MAYFIELD CLINIC & SPINE INSTITUTE

Electromyography & Nerve Conduction Velocity

basic level

Overview

Electromyography (EMG), often done along with a nerve conduction velocity (NCV) study, measures your muscle and nerve electrical activity. Small needles, or electrodes, are placed in your muscles and the results are recorded on a special machine. These tests are used to determine if a person's muscle weakness is from nerve damage or some other muscle condition.

How does EMG and NCV work?

An EMG tests muscles and nerves for abnormal patterns of electrical activity. This test only measures muscle activity, so it is often done along with a NCV test— a study that goes beyond observation and stimulates your nerves with small bursts of energy. An EMG can detect peripheral nerve damage and can tell if a muscle is truly weak or if you just aren't using it because of pain.

Who performs the test?

A doctor who specializes in Physical Medicine and Rehabilitation (PM&R) or neurology will perform the test in the office.

How should I prepare for the test?

You can eat normally the day of the test. Continue taking your prescribed medications unless otherwise instructed.

What happens during the test?

During an EMG, thin needles will be inserted into the muscles being tested. The needles are thinner than those used to draw blood, but you may still feel some mild discomfort. Each needle contains an electrode attached to a wire. The wire transmits signals from the electrode in your muscle to a machine called an oscilloscope. The machine displays the signals as an electrical waveform. You may be asked to slowly contract your muscle. If you are having a NCV study, then small pads will be taped along the path of the nerve. These pads deliver light electric "shocks" that are too mild to be harmful; they feel a bit like the shock you get when you first rub your feet on carpet then touch a doorknob. One end of your nerve is stimulated with the electricity, and if your nerve is functioning properly, then the pads along the nerve will capture the signal as it passes. The signal moves faster or slower depending on how healthy your nerve is.

The test takes about 30 to 60 minutes, depending on how many muscles are being tested.

What are the risks?

The needles won't cause bleeding, and the shocks are too mild to cause any damage to your muscles. Your muscles may be sore for a day or two following the test.

How do I get the results?

The doctor will promptly review your results and communicate directly with your referring doctor.

Sources & Links

If you have further questions about this diagnostic test, contact the doctor that ordered the test or visit: www.nlm.nih.gov/medlineplus/diagnosticimaging.html

Glossary

electrode: a conductor that carries current. Can be used for diagnostic testing to receive and record electrical activity of nerves or can be used for therapy to deliver a heating current to destroy nerve fibers.

oscilloscope: a device that displays electrical signals on a screen.

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