Anthem

Clinical UM Guideline

Subject: Electromyography and Nerve Conduction Studies
Guideline #: CG-MED-24
Status: Reviewed
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Description

This document addresses the use of electromyography (EMG) and nerve conduction studies (NCS) in the outpatient setting. Needle EMG and NCS typically comprise the electrodiagnostic evaluation of function of the motor neurons, nerve roots, peripheral nerves, neuromuscular junction and skeletal muscles. This document also addresses neuromuscular junction testing regardless of place of service.

Note: For information about other related topics, see:

- CG-MED-50 Visual, Somatosensory and Motor Evoked Potentials
- CG-SURG-112 Carpal Tunnel Decompression Surgery
- MED.00082 Quantitative Sensory Testing
- MED.00092 Automated Nerve Conduction Testing

Clinical Indications

Medically Necessary:

A. Needle EMG when performed with NCS at the same time of testing are considered **medically necessary** for diagnosing neuropathy with sensory loss, weakness or muscle atrophy for ***any*** of the following indications (1 thru 5):
   1. Unexplained peripheral neuropathy with pain of a neuropathic pattern, demonstrated sensory loss, or motor loss on physical examination; **or**
   2. Neuropathy suspected to be due to trauma; **or**
   3. When test results are expected to guide the management of conditions known to cause neuropathy, including but not limited to (a thru d):
      a. HIV-positive individuals with symptoms of neuropathy; **or**
      b. Mononeuropathies, such as Bell's palsy of the facial nerve; **or**
      c. Diabetics with persistent or progressive symptoms refractory to conventional treatments; **or**
      d. Individuals on dialysis or those considering dialysis; **or**
   4. Suspected neural impingement or entrapment where symptoms are persistent or unresponsive to initial conservative treatments, as indicated by any of the following (a thru g):
      a. Carpal tunnel syndrome (when clinical documentation shows impingement symptoms refractory to activity modification and at least 4 weeks of wrist splint use)*; **or**
      b. Ulnar neuropathy at the elbow or wrist (when clinical documentation shows impingement symptoms refractory to activity modification and at least 4 weeks of elbow pad use)*; **or**
      c. Cervical or lumbar radiculopathy (when clinical documentation shows 4-6 weeks of failed conservative therapy, including physical therapy **and** where the etiology of the radicular symptoms is not explained by MRI or other diagnostic studies); **or**
      d. Tarsal tunnel syndrome (when clinical documentation shows pain and numbness isolated to the foot); **or**
      e. Peroneal palsy with foot drop; **or**
      f. Suspected brachial or lumbosacral plexus impingement; **or**
      g. Other peripheral nerve entrapment syndromes; **or**
   5. Significant clinical suspicion for any of the following conditions (a thru g):
      a. Amyotrophic lateral sclerosis; **or**
      b. Guillain-Barre syndrome; **or**
      c. Hereditary myopathies, (for example, muscular dystrophy); **or**
      d. Hereditary neuropathies, (for example, Charcot-Marie-Tooth disease); **or**
      e. Inflammatory myopathies, (for example, polymyositis, chronic inflammatory demyelinating polyneuropathy [CIDP]); **or**
      f. Inflammatory or idiopathic brachial or lumbosacral plexopathy; **or**
      g. Post-polio syndrome.

*__Note:__ In cases of carpal tunnel syndrome or ulnar neuropathy, the requirement for a period of conservative treatment may be waived if the physical exam demonstrates significant atrophy or weakness or sensory loss.

B. Needle EMG when performed with NCS at the same time of testing are considered **medically necessary** for diagnosis of individuals with significant clinical suspicion for ***any*** of the following neuromuscular junction diseases (1 thru 3):
   1. Myasthenia gravis; **or**
   2. Eaton-Lambert syndrome; **or**
   3. Botulism.

C. NCS performed without needle EMG at the same time of testing is considered **medically necessary** for ***any*** of the following clinical indications (1 thru 7):
   1. Evaluation of suspected carpal or tarsal tunnel syndrome; **or**
   2. Evaluation of suspected acute nerve injury (that is within 3 weeks of occurrence); **or**
   3. For individuals on anticoagulant therapy (not merely anti-platelet treatments); **or**
   4. For individuals with significant lymphedema; **or**
   5. Evaluation of suspected peroneal palsy; **or**
   6. Evaluation of thoracic outlet syndrome; **or**
   7. For facial nerve monitoring in Bells palsy.

D. Needle EMG performed without NCS at the same time of testing is considered **medically necessary** for the evaluation of suspected radiculopathy.

Not Medically Necessary:

Needle EMG performed with NCS at the same time of testing are considered **not medically necessary** when the criteria listed above are not met, including as a screening tool for the general population, in the absence of related symptoms.

NCS performed without needle EMG at the same time of testing is considered **not medically necessary** except the limited clinical indications listed above.

Needle EMG performed without NCS at the same time of testing is considered **not medically necessary** when the criteria listed above are not met.

Testing for neuromuscular junction diseases with needle EMG or NCS is considered **not medically necessary** when the criteria above are not met, and for all other indications.

Needle EMG or NCS is considered **not medically necessary** for all other conditions, including but not limited to, back pain without radiculopathy, or headaches when there is no suspicion of an underlying disorder of the cranial nerves.

Coding

The following codes for treatments and procedures applicable to this document are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

When services may be Medically Necessary when criteria are met:

CPT	
95860	Needle electromyography; 1 extremity with or without related paraspinal areas
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 muscle(s), bilateral
95869	Needle electromyography; thoracic paraspinal muscles (excluding T1 or T12)
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
95872	Needle electromyography using single fiber electrode, with quantitative measurement of jitter, blocking and/or fiber density, any/all sites of each muscle studied
95875	Ischemic limb exercise test with serial specimen(s) acquisition for muscle(s) metabolites(s)
95885	Needle electromyography, each extremity, with related paraspinal areas, when performed, done with nerve conduction, amplitude and latency/velocity study; limited
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
95887	Needle electromyography, non-extremity (cranial nerve supplied or axial) muscle(s) done with nerve conduction, amplitude and latency/velocity study
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
95937	Neuromuscular junction testing (repetitive stimulation, paired stimuli); each nerve, any 1 method

ICD-10 Diagnosis	
	All diagnoses

When services are Not Medically Necessary:
For the procedure codes listed above when criteria are not met or for situations designated in the Clinical Indications section as not medically necessary.

Discussion/General Information

In EMG, electrical potentials are detected by a needle electrode inserted directly into a skeletal muscle. This test is useful in the outpatient evaluation of the motor neuron, nerve root, peripheral nerve, neuromuscular junction and the muscle itself. It is helpful in distinguishing between inflammatory and chronic, metabolic or inherited muscle diseases, and in differentiating between acute, recovering, and chronic denervation. While EMG may not necessarily provide a clinical diagnosis, patterns of EMG abnormalities may suggest specific pathologic entities.

NCS performed in the outpatient setting provides information regarding the presence, severity and location of a peripheral neuropathy, mononeuropathy, or disorders affecting the neuromuscular junction. Additional information suggested by NCS includes the functional modality most involved (sensory or motor) and the predominant pattern of pathology, (for example, axonal, demyelinating, or both).

EMG and NCS tests require needle insertion and then repositioning at multiple sites and at anatomically critical areas, in order to assist in clinical diagnosis, prognosis, and clinical management decisions. In NCS, surface electrodes are usually used for both stimulation and recording of the electrical responses. However, needle electrodes are sometimes needed to evaluate a deep nerve, such as the sciatic or the femoral nerve.

EMG and NCS are most effective when preliminary investigation (including history and neurologic examination) is suggestive of a significant probability of pathology. EMG and NCS should be performed and interpreted by individuals with appropriate training and expertise and should be evaluated in the context of the individual clinical scenario.

It is the position of the American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM), in its *Recommended Policy for Electrodiagnostic Medicine* (2017), that the selection of the number and type of specific EMG and NCS tests to be performed on an individual is best determined by the testing physician, based on multiple factors, including: the referral diagnosis, presenting symptoms, medical history, findings on prior clinical examination or diagnostic testing, and suspected etiology.

The use of NCS testing without concurrent needle EMG has increased over 30% in one year (AANEM, 2020). In the 2020 position statement *Proper Performance and Interpretation of Electrodiagnostic Studies*, AANEM states that except for unique situations, needle EMG and NCS should be performed together in a study design determined by a trained physician, in order that healthcare decisions are based on complete diagnostic information. The AANEM position statement also reiterated the importance of the physician performing a history and physical prior to any testing and designing the NCS and EMG testing based upon the information obtained during that exam. Some excerpted comments follow:

> Because needle EMG studies offer information needed for an accurate diagnosis, except in unique situations, it is the AANEM's position that NCSs and needle EMGs should be performed together in the same setting. It is the opinion of the AANEM that utilizing only NCSs provides incomplete diagnostic information, potentially leading to inadequate or inappropriate treatment (including inappropriate surgery) and increased health care costs.
>
> Using a predetermined or standardized battery of NCSs for all patients is inappropriate because it may be possible to obtain the data needed to reach a diagnosis with fewer studies. Alternatively, a pre-determined battery may not include the appropriate NCSs and/or EMG tests to determine the diagnosis.

In another AANEM document, the *Model Policy for Needle Electromyography and Nerve Conduction Studies*, updated in 2016, the following was noted:

> The necessity and reasonableness of the following uses of needle EMG studies have not been established:
>
> 1. exclusive testing of intrinsic foot muscles in the diagnosis of proximal lesions
> 2. definitive diagnostic conclusions based on paraspinal EMG in regions bearing scar of past surgeries (e.g., previous laminectomies)
> 3. pattern-setting limited limb muscle examinations, without paraspinal muscle testing for a diagnosis of radiculopathy
> 4. needle EMG testing shortly after trauma, before needle EMG abnormalities would have reasonable time to develop
> 5. surface and macro EMGs
> 6. multiple uses of needle EMG in the same patient at the same location for the purpose of optimizing botulinum toxin injections.

Currently, the published literature does not support that the use of EMG and NCS testing for other conditions, such as headaches without suspected cranial nerve pathology, or back pain without suspected radiculopathy provides additional meaningful clinical information.

References

Peer Reviewed Publications:

1. Callaghan BC, Price RS, Feldman EL. Distal symmetric polyneuropathy: a review. JAMA. 2015; 314(20):2172-2181.
2. Chang MH, Liu LH, Lee YC, et al. Comparison of sensitivity of transcarpal median motor conduction velocity and conventional conduction techniques in electrodiagnosis of carpal tunnel syndrome. Clin Neurophysiol. 2006; 117(5):984-991.
3. Dabbagh A, MacDermid JC, Yong J, et al. Diagnostic accuracy of sensory and motor tests for the diagnosis of carpal tunnel syndrome: a systematic review. BMC Musculoskelet Disord. 2021; 22(1):337.
4. Gooch CL, Weimer LH. The electrodiagnosis of neuropathy: basic principles and common pitfalls. Neurol Clin. 2007; 25(1):1-28.
5. Katz JN, Simmons BP. Carpal tunnel syndrome. N Engl J Med. 2002; 346(23):1807-1812.
6. Lazaro RP. Electromyography in musculoskeletal pain: A reappraisal and practical considerations. Surg Neurol Int. 2015; 6:143.
7. Megerian JT, Kong X, Gozani SN. Utility of nerve conduction studies for carpal tunnel syndrome by family medicine, primary care, and internal medicine physicians. J Am Board Fam Med. 2007; 20(1):60-64.
8. Mendell JR, Sahenk Z. Clinical Practice. Painful sensory neuropathy. N Engl J Med. 2003; 348(13):1243-1255.
9. Mondelli M, Aretini A, Arrigucci U, et al. Clinical findings and electrodiagnostic testing in 108 consecutive cases of lumbosacral radiculopathy due to herniated disc. Neurophysiol Clin. 2013; 43(4):205-215.
10. Tankisi H, Pugdahl K, Euglsang-Frederiksen A, et al. Pathophysiology inferred from electrodiagnostic nerve tests and classification of polyneuropathies. Suggested guidelines. Clin Neurophysiol. 2005; 116(7):1571-1580.

Government Agency, Medical Society, and Other Authoritative Publications:

1. American Academy of Neurology (AAN), American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM) and the American Academy of Physical Medicine and Rehabilitation (AAPM&R). Practice parameter: Electrodiagnostic studies in ulnar neuropathy at the elbow. Neurology. 1999; 52(4):688-690.
2. American Association of Electrodiagnostic Medicine, American Academy of Neurology, and American Academy of Physical Medicine and Rehabilitation. Practice parameter for electrodiagnostic studies in carpal tunnel syndrome: summary statement. Muscle Nerve. 2002; 25(6):918-22.
3. American Association of Electrodiagnostic Medicine; So YT. Guidelines in electrodiagnostic medicine. Practice parameter for needle electromyographic evaluation of patients with suspected cervical radiculopathy. Muscle Nerve Suppl. 1999;8:S209-21. Reaffirmed 2020.
4. AANEM. Available at: https://www.aanem.org/clinical-practice-resources. Accessed on June 29, 2023.
    - AANEM Policy Statement on Electrodiagnosis for Distal Symmetric Polyneuropathy. Approved July 2017.
    - Model Policy for Needle Electromyography and Nerve Conduction Studies. Updated and reapproved December 2022.
    - Proper Performance and Interpretation of Electrodiagnostic Studies. Muscle Nerve. 2020; 61(5):567-569.
    - Recommended Policy for Electrodiagnostic Medicine. Updated January 2023. Endorsed by the American Academy of Neurology (AAN), the American Academy of Physical Medicine and Rehabilitation (AANEM).
    - Referral Indications for Primary Care Providers. January 7, 2020.
    - Reporting the results of needle EMG and nerve conduction studies: An educational report. Updated and approved August 2019.
5. Cho SC, Ferrante MA, Levin KH, Harmon RL, So YT. Utility of electrodiagnostic testing in evaluating patients with lumbosacral radiculopathy: An evidence-based review. Muscle Nerve. 2010; 42(2):276-282. Reaffirmed 2017.
6. England JD, Gronseth GS, Franklin G, et al. Distal symmetric polyneuropathy: a definition for clinical research: report of the

American Academy of Neurology (AAN), the American Association of Neuromuscular and Electrodiagnostic Medicine (AAEM) and the American Academy of Physical Medicine and Rehabilitation (AAPM&R). Neurology. 2005; 64(2):199-207.
7. Kang PB, McMillan HJ, Kuntz NL, et al; Professional Practice Committee of the American Association of Neuromuscular & Electrodiagnostic Medicine. Utility and practice of electrodiagnostic testing in the pediatric population: An AANEM consensus statement. Muscle Nerve. 2020; 61(2):143-155.
8. Marciniak C, Armon C, Wilson J, Miller R. Practice parameter: utility of electrodiagnostic techniques in evaluating patients with suspected peroneal neuropathy: an evidence-based review. Muscle Nerve. 2005; 31(4):520-527. Reaffirmed October 2020.

Websites for Additional Information

1. American Academy of Orthopaedic Surgeons (AAOS). OrthoInfo: Electrodiagnostic Testing. Last reviewed March 2023. Available at: http://orthoinfo.aaos.org/topic.cfm?topic=a00270. Accessed on August 14, 2023.
2. National Institute of Health (NIH). National Institute of Neurological Disorders and Stroke. Neurological Diagnostic Tests and Procedures Fact Sheet. Last Reviewed April 2019. Available at: https://catalog.ninds.nih.gov/sites/default/files/publications/neurological-diagnostic-tests-procedures.pdf. Accessed on August 14, 2023.

Index

The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

History

Status	Date	Action
Reviewed	08/10/2023	Medical Policy & Technology Assessment Committee (MPTAC) review. Updated References, References and Websites for Additional Information sections.
Reviewed	08/11/2022	MPTAC review. Updated References section.
Reviewed	08/12/2021	MPTAC review. Updated References section.
Reviewed	08/13/2020	MPTAC review. Updated Discussion and References sections. Reformatted Coding section.
Reviewed	08/22/2019	MPTAC review. Updated Description and References sections.
Reviewed	09/13/2018	MPTAC review. Updated References and Websites sections.
Revised	11/02/2017	MPTAC review. Added not medically necessary statement regarding back pain without radiculopathy and headaches. The document header wording updated from “Current Effective Date” to “Publish Date.” Updated Discussion, References and Websites sections.
Reviewed	05/04/2017	MPTAC review. Updated formatting in Clinical Indications section. Updated Discussion, References and Websites sections.
Revised	05/05/2016	MPTAC review. Minor change to clinical indications, move the*Note* statement and added asterisks. Updated the Discussion and References sections. Added a Websites for Additional Information section. Removed ICD-9 codes from Coding section.
Revised	05/07/2015	MPTAC review. A medically necessary statement was added to the Clinical Indications section for needle EMG when performed with NCS at the same time for neuromuscular junction diseases for clarification. A not medically necessary statement was added for neuromuscular junction testing with needle EMG or NCS when criteria are not met and for all other indications. References were updated.
Reviewed	11/13/2014	MPTAC review. The Discussion section and References were updated.
Reviewed	11/14/2013	MPTAC review. The Discussion section and References were updated.
Reviewed	11/08/2012	MPTAC review. Updated Reference section. Updated Coding section with 01/01/2013 CPT changes.
Revised	11/17/2011	MPTAC review. The medically necessary criteria for testing were revised to clarify that needle EMG is to be performed with NCS, in order to meet medical necessity. New statements were added to address the medical necessity criteria for performance of NCS without EMG and for doing EMG without NCS. The Appendix was removed. The Discussion and References were updated. Updated Coding section with 01/01/2012 CPT changes.
Reviewed	02/17/2011	MPTAC review. References were updated.
Reviewed	02/25/2010	MPTAC review. Information in the Description and Discussion sections was clarified to indicate that this document addresses *outpatient* use of these testing modalities. References and coding were updated.
Reviewed	02/26/2009	MPTAC review. The formatting of the medical necessity criteria was updated with no change to the actual criteria. Removed the section on Place of Service/Duration. References were updated.
Reviewed	02/21/2008	MPTAC review. References were updated.
Revised	03/08/2007	MPTAC review. Revised guideline statement to delete reference to unknown etiology under peripheral neuropathy indications. Added “ors” for clarification under medically necessary indications. Discussion section was also updated with some clarifying language about the AANEM Recommended Policy for Electrodiagnostic Medicine.
Reviewed	12/07/2006	MPTAC review. References and coding were updated.
Revised	12/01/2005	MPTAC review. Revision based on Harmonization: Pre-merger Anthem and Pre-merger WellPoint.

Pre-Merger Organizations	Last Review Date	Document Number	Title

Anthem, Inc.			No document
Anthem BCBS WellPoint Health Networks, Inc.	07/14/2005	Clinical Guideline	No document Electromyography and Nerve Conduction Study (EMG/NCS)
