

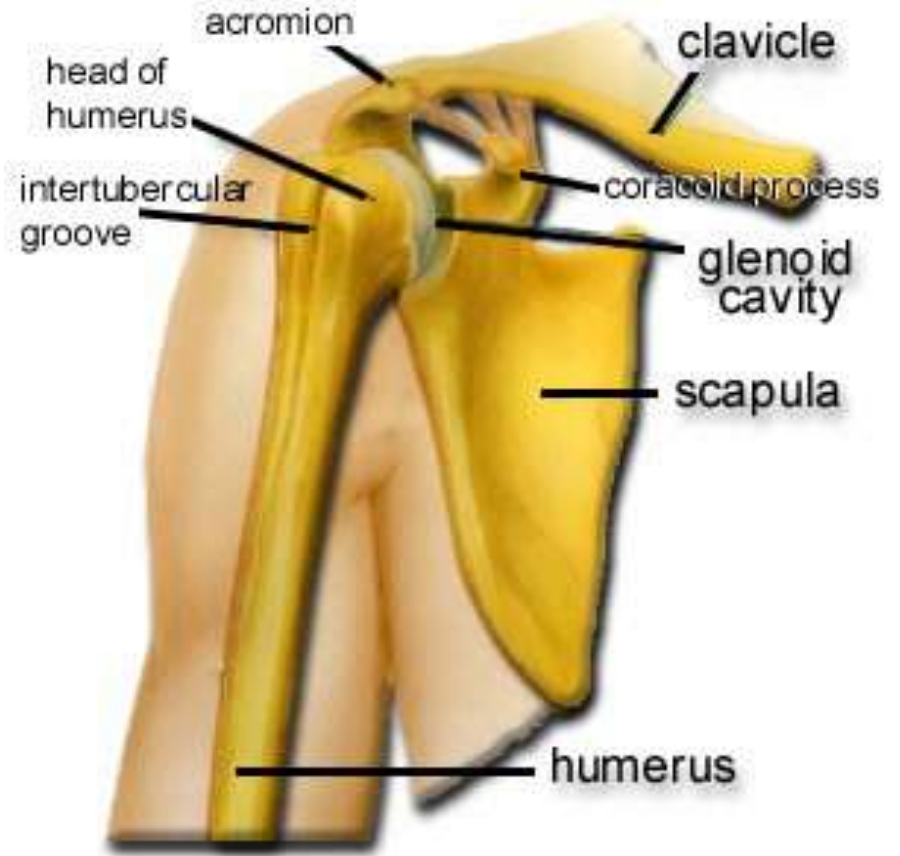
Anatomy of the Shoulder Girdle

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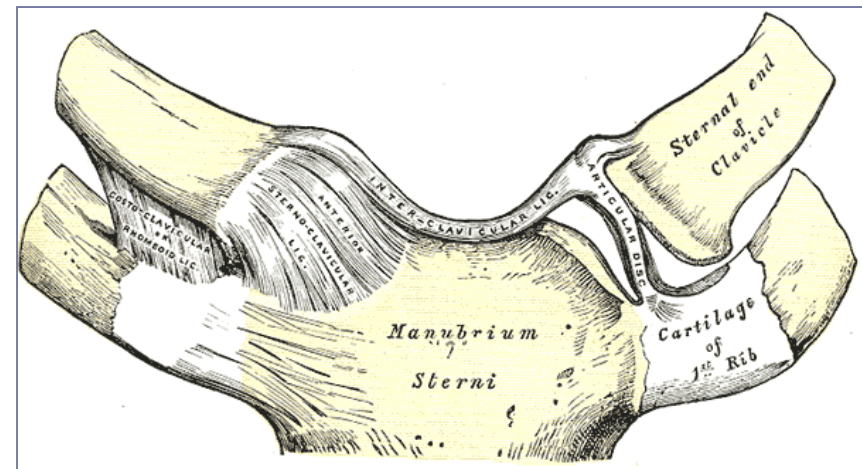
Bony Anatomy

- ▶ **Shoulder Complex:**
 - ▶ Sternum(manubrium)
 - ▶ Clavicle
 - ▶ Scapula
 - ▶ Proximal humerus



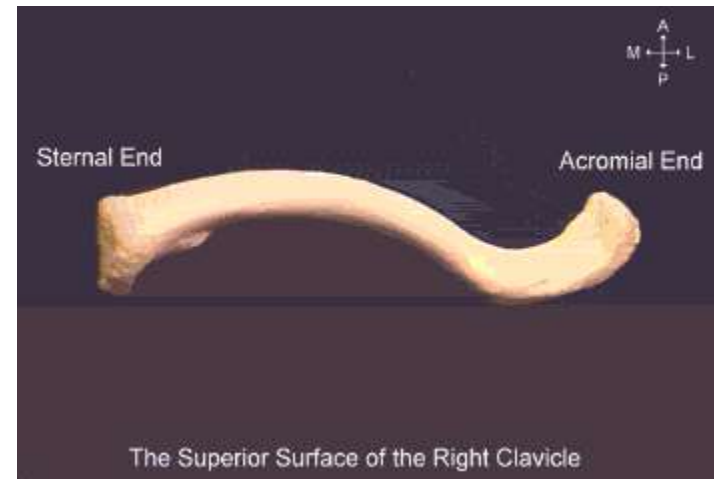
Manubrium Sterni

- ▶ Upper part of the sternum
- ▶ Attachment site of the clavicle to the manubrium is at the clavicular notch



Clavicle

- ▶ Convex proximal (lateral) 2/3
- ▶ Concave distal (medial) 1/3 to meet scapula
- ▶ Superior surface not protected by muscle mass
- ▶ Elevates and rotates to maintain alignment of scapula



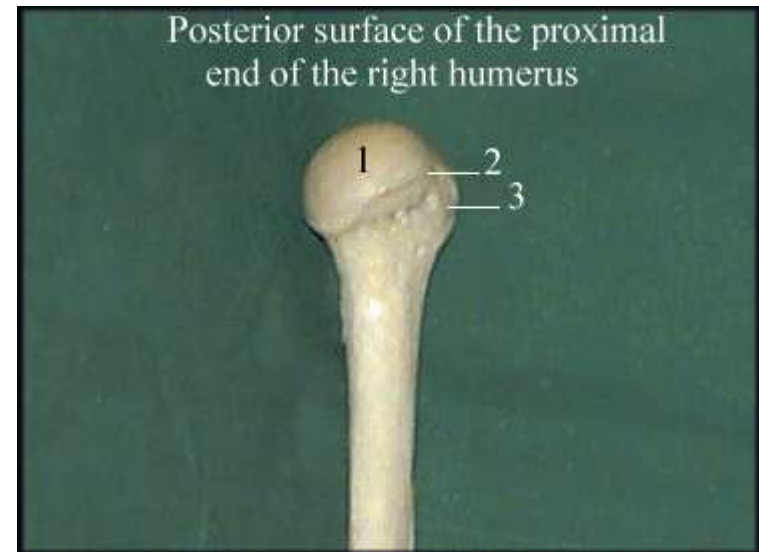
Scapula

- ▶ Subscapular fossa
- ▶ Vertebral borders
- ▶ Spine of scapula
- ▶ Coracoid process
- ▶ Glenoid fossa



Proximal Humerus

- ▶ **Humeral head**
 - ▶ projects medially off the anatomical neck
- ▶ **Bicipital groove**
 - ▶ Lodges the long head of the biceps brachii
- ▶ **Greater tuberosity**
- ▶ **Lesser tuberosity**
- ▶ **Surgical neck**



Acromioclavicular Joint (AC)



Glenohumeral Joint (Shoulder)

- ▶ Bony components:
 - Head of the humerus
 - Glenoid cavity of the scapula
 - The glenoid cavity is widened and deepened slightly by a lip of fibrocartilage, the glenoid labrum



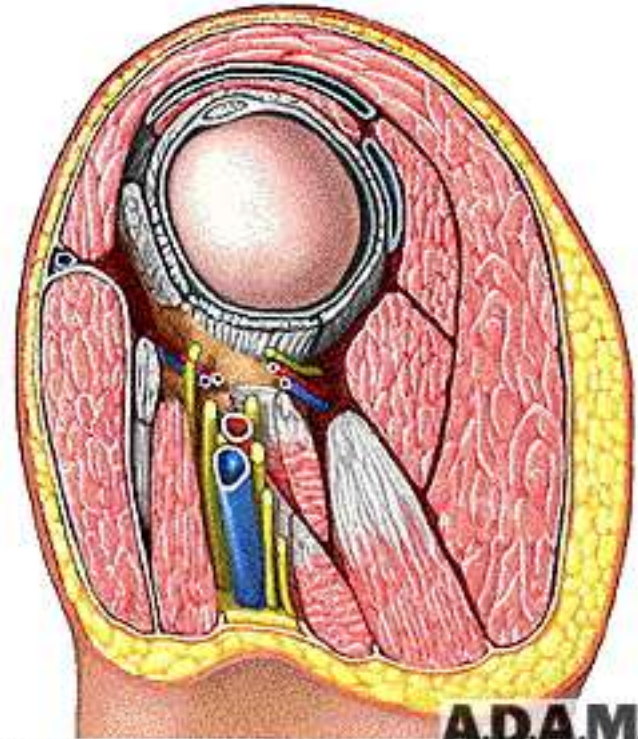
Shoulder (anterior)

- ▶ Fibrous capsule
 - This attaches to the bony framework
 - Proximally to the circumference of the glenoid cavity
 - Distally to the anatomical neck of the humerus, except medially, where the attachment descends for a short distance on the shaft of the humerus



Shoulder

- ▶ The shoulder capsule is so thin and lax that it is not strong enough by itself to keep the head of the humerus in the glenoid cavity; this function is subserved by the rotator cuff muscles



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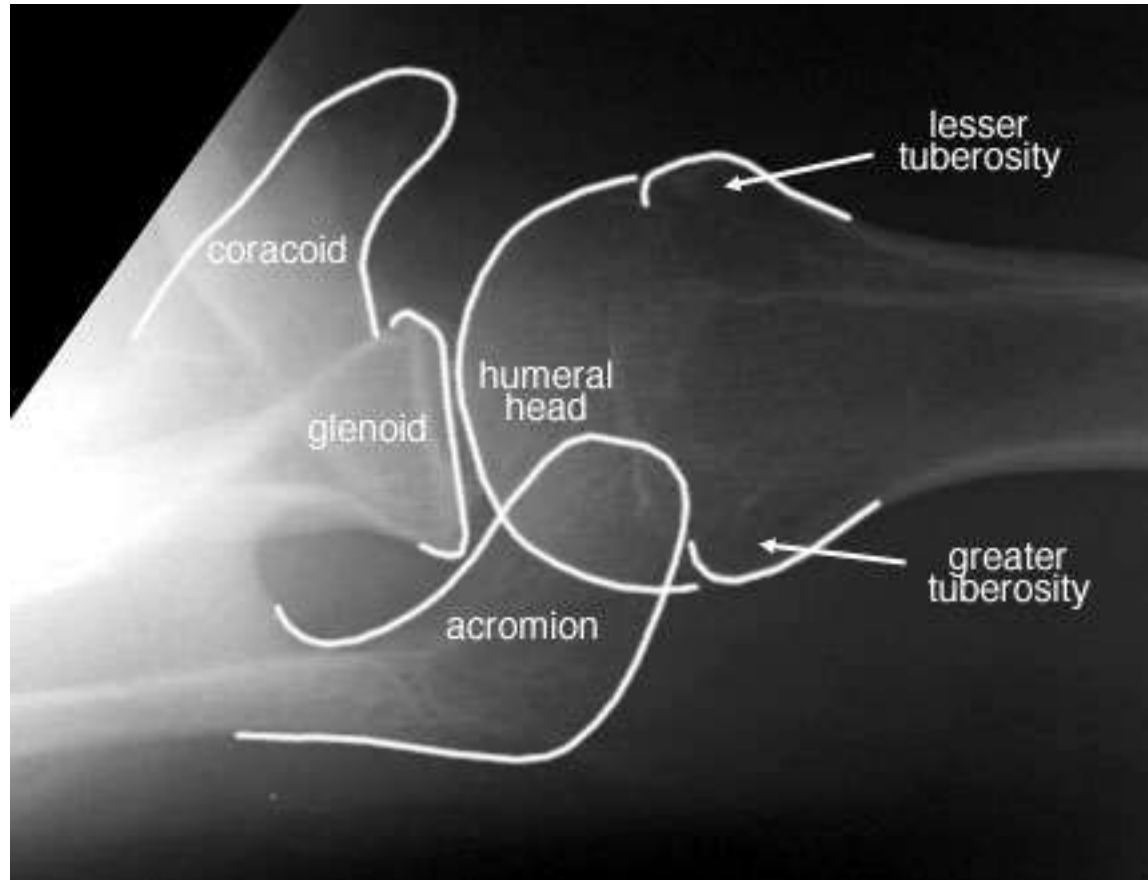


Shoulder Girdle X-Ray appearance

Anterior Posterior view



Shoulder Girdle X-Ray appearance (Axillary view)



Movements at the shoulder joint

- ▶ A ventral movement of the arm in a sagittal plane is flexion of the shoulder; the opposite movement is extension of the shoulder
- ▶ Movement of the arm away from the midline in a coronal plane is abduction of the shoulder; the opposite movement is adduction of the shoulder
- ▶ Rotation of the humerus around its longitudinal axis such that the anterior surface of the humerus turns medially is medial rotation of the shoulder; the opposite movement is lateral rotation of the shoulder



Muscles of the shoulder girdle

- ▶ **Two groups of muscles:**
 - ▶ Muscles acting on the scapula
 - ▶ Muscles acting on the humerus



Muscles acting on the scapula

Actions

- ▶ Move the scapula to allow increased range of motion of the shoulder joint
- ▶ Fixate scapula to thorax
- ▶ **Muscles include:**
 - ▶ Rhomboid major and minor
 - ▶ Levator scapulae
 - ▶ Serratus Anterior
 - ▶ Pectoralis Major and Minor
 - ▶ Trapezius
 - ▶ Latissimus Dorsi



Rhomboid major and minor

O: **Rhomboid Minor** - Nuchal ligament and spinous processes C7 - T1

Rhomboid Major - Spinous processes T2 - T5

I: Medial border of scapula from level of the spine to inferior angle

A: Retracts the scapula, moving it towards the spine; and rotates it so that the glenoid tilts downward

N: Dorsal Scapular Nerve



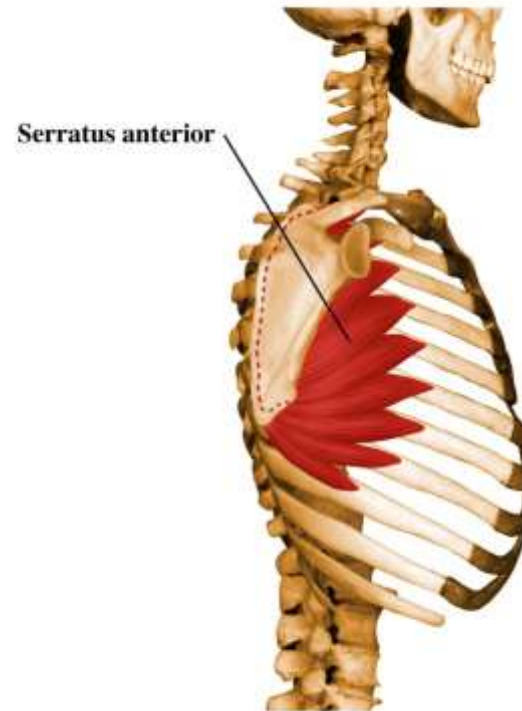
Levator scapulae

- O:** Posterior tubercles of transverse processes of C1 - C4 vertebrae
- I:** Superior part of medial border of scapula
- A:** Elevates scapula and tilts its glenoid cavity inferiorly by rotating scapula
- N:** Dorsal Scapular Nerve



Serratus anterior

- O**: External surfaces of lateral parts of ribs 1 - 8
- I**: Anterior surfaces of medial border of the scapula
- A**: Protracts scapula and rotates it
- N**: Long Thoracic Nerve



Trapezius

- O**: Medial 1/3 of superior nuchal line; external occipital protuberance; nuchal ligament; spinous processes of C7 - T12 vertebrae
- I**: Lateral third of clavicle; acromion and spine of scapula
- A**: Upperpart: Elevation, Lower Part: retraction and depression
- N**: Spinal root of Accessory Nerve



Latissimus Dorsi

- ▶ **O**: lumbar spine/iliac crest
- ▶ **I**: Intertubercular groove
- ▶ **A**:Adduction
 - Internal rotation
 - Extension
 - Upper fibers assist in retraction and downward rotation of scapula
- **N**:Thoracodorsal Nerve



Pectoralis Major

Has two heads

O: **Clavicular head:** anterior surface of medial half of clavicle

Sternocostal head: anterior surface of sternum, superior six costal cartilages, and aponeurosis of external oblique muscle

I: Lateral lip of intertubercular groove of humerus

A: Adducts and medially rotates humerus;
Acting alone: clavicular head flexes humerus and sternocostal head extends it

N: Lateral and Medial Pectoral Nerves



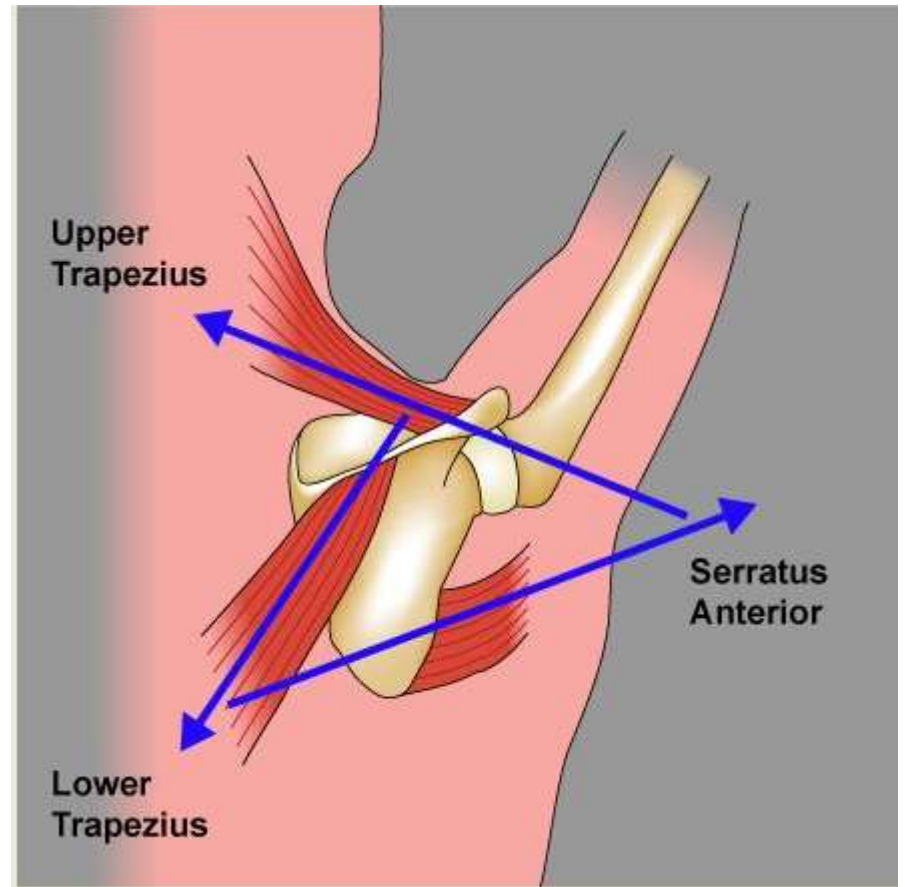
Pectoralis Minor

- O:** 3rd to 5th ribs near their costal cartilages
- I:** Medial border and superior surface of coracoid process of scapula
- A:** Stabilizes scapula by drawing it inferiorly and anteriorly against thoracic wall
- N:** Medial Pectoral Nerves



Rotation of the scapular

Combined effects
of many muscles



Muscles acting on the humerus

- ▶ Rotator Cuff
- ▶ Teres Major
- ▶ Deltoid
- ▶ Pectoralis Major
- ▶ Latissimus Dorsi
- ▶ Long Head of triceps
- ▶ Coracobrachialis
- ▶ Biceps

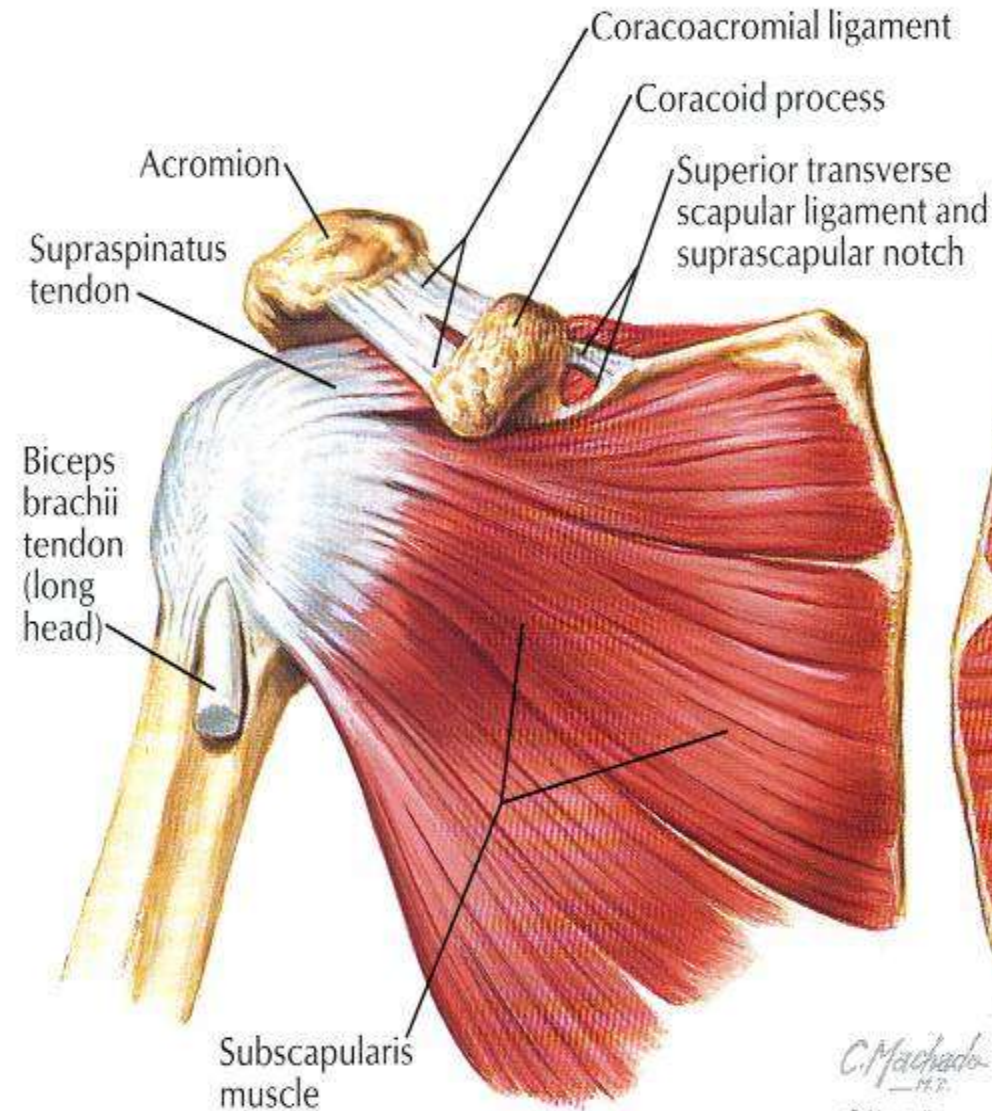


Rotator Cuff Muscles

- ▶ **S**upraspinatus
 - ▶ abduction/external rotation
- ▶ **I**nfraspinatus
 - ▶ external rotation/horizontal abduction
- ▶ **T**eres Minor
 - ▶ external rotation/horizontal abduction
- ▶ **S**ubscapularis
 - ▶ internal rotation

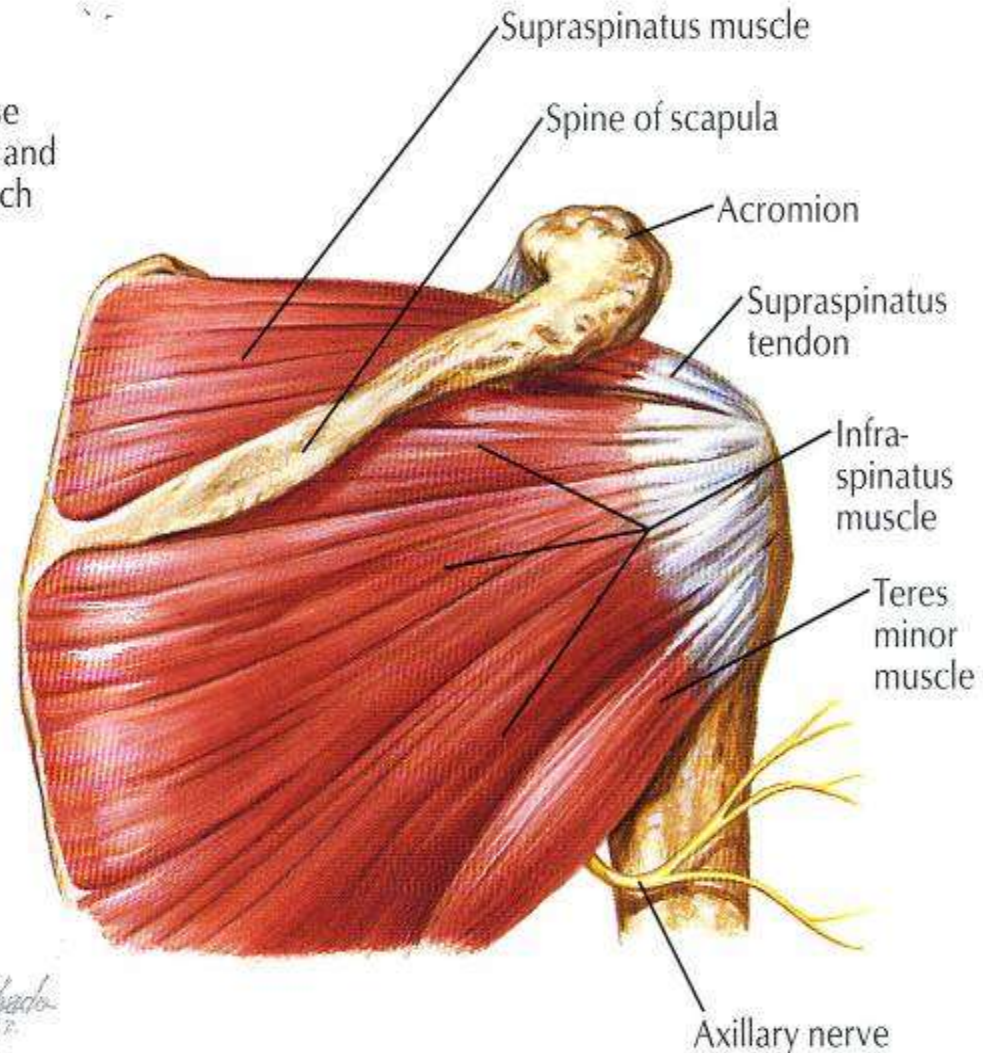


rotator cuff musculature



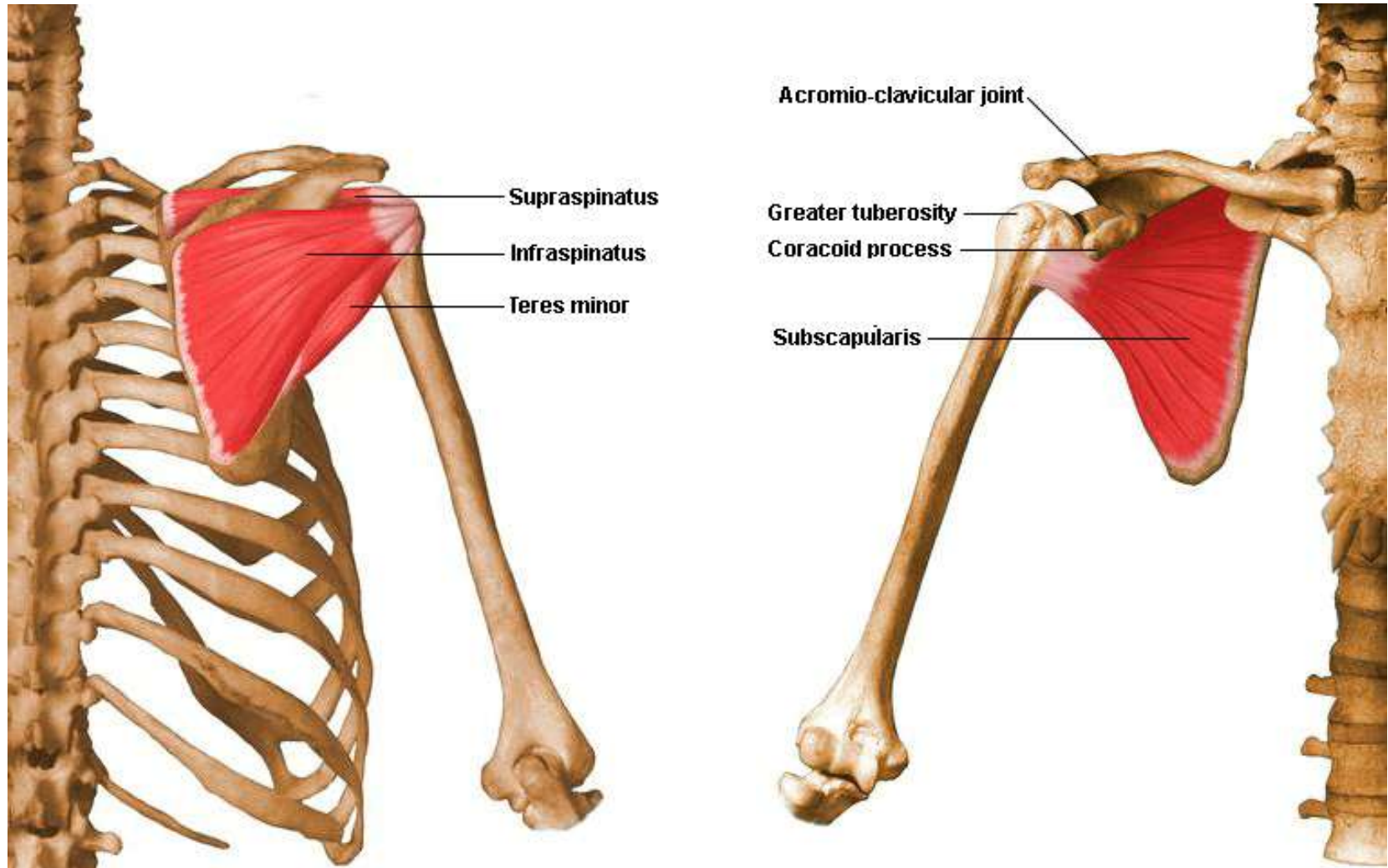
Anterior view

C. Machado
— M.D. —
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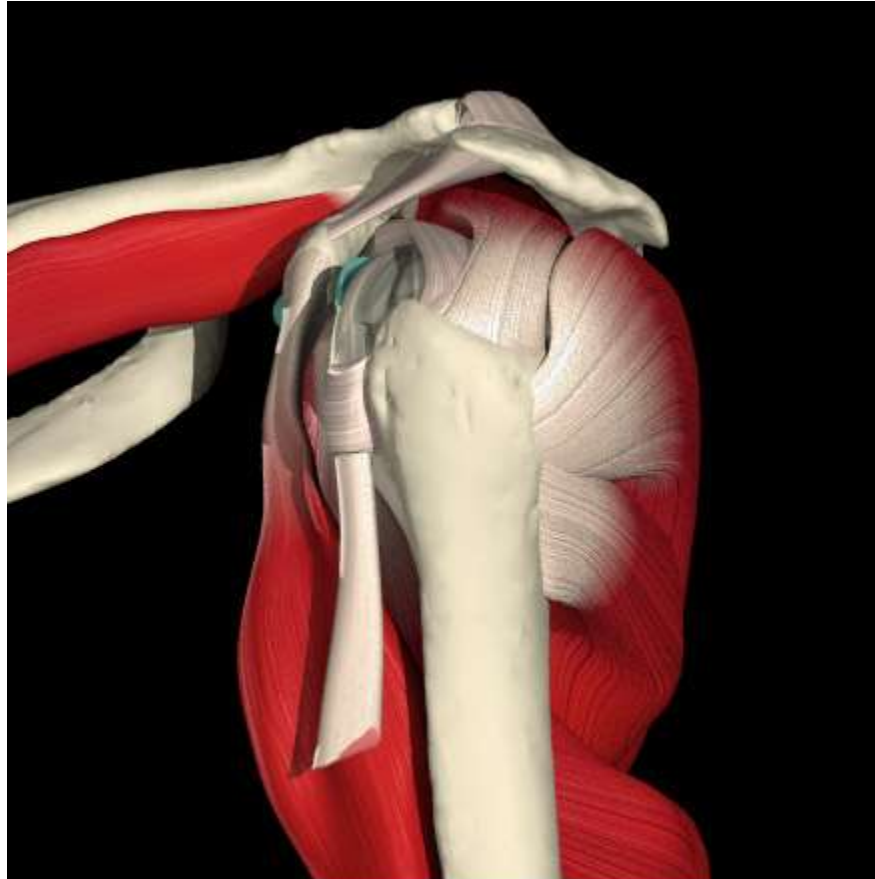


Posterior view

Rotator Cuff



Rotator cuff



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Supraspinatus

- O:** Supraspinous fossa
- I:** Superior facet on greater tubercle of humerus
- A:** Initiates and assists Deltoid in abduction; acts with other rotator cuff muscles
- N:** Suprascapular Nerve



Infraspinatus

- O:** Infraspinous fossa
- I:** Middle facet on greater tubercle of humerus
- A:** Laterally rotates the arm
- N:** Suprascapular Nerve



Subscapularis

- O**: Subscapular fossa
- I**: Lesser tubercle of humerus
- A**: Medial rotation of arm and adduction
- N**: Upper and Lower Subscapular



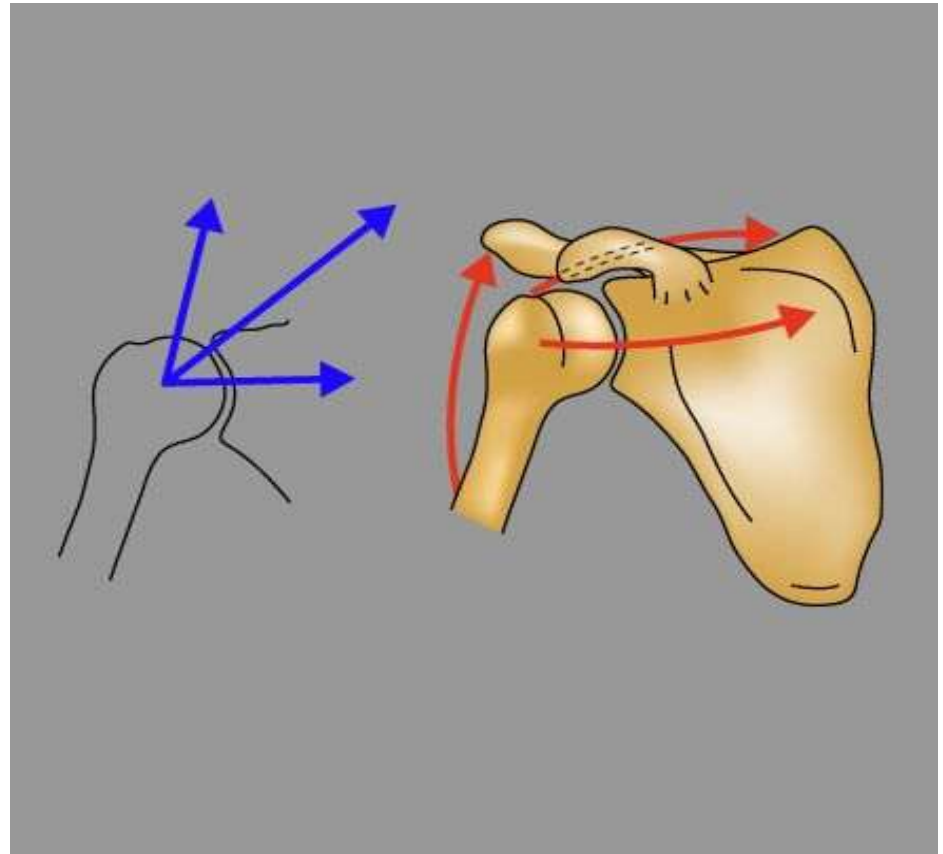
Teres minor

- O:** Superior part of the lateral border of the scapula
- I:** Inferior facet on greater tubercle of humerus
- A:** Laterally rotates the arm
- N:** Axillary Nerve



Action of Rotator cuff

The Rotator cuff stabilizes the head of the humerus on the glenoid to allow the deltoid abduct the arm



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Teres Major

- O**: Dorsal surface of inferior angle of scapula
- I**: Medial lip of intertubercular groove of humerus
- A**: Adducts and medially rotates arm
- N**: Lower subscapular nerve



Deltoid

O: Lateral third of clavicle,
acromion, and spine of scapula

I: Deltoid tuberosity

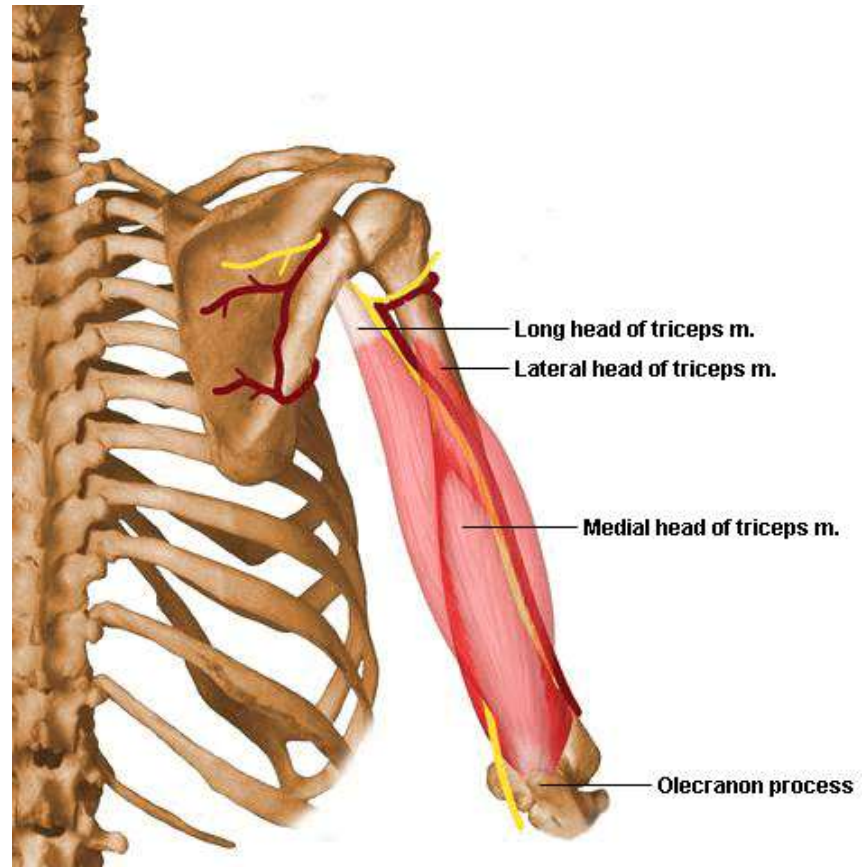
A: Anterior part: Flexes and
Medially rotates arm, Middle Part:
Abduction, Posterior part:
Extends and laterally rotates arm

N: Axillary Nerve



Triceps

- O:** **Long head:** infraglenoid tubercle of scapula
- Lateral head:** posterior surface of humerus, superior to radial groove
- Medial head:** posterior surface of humerus, inferior to radial groove
- I:** Proximal end of olecranon process of ulna and fascia of forearm
- A:** Chief extensor of forearm; long head steadies head of abducted humerus
- N:** Radial Nerve



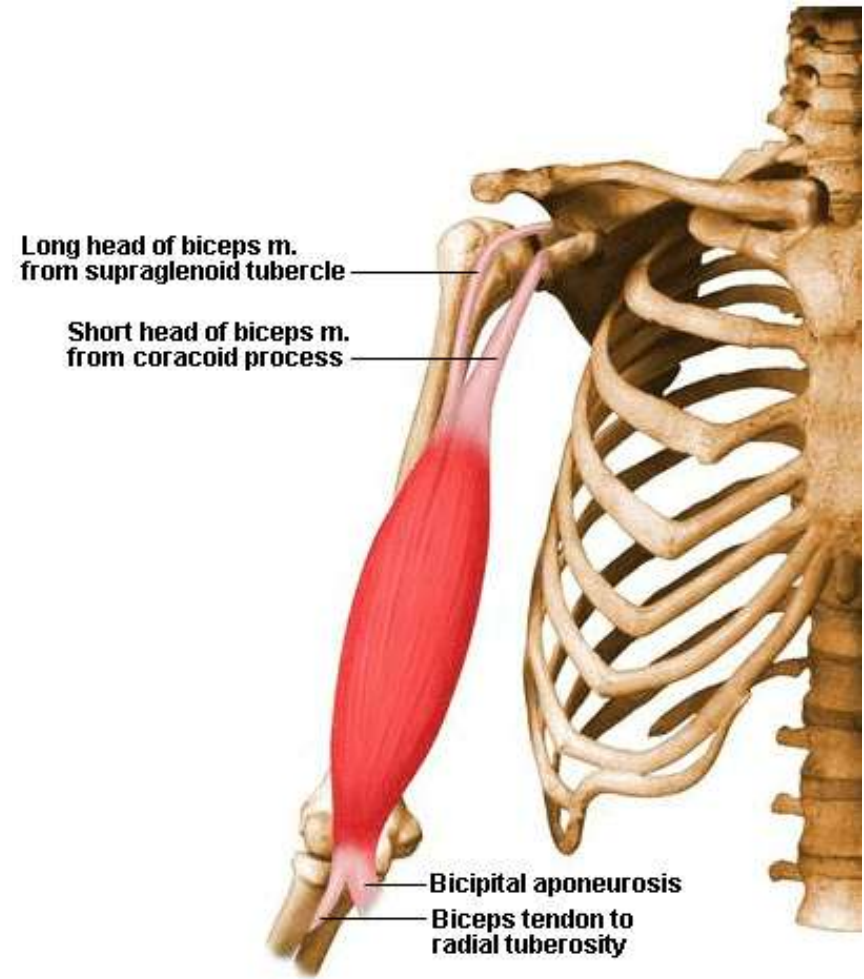
Coracobrachialis

- O:** Tip of coracoid process of scapula
- I:** Middle third of medial surface of humerus
- A:** Helps to flex and adduct arm
- N:** Musculocutaneous nerve



Biceps Brachii

- O:** **Short head:** tip of coracoid process of scapula
Long head: supraglenoid tubercle of scapula
- I:** Tuberosity of radius and fascia of forearm via bicipital aponeurosis
- A:** Supinates forearm and, when it is supine, flexes forearm
- N:** Musculocutaneous nerve



Thank you for your attention



ANY
QUESTION?

