Motor unit's relationship with \textit{Electromyography} (EMG)

\textit{Motor unit}:

A single motoneuron and its axons supply not only just a muscle fiber, but several muscle fibers through its axons. A motor unit comprises all the muscle fibers supplied by a single motor neuron through its single axon, along with its branches. A variety of numbers of muscle fibers are present in a single motor unit—for instance, it has been reported that approximately 120,165 fibers are present in one motor unit.

\textit{EMG}

The first step in measuring a motor unit's activity is measured through placing a coaxial electrode in the muscle to be studied. A hollow needle can be made into a coaxial electrode by adding an insulated inner wire. Next, the muscle is connected to an electromyography (EMG) device via the electrode. A recording (called an electromyogram) is then obtained during muscular activity. This recording is called an electromyogram (EMG).

A hollow needle can be made into a coaxial electrode introducing an insulated inner wire with it. After that, possible changes are recorded from a small number of the muscle fibers near the immediate neighborhood of the tip of the needle. Thus, it is been observed that most of the electrical activity comes from the active fibers near the electrodes. Sometimes, surface electrodes are used instead of deep muscle coaxial electrodes. In this recording method, two surface electrodes are placed at an appropriate distance from each other over the muscles to be studied muscle's at a reasonable distance.

When the muscle is at rest, no action is potential recorded. No action potentials are recorded when the muscle is at rest; however, potentials are recorded as soon as once the muscle
becomes active, potentials are recorded. These potentials recorded during activity are a result of the asynchronous discharge of motoneurons in the vicinity of the electrodes. During minimal voluntary activity, only a few motor units discharge, with more units becoming active, and as the voluntary effort increases the number of units is activated. This phenomenon is called the recruitment of motor units.

The gradation of muscular activity is partly a function of the number of motor units activated. Electromyographic studies have clinical importance in diagnosing motor unit disorders, including peripheral nerve injuries and neuromuscular disorders such as myotonia and myasthenia gravis, so on and so forth.