



Medical Policy

Quantitative Sensory Testing

Table of Contents

- [Policy: Commercial](#)
- [Policy: Medicare](#)
- [Authorization Information](#)
- [Coding Information](#)
- [Description](#)
- [Policy History](#)
- [Information Pertaining to All Policies](#)
- [References](#)

Policy Number: 258

BCBSA Reference Number: 2.01.39

NCD/LCD: National Coverage Determination for Sensory Nerve Conduction Threshold Tests (sNCTs) (160.23)

Related Policies

Nerve Fiber Density Measurement, [#393](#)

Policy

Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity

Quantitative sensory testing, including but not limited to current perception threshold testing, pressure-specified sensory device testing, vibration perception threshold testing, and thermal threshold testing, is considered [INVESTIGATIONAL](#).

Medicare HMO BlueSM and Medicare PPO BlueSM Members

BCBSMA does not cover sensory nerve conduction threshold tests to diagnose sensory neuropathies or radiculopathies for Medicare HMO Blue and Medicare PPO Blue members in accordance with CMS NCD.

[National Coverage Determination for Sensory Nerve Conduction Threshold Tests \(sNCTs\) \(160.23\)](#)

Prior Authorization Information

Inpatient

- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

Outpatient

- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

	Outpatient
Commercial Managed Care (HMO and POS)	This is not a covered service.
Commercial PPO and Indemnity	This is not a covered service.

Medicare HMO Blue SM	This is not a covered service.
Medicare PPO Blue SM	This is not a covered service.

CPT Codes / HCPCS Codes / ICD Codes

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.

Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The following CPT and HCPCS codes are considered investigational for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:

CPT Codes

CPT codes:	Code Description
0106T	Quantitative sensory testing (QST), testing and interpretation per extremity; using touch pressure stimuli to assess large diameter sensation
0107T	Quantitative sensory testing (QST), testing and interpretation per extremity; using vibration stimuli to assess large diameter fiber sensation
0108T	Quantitative sensory testing (QST), testing and interpretation per extremity; using cooling stimuli to assess small nerve fiber sensation and hyperalgesia
0109T	Quantitative sensory testing (QST), testing and interpretation per extremity; using heat-pain stimuli to assess small nerve fiber sensation and hyperalgesia
0110T	Quantitative sensory testing (QST), testing and interpretation per extremity; using other stimuli to assess sensation

HCPCS Codes

HCPCS codes:	Code Description
G0255	Current perception threshold/sensory nerve conduction test (SNCT), per limb, any nerve

Description

NERVE DAMAGE AND DISEASE

Nerve damage and nerve diseases can reduce functional capacity and lead to neuropathic pain.

Treatment

There is a need for tests that can objectively measure sensory thresholds. Moreover, quantitative sensory testing (QST) could aid in the early diagnosis of disease, before patients would be diagnosed clinically. Also, although the criterion standard for evaluation of myelinated, large fibers is electromyography nerve conduction study, there are no criterion standard reference tests to diagnose small fiber dysfunction.

Quantitative Sensory Testing

QST systems measure and quantify the amount of physical stimuli required for sensory perception to occur. As sensory deficits increase, the perception threshold of QST will increase, which may be informative in documenting the progression of neurologic damage or disease. QST has not been established for use as a sole tool for diagnosis and management but has been used with standard evaluative and management procedures (eg, physical and neurologic examination, monofilament

testing, pinprick, grip and pinch strength, Tinel sign, and Phalen and Roos test) to enhance the diagnosis and treatment-planning process, and to confirm physical findings with quantifiable data. Stimuli used in QST includes touch, pressure, pain, thermal (warm and cold), or vibratory stimuli.

The criterion standard for evaluation of myelinated, large fibers is the electromyography nerve conduction study. However, the function of smaller myelinated and unmyelinated sensory nerves, which may show pathologic changes before the involvement of the motor nerves, cannot be detected by nerve conduction studies. Small fiber neuropathy has traditionally been a diagnosis of exclusion in patients who have symptoms of distal neuropathy and a negative nerve conduction study.

Depending on the type of stimuli used, QST can assess both small and large fiber dysfunction. Touch and vibration measure the function of large myelinated A alpha and A beta sensory fibers. Thermal stimulation devices are used to evaluate pathology of small myelinated and unmyelinated nerve fibers; they can be used to assess heat and cold sensation, as well as thermal pain thresholds. Pressure-specified sensory devices assess large myelinated sensory nerve function by quantifying the thresholds of pressure detected with light, static, and moving touch. Finally, current perception threshold testing involves the quantification of the sensory threshold to transcutaneous electrical stimulation. In current perception threshold testing, typically 3 frequencies are tested: 5 Hz, designed to assess C fibers; 250 Hz, designed to assess A delta fibers; and 2000 Hz, designed to assess A beta fibers. Results are compared with those of a reference population.

Because QST combines the objective physical, sensory stimuli with the subject patient response, it is psychophysical and requires patients who are alert, able to follow directions, and cooperative. Also, to get reliable results, examinations need to include standardized instructions to the patients, and stimuli must be applied consistently by trained staff. Psychophysical tests have greater inherent variability, making their results more difficult to reproduce.

QST has primarily been applied in patients with conditions associated with nerve damage and neuropathic pain. There have also been preliminary investigations to identify sensory deficits associated with conditions such as autism spectrum disorder, Tourette syndrome, restless legs syndrome, musculoskeletal pain, and response to opioid treatment.

Summary

For individuals who have conditions linked to nerve damage or disease (eg, diabetic neuropathy, carpal tunnel syndrome) who receive current perception threshold testing, the evidence includes several studies on technical performance and diagnostic accuracy. Relevant outcomes are test accuracy and validity, symptoms, and functional outcomes. The existing evidence does not support the accuracy of current perception threshold testing for diagnosing any condition linked to nerve damage or disease. Studies comparing current perception threshold testing with other testing methods have not reported on sensitivity or specificity. Also, there is a lack of direct evidence on the clinical utility of current perception testing and, because there is insufficient evidence on test performance, an indirect chain of evidence on clinical utility cannot be constructed. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have conditions linked to nerve damage or disease (eg, diabetic neuropathy, carpal tunnel syndrome) who receive PSST, the evidence includes several studies on diagnostic accuracy. Relevant outcomes are test accuracy and validity, symptoms, and functional outcomes. Current evidence does not support the diagnostic accuracy of PSST for diagnosing any condition linked to nerve damage or disease. A systematic review found that PSST had low accuracy for diagnosing spinal conditions. Also, there is a lack of direct evidence on the clinical utility of current perception testing and, because there is insufficient evidence on test performance, an indirect chain of evidence on clinical utility cannot be constructed. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have conditions linked to nerve damage or disease (eg, diabetic neuropathy, carpal tunnel syndrome) who receive vibration perception testing, the evidence includes several studies on

diagnostic accuracy. Relevant outcomes are test accuracy and validity, symptoms, and functional outcomes. A few studies have assessed the diagnostic performance of vibration testing using devices not cleared by the Food and Drug Administration. Also, there is a lack of direct evidence on the clinical utility of vibration perception testing and, in the absence of sufficient evidence on test performance, an indirect chain of evidence on clinical utility cannot be constructed. The evidence is insufficient to determine the effects of the technology on health outcomes.

For individuals who have conditions linked to nerve damage or disease (eg, diabetic neuropathy, carpal tunnel syndrome) who receive thermal sensory testing, the evidence includes diagnostic accuracy. Relevant outcomes are test accuracy and validity, symptoms, and functional outcomes. Two studies identified evaluated the diagnostic accuracy of thermal QST using the same Food and Drug Administration–cleared device. Neither found a high diagnostic accuracy for thermal QST, but both studies found the test had potential when used with other tests. The optimal combination of tests is currently unclear. Also, there is a lack of direct evidence on the clinical utility of thermal sensory testing and, because there is insufficient evidence on test performance, an indirect chain of evidence on clinical utility cannot be constructed. The evidence is insufficient to determine the effects of the technology on health outcomes.

Policy History

Date	Action
7/2018	New references added from BCBSA National medical policy. Background and summary clarified.
7/2017	New references added from BCBSA National medical policy.
1/2016	New references added from BCBSA National medical policy.
12/2015	Added coding language. BCBSA National medical policy references added.
12/2014	New references added from BCBSA National medical policy.
1/2014	New references added from BCBSA National medical policy.
4/2013	New references from BCBSA National medical policy.
11/2011-4/2012	Medical policy ICD 10 remediation: Formatting, editing and coding updates. No changes to policy statements.
1/2011	Medical Policy Group – Neurology and Neurosurgery. No changes to policy statements.
12/1/2010	Medical Policy 258 effective 12/1/2010 describing ongoing non-coverage.

Information Pertaining to All Blue Cross Blue Shield Medical Policies

Click on any of the following terms to access the relevant information:

[Medical Policy Terms of Use](#)

[Managed Care Guidelines](#)

[Indemnity/PPO Guidelines](#)

[Clinical Exception Process](#)

[Medical Technology Assessment Guidelines](#)

References

1. Ziccardi VB, Dragoo J, Eliav E, et al. Comparison of current perception threshold electrical testing to clinical sensory testing for lingual nerve injuries. *J Oral Maxillofac Surg*. Feb 2012;70(2):289-294. PMID 22079068
2. Park R, Wallace MS, Schulteis G. Relative sensitivity to alfentanil and reliability of current perception threshold vs von Frey tactile stimulation and thermal sensory testing. *J Peripher Nerv Syst*. Dec 2001;6(4):232-240. PMID 11800047
3. Weber RA, Schuchmann JA, Albers JH, et al. A prospective blinded evaluation of nerve conduction velocity versus Pressure-Specified Sensory Testing in carpal tunnel syndrome. *Ann Plast Surg*. Sep 2000;45(3):252-257. PMID 10987525

4. Nath RK, Bowen ME, Eichhorn MG. Pressure-specified sensory device versus electrodiagnostic testing in brachial plexus upper trunk injury. *J Reconstr Microsurg*. May 2010;26(4):235-242. PMID 20143301
5. Hubscher M, Moloney N, Leaver A, et al. Relationship between quantitative sensory testing and pain or disability in people with spinal pain-A systematic review and meta-analysis. *Pain*. Sep 2013;154(9):1497-1504. PMID 23711482
6. Suokas AK, Walsh DA, McWilliams DF, et al. Quantitative sensory testing in painful osteoarthritis: A systematic review and meta-analysis. *Osteoarthritis Cartilage*. Jul 11 2012;20(10):1075-1085. PMID 22796624
7. Mythili A, Kumar KD, Subrahmanyam KA, et al. A comparative study of examination scores and quantitative sensory testing in diagnosis of diabetic polyneuropathy. *Int J Diabetes Dev Ctries*. Jan 2010;30(1):43-48. PMID 20431806
8. Abraham A, Albulaihe H, Alabdali M, et al. Elevated vibration perception thresholds in CIDP patients indicate more severe neuropathy and lower treatment response rates. *PLoS One*. Nov 2015;10(11):e0139689. PMID 26545096
9. Goel A, Shivaprasad C, Kolly A, et al. Comparison of electrochemical skin conductance and vibration perception threshold measurement in the detection of early diabetic neuropathy. *PLoS One*. Sep 2017;12(9):e0183973. PMID 28880907
9. Azzopardi K, Gatt A, Chockalingam N, et al. Hidden dangers revealed by misdiagnosed diabetic neuropathy: A comparison of simple clinical tests for the screening of vibration perception threshold at primary care level. *Prim Care Diabetes*. Apr 2018;12(2):111-115. PMID 29029862
10. Devigili G, Tugnoli V, Penza P, et al. The diagnostic criteria for small fibre neuropathy: from symptoms to neuropathology. *Brain*. Jul 2008;131(Pt 7):1912-1925. PMID 18524793
11. Lefaucheur JP, Wahab A, Plante-Bordeneuve V, et al. Diagnosis of small fiber neuropathy: A comparative study of five neurophysiological tests. *Neurophysiol Clin*. Dec 2015;45(6):445-455. PMID 26596193
12. Anand P, Privitera R, Yiangou Y, et al. Trench foot or non-freezing cold injury as a painful vaso-neuropathy: clinical and skin biopsy assessments. *Front Neurol*. Sep 2017;8:514. PMID 28993756
13. Cruccu G, Sommer C, Anand P, et al. EFNS guidelines on neuropathic pain assessment: revised 2009. *Eur J Neurol*. Aug 2010;17(8):1010-1018. PMID 20298428
14. Shy ME, Frohman EM, So YT, et al. Quantitative sensory testing: report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology*. Mar 25 2003;60(6):898-904. PMID 12654951
15. American Academy of Neurology. Quantitative Sensory Testing (reaffirmed 2016). 2003; <https://www.aan.com/Guidelines/home/GuidelineDetail/87>. Accessed May 18, 2018.
16. Chong PS, Cros DP. Technology literature review: quantitative sensory testing. *Muscle Nerve*. May 2004;29(5):734-747. PMID 15116380
17. England JD, Gronseth GS, Franklin G, et al. Distal symmetrical polyneuropathy: definition for clinical research. *Muscle Nerve*. Jan 2005;31(1):113-123. PMID 15536624
18. Centers for Medicare & Medicaid Services (CMS). National Coverage Determination (NCD) for sensory Nerve Conduction Threshold Tests (sNCTs) (160.23). 2004; [https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?CALId=192&CalName=Prothrombin+Time+\(PT\)+\(Addition+of+ICD-9-CM+V58.83%2C+Encounter+for+therapeutic+drug+monitoring%2C+as+a+covered+indication\)&ExpandComments=y&CommentPeriod=0&NCDId=270&ncdver=2&CoverageSelection=Both&ArticleType=All&PolicyType=Final &s=New+York+-+Upstate&CptHcpcsCode=36514&bc=gAAAABABAEAAAA%3D%3D&](https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?CALId=192&CalName=Prothrombin+Time+(PT)+(Addition+of+ICD-9-CM+V58.83%2C+Encounter+for+therapeutic+drug+monitoring%2C+as+a+covered+indication)&ExpandComments=y&CommentPeriod=0&NCDId=270&ncdver=2&CoverageSelection=Both&ArticleType=All&PolicyType=Final &s=New+York+-+Upstate&CptHcpcsCode=36514&bc=gAAAABABAEAAAA%3D%3D&). Accessed May 18, 2018.