



The Upper Limb IV



Muscles

Anatomy

RHS 241

Lecture 13

Dr. Einas Al-Eisa

Humerus

- Articulates with the glenoid surface of the scapula to form the “**glenohumeral joint**”
- Articulates with the radius & ulna to form the “**elbow joint**”

Humerus

- **Proximal end:**

- Head

- Anatomical & surgical neck

- Greater & lesser tubercles

- Bicipital (intertubercular) groove

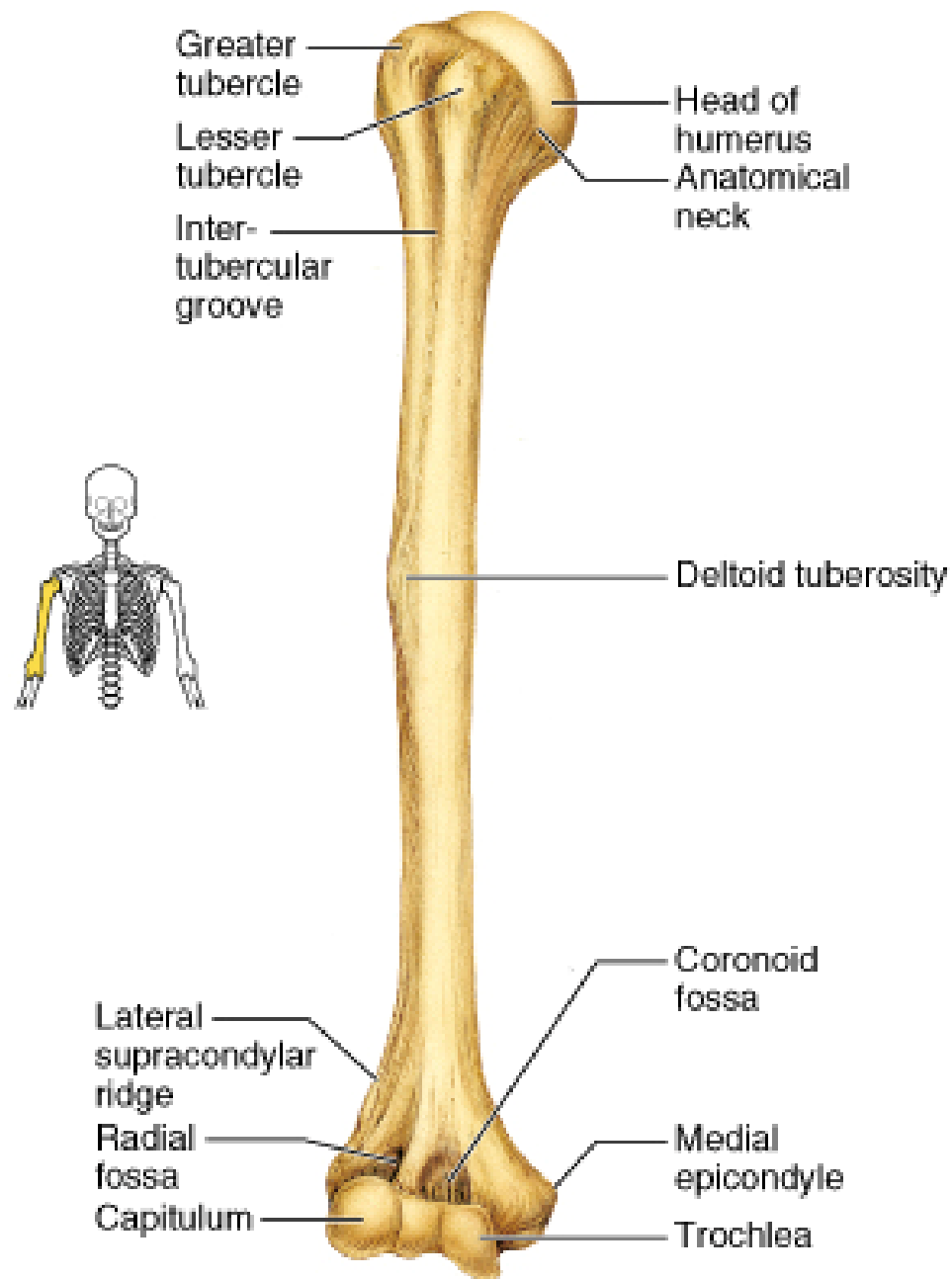
Humerus

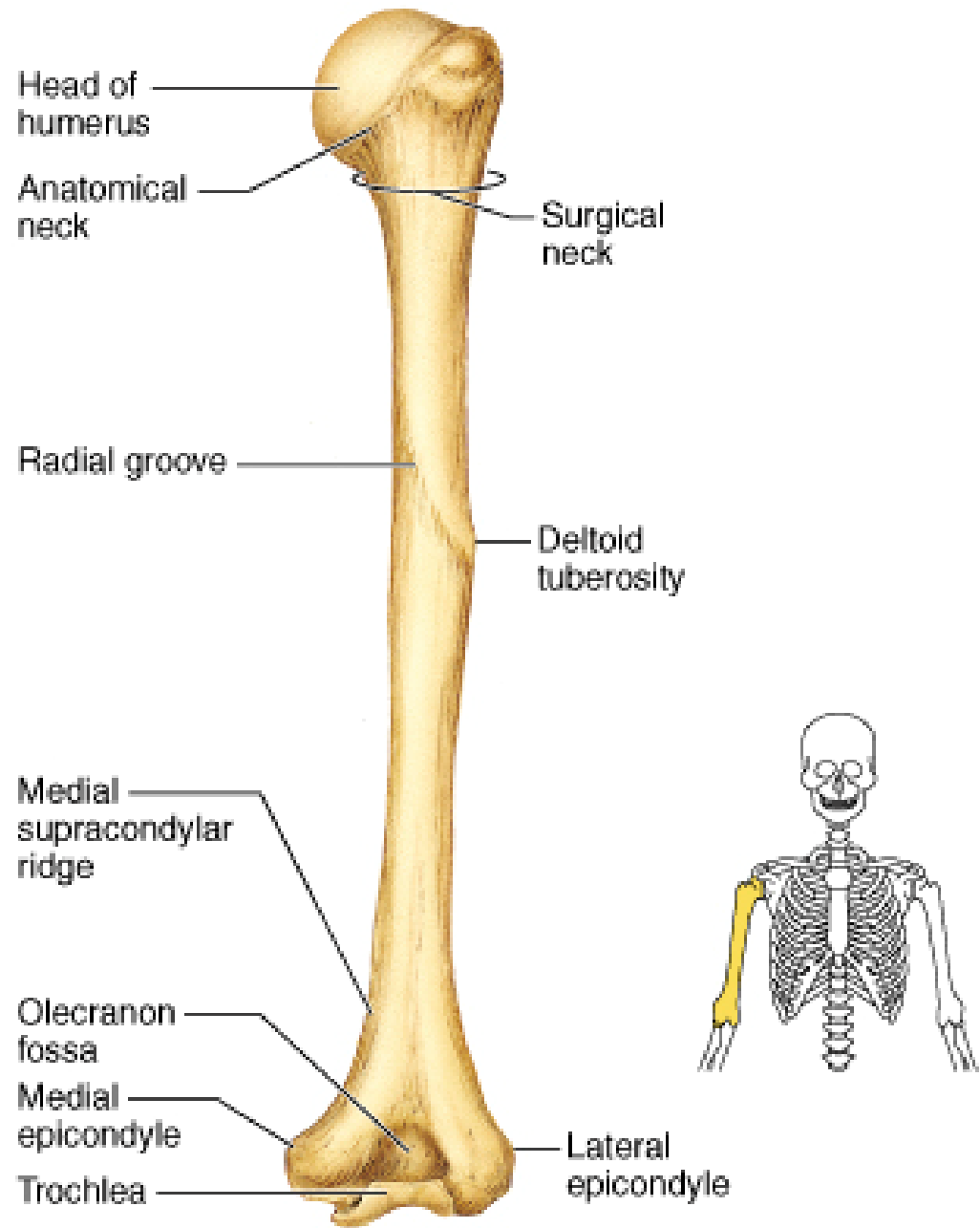
- **Distal end:**

- Medial & lateral epicondyles

- **Capitulum** (articulates with the proximal surface of the head of radius)

- **Trochlea** (articulates with the trochlear notch of the ulna)





(b) Posterior view

Muscles of the pectoral region

- **Pectoralis major:**

- large muscle covering most of the upper part of the thorax
- forms the wall of the axilla as it extends across to attach to the humerus
- at its insertion, it passes deep to the deltoid, but superficial to the coracobrachialis and the short head of biceps brachii

Pectoralis major

- **Origin:**

- medial two-thirds of clavicle
- sternum
- costal cartilage 1-6

- **Insertion:**

- lateral lip of intertubercular groove (crest of greater tubercle of humerus)

Pectoralis major

- **Action:**

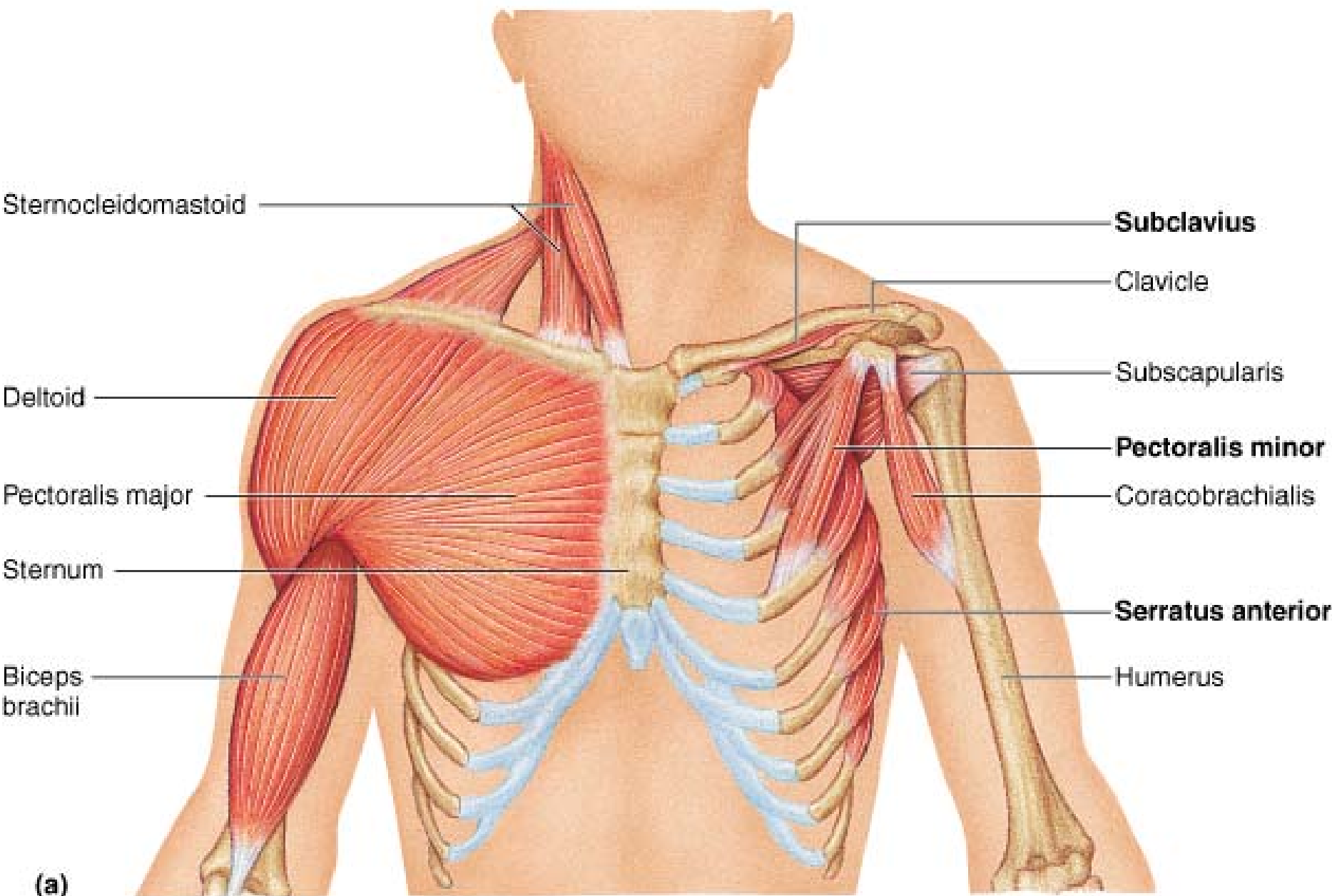
- adduction & medial rotation
- clavicular fibers (working alone): flexion such as touching the lobe of the opposite ear
- sternocostal fibers (working alone): extension of arm if the arm is already flexed

- **Innervation:**

- medial & lateral pectoral nerves

Pectoralis major

- All or most of this muscle is removed in **radical mastectomy** (removal of the breast & surrounding diseased tissue)
- The approximately normal movement of the arm in the absence of this muscle indicates the role of the coracobrachialis & anterior fibers of deltoid in substituting this muscle



(a)

Pectoralis minor

- **Origin:**

- Ribs 3-5

- **Insertion:**

- Coracoid process of scapula

Pectoralis minor

- **Action:**

- depression of shoulder
- downward rotation of scapula

- **Innervation:**

- medial pectoral nerve

Muscles of the shoulder proper

- Sternocleidomastoid:
- Subclavius
- Trapezius
- Latissimus dorsi
- Levator scapulae
- Rhomboids
- Serratus anterior
- Deltoid
- Rotator cuff

Sternocleidomastoid

- **Origin:**

- Sternum (tendinous head)
- Medial third of clavicle (muscular head)

- **Insertion:**

- Mastoid process of skull

Sternocleidomastoid

- **Action:**

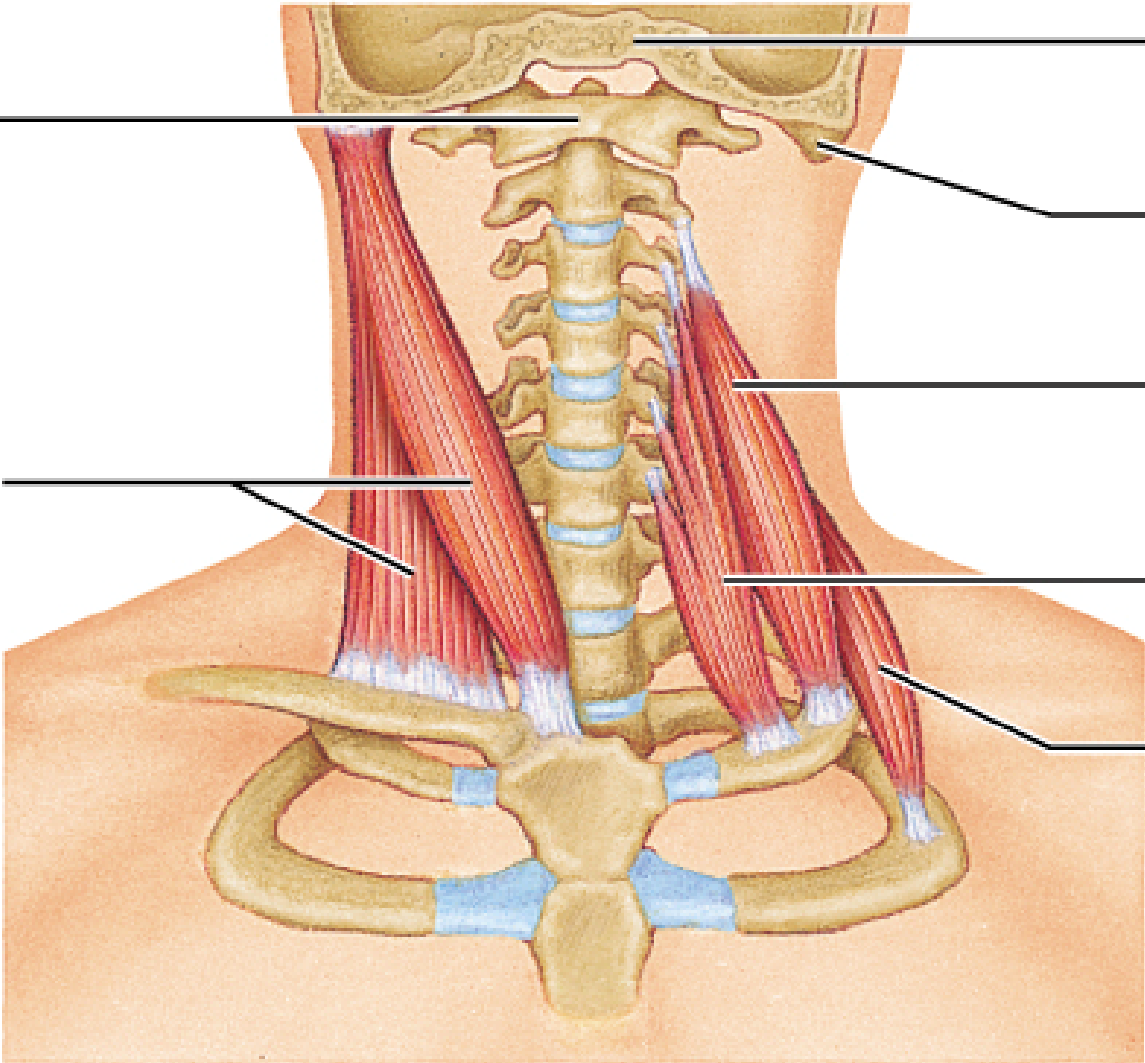
- Unilateral (one side): flexion of neck toward the same side (bringing the ear to clavicle)
- Bilateral action: neck flexion (like in raising the head when in supine)

- **Innervation:**

- Accessory nerve (11th cranial nerve)

1st cervical
vertebra

Sternocleido-
mastoid



Base of occipital
bone

Mastoid
process

Middle
scalene

Anterior
scalene

Posterior
scalene

(a) Anterior view

Subclavius

- **Origin:**

- Rib 1

- **Insertion:**

- Undersurface of clavicle

Subclavius

- **Action:**

- Possibly depress clavicle
- Help rise the 1st rib
- Maintain the sternoclavicular joint

- **Innervation:**

- Tiny branch from the upper trunk of brachial plexus

Trapezius

- **Origin:**

- External occipital protuberance
- Ligamentum nuchae
- Spinous processes of C7 and all thoracic vertebrae

- **Insertion:**

- Spine of scapula
- Acromion
- Lateral third of clavicle

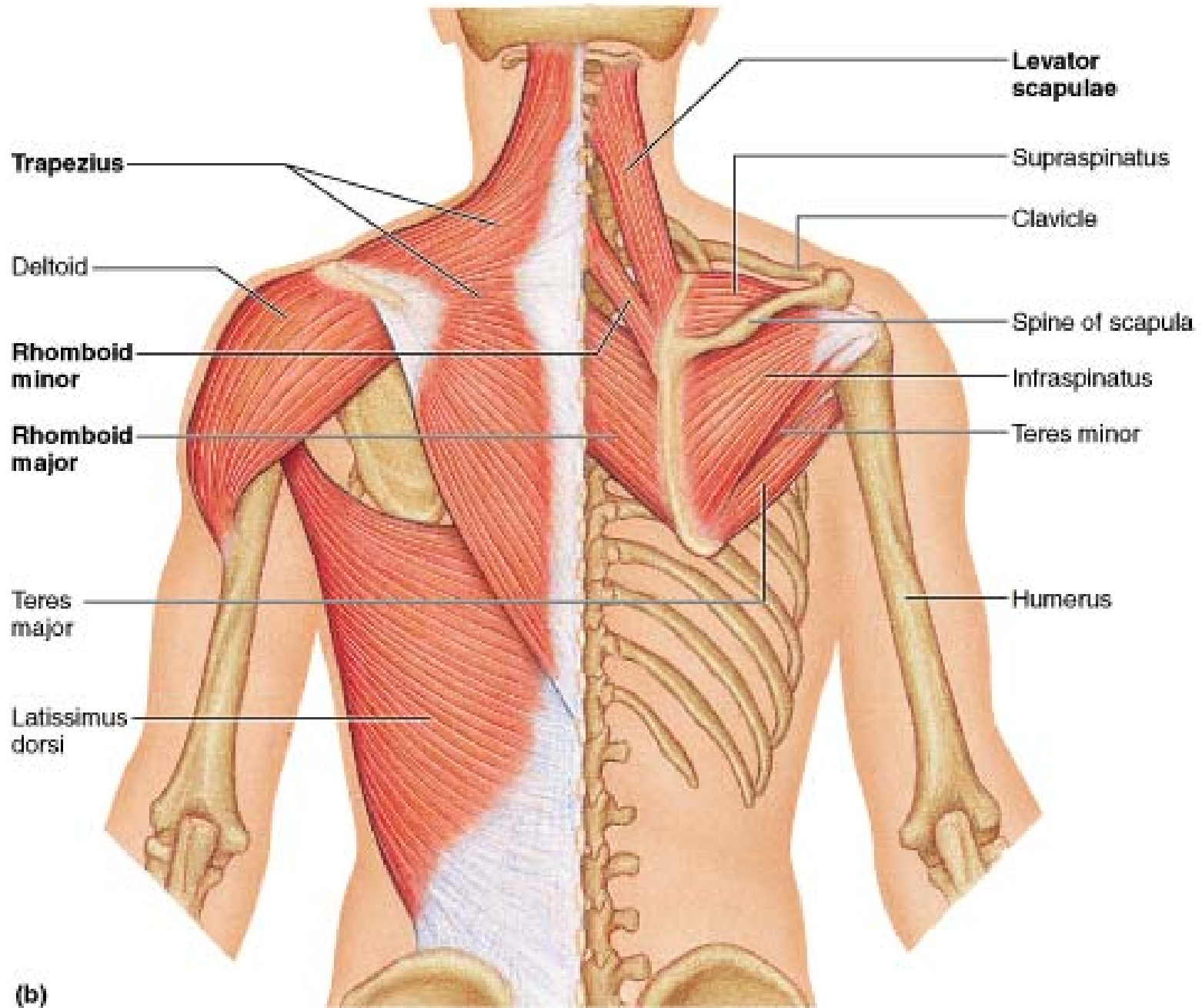
Trapezius

- **Action:**

- Upper fibers: elevation of scapula
- Middle fibers: retraction of scapula
- Inferior fibers: depression of scapula
- Upward rotation of scapula

- **Innervation:**

- Accessory nerve
- Sensory: C3 & C4



(b)

Latissimus dorsi

- **Origin:**

- Spinous processes of lower 6 thoracic vertebrae & all lumbar and sacral vertebrae
- Posterior part of iliac crest

- **Insertion:**

- Medial lip (crest of lesser tubercle)
- Floor of intertubercular groove of humerus

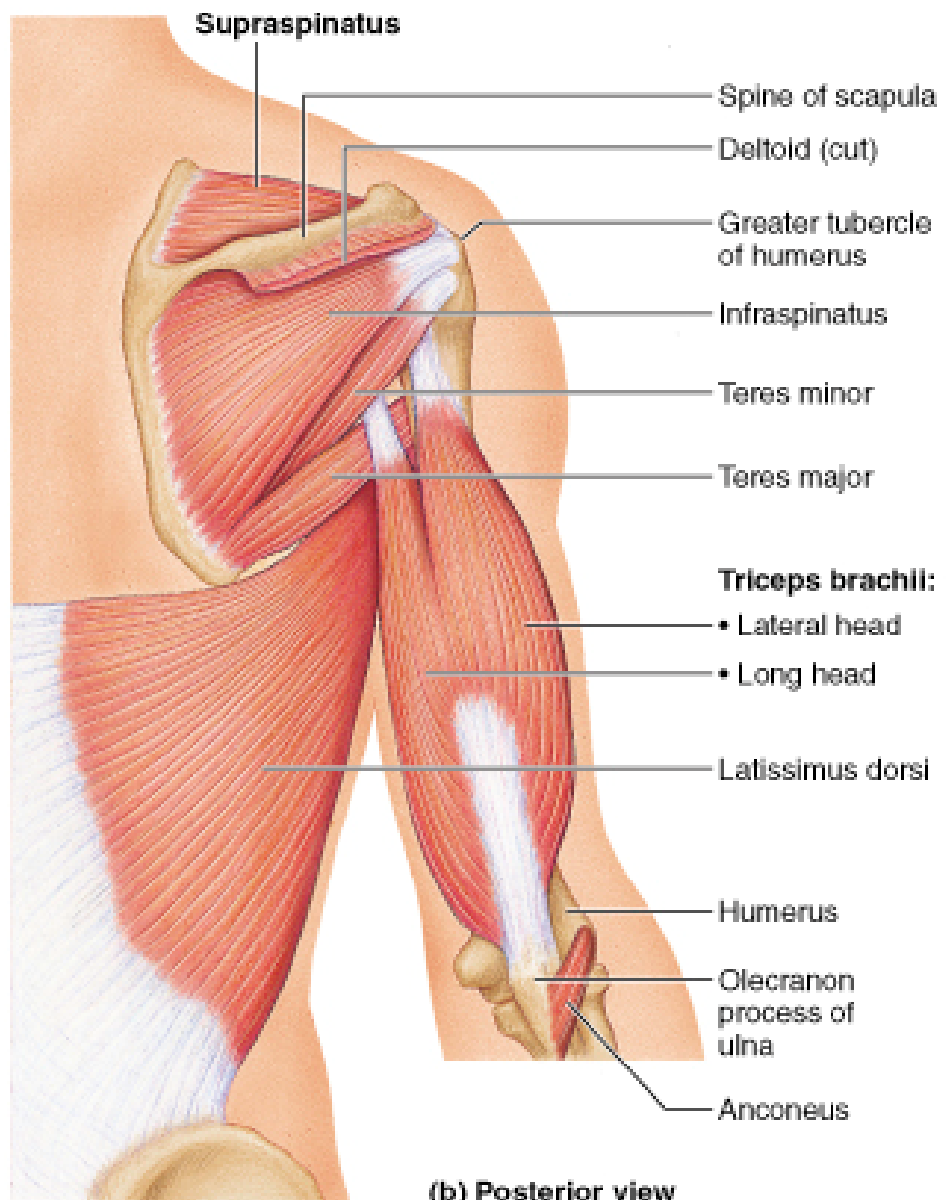
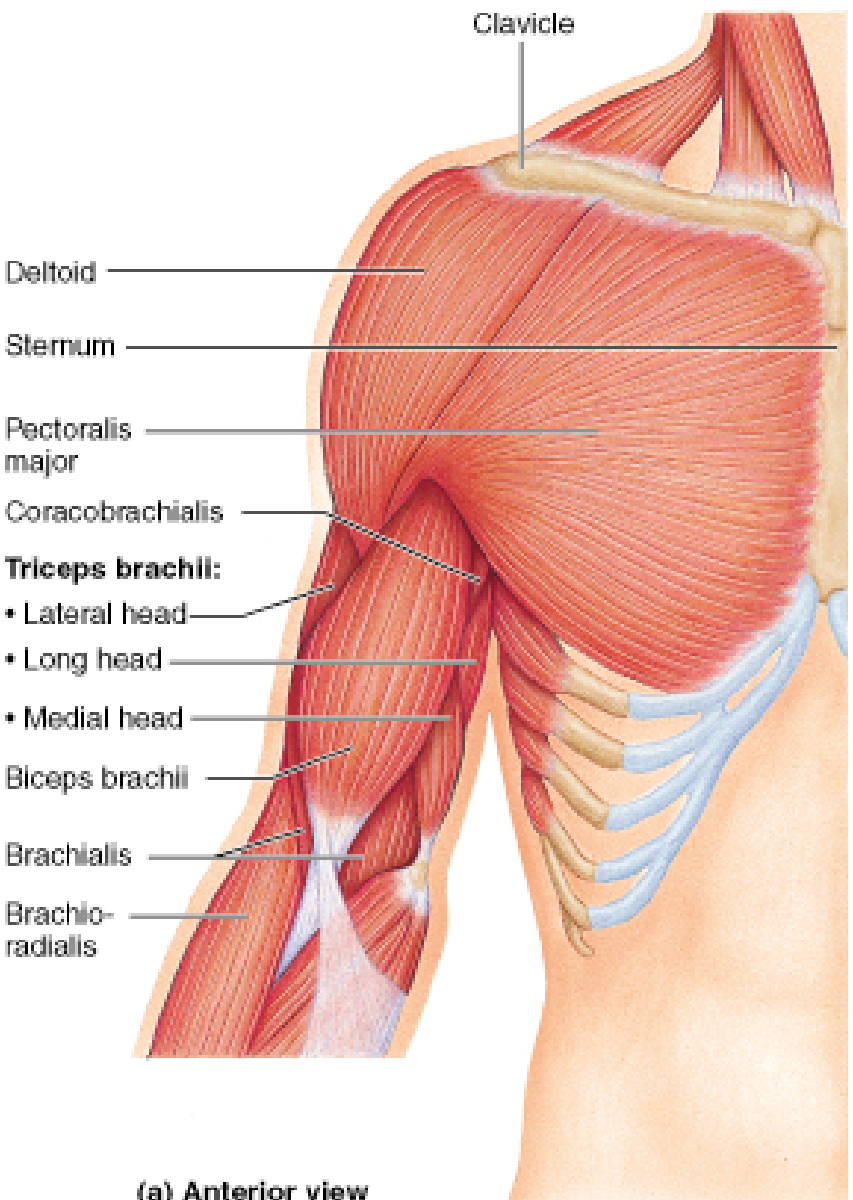
Latissimus dorsi

- **Action:**

- Extension of arm
- Adduction
- Medial rotation

- **Innervation:**

- Thoracodorsal nerve



Levator scapulae

- **Origin:**

- Transverse processes of upper 4 cervical vertebrae

- **Insertion:**

- Superior angle of scapula

Levator scapulae

- **Action:**

- Elevation of scapula

- **Innervation:**

- C3 & C4

- (sometimes receives innervation from dorsal scapular nerve)

Rhomboid minor

- **Origin:**

- Lower part of ligamentum nuchae
- Spinous processes of C7 & T1

- **Insertion:**

- Medial boarder of scapula at the base of spine

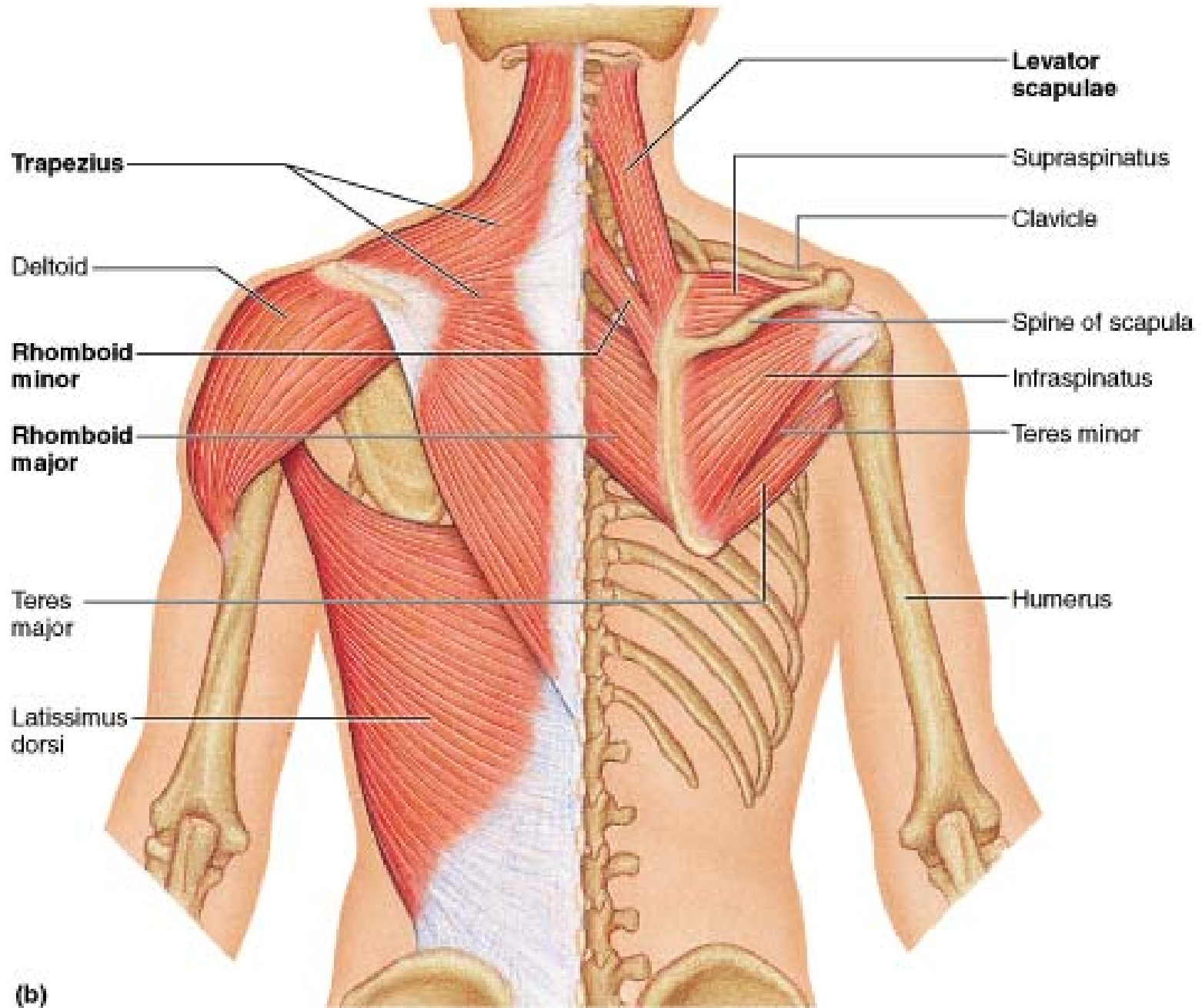
Rhomboid minor

- **Action:**

- elevation & retraction of scapula
- downward rotation of glenoid cavity

- **Innervation:**

- dorsal scapular nerve (C5)



(b)

Rhomboid major

- **Origin:**

- Spinous processes of 2nd to 5th thoracic vertebrae

- **Insertion:**

- Medial boarder of scapula below rhomboid minor

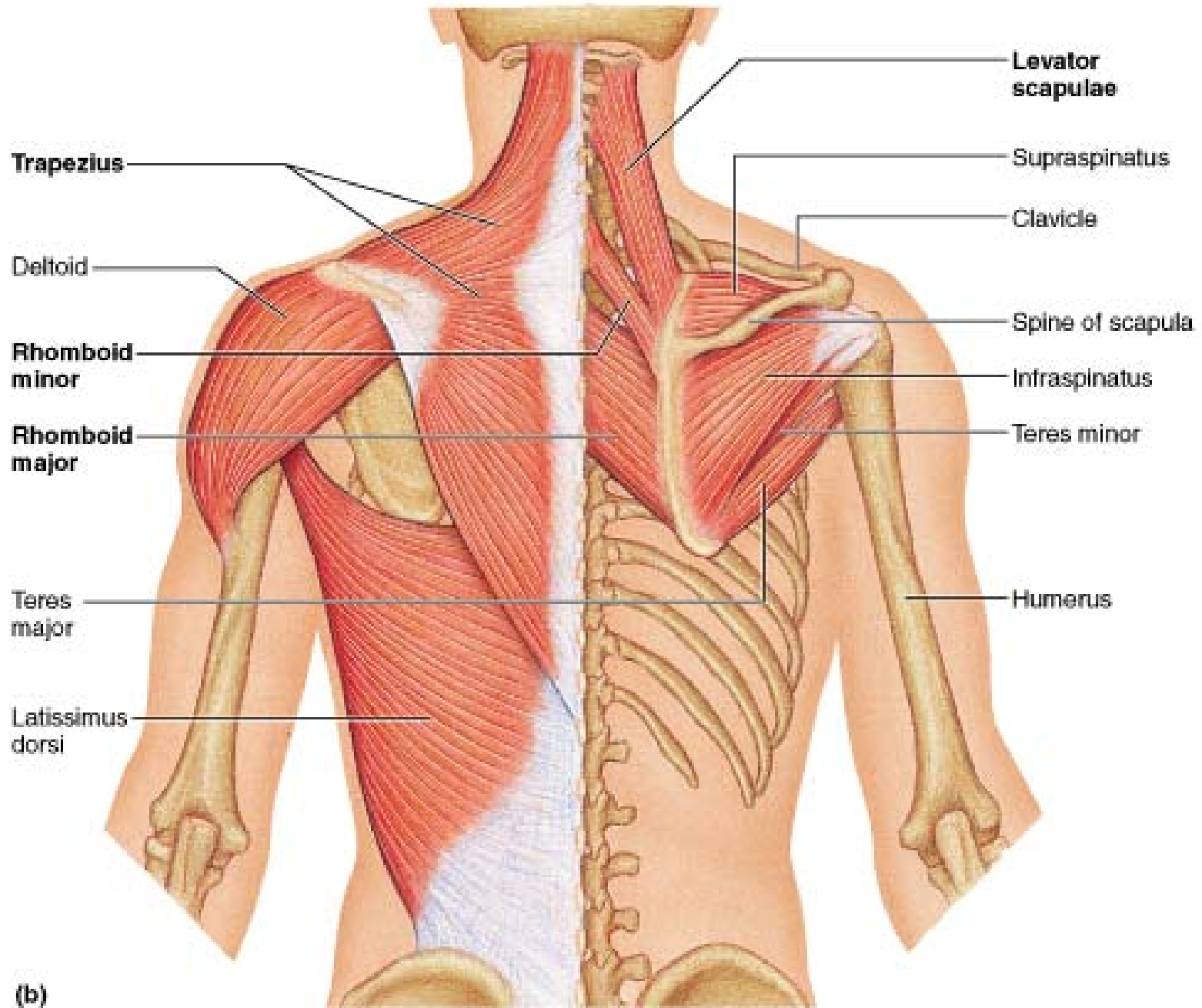
Rhomboid major

- **Action:**

- elevation & retraction of scapula
- downward rotation of glenoid cavity

- **Innervation:**

- dorsal scapular nerve (C5)



(b)

Serratus anterior

- **Origin:**

- Ribs 1-8 on antero-lateral thoracic wall

- **Insertion:**

- Medial boarder of scapula

- Heaviest insertion on inferior angle

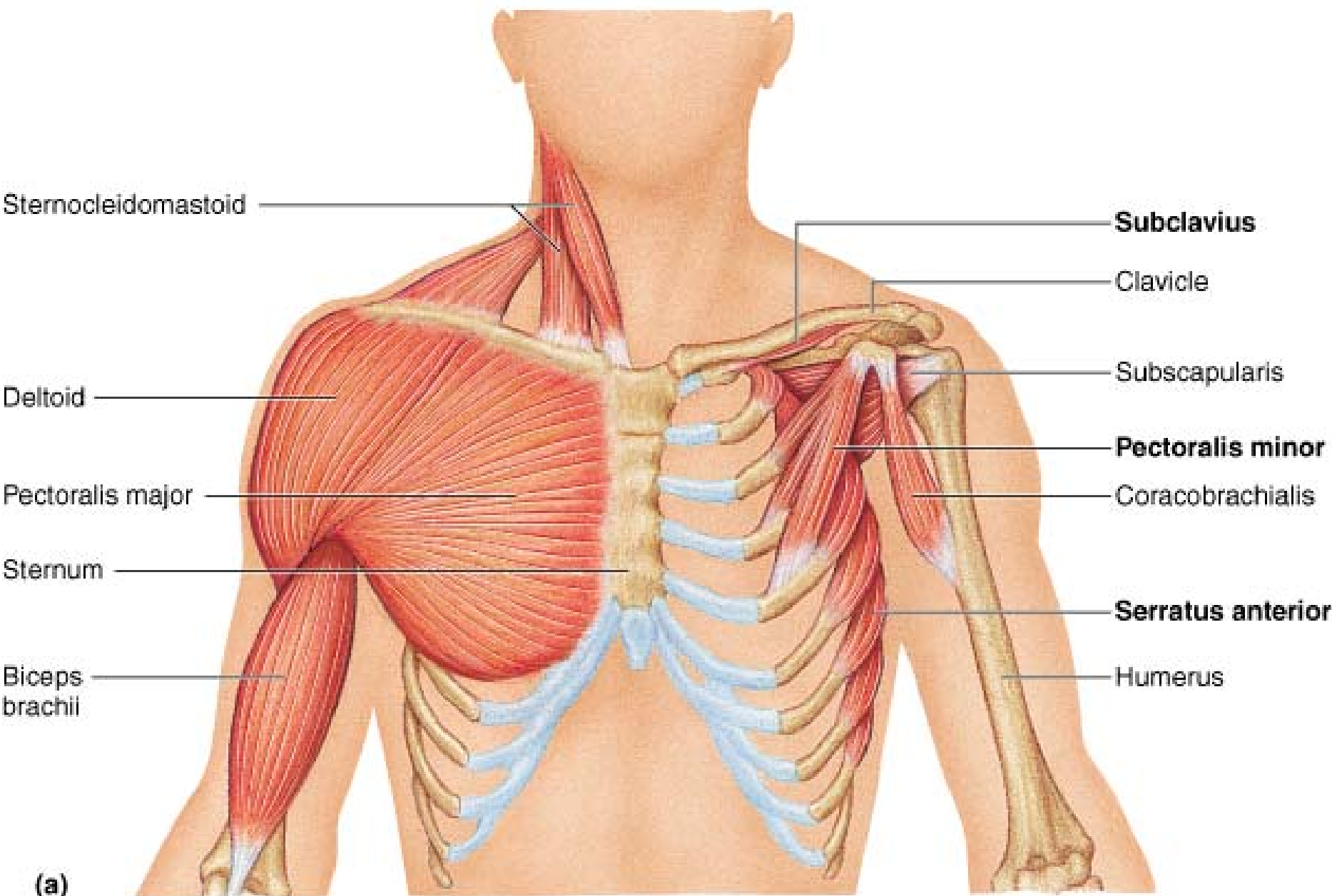
Serratus anterior

- **Action:**

- protraction of scapula
- upward rotation of glenoid cavity
- holds medial boarder of scapula against thoracic wall

- **Innervation:**

- Long thoracic nerve (C5)



Sternocleidomastoid

Subclavius

Clavicle

Deltoid

Subscapularis

Pectoralis major

Pectoralis minor

Coracobrachialis

Sternum

Serratus anterior

Biceps brachii

Humerus

(a)

Deltoid

- **Origin:**

- Lateral third of clavicle
- Acromion
- Spine of scapula

- **Insertion:**

- Deltoid tuberosity on shaft of humerus

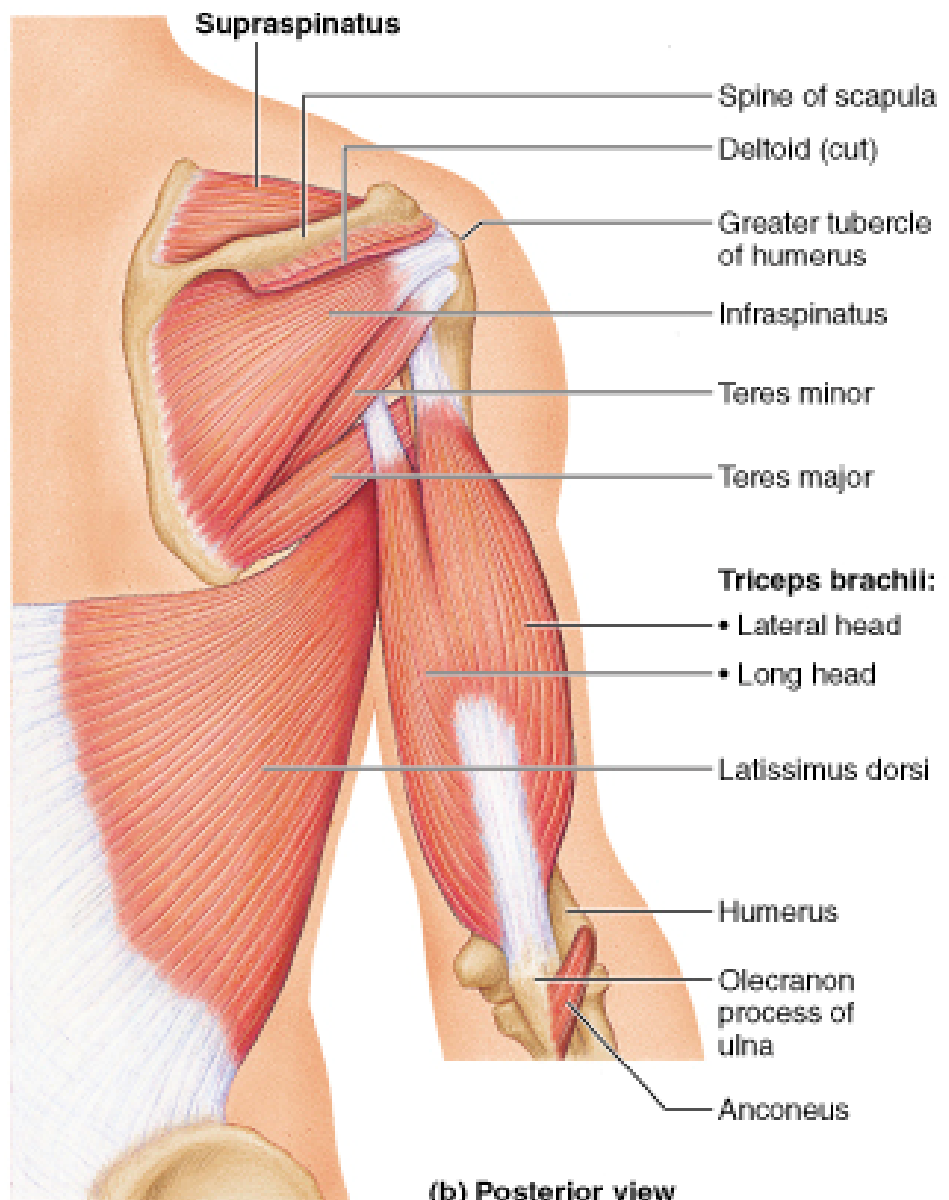
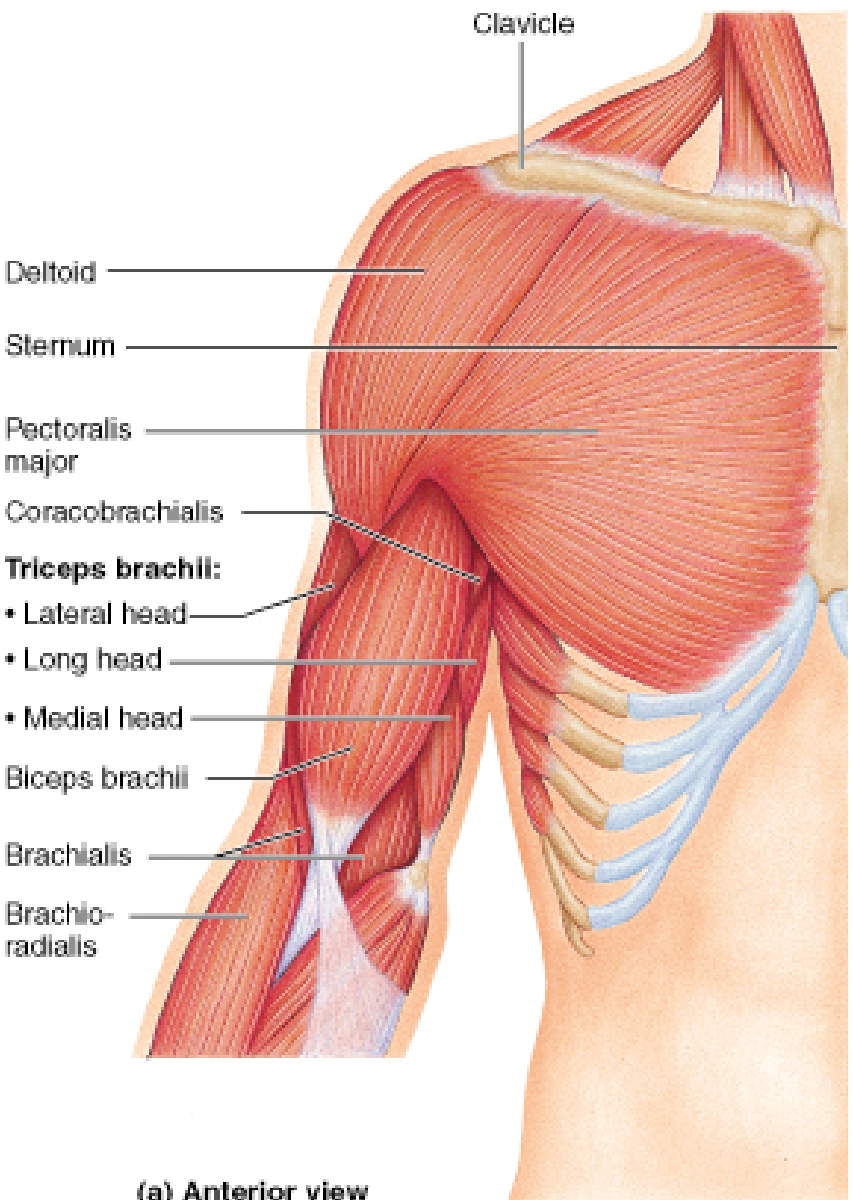
Deltoid

- **Action:**

- Anterior fibers: flexion & medial rotation
- Posterior fibers: extension & lateral rotation
- Middle fibers: abduction

- **Innervation:**

- Axillary nerve



Supraspinatus

- **Origin:**

- Supraspinous fossa of scapula

- **Insertion:**

- Greater tubercle of humerus

Supraspinatus

- **Action:**

- Abduction of arm

- **Innervation:**

- Suprascapular nerve

Infraspinatus

- **Origin:**

- Infraspinous fossa of scapula

- **Insertion:**

- Greater tubercle of humerus below supraspinatus

Infraspinatus

- **Action:**

- Lateral rotation of arm

- **Innervation:**

- Suprascapular nerve

Teres minor

- **Origin:**

- Upper two-thirds of lateral boarder of scapula

- **Insertion:**

- Greater tubercle of humerus below infraspinatus

Teres minor

- **Action:**

- Lateral rotation of arm

- **Innervation:**

- Axillary nerve

Teres major

- **Origin:**

- Inferior angle of scapula

- **Insertion:**

- Medial lip of intertubercular groove of humerus

Teres major

- **Action:**

- Adduction
- Extension & medial rotation of arm

- **Innervation:**

- Lower subscapular nerve

Subscapularis

- **Origin:**

- Subscapular fossa of scapula

- **Insertion:**

- Lesser tubercle and crest of humerus

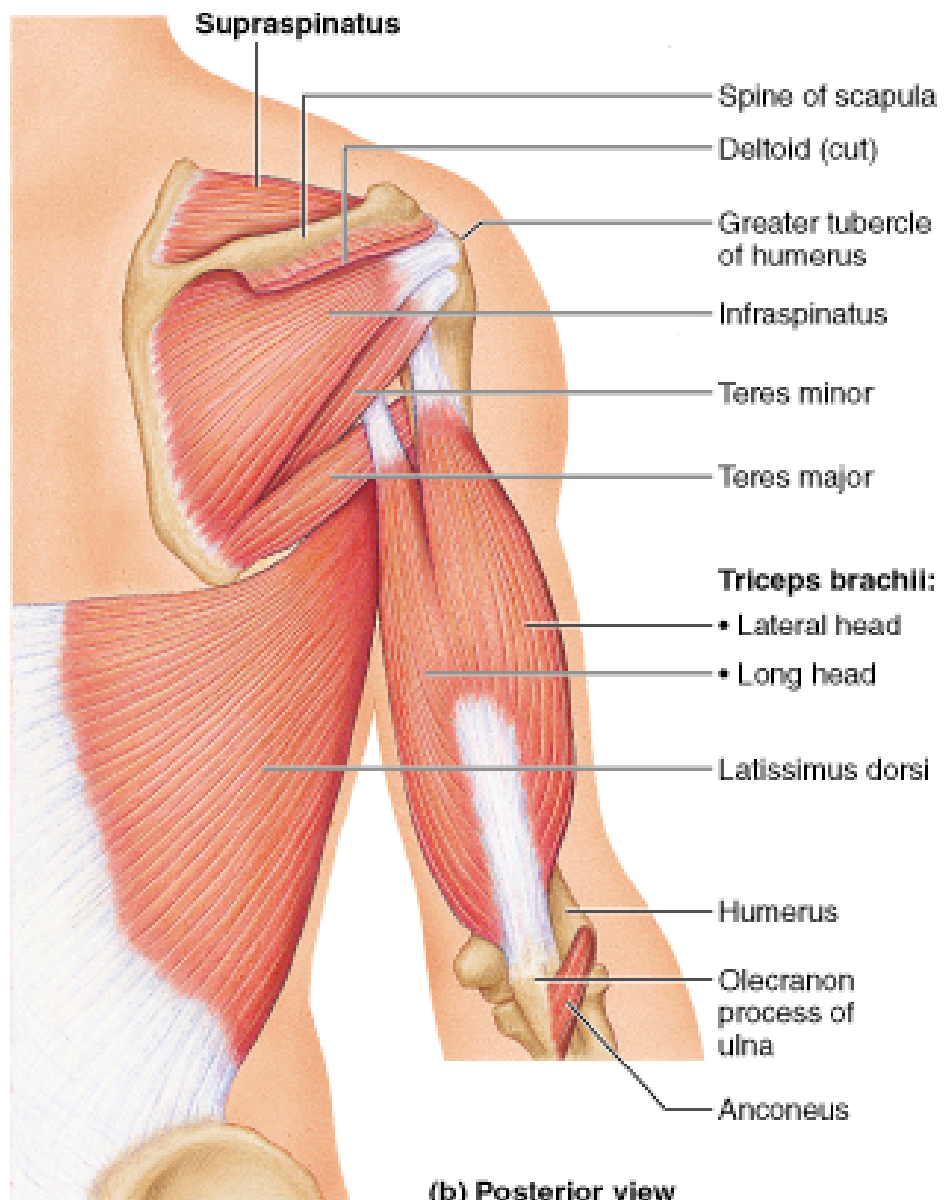
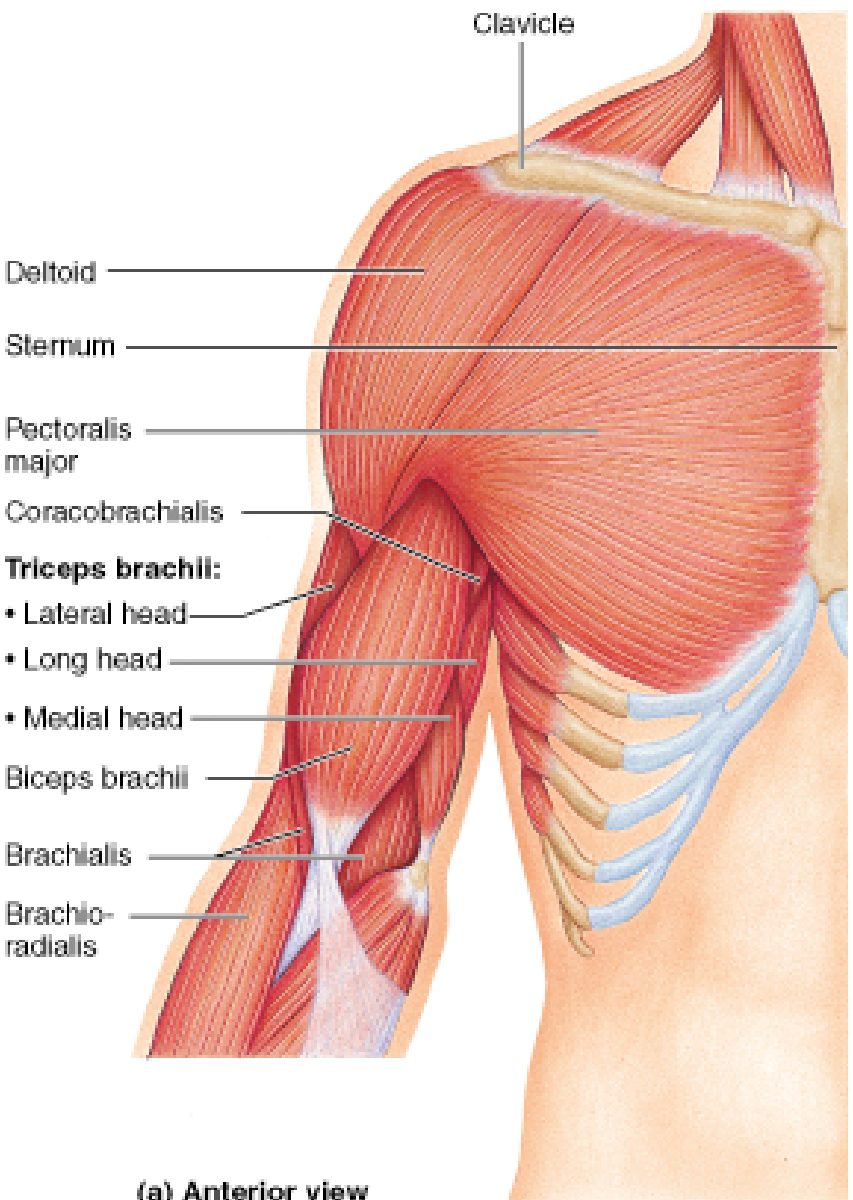
Subscapularis

- **Action:**

- Medial rotation of arm

- **Innervation:**

- Upper & lower subscapular nerves



Rotator (musculotendinous) cuff

- Supraspinatus
 - Infraspinatus
 - Teres minor
 - Subscapularis
-
- As the tendons of these muscles cross the shoulder joint, they are closely applied to the joint capsule

Rotator (musculotendinous) cuff

- Aid in stabilizing the joint by holding the head of humerus in the glenoid cavity
- No tendons are present to support the inferior part of the joint (possible dislocation in that area)