Muscular System

Chapter 4

FUNCTIONS OF THE MUSCULAR SYSTEM

- Makes movement possible
- Produces body heat
- Moves blood through veins via muscle contraction
- Allows organs to function, food to move through the digestive system and secretions to be released from ducts

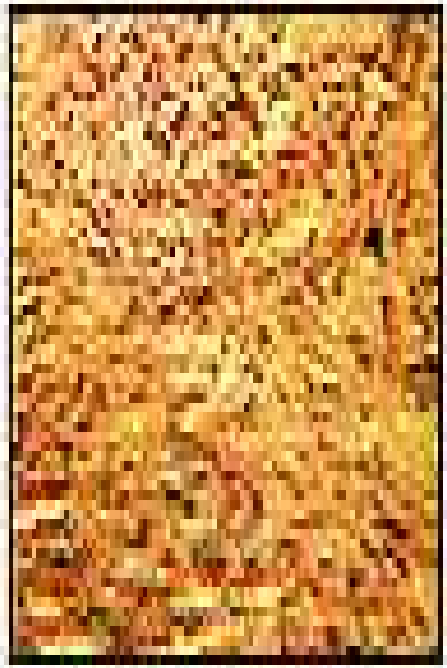
Related Combining Forms:

- my/o, myos/o

THE THREE TYPES OF MUSCLE

Type of Muscle	Striated	Location	Function	Voluntary/ Involuntary
Skeletal	Yes	Attached to bones	Pull on bones for movement	Voluntary
Smooth	No	Internal Organs	Contract to release fluids or for organ function	Involuntary
Cardiac	Yes	Heart Muscle	Contracts to send blood to body tissues	Involuntary *Cardiac muscle never fatigues

Skeletal muscle



Smooth muscle

Cardiac muscle

Fascia

- Primary Functions
  - Cover, support, and separate muscles.
- Related Combining Form
  - fasci/o

Fascia

- Primary Functions
  - Cover, support, and separate muscles.
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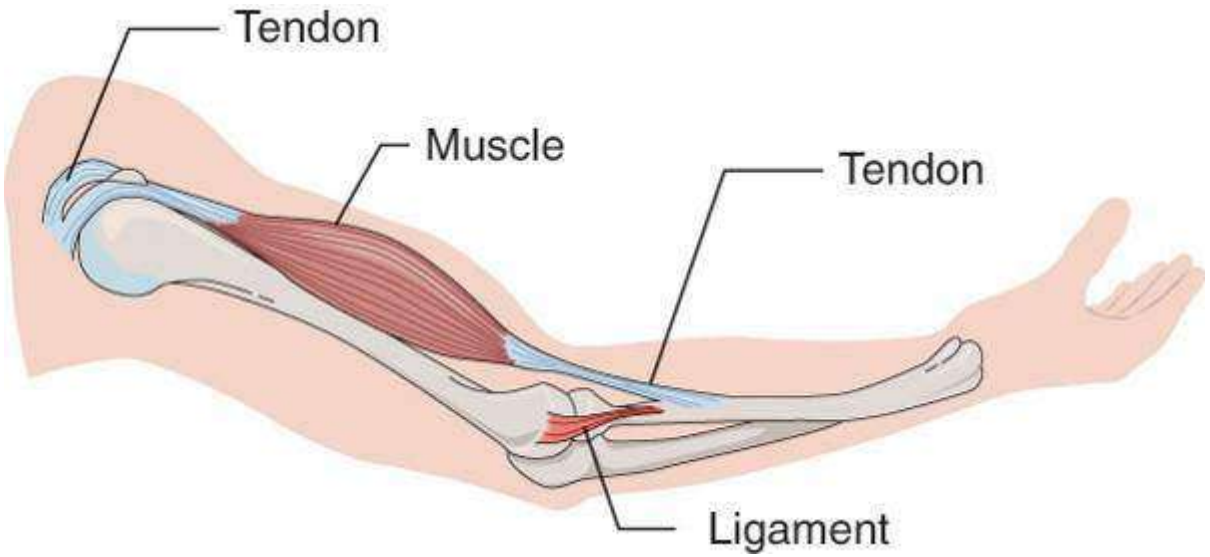
Tendons

- Primary Function
  - Attach muscles to bones.
- Related Combining Forms
  - ten/o, tend/o, tendin/o



Aponeurosis

- Flat fibrous sheet of connective tissue, like tendons
- Connect muscle to bones and muscle to other tissues

Range of Motion

- Abduction – Movement away from the midline of the body
  - Abductor muscles move a part away from the midline
- Adduction – movement toward the midline of the body
  - Adductor muscles move a part toward the midline

Range of Motion

- Flexion – means decreasing the angle between two bones or bending a limb
  - Flexor muscle bends a limb or joint
- Extension – means increasing the angle between two bones or straightening out a limb
  - Extensor muscle straightens a limb at a joint

Range of Motion

- Elevation – is the act of raising or lifting a body part
  - Levator muscle is a muscle that raises a body part
- Depression – is the act of lowering a body part
  - Depressor muscle a muscle that lowers a body part

Range of Motion

- Rotation – is a circular movement around an axis
  - Rotator muscle – turns a body part on its axis
  - Rotator Cuff muscles that holds the head of the humerus securely in place as it rotates within the shoulder joint
- Circumduction – is the circular movement of a limb at the far end

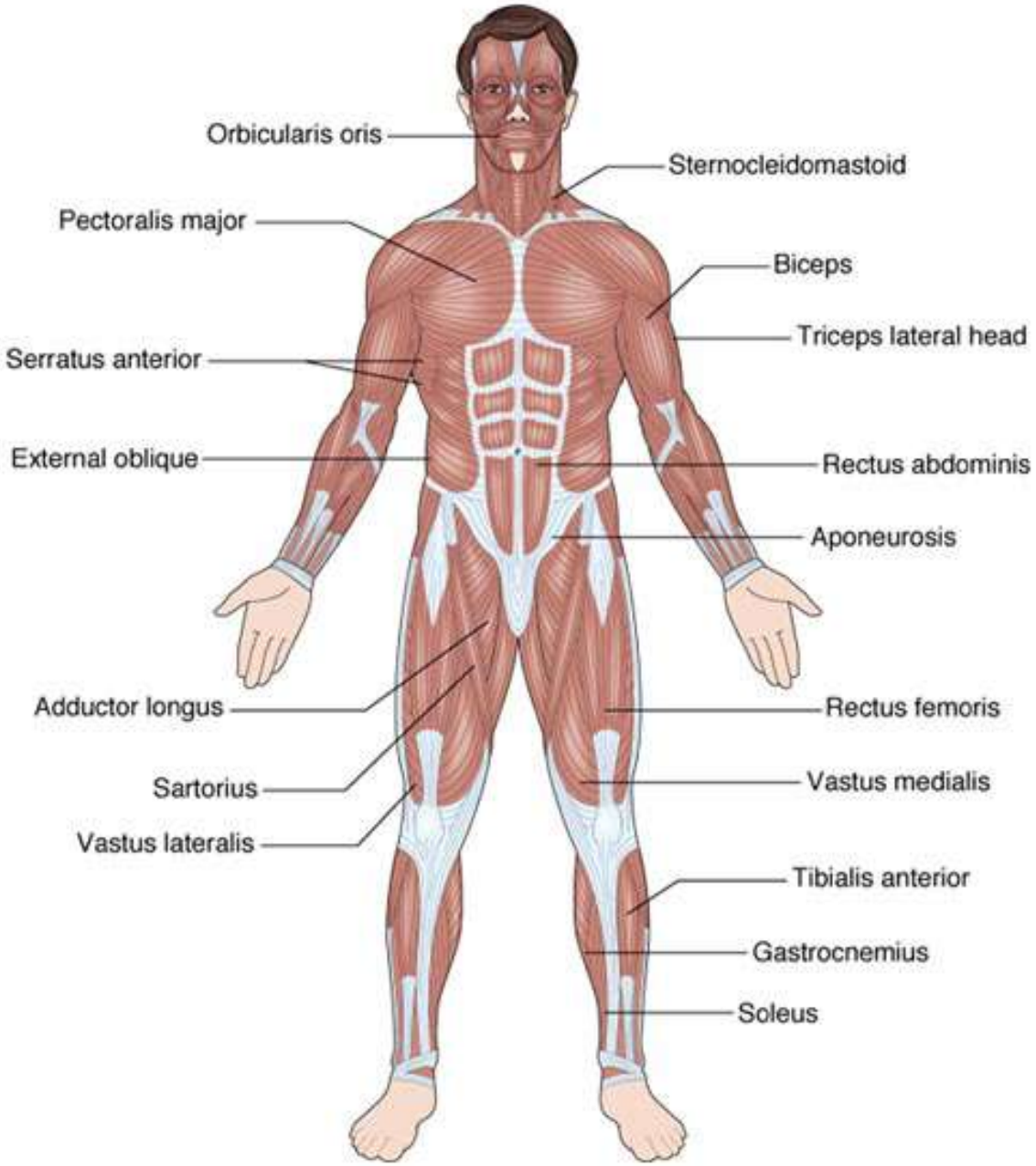
Range of Motion

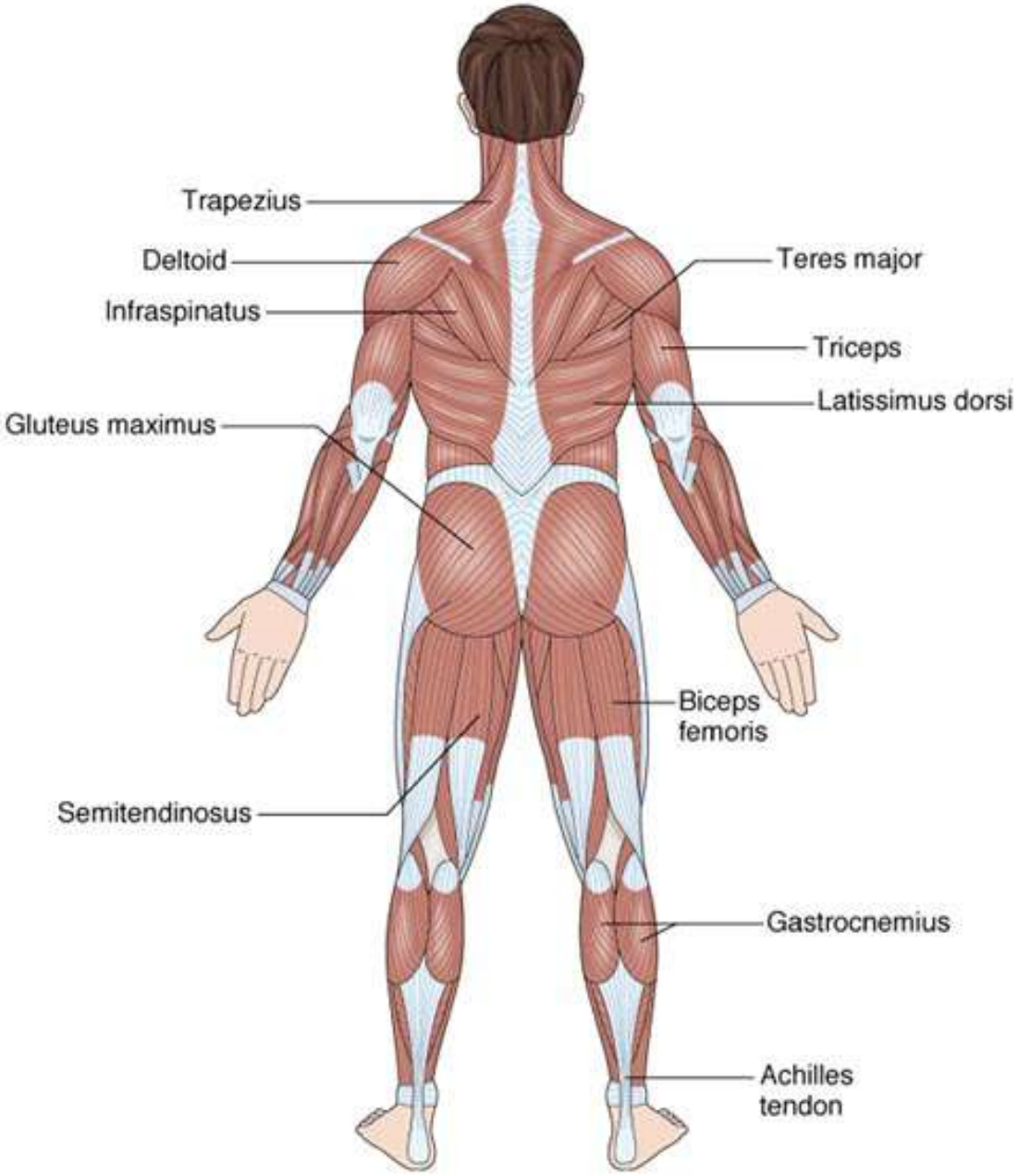
- Supination – is the act of rotating the arm or the leg so that the palm of the hand and sole of the feet is turned forward or upward

- Pronation – is the act of rotating the arm or leg so that the palm of the hand or sole of the foot is turned downward or backward

Range of Motion

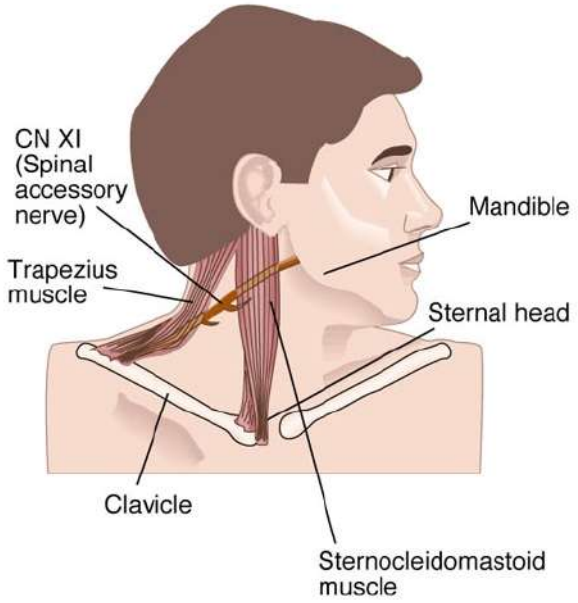
- Dorsiflexion – bends the foot upward at the ankle
  - Brings your toes towards your shin
- Plantar Flexion – bends the foot downward at the ankle
  - Pointing your toes


Orbicularis oris
Sternocleidomastoid
Pectoralis major
Biceps
Triceps lateral head
Serratus anterior
External oblique
Rectus abdominis
Aponeurosis
Adductor longus
Rectus femoris
Sartorius
Vastus medialis
Vastus lateralis
Tibialis anterior
Gastrocnemius
Soleus


Trapezius
Deltoid
Infraspinatus
Gluteus maximus
Semitendinosus
Teres major
Triceps
Latissimus dorsi
Biceps femoris
Gastrocnemius
Achilles tendon

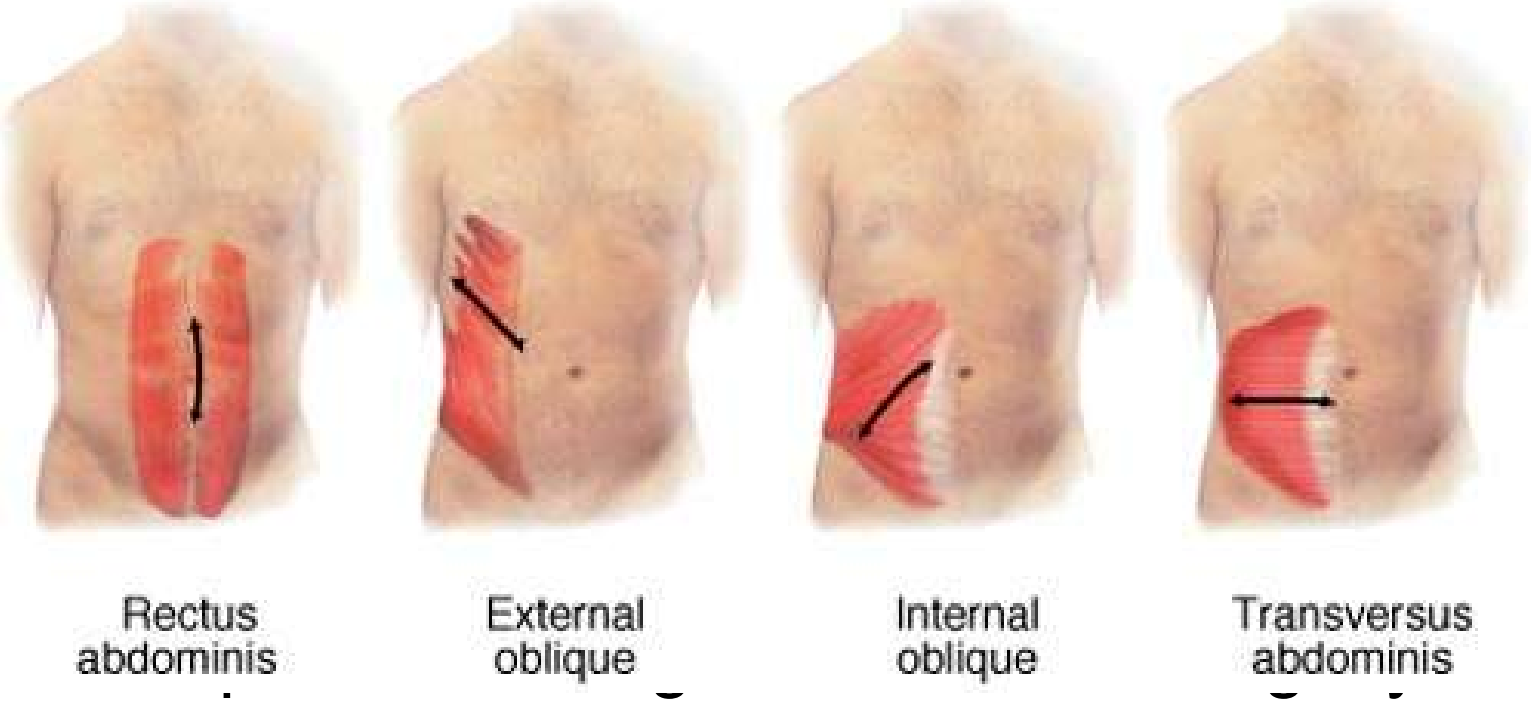
How Muscles are Named

- Origin and insertion
  - sternocleidomastoid
- Muscles named for their action
  - Flexor carpi muscles (wrist)
- Muscles named for their location
  - Pectoralis major



How Muscles are Named

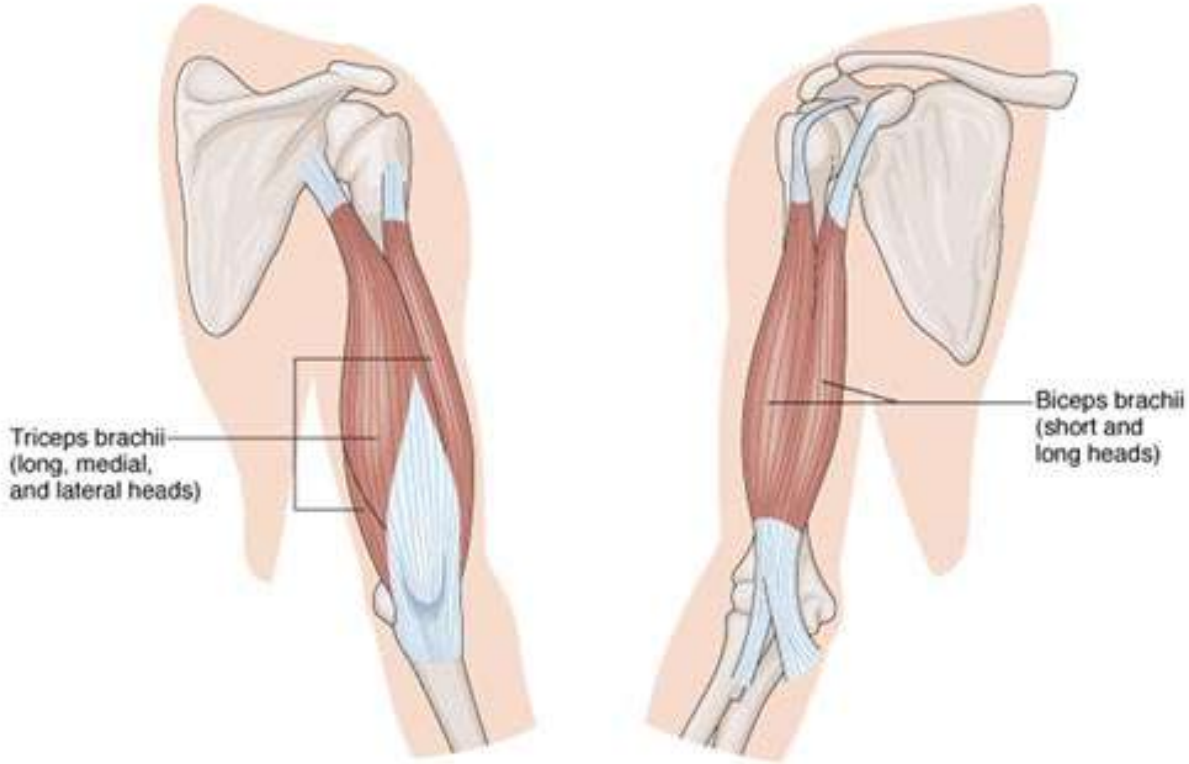
- Muscles named for their fiber direction



constricts the opening of a passageway

How Muscles are Named

- Muscles named for number of divisions



How Muscles are Named

- Muscles are named for their SIZE
  - Named because they are broad, narrow, large, or small
  - Ex. Gluteus maximus

How Muscles are Named

- Muscles are named for their shape
  - Named because they are shaped like a familiar object.
    - Ex. Deltoid Muscle shaped like an inverted triangle or Greek letter delta

VOCABULARY TERMS

- Tendon: band of connective tissue that attaches muscle to bone
- antagonistic pairs: muscles that work together in opposite actions
- Contraction: tightening of the muscle when it does work

- Relaxation: when muscle returns to its original form
- muscle tone: constant state of partial contraction of a muscle

- muscle innervation: when a motor nerve sends a stimulus to the muscle to tell it to do work
- range of motion: the available amount of movement possible in a joint
- muscle origin: where the muscle begins or attaches to the bone on the immoval part
- muscle insertion: where the muscle ends or attaches to a bone on the movable part

Medical Specialties Related to the Muscular System

- **Orthopedic surgeon** – treats injuries & disorders involving bones, joints, muscles, tendons
- **Rheumatologist –** treats disorders involving inflammation of connective tissue, incl muscles
- **Neurologist –** treats causes of paralysis & similar muscle disorders involving loss of function
- **Specialist in Sports Medicine –** treats sports related injuries of bones, joints,

PATHOLOGY

Fibers, Fascia, and Tendons

- Fasciitis
- Tenalgia or Tenodynia
- Tendinitis or Overuse Tendinitis

PATHOLOGY

Muscles

- Adhesion
- Muscle Atrophy
- Myalgia
- Myolysis
- Myositis
- Polymyositis
- Myomalacia
- Myorrhexis
- Myosclerosis

PATHOLOGY

Hernias

- Hernia
- Myocele

PATHOLOGY

Muscle Tone

- Atonic
- Dystonia
- Hypertonia
- Hypotonia
- Myotonia

PATHOLOGY

Voluntary Muscle Movement

- Ataxia
- Dystaxia
- Contracture
- Intermittent Claudication
- Spasm
- Spasmodic Torticollis (Wryneck)

PATHOLOGY

Muscle Function

- Bradykinesia
- Dyskinesia
- Hyperkinesia
- Hypokinesia
- Tardive Dyskinesia

PATHOLOGY

Myoclonus

- Myoclonus
- Nocturnal Myoclonus
- Singultus (hiccups)

PATHOLOGY

Myasthenia Gravis

- Myasthenia
- Myasthenia Gravis (MG)

PATHOLOGY

Muscular Dystrophy

- Muscular Dystrophy
- Duchenne’s muscular dystrophy (DMD)
- Becker’s muscular dystrophy (BMD)

PATHOLOGY

Fibromyalgia Syndrome

- Fibromyalgia Syndrome (FMS)
- Tender Points

PATHOLOGY

Repetitive Stress Disorders

- Repetitive Stress Disorders
- Ergonomics
- Overuse Injuries

PATHOLOGY

- Myofascial Damage
- Cervical Radiculopathy
- Carpal Tunnel Syndrome
- Plantar Fasciitis

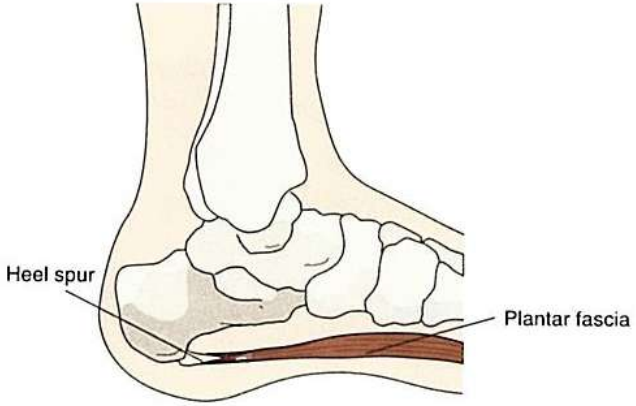


FIGURE 4.14 Plantar fasciitis and heel spur.

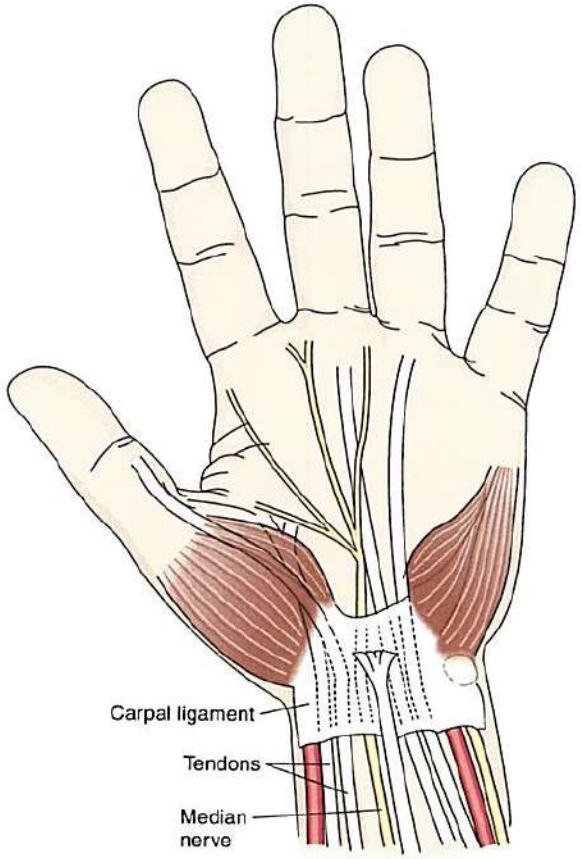
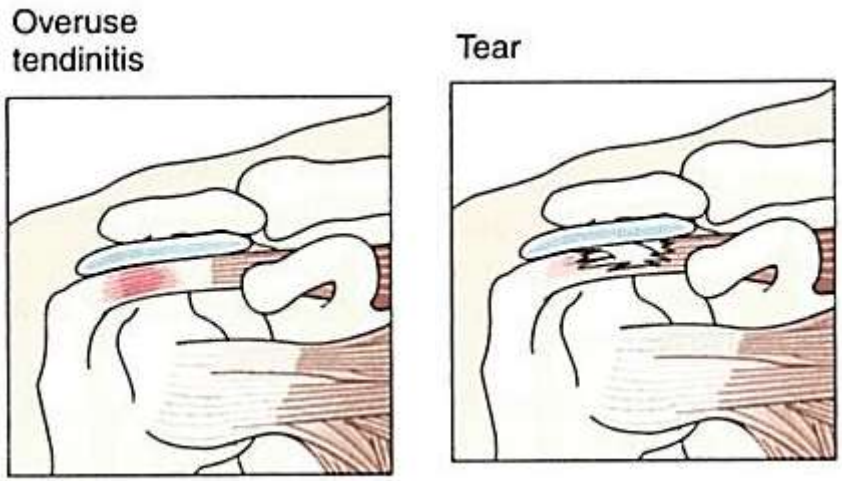


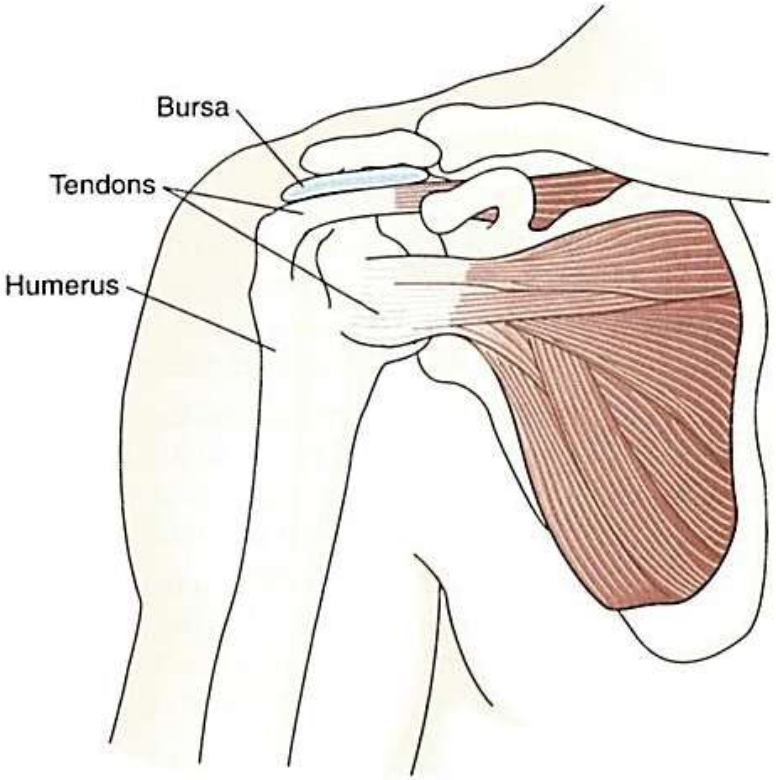
FIGURE 4.13 Carpal tunnel syndrome.

PATHOLOGY

Rotator Cuff Injuries

- Rotator Cuff Tendinitis
- Impingement Syndrome
- Calcium Deposit
- Torn Tendon





PATHOLOGY

Epicondylitis

- Epicondylitis
- Lateral Epicondylitis
- Medial Epicondylitis

PATHOLOGY

Sports Injuries

- Sprain
- Strain
- Shin Splints
- Hamstring Injuries
- Achilles tendinitis

PATHOLOGY

Paralysis

- Myoparesis
- Hemiparesis
- Paralysis
- Spinal Cord Injury
- Paraplegia
- Quadriplegia
- Hemiplegia
- Cardioplegia

Diagnostic Procedures

- Deep Tendon Reflexes
- Electromyography
- Electroneuromyography
- Range of Motion Testing

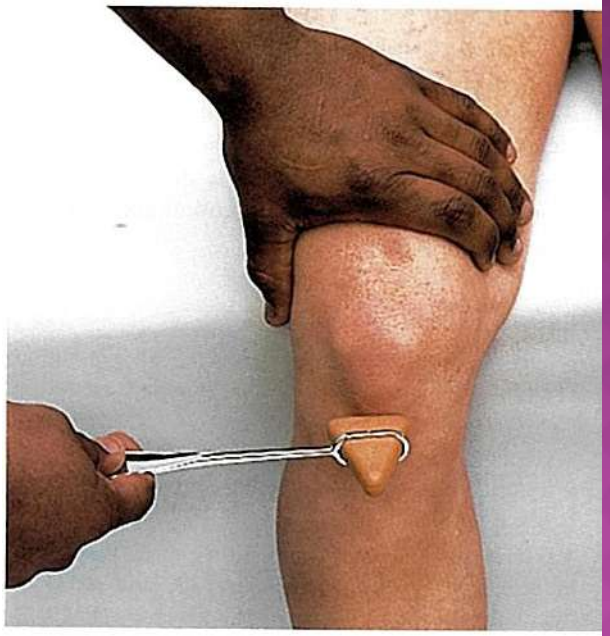


FIGURE 4.16 Assessment of deep tendon reflexes. (

Treatment Procedures

- Medications
  - Anti-inflammatory
  - Antispasmodic or anticholinergic Drug
  - Atropine
  - Muscle Relaxant
- Physical Therapy
  - Physical Therapy
  - Range of Motion Exercises
  - Activities of Daily Living (ADL)

Treatment Procedures

- Fascia
  - Fasciotomy
  - Fascioplasty
- Tendons
  - Carpal Tunnel Release
  - Tenectomy
  - Tenodesis
  - Tenonectomy
  - Tenolysis
  - Tenotomy (tendotomy
  - Tenoplasty (tendoplasty)
  - Tenorrhaphy

Treatment Procedures

- Muscles
  - Myectomy
  - Myoplast
  - Myorrhaphy