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# Electromyography

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 appears on a nearby monitor, 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 electrical activity seen on the monitor provides information about your muscle's ability to respond when the nerves to your muscles 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.

Body temperature can affect the results of this test. If it is extremely cold outside, wait in a warm room for a while before the test is performed.

## How the Test Will Feel

You may feel some pain or discomfort when the needles 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 tell the difference between muscle weakness caused by injury of a nerve attached to a muscle and weakness due to neurologic disorders.

## Normal Results

There is normally very little electrical activity in a muscle while at rest. Inserting the needles can cause some electrical activity, but once the muscles quiet down, there should be little electrical activity detected.

When you flex a muscle, activity begins to appear. As you contract your muscle more, the electrical activity increases and a pattern can be seen. This pattern helps your doctor determine if the muscle is responding as it should.

## What Abnormal Results Mean

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An EMG can detect problems with your muscles during rest or activity. 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 nerve stimulation of a muscle)
- Dermatomyositis
- Distal median nerve dysfunction
- Duchenne muscular dystrophy
- Facioscapulohumeral muscular dystrophy (Landouzy-Dejerine)
- Familial periodic paralysis
- Femoral nerve dysfunction
- Friedreich's ataxia
- Guillain-Barre syndrome
- 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; Electromyogram

## References

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**Update Date: 8/27/2010**

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