Notes for Friday October 11, 2002

Outline

- Contraction of skeletal muscle
- Skeletal System:
  - Types of bones
  - Functions
  - Structure of bone tissue

**Contraction cycle**
1. ATP bound to myosin splits => energizes myosin
2. Myosin attaches to actin to form a cross bridge
3. Power stroke
4. Actin slides over myosin
5. ATP attaches to myosin
6. Myosin detaches from actin

**Relaxation**
- ACh is broken down by AChE
- Calcium is transported back into SR

**Contraction of skeletal muscle**
- Contraction and tension of a whole muscle depends on:
  - Frequency of stimulation => force of contraction of muscle fiber
  - Recruitment of muscle fibers => total contraction of muscle

**Frequency of stimulation**
- Muscle twitch = single MAP in response to a single AP
- Wave summation
- Unfused/incomplete tetanus
- Fused/complete tetanus => muscle fiber reaches maximum tension

**Recruitment**
- Increase in the number of motor units involved => increase in number of muscle fibers contracting
- Asynchronous recruitment
- Peak recruitment

**Muscle tone**
- Maintains posture
- Maintains muscle strength
- "Use-it-or-lose-it"
- Atrophy = loss of size, power & tone

**Isotonic contractions**
- Cause change in muscle length => body movement
Concentric isotonic contractions
Eccentric isotonic contractions

**Isometric contractions**
o No body movement

**Physical conditioning**
o Improvement of endurance and power
o Aerobic exercise => endurance
o Anaerobic exercise => powerful muscle (hypertrophy)

**Skeletal System**
- Oste = bone
- osteology
- Ortho = cure/repair/correct
- orthopedic

**Divisions**
- AXIAL skeleton - 80 bones
- APPENDICULAR skeleton - 126 bones

**Axial**
- Skull bones; foramen magnum
- Vertebral column & regions
- Ribs & sternum
- Pelvic girdle

**Appendicular**
- Clavicle & scapula
- Humerus; ulna & radius
- Femur; patella, tibia & fibula

**Types of Bones**
- Long bone
• Short bone
• Flat bone
• Irregular bone
• Sesamoid bone

**Functions**
• Support
• Protection
• Movement
• Mineral homeostasis
• Blood cell production = Hemopoiesis

**Terms**
• LIGAMENT = bone to bone
• TENDON = muscle to bone

• Both dense connective tissue