

Electromyography

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Electromyography (EMG) is a test that checks the health of the muscles and the nerves that control the muscles.

See also: Nerve conduction velocity test

How the Test is Performed

The health care provider will insert a very thin needle electrode through the skin into the muscle. The electrode on the needle picks up the electrical activity given off by your muscles. This activity is displayed on a special monitor called an oscilloscope, and may be heard through a speaker.

After placement of the electrodes, you may be asked to contract the muscle. For example, bending your arm. The presence, size, and shape of the wave form -- the action potential -- produced on the monitor provide information about your muscle's ability to respond when the nerves are stimulated.

A nerve conduction velocity test is usually performed along with an EMG.

How to Prepare for the Test

No special preparation is usually necessary. Avoid using any creams or lotions on the day of the test.

How the Test Will Feel

You may feel some pain or discomfort when the electrodes are inserted, but most people are able to complete the test without significant difficulty.

Afterward, the muscle may feel tender or bruised for a few days.

Why the Test is Performed

EMG is most often used when people have symptoms of weakness, and examination shows impaired muscle strength. It can help to differentiate primary muscle conditions from muscle weakness caused by neurologic disorders.

Normal Results

Muscle tissue is normally electrically silent at rest. Once the muscles quiet down after the needles are inserted, there should be little muscle cell electrical activity noted on the screen.

When the muscle is voluntarily contracted, activity begins to appear. As contraction is increased, more and more muscle fibers produce action potentials until a disorderly group of action potentials of varying rates and amplitudes (complete recruitment and interference pattern) appears with full contraction.

What Abnormal Results Mean

Disorders or conditions that cause abnormal results include the following:

- Alcoholic neuropathy
- Amyotrophic lateral sclerosis (ALS)
- Axillary nerve dysfunction
- Becker's muscular dystrophy
- Brachial plexopathy
- Carpal tunnel syndrome
- Cervical spondylosis
- Common peroneal nerve dysfunction
- Denervation (reduced nervous stimulation)
- Dermatomyositis
- Distal median nerve dysfunction
- Duchenne muscular dystrophy
- Facioscapulohumeral muscular dystrophy (Landouzy-Dejerine)
- Familial periodic paralysis
- Femoral nerve dysfunction
- Friedreich's ataxia
- Guillain-Barre
- Lambert-Eaton Syndrome
- Mononeuritis multiplex
- Mononeuropathy
- Myopathy (muscle degeneration caused by a number of disorders, including muscular dystrophy)
- Myasthenia gravis
- Peripheral neuropathy
- Polymyositis
- Radial nerve dysfunction
- Sciatic nerve dysfunction
- Sensorimotor polyneuropathy
- Shy-Drager syndrome
- Thyrotoxic periodic paralysis
- Tibial nerve dysfunction
- Ulnar nerve dysfunction

Risks

- Bleeding (minimal)
- Infection at the electrode sites (minimal risk)

Considerations

Trauma to the muscle from EMG may cause false results on blood tests, including creatine kinase, a muscle biopsy, or other medical tests.

Alternative Names

EMG; Myogram

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