MUSCLES
Muscles

- Over 600 muscles in muscular system
- Made of bundles of muscle fibers that are held together by connective tissue
Three Kinds of Muscles

- Cardiac
- Smooth
- Skeletal
Cardiac Muscle

- Forms the walls of the heart
- Contract to circulate blood
- Involuntary; function without conscious thought
Smooth Muscle

- Found in the internal organs of the body
- Contract to cause movement in these systems
- Involuntary; function without conscious thought
Skeletal

- Attached to bones
- Cause body movements
- Voluntary; person has control over their action
Skeletal Muscles

Function

- Attach to bones to provide movement
- Produce heat and energy
- Help maintain posture
- Protect internal organs
Methods of Attachment to Bones

- **Tendon**
  - Strong, tough connective tissue

- **Fascia**
  - Tough, sheetlike membrane
  - Covers and protects the tissue

- **Origin and insertion**
  - Origin: end that does not move
  - Insertion: end that moves when muscle contracts
Actions of Muscles

- **Adduction**
  - Moving a body part toward the midline

- **Abduction**
  - Moving a body part away from the midline
Actions of Muscles

- **Flexion**
  - Decreasing the angle between two bones or bending a body part

- **Extension**
  - Increasing the angle between two bones or straightening a body part
Flexion and Extension

1. The biceps contracts.

2. The triceps relaxes and get stretched.

Elbow Joint = Fulcrum

Humerus

Biceps

Scapula

Triceps

Elbow Joint = Pivot

Humerus

Biceps

Ulna

Scapula
Actions of Muscles

- **Rotation**
  - Turning a body part around (head to side)

- **Circumduction**
  - Moving one end of a body part in a circle
    (swinging arm in a circle)
Major Muscles

- Pecs
- Abs
- Quads
- Biceps
- Triceps
- Hamstrings
Muscle Tone

- Muscles are partially contracted at all times
- A state of readiness to act
- Lack of use can result in a contracture
  - Severe tightening of a flexor muscle
  - Results in a bending of a joint
  - Foot drop is a common contracture
  - Fingers, wrists, knees and others can be affected
Muscular Diseases

- Fibromyalgia
- Muscular Dystrophy
- Myasthenia Gravis
- Rhabdomyosarcoma
Fibromyalgia

- Chronic, widespread pain
- Muscle stiffness, numbness or tingling in arms or legs, fatigue, headaches
- Etiology unknown, but stress, weather, and poor physical fitness affect disease

Treatmetn
- Pain relief
- Physical therapy, massage, exercise, stress relief
Muscular Dystrophy

- Group of inherited diseases
  - Duchenne’s
- Chronic progressive muscle atrophy
- Usually appears in early childhood
- Leads to total disability and early death
- Physical therapy is used to slow progress of disease
Myasthenia Gravis

- Chronic – Nerve impulses are not transmitted properly to the muscles
- Leads to progressive muscular weakness and paralysis
- Fatal when it affects respiratory muscles
- Etiology unknown, may be autoimmune
- No cure, treatment is supportive
Rhabdomyosarcoma

- Tumor of the muscles
- Usually in young children
- Arise from rhabdomyoblast (primitive muscle cells)
- Treatable with chemotherapy and radiation
Cramps

- Sudden, painful, involuntary contractions of muscles
- Usually occur in legs or feet
- May result from overexertion, low electrolyte levels, or poor circulation
- Stretch muscle to relieve pain
Strains

- Overstretching or injury to a muscle/tendon
- Usually in the back, arms, and legs
- Prolonged or sudden muscle exertion is usual cause
- Symptoms: muscle pain, swelling

Treatment
- Rest & elevation
- Muscle relaxants, pain meds
- Alternating heat & cold applications