Motor units and their relation with electromyogram (EMG)

Motor unit:
A single motor neuron and its axon innervate supply not only just a muscle fiber, but also several muscle fibers. The muscle fibers that are supplied by one motor neuron through its single axon along with branches are called a motor unit. The number of muscle fibers in a motor unit varies. It has been observed in cat leg muscles that approximately 120–165 fibers are present in one motor unit.

Electromyography: EMG
A motor unit activity is measured by inserting a coaxial electrode in-to the muscle that is to be studied. Next, the electrode is connected to an electromyograph and a recording is obtained during muscular activity. This recording is called an electromyogram (EMG).

A hollow needle can be made into a coaxial electrode by introducing an insulated inner wire into it. Possible changes are recorded from the small volume of the muscles in the immediate vicinity of the tip of the needle. Thus, it has been observed that most of the highest electrical activity is observed from the active fibers near the electrodes. Sometimes, surface electrodes are used in stead of deep muscle coaxial electrode. In this recording method, two surface electrodes are placed over the muscle to be studied a reasonable distance.

When the muscle is at rest, no action potential is recorded; however, as soon as the muscle becomes active, action potentials result from are recorded. The potential recorded during activity is as a result of the asynchronous discharge of motor neurons in the vicinity of the electrodes. During minimal voluntary activity, only a few motor neurons are activated.
units—**are discharged**—and as voluntary effort **activity** increases, the more number of units **are** activated. This is called recruitment of motor units.

Gradation of muscular activity is a **function of the part of the function of** a number of motor units activated. **Electromyographic studies** are clinically important in the diagnosis of motor unit disorders, including peripheral nerve injuries, and neuromuscular disorders, **such as including** myotonia and myasthenia gravis, *so on and so forth.*

**Comment [A3]:** Redundant phrases make a sentence wordy. Being economical in writing enhances clarity (in terms of meaning) and readability of the sentence. Here, the phrase “so on and so forth” is not required as this is implied by the use of “including.”