

## muscle physiology lecture 7

factors that affect velocity of muscle shortening

- alpha motor nerve innervation
- myosin regulatory light chain isoform
- myosin ATPase activity
- sarcoplasmic reticulum concentration & enzymes for calcium release & reuptake

gene expression in skeletal muscle can be influenced by changes in metabolic activity

physiological and biochemical differences follow cross-reinnervation, which is

surgically attaching a new motor nerve to a fiber

controlling exertion by controlling the # of motor units recruited (rate coding also)

henneman's size principle - first to discover was denny-brown pennybacker

orderly recruitment - sequence is the same everytime - weakest recruited first, strong last.

first ones to give up are strongest (type II) last to join, first to leave

second to discover it - elwood henneman "size principle"

- size of motor unit determines its orderly recruitment

metabolism heats up muscle (warming up)

need a large stimulus in order to wake up the type II fibers as opposed to type I

this is because if we use our type II fibers for normal everyday activities, we

will not be using energy inefficiently, be fatigued, and risk injury

higher threshold motor units have faster conduction velocities.

postactivation potentiation

- can improve your performance by having previous exposure to the motion.

exceptions to the size principle

- selective recruitment

- fast changes of direction in force production can lead to a preferential recruitment of fast-twitch motor units

- happens bc not enough time to recruit all the motor units in order & still perform

temperature can affect muscle force - peak force development rate is slower in colder temperatures

the best way to recruit every motor unit is to lift heavy (not the only way)

recruitment is based on need - based on intensity