MEDICAL POLICY

QUANTITATIVE SENSORY TESTING (QST)

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By: Roger Hinkson, MD, MPH
Consulting Medical Director

POLICY

Description: The gold standard for evaluation of large nerve fibers is electromyographic nerve conduction study (EMG-NCS). However, the function of smaller sensory nerves, which may demonstrate pathologic changes before the involvement of the motor nerves, cannot be detected by NCS. QST measures and quantifies the amount of physical stimuli required for sensory perception to occur in the patient. As sensory deficits increase, the perception threshold of QST will increase, which may be informative in documenting progression of neurologic damage or disease. QST uses a computerized system to measure how the nerves react to vibration and changes in temperature. Types of QST include: a) current perception threshold testing, b) pressure-specified sensory device testing, c) vibration perception threshold testing, d) thermal threshold testing.

- Not recommended

- QST is considered experimental or investigational, as there are no quality published studies to support any conclusions regarding the effects of this testing on health outcomes. There are no clinical studies demonstrating that such tests improve the management and clinical outcomes of patients over standard qualitative methods of sensory testing.

DOCUMENTATION

Quantitative sensory threshold (QST) testing:
Not recommended. See also Current perception threshold (CPT) testing. Quantitative sensory testing (QST) has been used to assist in the diagnosis and management of a variety of conditions such as diabetic neuropathy and other neuropathies, as well as carpal tunnel syndrome and other nerve entrapment/compression disorders or damage. Because QST combines the objective physical sensory stimuli with the subjective patient response, it is psychophysical in nature and requires that its use be in patients who are alert, able to follow directions, and cooperative. Due to the subjective component of testing, psychological factors must be taken into consideration during testing and in evaluating test results, thus reducing the degree of objectivity QST can provide. QST is considered experimental or investigational, as there are no quality published studies to support any conclusions regarding the effects of this testing on health outcomes.

**Current perception threshold (CPT) testing:**

Not recommended. There are no clinical studies demonstrating that quantitative tests of sensation improve the management and clinical outcomes of patients over standard qualitative methods of sensory testing. The American Academy of Neurology (AAN) and the American Association of Electrodiagnostic Medicine (AAEM) have both concluded that quantitative sensory threshold (QST) testing standards need to be developed and that there is as yet insufficient evidence to validate the usage of current perception threshold (CPT) testing. The Centers for Medicare and Medicaid Services (CMS) conducted an independent review of 342+ published studies and reconfirmed their 2002 findings that there still exist conflicting data reports, lack of standards, and insufficient trials to validate the efficacy of any type of sNCT device. (CMS, 2004) (Cigna, 2005) (Aetna, 2006) These tests provide a psychophysical assessment of both central and peripheral nerve functions by measuring the detection threshold of accurately calibrated sensory stimuli, and they are intended to evaluate and quantify function in both large and small caliber fibers for the purpose of detecting neurologic disease. This is different and distinct from assessment of nerve conduction velocity, amplitude and latency. It is also different from short-latency somatosensory evoked potentials. CMS concludes that the use of any type of sNCT device, including “current output” type device used to perform current perception threshold (CPT), pain perception threshold (PPT), or pain tolerance threshold (PTT) testing or “voltage input” type device used for voltage-nerve conduction threshold (v-NCT) testing, to diagnose sensory neuropathies or radiculopathies is not reasonable and necessary.

The following codes for treatments and procedures applicable to this policy are included below for informational purposes.

**When services are Investigational/Not Medically Necessary:**

**Current Procedural Terminology (CPT) codes:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>0106T</td>
<td>Quantitative sensory testing (QST), testing and interpretation per extremity; using touch pressure stimuli to assess large diameter sensation</td>
</tr>
<tr>
<td>0107T</td>
<td>Quantitative sensory testing (QST), testing and interpretation per extremity; using vibration stimuli to assess large diameter fiber sensation</td>
</tr>
<tr>
<td>0108T</td>
<td>Quantitative sensory testing (QST), testing and interpretation per</td>
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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

The rating system and the methodology identified in the **National Guideline Clearinghouse** establish the Classification of the Evidence by using the standard American Medical Association criteria for evidence based rules:

**Class I**: (A) Evidence provided by a prospective study in a broad spectrum of persons with the suspected condition, using a "gold standard" for case definition, where test is applied in a blinded evaluation, and enabling the assessment of appropriate tests of diagnostic accuracy.

**Class II**: (B) Evidence provided by a prospective study of a narrow spectrum of persons with the suspected condition, or a well-designed retrospective study of a broad spectrum of persons with an established condition (by "gold standard") compared to a broad spectrum of controls, where test is applied in a blinded evaluation, enabling the assessment of appropriate tests of diagnostic accuracy.

**Class III**: (C) Evidence provided by a retrospective study where either persons with the established condition or controls are of a narrow spectrum, and where test is applied in a blinded evaluation.

**Class IV**: (D) Any design where test is not applied in blinded evaluation OR evidence provided by expert opinion alone or in descriptive case series (without controls).

**Diabetic Neuropathy**
- Based on Class II evidence, quantitative sensory testing (QST) measuring vibration and thermal perception thresholds is probably an effective tool in the documentation of sensory abnormalities in patients with diabetic neuropathy (*Level B recommendation*).
- Based on several Class II studies, QST is probably useful in documenting changes in sensory thresholds in longitudinal evaluation of patients with diabetic neuropathy (*Level B recommendation*).
- Although there is data to suggest that QST abnormalities may be detectable in the absence of clinical evidence of neuropathy in diabetic patients, there is no credible prospective evidence that patients with these abnormalities will ultimately go on to develop clinical neuropathy. Thus, whether QST is useful in the detection of preclinical neuropathy is unproven. (D)

**Small Fiber Sensory Neuropathy**
- Based on limited Class II and Class III evidence, QST is possibly useful in demonstrating thermal threshold abnormalities in patients with small fiber neuropathy (*Level C recommendation*). The clinical utility of demonstrating such abnormalities has yet to be fully defined.

**Pain Syndromes**
• Although there is limited Class II evidence to suggest that QST may be useful in demonstrating altered thresholds for pain perception in patients with various pain syndromes, the sensitivity and specificity of QST in the diagnosis of such disorders are unclear. (D)

Toxic Neuropathies
• Based on limited Class II evidence, QST is possibly useful in demonstrating sensory abnormalities that result from chemotherapy-induced neuropathy (Level C recommendation).
• There is insufficient evidence to support the use of QST in monitoring the development of neuropathy secondary to workplace exposures. (D)

Uremic Neuropathy
• QST is possibly useful in identifying large sensory fiber dysfunction in uremic patients on the basis of limited Class II and Class III evidence (Level C recommendation).

Acquired and Inherited Demyelinating Neuropathies
• The usefulness of QST in the diagnosis or prognosis of patients with acquired or inherited demyelinating neuropathy is unproven due to the limited Class III evidence available.

Malingering
• There is insufficient evidence to support the use of QST in the diagnosis of psychogenic sensory loss or malingering (Level D recommendation)

Legal Proceedings
• Malingering and other nonorganic factors can influence the testing results, and there is currently no reliable means to account for these factors. At this time, QST is not sufficiently established to justify utilization of this technique for the purpose of resolving medicolegal matters (Level D recommendation). Therefore, it should not be used in legal proceedings.

REFERENCES


2. ODG Neck and Pain Chapters, 2013