



The Upper Limb II



Anatomy

RHS 241

Lecture 11

Dr. Einas Al-Eisa

Sternoclavicular joint

- Double joint....?
- Each side separated by intercalating **articular disc**
- Grasp the mid-portion of your clavicle on one side between your thumb and fingers of the opposite side, then swing your arm about....

Sternoclavicular joint

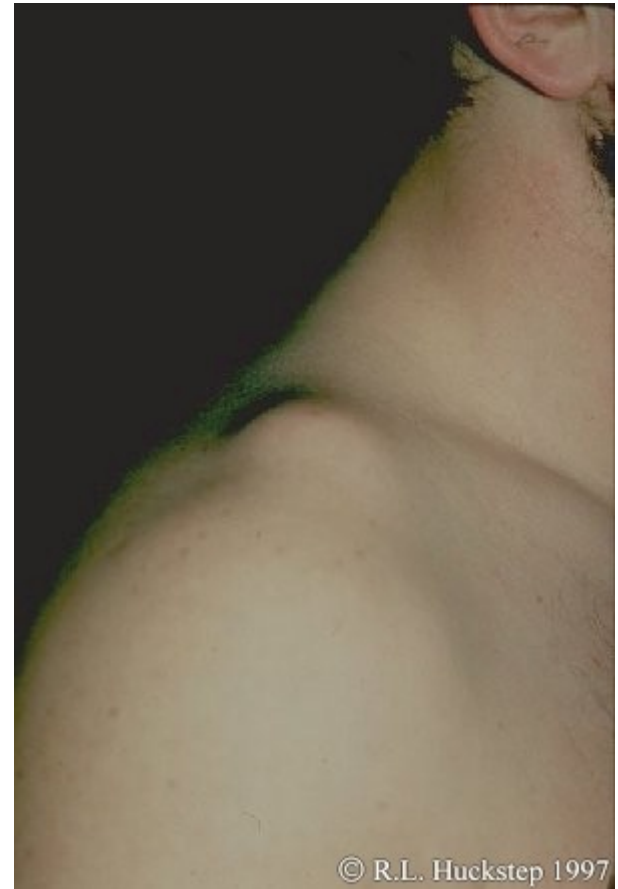
- Observe that the sternoclavicular joint allows for both **elevation & rotation of the clavicle** on the sternum
- What would be the range of motion of the shoulder if the sternoclavicular joint had an arthritic disease?

Acromioclavicular joint

- Type??
- Allows for some limited gliding motion
- Important for transmission of forces from the arm to the body

Acromioclavicular joint dislocation:

- treated in most cases by a triangular sling
- occasionally operative repair may be indicated if cosmetic appearance is important



Coracoclavicular joint

- Syndesmosis (fibrous)
- **Coracoclavicular ligaments** (double band of fibrous tissue): essential for maintaining the normal relationship of the scapula to the clavicle and thorax
- Tearing of these ligaments (e.g., in contact sports) leads to “**shoulder separation**”= upward and lateral movement of the clavicle relative to the acromion of the scapula

Coracoacromial ligament

- Ligamentous band that cross from the coracoid process to the acromion
- Helps to **support the glenohumeral joint**
- Considered “**extracapsular**”
- What do you think about this ligament going from one part of a bone to another part of the same bone (scapula)?

Clavicle

Acromioclavicular ligament

Coracoacromial ligament

Acromion of scapula

Subacromial bursa

CORACOHUMERAL LIGAMENT

GLENOHUMERAL LIGAMENTS

TRANSVERSE HUMERAL LIGAMENT

Tendon of subscapularis muscle

Humerus

Coracoclavicular ligament:

Trapezoid ligament

Conoid ligament

Superior transverse scapular ligament

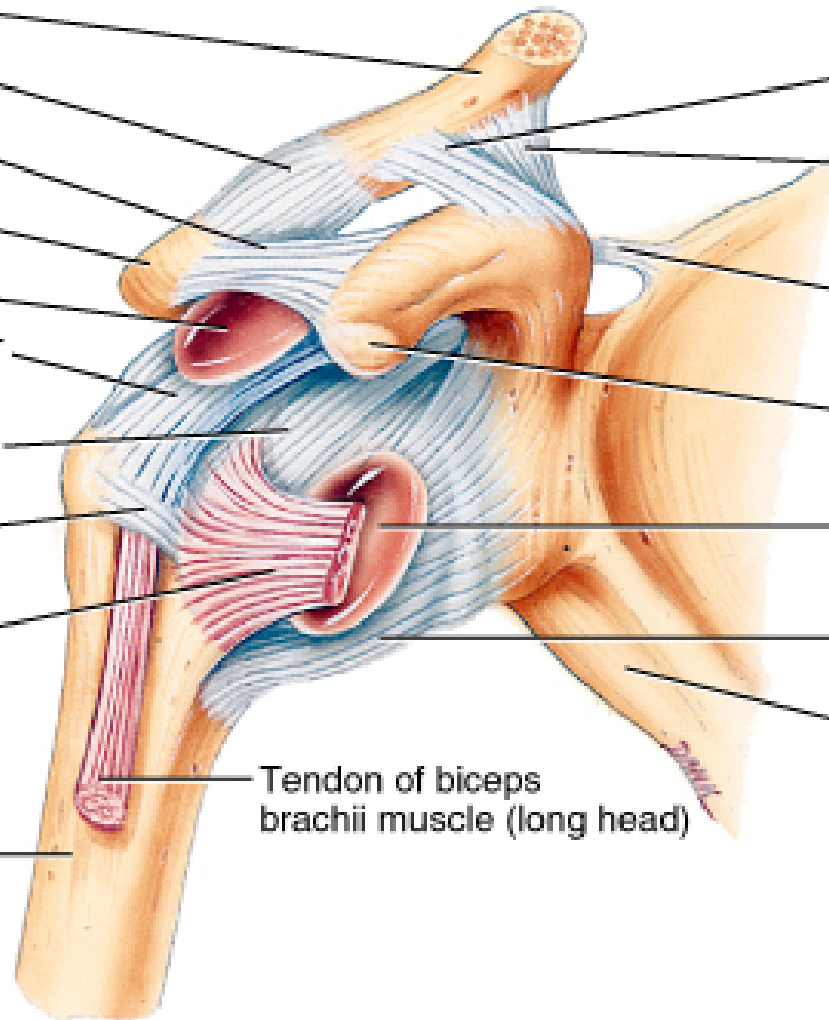
Coracoid process of scapula

SUBSCAPULAR BURSA

ARTICULAR CAPSULE

Scapula

Tendon of biceps brachii muscle (long head)



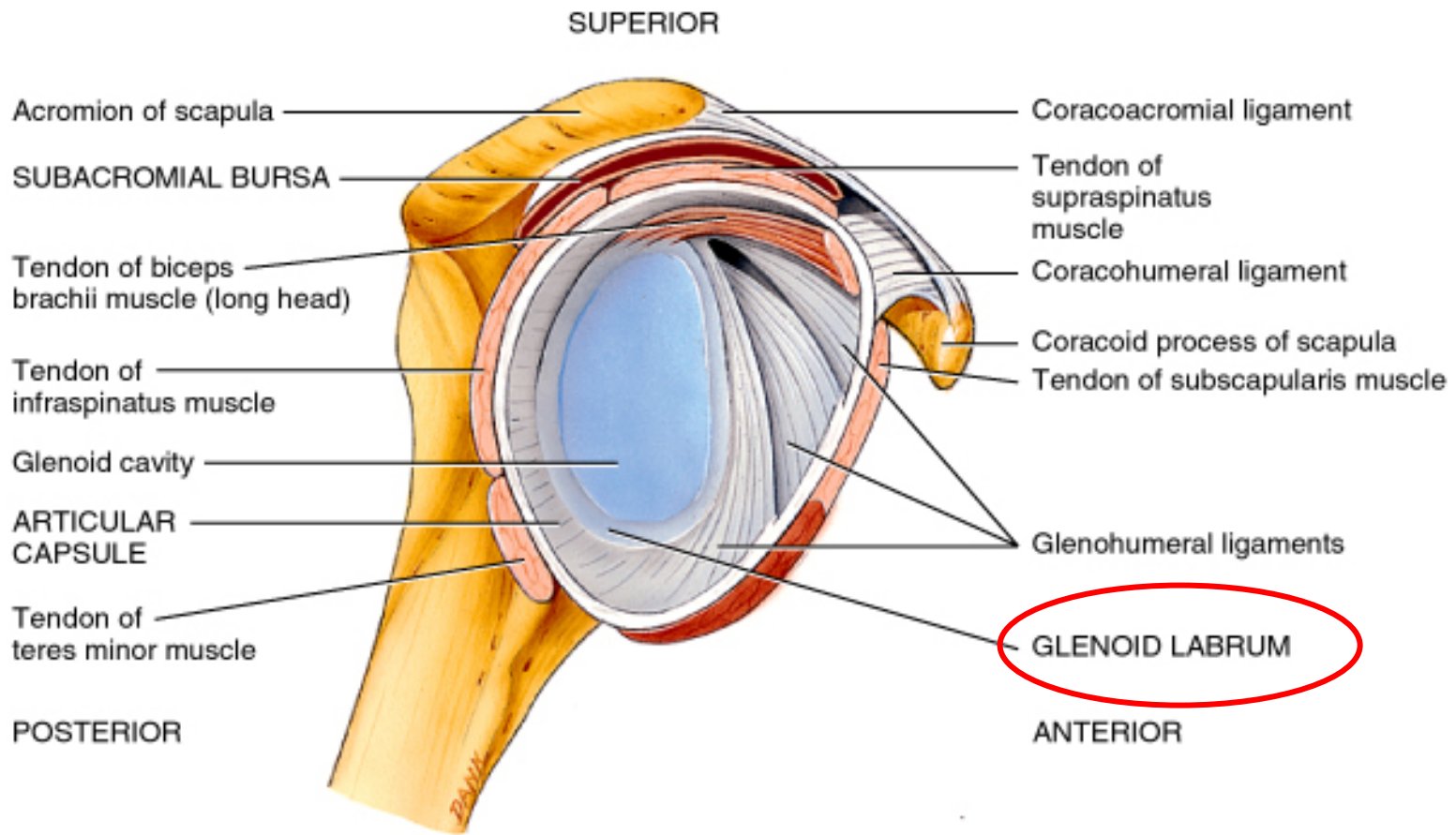
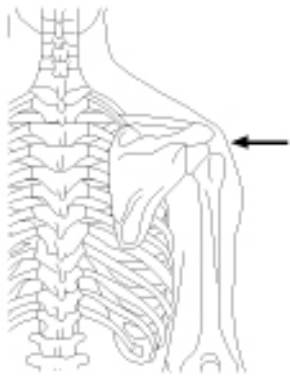
(a) Anterior view

Glenohumeral joint

- Synovial joint = a joint with a fluid-filled space between articulating bones
- Multiaxial joint
- 3 axes of rotation
- Allows movement of the arm in three planes

Glenohumeral joint

- **Articular surfaces:**
 - head of the humerus
 - glenoid surface of the scapula
- The glenoid cavity is deepened slightly by the **glenoid labrum** (often torn or detached during shoulder dislocation)



(b) Lateral view (opened)

Glenohumeral joint

- **Glenoid labrum:** fibrocartilage ring that contributes to the stability of the shoulder joint
- **Articular cartilages** (on both the glenoid and humeral surfaces of the joint)
- Tendon of the long head of biceps brachii

Glenohumeral joint

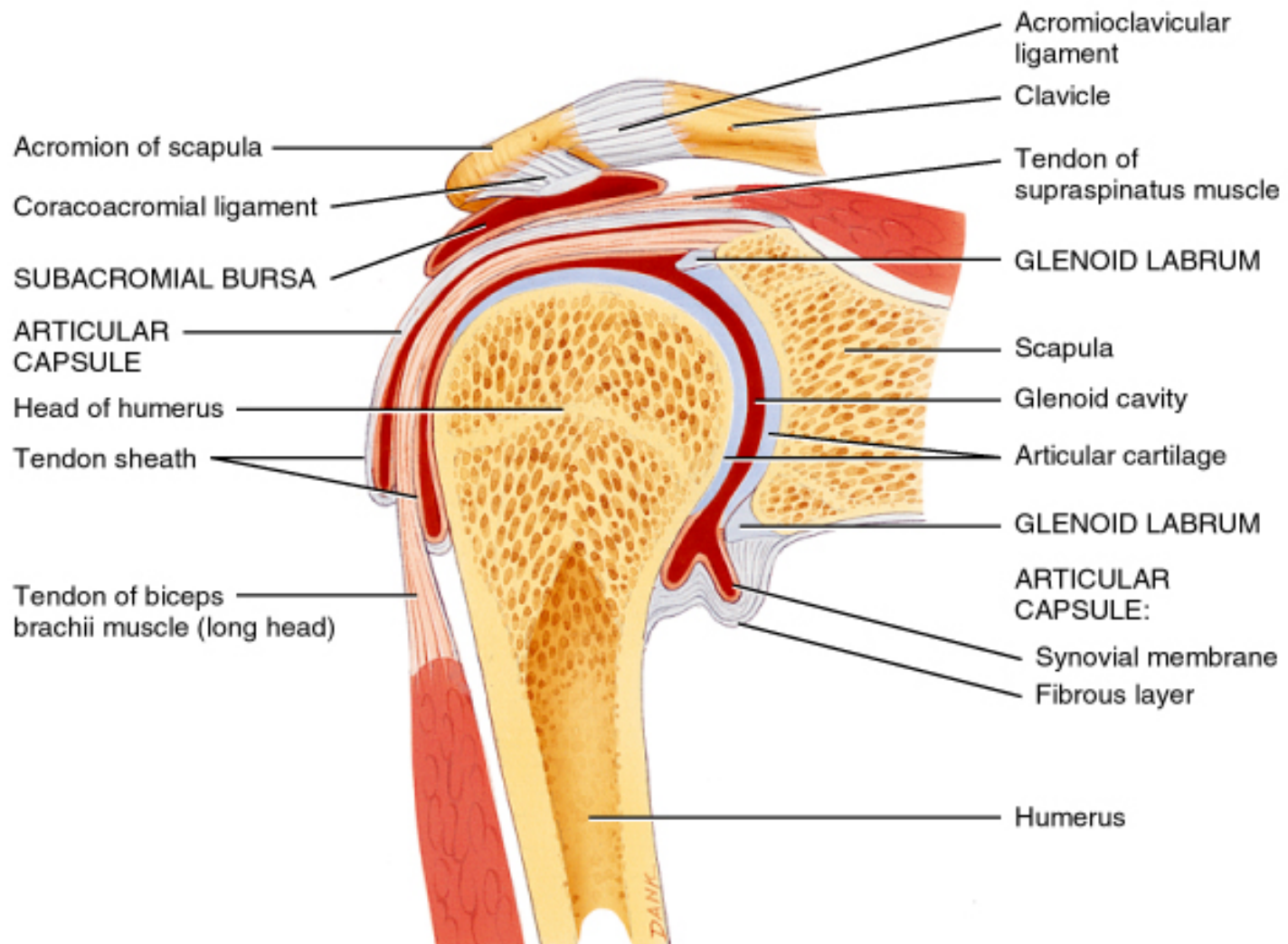
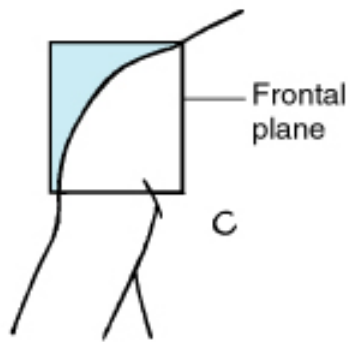
- **Glenohumeral ligaments** (capsular):
loose and poorly defined (inferior / middle / superior)

Glenohumeral joint

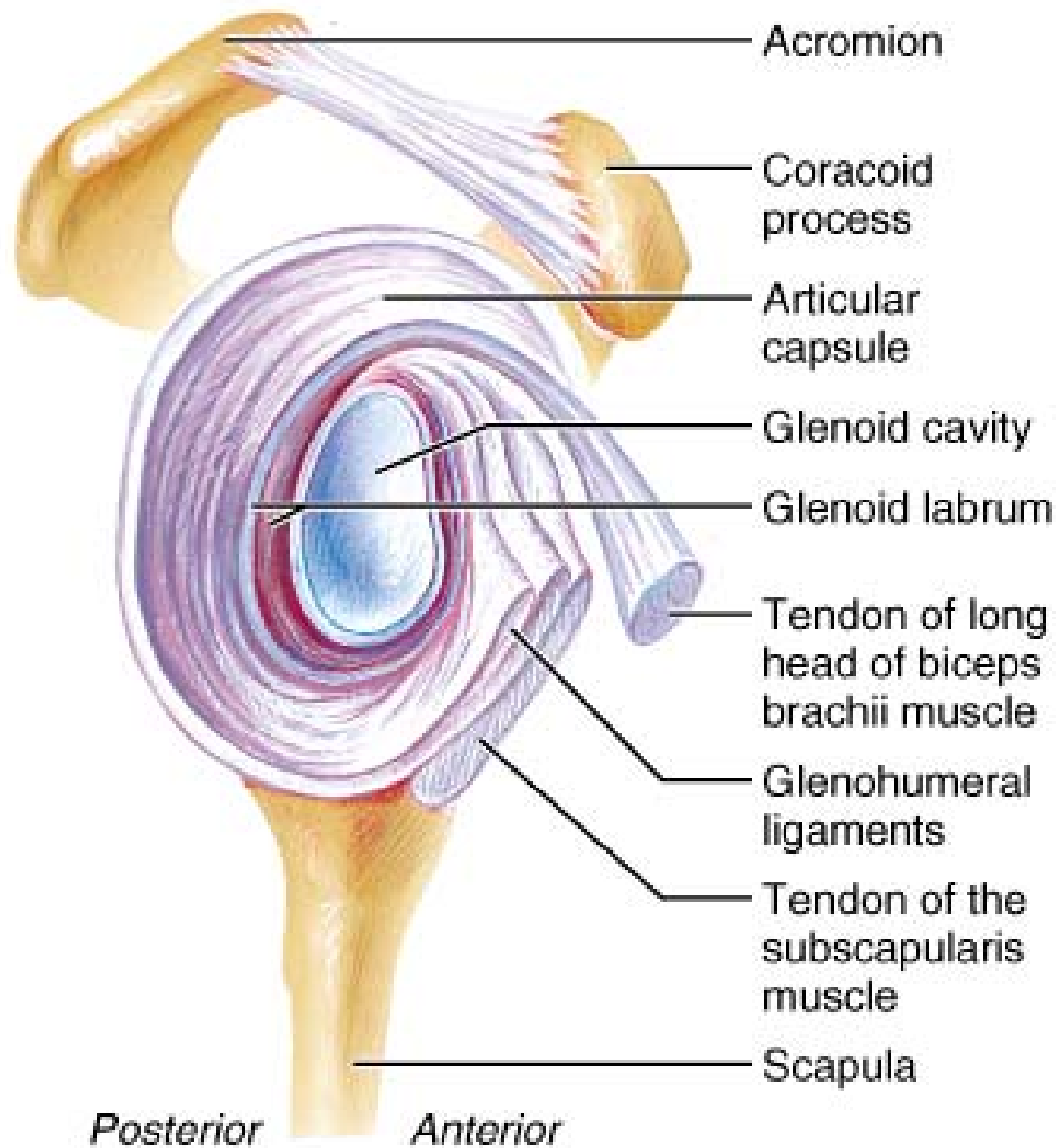
- Non-capsular ligaments (well defined):
 - **coracoacromial ligament:** prevents upward dislocation of the humerus
 - **transverse humeral ligament:** holds the long head of the biceps brachii within the bicipital groove
 - **coracoclavicular ligament:** two bands, the conoid ligament (medial) and the trapezoid ligament (lateral)- tie the distal end of the clavicle to the scapula



Inferior dislocation of the shoulder: due to paralysis of the deltoid (rare)



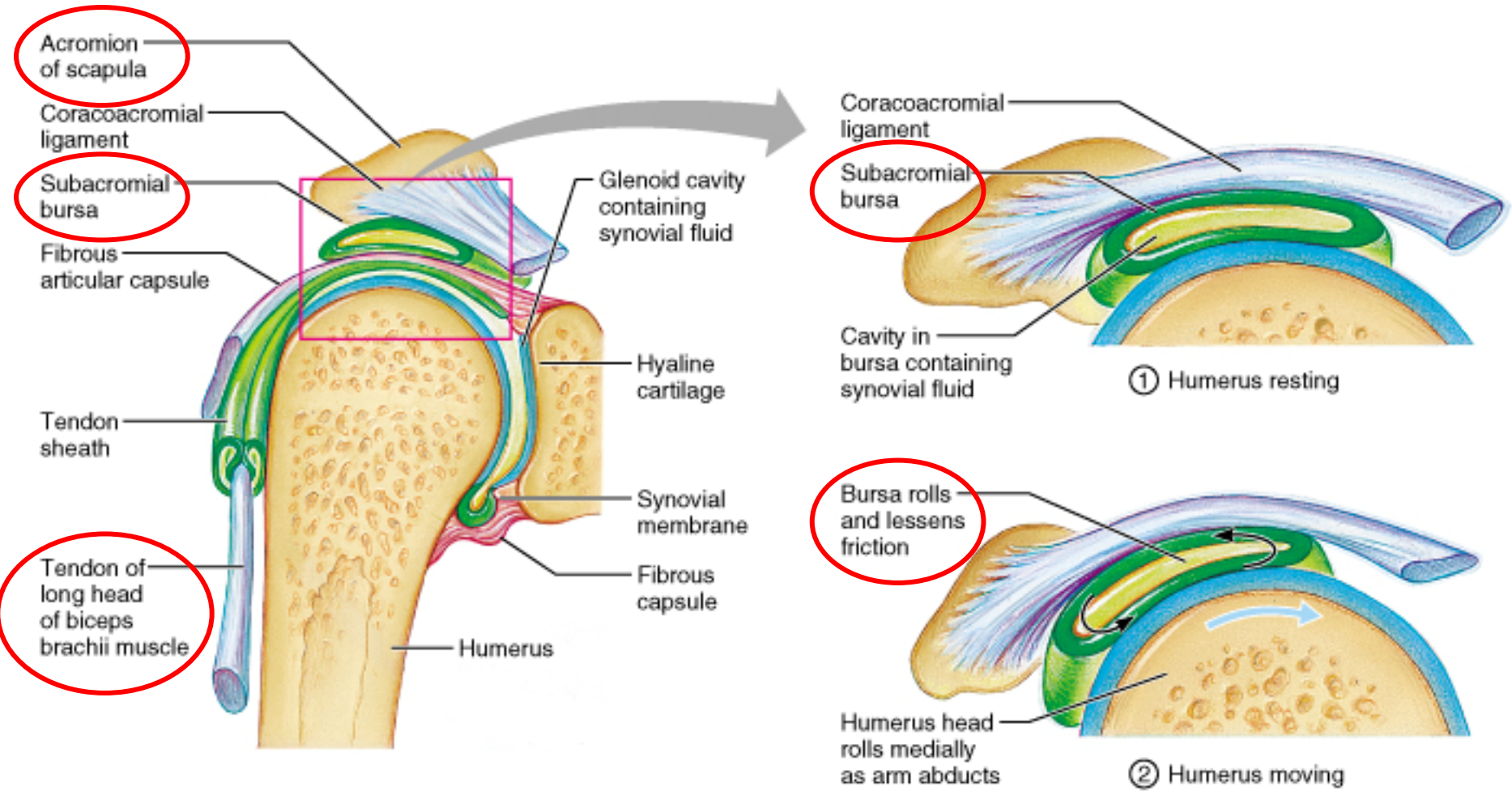
(c) Frontal section



(d)

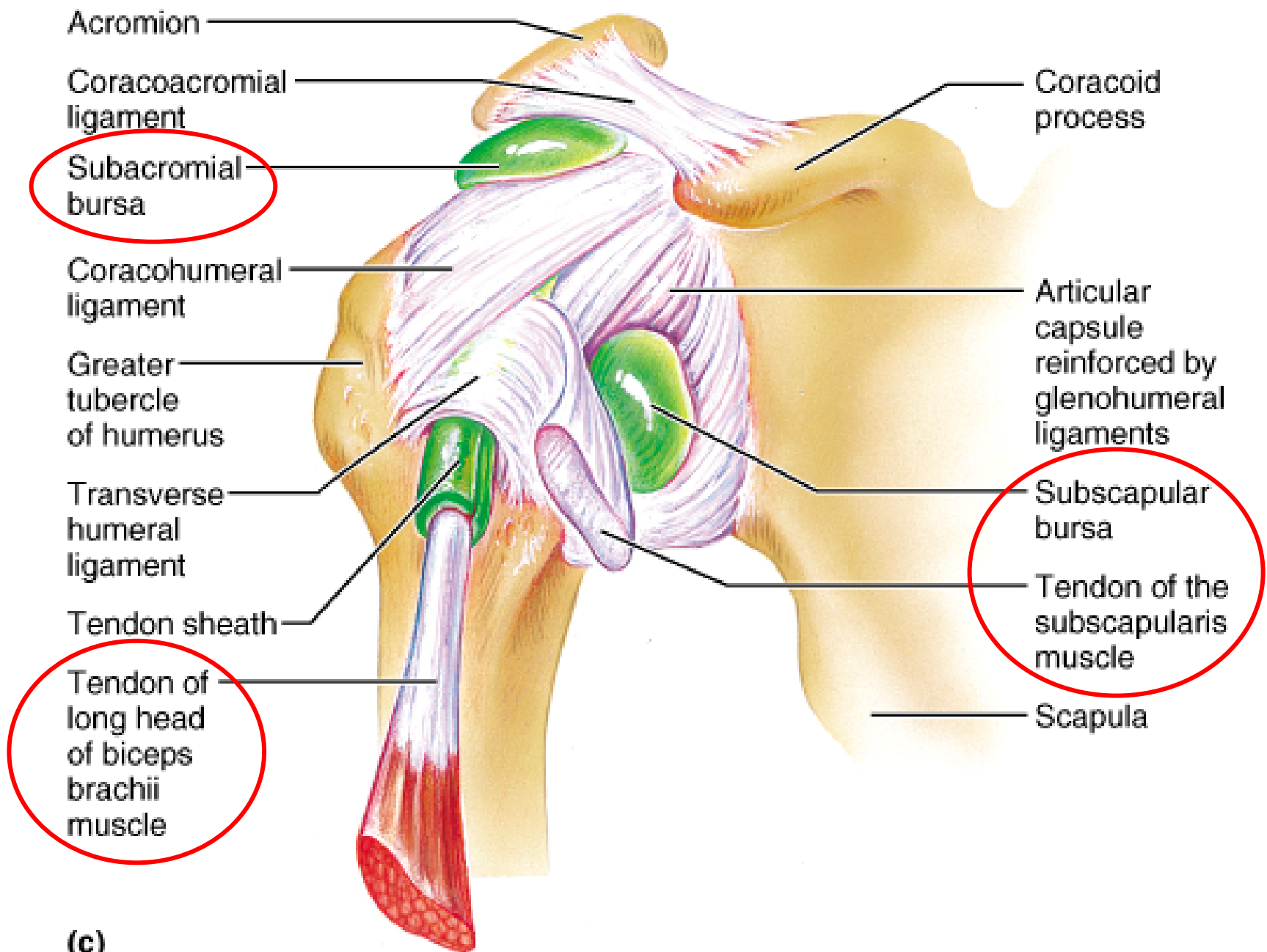
Glenohumeral joint

- **Subacromial (subdeltoid) bursa**: major site for bursitis
- **Subscapularis bursa** (at the base of the coracoid process and subscapularis muscle): usually communicates with the shoulder joint cavity, i.e., it is an outpocketing of the synovial space



(a)

(b)



(c)

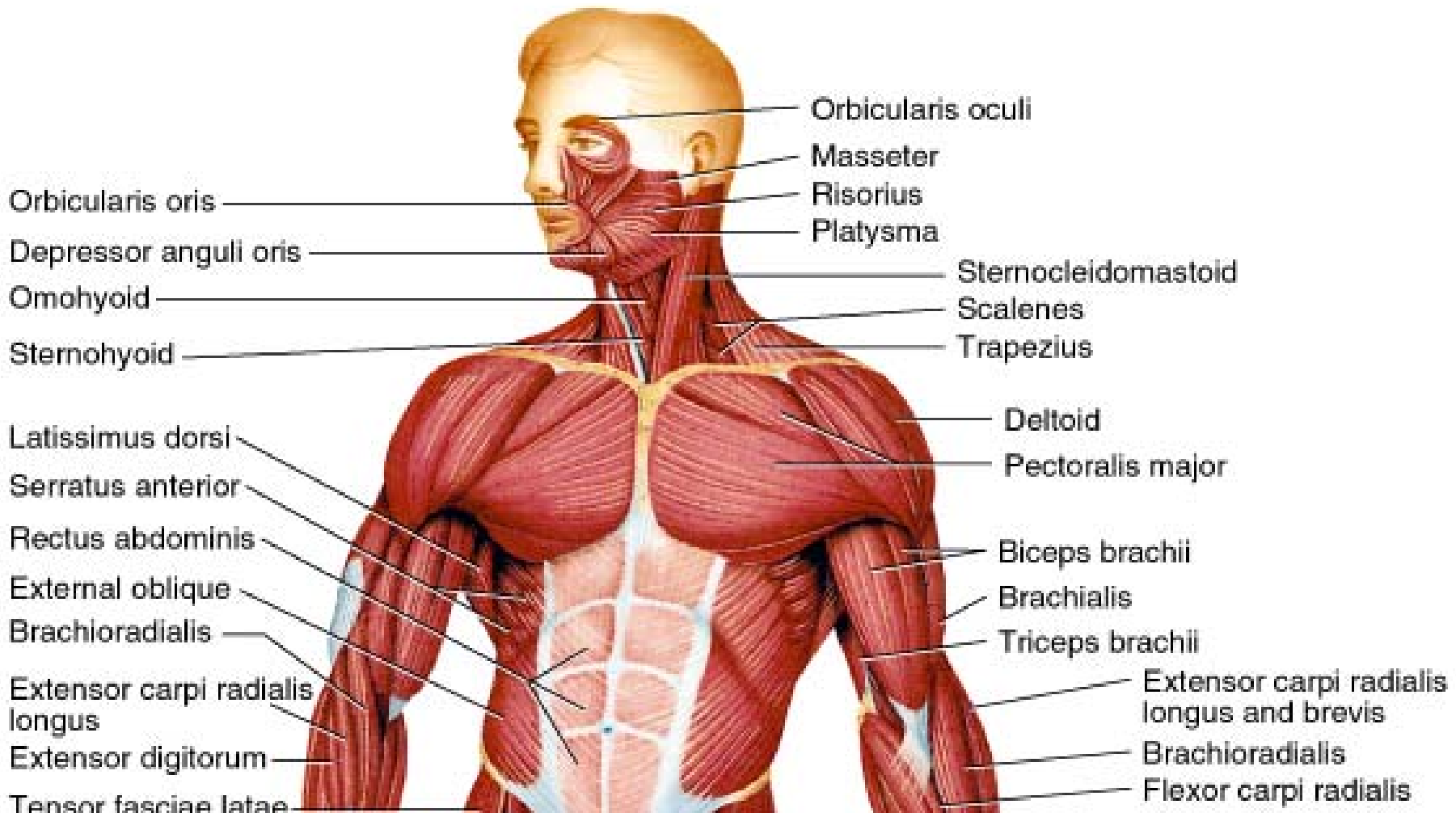
Primary movers of the shoulder

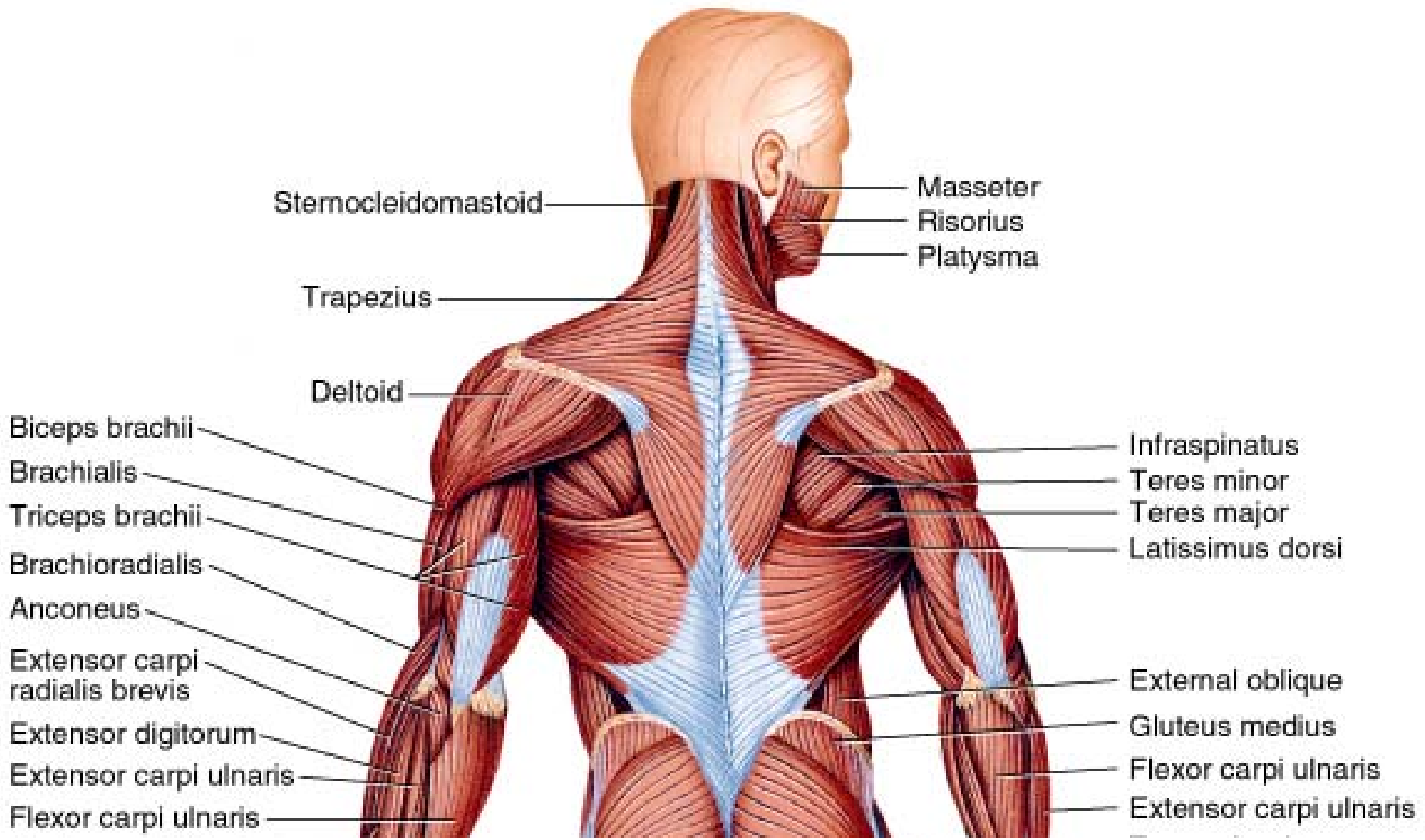
- **Vertical flexors:**

- Deltoid (anterior fibers)
- Pectoralis major (clavicular fibers)

- **Vertical extensors:**

- Deltoid (posterior fibers)
- Latissimus dorsi
- Teres major





Sternocleidomastoid

Masseter

Risorius

Platysma

Trapezius

Deltoid

Biceps brachii

Brachialis

Triceps brachii

Brachioradialis

Anconeus

Extensor carpi radialis brevis

Extensor digitorum

Extensor carpi ulnaris

Flexor carpi ulnaris

Infraspinatus

Teres minor

Teres major

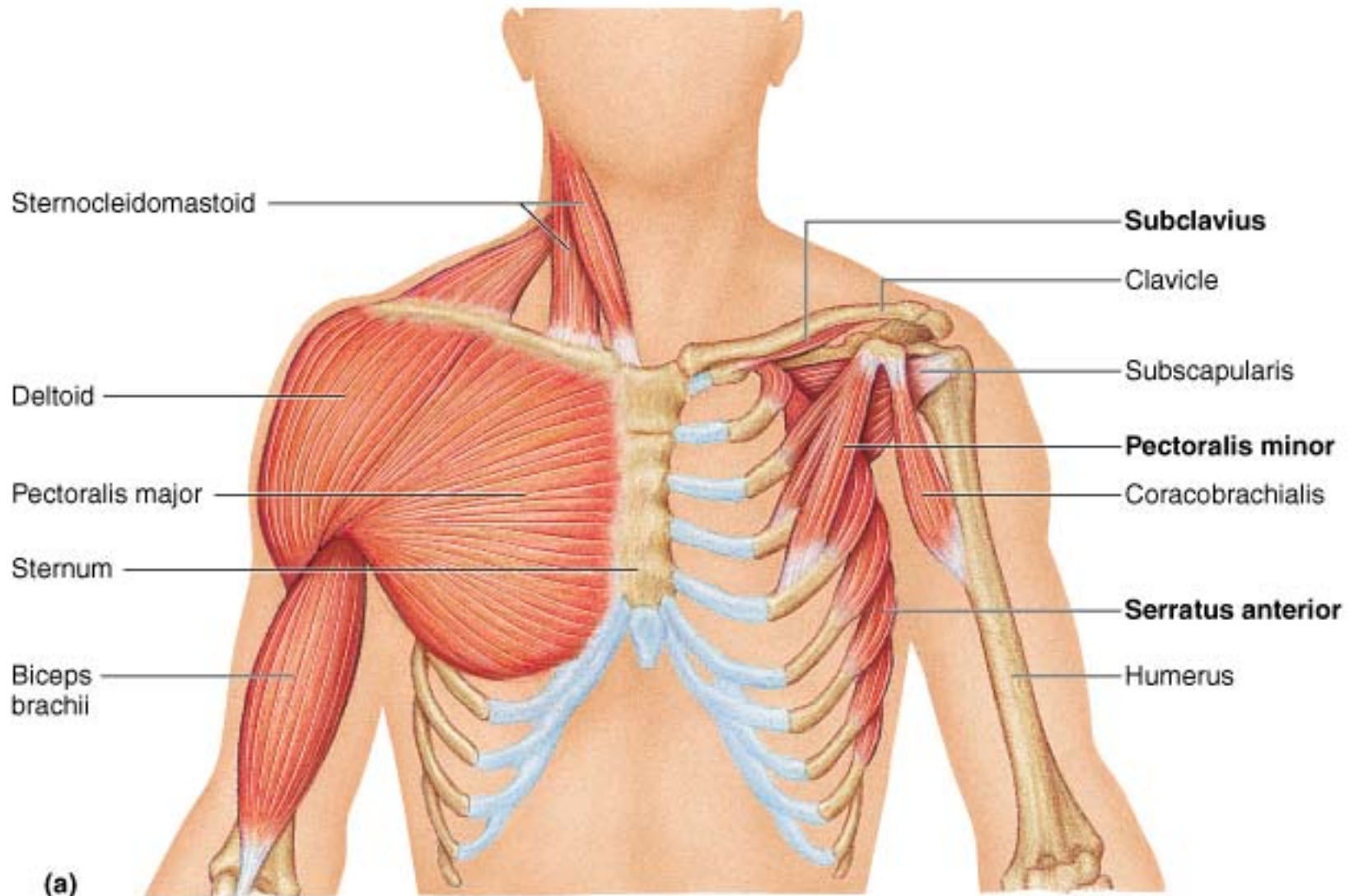
Latissimus dorsi

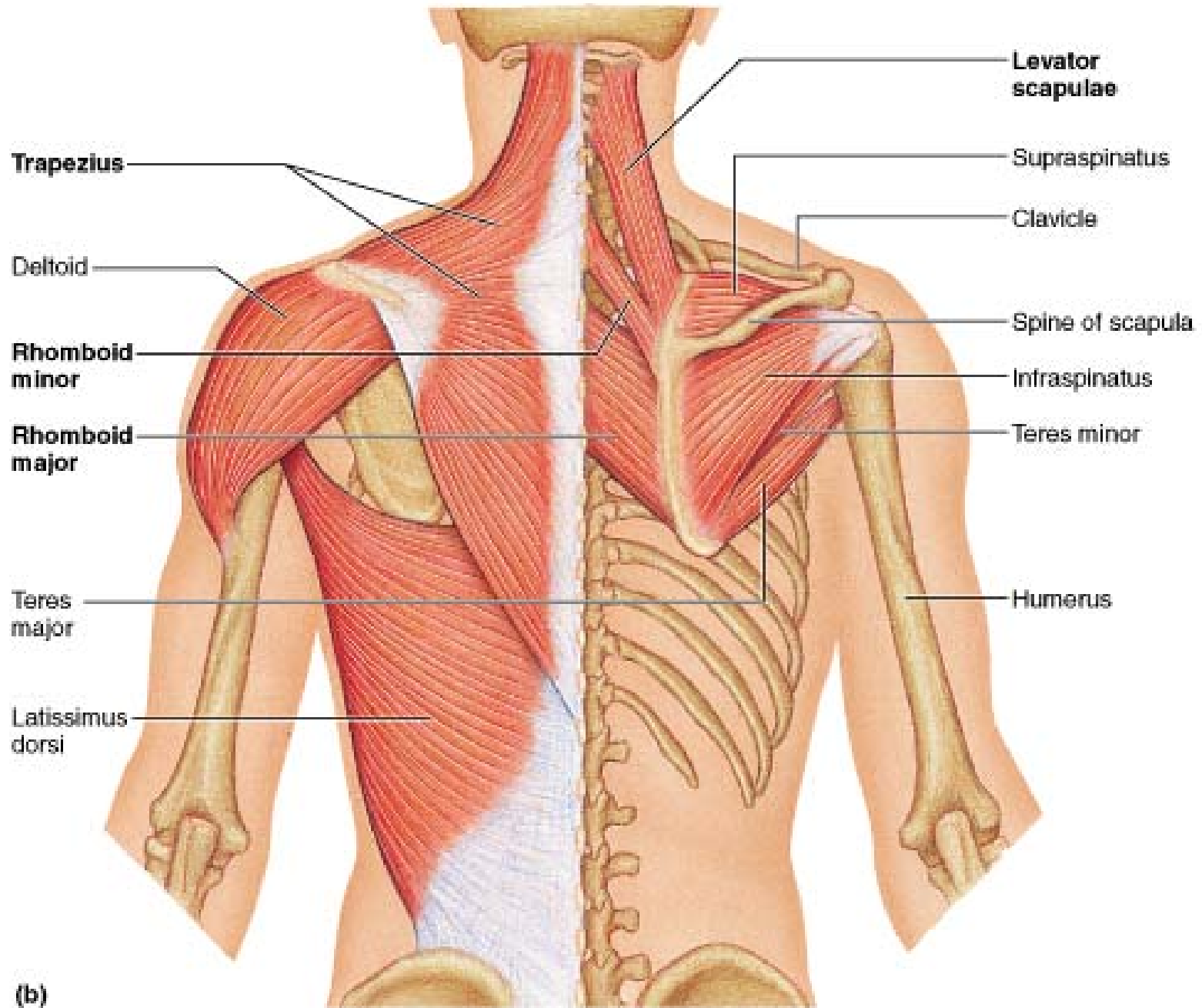
External oblique

Gluteus medius

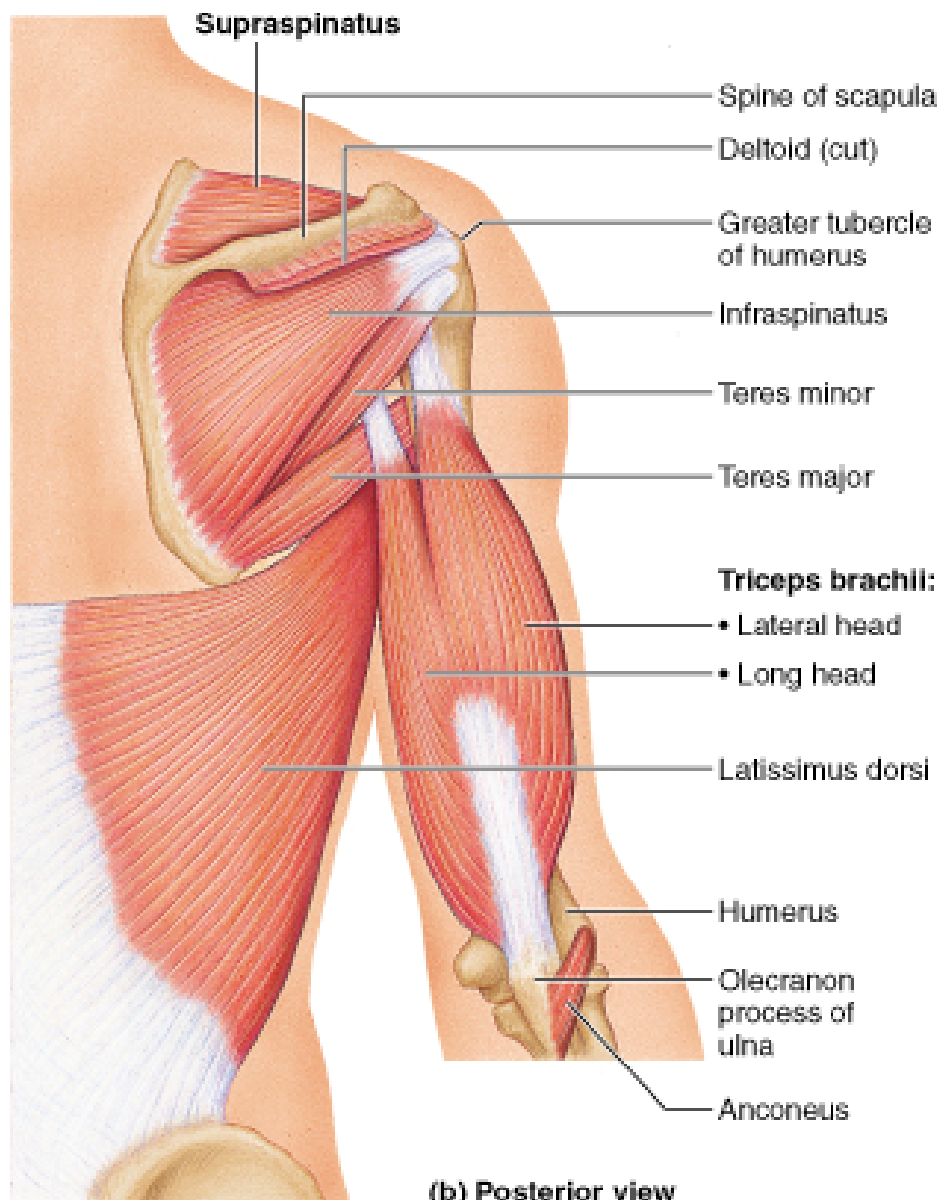
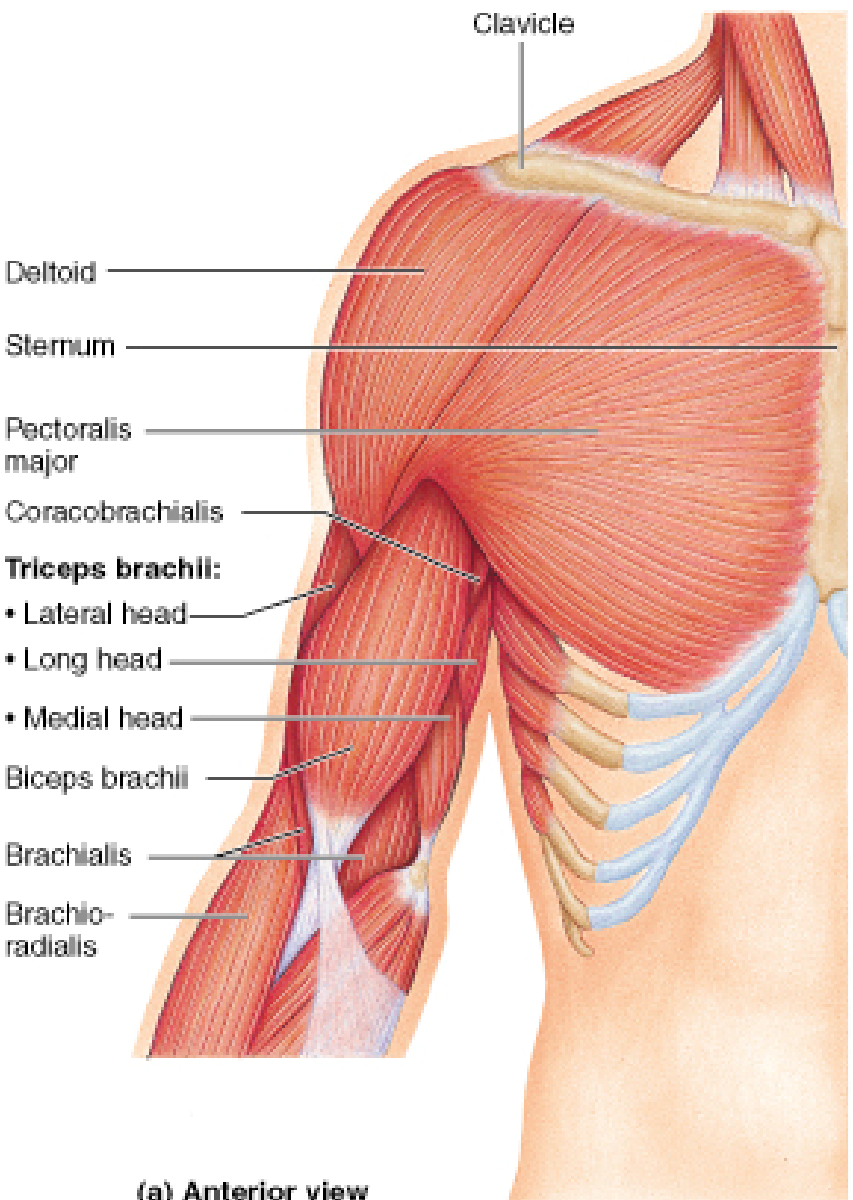
Flexor carpi ulnaris

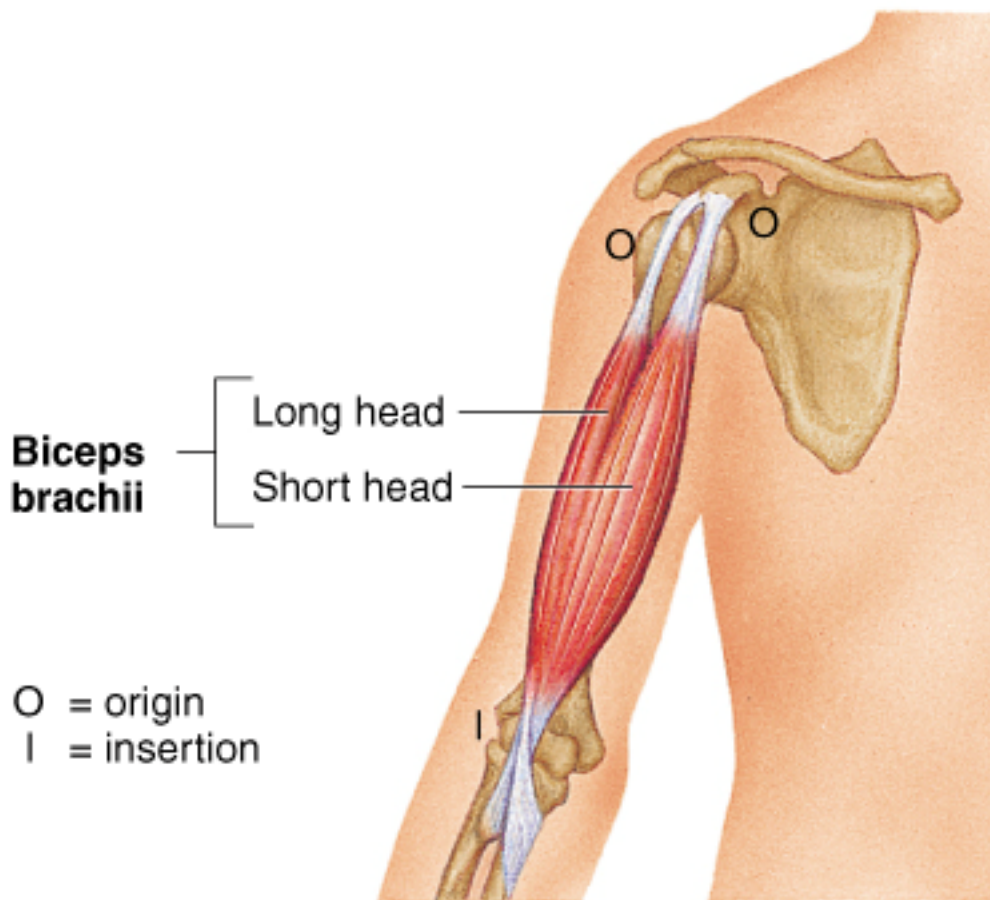
Extensor carpi ulnaris



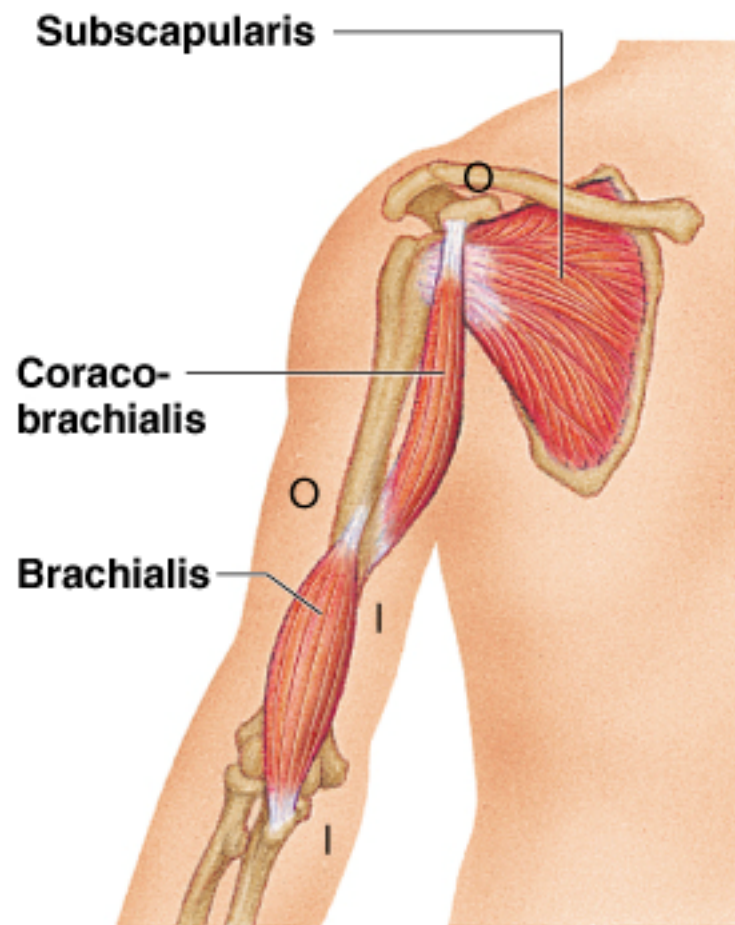


(b)





(c) Anterior view



(d) Anterior view

Primary movers of the shoulder

- **Horizontal flexors:**
 - Deltoid (anterior fibers)
 - Pectoralis major
- **Horizontal extensors:**
 - Deltoid (posterior fibers)
 - Latissimus dorsi
 - Teres major

Primary movers of the shoulder

- **Abductors:**

- Deltoid (lateral fibers)
- Supraspinatus

- **Adductors:**

- Pectoralis major (sternocostal fibers)
- Latissimus dorsi
- Teres major

Primary movers of the shoulder

- **Medial (internal) rotators:**
 - Pectoralis major
 - Deltoid (anterior fibers)
 - Subscapularis
 - Latissimus dorsi
 - Teres major
- **Lateral (external) rotators:**
 - Deltoid (posterior fibers)
 - Infraspinatus
 - Teres minor

Rotator cuff muscles

- A group of muscles that merge with and locally **thicken the fibrous capsule** of the shoulder joint
- = “**musculotendinous**” cuff of the shoulder
- Collectively contribute most of the **stability of the shoulder joint**

Rotator cuff muscles (SITS)

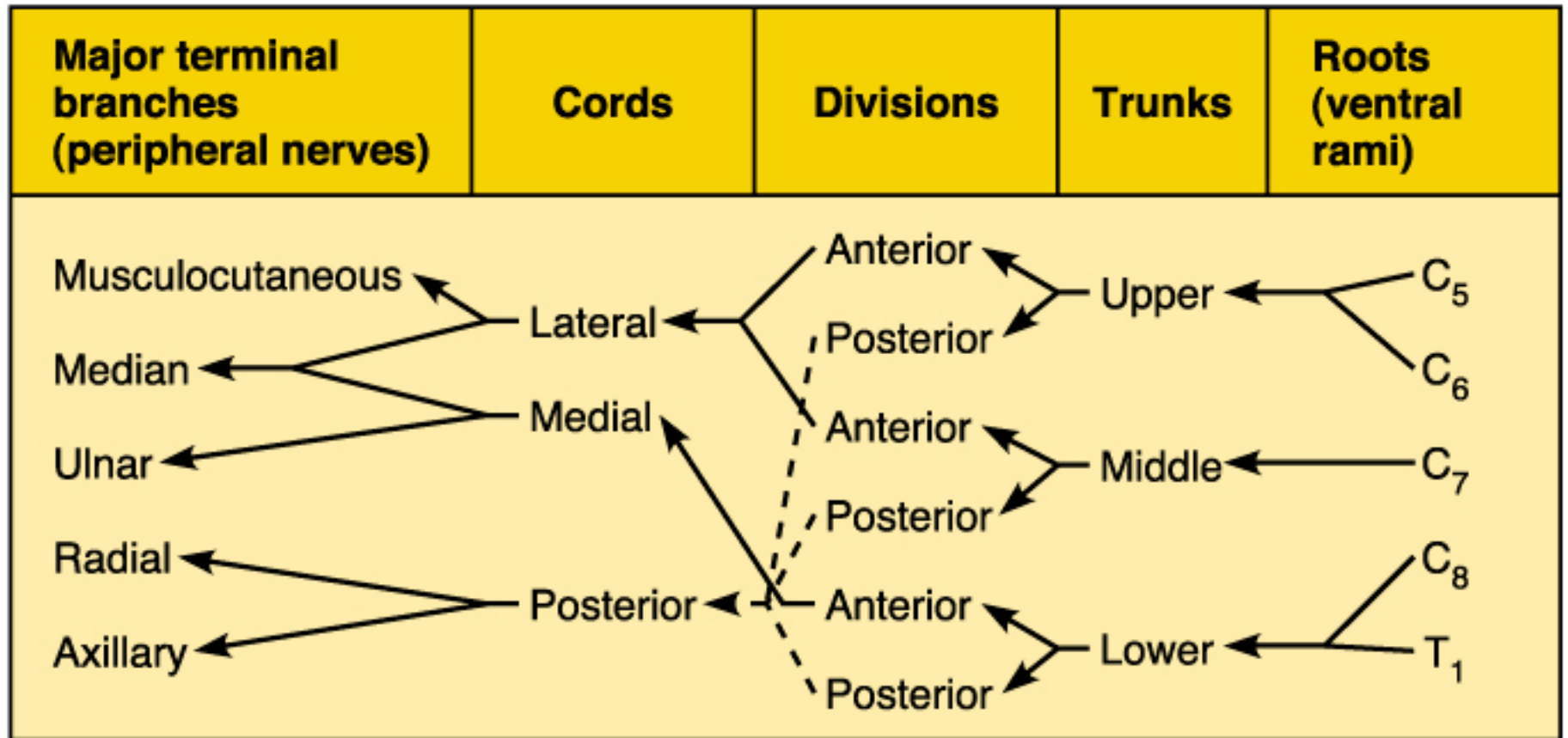
- Supraspinatus
- Infraspinatus
- Subscapularis
- Teres minor

Rotator cuff muscles

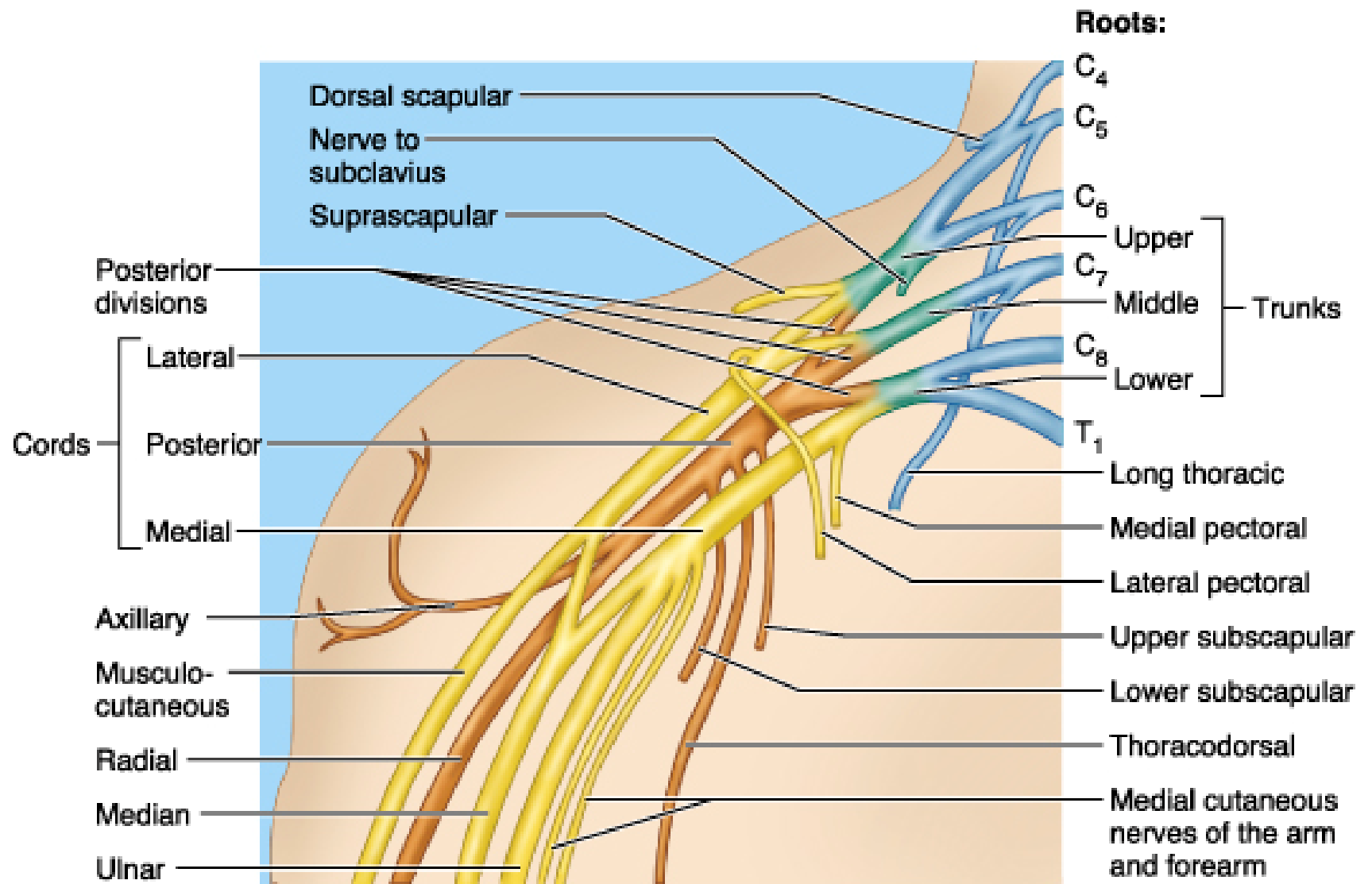
- Which of the rotator cuff tendons is most commonly involved in shoulder injuries? Why?
- **Supraspinatus** due to rupture near its insertion in the humerus as it passes through the small space beneath the acromion

Rotator cuff muscles

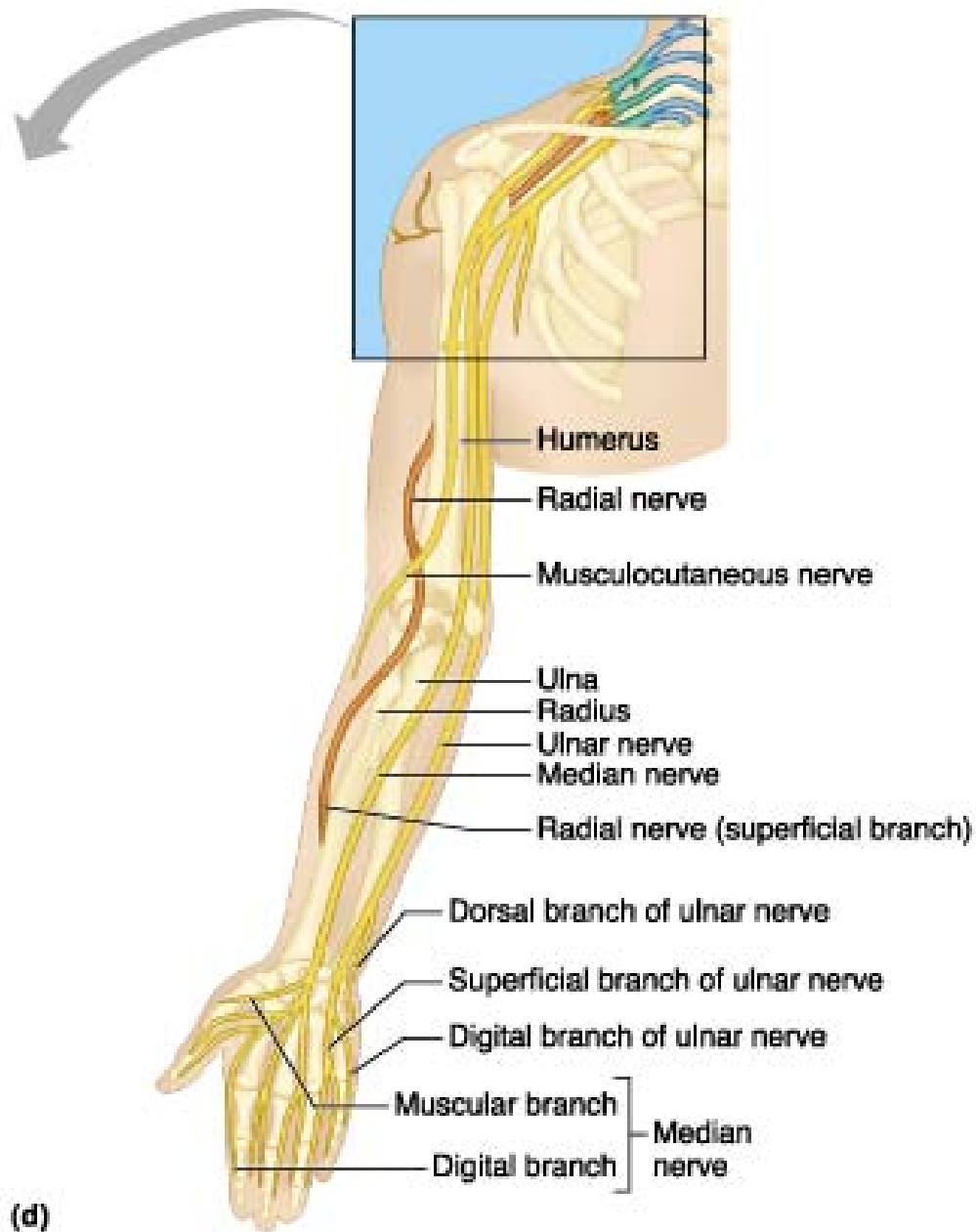
- Which region of the fibrous capsule of the shoulder is the weakest and why?
- **Anterior inferior**, because there is no muscular coverage



(c)



(a) **Key:** ■ = Roots ■ = Trunks ■ = Anterior division ■ = Posterior division



(d)