

Electromyography



An electromyogram (EMG) is a test that is used to record the electrical activity of muscles. When muscles are active, they produce an electrical current. This current is usually proportional to the level of the muscle activity. An EMG is also referred to as a myogram. EMGs can be used to detect abnormal electrical activity of muscle that can occur in many diseases and conditions, including muscular dystrophy, inflammation of muscles, pinched nerves, peripheral nerve damage (damage to nerves in the arms and legs), amyotrophic lateral sclerosis (ALS), myasthenia gravis, disc herniation, and others.

Why is an EMG test done? An EMG is often performed when patients have unexplained muscle weakness. The EMG helps to distinguish between muscle conditions in which the problem begins in the muscle and muscle weakness due to nerve disorders. The EMG can also be used to detect true weakness, as opposed to weakness from reduced use because of pain or lack of motivation. EMGs can also be used to isolate the level of nerve irritation or injury.

How is an intramuscular EMG done? A needle is inserted through the skin into the muscle. The electrical activity is detected by this needle (which serves as an electrode). The activity is displayed visually on an oscilloscope and may also be detected audibly with a speaker. Since skeletal muscles are often large, several needle electrodes may need to be placed at various locations to obtain an informative EMG.

After placement of the electrode(s), the patient may be asked to contract the muscle (for example, to bend the leg). The presence, size, and shape of the

wave form (the action potential) produced on the oscilloscope provide information about the ability of the muscle to respond to nervous stimulation. Each muscle fiber that contracts produces an action potential. The size of the muscle fiber affects the rate (how frequently an action potential occurs) and the size (the amplitude) of the action potential.