



## Corporate Medical Policy

### Automated Nerve Conduction Tests

**File Name:** automated\_nerve\_conduction\_tests  
**Policy Number:** MED1043  
**Origination:** 6/2007  
**Last CAP Review:** 5/2009  
**Next CAP Review:** 5/2011  
**Last Review:** 5/2009

#### Description of Procedure or Service

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Nerve conduction studies (NCS) and needle electromyography (EMG), when properly performed by a trained practitioner, are considered the gold standard of electrodiagnostic testing. However, the need for specialized equipment and personnel may limit the availability of electrodiagnostic testing for some patients. Portable devices have been developed to provide point-of-care NCS. These portable devices have computerized algorithms that are able to drive stimulus delivery, measure and analyze the response, and provide a detailed report of study results. Automated nerve conduction could be used in various settings, including primary care, without the need for specialized training or equipment.

One proposed use of automated nerve conduction devices is to assist in the diagnosis of carpal tunnel syndrome (CTS). CTS is a pressure-induced entrapment neuropathy of the median nerve as it passes through the carpal tunnel, resulting in sensorimotor disturbances. This syndrome is defined by its characteristic clinical symptoms, which may include pain, subjective feelings of swelling, and nocturnal paresthesia. A variety of simple diagnostic tools are available, and a positive response to conservative management (steroid injections, splints, and modification of activity) can confirm the clinical diagnosis. Electrodiagnostic studies may also be used to confirm the presence or absence of a median neuropathy at the wrist, assess the severity of the neuropathy, and assess alternate associated diagnoses. Nerve conduction is typically assessed prior to surgical release of the carpal tunnel, but the use of electromyography in the diagnosis of CTS is controversial.

Point-of-care nerve conduction has also been proposed for the diagnosis of peripheral neuropathy and, in particular, for detecting neuropathy in patients with diabetes. Peripheral neuropathy is relatively common in patients with diabetes mellitus, and the diagnosis is often made clinically through the physical examination. Diabetic peripheral neuropathy can lead to important morbidity including pain, foot deformity, and foot ulceration. Clinical practice guidelines recommend using simple sensory tools such as the 10-g Semmes-Weinstein monofilament or the 128-Hz vibration tuning fork for diagnosis. These simple tests predict the presence of neuropathy defined by electrophysiological criteria with a high level of accuracy. Electrophysiological testing may be used in research studies and may be required in cases with atypical presentation.

NC-stat® by NeuroMetrix is a portable nerve conduction test device designed to be used at the point-of-care. The system comprises a biosensor array, an electronic monitor, and a remote report generation system. The biosensor is a single use, preconfigured array consisting of a stimulation anode and cathode, skin surface digital thermometer, and response sensor. Biosensor arrays are available for assessment of sensory and motor nerves of the wrist (median and ulnar), and for the foot (peroneal, posterior tibial, and sural). A chip embedded in the biosensor panel measures skin surface temperature, the analysis algorithm adjusts for differences in temperature from 30° C, or if skin surface temperature is less than 23° C the monitor will indicate that limb warming is necessary. Data are sent to a remote computer via a modem in the docking station, and the remote computer generates a report based on the average of 6 responses that is sent back by fax or email. In addition to the automated stimulus delivery and reporting, NC-stat® analysis adjusts the calculation for

## Policy: Automated Nerve Conduction Tests

body temperature, height, and weight, and uses the average of 6 responses. Sensitivity of the device for sensory nerve amplitude potentials is 2.1  $\mu$ V, values lower than this are analyzed as zero, and responses with artifact are automatically eliminated from the analysis.

NeuroMetrix receive specific clearance to market NC-stat® via the U.S. Food and Drug Administration's FDA 510(k) process in 1998, listing as predicate devices the TECA model-10 electromyograph and the Neurometer by Neutron, which measures vibration threshold. The FDA-listed intended use was "to measure neuromuscular signals that are useful in diagnosing and evaluating systemic and entrapment neuropathies." In addition, the approved application stated that "The NC-stat® is intended to be used as an adjunct to and not a replacement for conventional electrodiagnostic measurements." NeuroMetrix subsequently received FDA clearance to market newer models with biosensors and engineering changes that enable the NC-stat® to be used for motor and sensory nerves of the wrist (median and ulnar) and foot (peroneal, tibial, and sural). The intended use as listed on the 510(k) approval from 2006 (#K060584) is "to stimulate and measure neuromuscular signals that are useful in diagnosing and evaluating systemic and entrapment neuropathies."

**\*\*\*Note: This Medical Policy is complex and technical. For questions concerning the technical language and/or specific clinical indications for its use, please consult your physician.**

## Policy

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**Automated nerve conduction tests are considered investigational. BCBSNC does not provide coverage for investigational services.**

## Benefits Application

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Please refer to Certificate for availability of benefits. This policy relates only to the services or supplies described herein. Benefits may vary according to benefit design, therefore certificate language should be reviewed before applying the terms of the policy.

## When automated nerve conduction tests are covered

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Not applicable

## When automated nerve conduction tests are not covered

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BCBSNC **does not** provide coverage for automated nerve conduction tests. They are considered investigational. BCBSNC does not provide coverage for investigational services.

## Policy Guidelines

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Some studies have shown a correlation between automated nerve conduction study results with those of standard testing. The diagnostic ability and clinical use of automated nerve conduction testing has not been determined.

Early identification of **asymptomatic** diabetic neuropathy could be useful in starting appropriate treatment before ulcerations begin. However, no studies have been identified that demonstrate how automated nerve conduction tests would alter the health outcomes of diabetic patients. At this time there is inadequate scientific evidence to conclude that automated nerve conduction tests are equivalent to traditional nerve conduction studies for the use of evaluating the median, ulnar, peroneal, sural, or tibial nerves.

## Policy: Automated Nerve Conduction Tests

In 2006, the American Association of **Neuromuscular** & Electrodiagnostic Medicine (AANEM) issued a position statement that illustrates how standardized nerve conduction studies performed independent of needle EMG studies may miss data essential for an accurate diagnosis, and how nerve disorders are far more likely to be misdiagnosed or missed completely if a practitioner without the proper skill and training is interpreting the data, making a diagnosis, and establishing a treatment plan. The organization states that, "the standard of care in clinical practice dictates that using a predetermined or standardized battery of NCSs [nerve conduction studies] for all patients is inappropriate," and concludes that, "It is the position of the AANEM that, except in unique situations, NCSs and needle EMG should be performed together in a study design determined by a trained **neuromuscular** physician."

The American Academy of Neurology (AAN), American Academy of Physical Medicine and Rehabilitation (AAPM&R), and the American Association of **Neuromuscular** and Electrodiagnostic Medicine (AANEM) indicate that "Testing should be performed using EDX (electrodiagnostic medicine) equipment that provides assessment of all parameters of the recorded signals. Studies performed with devices designed only for "screening purposes" rather than diagnosis are not acceptable under this policy."

Particularly needed are data on the sensitivity and specificity of automated nerve conduction tests performed at the point-of-care in comparison with the "gold standard" of laboratory EMG. Overall, evidence remains insufficient to evaluate the effect of point-of-care automated nerve conduction tests on health outcomes.

## Billing/Coding/Physician Documentation Information

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This policy may apply to the following codes. Inclusion of a code in this section does not guarantee that it will be reimbursed. For further information on reimbursement guidelines, please see Administrative Policies on the Blue Cross Blue Shield of North Carolina web site at [www.bcbsnc.com](http://www.bcbsnc.com). They are listed in the Category Search on the Medical Policy search page.

*Applicable codes: S3905*

Based on CPT Assistant, December 2008/Volume 18, Issue 12; CPT codes 95900, 95903 or 95904 should not be used for this service.

BCBSNC may request medical records for determination of medical necessity. When medical records are requested, letters of support and/or explanation are often useful, but are not sufficient documentation unless all specific information needed to make a medical necessity determination is included.

## Medical Term Definitions

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### **Adjunct**

a supplement to the primary treatment.

### **Asymptomatic**

showing or causing no symptoms.

### **Electromyography**

a test to determine muscle response to nerve stimulation. Used to evaluate muscle weakness and to determine if the weakness is related to the muscles themselves, the nerves that supply the muscles or the neuromuscular junction.

## Policy: Automated Nerve Conduction Tests

### Neuromuscular

pertains to the nerves and the muscles.

### Peripheral Neuropathy

a disease or degenerative state (as polyneuropathy) of the peripheral nerves in which motor, sensory, or vasomotor nerve fibers may be affected and which is marked by muscle weakness and atrophy, pain, and numbness

### Systemic

affects the entire body; as a whole.

## Scientific Background and Reference Sources

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American Association of Neuromuscular & Electrodiagnostic Medicine (AANEM). Proper performance and interpretation of electrodiagnostic studies. *Muscle Nerve* 2006; 33(3):436-9.

BCBSNC Medical Policy Reference Manual [Electronic Version]. 2.01.77, 2/15/2007

Specialty Matched Consultant Advisory Panel - 5/2007

BCBSNC Medical Policy Reference Manual [Electronic Version]. 2.01.77, 4/9/2008

Specialty Matched Consultant Advisory Panel - 5/2009

## Policy Implementation/Update Information

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6/18/07 New policy adopted. Specialty Matched Consultant Advisory Panel review 5/23/2007. Automated nerve conduction tests are considered investigational. BCBSNC does not provide coverage for investigational services. Notification given 6/18/2007. Effective date 8/27/2007.

7/6/09 Specialty Matched Consultant Advisory Panel review 5/28/2009. "Description" section revised. No change to policy statement. Added additional rationale to the "Policy Guidelines" section. Added statement to "Billing/Coding" section to indicate; "Based on CPT Assistant, December 2008/Volume 18, Issue 12; CPT codes 95900, 95903 or 95904 should not be used for this service.' References added. (btw)

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Medical policy is not an authorization, certification, explanation of benefits or a contract. Benefits and eligibility are determined before medical guidelines and payment guidelines are applied. Benefits are determined by the group contract and subscriber certificate that is in effect at the time services are rendered. This document is solely provided for informational purposes only and is based on research of current medical literature and review of common medical practices in the treatment and diagnosis of disease. Medical practices and knowledge are constantly changing and BCBSNC reserves the right to review and revise its medical policies periodically.