# Clinical Summary: Diabetic Peripheral Neuropathy Evaluation

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**What information does the NC-stat DPNCheck add to the 5.07/10-g monofilament test?**
The 10-g monofilament detects late stage neuropathy and loss of protection sensation. NC-stat DPNCheck performs a nerve conduction study of the sural nerve and detects neuropathy at a much earlier stage. In a study of 195 patients with Type I diabetes,[1] 100% of patients with a positive monofilament test also had abnormal sural nerve conduction[†]. However, 60% of patients with a negative monofilament test actually had neuropathy as defined by abnormal sural nerve conduction.

**Will NC-stat DPNCheck confirm nerve abnormalities in patients I suspected of having diabetic peripheral neuropathy (DPN)?**
NC-stat DPNCheck is a sural nerve conduction test which is a standard, quantitative biomarker of DPN. The sural nerve conduction measurements provided by the NC-stat DPNCheck device are highly correlated to the presence of DPN. In a study of 72 patients with diabetes and confirmed diabetic neuropathy, the correlation of NC-stat* sural nerve conduction with laboratory methods ranged from 0.87 to 0.95.[2,3]

**Can NC-stat DPNCheck produce abnormal results when my physical exam is normal?**
Yes. NC-stat DPNCheck detects early stage neuropathy, even in the absence of signs and symptoms. As such, if a patient has a normal monofilament test, the NC-stat DPNCheck test could identify mild or moderate nerve conduction abnormalities even in the absence of symptoms.[4]

**Can NC-stat DPNCheck produce a normal result when my physical exam is abnormal?**
Yes. This finding can be caused by a false positive result of monofilament testing such as if the patient has a callous over the area being tested or if the patient was inattentive. Alternatively, this result can also be seen when the sensory loss is not caused by DPN but by a lumbosacral radiculopathy. Since the cell bodies giving rise to the axons making up the sural nerve are located in dorsal root ganglia located outside the spinal cord, radicular compression of nerve roots, such as due to spinal stenosis or disc herniation, does not disrupt the distal axons and sural nerve conduction is generally unaffected.

**What is the difference between small and large fiber neuropathy? Does NC-stat DPNCheck detect small or larger fiber neuropathy?**
Large fibers mediate vibration sensation and proprioception, while small fibers communicate pain and temperature inputs. Light touch sensation is carried by both large and small nerve fibers. All sural nerve conduction studies, including NC-stat DPNCheck, measure the function of large myelinated nerve fibers, and therefore do not directly identify small fiber neuropathies. However, DPN tends to involve both large and small nerve fibers. Furthermore, foot ulcer risk is primarily associated with large fiber dysfunction.[5]

**How much does sural nerve conduction vary from test to test?**
Like other physiological measurements, sural nerve conduction velocity and amplitude will vary from test to test. The reasons for variability include true underlying variation in the measurements, small differences in test setup (e.g., exact placement of device on leg), and random electrical interference such as from nearby computer and medical equipment. The variation should be less than 5% for conduction velocity and 25% for amplitude.[6] If you obtain a result that is on the border between normal and abnormal, the test can be repeated to confirm the finding. Amplitude results that are above 4 microvolts (normal) may have greater variability but are nonetheless generally considered normal.

**References:**

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3. Perkins BA, Orszag A, Grewal J, Ng E, Ngo M, Bril V. Multi-site testing with a point-of-care nerve conduction device can be used in an algorithm to diagnose diabetic sensorimotor polyneuropathy. *Diabetes Care.* 2008;31(3):522-524.
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5. Boulton AJ, Vinik AI, Arezzo JC. Diabetic neuropathies: a statement by the American Diabetes Association. *Diabetes Care.* Apr 2005;28(4):956-962.
6. Kong X, Lesser EA, Gozani SN. Repeatability of nerve conduction measurements derived entirely by computer methods. *Biomed Eng Online.* 2009;8:33.

†Defined as sural response amplitude <6µV measured using NC-stat. *NC-stat® | DPNCheck™ is a modified version of the widely used and validated NC-stat®.

*This information is intended as a resource only and is not a substitute for professional medical judgment. The ordering and interpretation of electrodiagnostic studies is always the responsibility of the physician.*

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