



Nerve Conduction Studies (NCS) and Electromyogram (EMG)

The term "electrodiagnostic testing" covers a whole spectrum of specialized tests, two of which are the EMG (or electromyogram) and NCS (or nerve conduction studies). Many problems involving nerves or muscles require electrodiagnostic testing to provide information. Although they are different tests, the EMG and NCS go hand in hand giving vital information regarding your nerve and muscle function. You can do one without the other (or both at the same visit) but these tests are considered an extension of the neurological exam; therefore, these tests are best done following a comprehensive neurological exam performed by a neurologist.

What are Nerve Conduction Studies (NCS)?

Small electrodes are placed on your skin over the area being examined. The physician then uses a stimulator to deliver a very small electrical current to your skin near the nerves being tested, causing your nerves to "fire" and send the current up or down the nerve. In most cases a series of shocks are necessary to get the optimal response. Any discomfort is transient (like getting snapped by a rubber band), and the stimulus is not strong enough to cause damage to your body. Many different motor and sensory nerves are typically evaluated. The electrical signals produced by the nerves and muscles are picked up by the electrodes on the skin and compared to "normal values". A physician specially trained in interpretation of the data then interprets the information. After the NCS, the physician may find it necessary to do an electromyogram (EMG).

What is an Electromyogram (EMG)?

An electromyogram (EMG) is a diagnostic study that has been used by health care providers for over 50 years. An EMG provides information about the integrity of the muscles and the nerves in your body. Using a computer, monitor, amplifier, loudspeaker, stimulator and high tech filters the physician actually sees and hears how your muscles and nerves are working. As part of the EMG a very small needle is inserted into various muscles in the arm, leg, neck or back where you are having symptoms. There is some discomfort with needle insertion, but most tolerate the testing without difficulty. You may notice some bruising after the needle portion of the examination; ice to sore areas can help with discomfort and limit the bruising. Any time the skin is penetrated with a needle there is a theoretical risk of infection developing but it is extremely unlikely.

How Should I Prepare for NCS and/or EMG testing?

After showering on the day of your examination, do not use any creams, moisturizers or powders on your skin. Remove all jewelry. Skin temperature should be warm for the tests so you should wear warm clothes to the visit. However, you should wear short-sleeves (or shorts) that can easily be pulled up over the elbow (or knee) underneath. A gown may still be necessary for some testing. Let the physician know if you have any medical concerns (including recent fever or chills), if you take blood thinners, have a pacemaker or other devices that are implanted in your body and/or any history of back or neck surgery.

When are the Results Ready?

After EMG/NCS testing, the examining physician must review the data and combine all the information into a report. The electrodiagnostic examination report will be added to your medical record and a copy will be sent to the referring physician. The time for report generation varies, but generally is no more than a few hours. You will need to follow-up with the referring physician for interpretation of the report. The EMG/NCS is best clinically interpreted by the physician who performed the neurological examination – preferably a neurologist.