

INHE

School of Massage Therapy

Kinesiology

Kinesiology studies the mechanics of human movement and how they impact our health and wellbeing.

Massage therapists must have the knowledge of Kinesiology to properly assess clients/patients, develop the therapeutic plan, and provide the effective treatment according to postural deviations and muscular skeleton discomforts.

Chapter 21

Lesson 21.1

Bones of the Upper Extremity, Lower Extremity, and Axial Skeleton

1. Identify and palpate bones and bony markings in Lesson One (bones of the upper extremity), Lesson Two (bones of the lower extremity), and Lesson Three (axial skeleton).

Introduction

- Kinesiology: Study of human motion
- Bones contain landmarks that are helpful in locating muscles or other structures
- Kinesiology and Massage Practice
- Assessment, treatment plan, positive results
- Abnormal postures and compensations



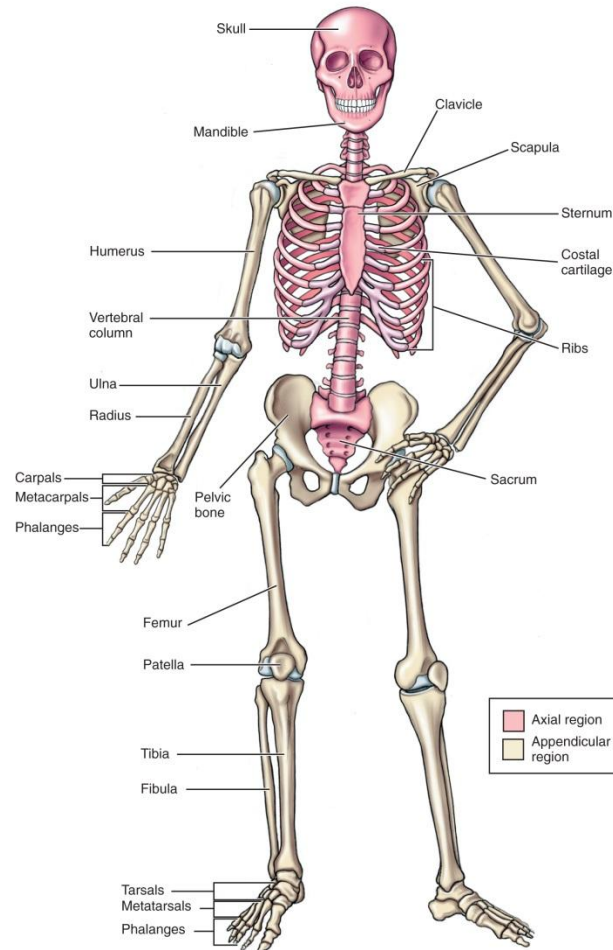
Introduction (Cont.)

- Lesson One: Bones of upper extremity
- Lesson Two: Bones of lower extremity
- Lesson Three: Bones of the axial skeleton
- Lesson Four: Muscles of scapular movement
- Lesson Five: Muscles of shoulder joint movement

Introduction (Cont.)

- Lesson Six: Muscles of elbow and radioulnar joint movement
- Lesson Seven: Muscles of wrist and hand movement
- Lesson Eight: Muscles of hip and knee movement
- Lesson Nine: Muscles of ankle and foot movement
- Lesson Ten: Muscles of neck and facial movement
- Lesson Eleven: Muscles of trunk and vertebral column movement
- Lesson Twelve: Muscles of respiration

Bones of Axial and Appendicular Regions



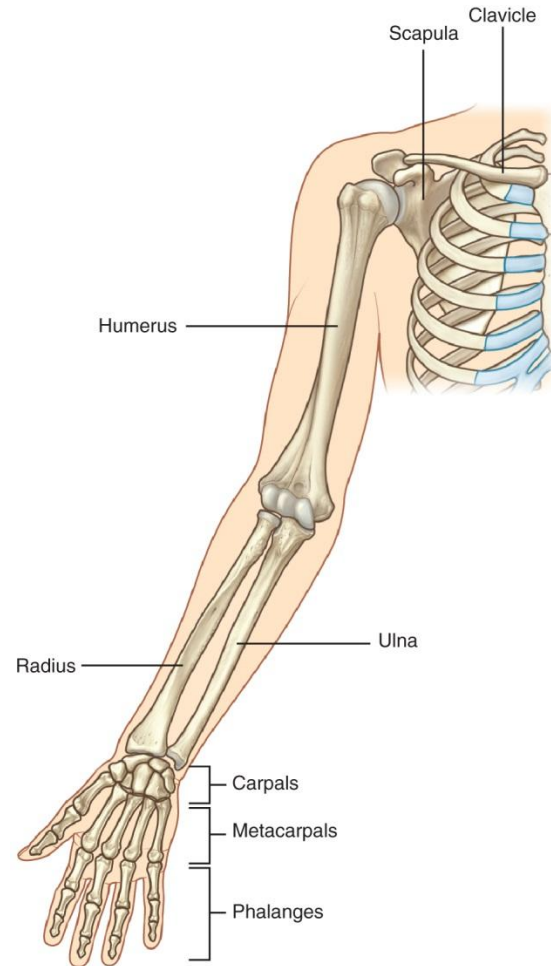
From Herlihy B: *The human body in health and illness*, ed 4, St. Louis, 2011, Saunders.

Lesson One:

Bones of Upper Extremity

- Clavicle
- Scapula
- Humerus
- Ulna
- Radius
- Carpals, metacarpals, and phalanges

Bones of Right Upper Extremity



Anterior View

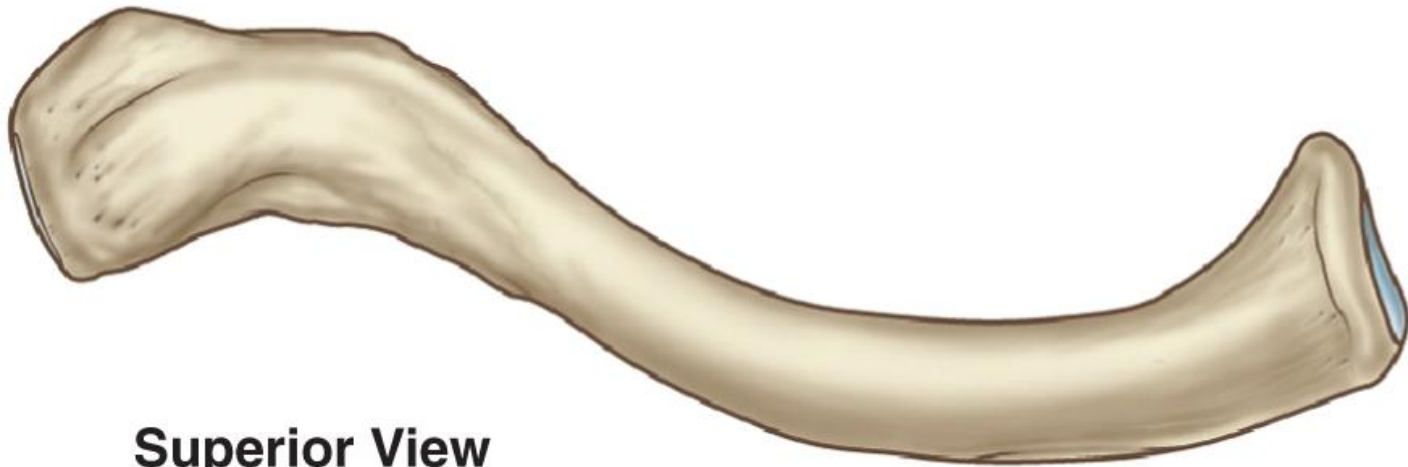
Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Clavicle

- Medial (sternal) end
- Lateral (acromial) end

Lateral end

Medial end



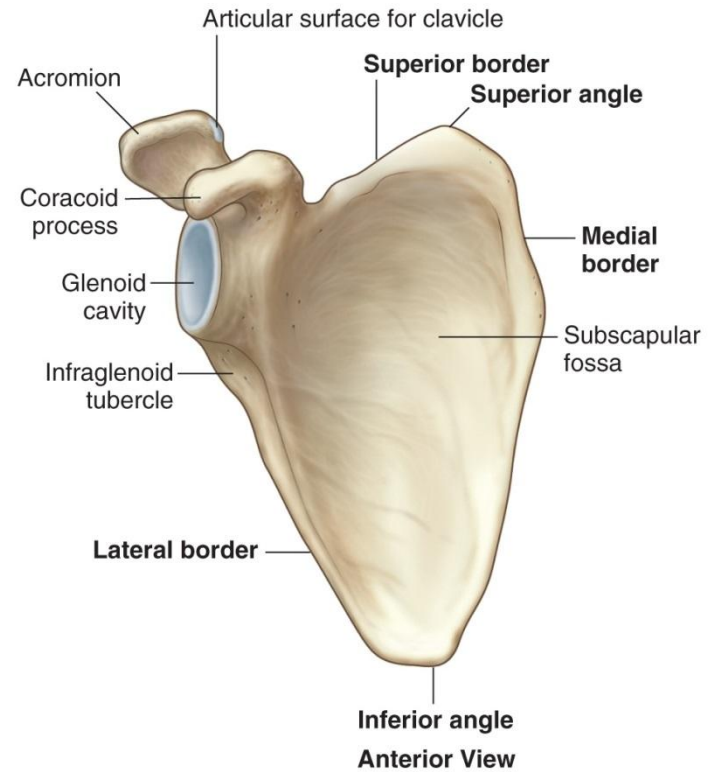
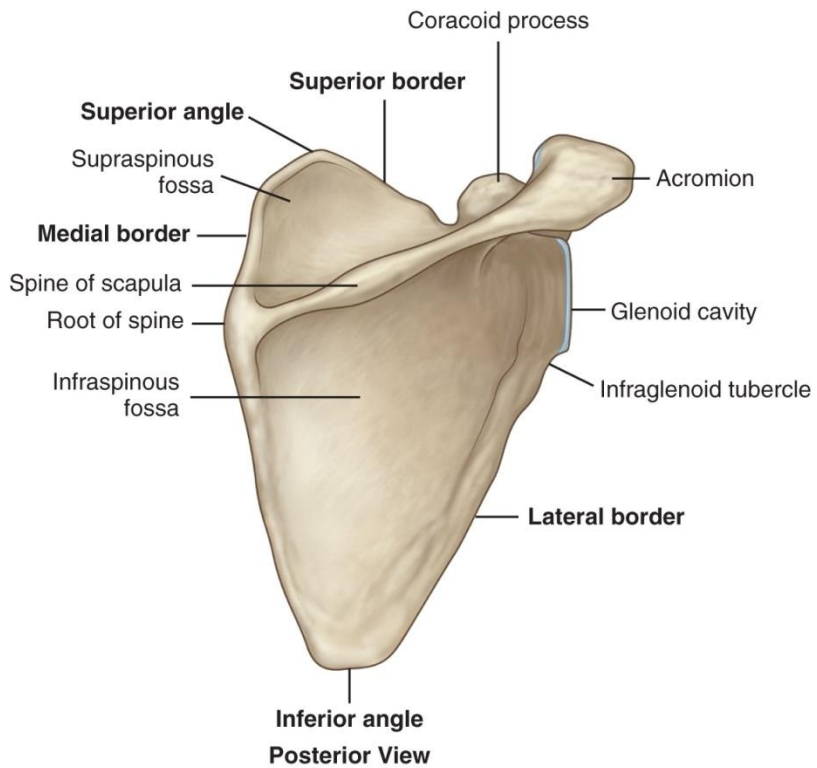
Superior View

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Scapula

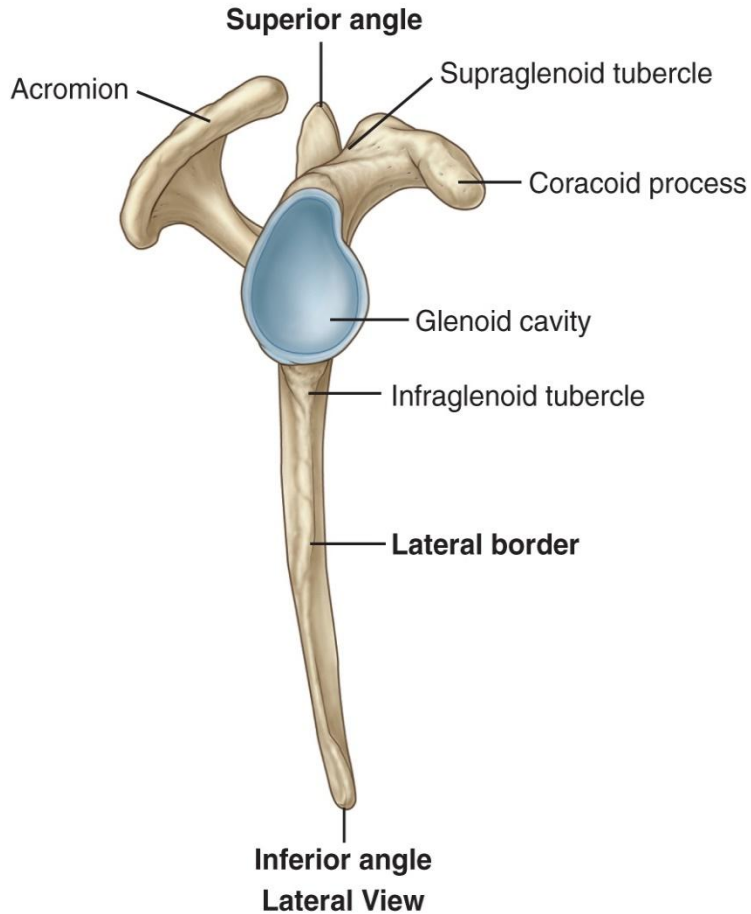
- Superior, medial, and lateral borders
- Superior and inferior angles
- Spine of scapula
- Root of spine
- Acromion and coracoid processes
- Glenoid cavity
- Supraspinous, infraspinous, and subscapular fossae
- Supraglenoid and infraglenoid tubercles

Scapula (Cont.)



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Scapula (Cont.)



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

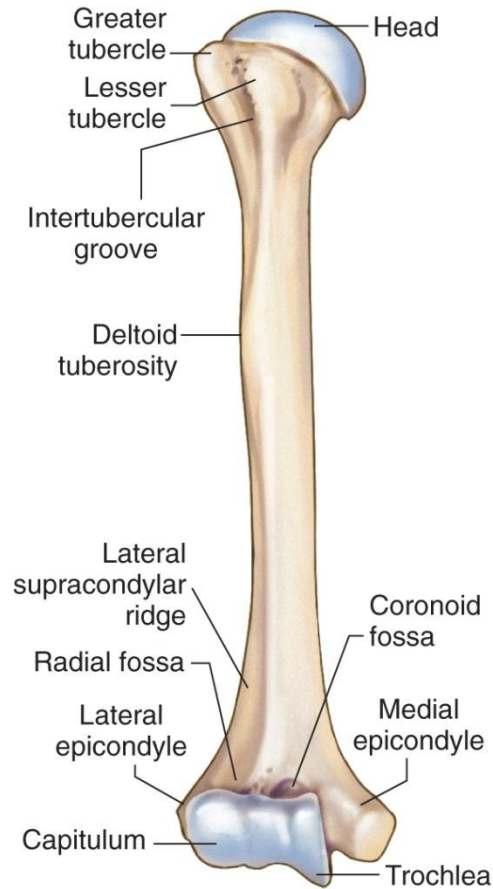
Humerus

- Humeral head
- Anatomic and surgical neck
- Greater and lesser tubercles
- Intertubercular groove
- Deltoid tuberosity
- Radial, olecranon, and coronoid fossae
- Capitulum

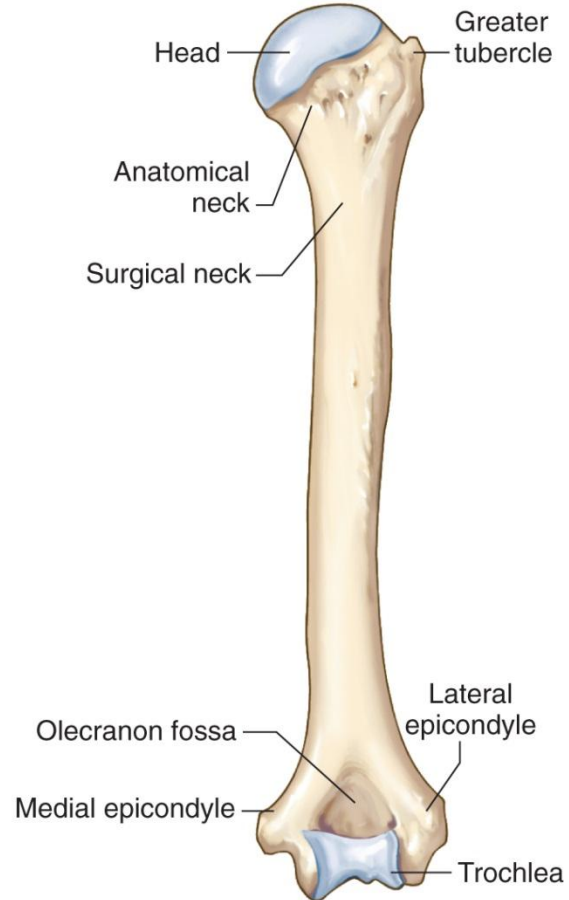
Humerus (Cont.)

- Trochlea
- Medial and lateral condyles
- Supracondylar ridge

Right Humerus



Anterior View

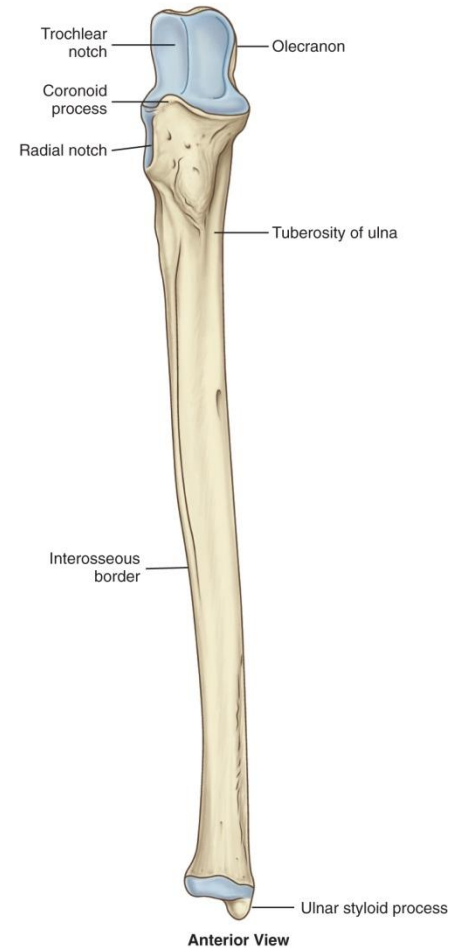


Posterior View

From Patton KT, Thibodeau GA: *Anatomy & physiology*, ed 7, St. Louis, 2010, Mosby.

Ulna

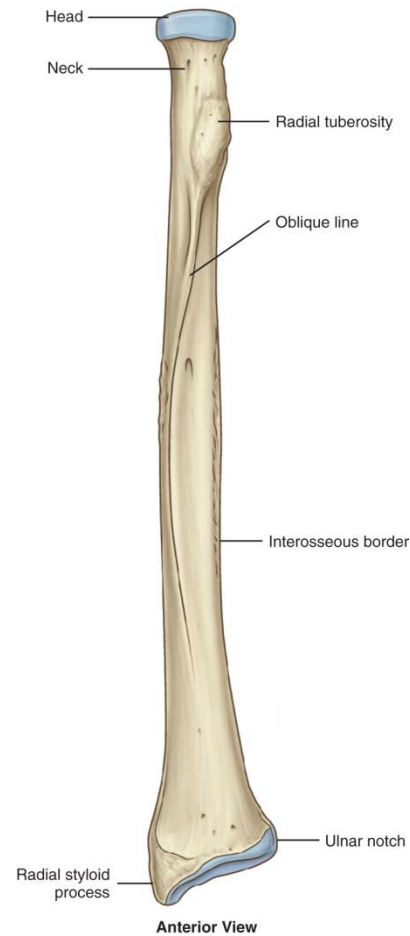
- Olecranon
- Trochlear and radial notches
- Ulnar tuberosity
- Coronoid and styloid processes



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

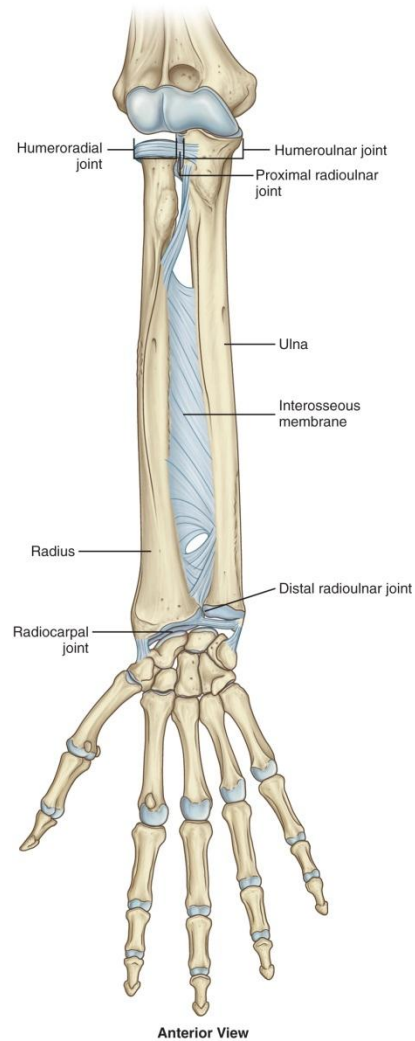
Radius

- Radial head
- Radial neck
- Oblique line
- Radial tuberosity
- Ulnar notch
- Styloid process



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Interosseous Membrane

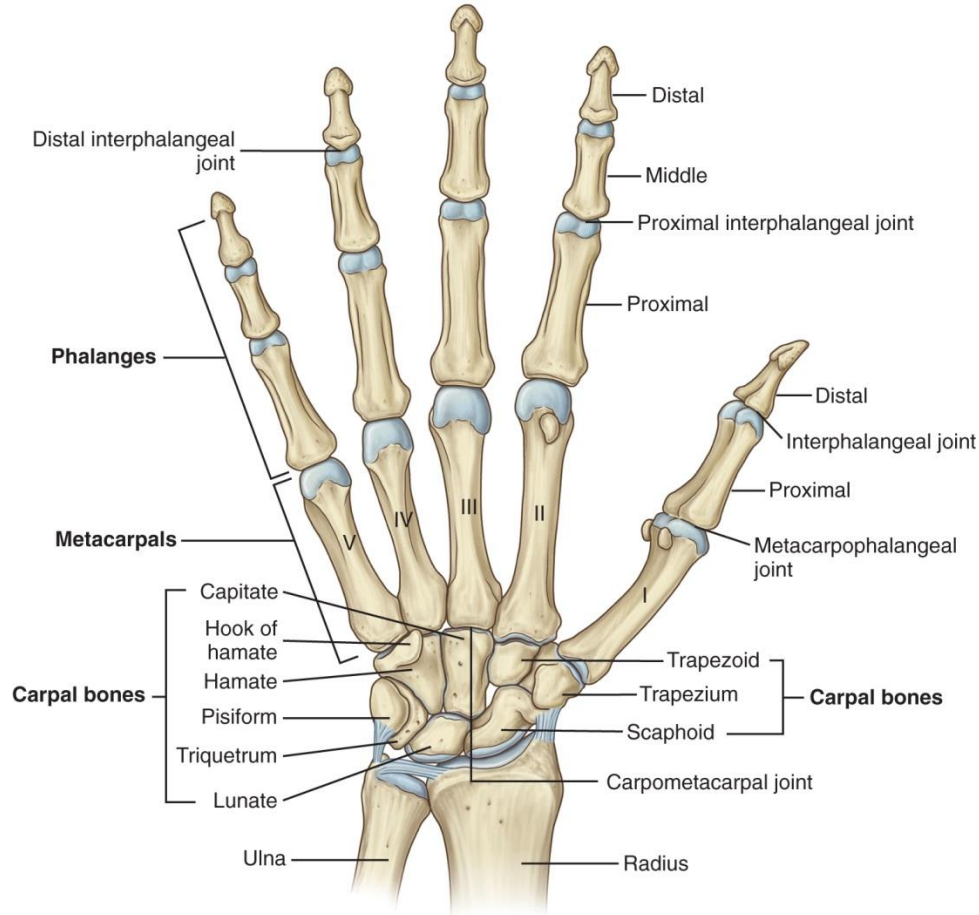


Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Carpals

- Scaphoid
- Lunate
- Triquetrum
- Pisiform
- Trapezium
- Trapezoid
- Capitate
- Hamate

Right Hand



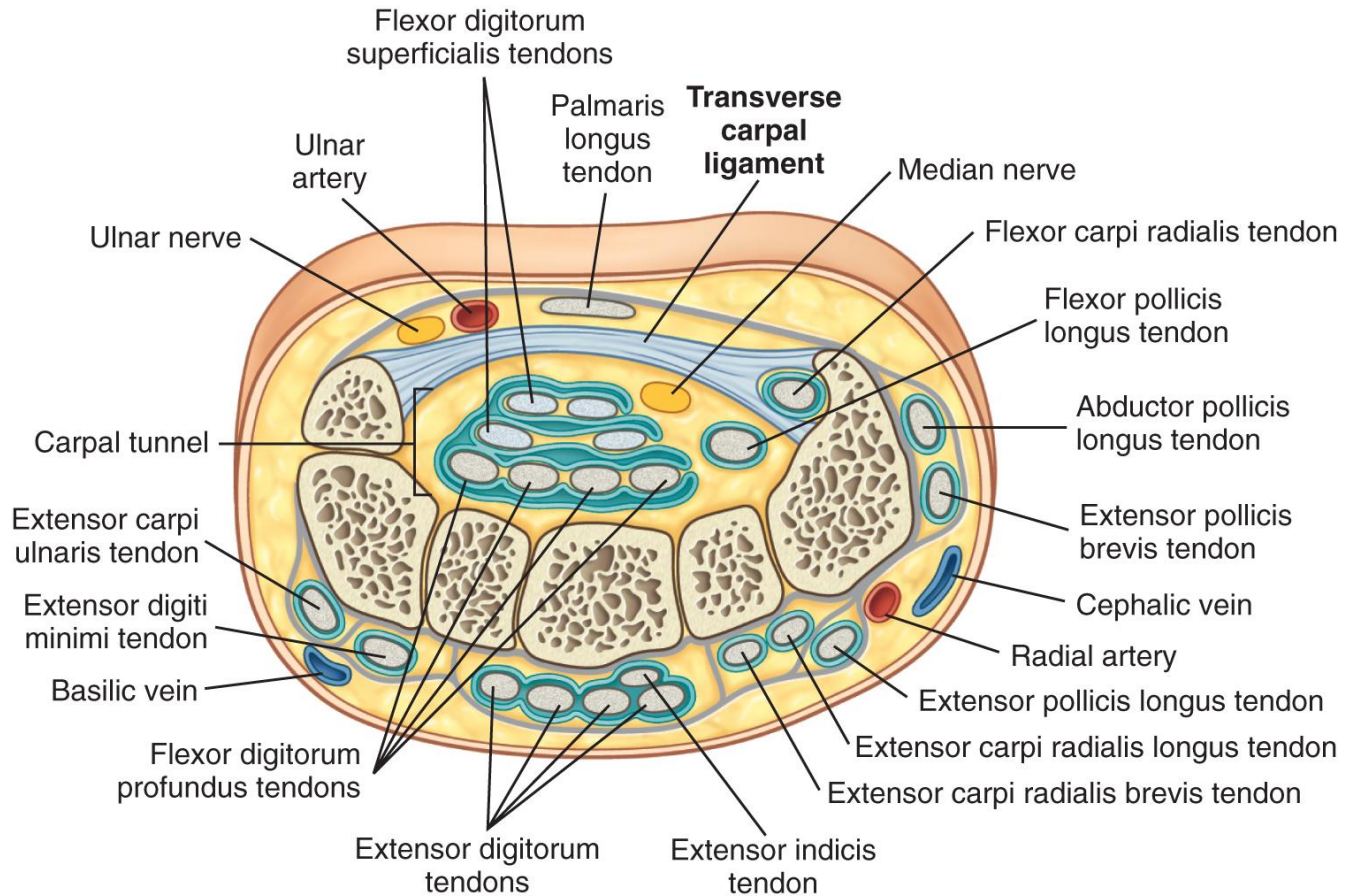
Anterior View

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Carpal Tunnel

- Produced by carpal bones
- Bound by transverse carpal ligament

Carpal Tunnel (Cont.)



Cross Section

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Metacarpals

- Located in each hand
- Numbered I through V
- Includes:
 - Head: Distal end
 - Base: Proximal end

Phalanges

- Located in fingers and thumb
- Also called *digits*
- Fourteen in each hand
 - Three in each finger
 - Two in each thumb (pollicis)
- Proximal, middle, and distal phalanx

ARM & SHOULDER
(ACTIIII)

Class Exercise

Locate and Identify Upper Extremity Bones on a Skeletal Model

On a skeletal model and on each other, identify the bones of the upper extremities, including their anatomical locations, landmarks, and articulations.

The bones to locate include:

- Clavicle (Collarbone)
- Scapula (Shoulder Blade)
- Humerus (Upper Arm Bone)
- Ulna (Medial Forearm Bone)
- Radius (Lateral Forearm Bone)
- Carpals (Wrist Bones)
- Metacarpals (Hand Bones)
- Phalanges (Finger Bones)

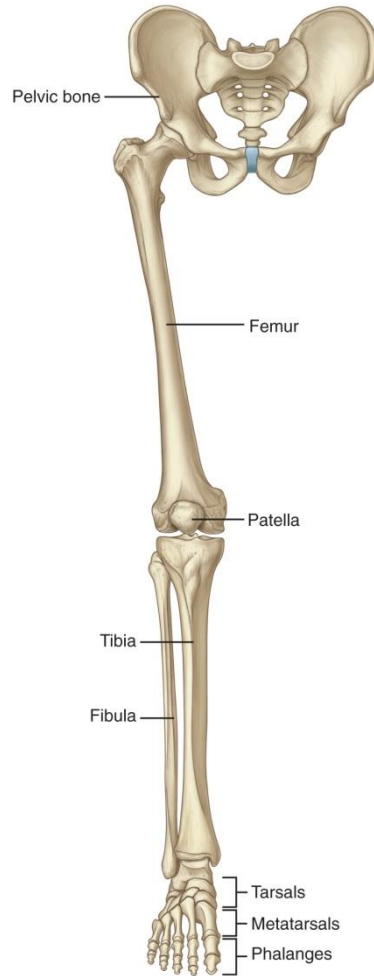
Pay close attention to the joints and points of articulation where these bones interact, such as the shoulder joint, elbow joint, wrist joint, and finger joints.

Lesson Two:

Bones of Lower Extremity

- Pelvic bone
- Femur
- Patella
- Tibia
- Fibula
- Tarsals, metatarsals, and phalanges

Bones of Lower Extremity



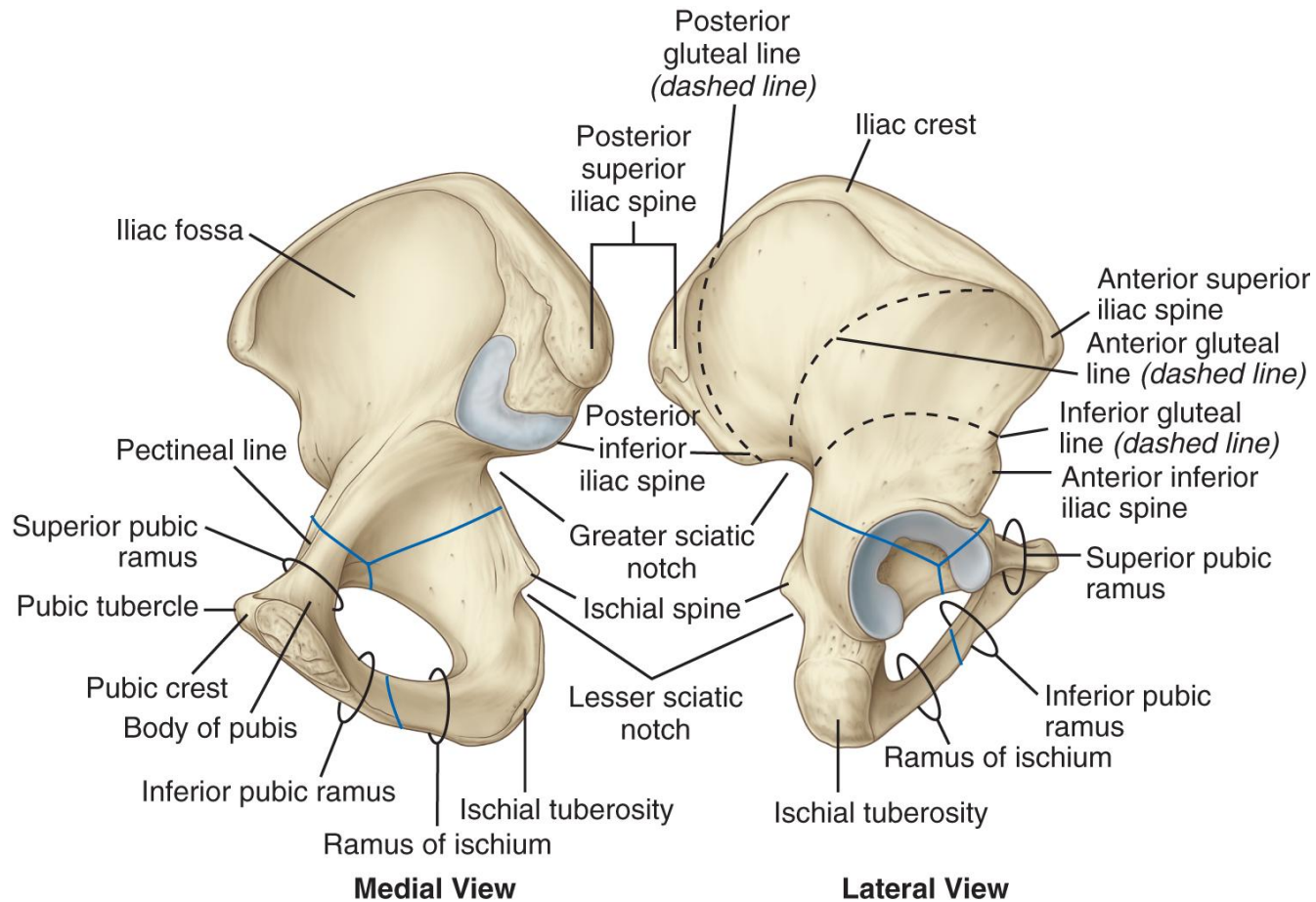
Anterior View

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Pelvic Bones

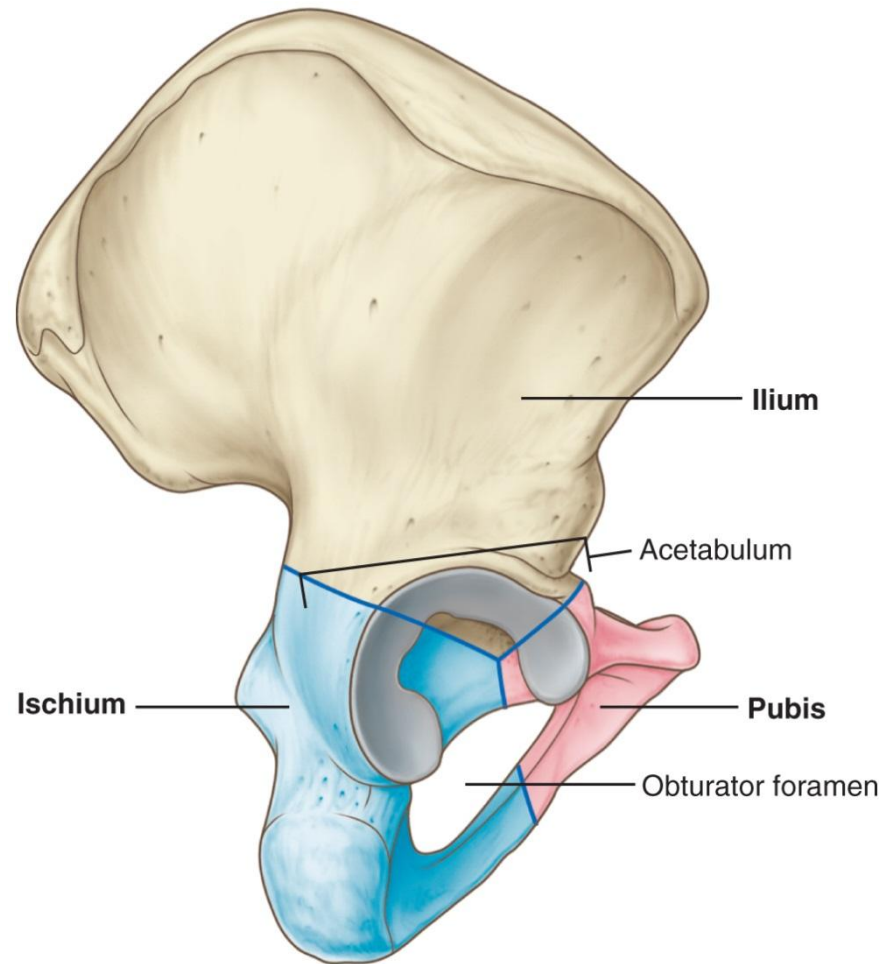
- Three fused bones
 - Ilium
 - Ischium
 - Pubis
- Acetabulum articulates with femoral head at the acetabulofemoral joint or hip joint

Pelvic Bones (Cont.)



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Pelvic Bones (Cont.)



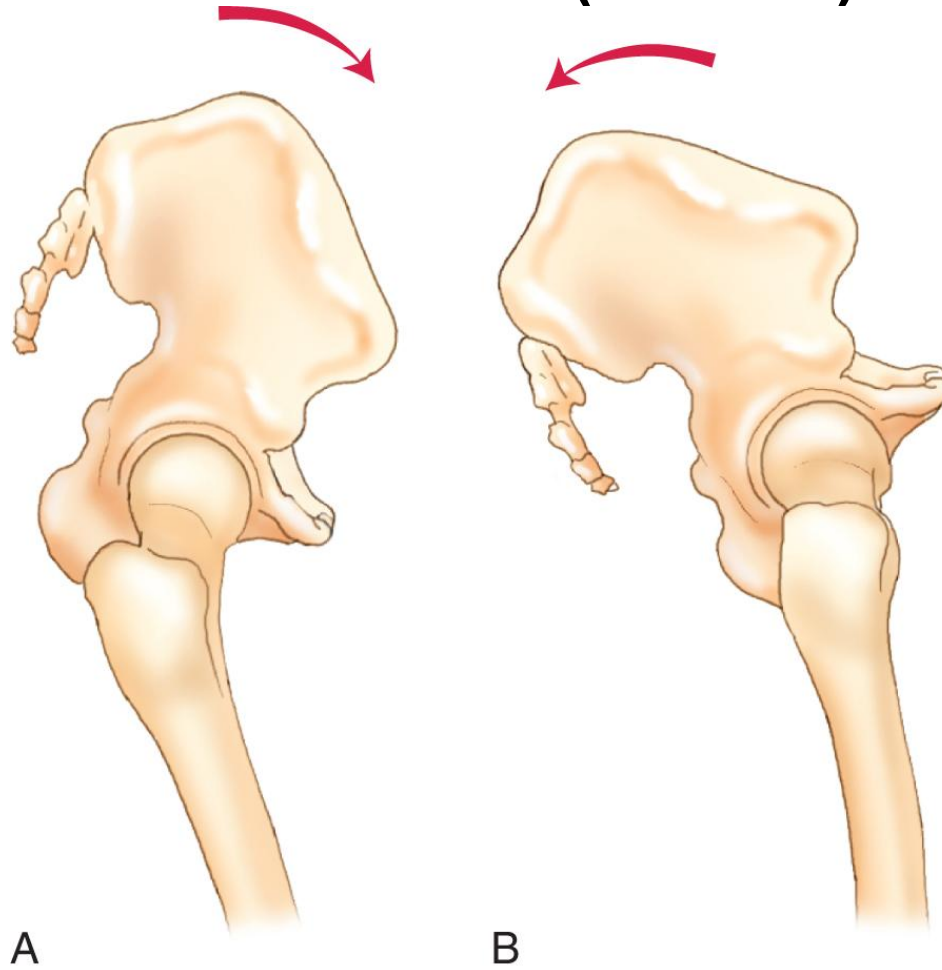
Lateral View

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Pelvic Tilt

- Refers to position of pelvis as it rests on the femurs
- Anterior tilt: Pelvis tilts forward
- Posterior tilt: Pelvis tilts backward
- Right pelvic tilt: Tilts toward right side
- Left pelvic tilt: Tilts toward the left

Pelvic Tilt (Cont.)



Lateral View

From Muscolino JE: *Kinesiology*, ed 2, St. Louis, 2011, Mosby.

Ilium

- Iliac crest
- Iliac fossa
- Anterior superior iliac spine (ASIS) and anterior inferior iliac spine (AIIS)
- Posterior superior iliac spine (PSIS) and posterior inferior iliac spine (PIIS)
- Anterior, posterior, and inferior gluteal lines
- Greater sciatic notch

Ischium

- Ischial tuberosity
- Ischial spine
- Ischial ramus
- Greater sciatic notch
- Lesser sciatic notch

Pubis

- Superior and inferior pubic rami
- Pubic tubercle
- Pubic crest
- Pectineal line
- Pubic body (body of pubis)



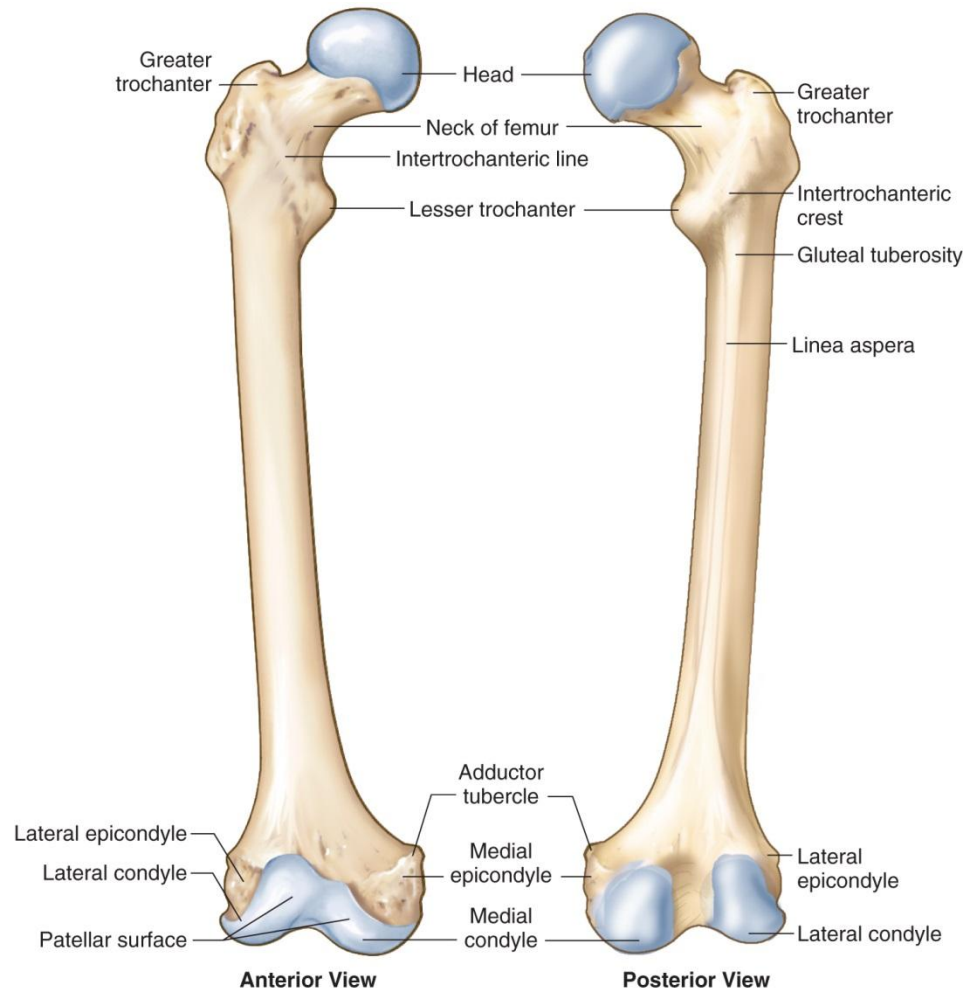
Femur

- Femoral head and neck
- Greater and lesser trochanters
- Intertrochanteric line and crest
- Linea aspera
- Gluteal tuberosity

Femur (Cont.)

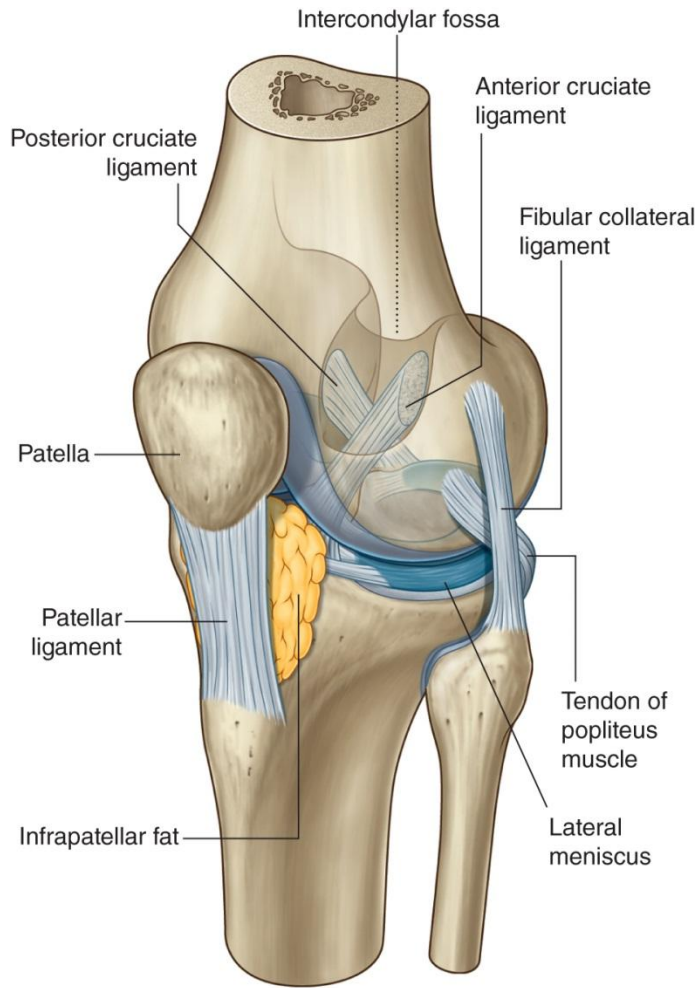
- Adductor tubercle
- Medial and lateral condyles
- Intercondylar fossa
- Medial and lateral epicondyles

Right Femur

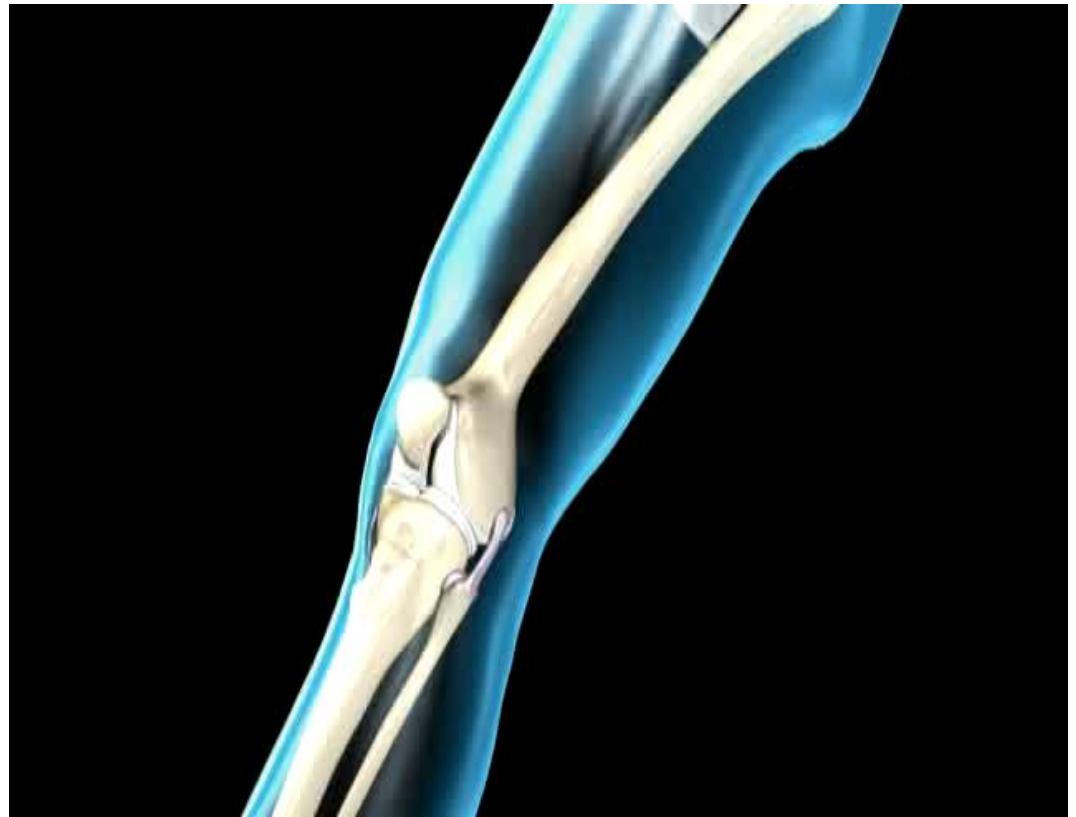


From Patton KT, Thibodeau GA: *Anatomy & physiology*, ed 7, St. Louis, 2010, Mosby.

Knee



Anterolateral View



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Knee (Cont.)

- Located between the thigh and the leg
- Lower portion contains fibrocartilage disks (medial meniscus and lateral meniscus)
- Internal ligament system consists of the anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL)
- External ligament system consists of the fibular collateral ligament and the tibial collateral ligament

Patella (Kneecap)

- Largest sesamoid bone in the body
- Embedded in quadriceps tendon
- Articulates with distal end of the femur

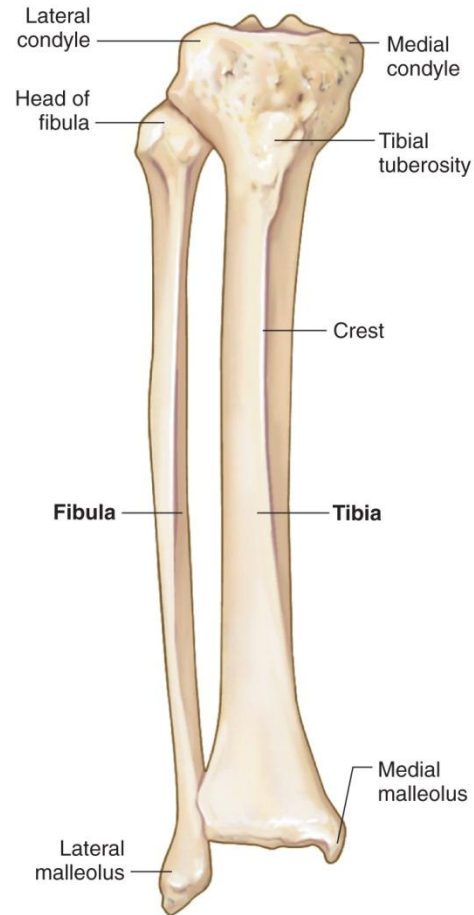
Tibia

- Medial and lateral condyles
- Tibial tuberosity
- Gerdy tubercle
- Crest (anterior border)
- Soleal line
- Medial malleolus

Fibula

- Landmarks are the fibular head and lateral malleolus
- An interosseous membrane connects the tibia and the fibula and provides muscle attachments

Tibia and Fibula



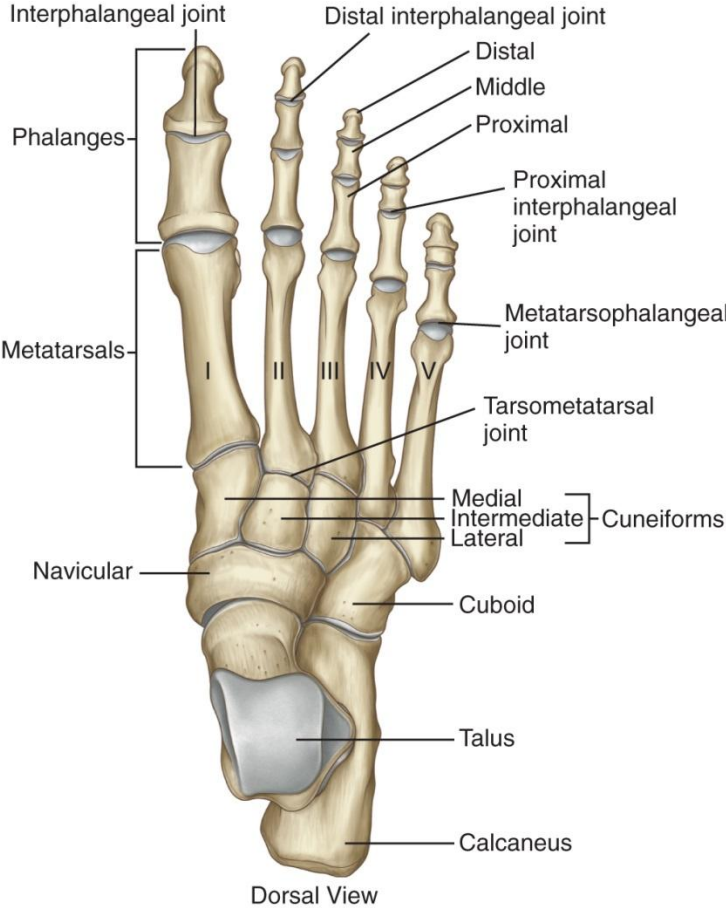
Anterior View

From Patton KT, Thibodeau GA: *Anatomy & physiology*, ed 7, St. Louis, 2010, Mosby.

Tarsals

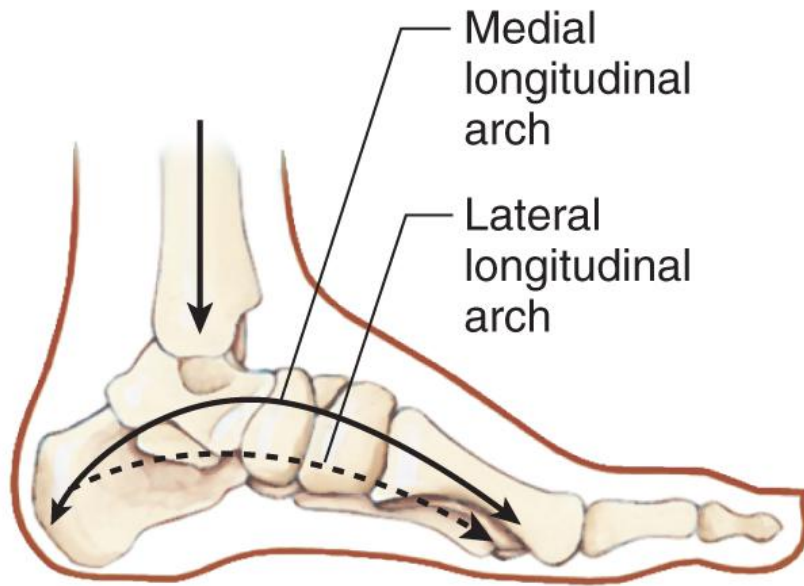
- Talus
- Cuneiforms
 - Medial
 - Intermediate
 - Lateral
- Navicular
- Cuboid
- Calcaneus

Right Foot



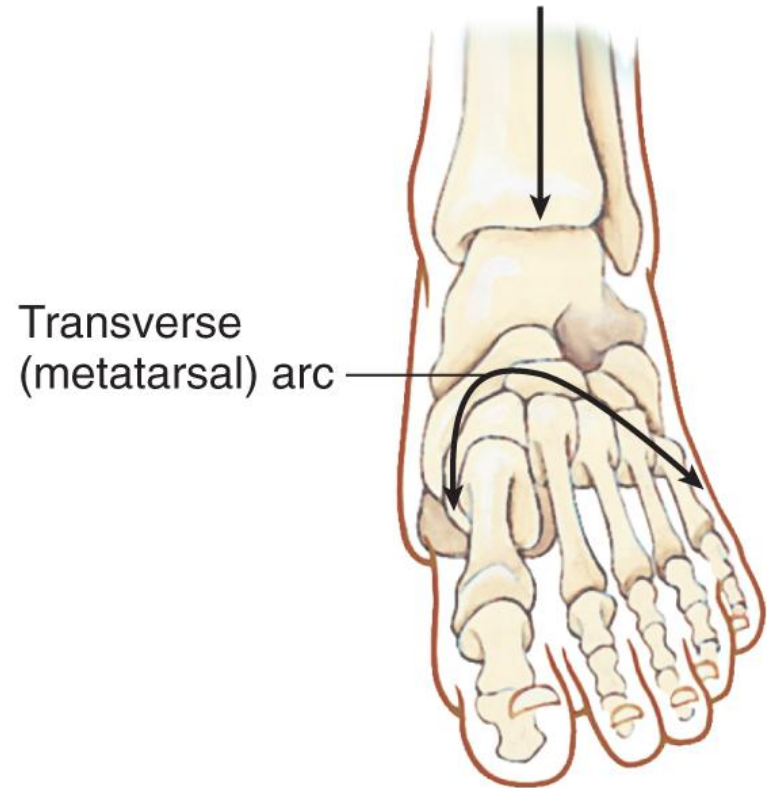
Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Right Foot Arches



Normal longitudinal arch

A



Transverse arch

B

From Patton K: *The Human Body in Health and Disease*, ed 5, St. Louis, 2014, Mosby.

Metatarsals

- Located in each foot
- Numbered I through V
- Proximal end articulates with the cuboid and cuneiforms at the tarsometatarsal joints
- Distal ends of the metatarsals articulate with the phalanges at the metatarsophalangeal (MTP) joints

Phalanges

- Located in toes
- Also called *digits*
- Fourteen in each foot
 - Three in each toe
 - Two in each great toe (hallux)
- Proximal phalanx, middle phalanx, and distal phalanx

Class Exercise

Locate and Identify Lower Extremity Bones on a Skeletal Model

Using a skeletal model and peer observation, identify the bones of the lower extremities, noting their anatomical locations, landmarks, and articulations.

The bones to locate include:

Pelvis (Hip Bone)

Femur (Thigh Bone)

Patella (Kneecap)

Tibia (Medial Lower Leg Bone)

Fibula (Lateral Lower Leg Bone)

Tarsals (Ankle and Hindfoot Bones)

Metatarsals (Foot Bones)

Phalanges (Toe Bones)

Pay close attention to the joints and points of articulation where these bones interact, such as the shoulder joint, elbow joint, wrist joint, and finger joints.

Lesson Three:

Bones of the Axial Skeleton

- Skull
- Ribcage
- Sternum
- Vertebral column

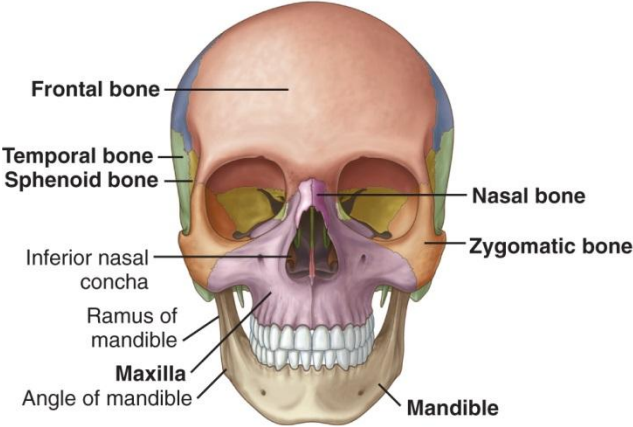
Cranial Bones

- Frontal bone
- Parietal bones
- Temporal bones
- Ethmoid bone
- Sphenoid bone
- Occipital bone

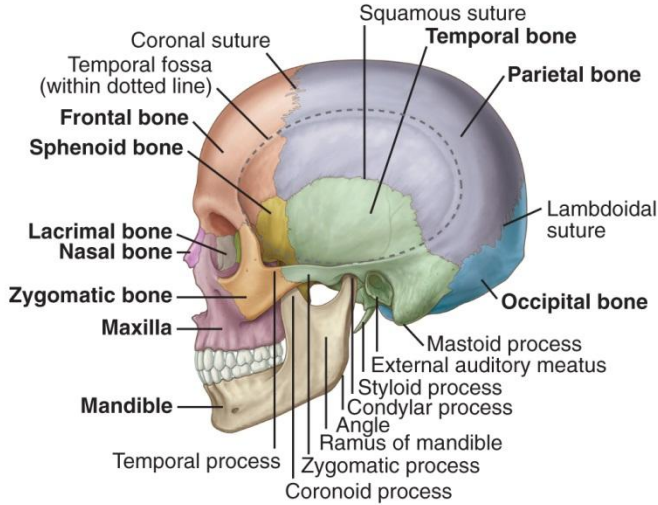
Cranial Bones (Cont.)

- Temporal
 - Styloid process, mastoid process, and zygomatic process
- Occipital
 - Foramen magnum
 - Superior and inferior nuchal lines
 - External occipital protuberance
 - Occipital condyles

Skull



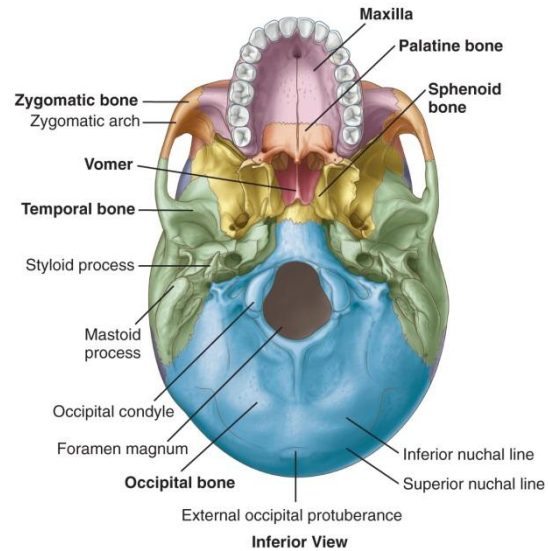
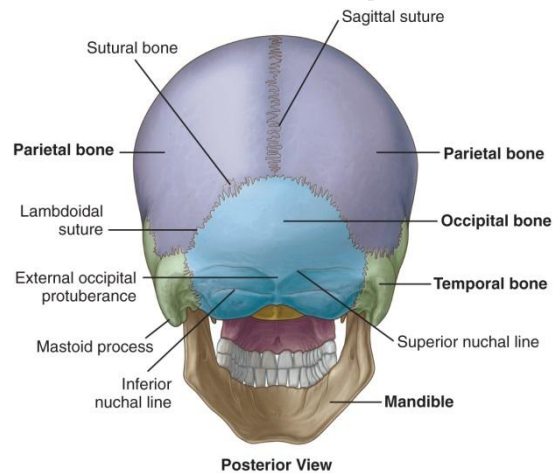
Anterior View



Lateral View

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Skull (Cont.)



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

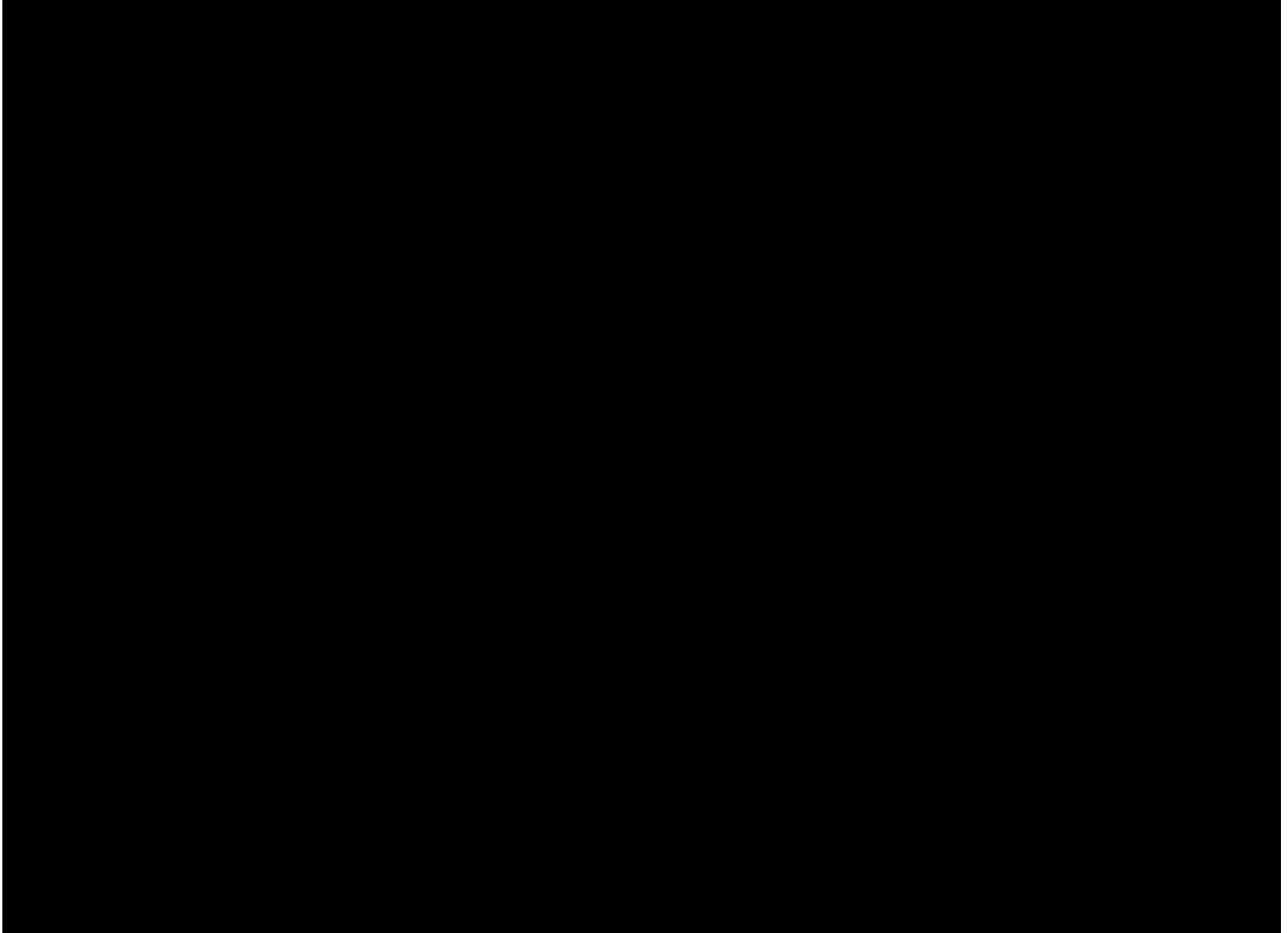
Sutures

- Sagittal suture
- Coronal suture
- Lambdoidal suture
- Squamosal suture

Facial Bones

- Nasal bones
 - Vomer bone
 - Zygomatic bones
 - Lacrimal bones
 - Inferior nasal concha
 - Palatine bones
 - Maxillae
 - Mandible
- Mandible
 - Mandibular ramus
 - Mandibular angle
 - Coronoid process
 - Condylar process

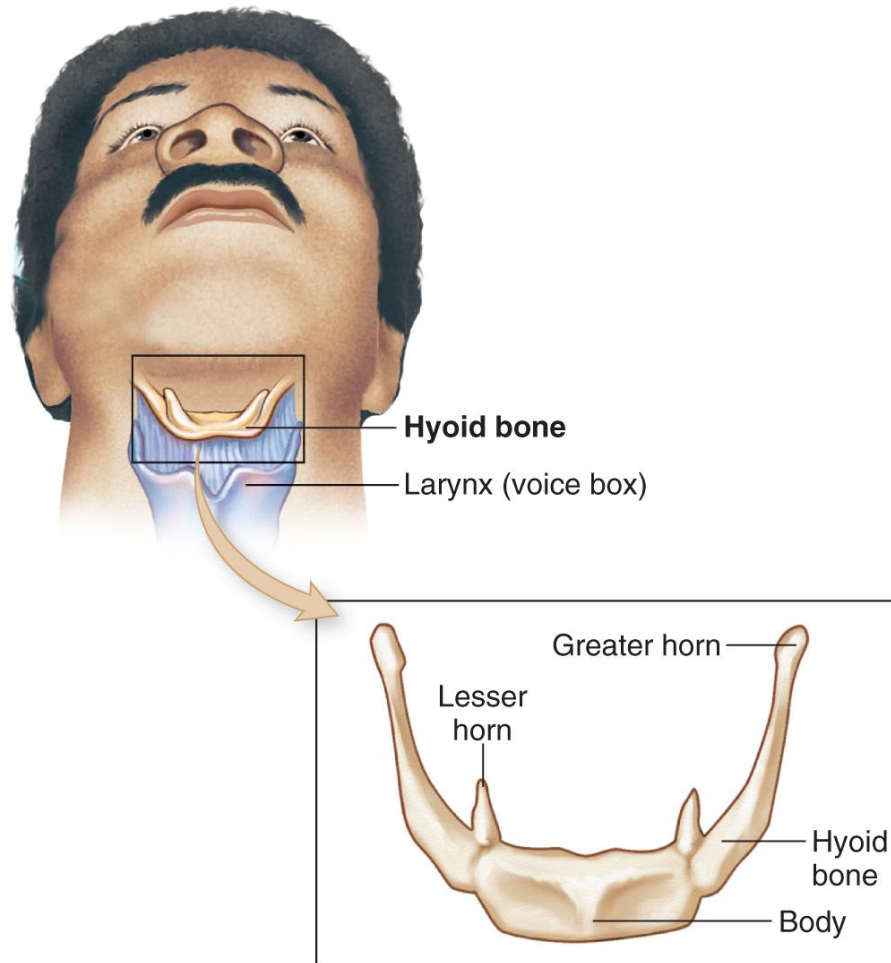
Cranial Bones



Hyoid

- Does not articulate directly with any other bones
- Suspended from styloid process of temporal bone by ligaments
- Supports the tongue and larynx
- Provides for muscle attachments

Hyoid (Cont.)



From Patton KT, Thibodeau GA: *Anatomy & physiology*, ed 7, St. Louis, 2010, Mosby.

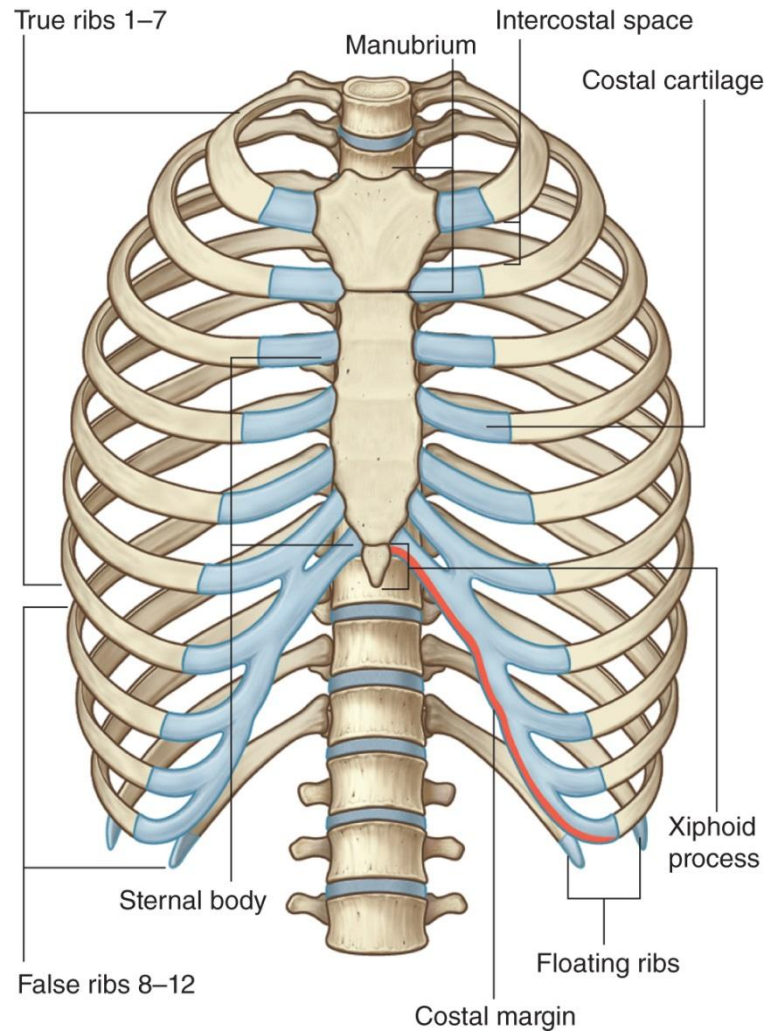
Ribcage

- 24 long, flat bones (12 pairs)
- True ribs (7 pairs)
 - Directly connected to the sternum
- False ribs (5 pairs)
 - Connected to sternum by cartilage
- Floating ribs
 - Do not connect with the sternum

Sternum

- Manubrium
- Sternal body
- Xiphoid process

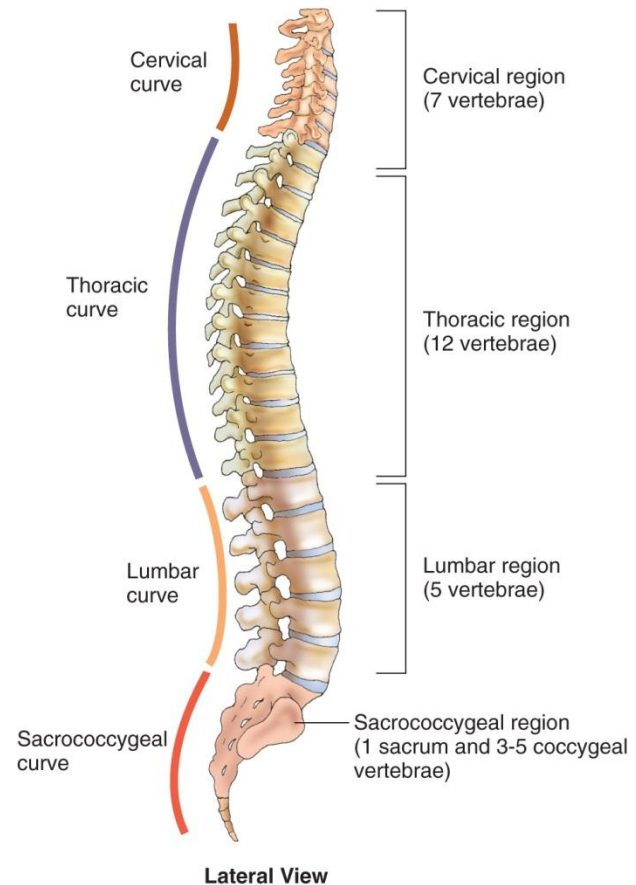
Ribcage and Sternum



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Vertebral Column

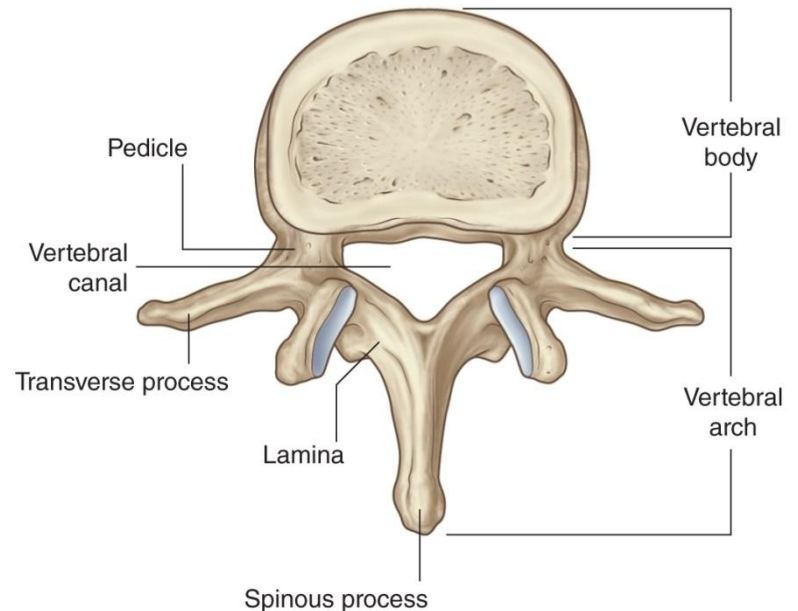
- Cervical region contains 7 vertebrae
- Thoracic region contains 12 vertebrae
- Lumbar region contains 5 vertebrae
- Sacrococcygeal region contains 8 total vertebrae



Modified from Leonard PC: *Building a medical vocabulary*, ed 7, St. Louis, 2009, Saunders.

Vertebra

- Vertebral body
- Pedicle
- Lamina
- Transverse processes
- Spinous process
- Articular processes (superior and inferior)

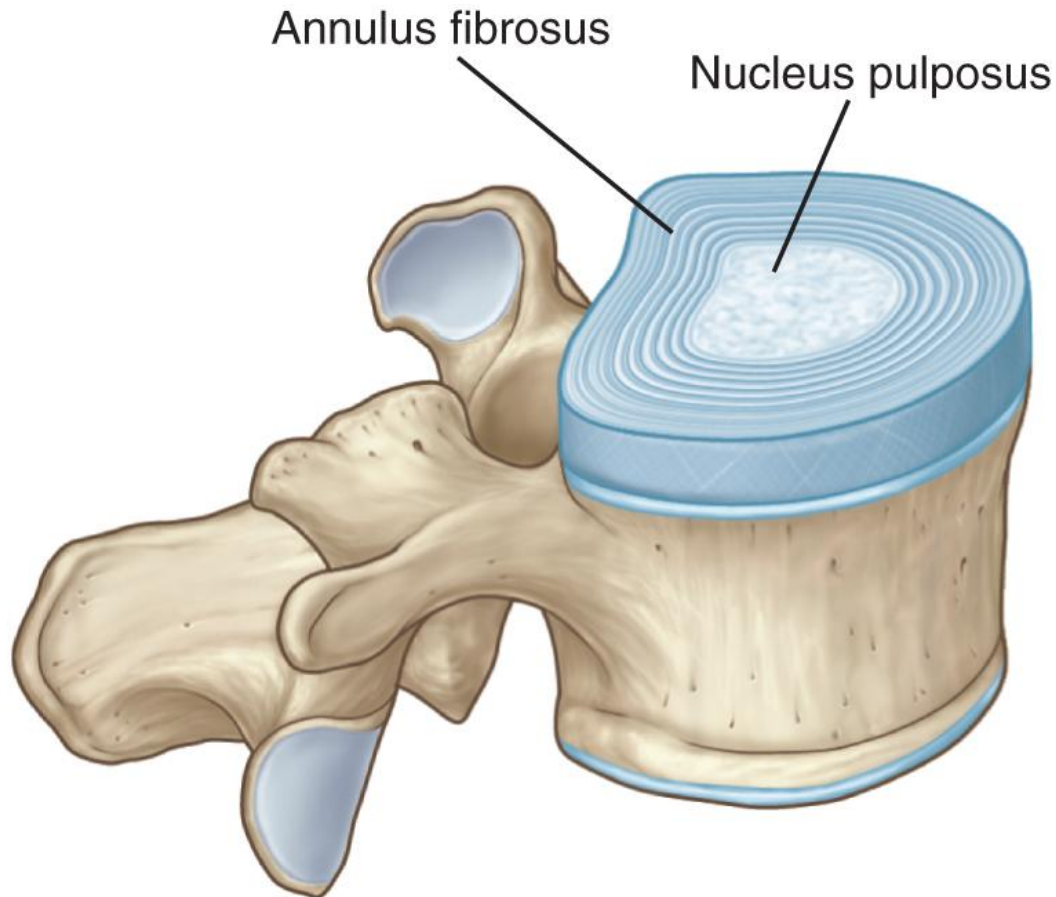


Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Vertebra (Cont.)

- Vertebral canal: Large central hole containing spinal cord
- Intervertebral foramen: Allows passage of spinal nerves and blood vessels
- Lamina groove: Located on either side of the spinous processes

Intervertebral Disk



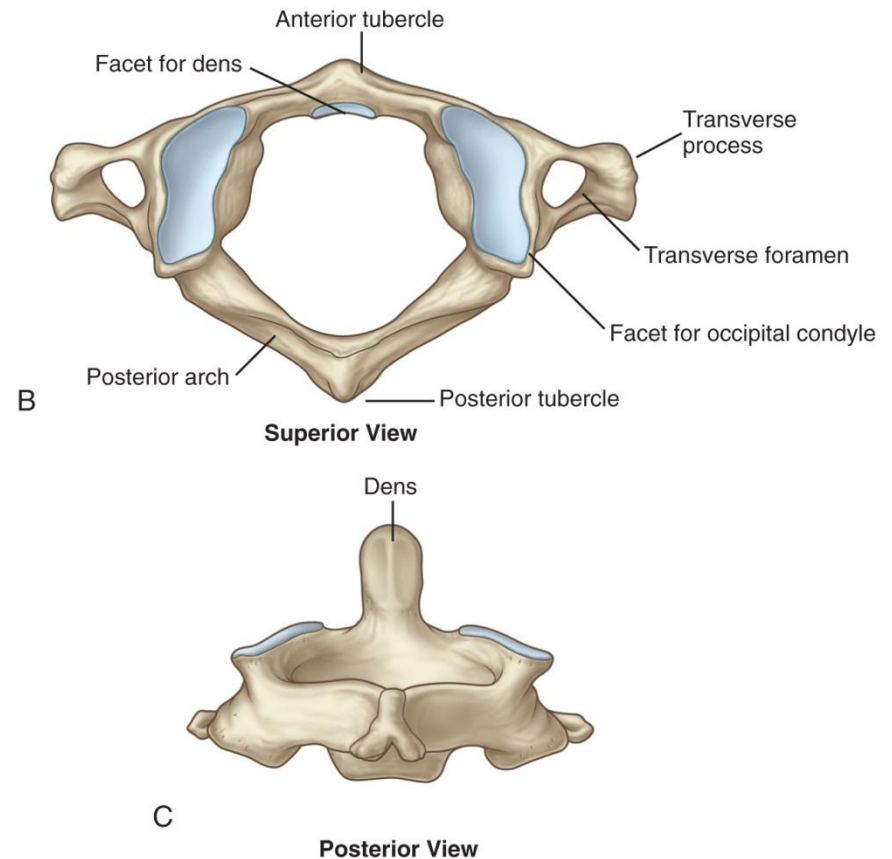
Superolateral View

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Atypical Vertebra

- Cervical vertebra

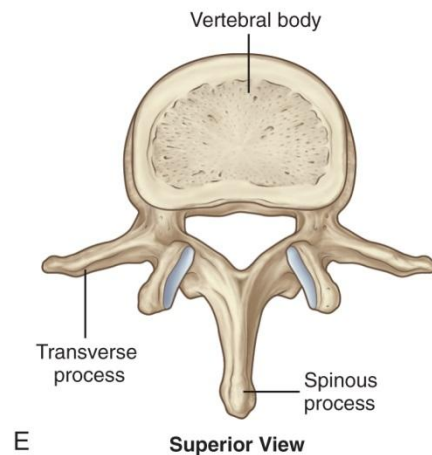
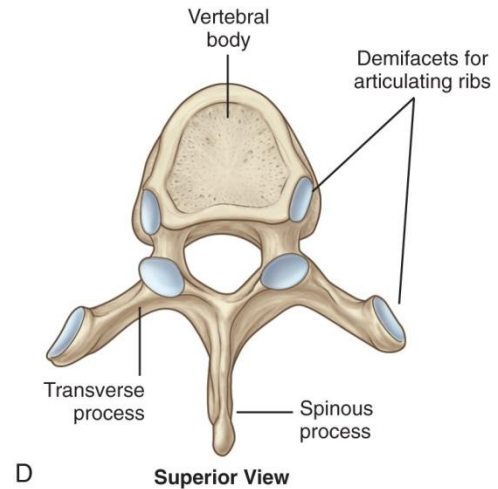
- C1: Atlas
- C2: Axis



Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Atypical Vertebra (Cont.)

- Thoracic vertebra: T1 through T12
 - Contain partial facets (demifacets)
- Lumbar vertebra: L1 through L5
 - Large vertebral bodies
 - Short thick processes



END OF WEEK 1

Modified from Drake RL, Vogl AW, Mitchell AWM: *Gray's anatomy for students*, ed 2, Philadelphia, 2010, Churchill Livingstone.

Class Exercise

Locate and Identify Axial Skeletal Bones on a Skeletal Model

Using a skeletal model and peer observation, identify the bones of the axial skeleton, noting their anatomical locations, landmarks, and articulations.

The axial skeleton includes:

- Skull (Cranium and Facial Bones)
- Mandible (Lower Jawbone)
- Hyoid Bone (Located in the throat)
- Vertebral Column (Spine)
 - Cervical Vertebrae (Neck)
 - Thoracic Vertebrae (Upper and mid-back)
 - Lumbar Vertebrae (Lower back)
 - Sacrum (Base of the spine)
 - Coccyx (Tailbone)
- Sternum (Breastbone)
- Ribs (12 pairs, forming the rib cage)

Pay close attention to the joints and points of articulation where these bones interact, including: Temporomandibular Joint (TMJ) (Connecting the mandible to the skull)

Atlanto-occipital Joint (Connecting the skull to the first cervical vertebra)

Intervertebral Joints (Connecting vertebrae throughout the spine)

Sternoclavicular Joint (Connecting the sternum to the clavicle)

Costovertebral Joints (Connecting ribs to the thoracic vertebrae)

Understanding these anatomical structures will help visualize the function and stability of the axial skeleton, which serves as the central framework of the body.

Knowledge Check

Kinesiology is the:

- a. Principles of how humans behave
- b. Study of human motion
- c. Development of biomechanics
- d. Connection between anatomy and physiology

Knowledge Check

Which of the following bone is part of lower extremities?

- a. Iliac
- b. Ulnar
- c. Tibia
- d. Radius

Knowledge Check

Which of the following muscle contraction generate force as muscle length stays the same?

- a. Eccentric
- b. Isometric
- c. Concentric
- d. Isotonic

Knowledge Check

Which of the following bone connects to the scapula bone via the lateral end?

- a. Clavicle
- b. Sternum
- c. Humerus
- d. 7th cervical vertebra

Knowledge Check

Acromion and coracoid processes belongs to:

- a. Clavicle
- b. Sternum
- c. Scapula
- d. Humerus

Knowledge Check

Which of the following bone is not a pelvic bone?

- a. Ilium
- b. Ischium
- c. Femur
- d. Pubis

Knowledge Check

Acromion and coracoid processes belongs to:

- a. Clavicle
- b. Sternum
- c. Scapula
- d. Humerus

Lesson 21.2 of Week 2

Muscles of Scapular Movement and Shoulder Joint Movement

2. Identify, palpate, and produce movements of muscles in Lesson Four (scapular movement) and Lesson Five (shoulder joint movement).

Muscles

- Five phase approach to learning muscles
 - Phase I: Decipher names and learn pronunciations
 - Phase II: Learn general locations of muscles
 - Phase III: Learn specific muscle locations using attachment sites
 - Phase IV: Learn muscle actions using multisensory approach
 - Phase V: Apply knowledge

Muscles: General Rules

- Origins are generally located medial or proximal to their insertions
- Muscles on the anterior side of the trunk and upper extremity generally create flexion
- Muscles on the posterior side of the lower extremity generally create flexion
- Muscles on the posterior side of the trunk and upper extremity generally create extension
- Muscles on anterior side of the lower extremity extend generally create extension

Muscles: General Rules (Cont.)

- Muscles on the medial side of the body generally create adduction
- Muscles on the lateral side of the body generally create abduction
- Muscles with fibers running superior to inferior generally create flexion or extension
- Muscles with oblique running fibers generally create rotation
- If a muscle crosses two joints, it acts on both joints
- Most muscles have at least two actions (primary and secondary)
- Prime movers and antagonists are generally located opposite each other

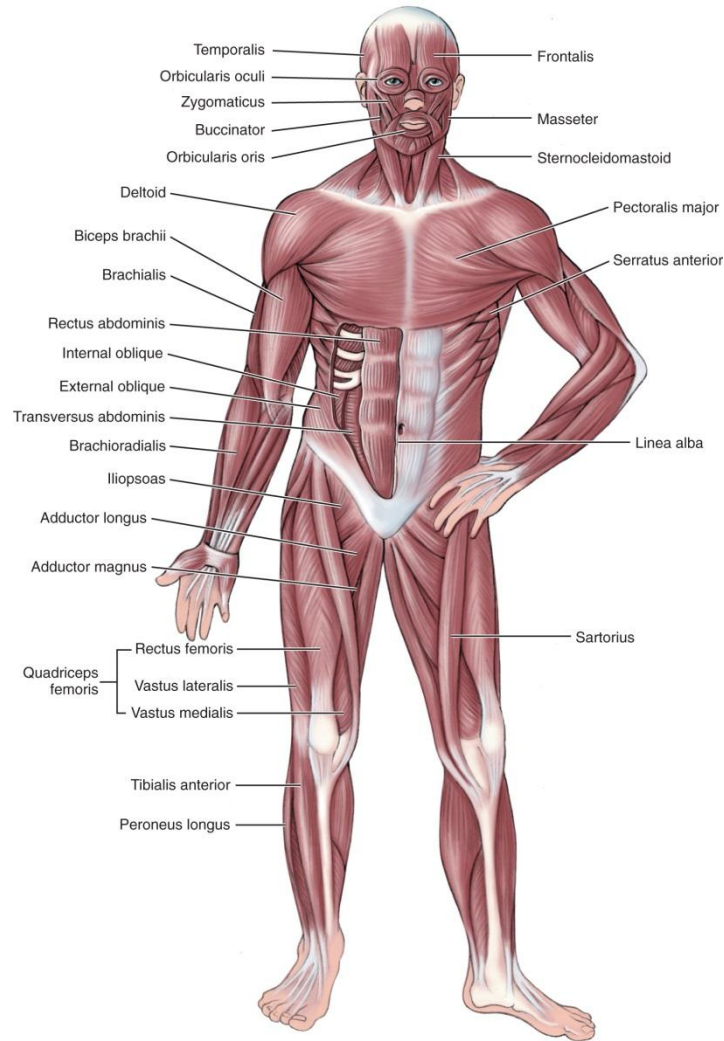
Learning Muscles

- Learn Latin and Greek roots
- Make flashcards
- Practice with palpation
- Key to learning is REPETITION

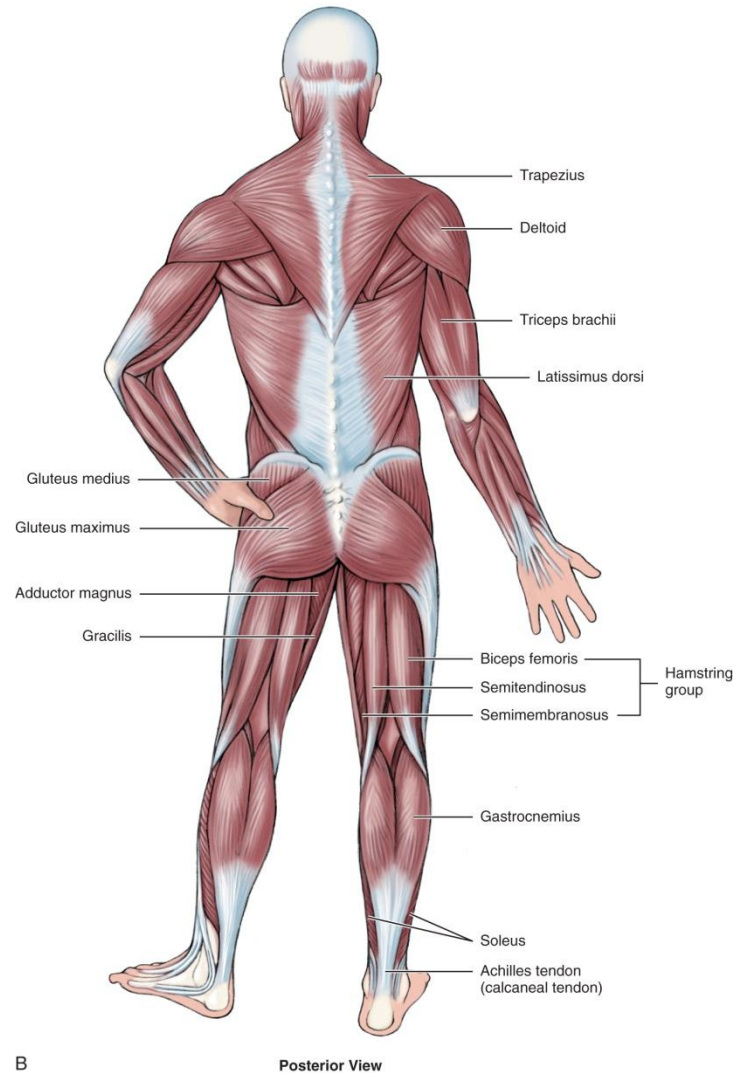
Naming Muscles

- Muscles are named by:
 - Origins and insertions
 - Actions or functions
 - Number of origins
 - Relative shape and size
 - Location and/or direction of fibers
 - Combinations

Superficial Muscles of the Body



Superficial Muscles of the Body (Cont.)

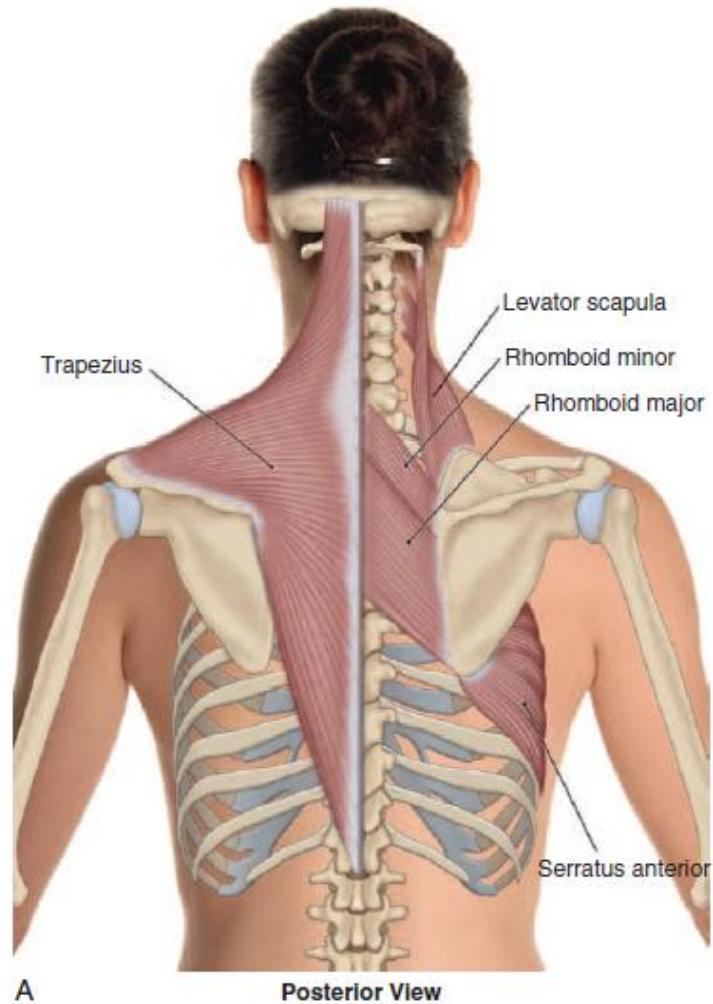


Lesson Four:

Muscles of Scapular Movement

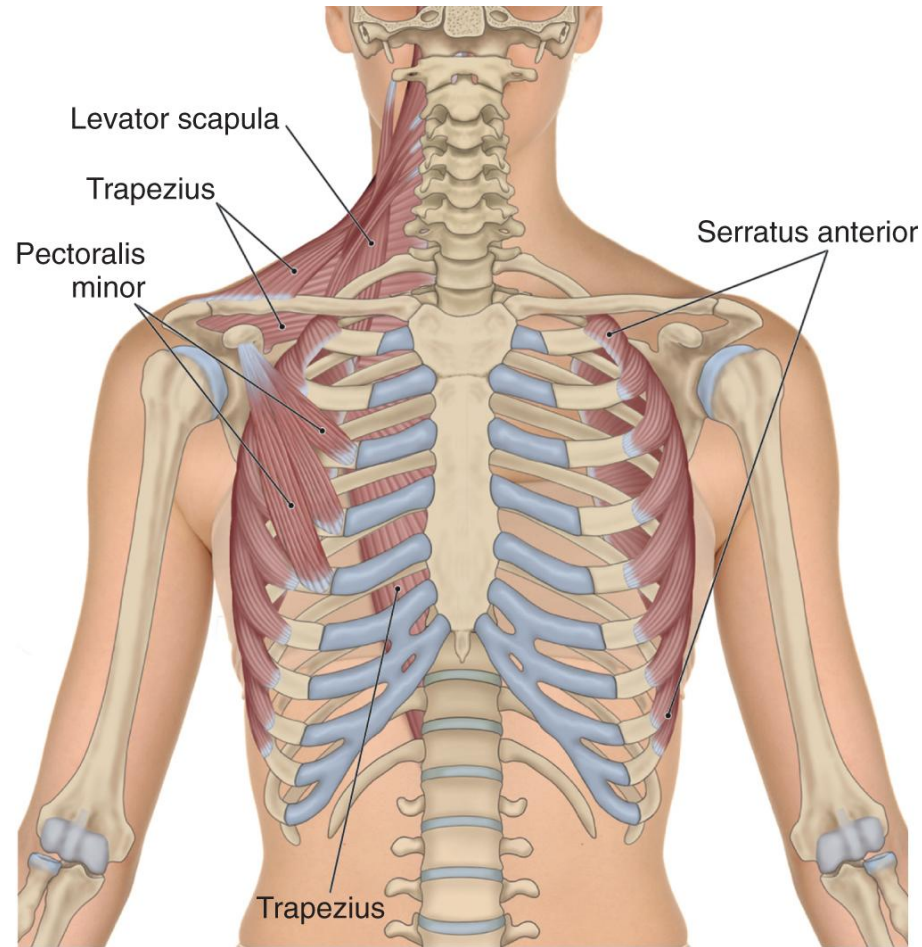
- Trapezius
- Levator scapulae
- Rhomboids
- Serratus anterior
- Pectoralis minor

Muscles of Scapular Movement



Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Muscles of Scapular Movement (Cont.)

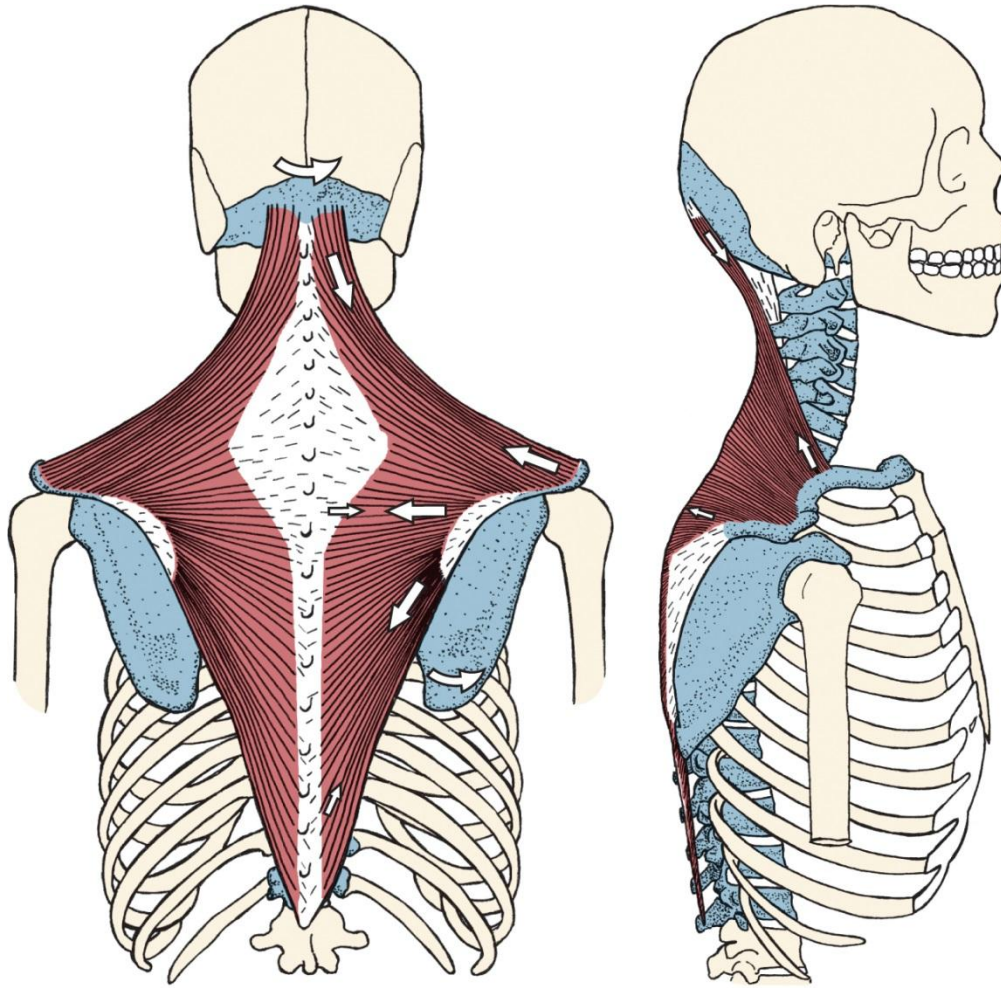


C

Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Trapezius



Posterior View

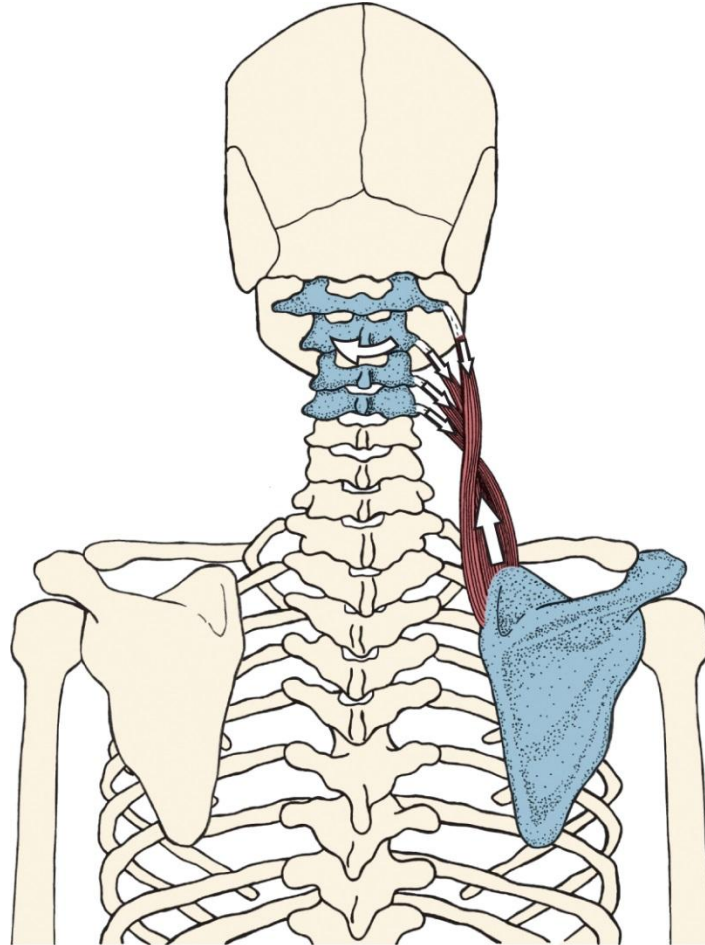
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Trapezius (Cont.)

- Origins: External occipital protuberance, superior nuchal line, nuchal ligament, and spinous processes of C7 through T12
- Insertions: Lateral third of clavicle, acromion process, and scapular spine
- Actions: Extends head and neck, elevates and upwardly rotates scapula, retracts and depresses the scapula, laterally flexes the neck, rotates the head, and stabilizes the scapula
- Nerves: Spinal accessory nerve and midcervical nerves

Levator Scapulae



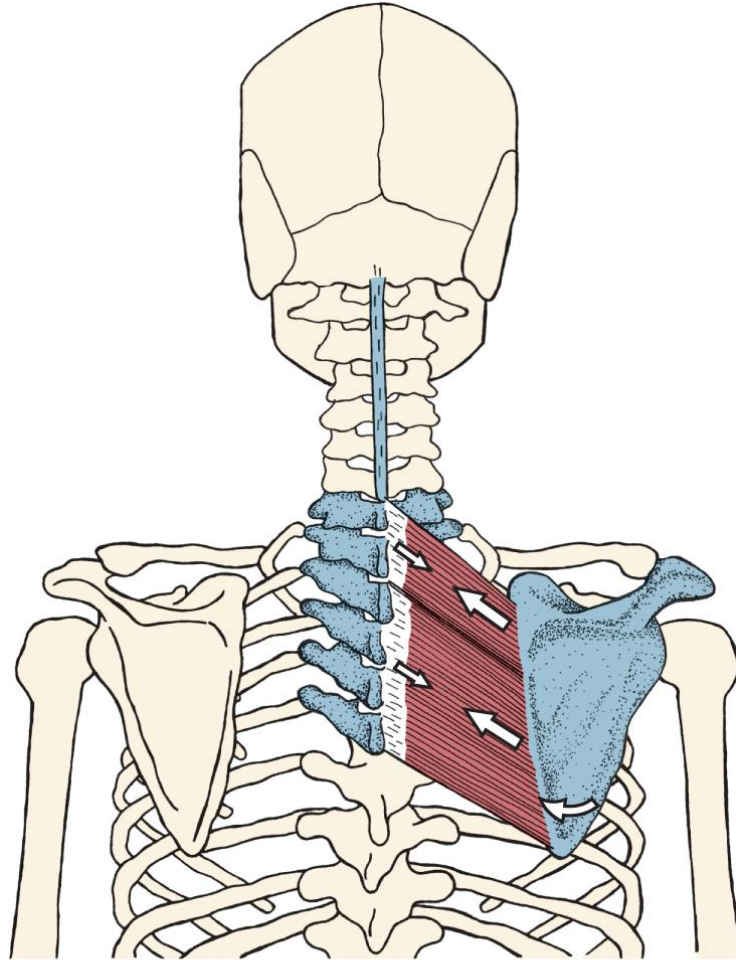
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Levator Scapulae (Cont.)

- Origins: Transverse processes of C1 through C4
- Insertion: Medial border of the scapula (from superior angle to root of spine)
- Actions: Elevates and downwardly rotates the scapula, laterally flexes the neck, and stabilizes the scapula
- Nerves: Dorsal scapular nerve and midcervical nerves

Rhomboids Major and Minor



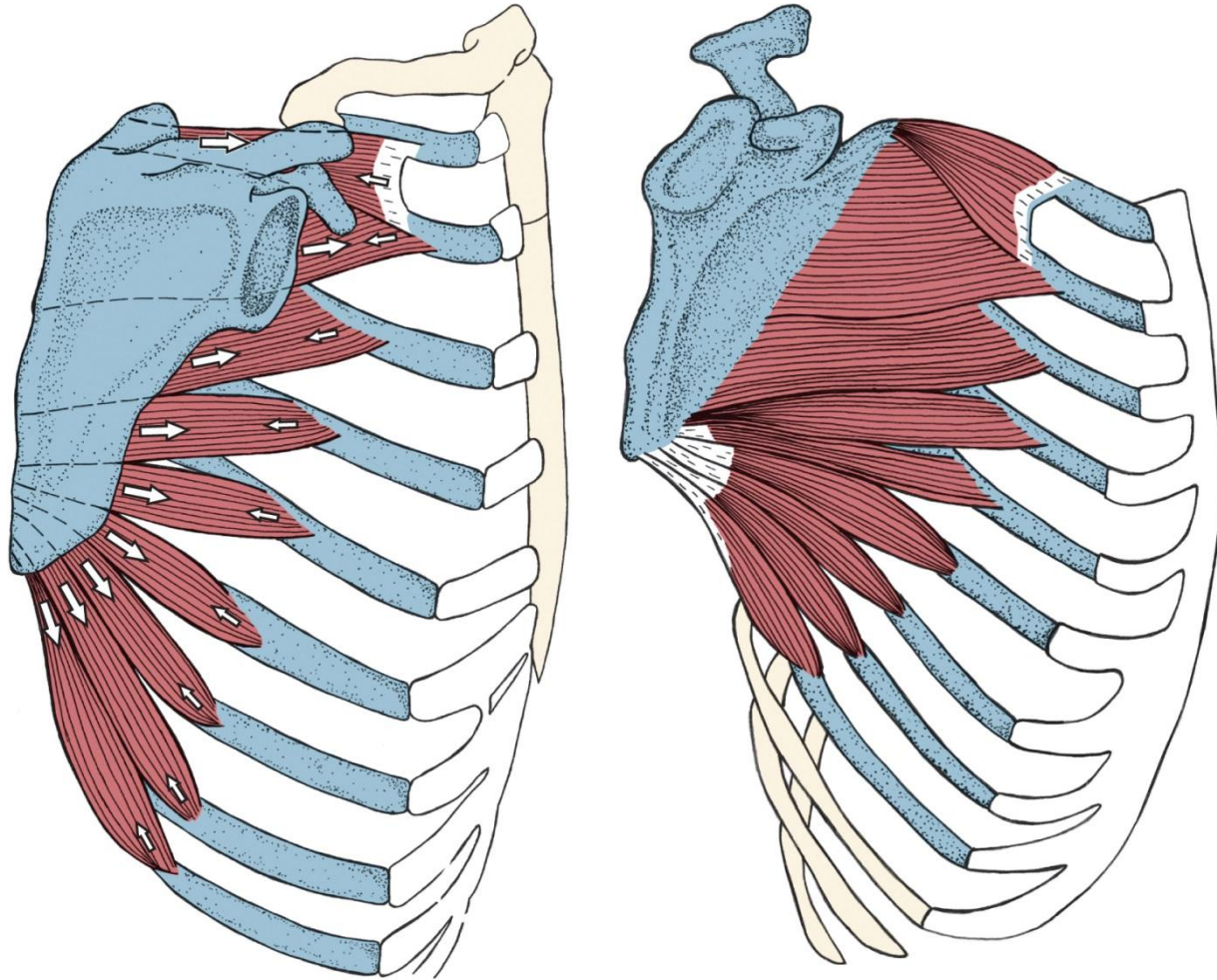
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Rhomboids Major and Minor (Cont.)

- Origins: Spinous processes C7 through T5
- Insertions: Medial border of scapula from superior to inferior angle
- Actions: Retracts, downwardly rotates, and stabilizes the scapula
- Nerve: Dorsal scapular nerve

Serratus Anterior



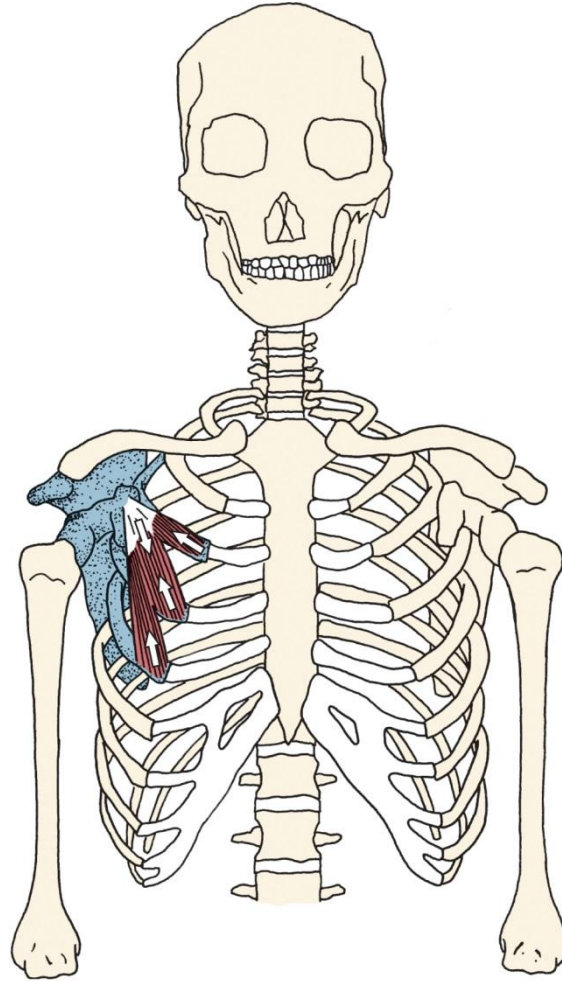
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Serratus Anterior (Cont.)

- Origins: Ribs 1 through 8 or 9
- Insertion: Anterior medial border of the scapula
- Actions: Protracts, upwardly rotates, and depresses the scapula
- Nerve: Long thoracic nerve

Pectoralis Minor



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Pectoralis Minor (Cont.)

- Origins: Ribs 3 through 5
- Insertion: Coracoid process of the scapula
- Actions: Depresses, protracts, and downwardly rotates the scapula; assists in forced inhalation
- Nerves: Medial pectoral nerves (C8 and T1)

Break & Lab Palpation

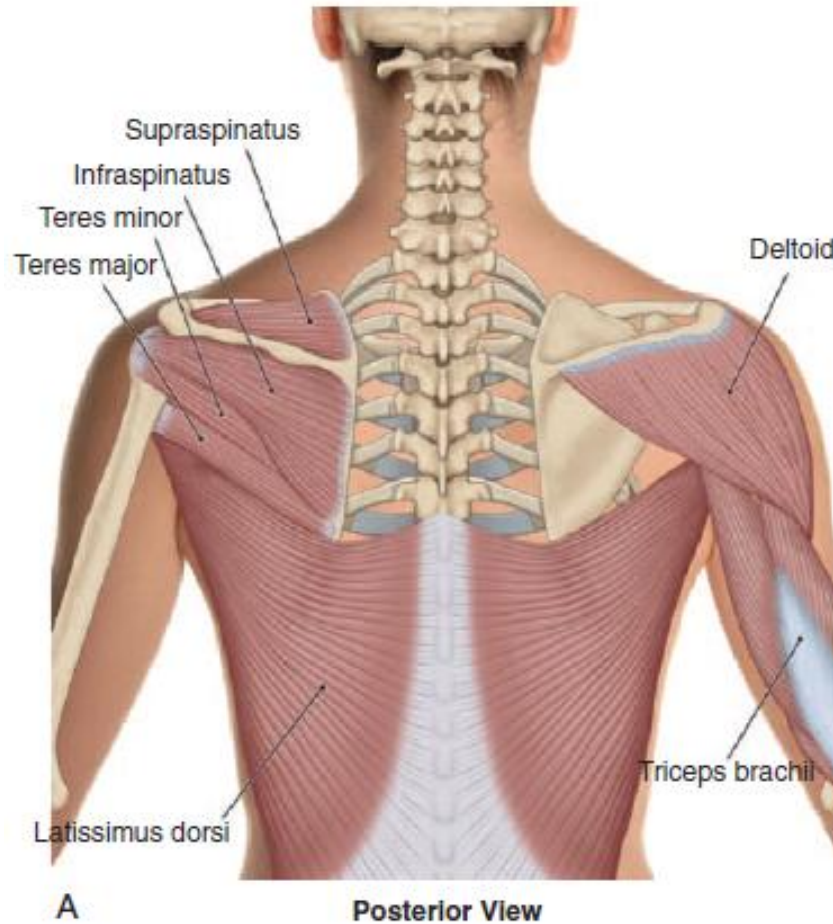
- Laboratory palpation of Muscles of Scapular Movement and pectoralis minor

Lesson Five:

Muscles of Shoulder Joint Movement

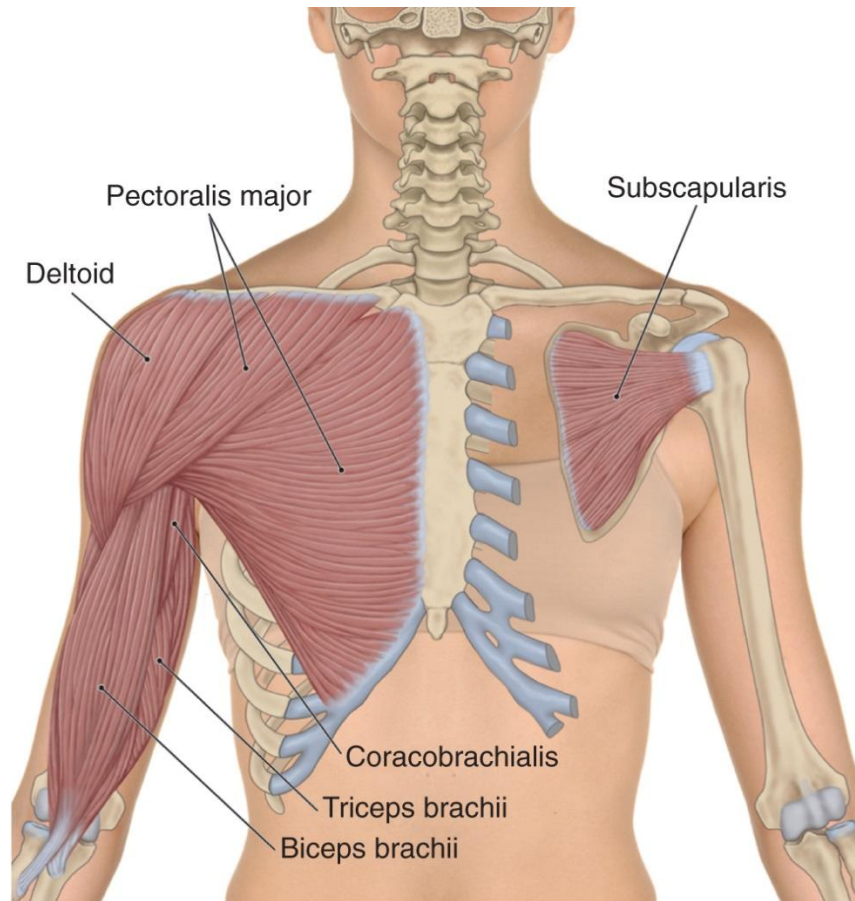
- Latissimus dorsi
- Teres major and minor
- Supraspinatus
- Infraspinatus
- Subscapularis
- Deltoid
- Pectoralis major
- Coracobrachialis
- Biceps and triceps brachii

Muscles of Shoulder Joint Movement (Cont.)



Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Muscles of Shoulder Joint Movement (Cont.)

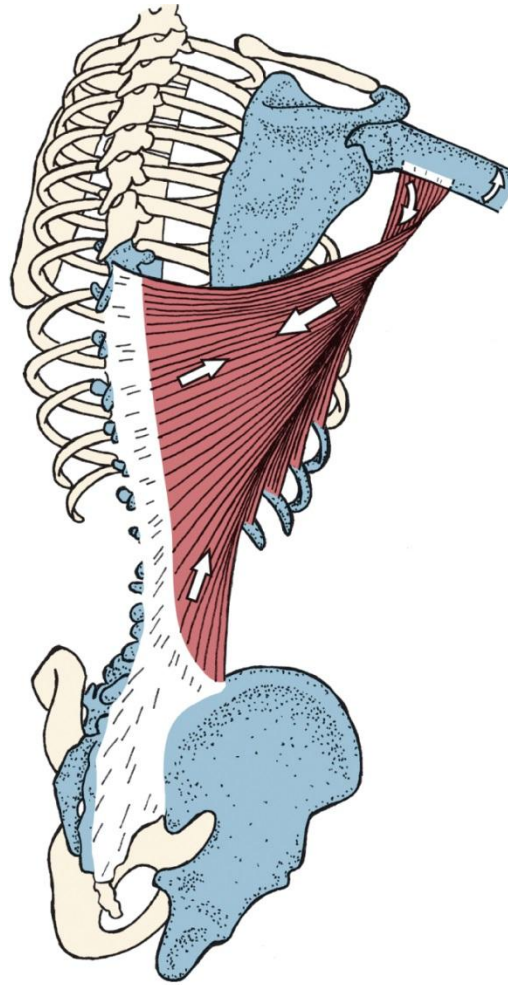


C

Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Latissimus Dorsi



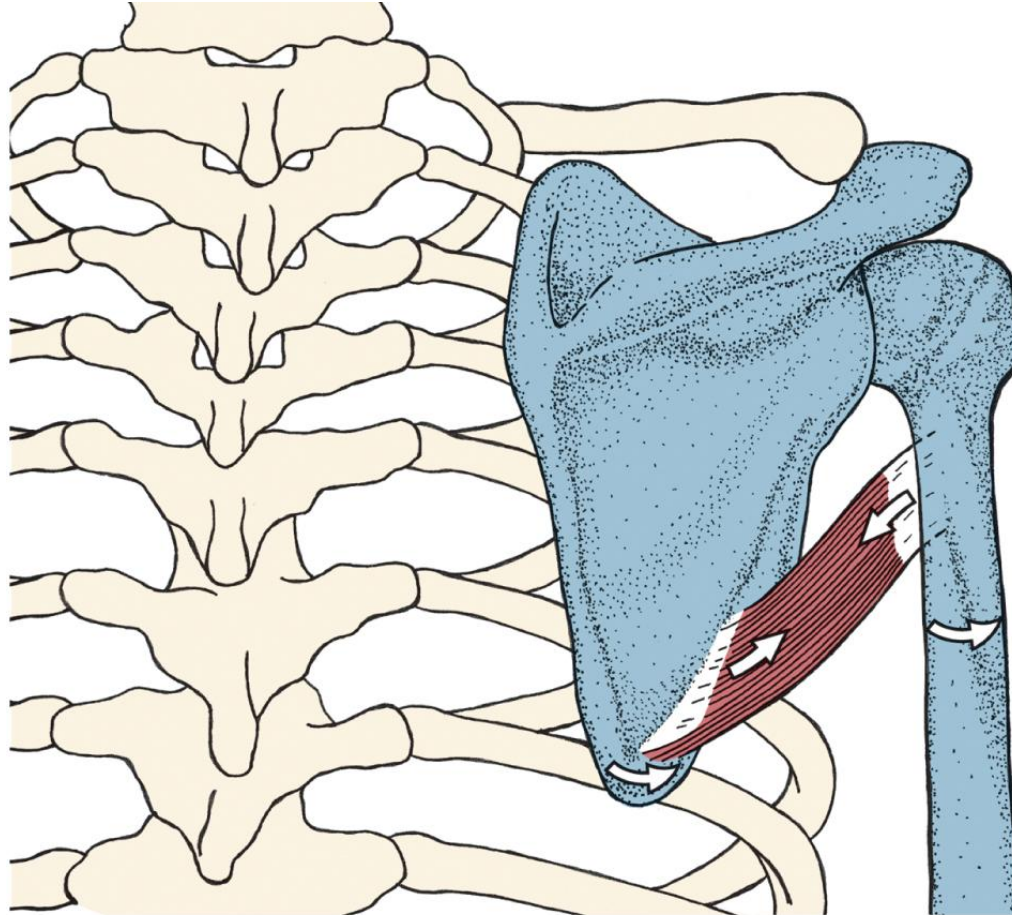
Posterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Latissimus Dorsi (Cont.)

- Origins: Spinous processes T7 through L5, ribs 9 through 12, posterior iliac crest, and posterior sacrum
- Insertion: Intertubercular groove of humerus
- Actions: Extends, medially rotates, and posteriorly adducts the humerus
- Nerve: Thoracodorsal nerve

Teres Major



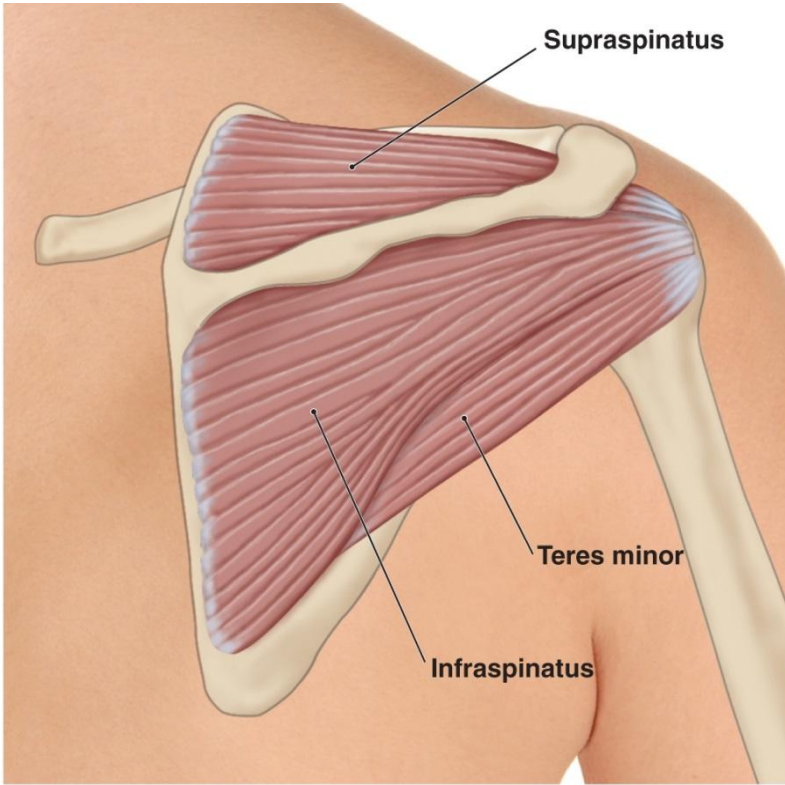
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

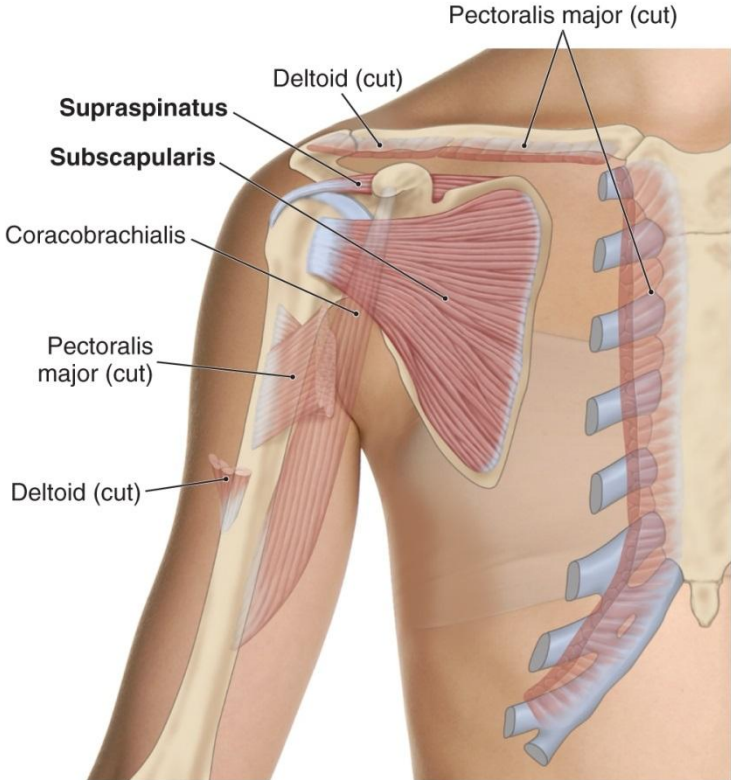
Teres Major (Cont.)

- Origin: Inferior third of the lateral border of the scapula
- Insertion: Intertubercular groove of the humerus
- Actions: Extends, medially rotates, and adducts the humerus
- Nerve: Lower subscapular nerve

Rotator Cuff



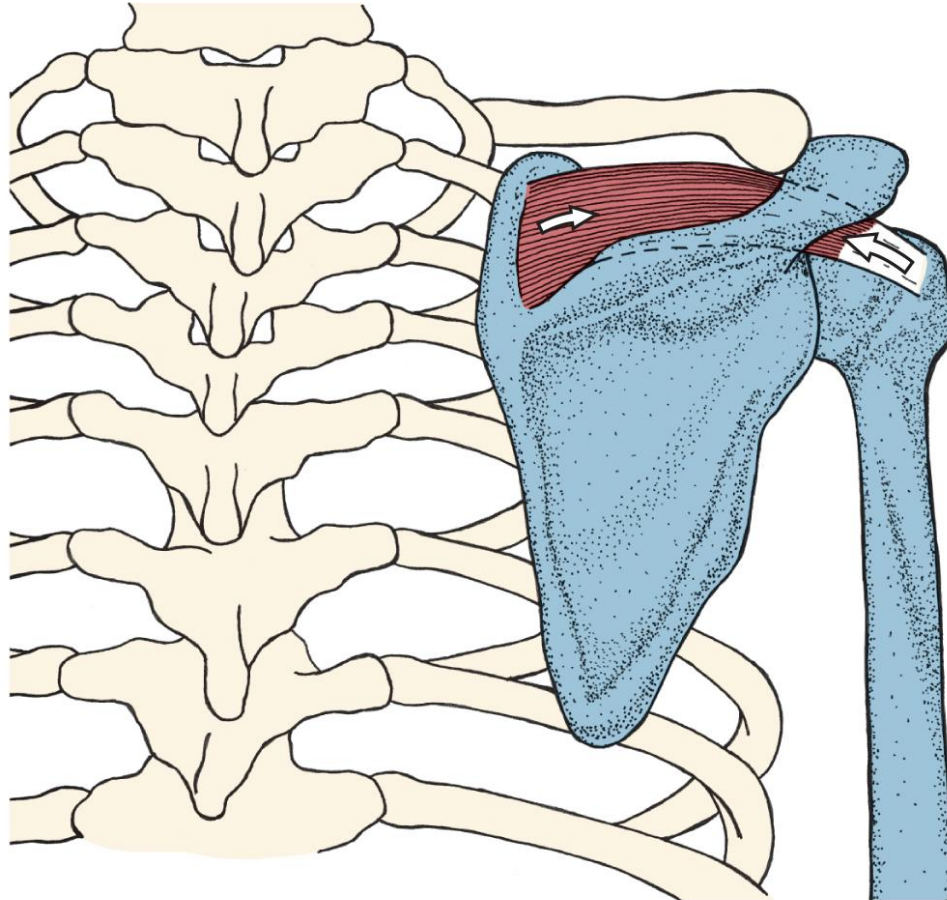
A Posterior View



B Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Supraspinatus



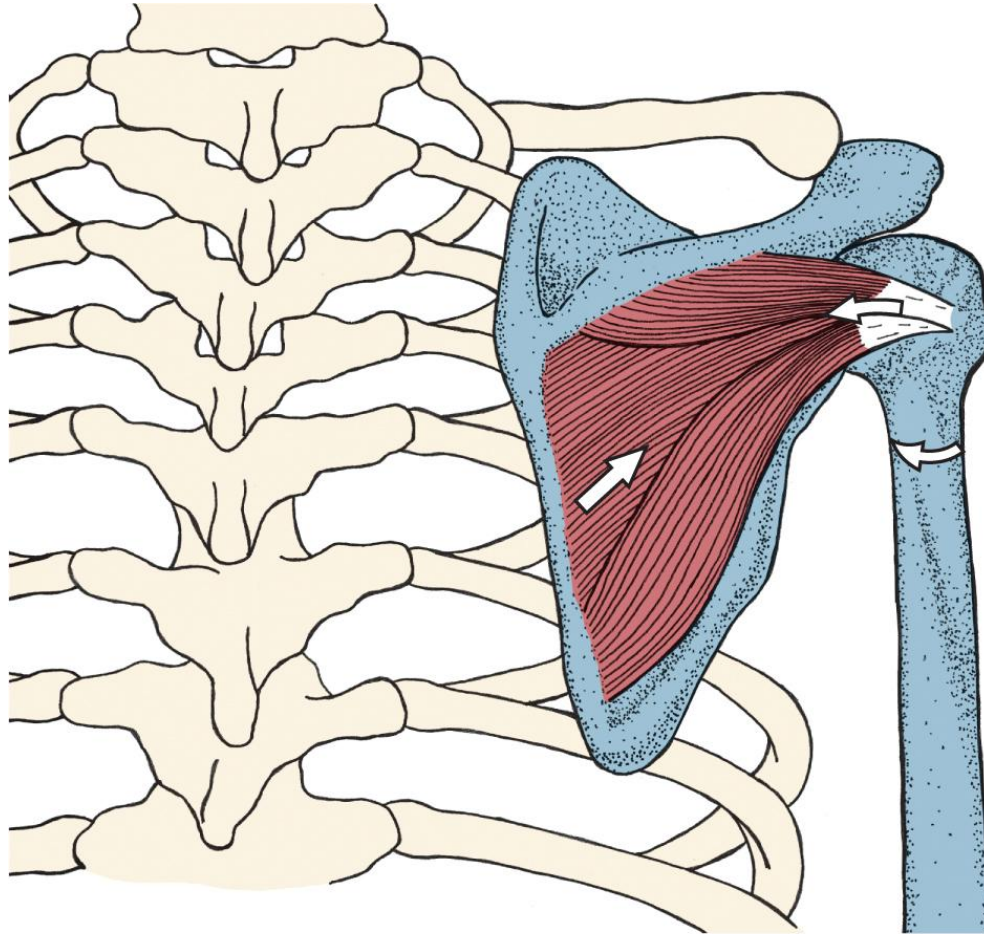
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Supraspinatus (Cont.)

- Origin: Supraspinous fossa of the scapula
- Insertion: Greater tubercle of humerus
- Action: Abducts the humerus
- Nerve: Suprascapular nerve

Infraspinatus



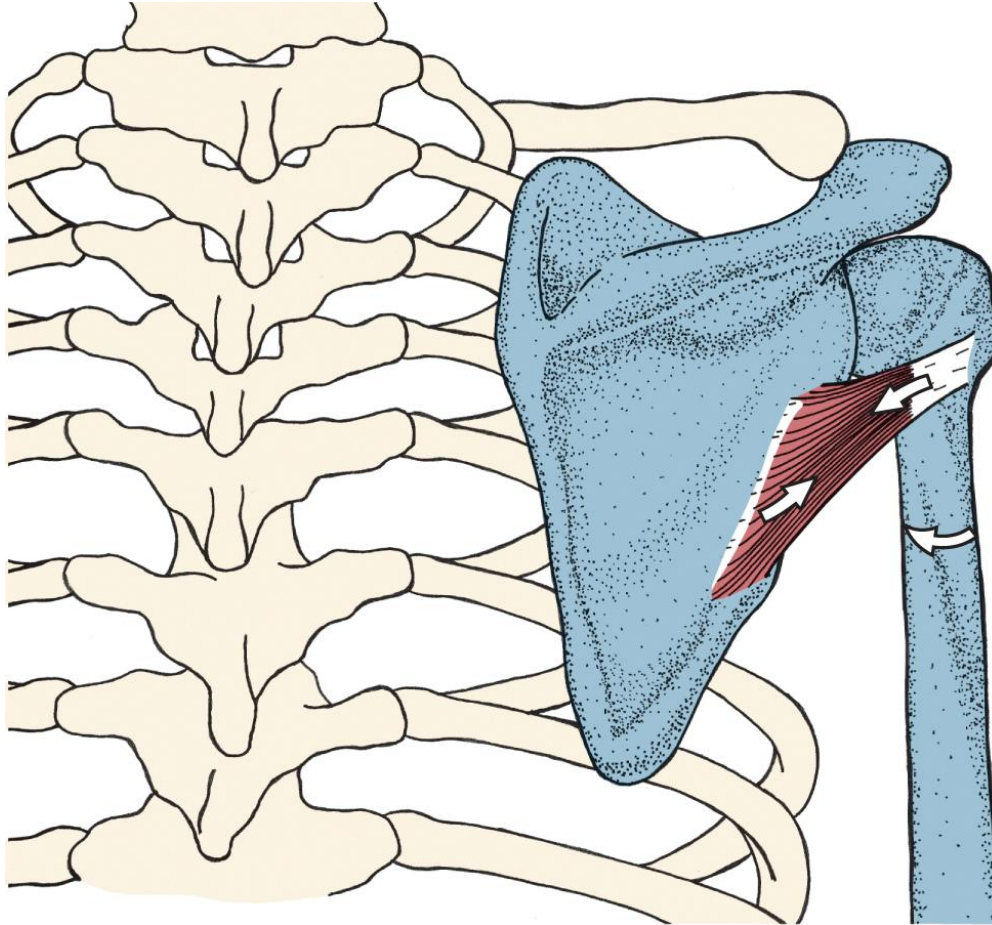
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Infraspinatus (Cont.)

- Origin: Infraspinous fossa of the scapula
- Insertion: Greater tubercle of humerus
- Action: Laterally rotates the humerus
- Nerve: Suprascapular nerve

Teres Minor



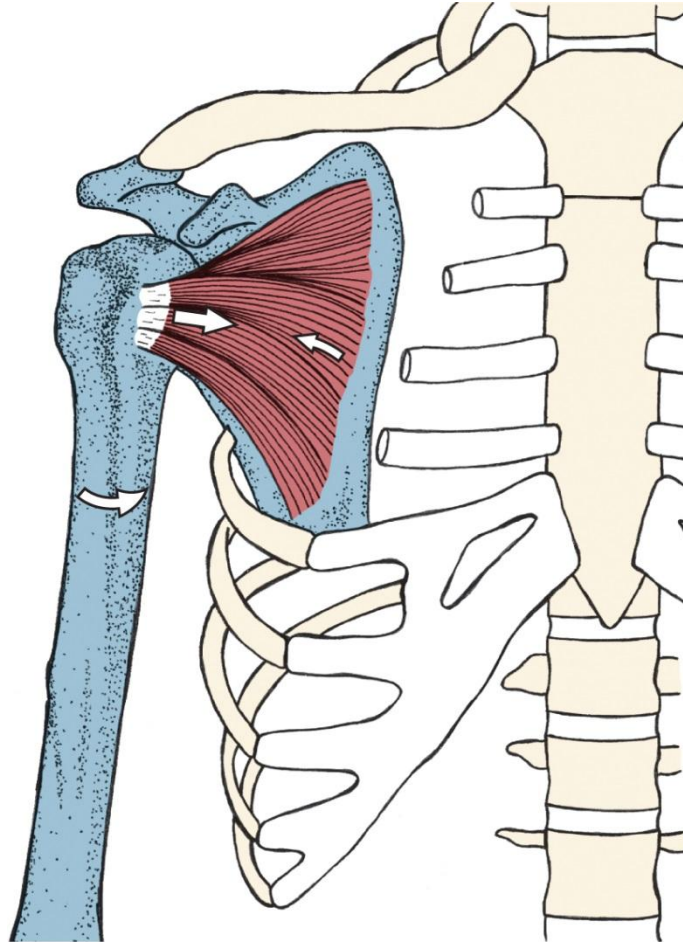
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Teres Minor (Cont.)

- Origin: Superior two thirds of lateral border of scapula
- Insertion: Greater tubercle of humerus
- Actions: Laterally rotates and adducts the humerus
- Nerve: Axillary nerve

Subscapularis



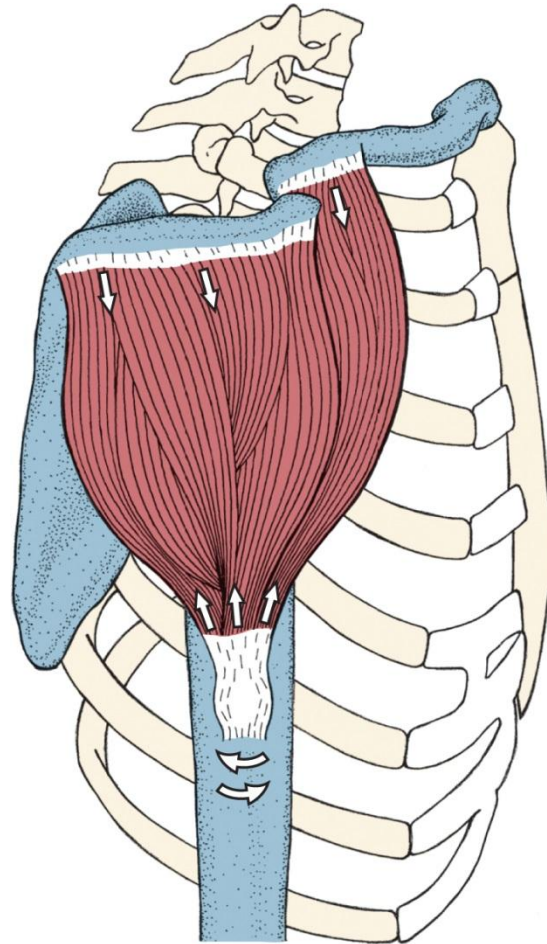
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Subscapularis (Cont.)

- Origin: Subscapular fossa of scapula
- Insertion: Lesser tubercle of humerus
- Action: Medially rotates the humerus
- Nerve: Subscapular nerve

Deltoid



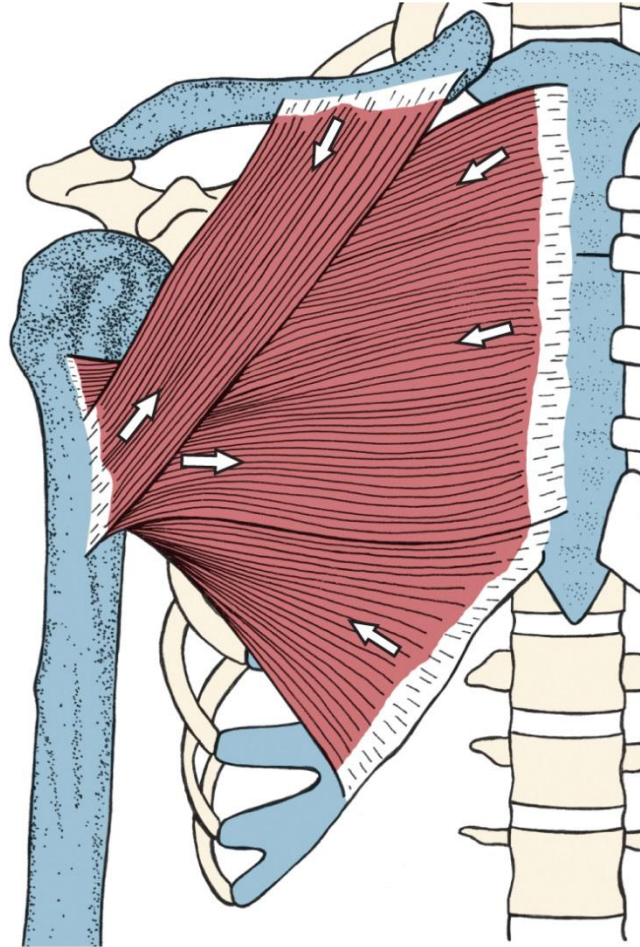
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Deltoid

- Origins: Lateral third of clavicle, acromion process, and scapular spine
- Insertion: Deltoid tuberosity
- Actions: Flexes, medially rotates, abducts, extends, and laterally rotates the humerus
- Nerve: Axillary nerve

Pectoralis Major



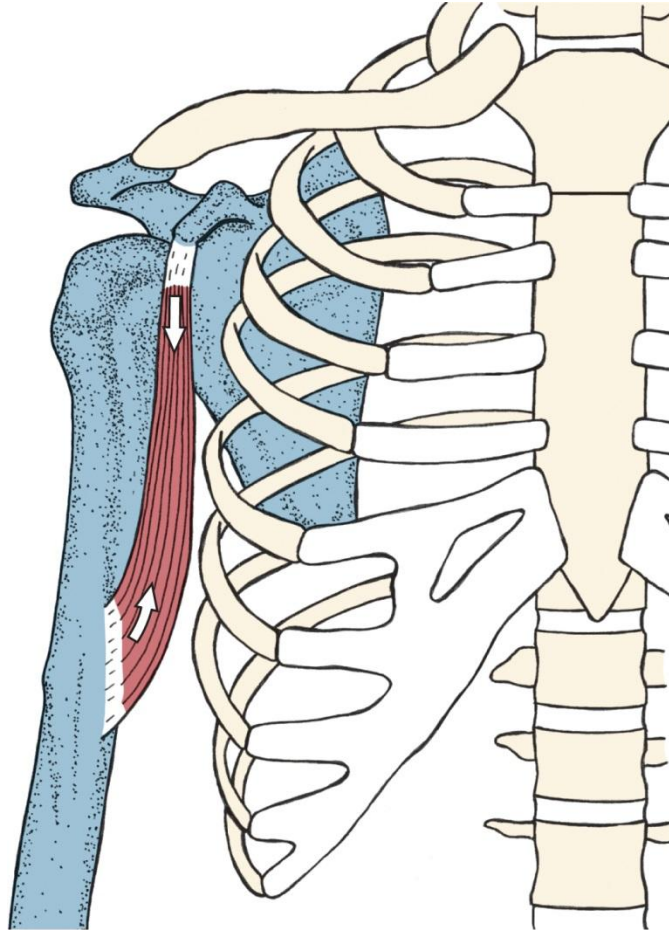
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Pectoralis Major (Cont.)

- Origins: Medial half of clavicle, edge of the sternal body, and ribs 1 through 7
- Insertion: Intertubercular groove of humerus
- Actions: Adducts, medially rotates, flexes, and extends the humerus
- Nerves: Medial and lateral pectoral nerves

Coracobrachialis



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Coracobrachialis (Cont.)

- Origin: Coracoid process of scapula
- Insertion: Medial humeral shaft
- Actions: Flexes and adducts the humerus
- Nerve: Musculocutaneous nerve

Break & Lab Palpation

- Laboratory palpation of Rotator Cuff, pectoralis major, and Coracobrachialis muscles.

Lesson 21.3

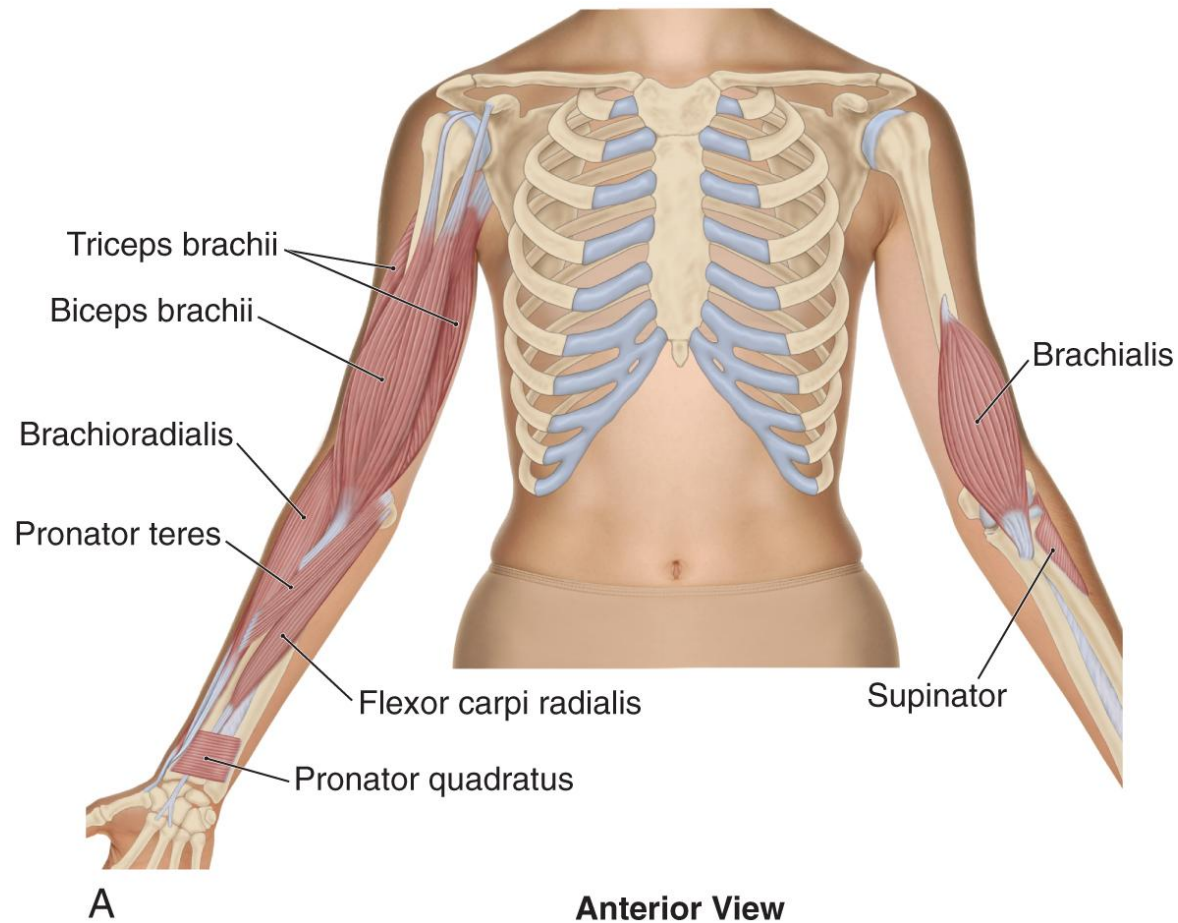
Muscles of the Elbow, Radioulnar Joint, Wrist, and Hand

3. Identify, palpate, and produce movements of muscles in Lesson Six (elbow and radioulnar joint movement) and Lesson Seven (wrist and hand movement).

Lesson 6: Muscles of Elbow and Radioulnar Joint Movement

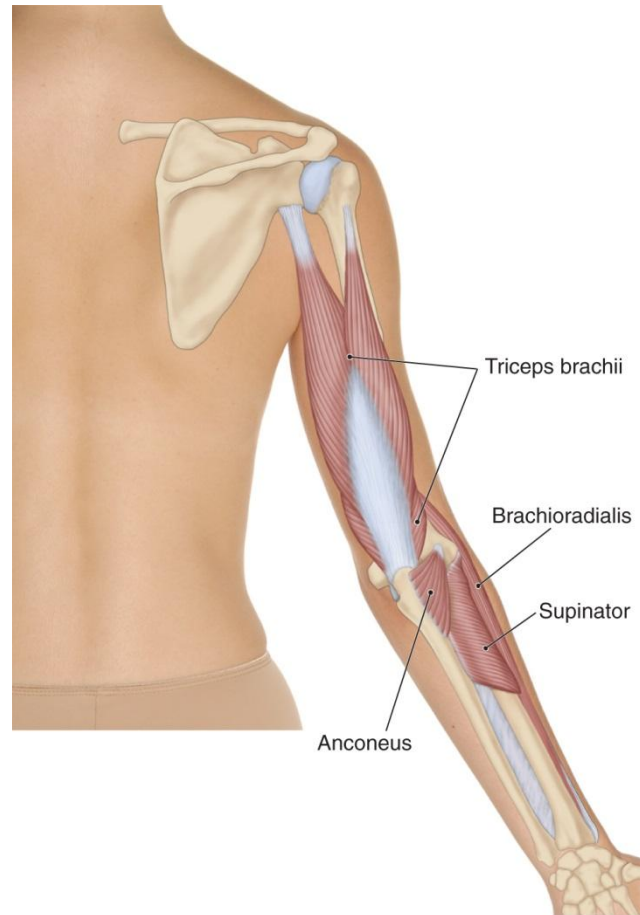
- Biceps brachii
- Brachialis
- Brachioradialis
- Triceps brachii
- Anconeus
- Pronator teres
- Pronator quadratus
- Supinator
- Flexor carpi radialis

Muscles of Elbow and Radioulnar Joint Movement



Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

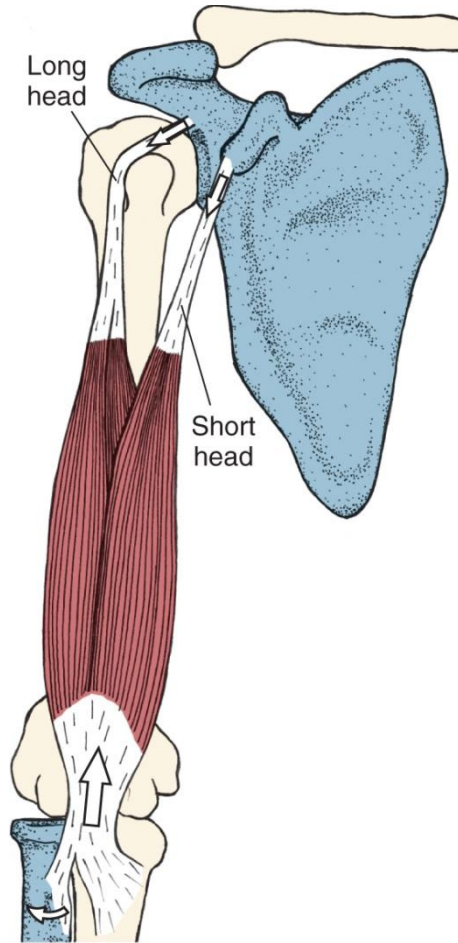
Muscles of Elbow and Radioulnar Joint Movement (Cont.)



C Posterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Biceps Brachii



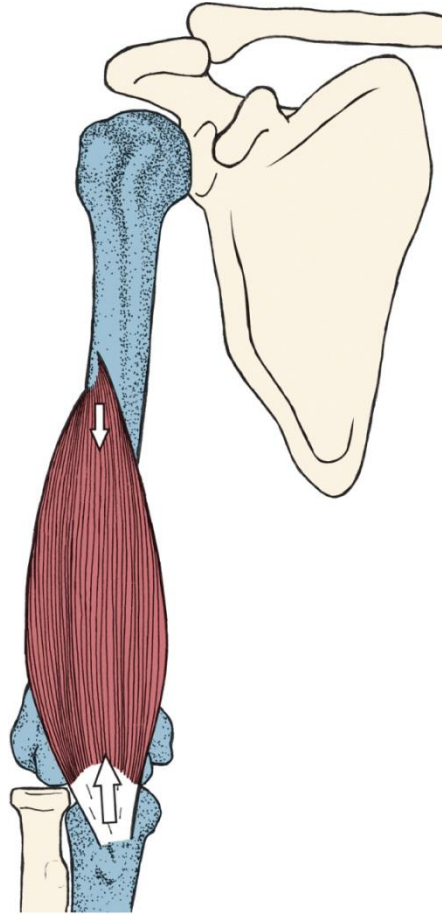
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Biceps Brachii (Cont.)

- Origins: Supraglenoid tubercle of scapula (long head) and coracoid process of scapula (short head)
- Insertions: Radial tuberosity and bicipital aponeurosis
- Actions: Flexes the elbow and humerus; supinates the forearm
- Nerve: Musculocutaneous nerve

Brachialis



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Brachialis (Cont.)

- Origin: Distal half of anterior humeral shaft
- Insertions: Ulnar tuberosity and coronoid process of ulna
- Action: Flexes the elbow
- Nerve: Musculocutaneous nerve

Brachioradialis



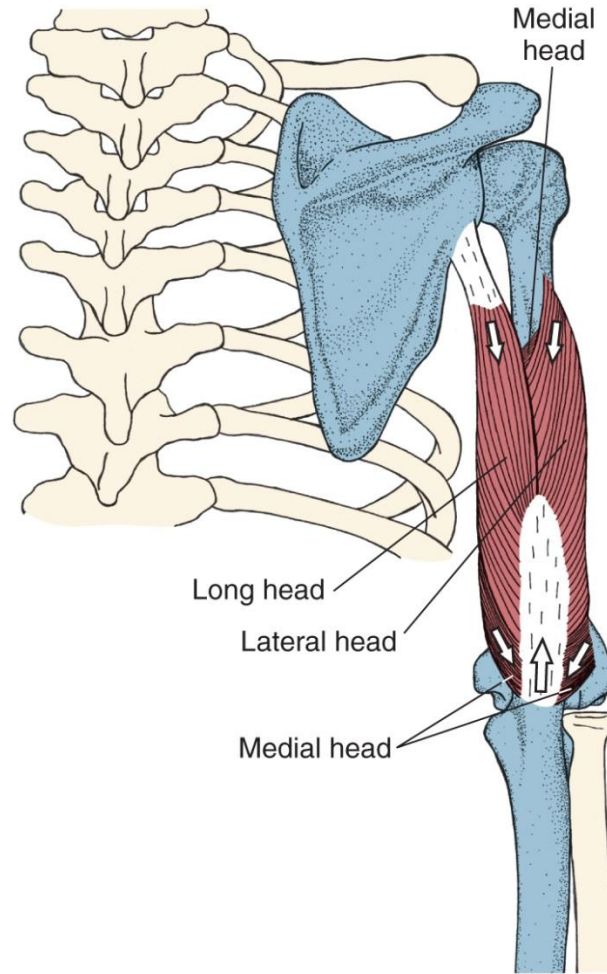
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Brachioradialis (Cont.)

- Origin: Lateral supracondylar ridge of humerus
- Insertion: Styloid process of radius
- Action: Flexes the elbow
- Nerve: Radial nerve

Triceps Brachii



Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

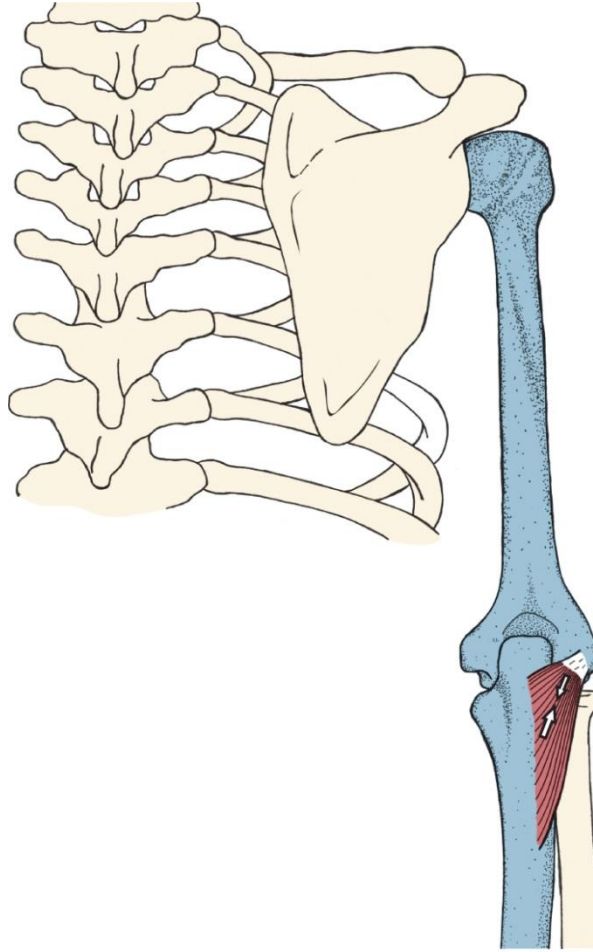
Triceps Brachii (Cont.)

- Origins: Infraglenoid tubercle of scapula, posterior proximal humeral shaft, and posterior distal humeral shaft
- Insertion: Olecranon process
- Actions: Extends the elbow; extends and adducts the humerus
- Nerve: Radial nerve

Lab Palpation & In class assignments

- Laboratory palpation of Muscles of Elbow and Radioulnar Joint Movement
- Complete the textbook matching activities related to muscles of the shoulder and brachial regions.
- Login to Evolve, select chapter 21, choose Body Spectrum, muscular, musculature posterior and anterior, and click on areas related to the lecture of today.

Anconeus



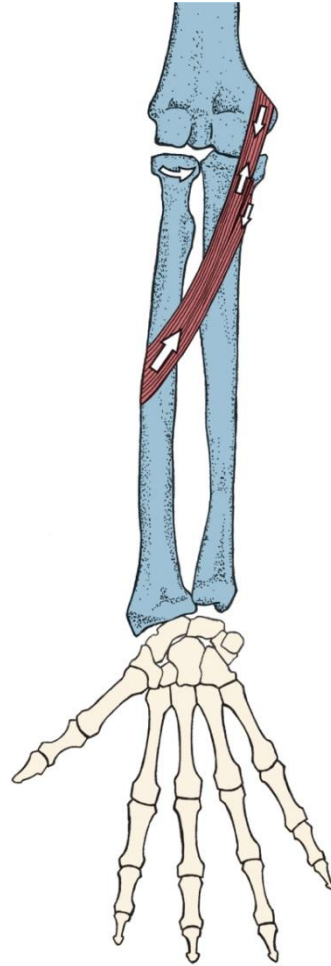
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Anconeus (Cont.)

- Origin: Lateral epicondyle of humerus
- Insertions: Olecranon process and superior eighth of posterior ulnar shaft
- Action: Extends the elbow
- Nerve: Radial nerve

Pronator Teres



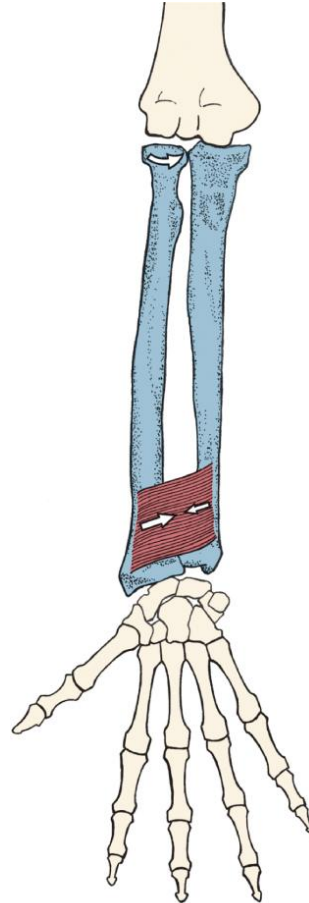
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Pronator Teres (Cont.)

- Origins: Medial epicondyle of humerus via the common flexor tendon and coronoid process of ulna
- Insertion: Midlateral radial shaft
- Actions: Pronates the forearm and flexes the elbow
- Nerve: Median nerve

Pronator Quadratus



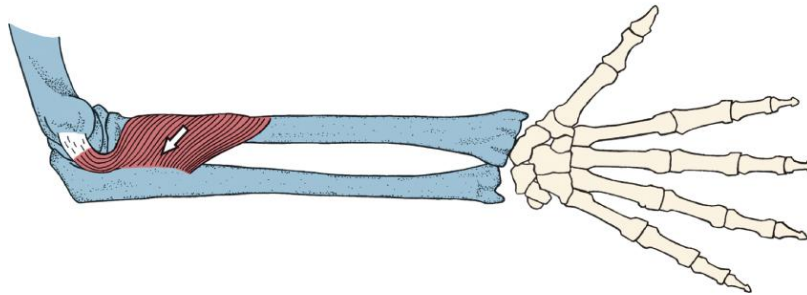
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

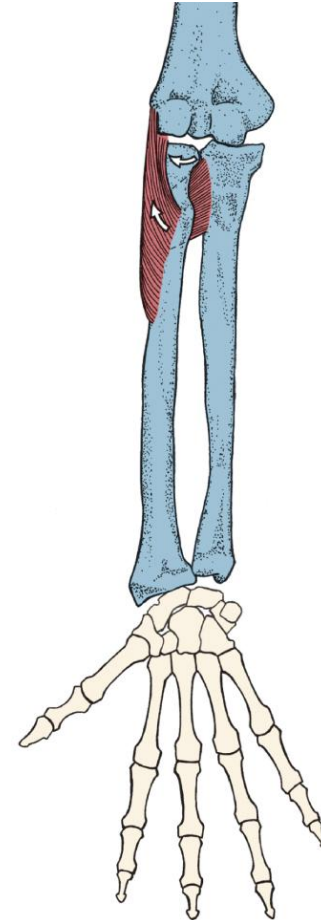
Pronator Quadratus (Cont.)

- Origin: Anterior distal quarter of ulnar shaft
- Insertion: Anterior distal quarter of radial shaft
- Action: Pronates the forearm
- Nerve: Median nerve

Supinator



Lateral View



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Supinator (Cont.)

- Origins: Lateral epicondyle of humerus, proximal eighth of ulnar shaft, radial collateral ligament, and annular ligament
- Insertion: Proximal lateral radial shaft
- Action: Supinates the forearm
- Nerve: Radial nerve

Lesson Seven: Muscles of Wrist and Hand Movement

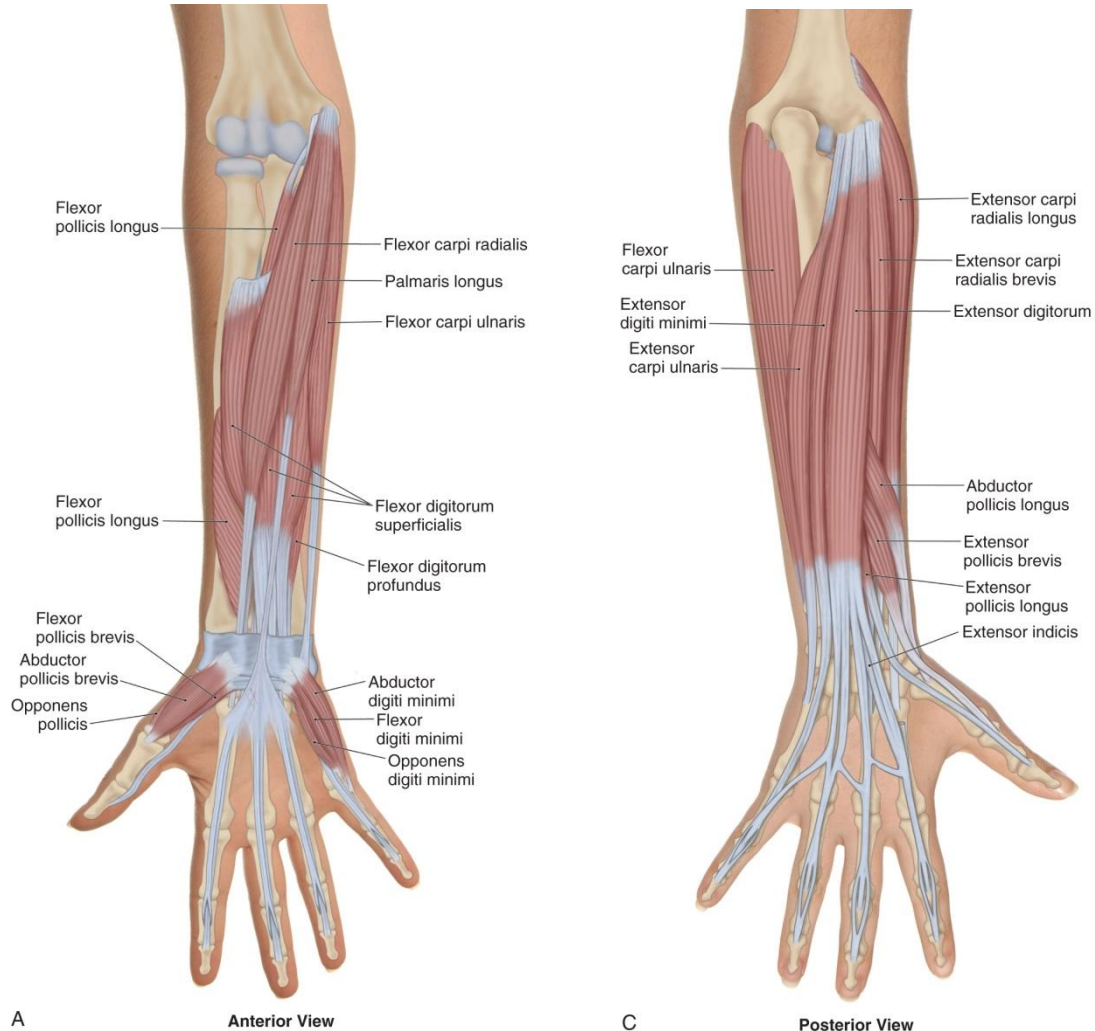
- Flexor carpi radialis and ulnaris
- Palmaris longus
- Flexor digitorum superficialis and profundus
- Extensor carpi radialis longus and brevis
- Extensor carpi ulnaris
- Extensor digitorum
- Extensor digiti minimi
- Extensor indicis

End of Week 2

Lesson Seven: Muscles of Wrist and Hand Movement (Cont.)

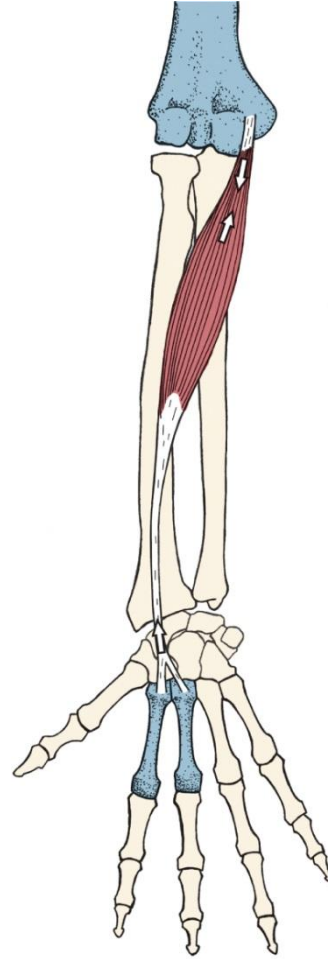
- Extensor pollicis longus and brevis
- Flexor pollicis longus and brevis
- Opponens pollicis
- Abductor pollicis longus and brevis
- Flexor digiti minimi
- Abductor digiti minimi
- Opponens digiti minimi

Muscles of Wrist and Hand Movement



A Anterior View C Posterior View
 Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Carpi Radialis



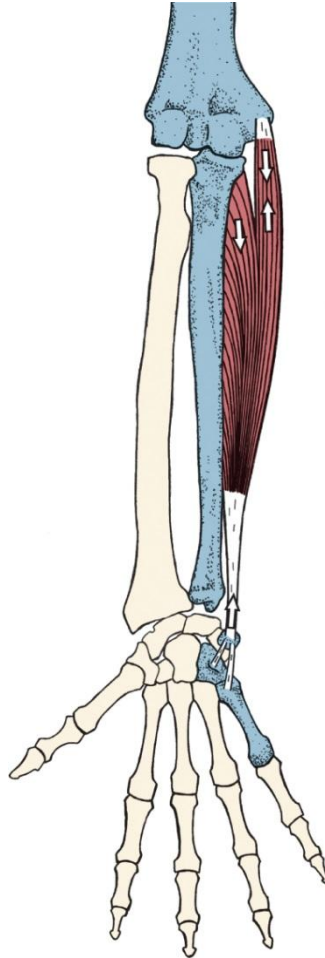
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Carpi Radialis (Cont.)

- Origin: Medial epicondyle of humerus via the common flexor tendon
- Insertions: Bases of metacarpals II and III
- Actions: Flexes and abducts the wrist; flexes the elbow
- Nerve: Median nerve

Flexor Carpi Ulnaris



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Carpi Ulnaris (Cont.)

- Origins: Medial epicondyle of humerus via the common flexor tendon, medial olecranon, and proximal two thirds of the ulna
- Insertions: Base of metacarpal V, pisiform, and hook of hamate
- Actions: Flexes and adducts the wrist
- Nerve: Ulnar nerve

Palmaris Longus



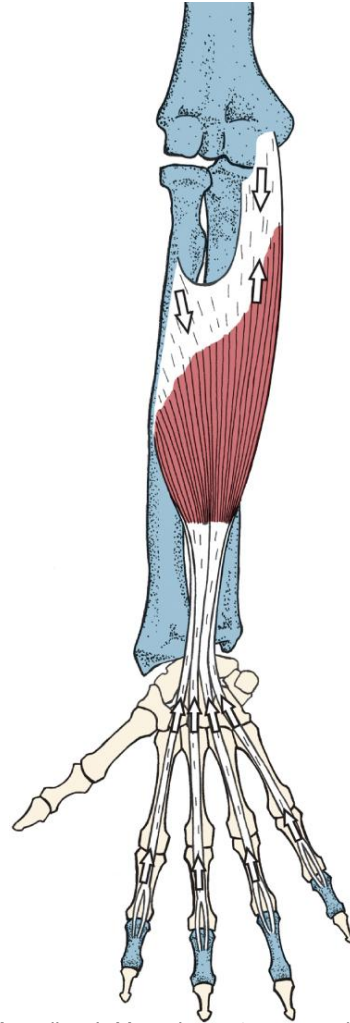
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Palmaris Longus (Cont.)

- Origin: Medial epicondyle of humerus via the common flexor tendon
- Insertion: Palmar aponeurosis
- Actions: Flexes the wrist and cups the palm
- Nerve: Median nerve

Flexor Digitorum Superficialis

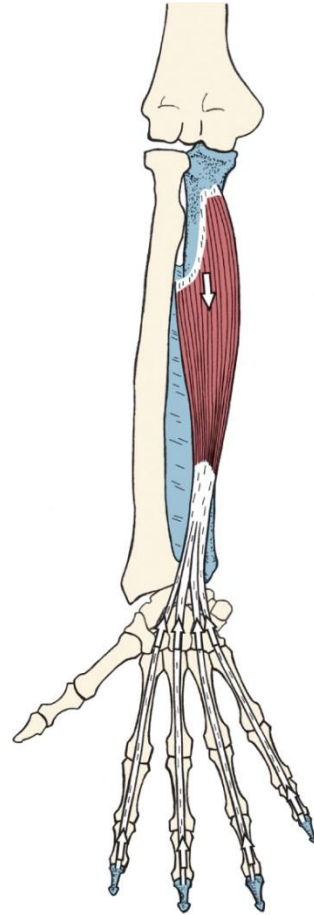


From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Digitorum Superficialis (Cont.)

- Origins: Medial epicondyle of humerus via the common flexor tendon, anterior proximal radial shaft, and coronoid process of ulna
- Insertions: Middle phalanges of digits II through V
- Actions: Flexes the wrist and the fingers at the PIP and MCP joints
- Nerve: Median nerve

Flexor Digitorum Profundus



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Digitorum Profundus (Cont.)

- Origins: Proximal three fourths of the anterior ulnar shaft and interosseus membrane
- Insertions: Distal phalanges of digits II through V
- Actions: Flexes the wrist and flexes the fingers at the DIP, PIP, and MCP joints
- Nerves: Ulnar and median nerve

Extensor Carpi Radialis Longus



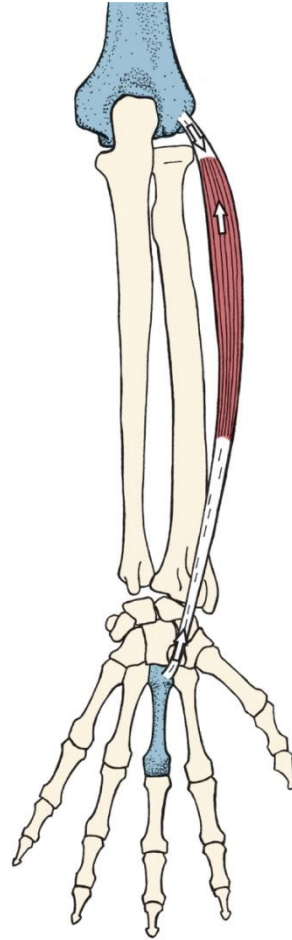
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Carpi Radialis Longus (Cont.)

- Origin: Lateral supracondylar ridge of humerus
- Insertion: Posterior base of metacarpal II
- Actions: Extends and abducts the wrist
- Nerve: Radial nerve

Extensor Carpi Radialis Brevis



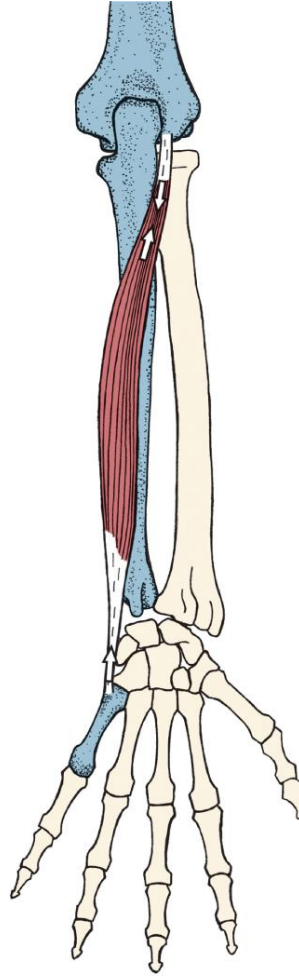
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Carpi Radialis Brevis (Cont.)

- Origin: Lateral epicondyle of humerus via the common extensor tendon
- Insertion: Posterior base of metacarpal III
- Actions: Extends and abducts the wrist
- Nerve: Radial nerve

Extensor Carpi Ulnaris



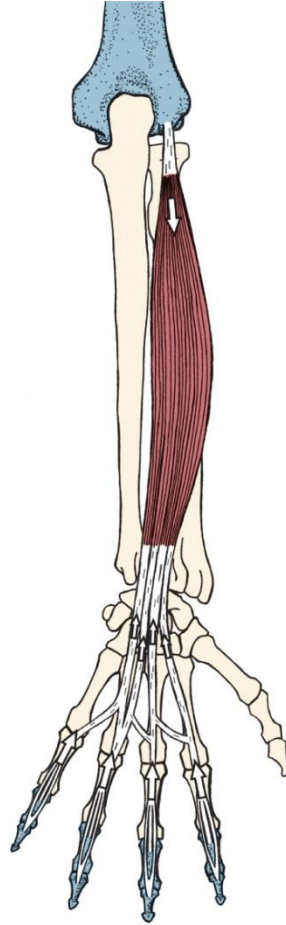
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Carpi Ulnaris (Cont.)

- Origin: Lateral epicondyle of humerus via the common extensor tendon
- Insertion: Metacarpal V
- Actions: Extends and adducts the wrist
- Nerve: Radial nerve

Extensor Digitorum



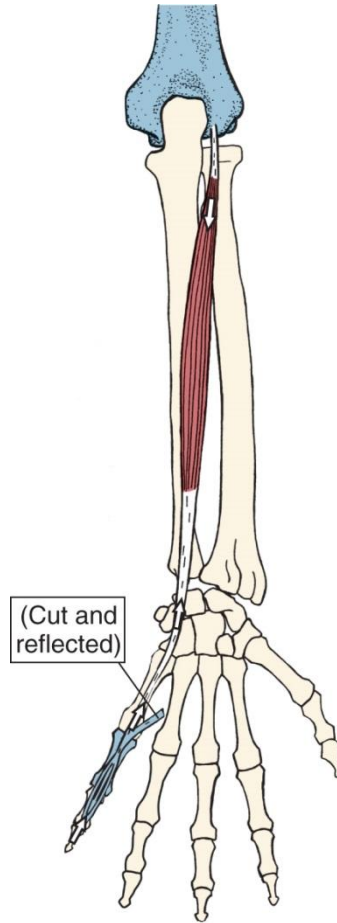
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Digitorum (Cont.)

- Origin: Lateral epicondyle of humerus via the common extensor tendon
- Insertions: Middle and distal phalanges of digits II through V
- Actions: Extends the wrist and extends the fingers at the DIP, PIP, and MCP joints
- Nerve: Radial nerve

Extensor Digiti Minimi



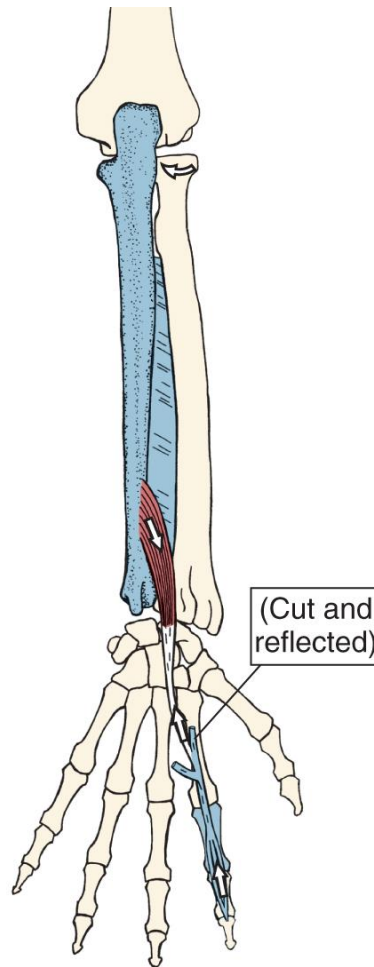
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Digiti Minimi (Cont.)

- Origin: Lateral epicondyle of humerus via the common extensor tendon
- Insertions: Posterior middle and distal phalanges of digit V via tendon of extensor digitorum
- Action: Extends the little finger (digit V)
- Nerve: Radial nerve

Extensor Indicis



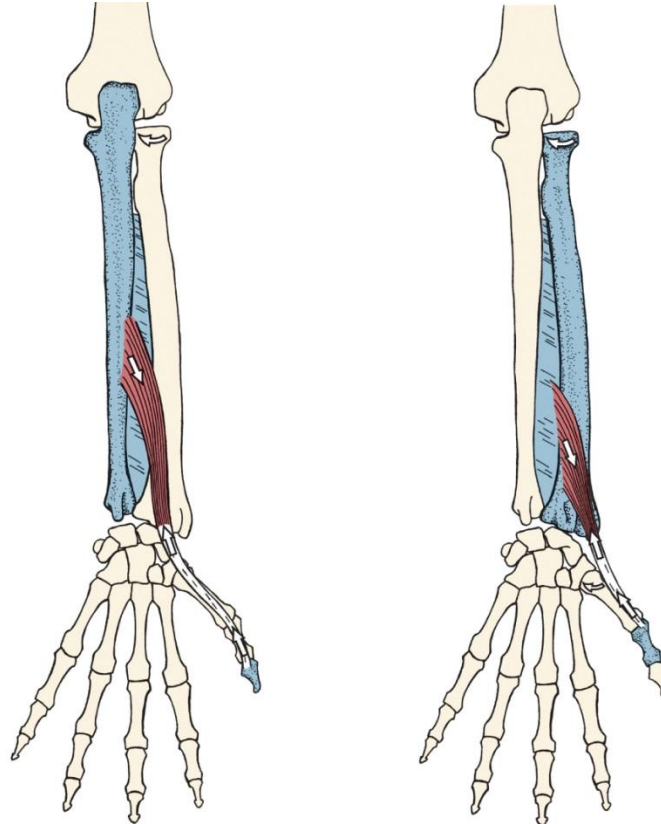
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Indicis (Cont.)

- Origins: Posterior ulnar shaft and interosseus membrane
- Insertions: Middle and distal phalanges of index finger (digit II)
- Action: Extends the index finger
- Nerve: Radial nerve

Extensor Pollicis Longus and Brevis



**Extensor Pollicis Longus
Posterior View**

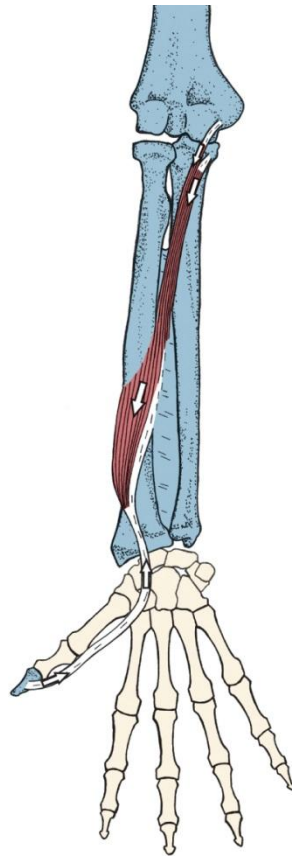
**Extensor Pollicis Brevis
Posterior View**

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

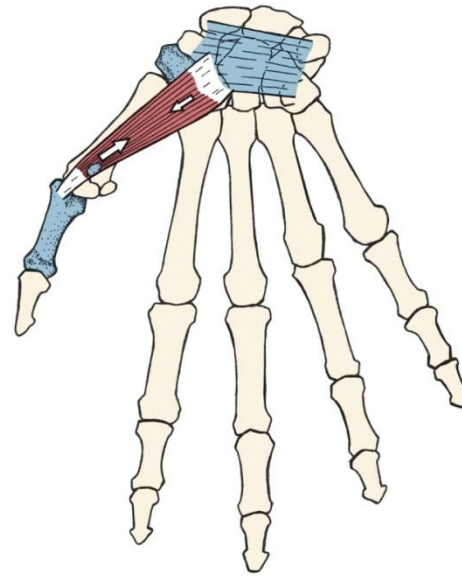
Extensor Pollicis Longus and Brevis (Cont.)

- Origins: Posterior ulnar shaft (longus), posterior radial shaft (brevis), and interosseous membrane
- Insertions: Posterior distal phalanx of the thumb (longus) and posterolateral proximal phalanx of the thumb (brevis)
- Action: Extends the thumb (digit I)
- Nerve: Radial nerve

Flexor Pollicis Longus and Brevis



**Flexor Pollicis Longus
Anterior View**



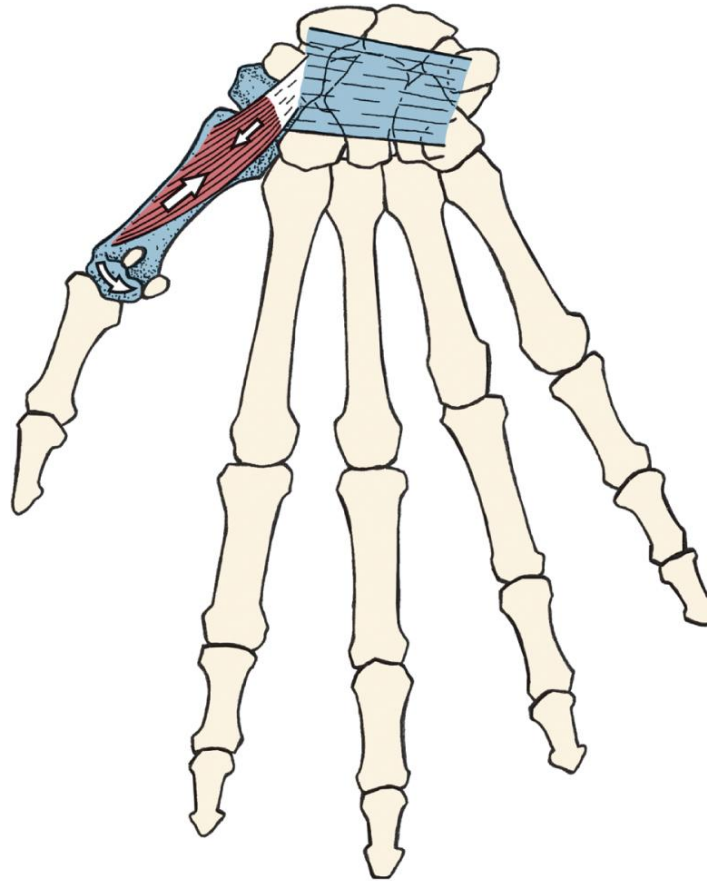
**Flexor Pollicis Brevis
Anterior View**

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Pollicis Longus and Brevis (Cont.)

- Origins: Anterior radial shaft (longus), interosseous membrane, trapezium, transverse carpal ligament (brevis)
- Insertions: Anterior distal phalanx of the thumb (longus) and proximal phalanx of the thumb (brevis)
- Action: Flexes the thumb
- Nerves: Median nerve (longus) and median and ulnar nerves (brevis)

Opponens Pollicis



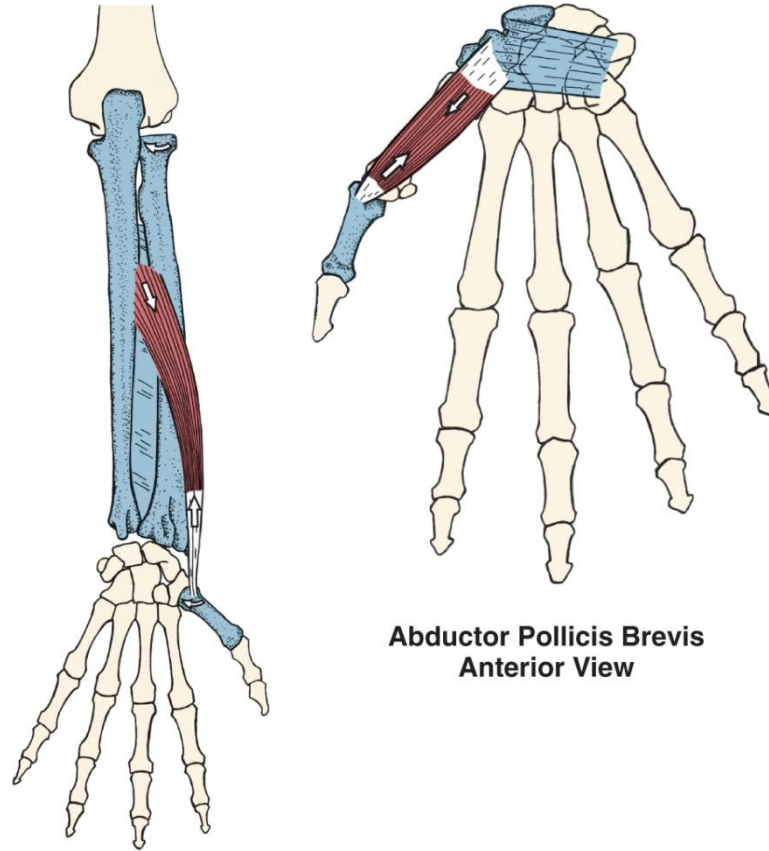
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Opponens Pollicis (Cont.)

- Origins: Trapezium and transverse carpal ligament
- Insertion: Anterior metacarpal I
- Actions: Adducts and flexes the thumb
- Nerve: Median nerve

Abductor Pollicis Longus and Brevis



**Abductor Pollicis Longus
Posterior View**

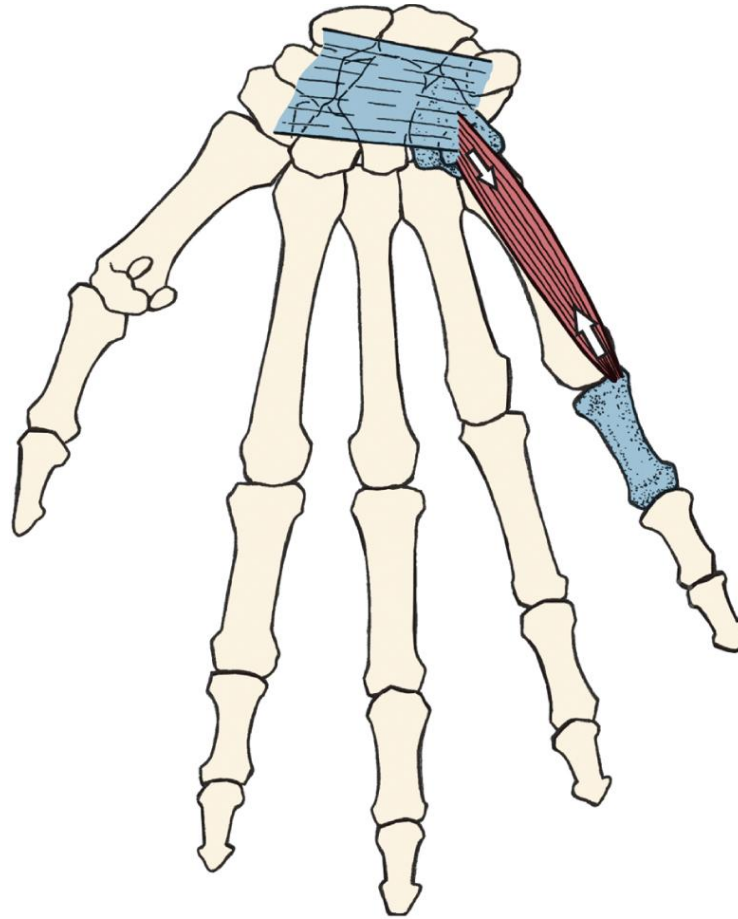
**Abductor Pollicis Brevis
Anterior View**

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Abductor Pollicis Longus and Brevis (Cont.)

- Origins: Posterior ulnar shaft, posterior ulnar and radial shaft, interosseus membrane (longus), trapezium, scaphoid, and transverse carpal ligament (brevis)
- Insertions: Lateral metacarpal I (longus) and proximal phalanx of the thumb (brevis)
- Action: Abducts the thumb (longus and brevis)
- Nerves: Radial nerve (longus) and median nerve (brevis)

Flexor Digiti Minimi



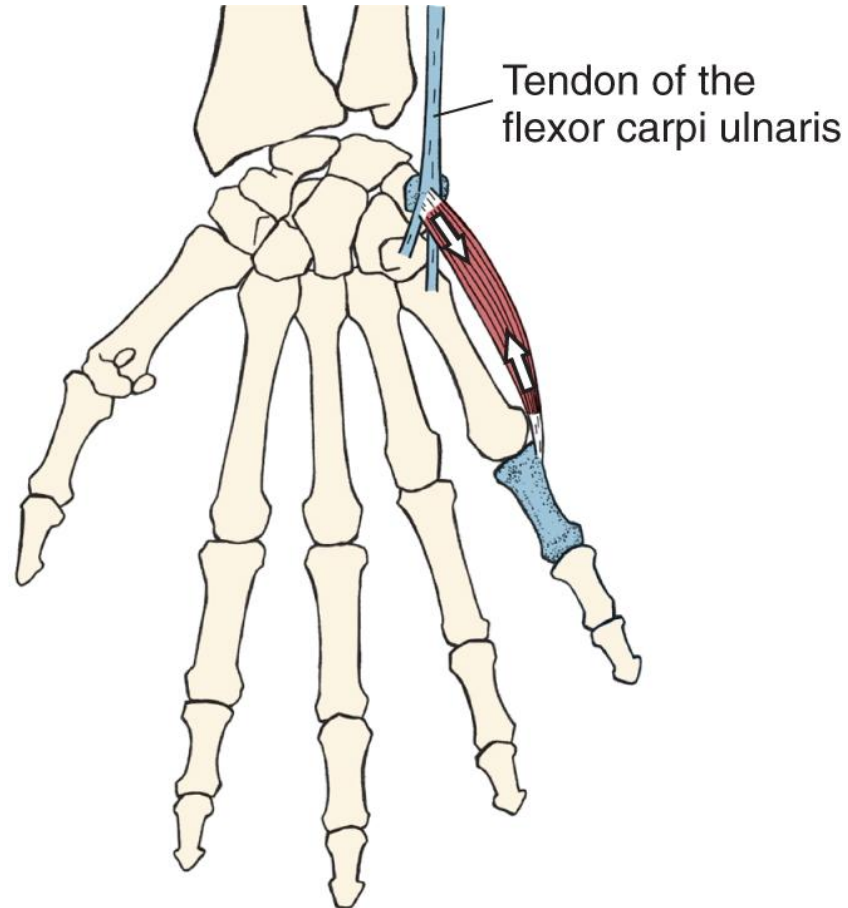
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Digiti Minimi (Cont.)

- Origins: Hook of hamate and transverse carpal ligament
- Insertion: Proximal phalanx of digit V
- Action: Flexes digit V
- Nerve: Ulnar nerve

Abductor Digiti Minimi



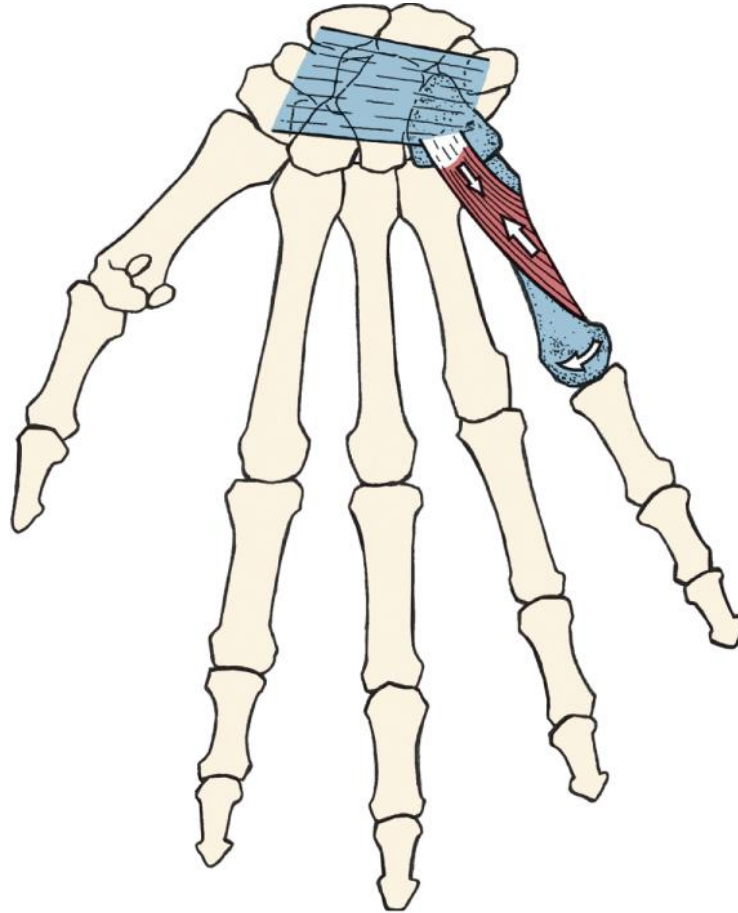
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Abductor Digiti Minimi (Cont.)

- Origins: Pisiform and tendon of flexor carpi ulnaris
- Insertion: Proximal phalanx of digit V (little finger)
- Action: Abducts digit V
- Nerve: Ulnar nerve

Opponens Digiti Minimi



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Opponens Digiti Minimi (Cont.)

- Origins: Hamate and transverse carpal ligament
- Insertion: Metacarpal V
- Action: Adducts the digit V
- Nerve: Ulnar nerve

Lesson 21.4

Muscles of the Hip, Knee, Ankle, and Foot

4. Identify, palpate, and produce movements of muscles in Lesson Eight (hip and knee movement) and Lesson Nine (ankle and foot movement).

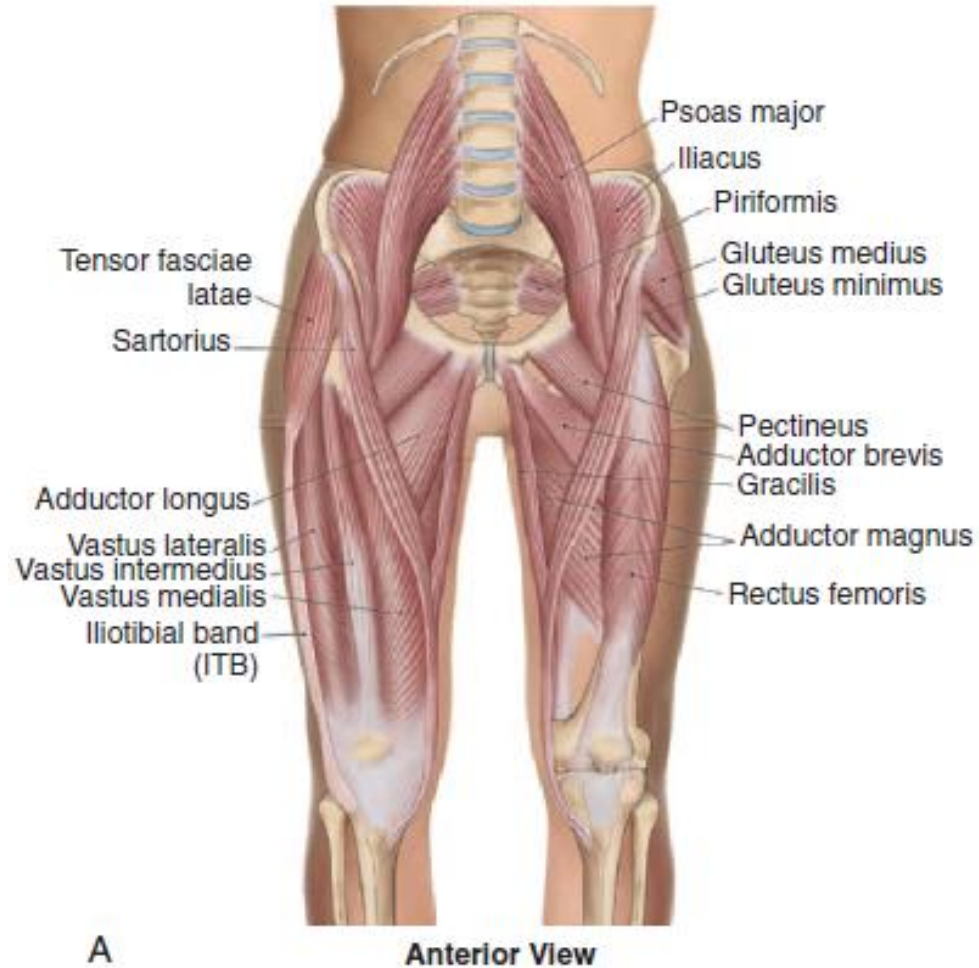
Lesson Eight: Muscles of Hip and Knee Movement

- Psoas major
- Iliacus
- Piriformis
- Gemellus superior and inferior
- Obturator internus and externus
- Quadratus femoris
- Gluteus maximus, medius, and minimus
- Tensor fascia lata
- Rectus femoris
- Vastus intermedius, medialis, and lateralis

Lesson Eight: Muscles of Hip and Knee Movement (Cont.)

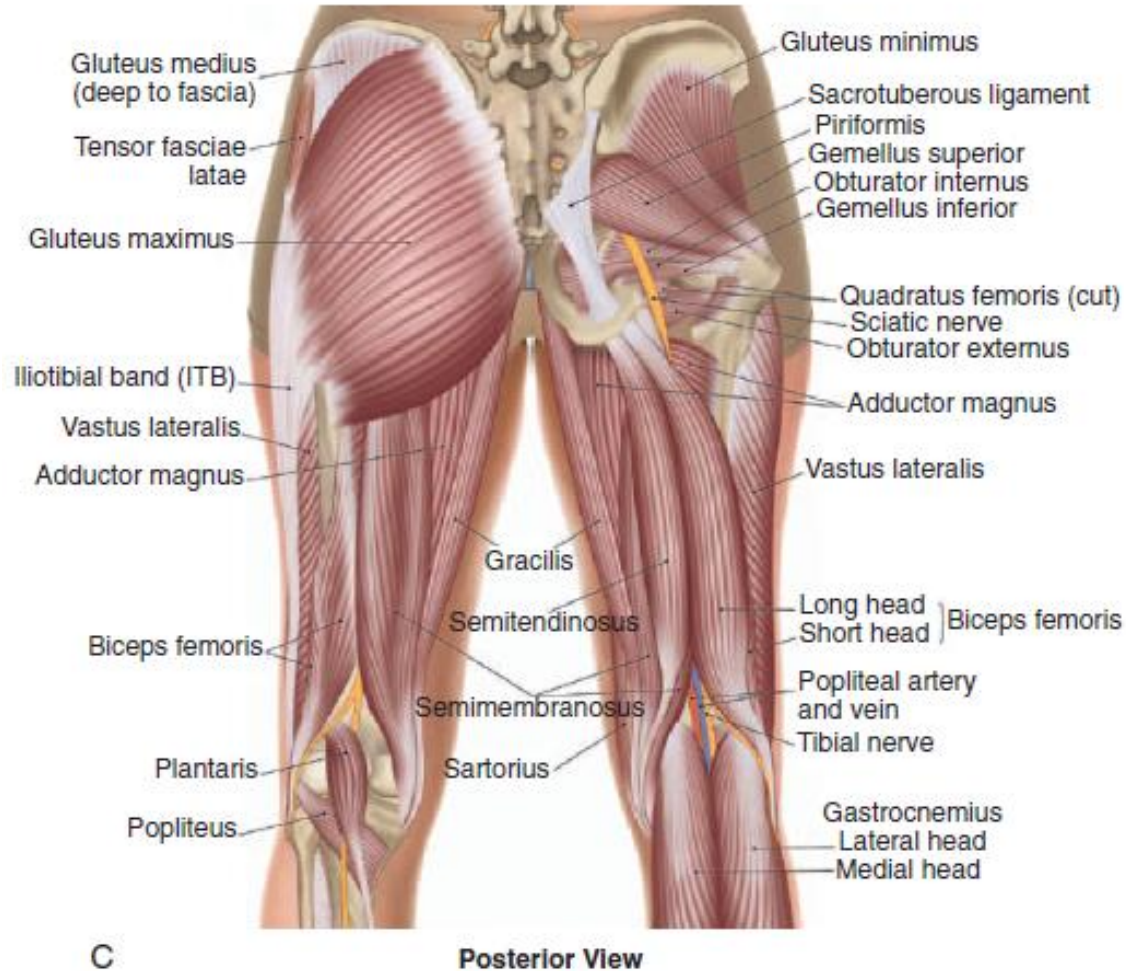
- Sartorius
- Semimembranosus
- Semitendinosus
- Biceps femoris
- Gracilis
- Adductor magnus, longus, brevis
- Pectineus and gastrocnemius
- Plantaris and popliteus

Muscles of Hip and Knee



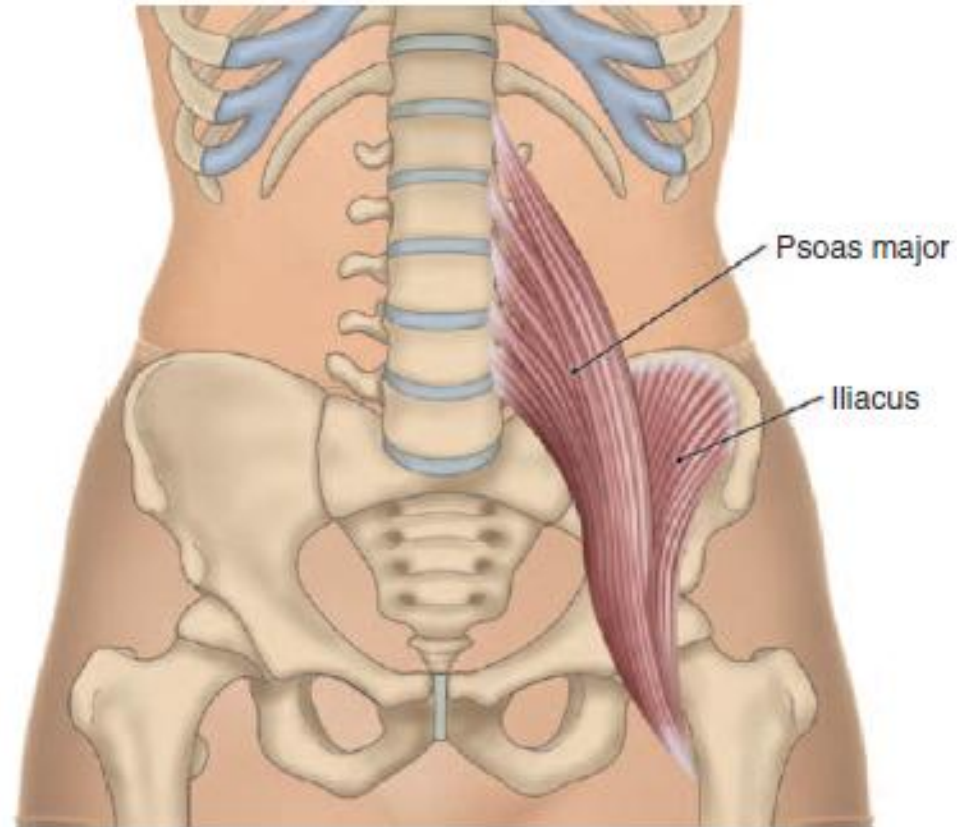
Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Muscles of Hip and Knee (Cont.)



Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

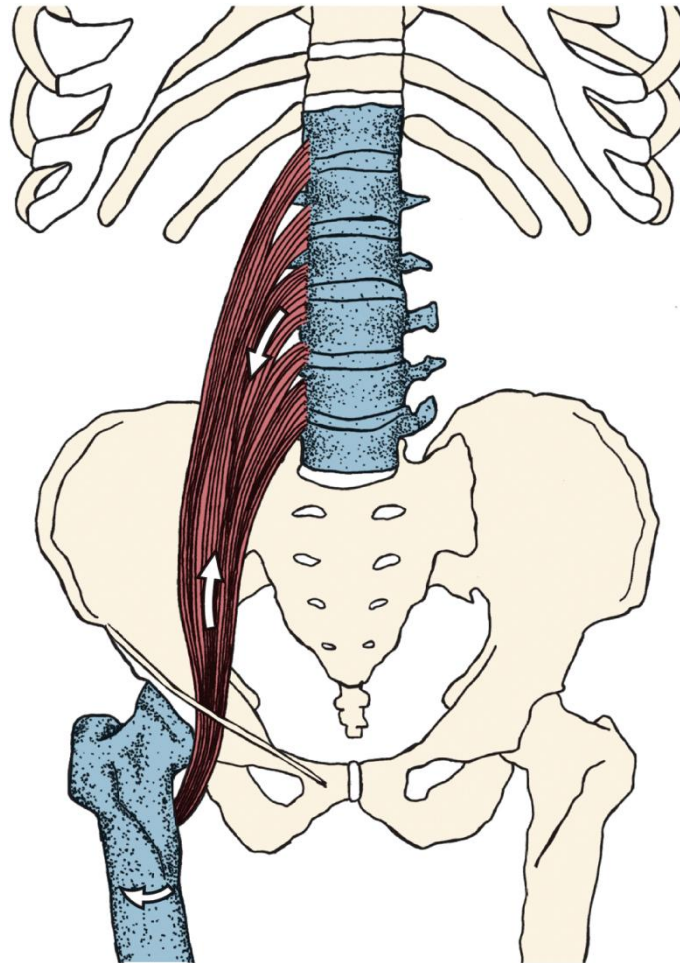
Iliopsoas



Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Psoas Major



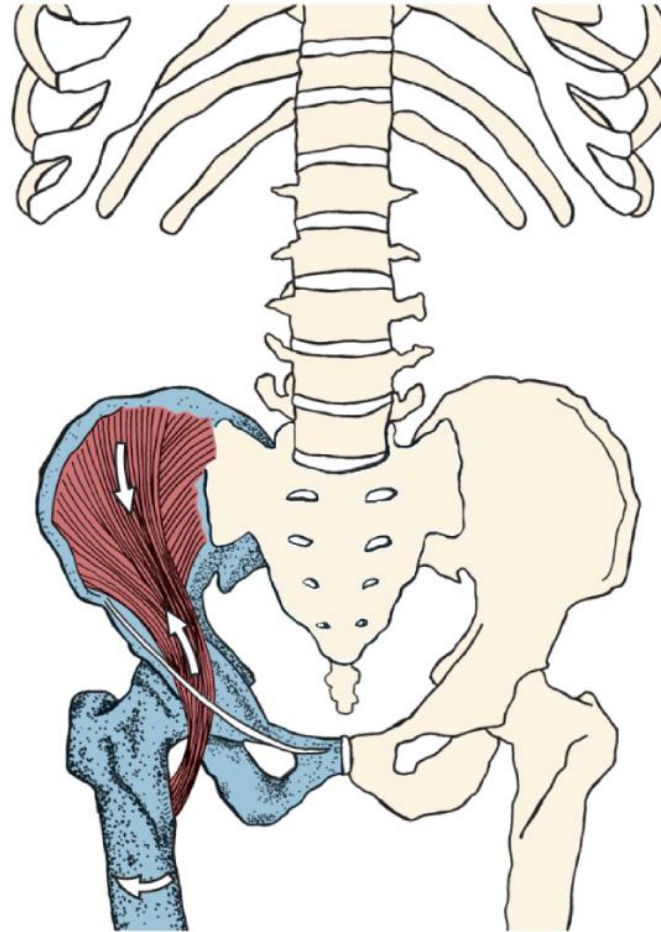
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Psoas Major (Cont.)

- Origins: Transverse processes of T12 through L5, vertebral bodies of T12 through L5, and intervertebral disks of lumbar vertebrae
- Insertion: Lesser trochanter
- Actions: Flexes and laterally rotates the hip, flexes the vertebral column, and anteriorly tilts the pelvis
- Nerves: Lumbar plexus

Iliacus



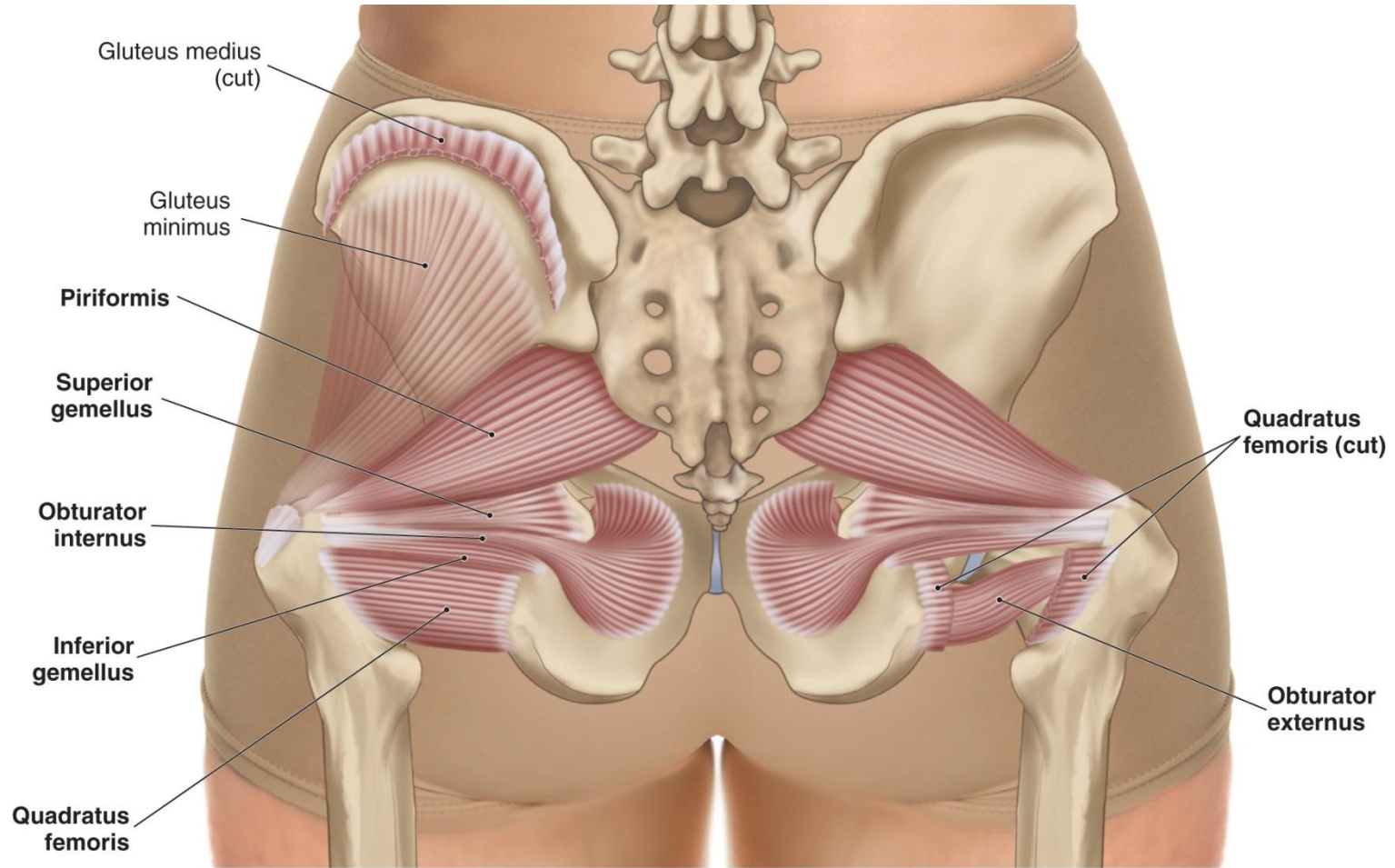
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Iliacus (Cont.)

- Origins: Iliac fossa
- Insertion: Lesser trochanter
- Actions: Flexes and laterally rotates the hips; anteriorly tilts the pelvis
- Nerve: Femoral nerve

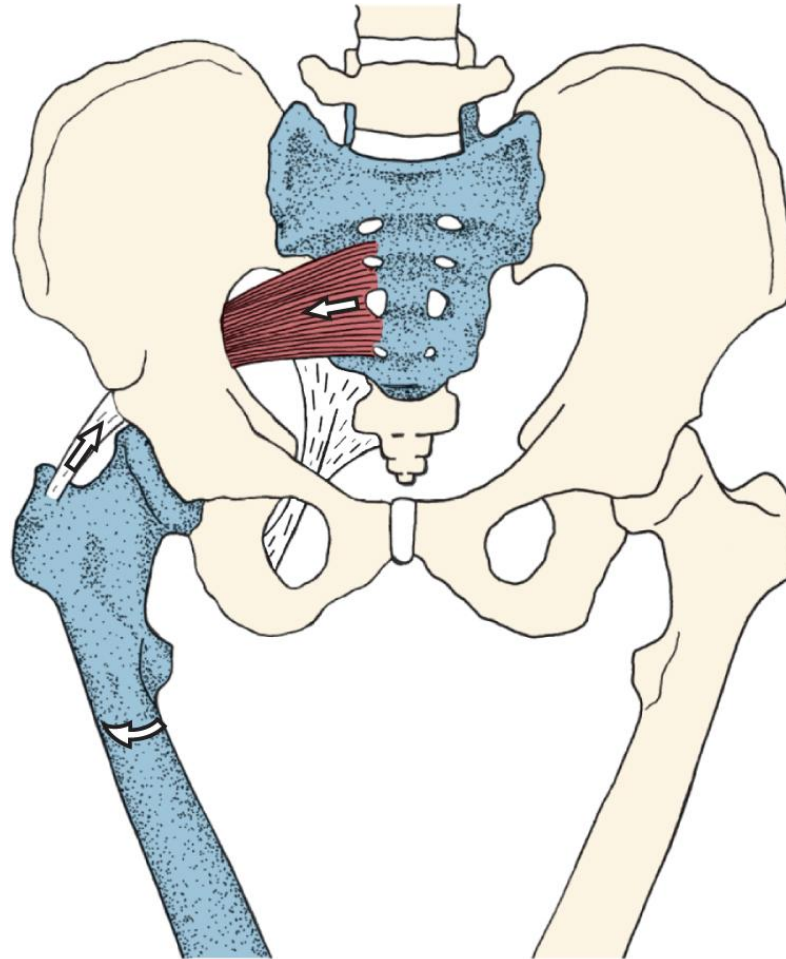
Lateral Rotators of the Hip



Posterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Piriformis



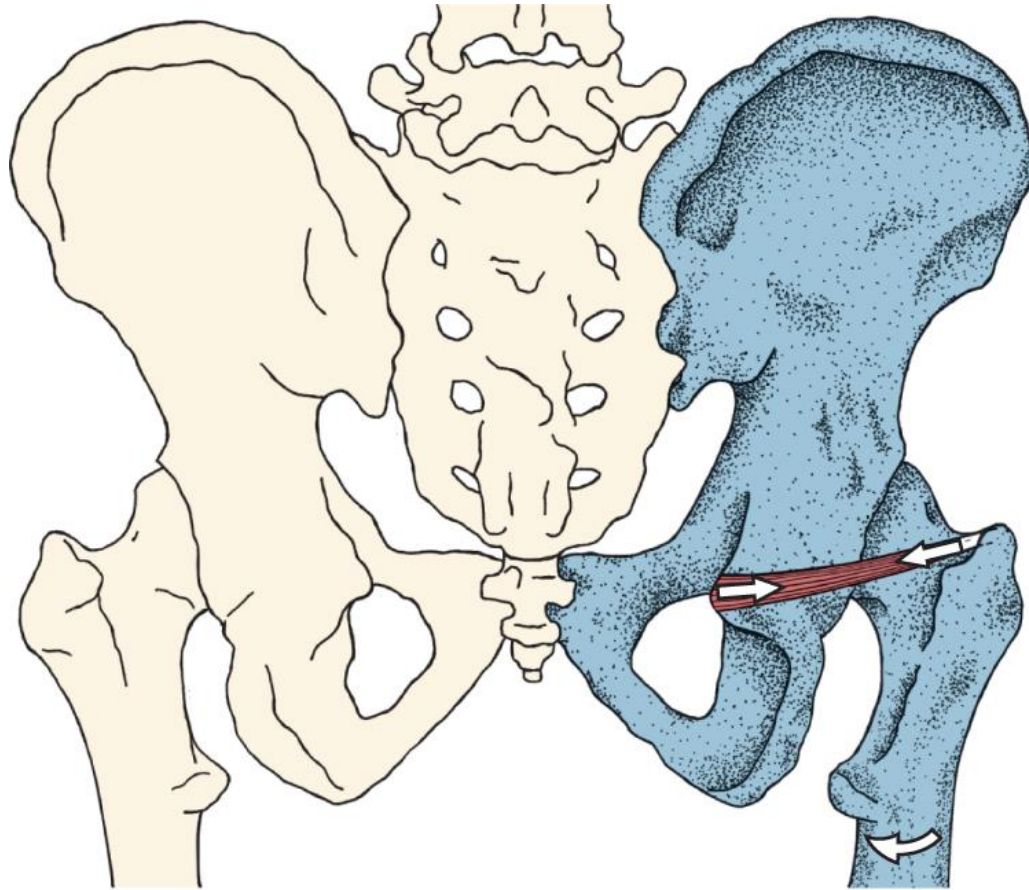
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Piriformis (Cont.)

- Origin: Anterior sacrum
- Insertion: Greater trochanter
- Actions: Laterally rotates and abducts the hip
- Nerve: Sciatic nerve

Gemellus Superior



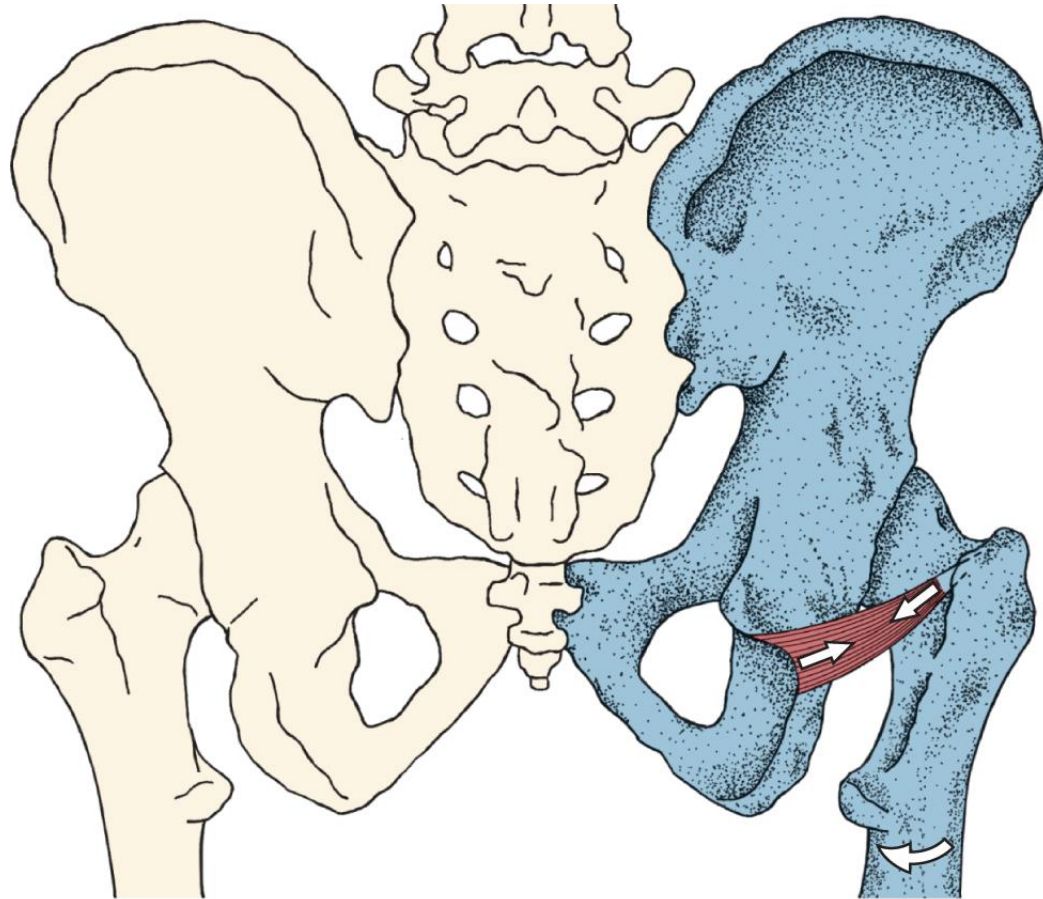
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Gemellus Superior (Cont.)

- Origin: Ischial spine
- Insertion: Greater trochanter
- Action: Laterally rotates the hip
- Nerve: Sciatic nerve

Gemellus Inferior



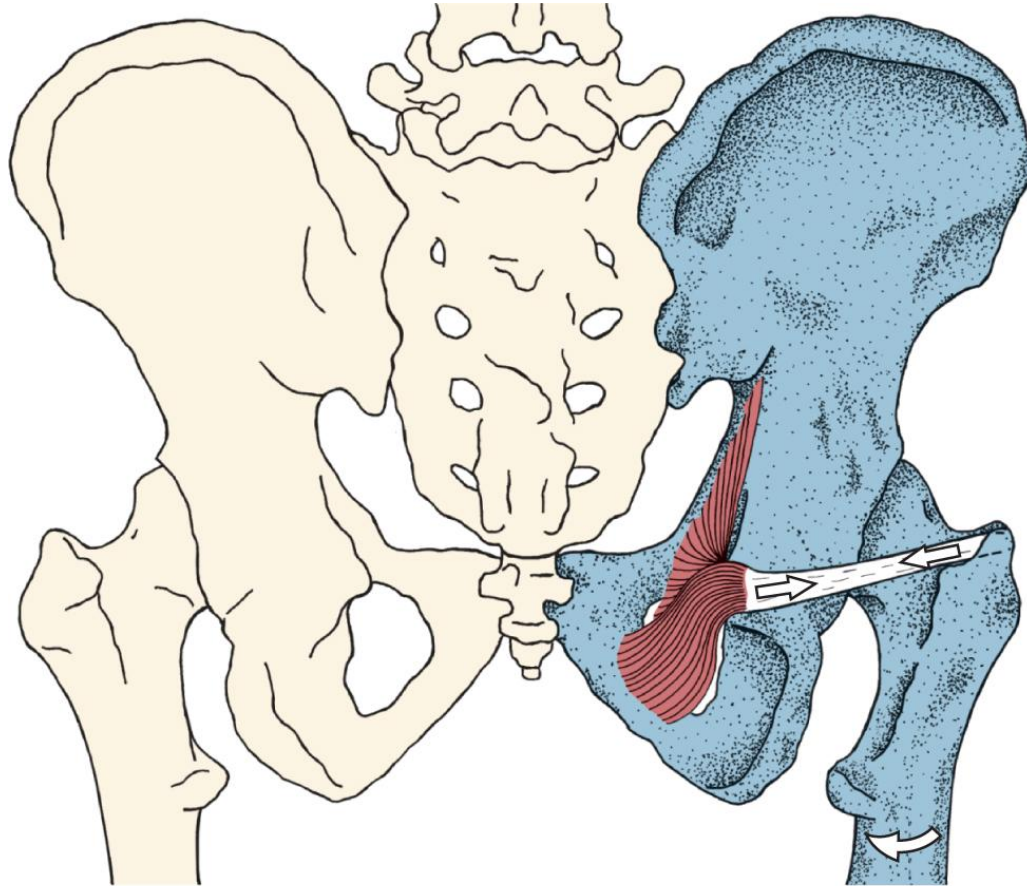
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Gemellus Inferior (Cont.)

- Origin: Superior ischial tuberosity
- Insertion: Greater trochanter
- Action: Laterally rotates the hip
- Nerve: Sciatic nerve

Obturator Internus



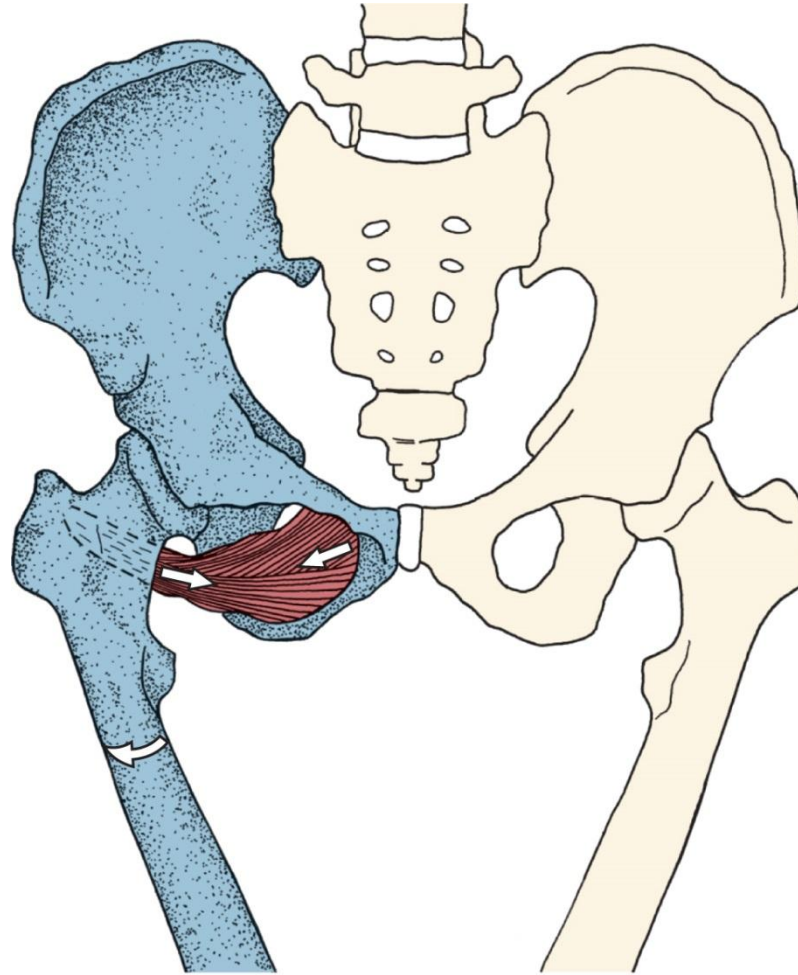
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Obturator Internus (Cont.)

- Origins: Obturator membrane and obturator margin
- Insertion: Greater trochanter
- Action: Laterally rotates the hip
- Nerve: Sciatic nerve

Obturator Externus



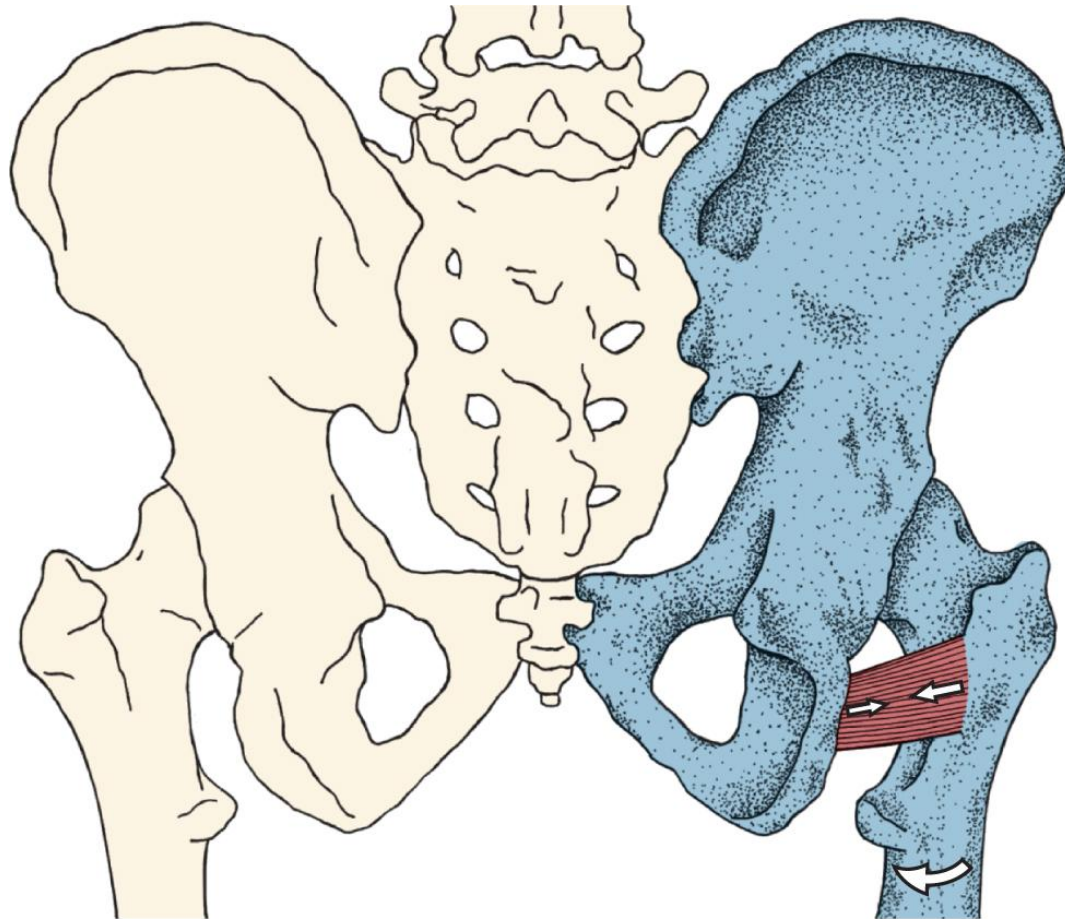
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Obturator Externus (Cont.)

- Origins: Obturator membrane, superior and inferior pubic rami, and ischial ramus
- Insertion: Greater trochanter
- Action: Laterally rotates the hip
- Nerve: Obturator nerve

Quadratus Femoris



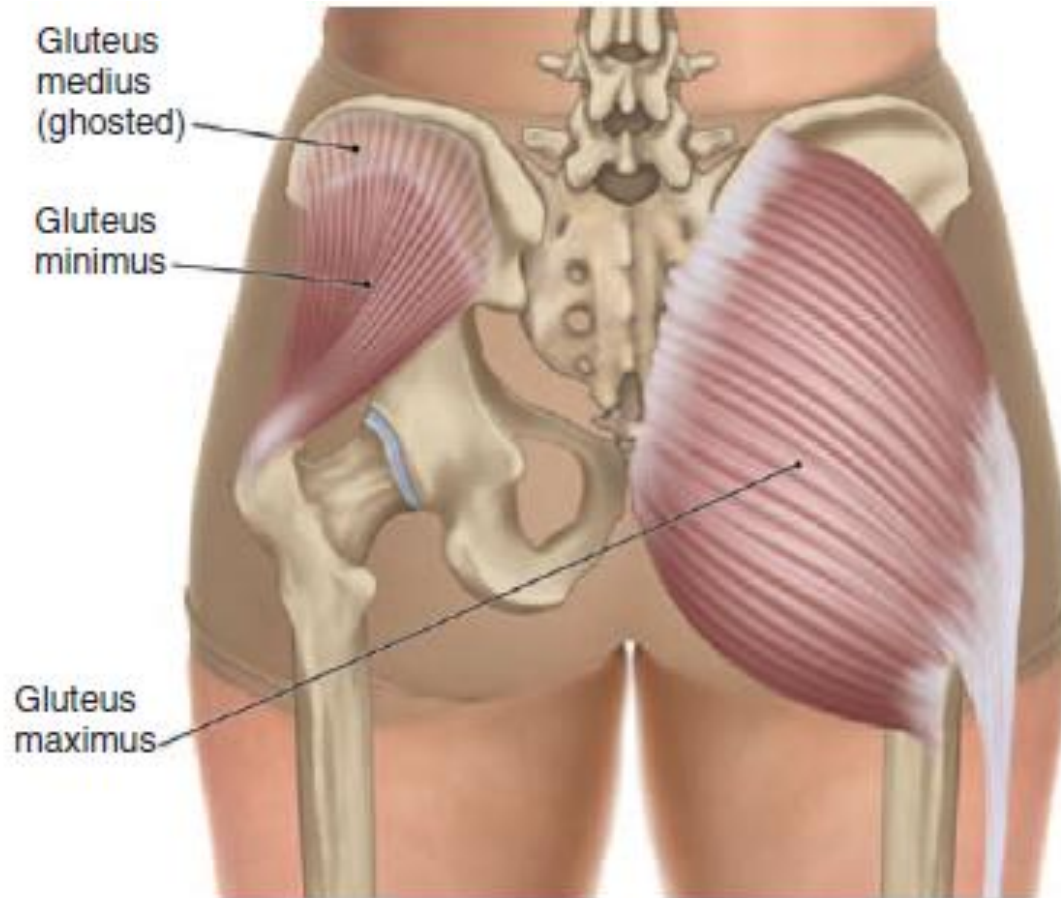
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Quadratus Femoris (Cont.)

- Origin: Lateral ischial tuberosity
- Insertion: Intertrochanteric crest
- Actions: Laterally rotates and adducts the hip
- Nerve: Sciatic nerve

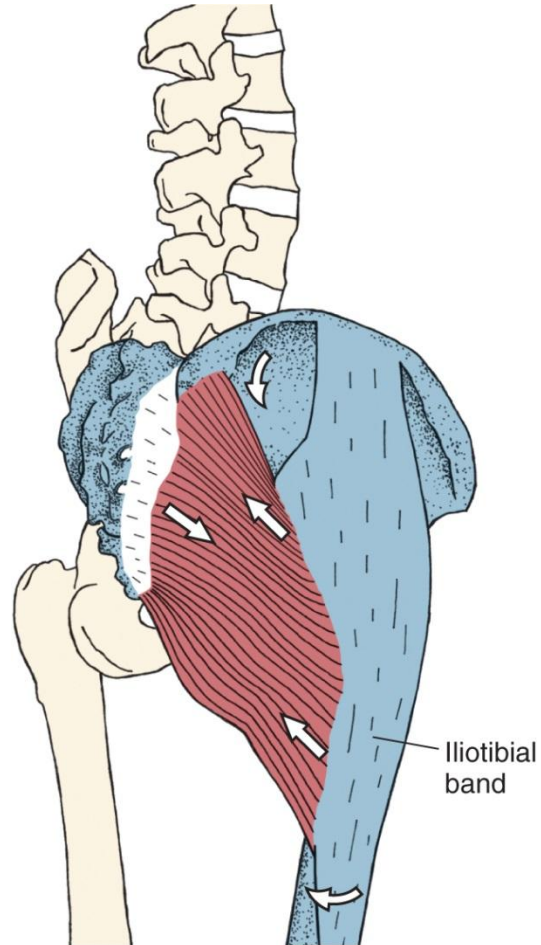
Gluteals



Posterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Gluteus Maximus



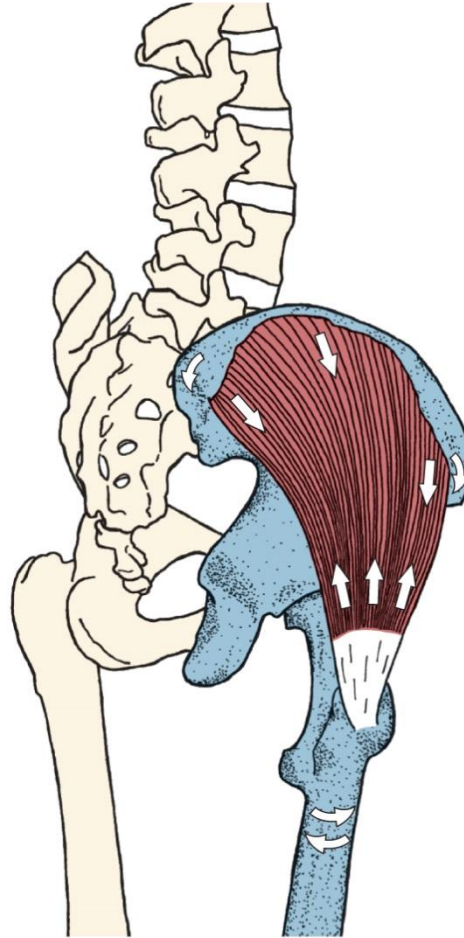
Posterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Gluteus Maximus (Cont.)

- Origins: Posterior sacrum, posterior coccyx, posterior iliac crest, and external ilium to posterior gluteal line
- Insertions: Gluteal tuberosity (25% of fibers) and iliotibial band (75% of fibers)
- Actions: Extends, laterally rotates, and abducts the hip; posteriorly tilts the pelvis
- Nerve: Inferior gluteal nerve

Gluteus Medius



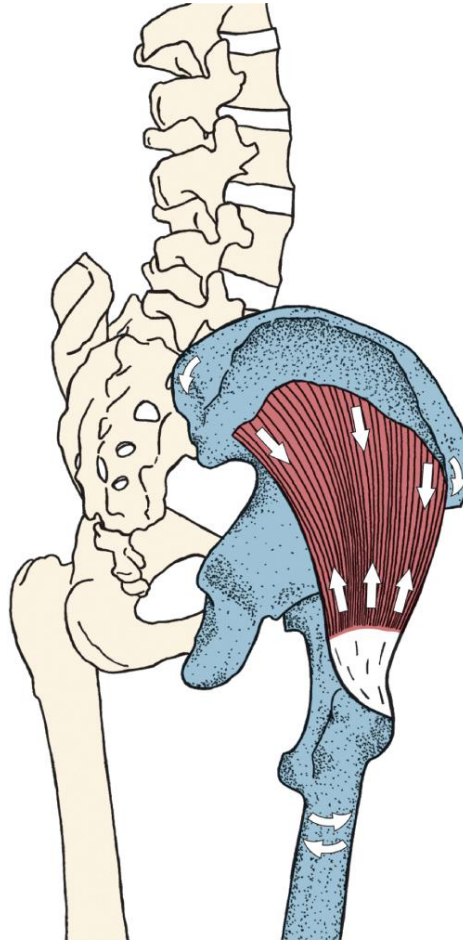
Posterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Gluteus Medius (Cont.)

- Origin: External ilium between anterior and posterior gluteal lines
- Insertion: Greater trochanter
- Actions: Abducts, laterally rotates, and medially rotates the hip; anteriorly and posteriorly tilts pelvis
- Nerve: Superior gluteal nerve

Gluteus Minimus



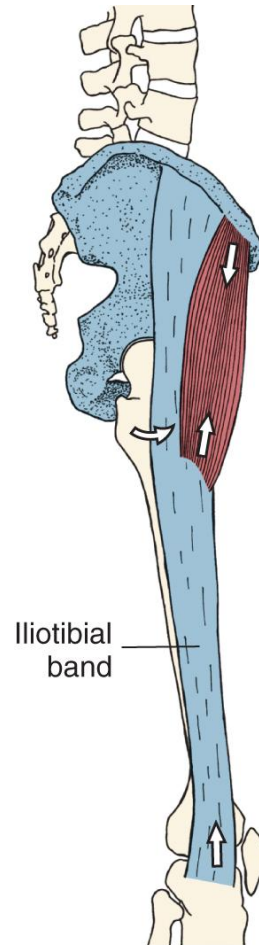
Posterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Gluteus Minimus (Cont.)

- Origin: External ilium between anterior and inferior gluteal lines
- Insertion: Greater trochanter
- Actions: Abducts, laterally rotates, and medially rotates the hip; anteriorly and posteriorly tilts pelvis
- Nerve: Superior gluteal nerve

Tensor Fasciae Latae



Lateral View

End of Week 3

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

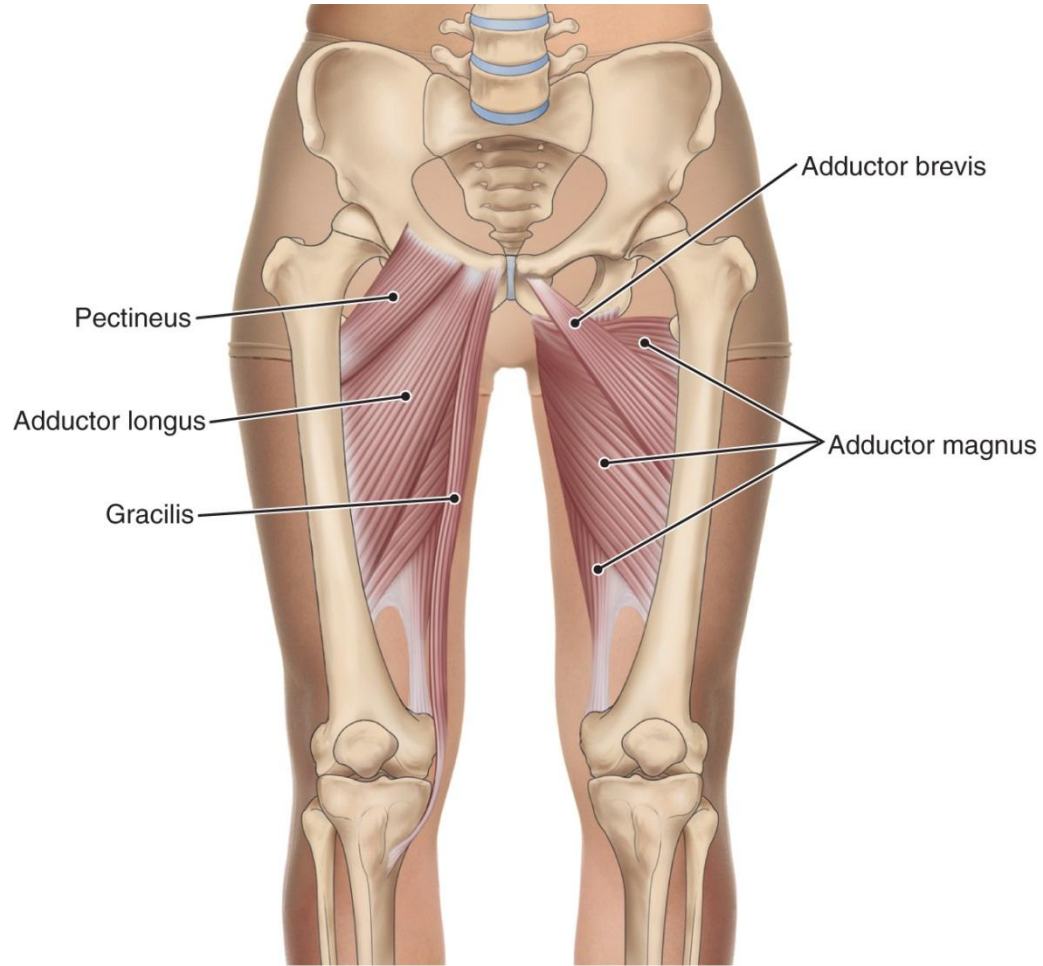
Tensor Fasciae Latae (Cont.)

- Origins: Anterior iliac crest and ASIS
- Insertion: ITB
- Actions: Abducts, flexes, and medially rotates the hip
- Nerve: Superior gluteal nerve

Lab Palpation & In class assignments

- Laboratory palpation of Muscles of antebrachial and hand.
- Complete the textbook matching activities related to muscles related to movements of antebrachial and hands
- Login to Evolve, select chapter 21, choose Body Spectrum, muscular, musculature posterior and anterior, and click on areas related to the lecture of today.

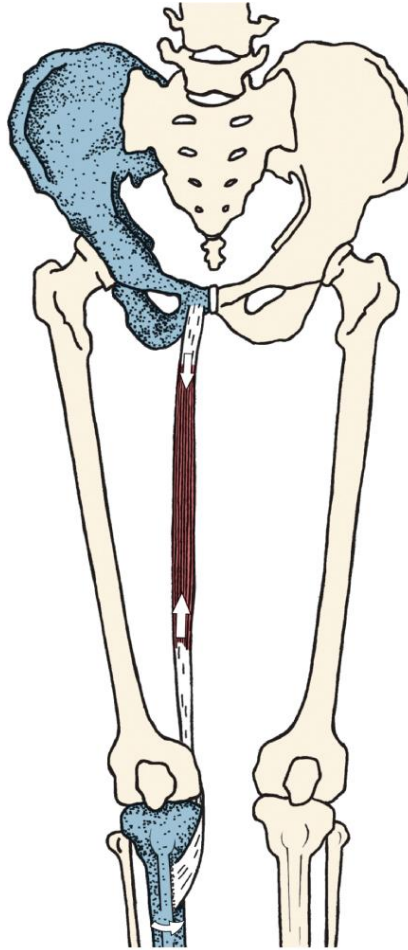
Adductors



Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

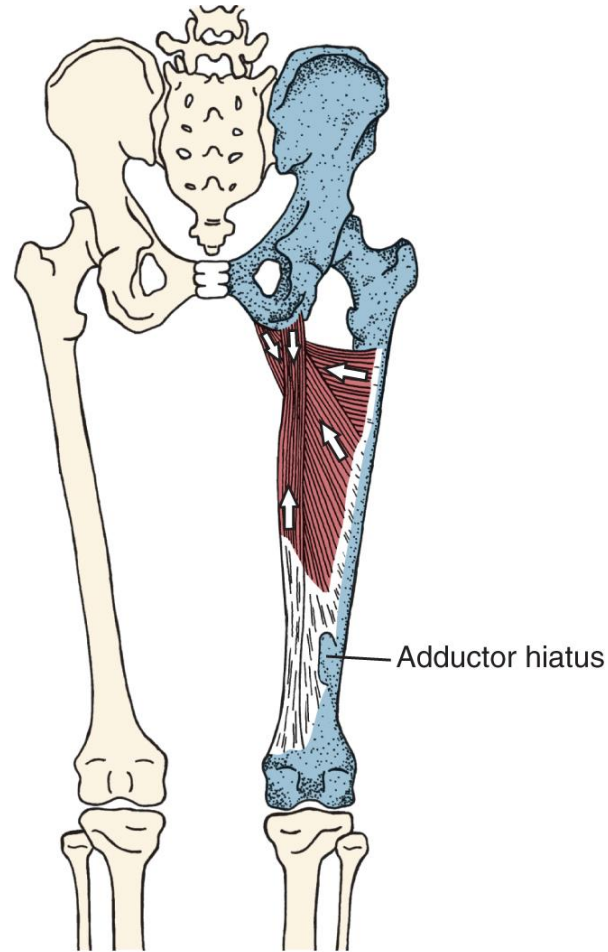
Gracilis



Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Adductor Magnus



Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

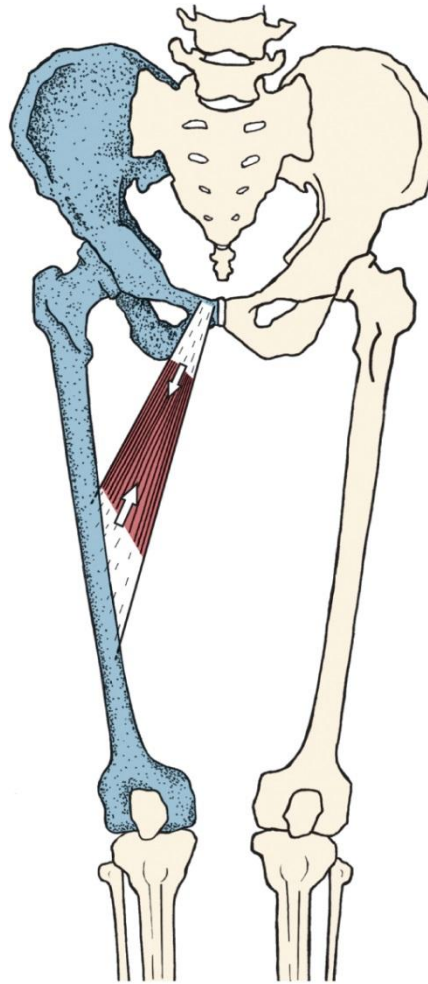
Gracilis (Cont.)

- Origin: Inferior pubic ramus
- Insertion: Medial proximal tibial shaft (at pes anserinus)
- Actions: Adducts and flexes the hip, flexes the knee, and medially rotates the leg (when knee is flexed)
- Nerve: Obturator nerve

Magnus (Cont.)

- Origins: Ischial tuberosity, inferior pubic ramus, and ischial ramus
- Insertions: Linea aspera and adductor tubercle of femur
- Actions: Adducts, flexes, and extends the hip
- Nerves: Sciatic and obturator nerves

Adductor Longus



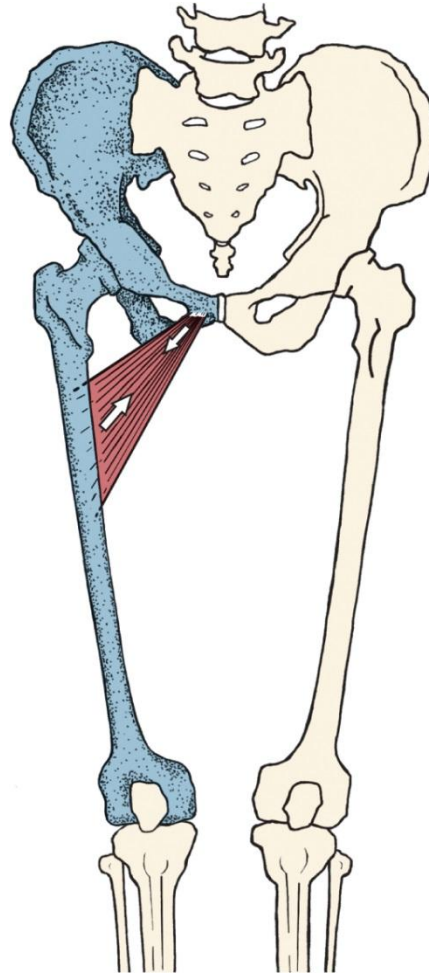
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Adductor Longus (Cont.)

- Origin: Anterior pubic body
- Insertion: Middle third of linea aspera
- Action: Adducts the hip
- Nerve: Obturator nerve

Adductor Brevis



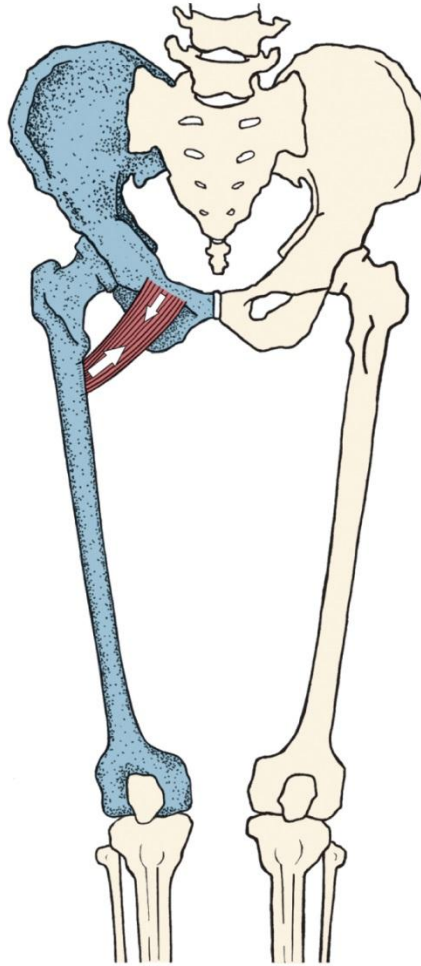
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Adductor Brevis (Cont.)

- Origin: Inferior pubic ramus
- Insertion: Proximal third of linea aspera
- Action: Adducts the hip
- Nerve: Obturator nerve

Pectineus



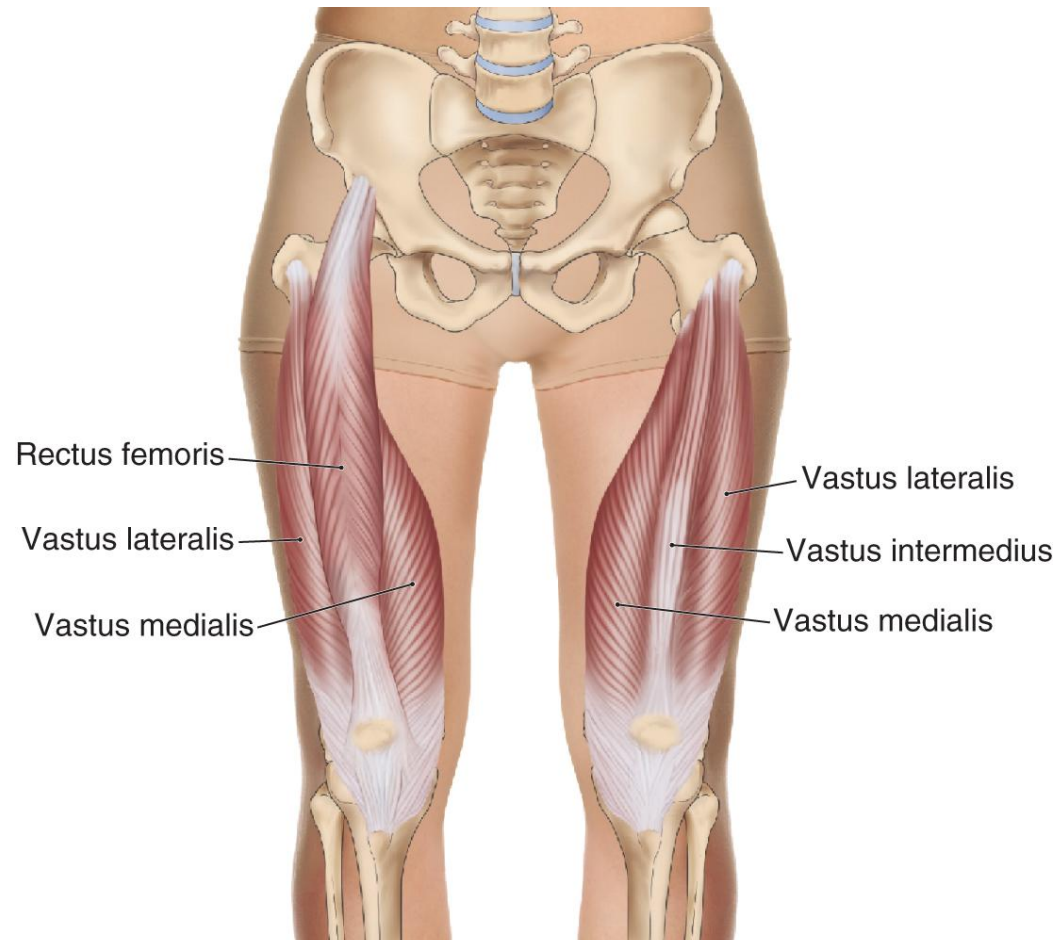
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Pectineus (Cont.)

- Origins: Superior pubic ramus and pectineal line on pubis
- Insertion: Posterior proximal femoral shaft (inferior to lesser trochanter)
- Actions: Flexes and adducts the hip
- Nerve: Femoral nerve

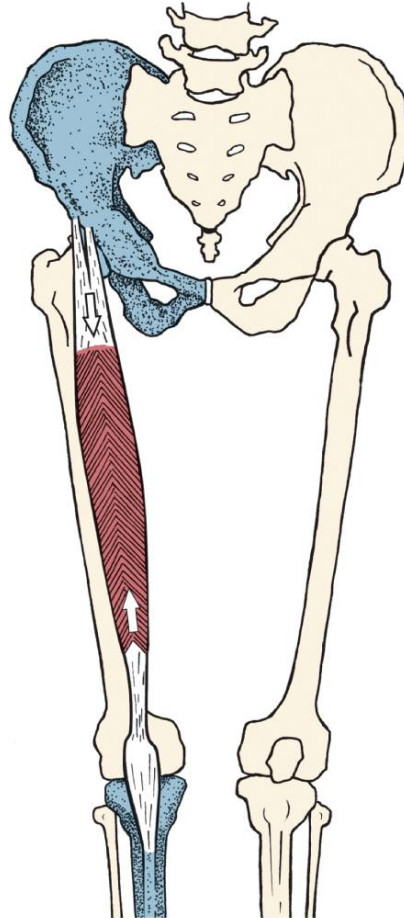
Quadriceps Femoris



Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Rectus Femoris



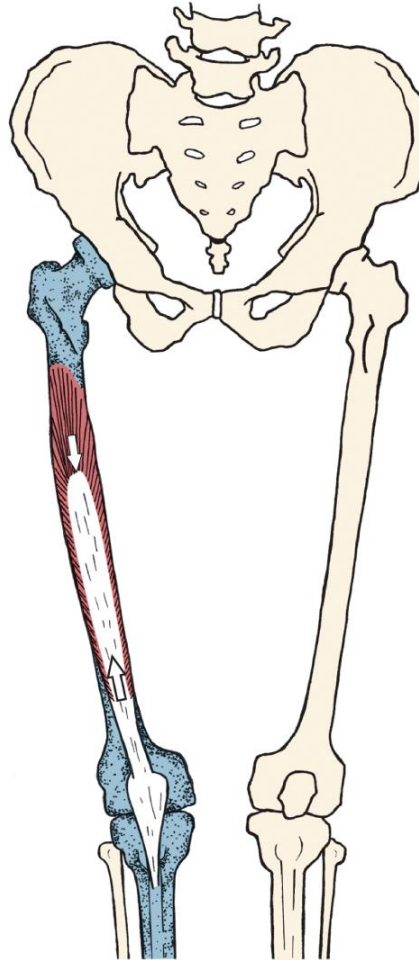
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Rectus Femoris (Cont.)

- Origins: AIIIS and external ilium just superior to acetabulum
- Insertion: Tibial tuberosity
- Actions: Flexes the hip, extends the knee, and anteriorly tilts the pelvis
- Nerve: Femoral nerve

Vastus Intermedius



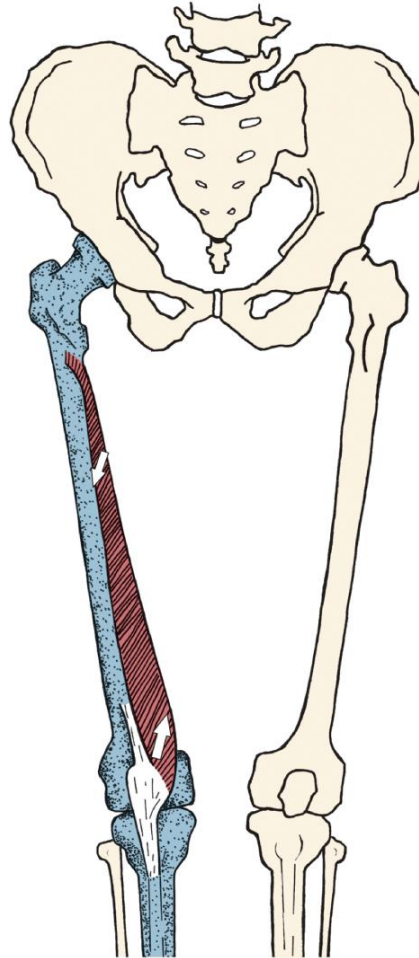
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Vastus Intermedius (Cont.)

- Origin: Anterior lateral femoral shaft
- Insertion: Tibial tuberosity
- Action: Extends the knee
- Nerve: Femoral nerve

Vastus Medialis



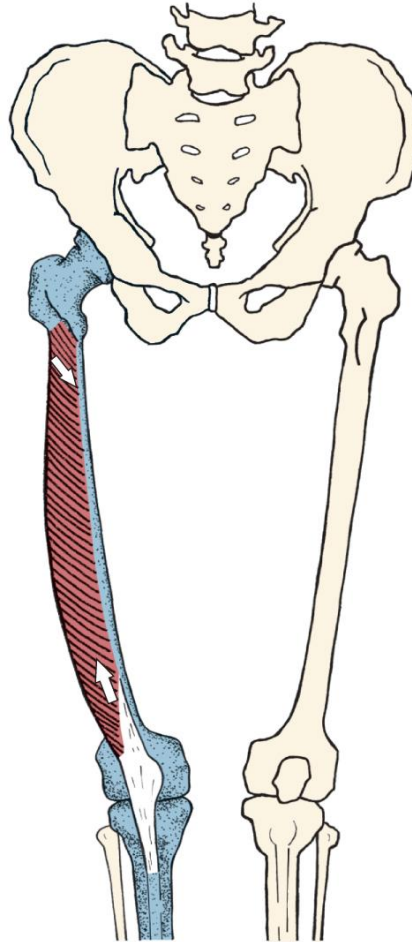
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Vastus Medialis (Cont.)

- Origins: Linea aspera and intertrochanteric line
- Insertion: Tibial tuberosity
- Action: Extends the knee
- Nerve: Femoral nerve

Vastus Lateralis



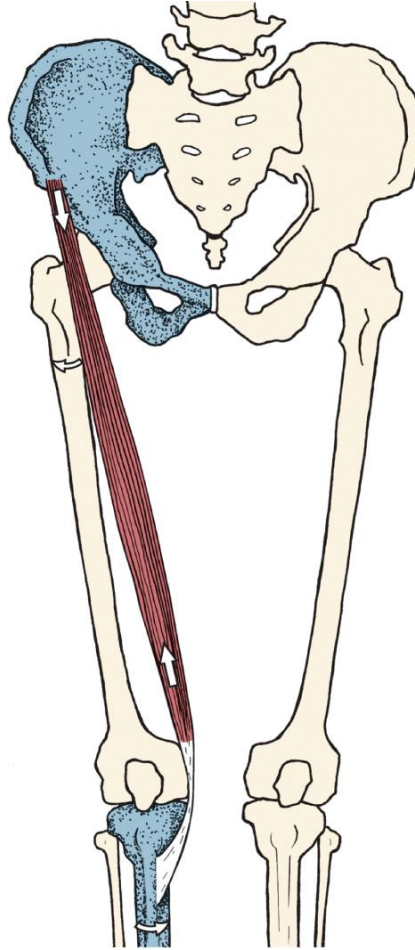
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Vastus Lateralis (Cont.)

- Origins: Linea aspera and gluteal tuberosity
- Insertion: Tibial tuberosity
- Action: Extends the knee
- Nerve: Femoral nerve

Sartorius



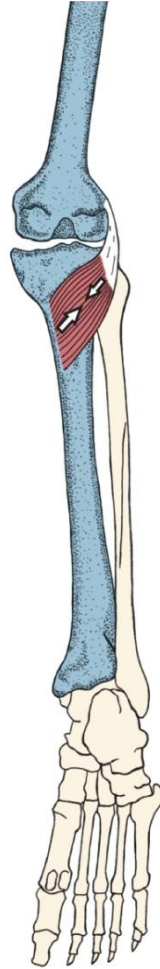
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Sartorius (Cont.)

- Origin: ASIS
- Insertion: Medial proximal tibial shaft (at pes anserine)
- Actions: Flexes, laterally rotates, and abducts the hip; flexes the knee; and medially rotates the leg
- Nerve: Femoral nerve

Popliteus



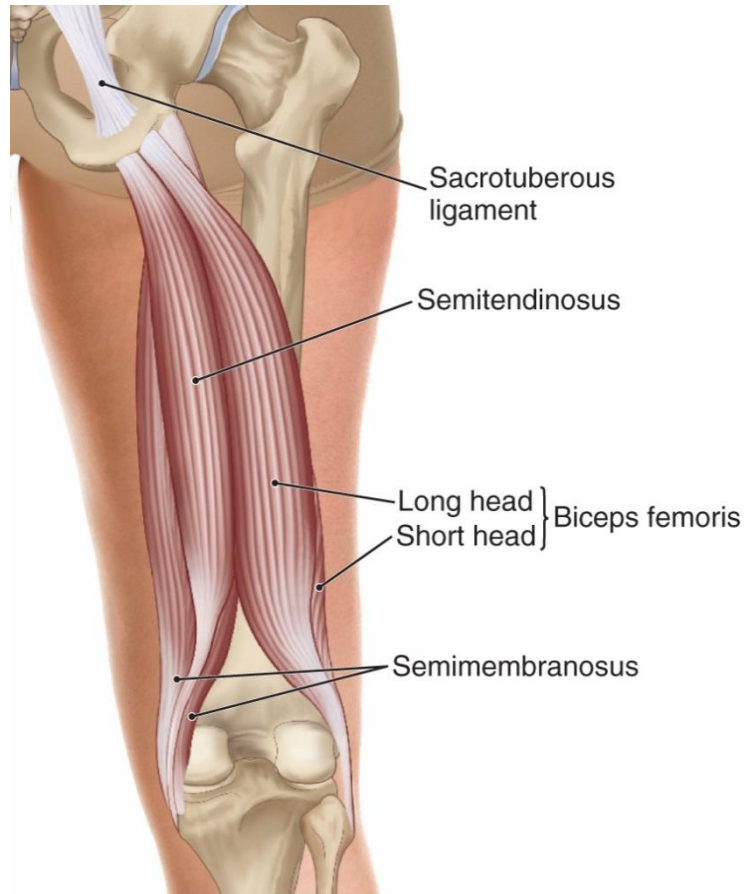
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Popliteus (Cont.)

- Origin: Lateral condyle of femur
- Insertion: Posterior proximal tibial shaft
- Actions: Flexes the knee and medially rotates the leg
- Nerve: Tibial nerve

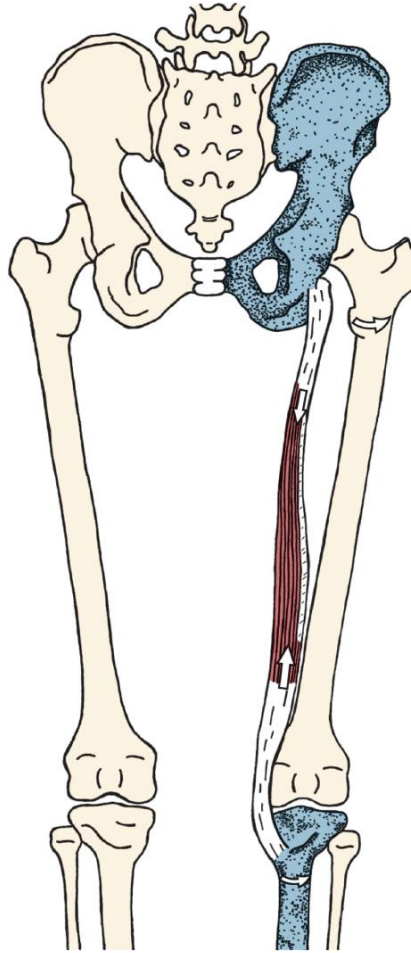
Hamstrings



Posterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Semimembranosus



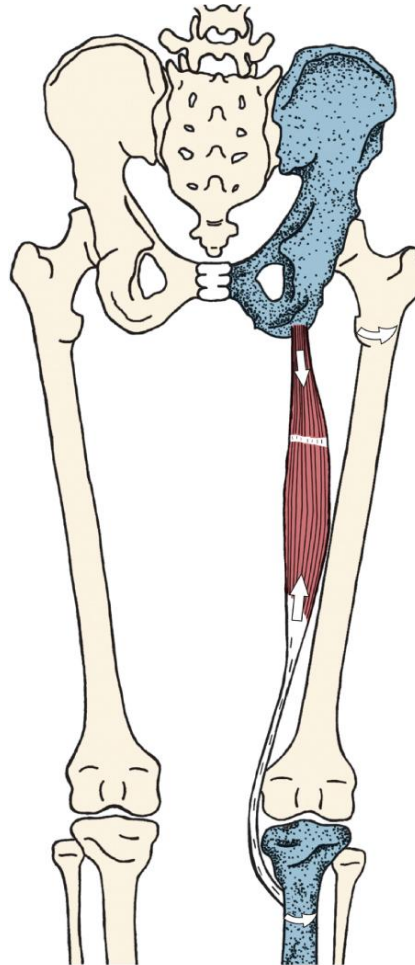
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Semimembranosus (Cont.)

- Origin: Ischial tuberosity
- Insertion: Medial condyle of tibia
- Actions: Flexes the knee, medially rotates the leg, extends the hip, and posteriorly tilts the pelvis
- Nerve: Tibial nerve

Semitendinosus



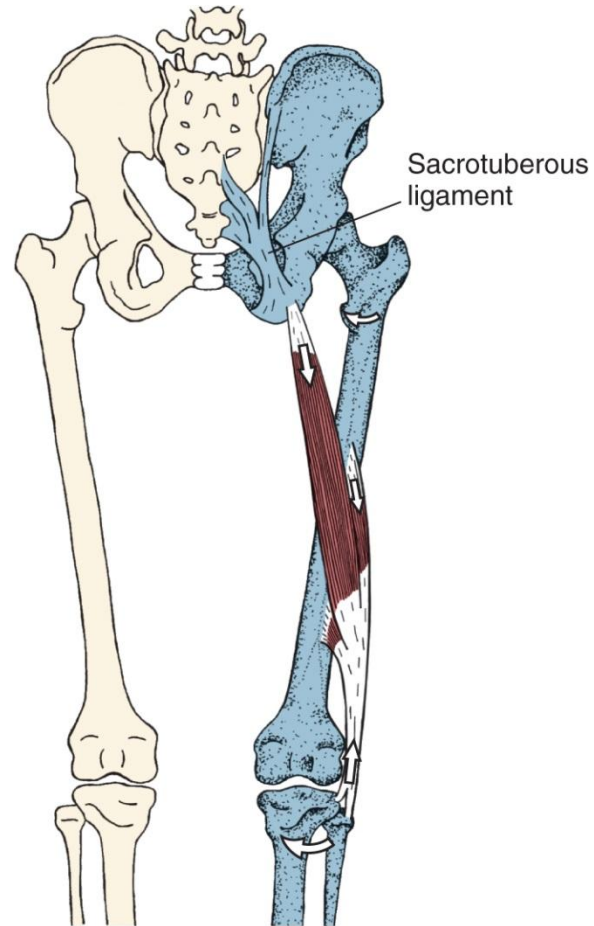
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Semitendinosus (Cont.)

- Origin: Ischial tuberosity
- Insertion: Medial proximal tibial shaft (at pes anserinus)
- Actions: Flexes the knee, medially rotates the leg, extends the hip, and posteriorly tilts the pelvis
- Nerve: Tibial nerve

Biceps Femoris



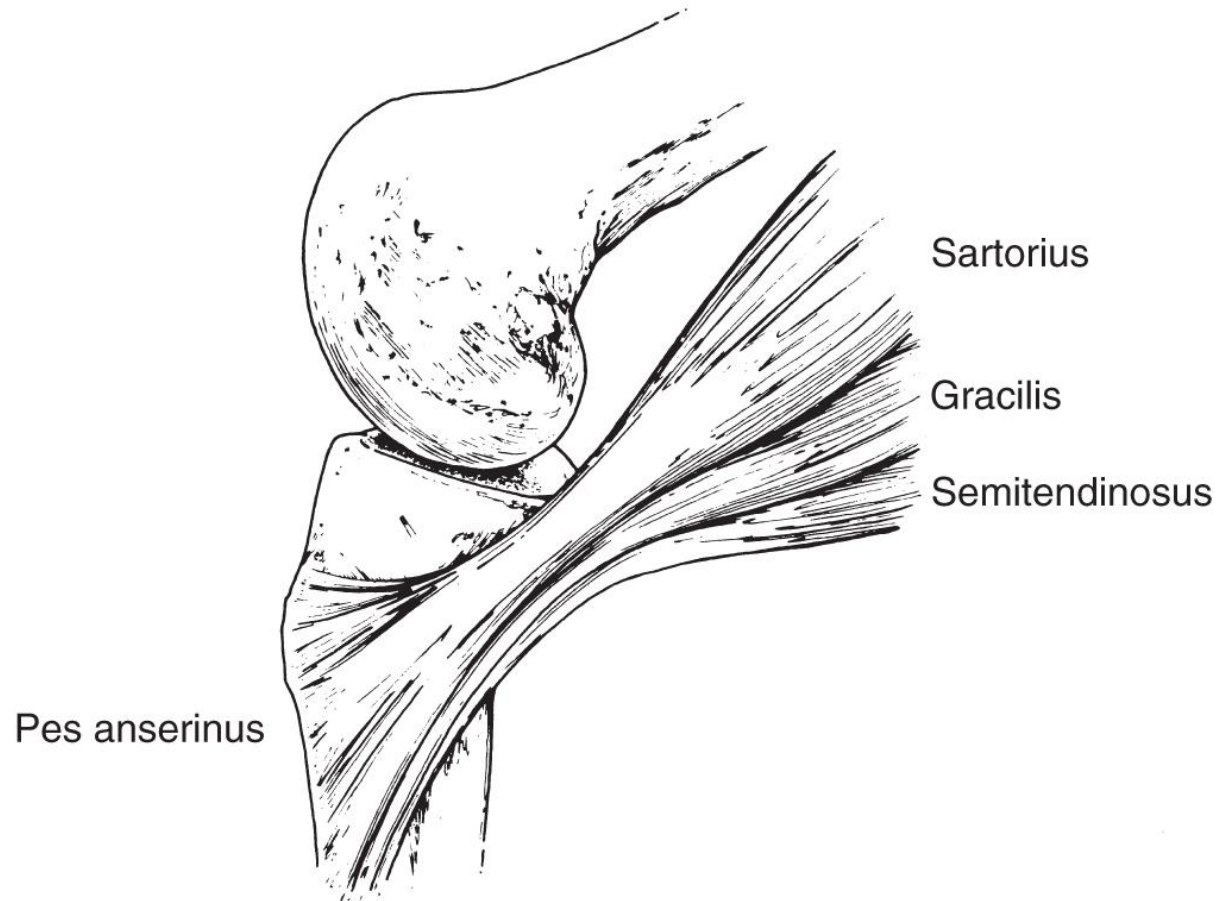
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Biceps Femoris (Cont.)

- Origins: Ischial tuberosity (long head) and linea aspera, lower lateral lip (short head)
- Insertion: Fibular head
- Actions: Flexes the knee, laterally rotates the leg, extends the hip, and posteriorly tilts the pelvis
- Nerves: Tibial nerve (long head) and common fibular/peroneal nerve (short head)

Pes Anserinus



Donatelli RA: *Orthopedic Physical Therapy*, ed 4, St. Louis, 2010, Churchill Livingstone.

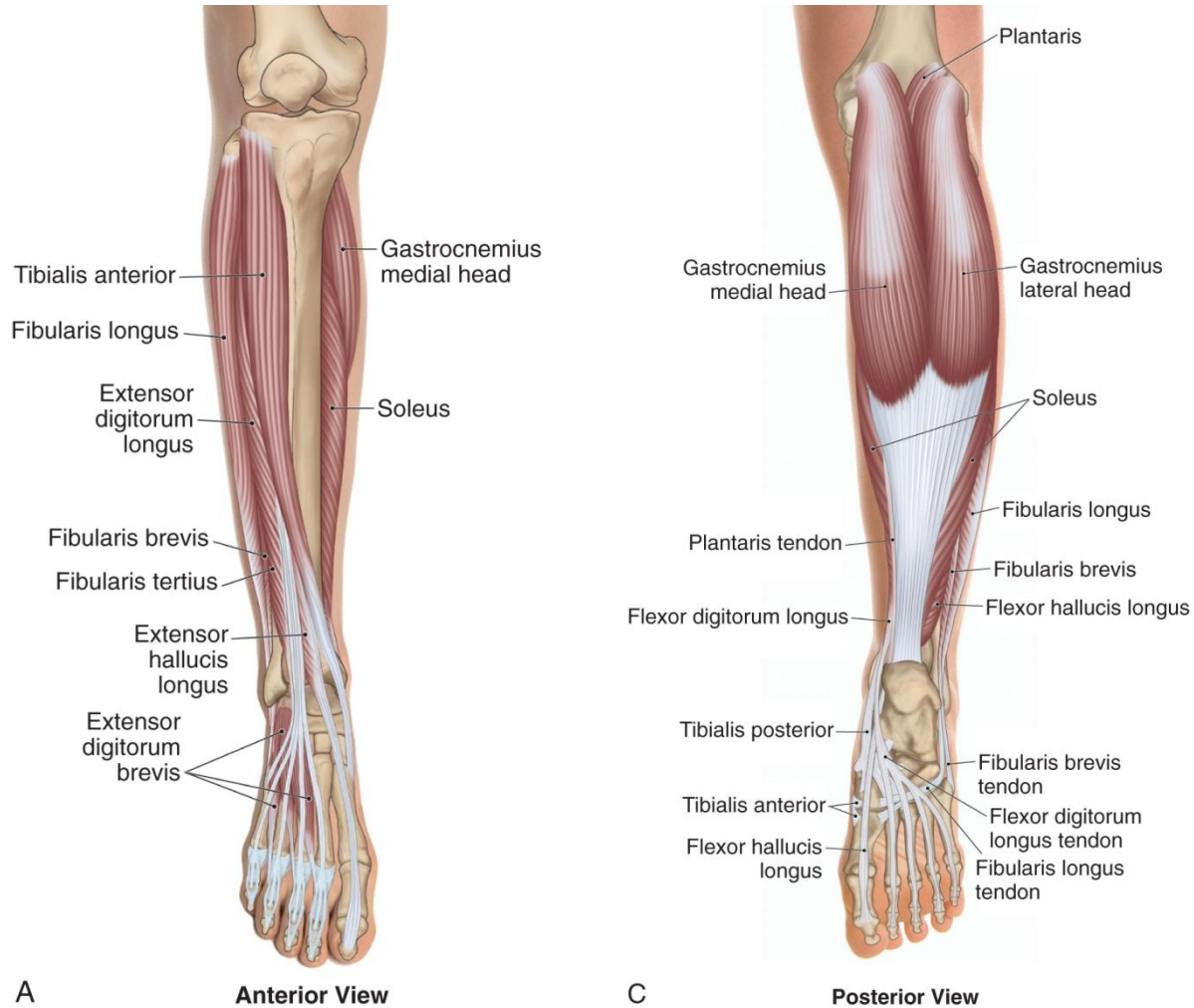
Lesson Nine: Muscles of Ankle and Foot Movement

- Tibialis anterior
- Extensor digitorum longus and brevis
- Extensor hallucis longus
- Fibularis longus, brevis, and tertius

Lesson Nine: Muscles of Ankle and Foot Movement (Cont.)

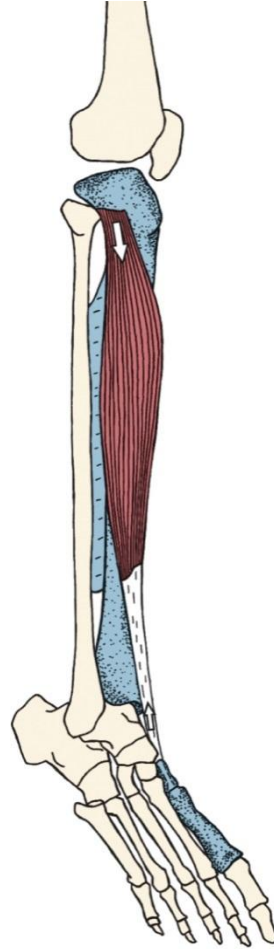
- Gastrocnemius
- Plantaris
- Soleus
- Tibialis posterior
- Flexor digitorum longus
- Flexor hallucis longus

Muscles of the Ankle and Foot



Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Tibialis Anterior



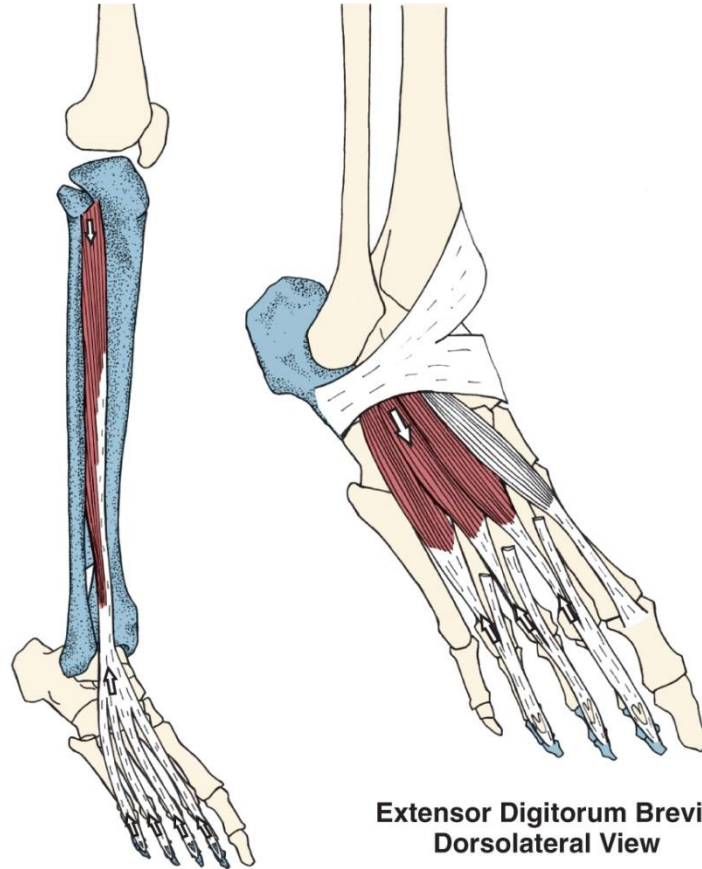
Anterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Tibialis Anterior (Cont.)

- Origins: Proximal half of lateral tibial shaft and interosseous membrane
- Insertions: Metatarsal I and medial cuneiform
- Actions: Dorsiflexes the ankle and inverts the foot
- Nerve: Deep fibular nerve

Extensor Digitorum Longus and Brevis



**Extensor Digitorum Longus
Dorsolateral View**

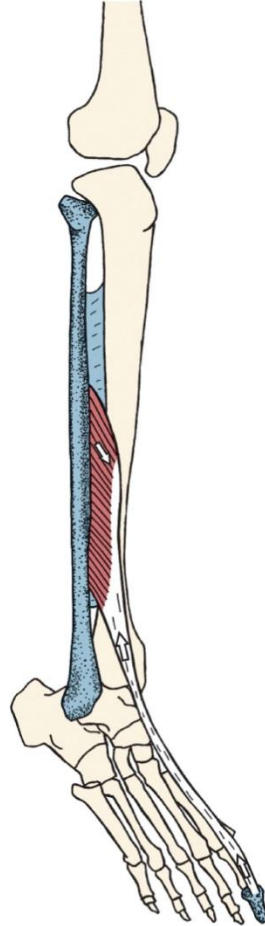
**Extensor Digitorum Brevis
Dorsolateral View**

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Digitorum Longus and Brevis (Cont.)

- Origins: Fibular head, proximal two thirds of the anterior fibular shaft, lateral condyle of tibia (longus), anterior surface of the interosseus membrane, and calcaneus (brevis)
- Insertions: Middle and distal phalanges of digits II through V (longus) and tendons of extensor digitorum longus to digits II through IV (brevis)
- Actions: Extends digits II through V, dorsiflexes ankle and everts the foot (longus), and extends digits II through IV (brevis)
- Nerve: Deep fibular nerve

Extensor Hallucis Longus



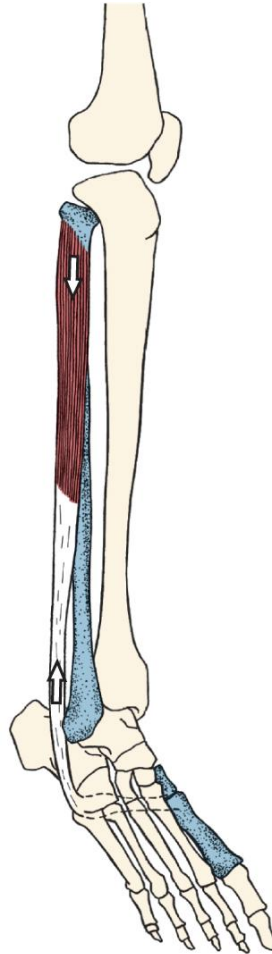
Anterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Extensor Hallucis Longus (Cont.)

- Origins: Anterior fibular shaft (middle region) and interosseous membrane
- Insertion: Distal phalanx of great toe
- Actions: Extends the great toe and dorsiflexes the ankle
- Nerve: Deep fibular nerve

Fibularis Longus



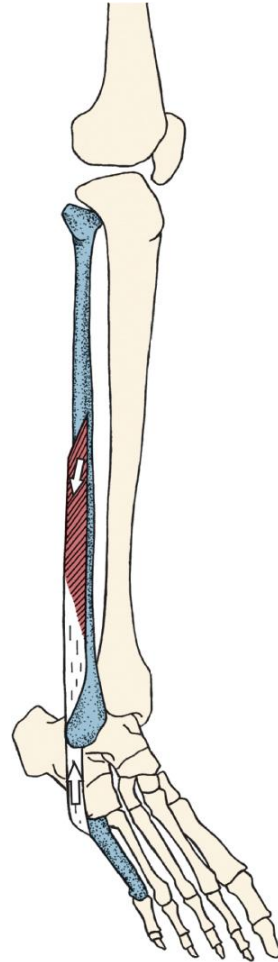
Anterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Fibularis Longus (Cont.)

- Origins: Fibular head and lateral proximal half of fibular shaft
- Insertions: Metatarsal I and medial cuneiform
- Actions: Everts the foot and plantar flexes the ankle
- Nerve: Superficial fibular nerve

Fibularis Brevis



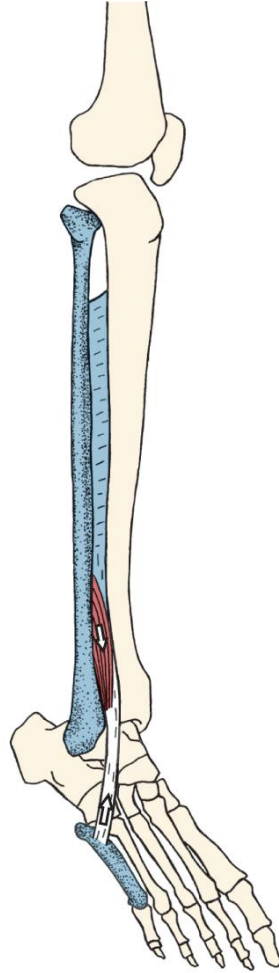
Anterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Fibularis Brevis (Cont.)

- Origin: Lateral distal half of fibular shaft
- Insertion: Metatarsal V
- Actions: Everts the foot and plantar flexes the ankle
- Nerve: Superficial fibular nerve

Fibularis Tertius



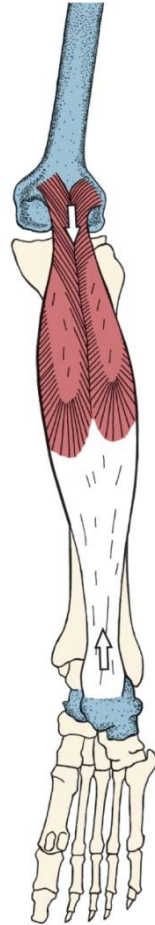
Anterolateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Fibularis Tertius (Cont.)

- Origins: Lateral distal third of fibular shaft and interosseus membrane
- Insertion: Dorsal metatarsal V
- Actions: Everts the foot and dorsiflexes the ankle
- Nerve: Deep fibular nerve

Gastrocnemius



Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Gastrocnemius (Cont.)

- Origins: Medial and lateral epicondyle of the femur
- Insertion: Calcaneus via the Achilles tendon
- Actions: Plantar flexes the ankle and flexes the knee
- Nerve: Tibial nerve

Plantaris



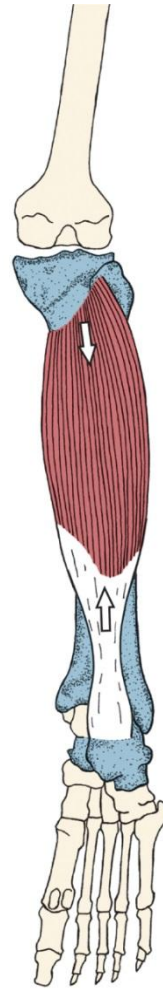
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Plantaris (Cont.)

- Origin: Lateral epicondyle of the femur
- Insertion: Calcaneus via the Achilles tendon
- Actions: Plantar flexes the ankle and flexes the knee
- Nerve: Tibial nerve

Soleus



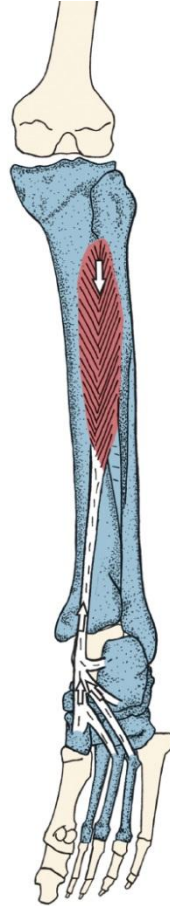
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Soleus (Cont.)

- Origins: Superior posterior third of fibular shaft and soleal line of tibia
- Insertion: Calcaneus via the Achilles tendon
- Action: Plantar flexes the ankle
- Nerve: Tibial nerve

Tibialis Posterior



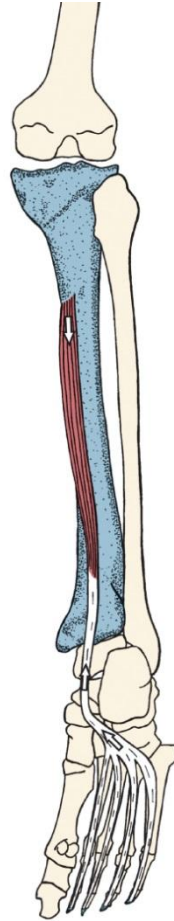
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Tibialis Posterior (Cont.)

- Origins: Posterior tibial and fibular shaft and posterior surface of the interosseous membrane
- Insertions: Plantar surfaces of most tarsals (navicular, cuneiforms, cuboid, calcaneus) and bases of metatarsals II, III, and IV
- Actions: Inverts the foot and plantar flexes the ankle
- Nerve: Tibial nerve

Flexor Digitorum Longus



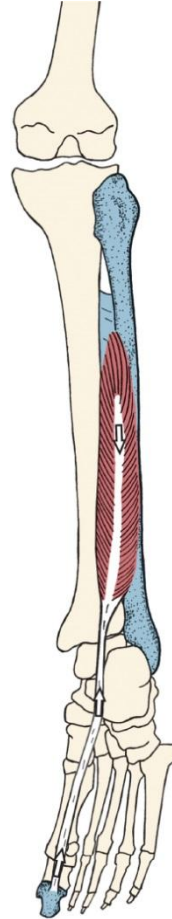
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Digitorum Longus (Cont.)

- Origin: Posterior tibial shaft
- Insertions: Distal phalanges of digits II through V
- Actions: Flexes digits II through V at the DIP, PIP, and MCP joints; plantar flexes the ankle; and inverts the foot
- Nerve: Tibial nerve

Flexor Hallucis Longus



Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Flexor Hallucis Longus (Cont.)

- Origins: Posterior fibular shaft and interosseus membrane
- Insertion: Distal phalanx of the great toe
- Actions: Flexes the great toe, plantar flexes the ankle, inverts the foot, and supports the longitudinal arch
- Nerve: Tibial nerve

Lesson 21.5

Muscles of the Neck, Face, Trunk, Vertebral Column, and Respiration

5. Identify, palpate, and produce movements of muscles in Lesson Ten (neck and facial movement), Lesson Eleven (trunk and vertebral column movement), and Lesson Twelve (respiration).

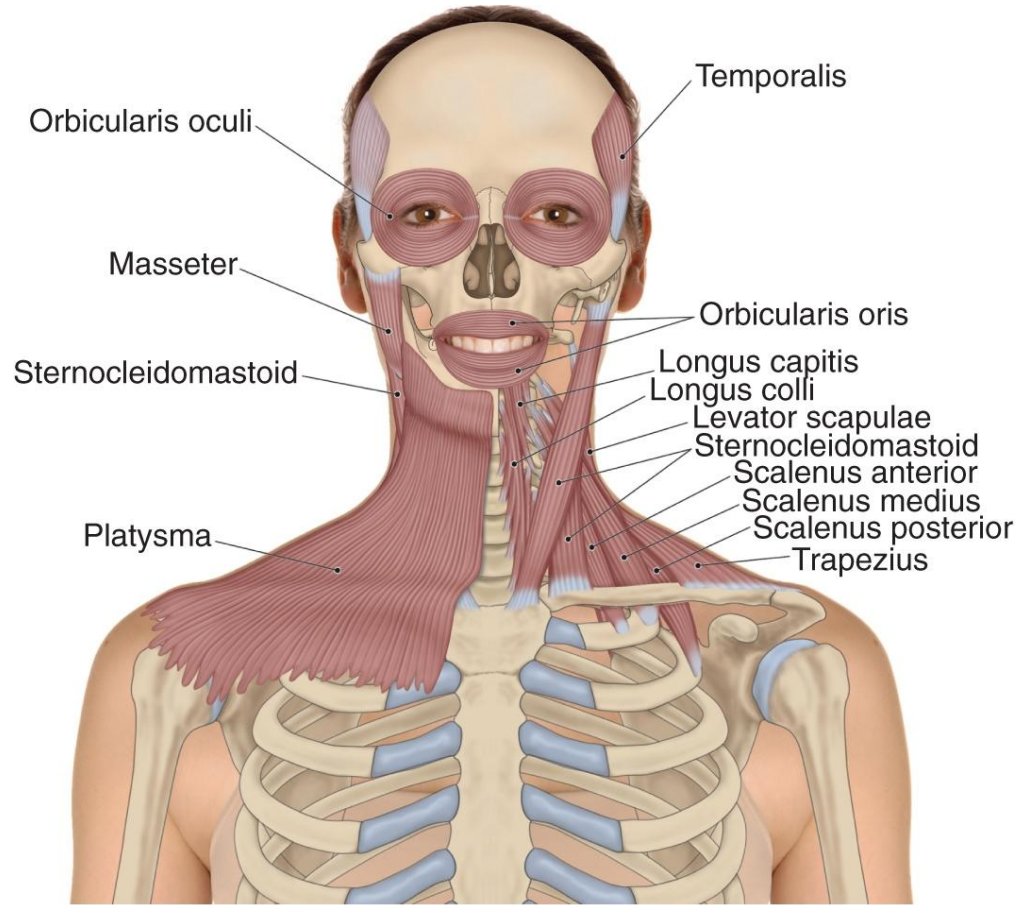
Lesson Ten: Muscles of the Neck and Facial Movement

- Occipitofrontalis
- Orbicularis oculi and oris
- Platysma
- Temporalis
- Masseter
- Lateral and medial pterygoid muscles

Lesson Ten: Muscles of the Neck and Facial Movement (Cont.)

- Sternocleidomastoid (SCM)
- Scalenus anterior, medius, and posterior
- Splenius capitis and cervicis
- Rectus capitis posterior major and minor
- Oblique capitis superior and inferior
- Levator scapulae
- Trapezius
- Spinalis
- Longissimus

Muscles of the Neck and Facial Movement

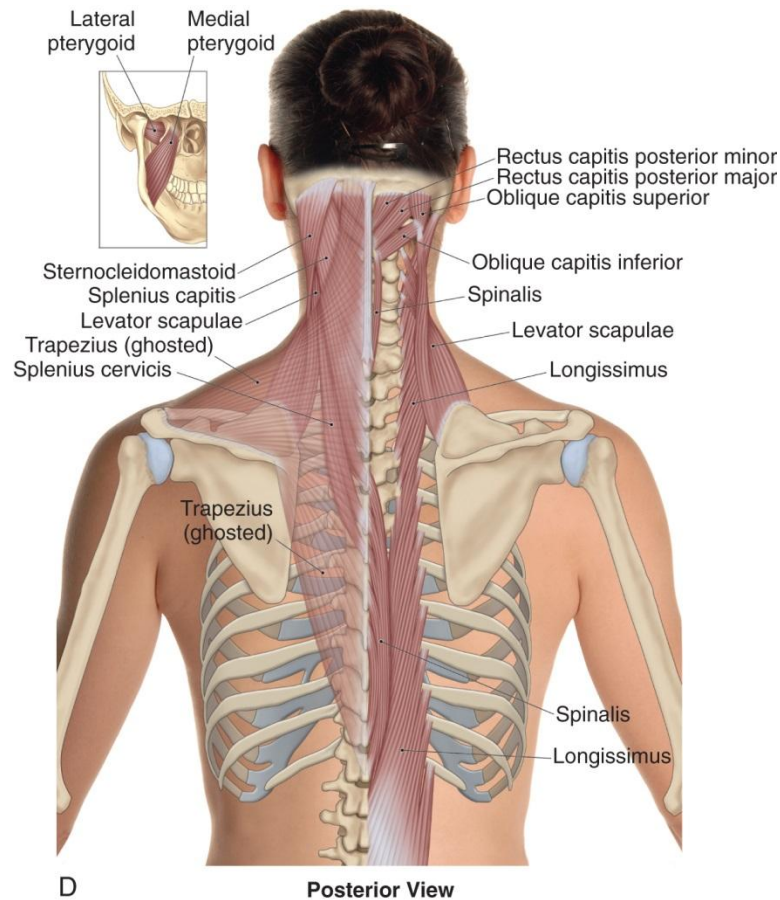


A

Anterior View

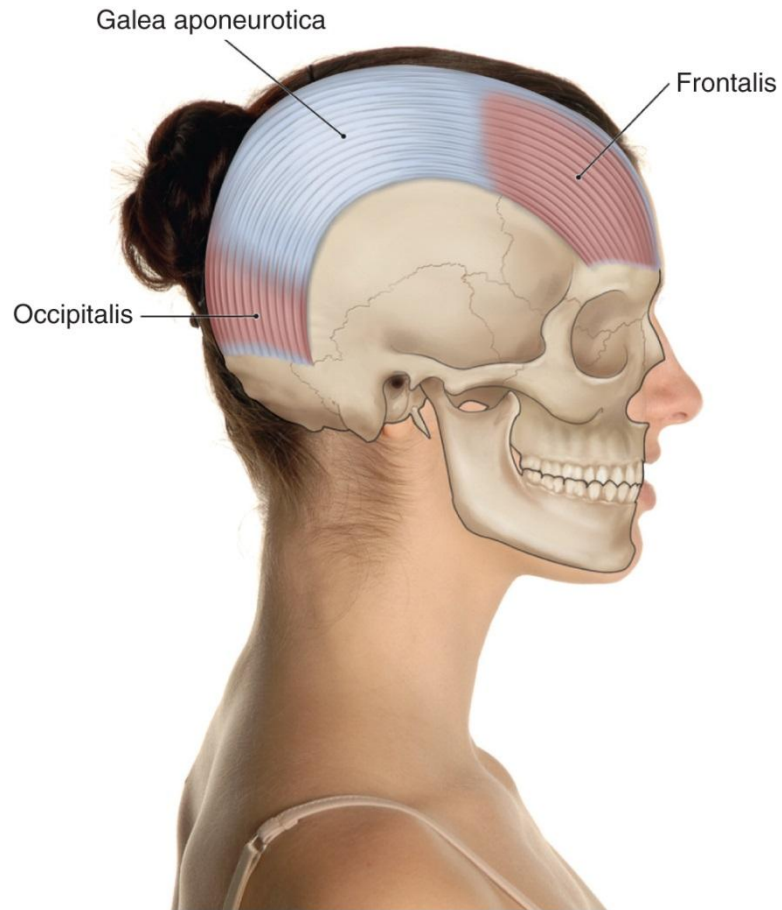
Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Muscles of the Neck and Facial Movement (Cont.)



Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Occipitofrontalis



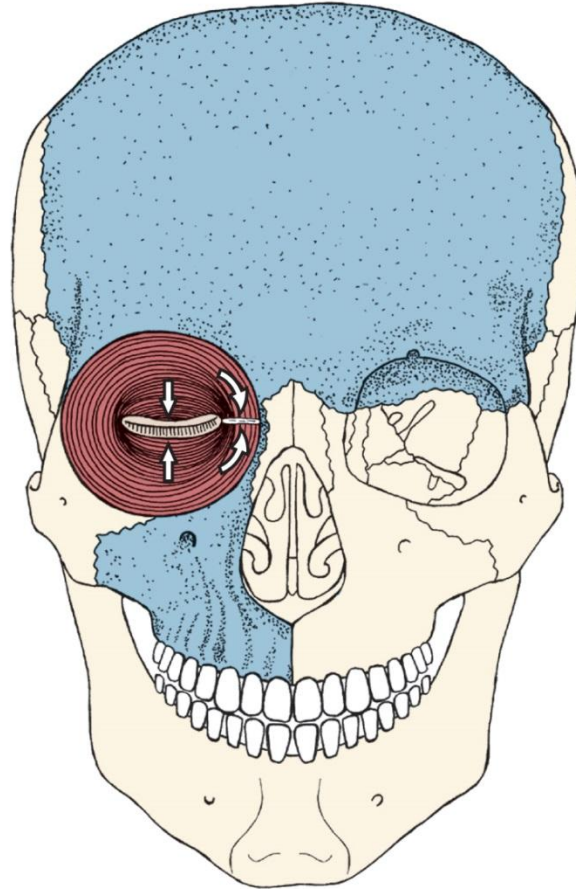
Lateral View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Occipitofrontalis (Cont.)

- Origins: Lateral two thirds of superior nuchal line (occipitalis) and galea aponeurotica (frontalis)
- Insertions: Galea aponeurotica (occipitalis) and superficial fascia beneath eyebrows (frontalis)
- Actions: Moves the scalp over the cranium (occipitalis), elevates the eyebrows (frontalis), and horizontally wrinkles the skin over the forehead (frontalis)
- Nerve: Facial nerve (cranial nerve VII)

Orbicularis Oculi



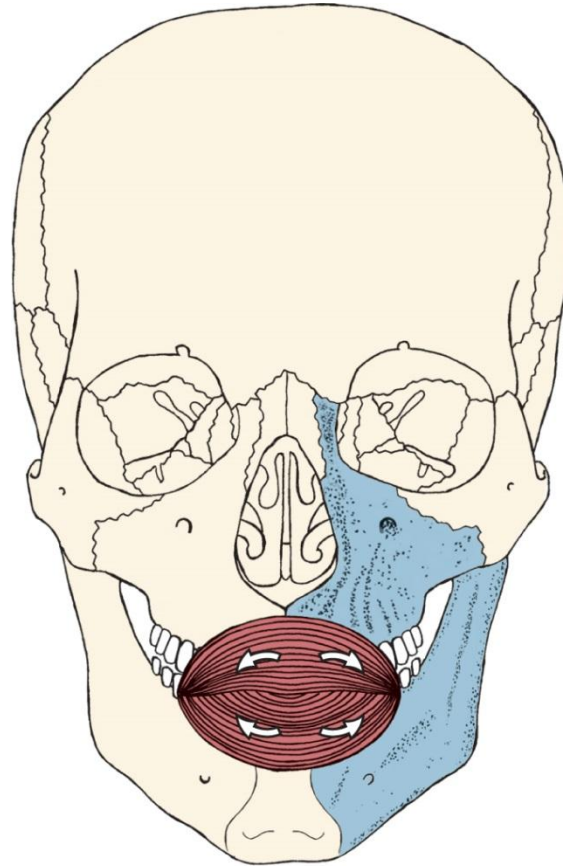
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Orbicularis Oculi (Cont.)

- Origin: Orbital margin
- Insertion: Superficial fascia beneath the upper eyelids
- Actions: Closes the eyelids, folds the skin around the orbit, and squints the eyelids
- Nerve: Facial nerve (cranial nerve VII)

Orbicularis Oris



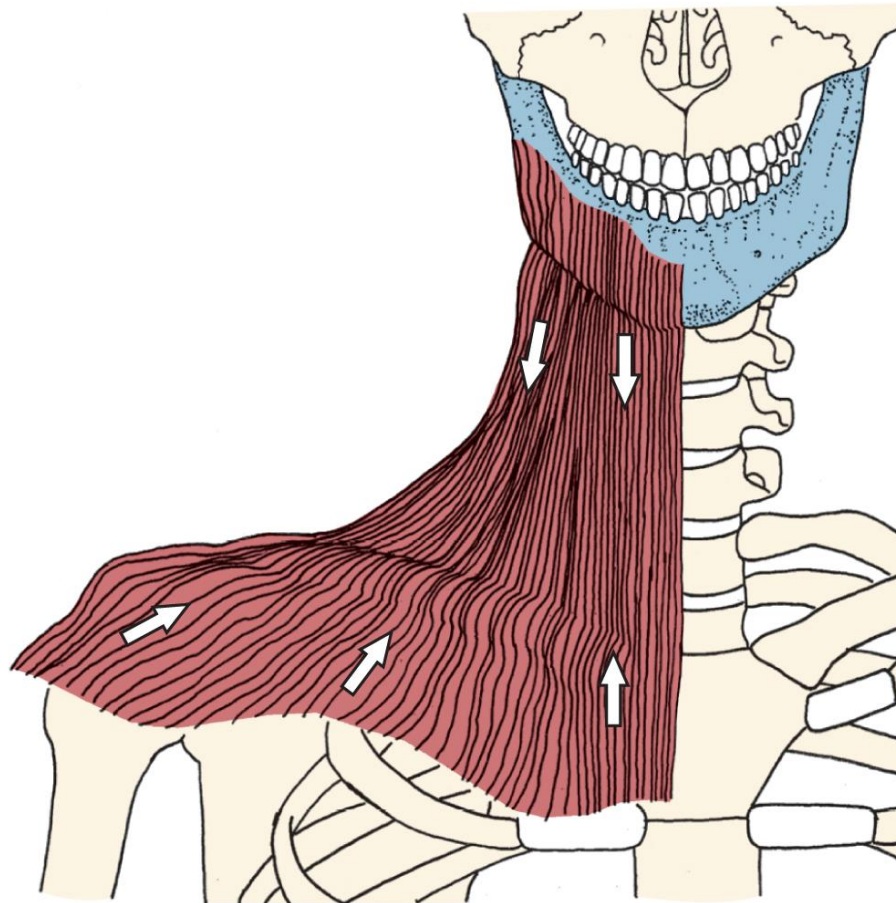
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Orbicularis Oris (Cont.)

- Origins: Maxilla and mandible
- Insertions: Mucous membranes of the lips and muscles inserting into lips
- Actions: Closes, protrudes, and protracts the lips; assists in dozens of activities such as eating, drinking, talking, and sucking
- Nerve: Facial nerve (cranial nerve VII)

Platysma



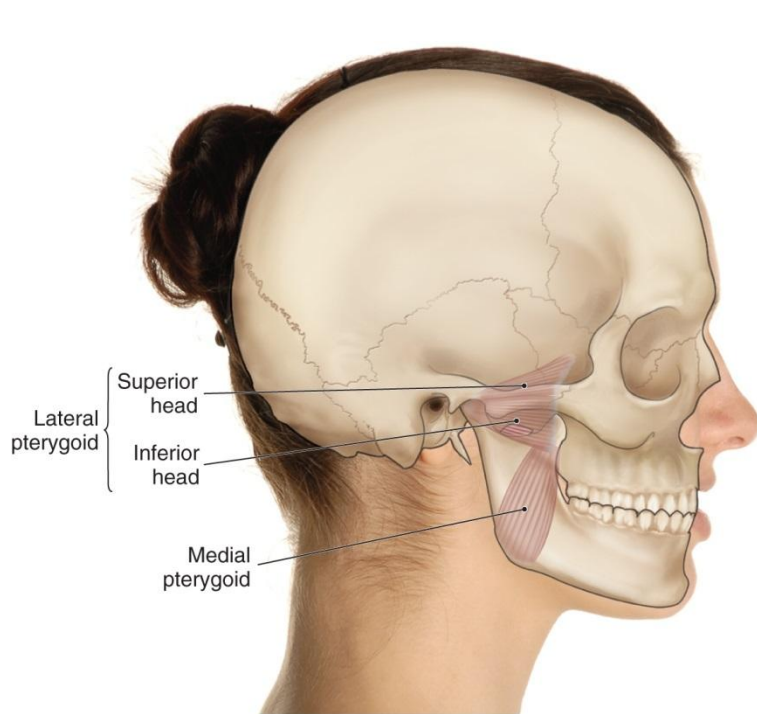
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

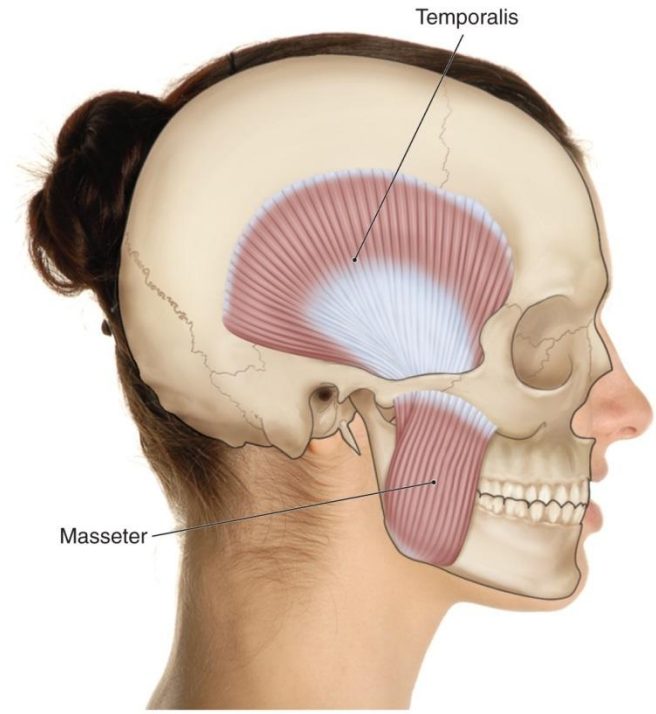
Platysma (Cont.)

- Origins: Superficial fascia of deltoid and pectoralis major
- Insertions: Mandible, muscles around angle of mouth, and superficial fascia of lower face
- Actions: Tenses the skin of the anterior neck, pulls the corner of the mouth downward and backward, and depresses the mandible
- Nerve: Facial nerve (cranial nerve VII)

Muscles of Mastication



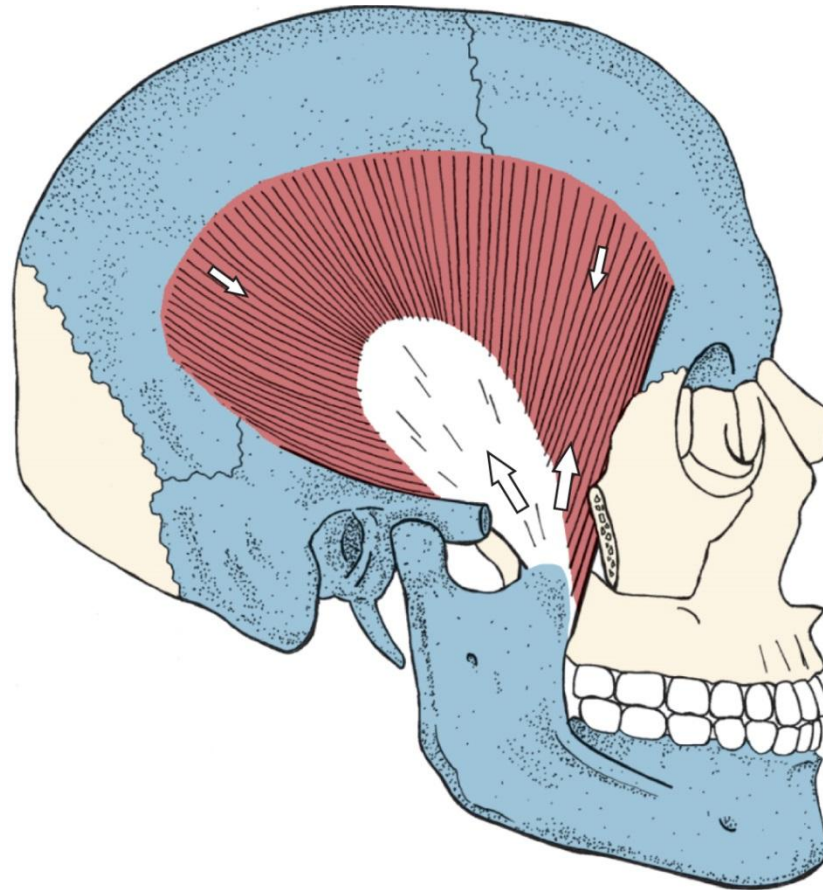
A Medial and lateral pterygoids located within the skull, Lateral View



B Masseter and temporalis which lie over the skull, Lateral View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Temporalis



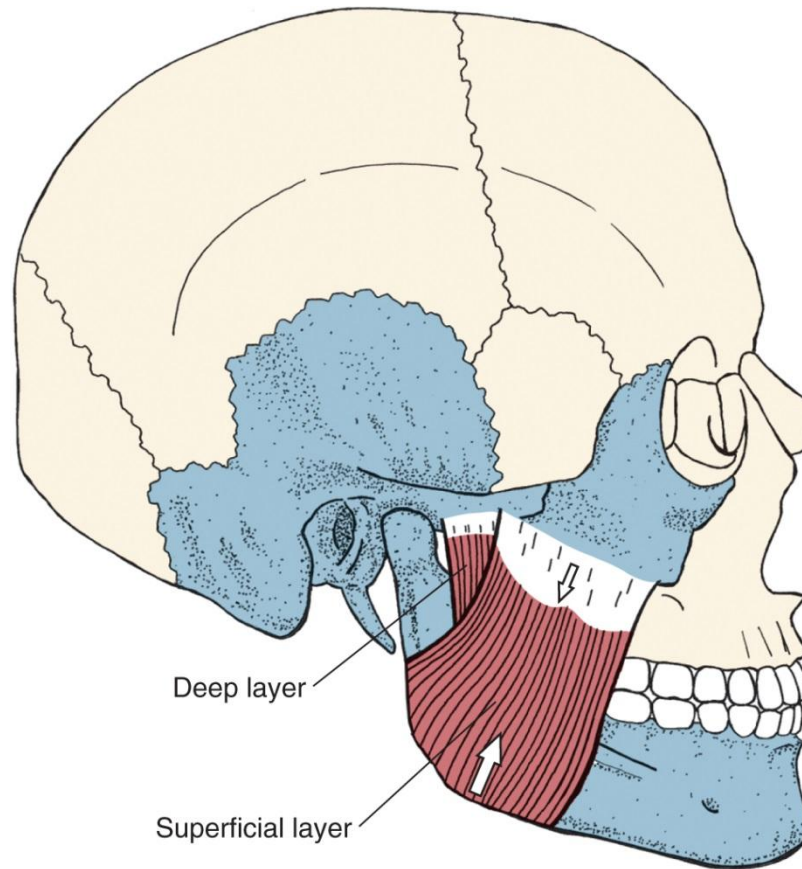
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Temporalis (Cont.)

- Origin: Temporal fossa
- Insertion: Coronoid process
- Actions: Elevates and retracts the mandible
- Nerve: Trigeminal nerve (cranial nerve V)

Masseter



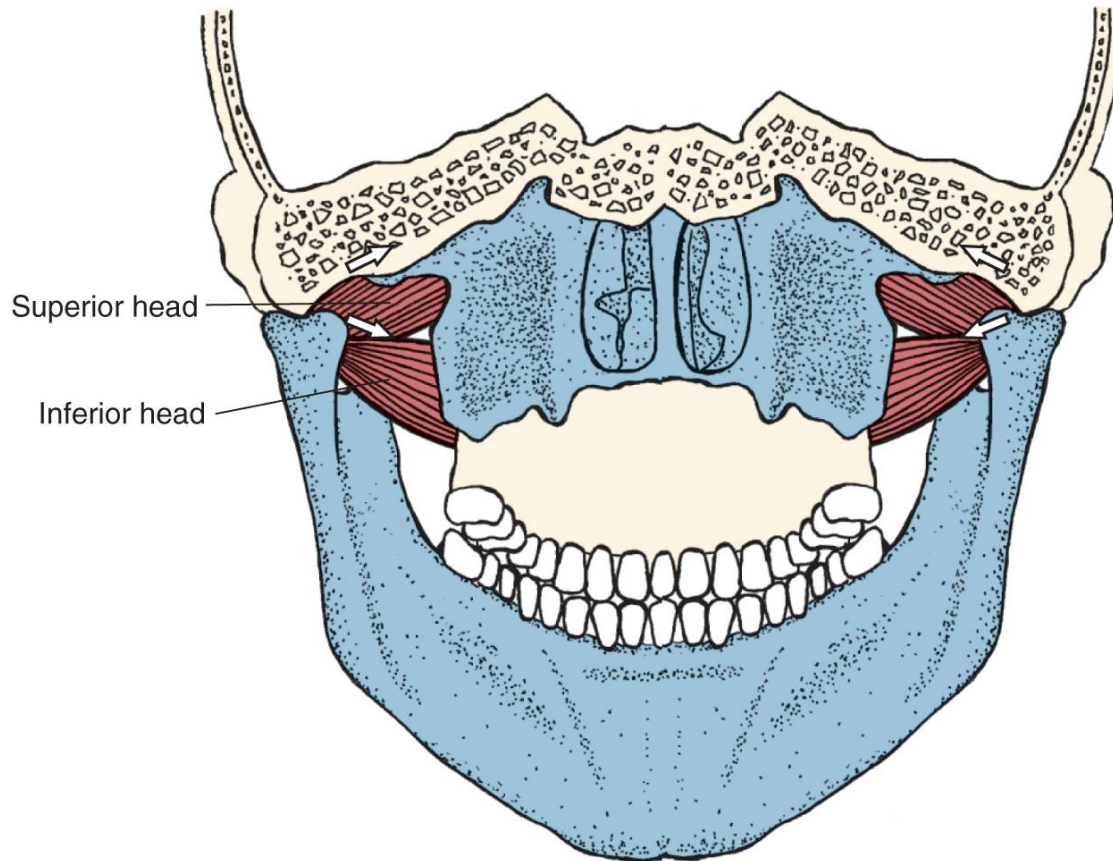
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Masseter (Cont.)

- Origin: Zygomatic arch
- Insertions: Mandibular angle and mandibular ramus
- Actions: Elevates and protracts the mandible
- Nerve: Trigeminal nerve (cranial nerve V)

Lateral Pterygoid



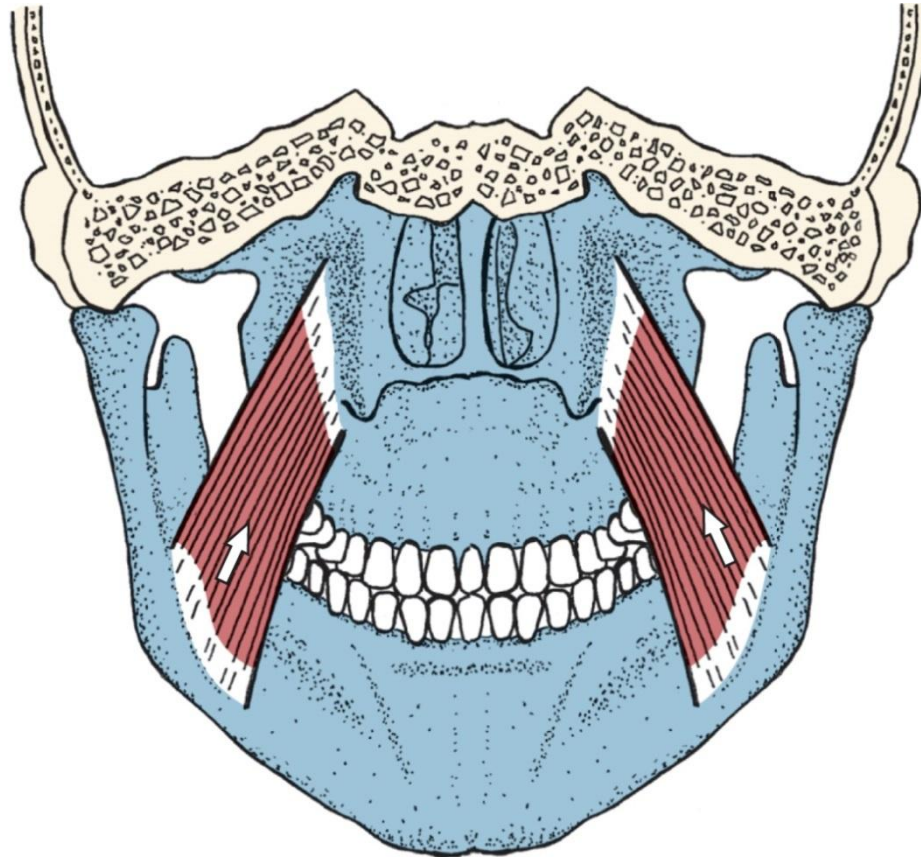
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Lateral Pterygoid (Cont.)

- Origins: Pterygoid plate of sphenoid bone and greater wing of sphenoid bone
- Insertions: Condylar process of mandible and TMJ capsule
- Actions: Produces lateral mandibular movements and depresses and protracts the mandible
- Nerve: Trigeminal nerve (cranial nerve V)

Medial Pterygoid



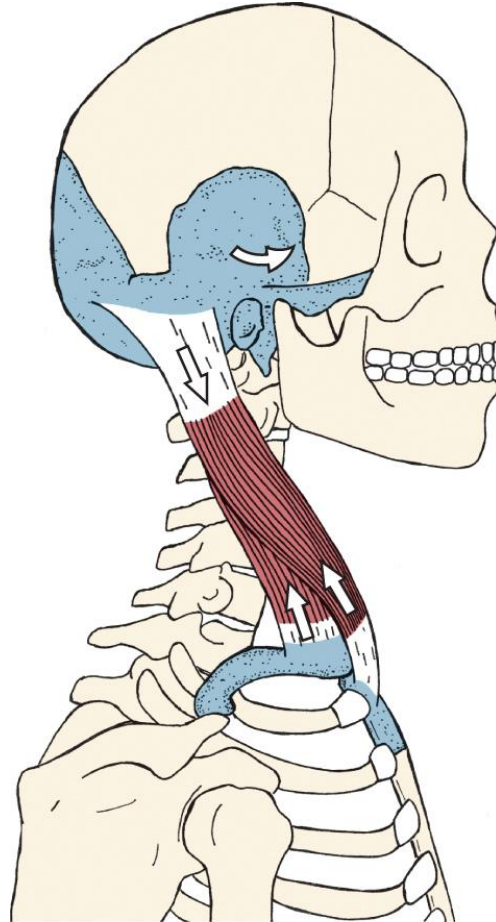
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Medial Pterygoid (Cont.)

- Origin: Pterygoid plate of sphenoid bone
- Insertions: Mandibular angle and ramus (interior surface)
- Actions: Produces lateral mandibular movements and elevates and protracts the mandible
- Nerve: Trigeminal nerve (cranial nerve V)

Sternocleidomastoid



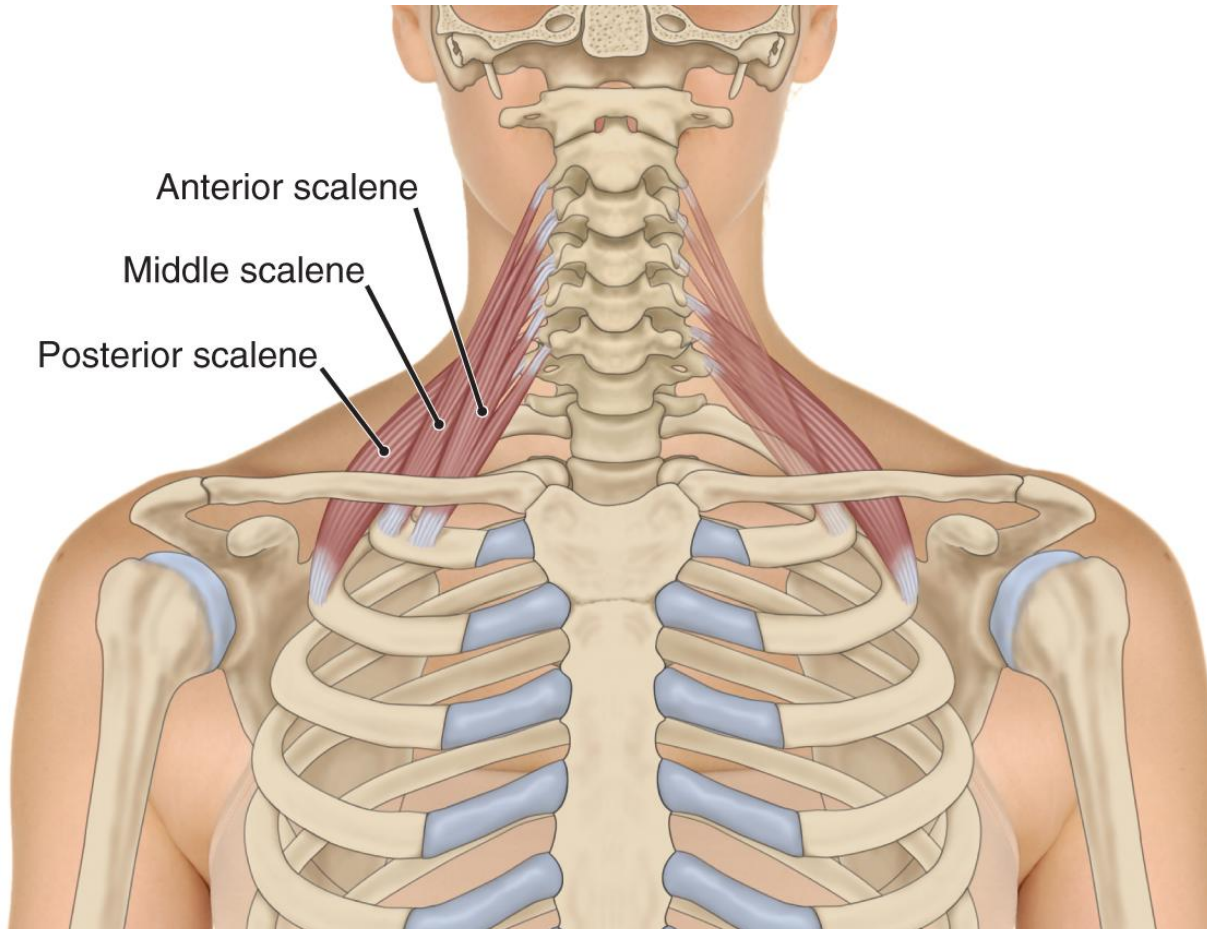
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Sternocleidomastoid (Cont.)

- Origins: Manubrium of sternum and medial third of clavicle
- Insertions: Mastoid process and superior nuchal line
- Actions: Laterally flexes the neck (unilateral contraction), rotates the head to opposite side, flexes the neck (bilateral contraction), and elevates the sternum to assist in forced inspiration
- Nerve: Spinal accessory nerve (cranial nerve XI)

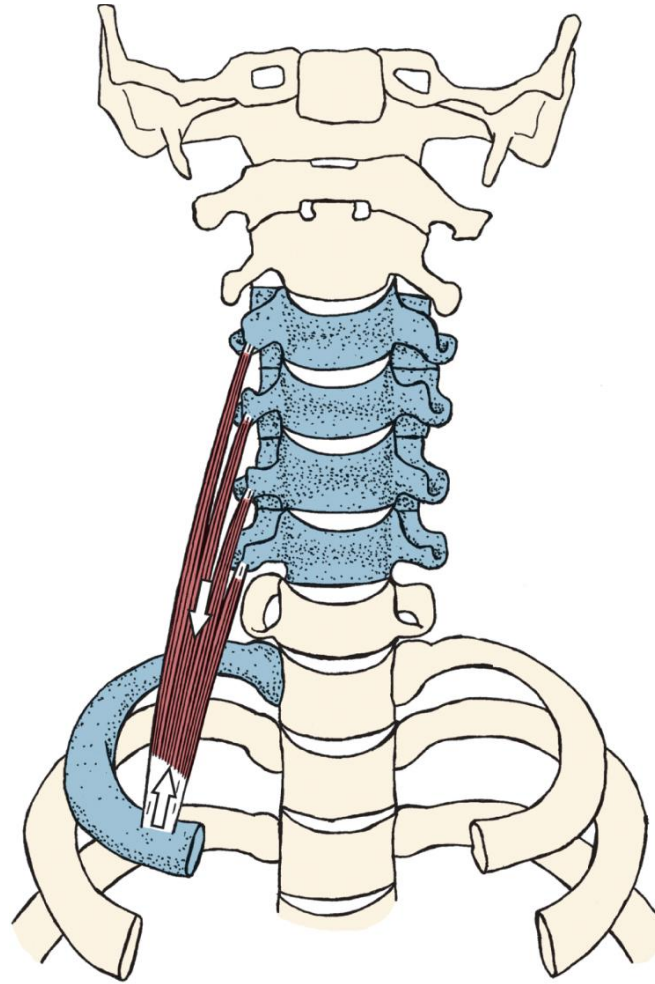
Scalenes



Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Scalenus Anterior



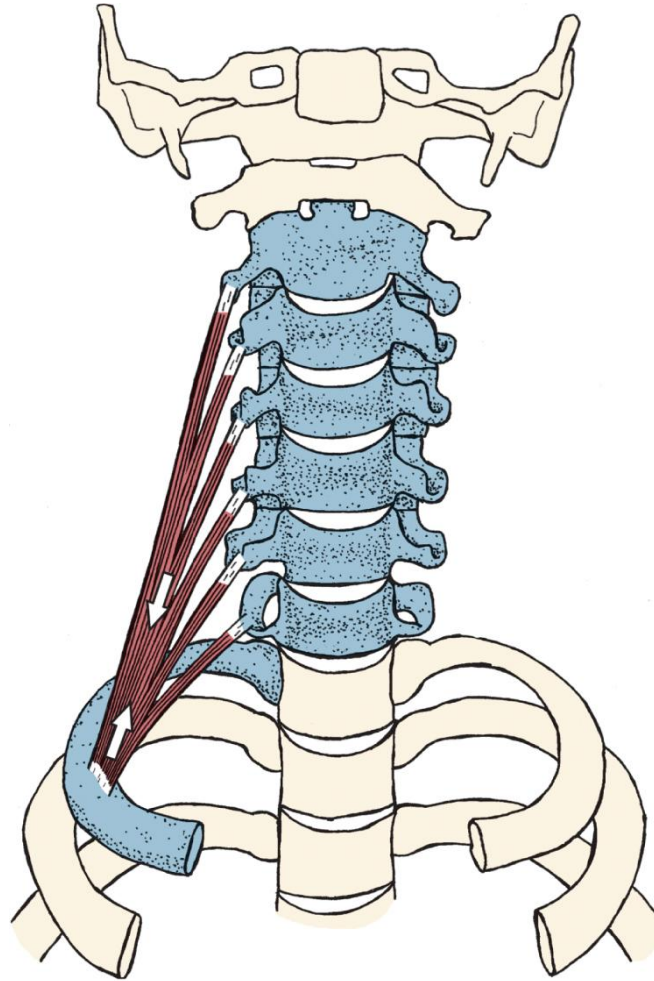
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Scalenus Anterior (Cont.)

- Origins: Transverse processes of C3 through C6
- Insertion: Rib 1
- Actions: Flexes the neck (bilateral contraction, laterally flexes the neck (unilateral contraction), rotates the head, and elevates the first rib during forced inspiration
- Nerves: Anterior rami of cervical nerves

Scalenus Medius



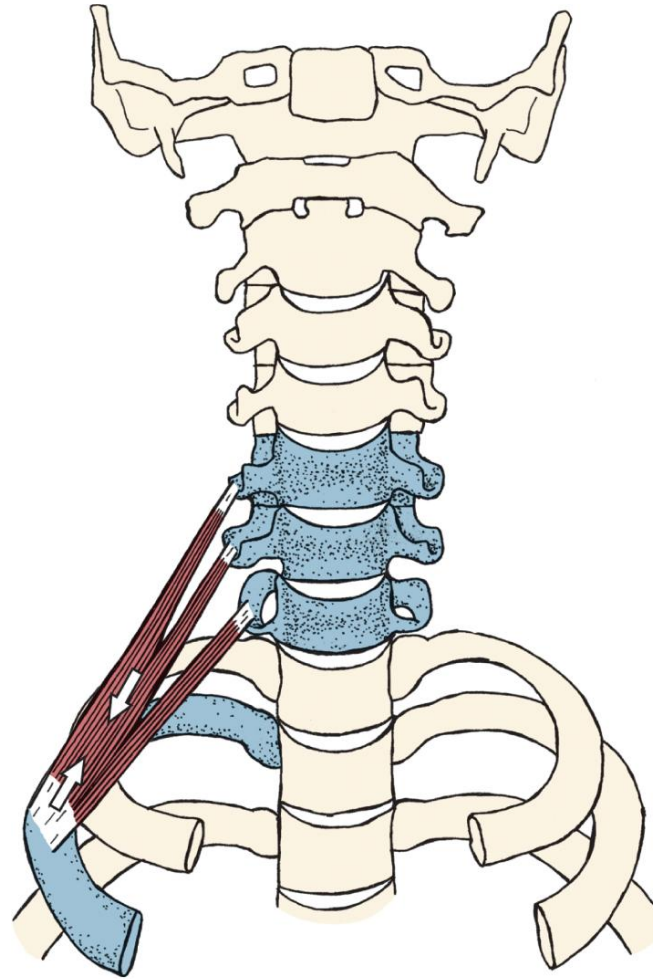
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Scalenus Medius (Cont.)

- Origins: Transverse processes of C2 through C7
- Insertion: Rib 1
- Actions: Flexes the neck (bilateral contraction), laterally flexes the neck (unilateral contraction), rotates the head, and elevates first rib during inspiration
- Nerves: Anterior rami of cervical nerves

Scalenus Posterior



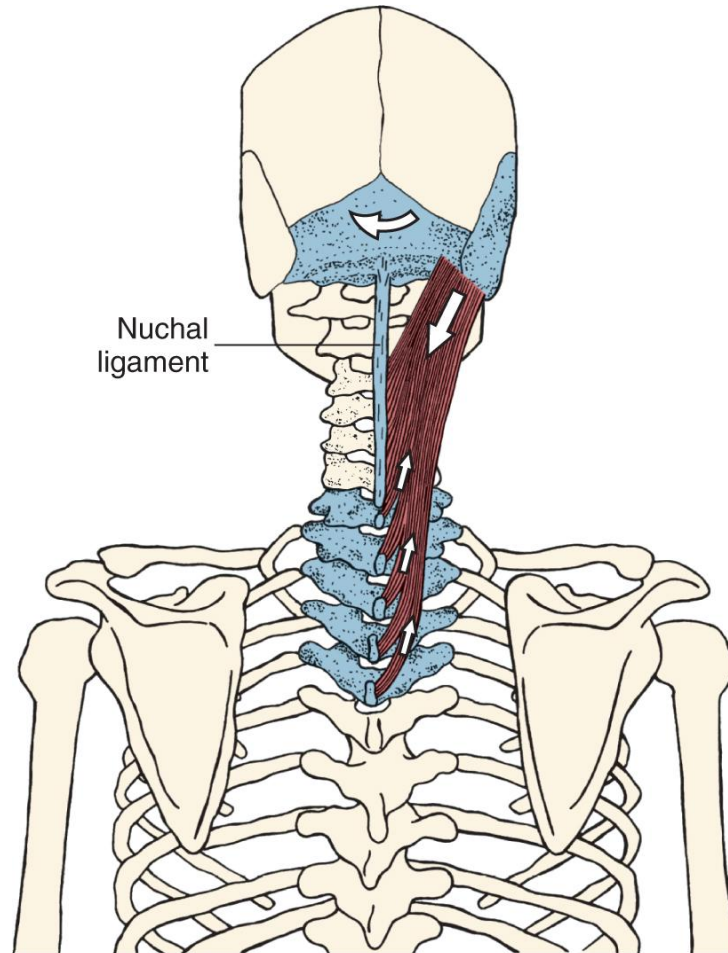
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Scalenus Posterior (Cont.)

- Origins: Transverse processes of C5 through C7
- Insertion: Rib 2
- Actions: Laterally flexes the neck and elevates second rib during inspiration
- Nerves: Anterior rami of cervical nerves

Splenius Capitis



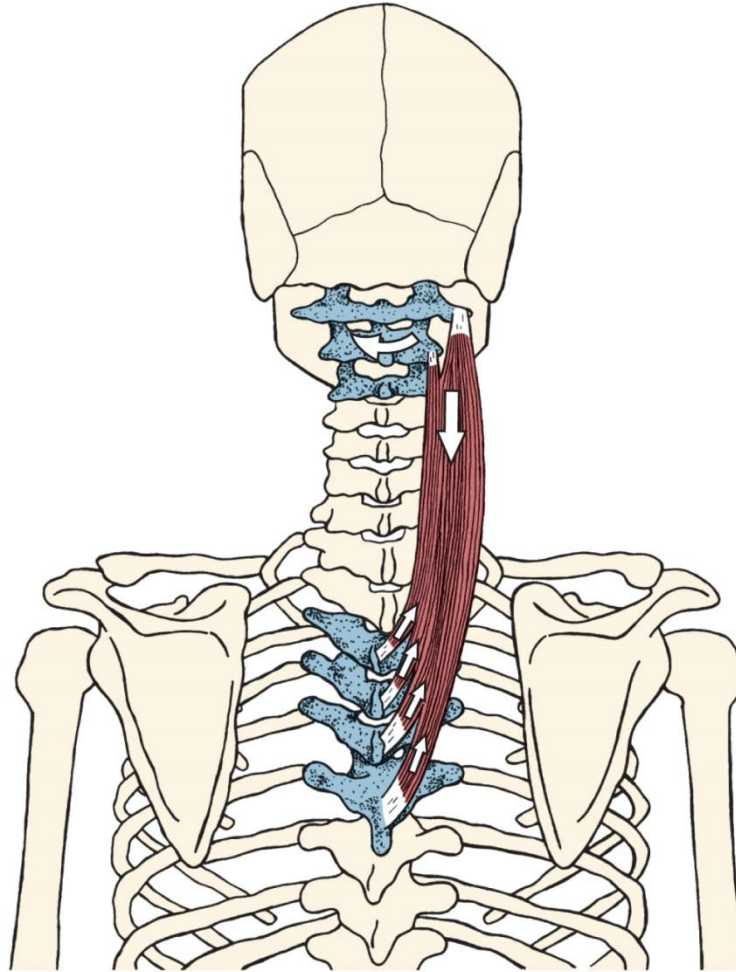
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Splenius Capitis (Cont.)

- Origins: Nuchal ligament (level of C3) and spinous processes of C7 through T4
- Insertions: Mastoid process and superior nuchal line
- Actions: Rotates and extends the head and laterally flexes the neck
- Nerves: Posterior rami of the middle lower cervical nerves

Splenius Cervicis



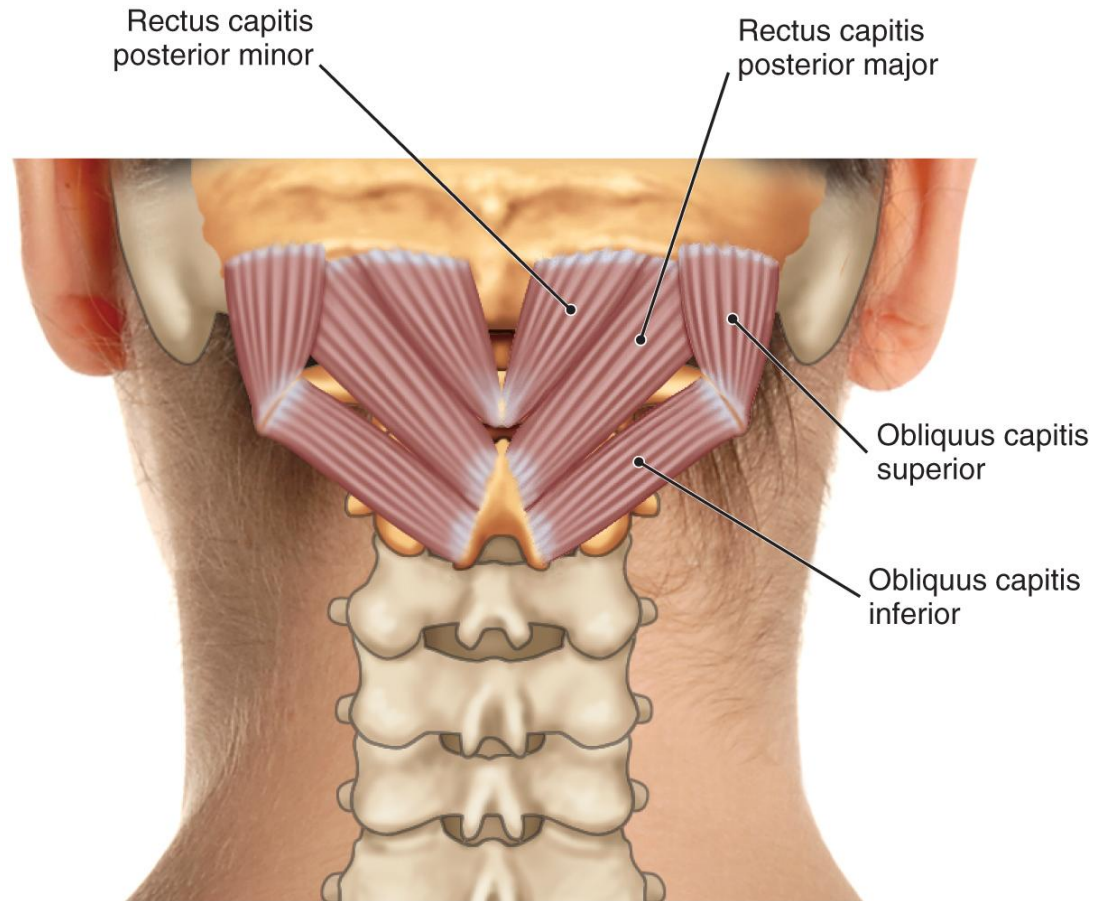
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Splenius Cervicis (Cont.)

- Origins: Spinous processes of T3 through T6
- Insertions: Transverse processes of C1 through C3
- Actions: Rotates and extends the head and laterally flexes the neck
- Nerves: Posterior rami of the middle lower cervical nerves

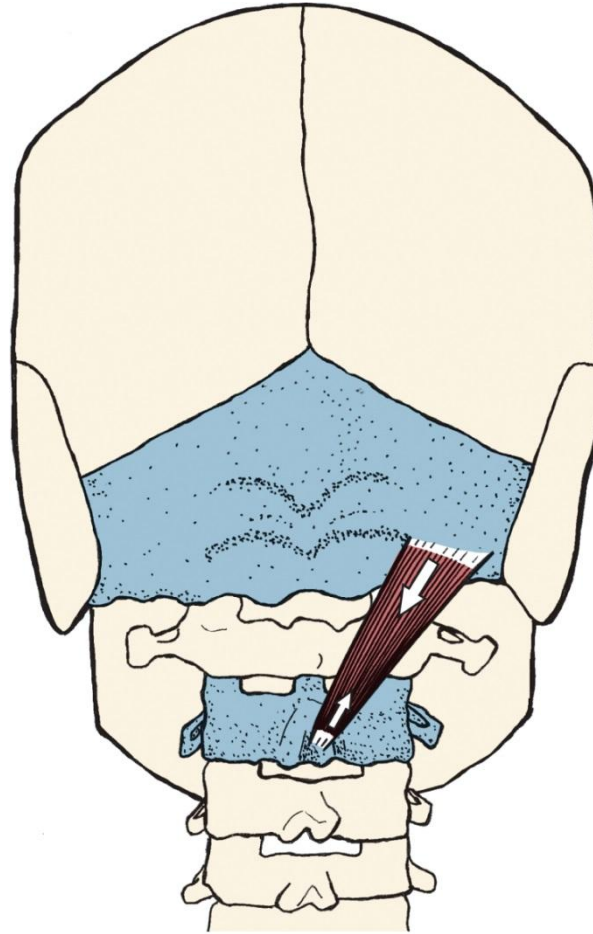
Suboccipitals



Posterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Rectus Capitis Posterior Major



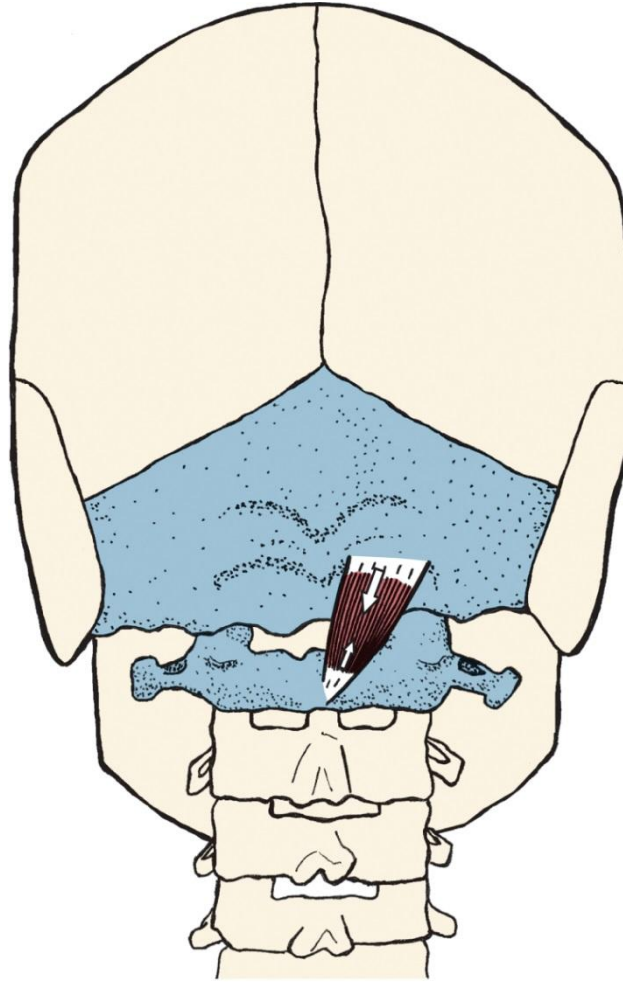
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Rectus Capitis Posterior Major (Cont.)

- Origin: Spinous process of C2
- Insertion: Lateral inferior nuchal line
- Actions: Extends and rotates the head
- Nerve: Suboccipital nerve

Rectus Capitis Posterior Minor



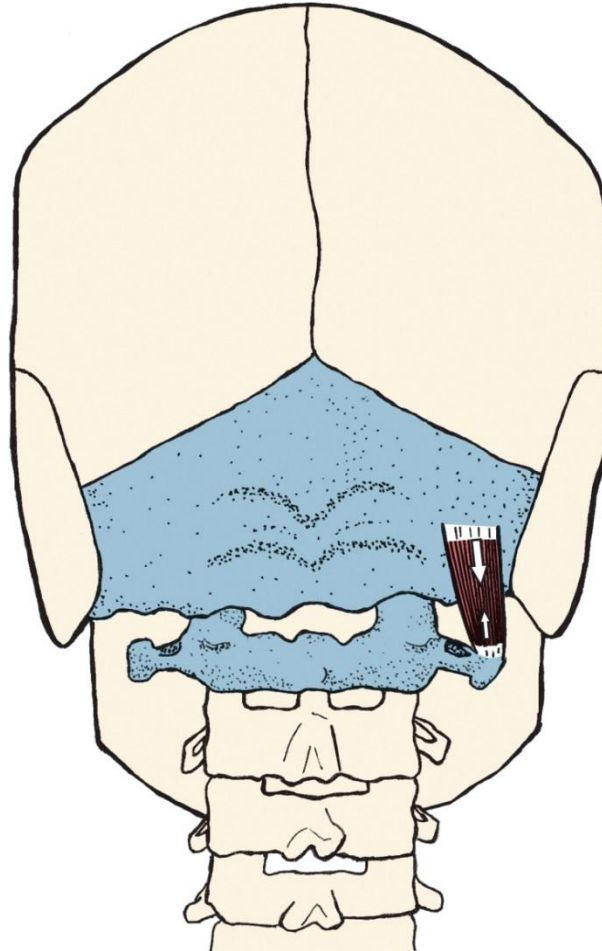
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Rectus Capitis Posterior Minor (Cont.)

- Origin: Posterior tubercle of C1
- Insertion: Medial inferior nuchal line
- Action: Extends the head
- Nerve: Suboccipital nerve

Oblique Capitis Superior



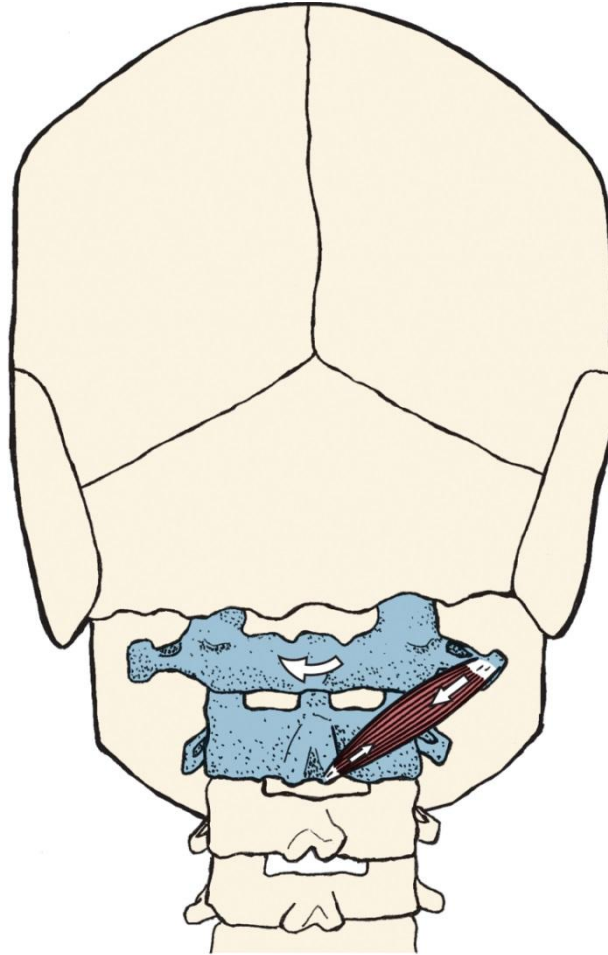
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Oblique Capitis Superior (Cont.)

- Origin: Transverse process of C1
- Insertion: Inferior nuchal line
- Actions: Extends and laterally flexes the head
- Nerve: Suboccipital nerve

Oblique Capitis Inferior



Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

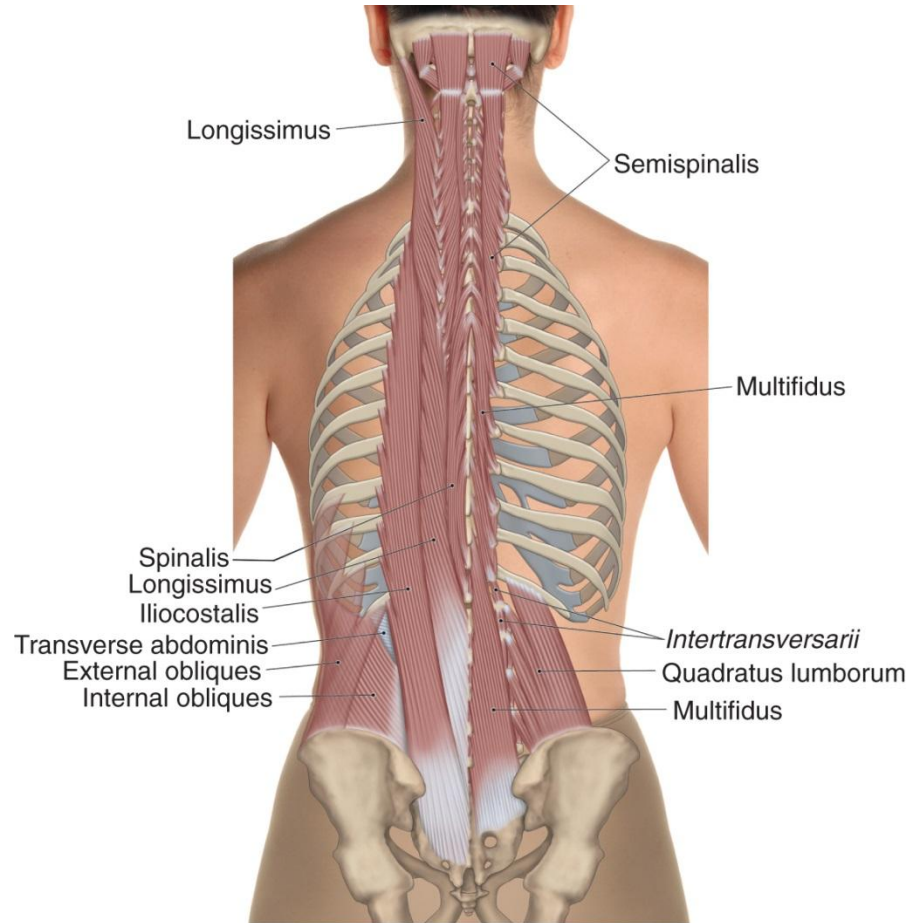
Oblique Capitis Inferior (Cont.)

- Origin: Spinous process of C2
- Insertion: Transverse process of C1
- Action: Rotates the head
- Nerve: Suboccipital nerve

Lesson Eleven: Muscles of Trunk and Vertebral Column Movement

- Rectus abdominis
- External and internal obliques
- Transverse abdominis
- Quadratus lumborum (QL)
- Semispinalis
- Rotatores
- Multifidus
- Spinalis
- Longissimus
- Iliocostalis

Muscles of the Trunk and Vertebral Column

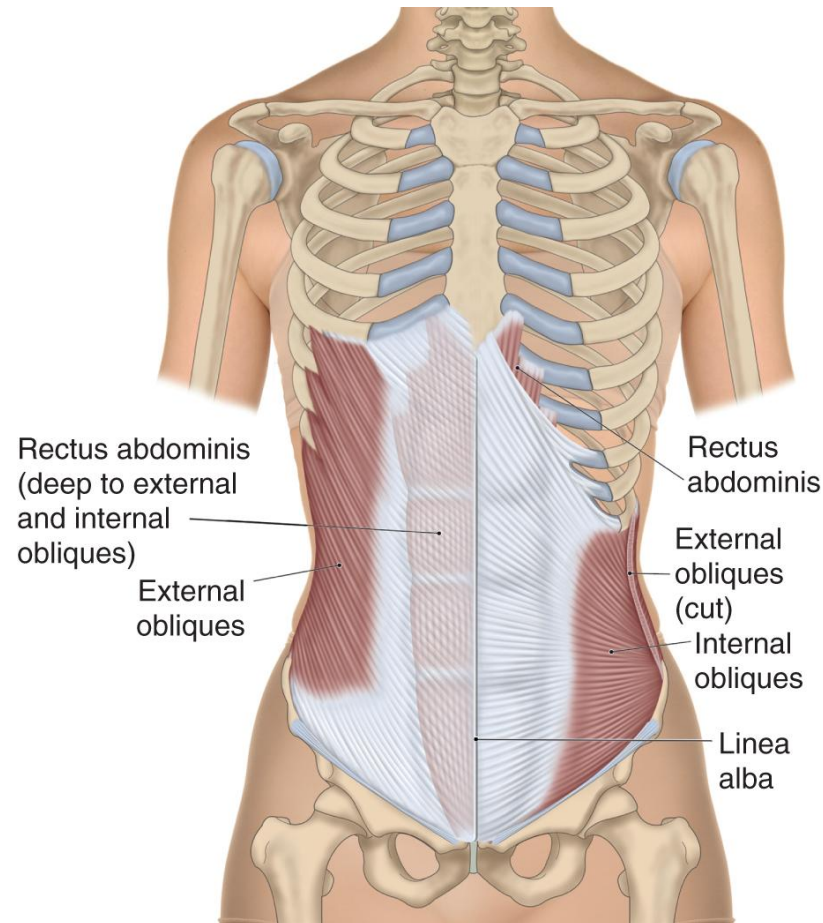


A

Posterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Abdominals

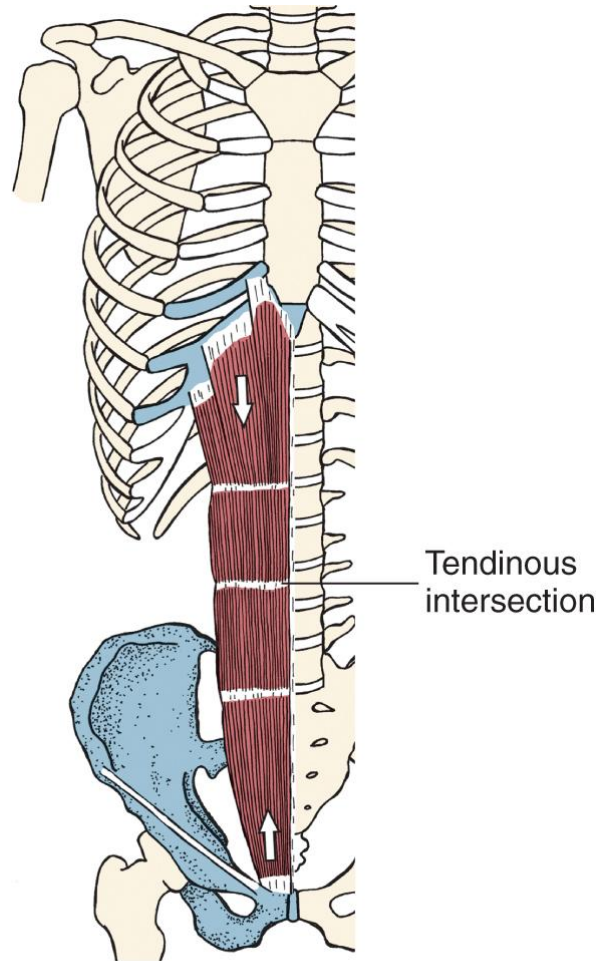


B

Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Rectus Abdominis



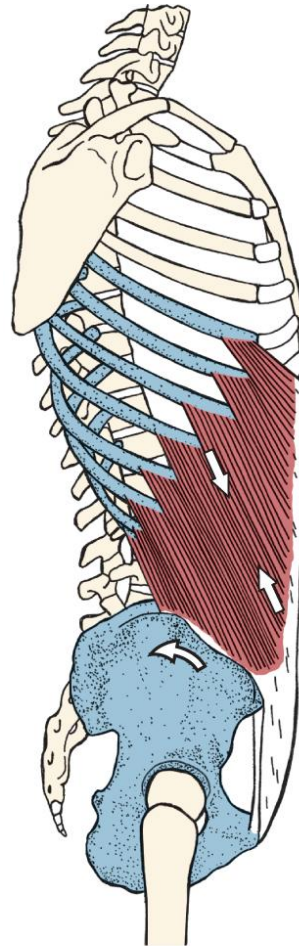
Anterior View

Neumann DA: *Kinesiology of the Musculoskeletal System*,
ed 2, St. Louis, 2010, Mosby.

Rectus Abdominis (Cont.)

- Origins: Pubic symphysis and pubic tubercle
- Insertions: Ribs 5 through 7 and xiphoid process
- Actions: Flexes and laterally flexes the vertebral column, compresses abdominal contents, and posteriorly tilts the pelvis
- Nerves: Anterior rami of intercostal nerves (T7 through T12)

External Obliques



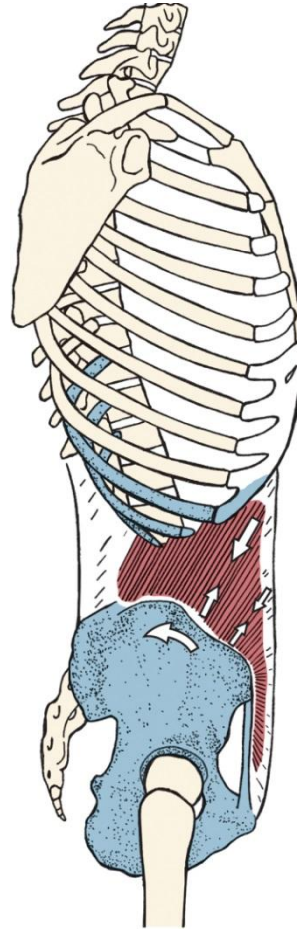
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

External Obliques (Cont.)

- Origins: Anterior iliac crest, abdominal fascia or aponeurosis, linea alba, and pubic crest
- Insertions: Ribs 5 through 12
- Actions: Laterally flexes, rotates, and flexes the vertebral column, compresses abdomen contents, and posteriorly tilts the pelvis
- Nerves: Anterior rami of intercostal nerves (T7 through T12)

Internal Obliques



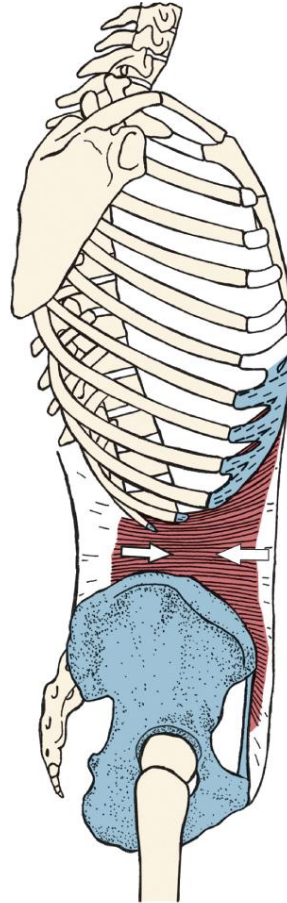
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Internal Obliques (Cont.)

- Origins: Iliac crest, thoracolumbar fascia, and inguinal ligament
- Insertions: Ribs 9 through 12 and linea alba
- Actions: Laterally flexes, rotates, and flexes the vertebral column, compresses abdominal contents, and posteriorly tilts the pelvis
- Nerves: Anterior rami of intercostal nerves

Transverse Abdominis



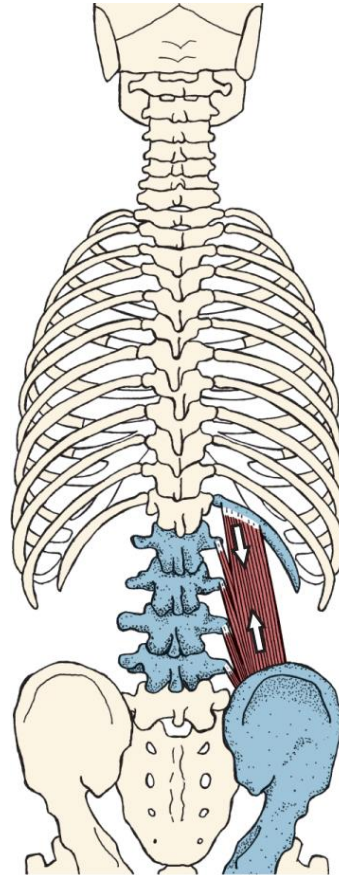
Lateral View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Transverse Abdominis (Cont.)

- Origins: Ribs 7 through 12, iliac crest, thoracolumbar aponeurosis, and inguinal ligament
- Insertions: Abdominal aponeurosis and linea alba
- Action: Compresses abdominal contents
- Nerves: Anterior rami of intercostal nerves

Quadratus Lumborum



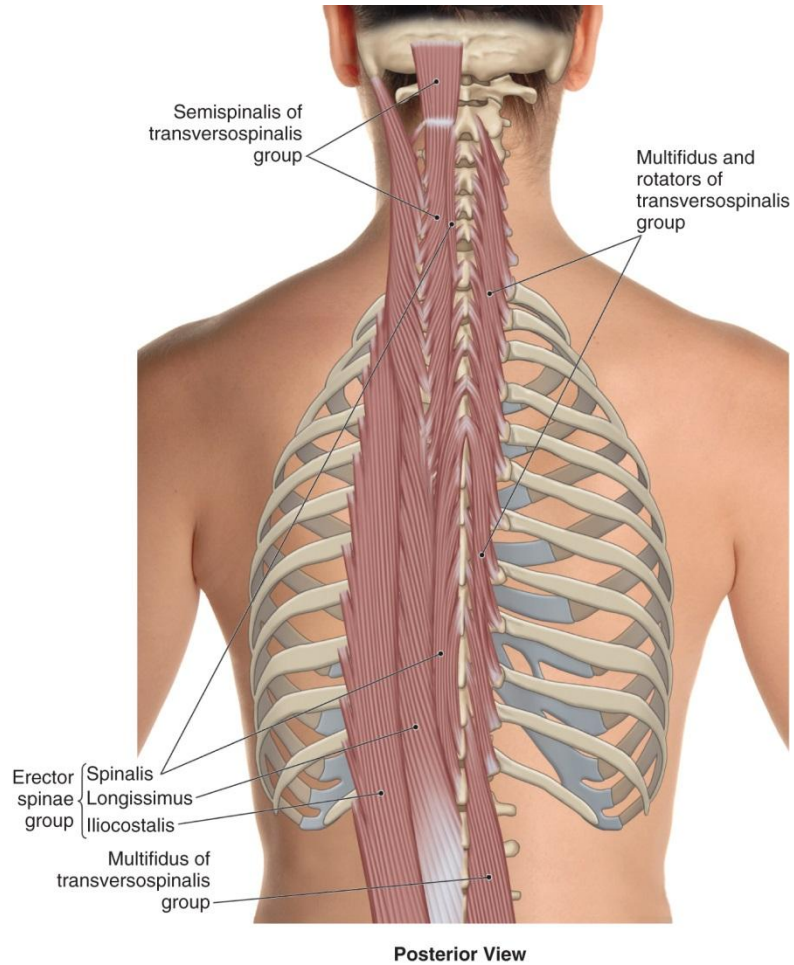
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Quadratus Lumborum (Cont.)

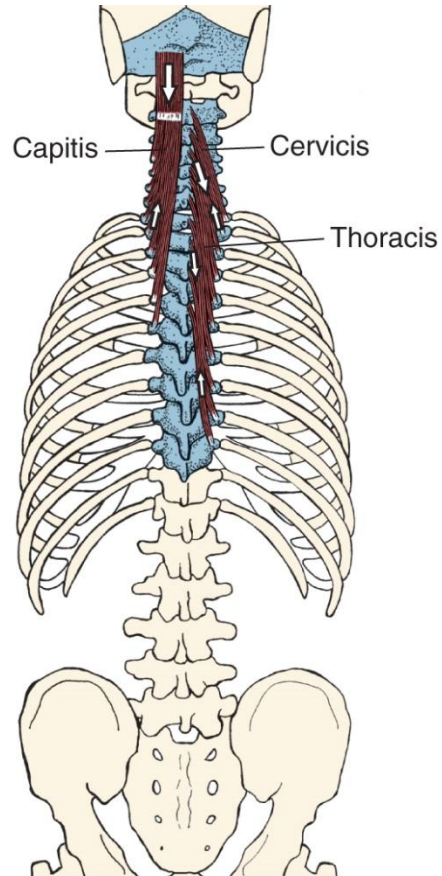
- Origin: Posterior iliac crest
- Insertions: Rib 12 and transverse processes of L1 through L4
- Actions: Laterally flexes the vertebral column, elevates the hip, extends the lumbar spine, and anteriorly tilts the pelvis
- Nerves: Lumbar plexus

Paraspinals



Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Transversospinalis Group: Semispinalis



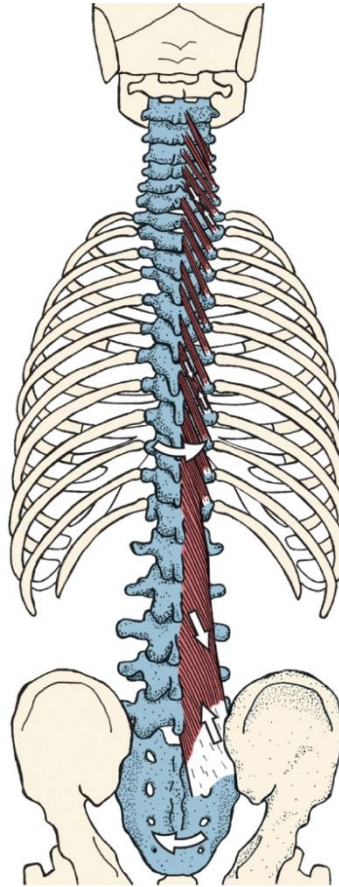
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Transversospinalis Group: Semispinalis (Cont.)

- Origins: Transverse process of one vertebra
- Insertions: Between superior and inferior nuchal lines and spinous processes of the fifth, sixth, and seventh vertebral segments above
- Actions: Rotates and extends the vertebral column
- Nerves: Posterior rami of cervical and thoracic spinal nerves

Transversospinalis Group: Multifidus



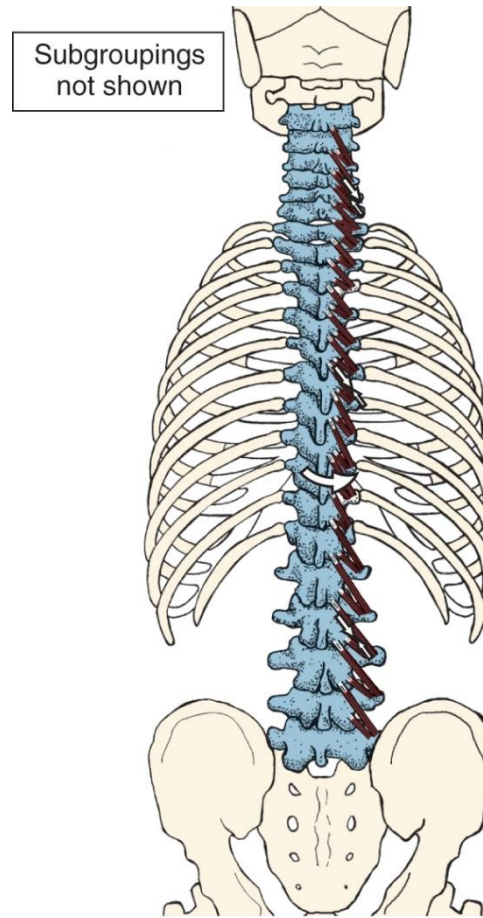
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Transversospinalis Group: Multifidus (Cont.)

- Origins: Transverse process of one vertebral segment
- Insertions: Spinous processes of the second, third, and fourth vertebral segments above
- Actions: Rotates, laterally flexes, and extends the vertebral column
- Nerves: Posterior rami of spinal nerves

Transversospinalis Group: Rotatores



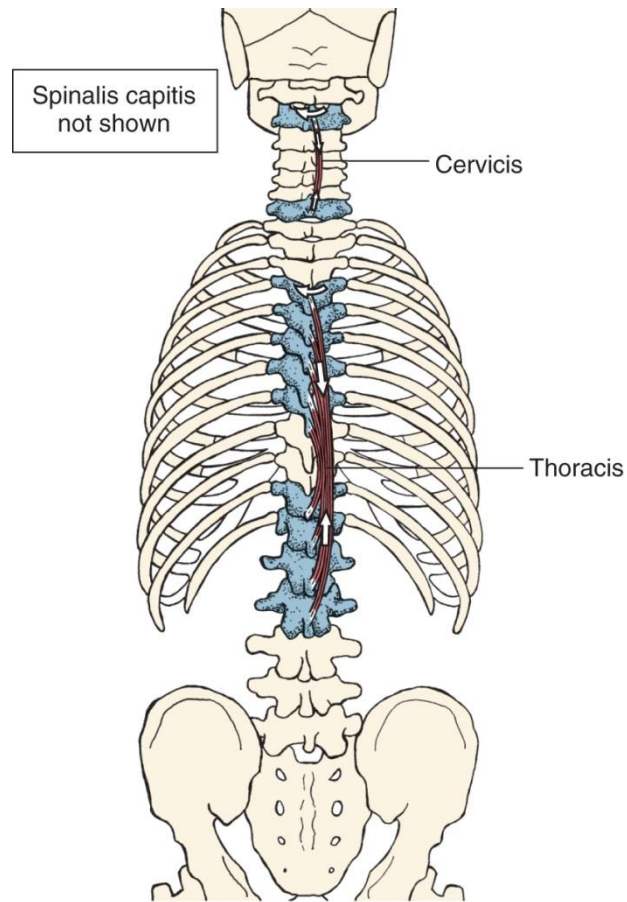
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Transversospinalis Group: Rotatores (Cont.)

- Origins: Transverse process of one vertebral segment
- Insertions: Spinous processes of first or second vertebral segments above
- Actions: Rotates and extends the vertebral column
- Nerves: Posterior rami of spinal nerves

Erector Spinae Group: Spinalis



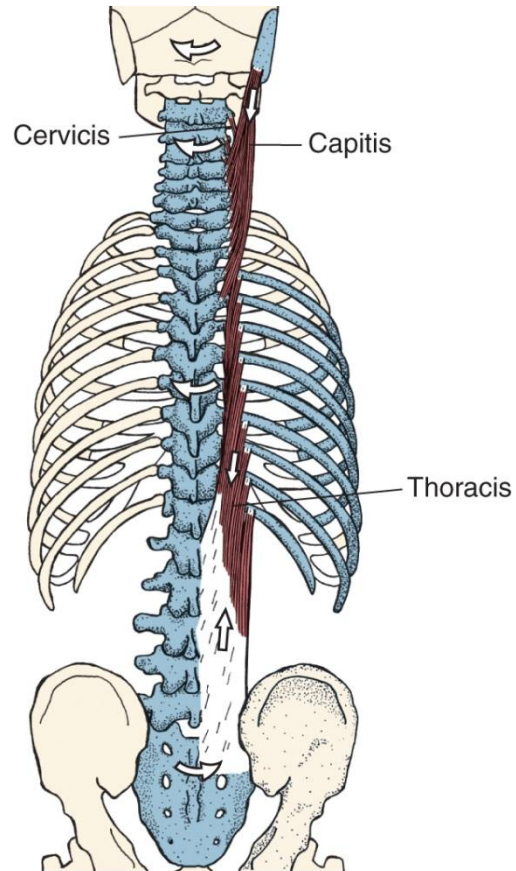
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Erector Spinae Group: Spinalis (Cont.)

- Origins: Spinous processes of C4 through T12, and C7 and nuchal ligament
- Insertions: Spinous processes of C2 and upper thoracic, and occipital bone (between superior and inferior nuchal lines)
- Actions: Laterally flexes and extends the vertebral column
- Nerves: Posterior rami of thoracic and lower cervical spinal nerves

Erector Spinae Group: Longissimus



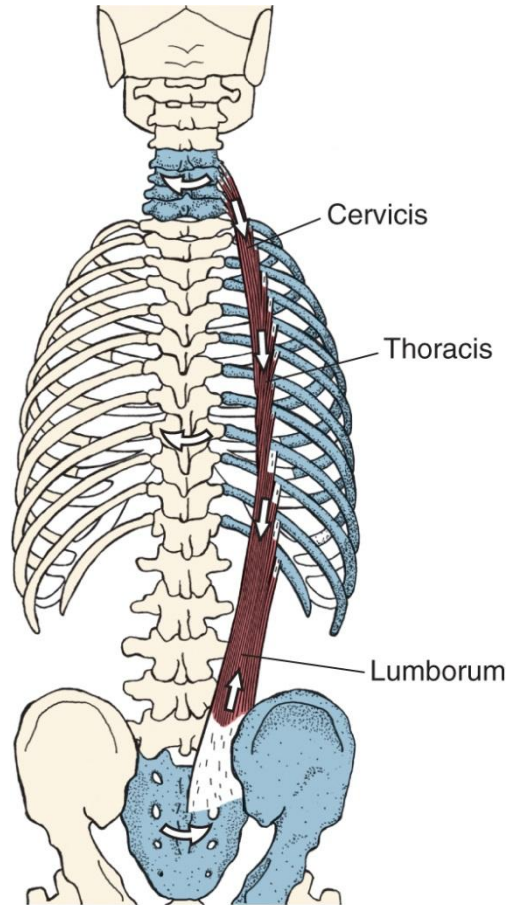
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Erector Spinae Group: Longissimus (Cont.)

- Origins: Posterior sacrum, transverse processes of T1 through T5 and L1 through L5, and transverse processes of C5 through C7
- Insertions: Mastoid process, transverse processes of C2 through T12, and ribs 4 through 12
- Actions: Laterally flexes, rotates, and extends the vertebral column, and extends the head
- Nerves: Posterior rami of lumbar, thoracic, and lower cervical spinal nerves

Erector Spinae Group: Iliocostalis



Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

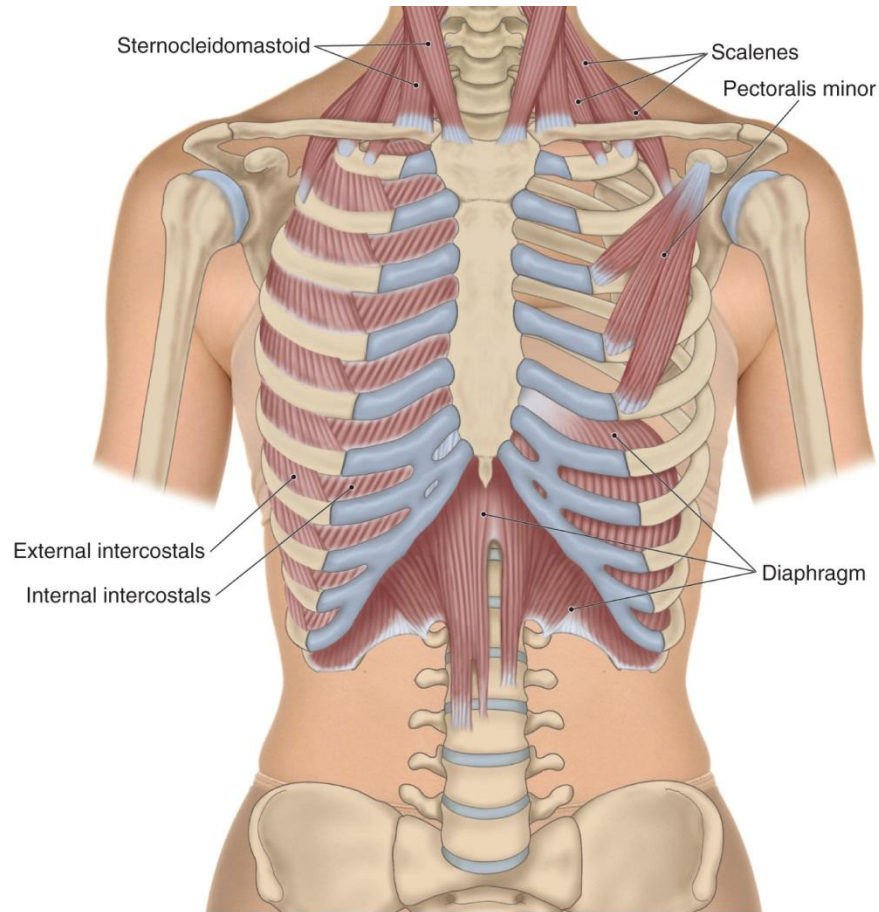
Erector Spinae Group: Iliocostalis (Cont.)

- Origins: Posterior iliac crest, posterior sacrum, and ribs 3 through 12
- Insertions: Ribs 1 through 12 and transverse processes of C4 through C7
- Actions: Laterally flexes and extends the vertebral column
- Nerves: Posterior rami of upper lumbar, thoracic, and lower cervical spinal nerves

Lesson Twelve: Muscles of Respiration

- Diaphragm
- External intercostals
- Internal intercostals
- Serratus posterior superior
- Serratus posterior inferior

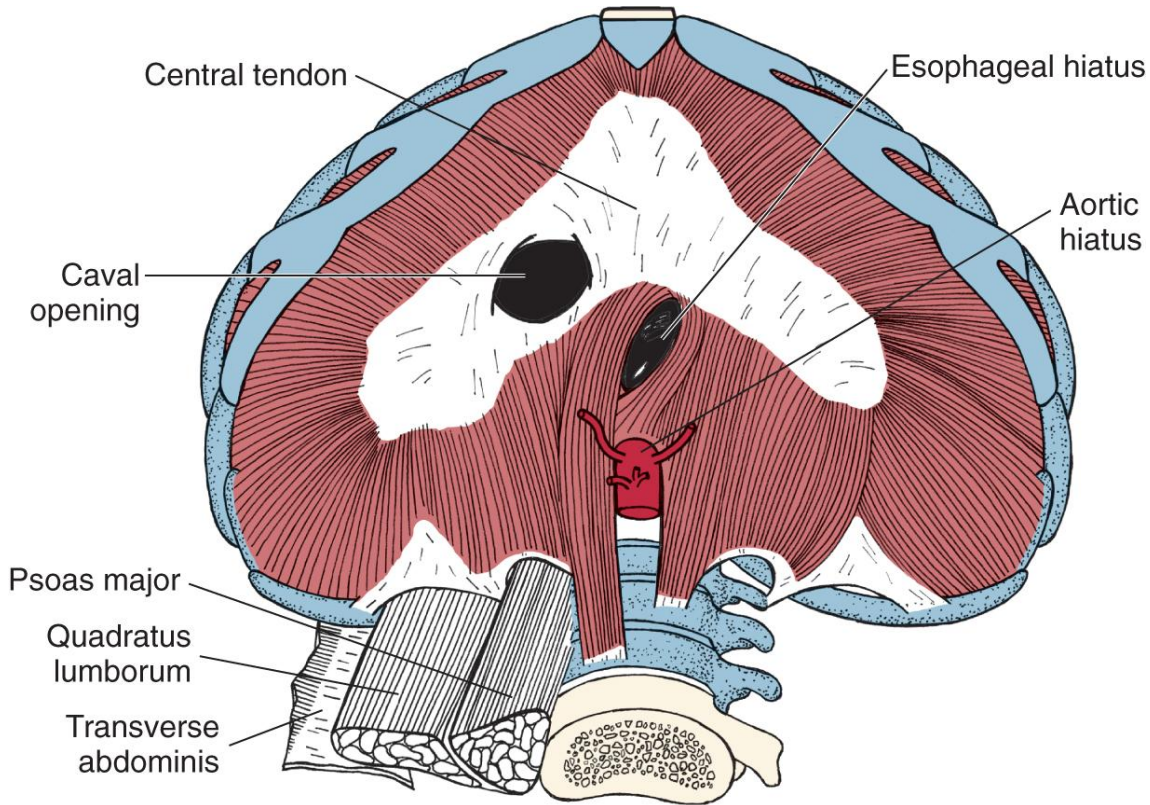
Select Muscles of Respiration



Anterior View

Modified from Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Diaphragm



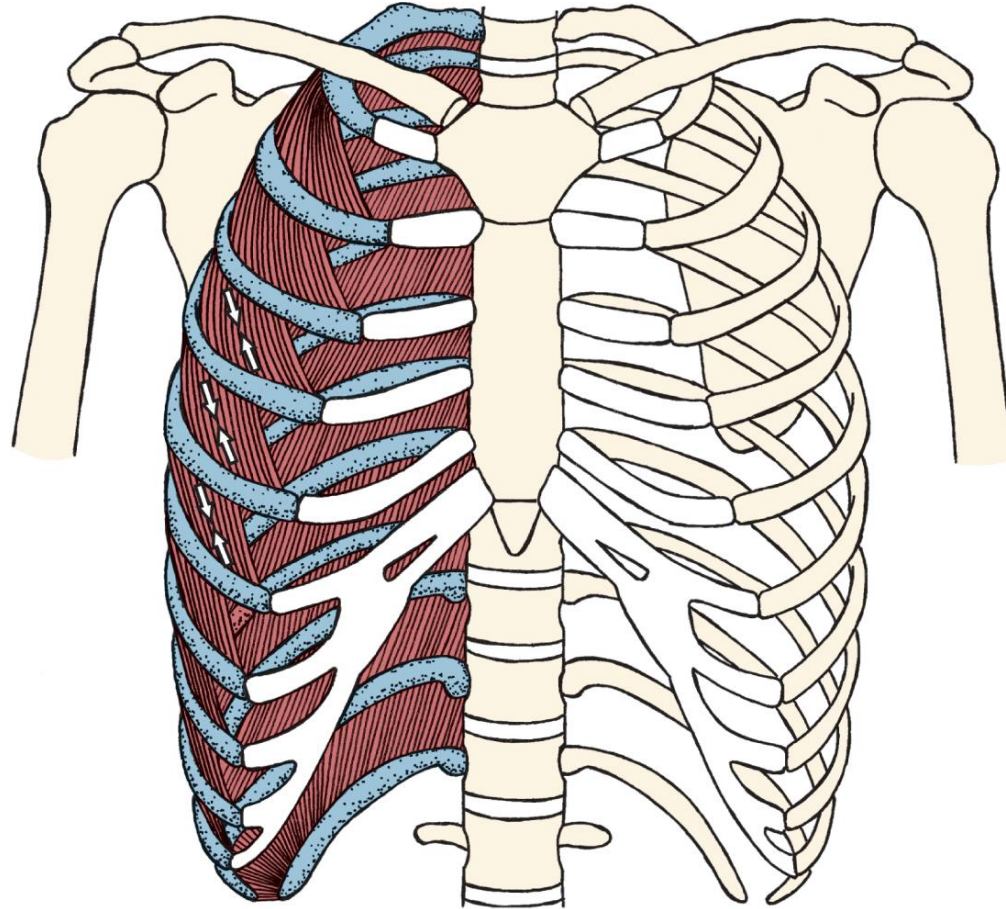
Inferior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Diaphragm (Cont.)

- Origins: L1 through L3, lower six costal cartilages, and xiphoid process
- Insertion: Central tendon
- Action: Increases thoracic cavity volume during inhalation and increases intraabdominal pressure
- Nerve: Phrenic nerve

External Intercostals



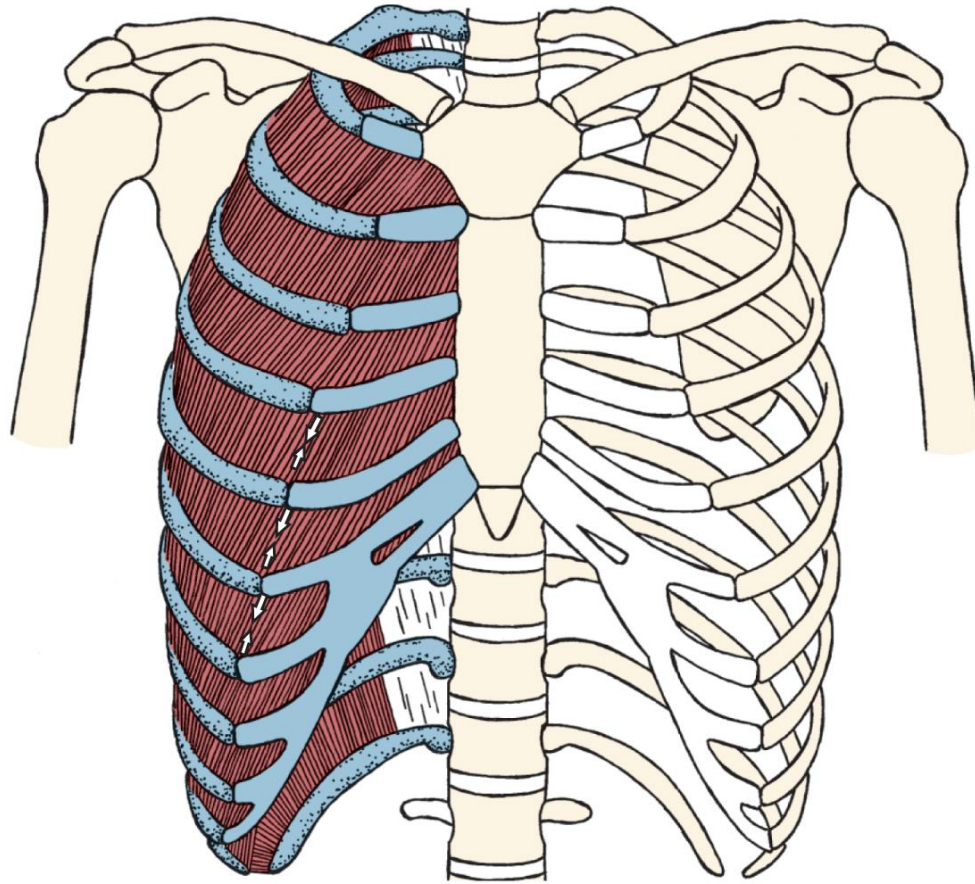
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

External Intercostals (Cont.)

- Origin: Inferior border of rib (above)
- Insertion: Superior border of rib (below)
- Actions: Elevates the ribcage during inhalation and maintains the intercostal spaces
- Nerves: Intercostal nerves

Internal Intercostals



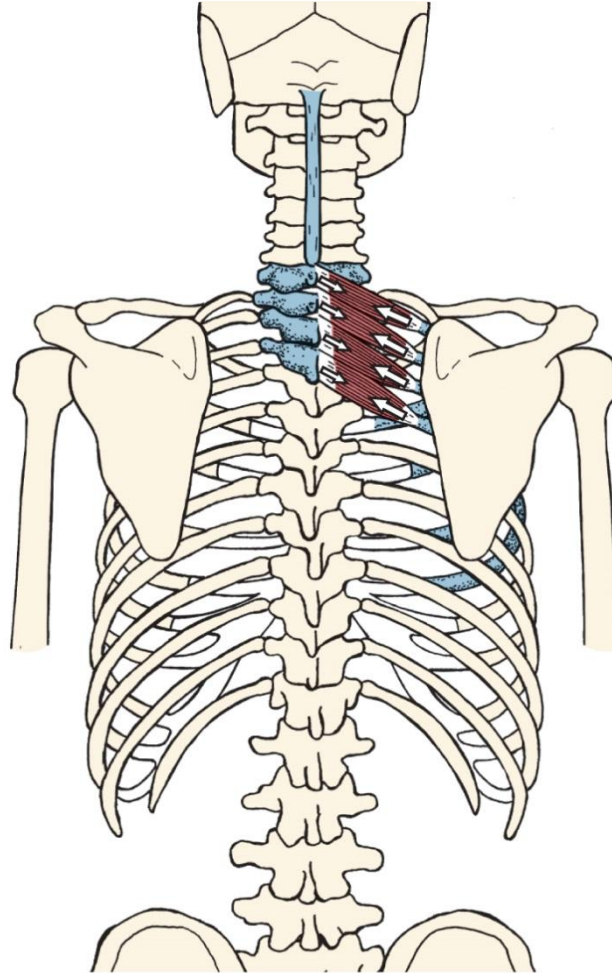
Anterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Internal Intercostals (Cont.)

- Origin: Superior border of rib (below)
- Insertion: Inferior border of rib (above)
- Actions: Depresses the ribcage during exhalation and maintains the intercostal spaces
- Nerves: Intercostal nerves

Serratus Posterior Superior



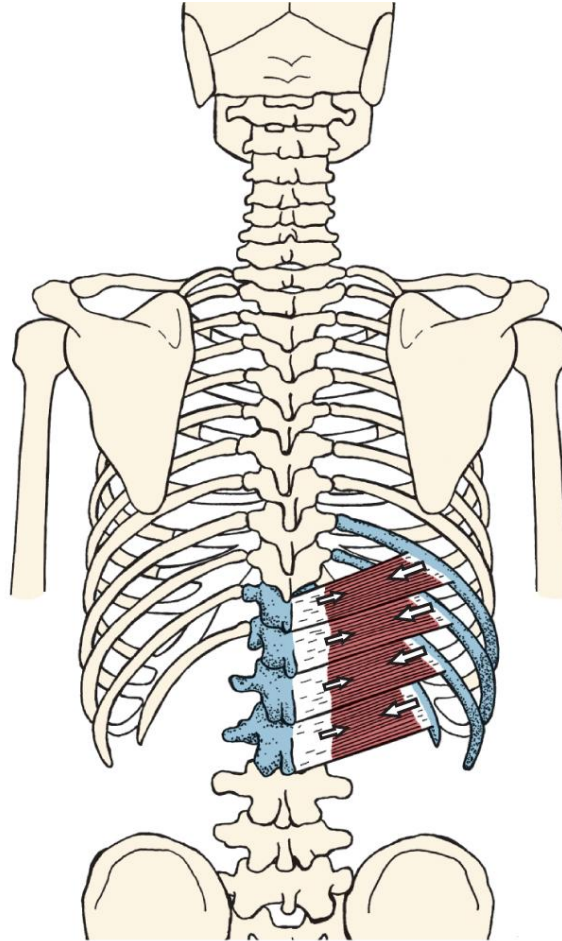
Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Serratus Posterior Superior (Cont.)

- Origins: Lower nuchal ligament and spinous processes of C7 through T3
- Insertions: Ribs 2 through 5
- Action: Elevates the ribs during inhalation
- Nerves: Intercostal nerves

Serratus Posterior Inferior



Posterior View

From Muscolino J: *Muscular system manual: the skeletal muscles of the human body*, ed 3, St. Louis, 2010, Mosby.

Serratus Posterior Inferior (Cont.)

- Origins: Spinous processes of T11 through L2
- Insertions: Ribs 9 through 2
- Action: Depresses the ribs during exhalation
- Nerves: Intercostal nerves (T9 through T12)

Questions?