Neuromuscular System and Motor Units
(Text Pg 34 - 35)

The Neuromuscular System
• The link between the nervous system and the muscular system
  • Brain - Muscle

3 Components of the Neuromuscular System

1. The Motor Neuron
• Conducts electrical signals from the motor cortex to the muscle.
• Initiates muscle contractions.

2. The Neuromuscular Junction
• The junction between the motor neuron and muscle tissue.
• It’s located between the endomysium and the sarcolemma.

3. *** The Motor Unit ***
• Consists of a motor neuron (one) and all the muscle fibres (few to hundreds) it innervates (recruits).
• It is the smallest independent contractile unit controlled by the central nervous system.
• Motor units come in different sizes!
• Motor units have different recruitment thresholds!

Precise/fine movements:
_ Small motor unit = few muscle fibers per nerve (5 - 10)
_ e.g. eye musculature

Gross movements:
_ Large motor unit = many muscle fibers per nerve (300 -800_)
_ e.g. Quadriceps

The All-or-none Principle
• Explains how we produce forces of varying sizes.
• Every motor unit has a specific recruitment threshold.
• The recruitment threshold must be reached before any of the fibers in that unit will contract.
• Once the threshold is reached, all the fibers contract within that unit (Hence the “All-or-none” principle!).
• We don’t recruit more motor units than necessary (efficiency).