed magnetic stimulation provided by a coil placed over the head. MEPs, especially when induced by magnetic stimulation, can be affected by anesthesia. The Digitimer electrical cortical stimulator has received FDA premarket approval. Devices for transcranial magnetic stimulation have not yet received FDA approval for this use.

**Somatosensory Evoked Potentials (SSEP)**:  
SSEP are generated in response to touch. Peripheral nerves (upper and lower extremity nerves) are typically stimulated. Dermatomal somatosensory evoked potentials involve cutaneous stimulation of the spinal cord.

**Visual Evoked Potentials (VEP)**:  
VEP are generated in response to light. VEP are used to track visual signals from the retina to the occipital cortex light flashes.

**EMG (Electromyography) Monitoring and Nerve Conduction Velocity Measurements**:  
Electromyogram monitoring and nerve conduction velocity measurements can be performed in the operating room and may be used to assess the status of the 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 purpose is similar—to verify that the neural pathway is intact.
SENSORY EVOKED POTENTIALS (cont.)

Criteria:

Diagnostic Monitoring of BAEP:

- Diagnostic monitoring of BAEP is considered *medically necessary* for **ANY** of the following:
  
  1. Adjunct to EEG in evaluating the irreversibility of coma or brain death
  2. Assess brain stem function recovery after removal of space occupying lesions that were compressing the brain stem
  3. Diagnose and manage demyelinating or degenerative diseases of the brain stem (e.g., multiple sclerosis, central pontine myelinolysis and olivopontocerebellar degeneration)
  4. Diagnose a brain stem tumor when clinical examination is suspicious and a CT or MRI are nondiagnostic
  5. Diagnose lesions in the auditory system external to the brain stem (e.g., acoustic neuroma)
  6. Evaluate brain stem function in acquired metabolic disorders (e.g., hypoxic encephalopathy)
  7. Evaluate neural maturation in neonates, infants and children less than 5 years of age
  8. Measure the type and extent of hearing impairment in neonates, infants and children less than 5 years of age.

Diagnostic Monitoring of SSEP:

- Diagnostic monitoring of SSEP is considered *medically necessary* for **ANY** of the following:
  
  1. Assess somatosensory function in an unconscious individual who has sustained traumatic damage to the spinal cord (e.g., vertebral fracture) as documented by radiological exam and who is a candidate for spinal surgery
  2. Diagnose and manage suspected space occupying lesions, demyelinating and degenerative diseases
  3. Diagnose and manage suspected dysfunctions of the peripheral nerves in the somatosensory system not disclosed by radiologic exam with documentation of **ALL** of the following:
    
    a. Numbness/tingling **OR** radiculopathy (pain, muscle weakness, atrophy, depression of deep tendon reflexes or sensory impairment to pin prickle, 2 point discrimination or light touch)
    b. Symptoms persisting for greater than 45 days
    c. Failure of medically supervised conservative treatment for 30 days or greater (i.e., rest, analgesics, NSAIDS, physical therapy, spinal manipulation, if appropriate)
    d. Other diagnostic tests (i.e., MRI, CT, vascular studies, lab tests) are not feasible or unable to determine etiology of symptoms.

Dysfunctions include, but are not limited to:

- Carpal tunnel syndrome
- Peripheral neuropathy
- Radiculopathy
SENSORY EVOKED POTENTIALS (cont.)

Criteria: (cont.)

Diagnostic Monitoring of VEP:

- Diagnostic monitoring of VEP is considered medically necessary for ANY of the following:
  1. Diagnose and manage multiple sclerosis (includes assessment during both the acute and chronic phases)
  2. Localize the basis for visual field defects which occur in the absence of structural lesions, acquired metabolic (cerebral anoxia) or infectious disease
  3. Evaluate neural maturation in neonates, infants and children less than 5 years of age.

Diagnostic Monitoring of BAEP, SSEP, VEP:

- Diagnostic monitoring of BAEP, SSEP or VEP for all other indications not previously listed is considered experimental or investigational based upon:
  1. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes, and
  2. Insufficient evidence to support improvement of the net health outcome, and
  3. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives.

Examples include, but are not limited to:

- Assessment of Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD) disorders
- Assessment of Autism spectrum disorders
- Recording SSEP without an EEG in an unconscious individual with head injuries to assess the status of the somatosensory system
- Determining conceptional or gestational age in preterm infants
SENSORY EVOKED POTENTIALS (cont.)

Criteria: (cont.)

Intraoperative Monitoring of BAEP, MEP, SSEP:

- Intraoperative monitoring of BAEP, MEP using transcranial electrical stimulation and SSEP is considered *medically necessary* for *ANY* of the following:
  1. Intracranial surgeries, *including but not limited to*:
     - Brain, brainstem
     - Carotid endarterectomy
     - Cranial nerves (e.g., acoustic neuroma)
  2. Spinal cord or neck surgeries when there is a risk of additional nerve root or spinal cord injury, e.g., mechanical trauma from instrumentations (not routine lumbar or cervical root decompression)
  3. Vascular surgeries when there is risk of hemorrhage
  4. Insertion and removal of hardware (e.g. rods, plates)

- Intraoperative monitoring of BAEP, MEP and SSEP for all other indications not previously listed is considered *experimental or investigational* based upon:
  1. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes, and
  2. Insufficient evidence to support improvement of the net health outcome, and
  3. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives.

Examples include, *but are not limited to*:

- Baseline pre-operative evaluation
- Routine lumbosacral back surgery

- Intraoperative monitoring of MEP using transcranial magnetic stimulation is considered *experimental or investigational* based upon:
  1. Lack of final approval from the Food and Drug Administration, and
  2. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes, and
  3. Insufficient evidence to support improvement of the net health outcome, and
  4. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives, and
  5. Insufficient evidence to support improvement outside the investigational setting.
SENSORY EVOKED POTENTIALS (cont.)

Criteria: (cont.)

Intraoperative Monitoring of VEP:

- Intraoperative monitoring of VEP is considered experimental or investigational based upon:
  1. Insufficient scientific evidence to permit conclusions concerning the effect on health outcomes, and
  2. Insufficient evidence to support improvement of the net health outcome, and
  3. Insufficient evidence to support improvement of the net health outcome as much as, or more than, established alternatives.

Intraoperative EMG and Nerve Conduction Monitoring:

- Intraoperative EMG and nerve conduction velocity monitoring during surgery on the peripheral nerves is considered not medically necessary.

Resources:

Literature reviewed 06/23/15. We do not include marketing materials, poster boards and non-published literature in our review.

The BCBS Association Medical Policy Reference Manual (MPRM) policy is included in our guideline review. References cited in the MPRM policy are not duplicated on this guideline.

SENSORY EVOKED POTENTIALS (cont.)

Resources: (cont.)


6. InterQual® Care Planning, Procedures Adult. Electromyography (EMG) and Nerve Conduction Studies (NCS).


