Anatomy Notes - Chapter 8 (Muscular System)

The ability to move provides the capability to adjust to a changing environment. (p230)

A muscle cell is a "muscle fiber"

Primary 3 functions of muscular system:

MPH = movement, posture=muscle tone, heat production

Three types of muscles: skeletal, smooth, cardiac.

skeletal = voluntary - attaches to bone, is striated, is multi-nucleated, is under voluntary control of the individual. Appears striated (striped) due to the arrangement of contractile proteins within the cells. Cells are large cylindrical cells.

"Form follows function"

cardiac muscle - found in the heart. cells are cylindrical, striated, have a single nucleus, and intercalated disks (where the plasma membranes of adjacent fibers contact each other. Cells are branched and recombine.

smooth muscle = involuntary - found in blood vessel walls, many hollow internal organs such as gut, urethra, and ureters (viscera, hence sometimes called visceral muscle). not striated, cells are tapered at ends and have a single nucleus.

myofilaments -

thick = myosin (myo is like mayo is fattening … as told to me by Jason)
thin = actin (actin is like Atkins, like the diet for getting thin … another Jasonism)

actin moves past myosin during contraction (remember, actin is active … a Bobism)

sarcomere arrangement - zline thin thick thin zline

contraction is dependant upon calcium (released from the ER) and ATP (for energy, produced by the mitochondria)

muscles responsible for most of the heat production needed to maintain normal body temp.

motor neuron is what stimulates a muscle to contract

motor unit = the neuron + all the muscle cells it innervates

all or none principle = a muscle fiber is either relaxed (completely) or completely contracted once the stimulus reaches the threshold stimulus.

different motor units have different threshold-stimulus levels allowing varying degrees of overall force to be generated.

types of contractions -

twitch - a single, isolated, jerky contraction

tetanic - more sustained and steady than a twitch. results from continual simulation at about 30 stimulations per second. results in a state called tetanus (not the disease)

isotonic - same tension, changing length

isometric - same length, changing tension … does not produce movement

myalgia = muscle pain

strain a muscle - remember, you strain to lift a heavy object and that requires a muscle to contract

sprain a ligament (the other one, i.e. not the strain)

myositis = muscle inflammation

fibromyositis = tendon inflammation coupled with myositis (a charley horse)

cramps are muscle spasms