

Shoulder Anatomy

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Shoulder Complex Bone Anatomy



■ Clavicle

- Sternal end
- Acromion end

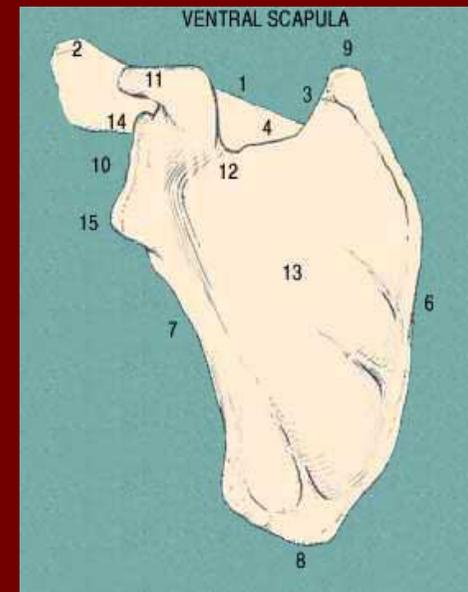
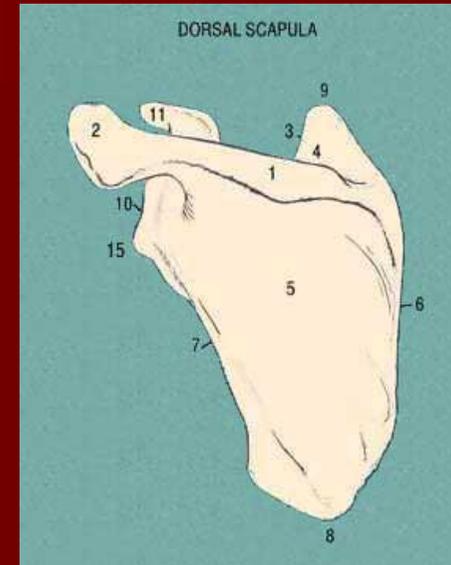
■ Scapula

- Surfaces
 - Costal
 - Dorsal
- Borders
- Angles

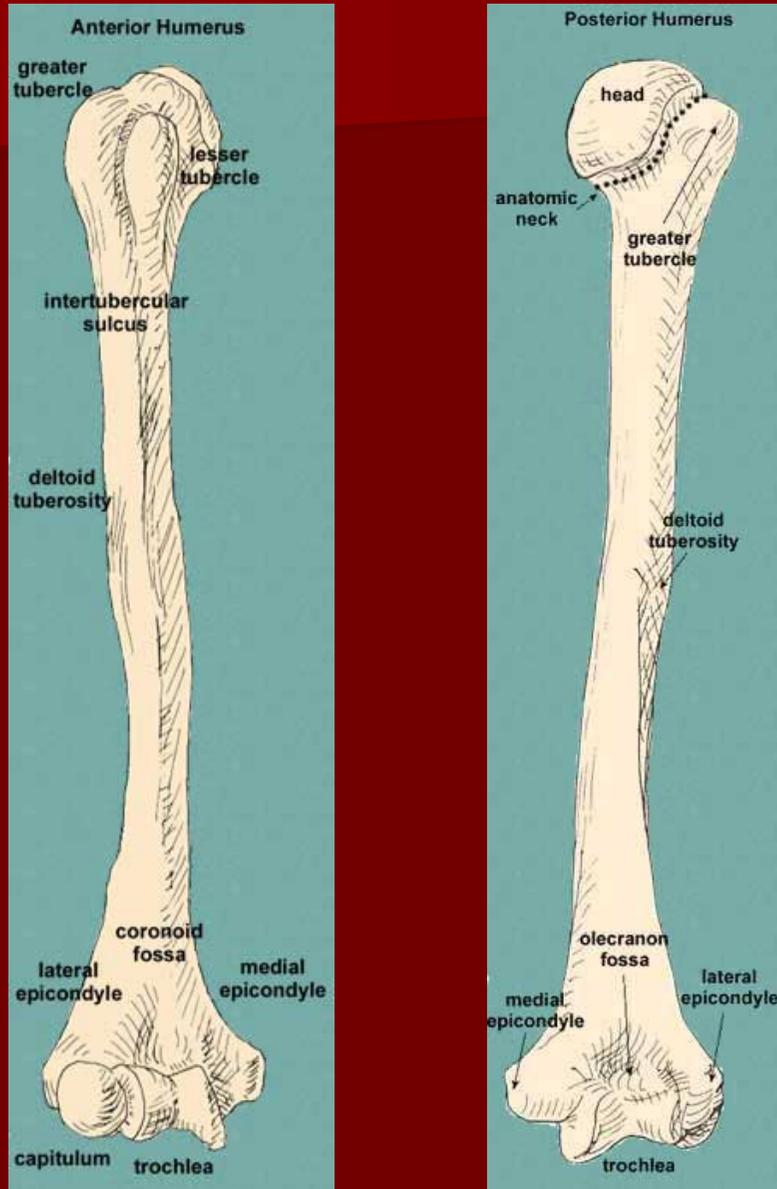
Shoulder Complex Bone Anatomy

■ Scapula

1. spine
2. acromion
3. superior border
4. supraspinous fossa
5. infraspinous fossa
6. medial (vertebral) border
7. lateral (axillary) border
8. inferior angle
9. superior angle
10. glenoid fossa (lateral angle)
11. coracoid process
12. superior scapular notch
13. subscapular fossa
14. supraglenoid tubercle
15. infraglenoid tubercle



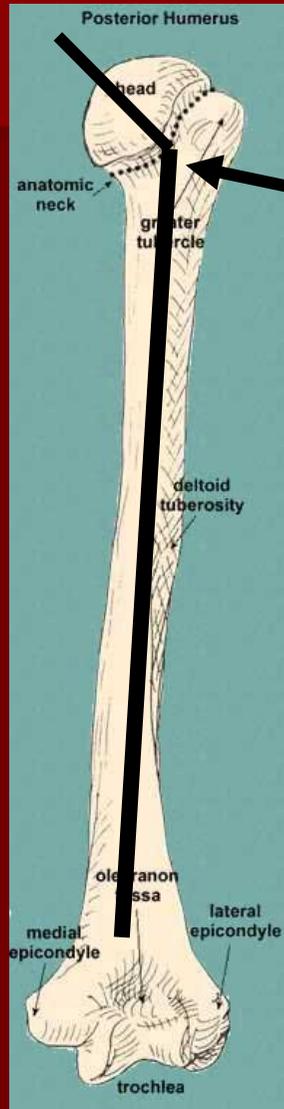
Shoulder Complex Bone Anatomy



■ Humerous

- head
- anatomical neck
- greater tubercle
- lesser tubercle
- greater tubercle
- lesser tubercle
- intertubercular sulcus (AKA bicipital groove)
- deltoid tuberosity

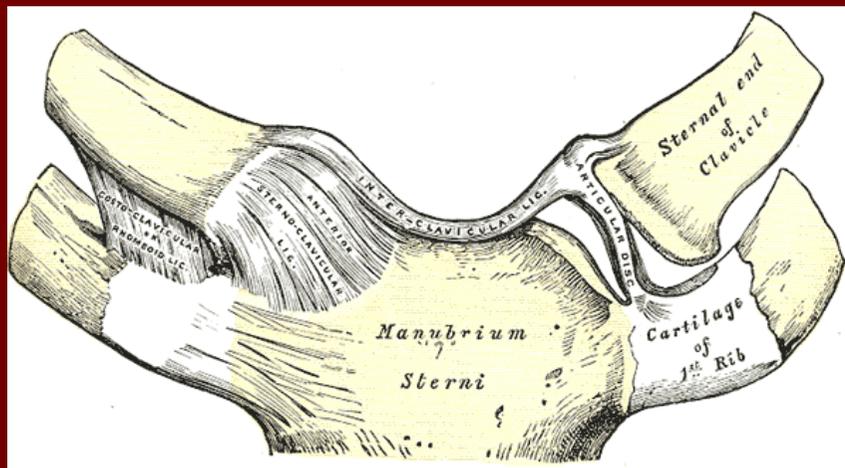
Shoulder Complex Bone Anatomy



- Humerous

- Surgical Neck
- Angle of Inclination
 - 130-150 degrees
- Angle of Torsion
 - 30 degrees posteriorly

Shoulder Complex Articulations



■ Sternoclavicular Joint

– Sternal end of clavicle with manubrium/ 1st costal cartilage

– 3 degree of freedom

– Articular Disk

– Ligaments

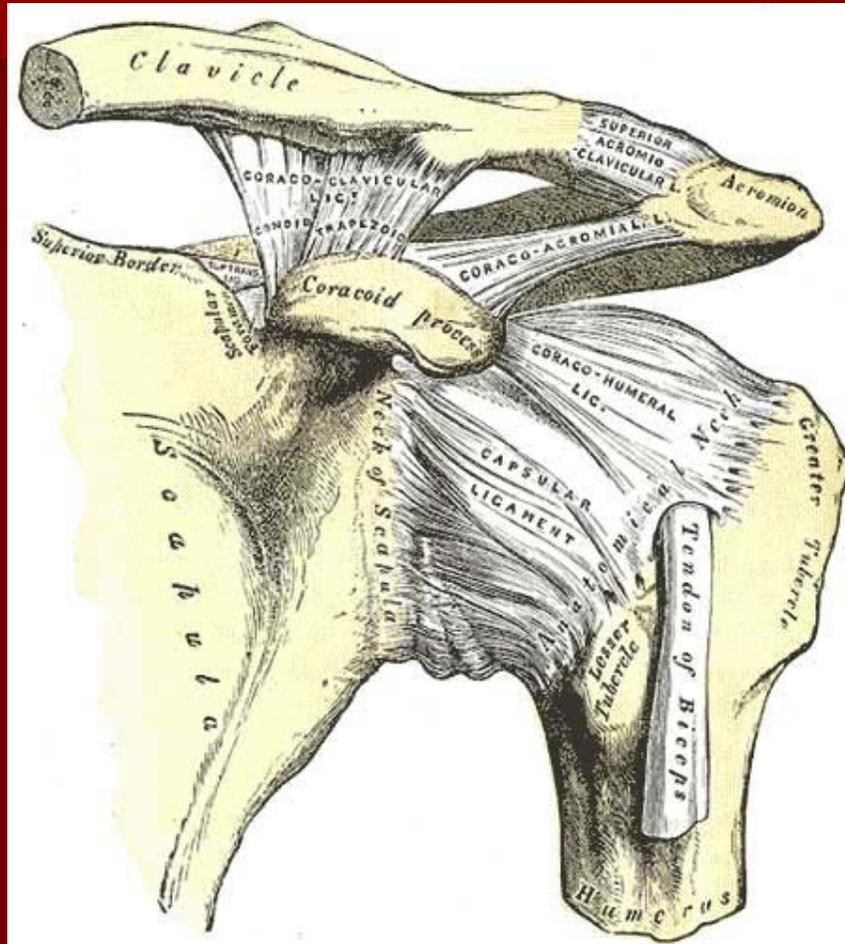
■ Capsule

■ Anterior/Posterior Sternoclavicular Ligament

■ Interclavicular Ligament

■ Costoclavicular Ligament

Shoulder Complex Articulations



■ Acromioclavicular Joint

- 3 degrees of freedom
- Articular Disk
- Ligaments
 - Superior/Inferior Acromioclavicular Ligaments
 - Coracoclavicular
 - Trapezoid
 - Conoid

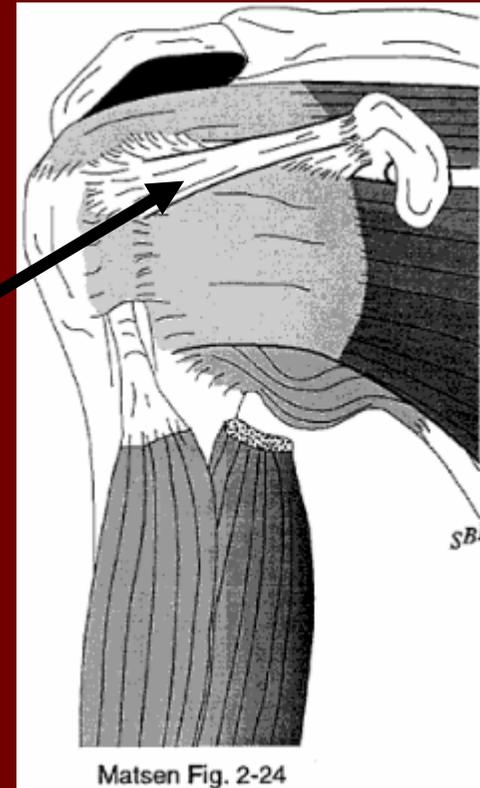
Shoulder Complex Articulations

- Glenohumeral Joint
 - Configuration
 - 3 degrees of freedom
 - **Labrum**
 - Ligaments
 - Capsule
 - Coracohumeral Ligament
 - Glenohumeral Ligaments
 - Superior
 - Middle
 - Inferior of Weitbrecht
 - Foramen of
 - Posterior Capsule



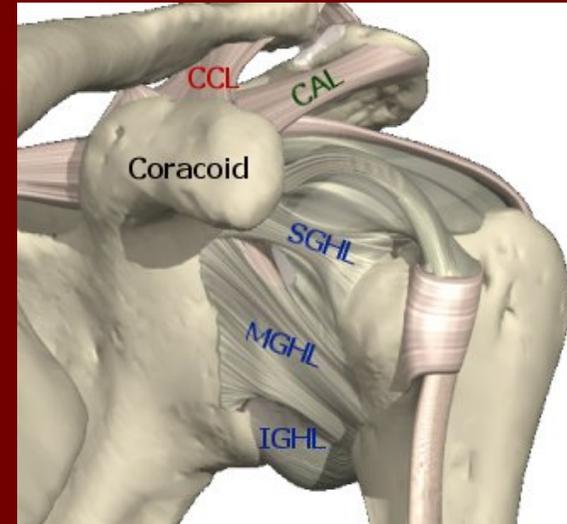
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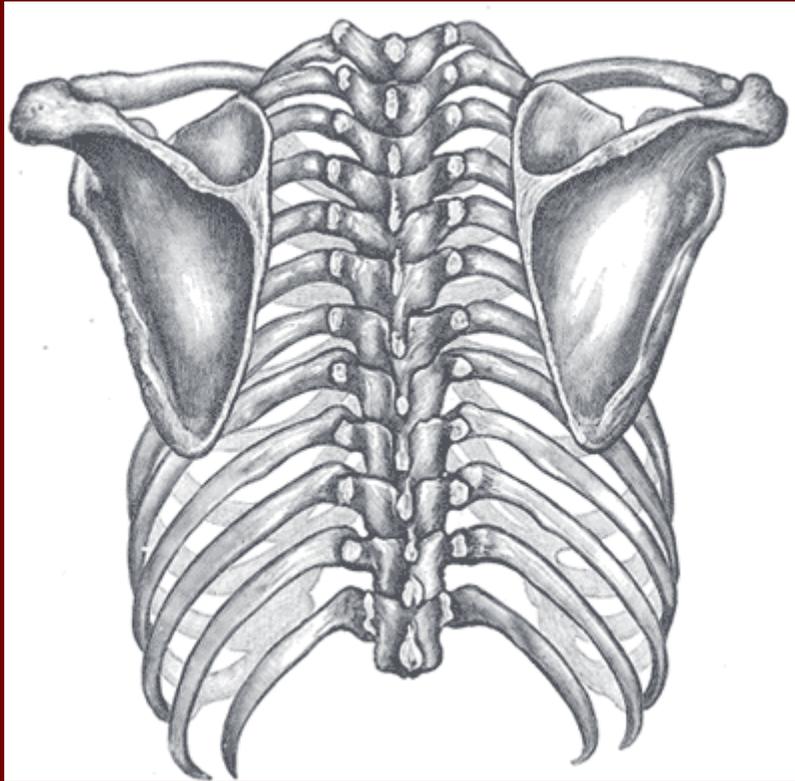


Shoulder Complex Articulations

- Glenohumeral Joint
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Shoulder Complex Articulations

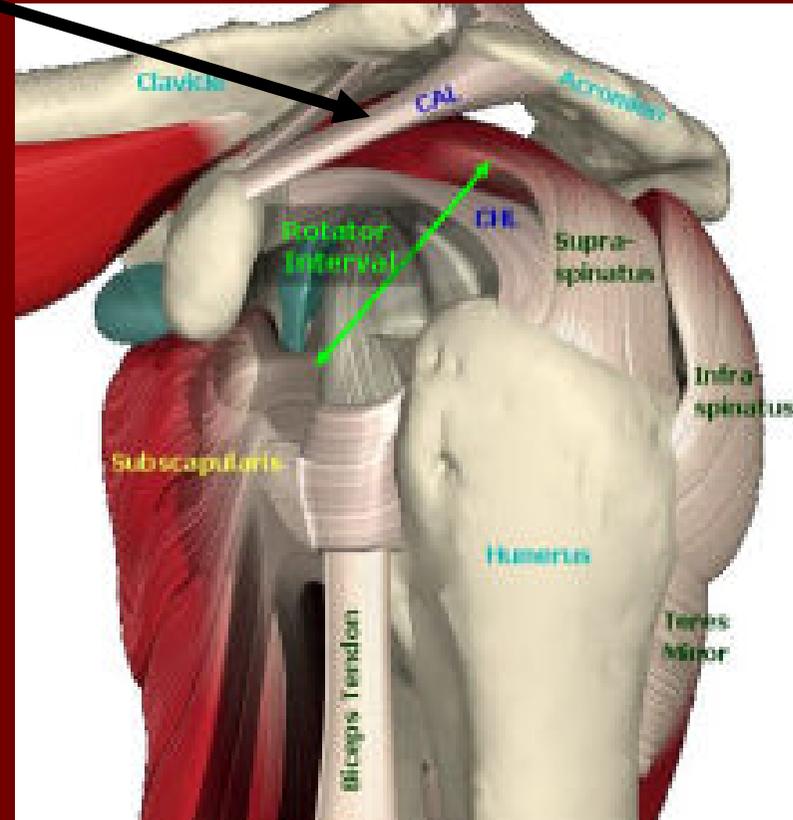


- Scapulothoracic
 - Not a joint
 - Movements here very important

Other Shoulder Complex Structures

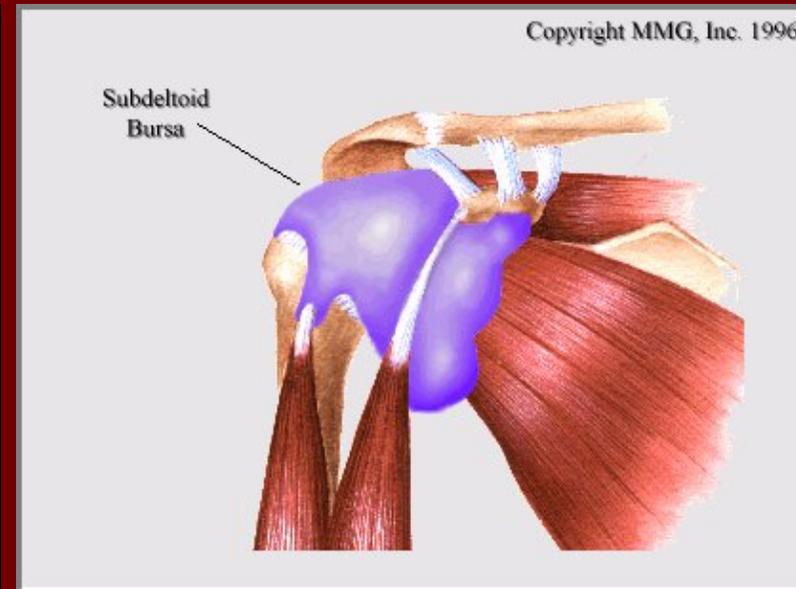
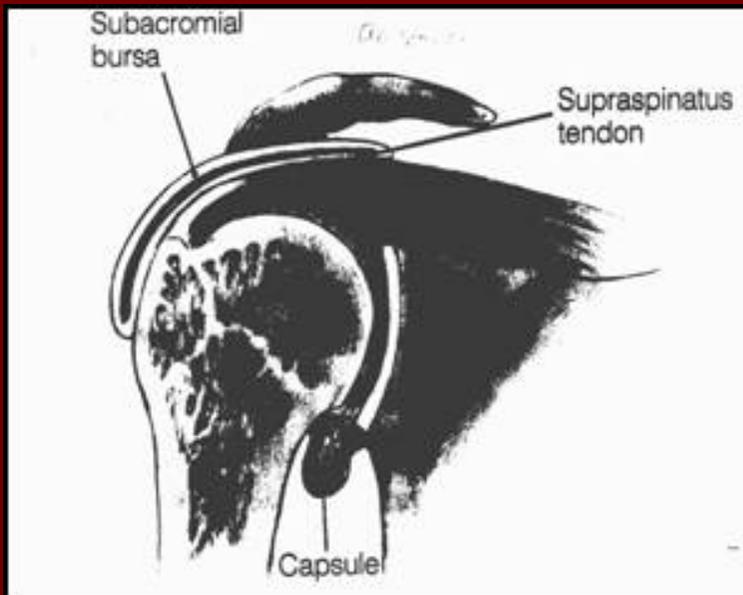
■ Coracoacromial Arch

- AKA suprahumeral arch
- Coracoid process, acromion and coracoacromial ligament
- Osteoligamentous vault
- Function



Other Shoulder Complex Structures

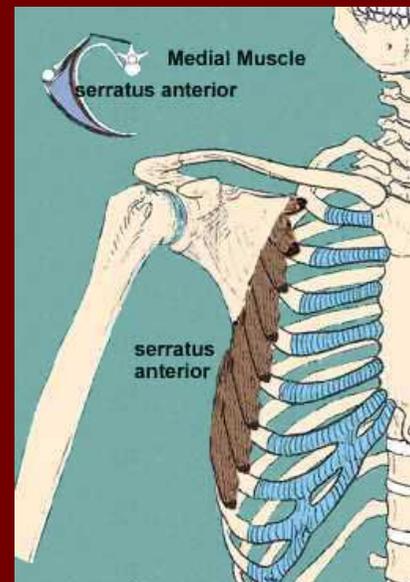
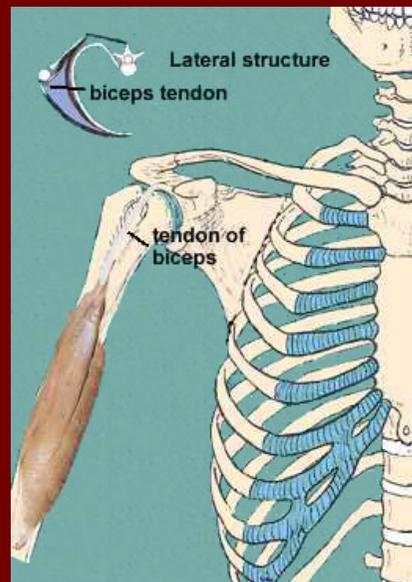
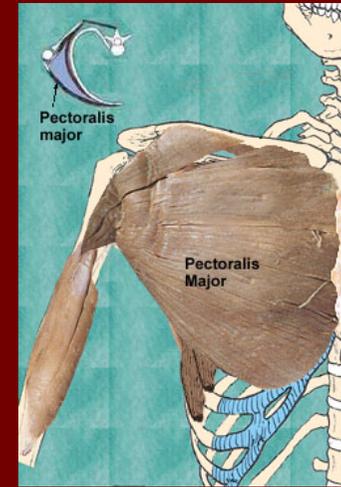
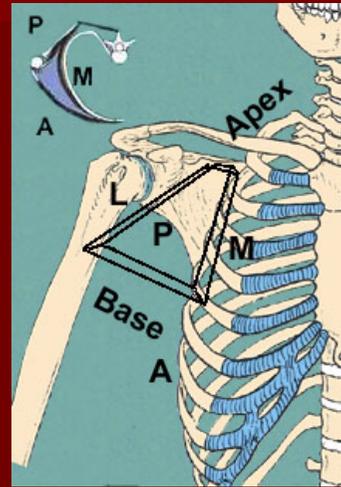
- Bursae



Other Shoulder Complex Structures

■ Axilla

- Anterior Border
- Posterior Border
- Medial Border
- Lateral Border



Shoulder Complex Muscles

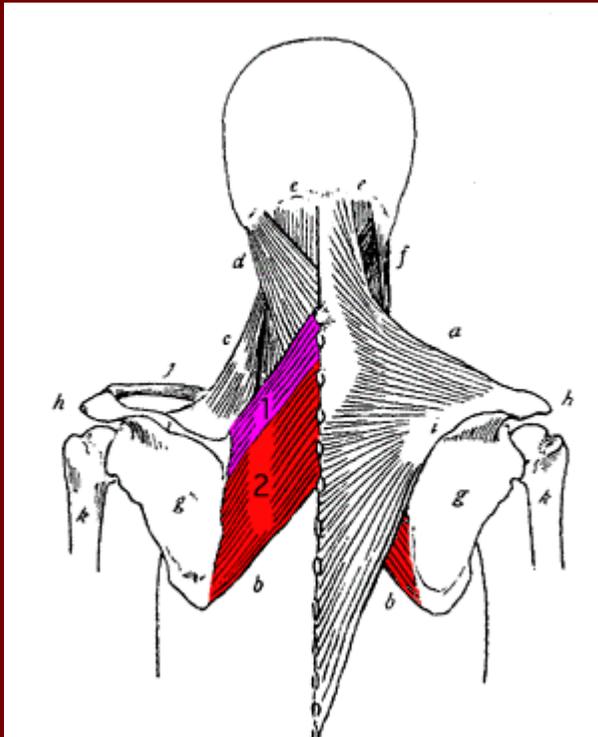
Scapular Muscles

Levator Scapulae



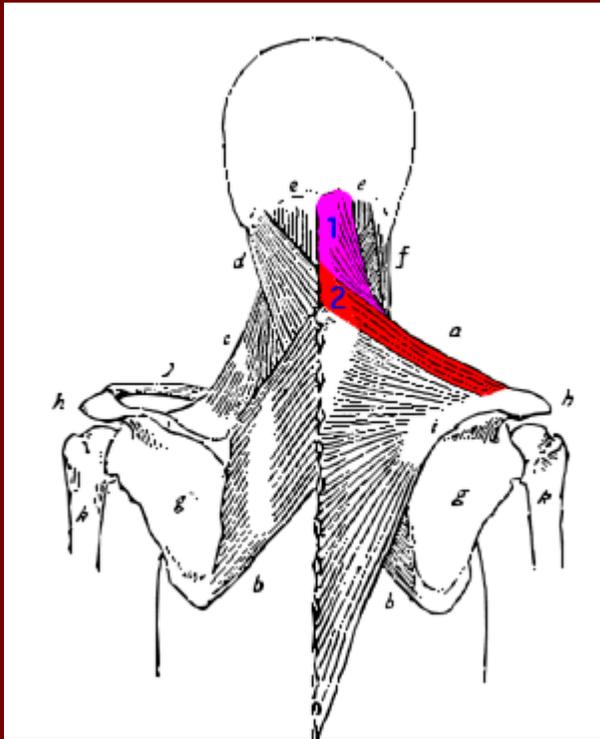
- O – Transverse processes of C1-C4
- I – Medial border of scapula between superior angle and root of spine of scapula
- N – Nerve root C3-5
- F
 - scapular elevation
 - retraction

Rhomboid Major



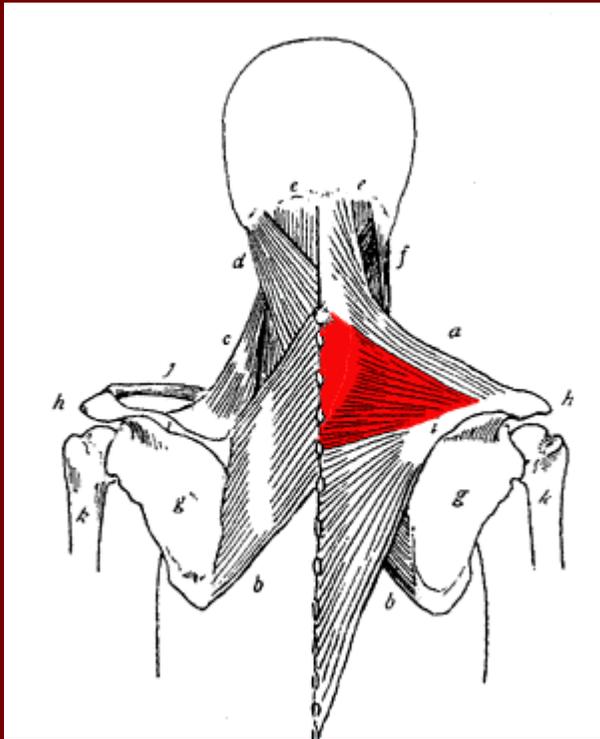
- O –
 - Major – T2-T5 spinous processes
 - Minor – Ligamentum nuchae, C7-T1 spinous processes
- I –
 - Major – Medial border of scapula between spine and inferior angle
 - Minor – medial border at root of spine of scapula
- N – Dorsal Scapular

Upper Trapezius



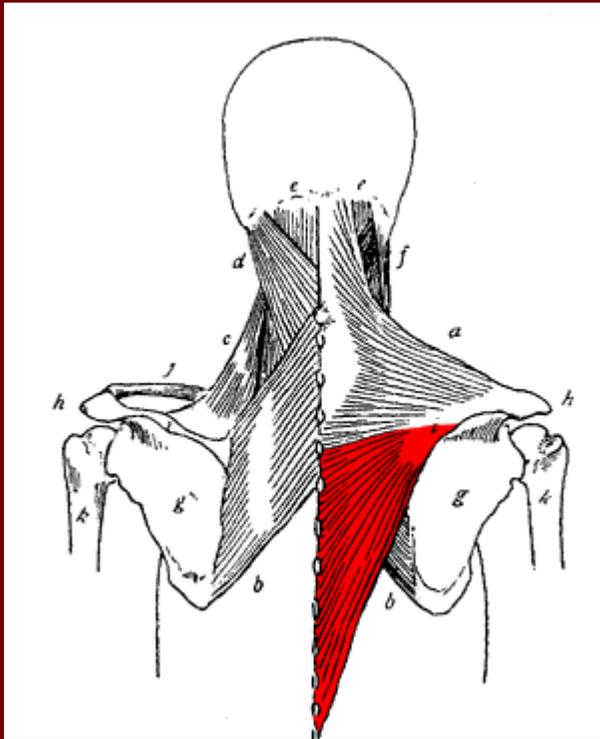
- O –
 - Occipital protuberance
 - Medial 1/3 of nuchal line
 - Upper part of ligamentum nuchae
 - C7 spinous process
- I –
 - Posterior border of lateral 1/3 of clavicle
 - Acromion process
- N – spinal accessory
- F –
 - Scapular elevation, retraction
 - Rotation of head to opp. Side
 - Lateral flexion of head to opp. side

Middle Trapezius



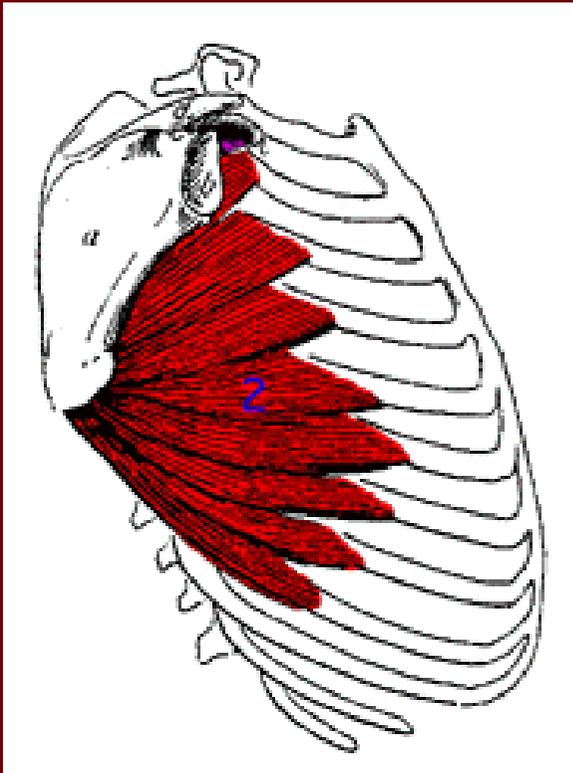
- O –
 - Inferior part of ligamentum nuchea
 - T1-T5 spinous processes
- I –
 - Medial margin of acromion process
 - Superior lip of spine of scapula
- N – Spinal accessory
- F –
 - Scapular retraction

Lower Trapezius



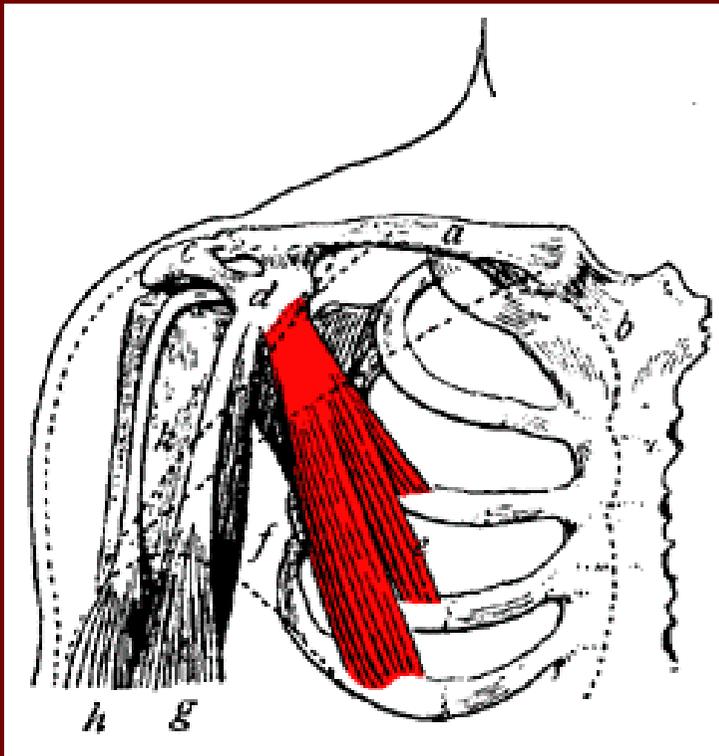
- O –
 - T6-T12 spinous processes
- I –
 - Tubercle at apex of root of spine of scapula
- N – spinal accessory
- F –
 - Scapular depression, retraction and upward rotation

Serratus Anterior



- O –
 - Outer surfaces and superior border of ribs 1-8
- I –
 - Ventral scapular surface on medial border from superior angle to inferior angle
- N –
 - Long Thoracic
- F –
 - Scapular protraction, upward rotation
 - Scapular depression (lower fibers)
 - Scapular elevation (upper fibers)

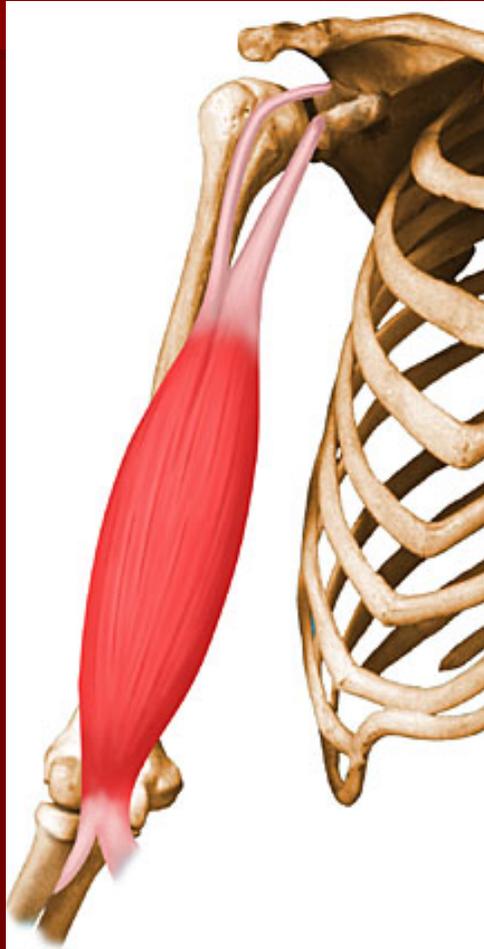
Pectoralis Minor



- O –
 - Superior margins and outer surface ribs 3-5 near cartilages
 - Fascia overlying corresponding intercostal muscles
- I –
 - Medial border, superior surface of coracoid process
- N –
 - Medial Pectoral
- F –
 - Scapular depression, downward rotation, protraction

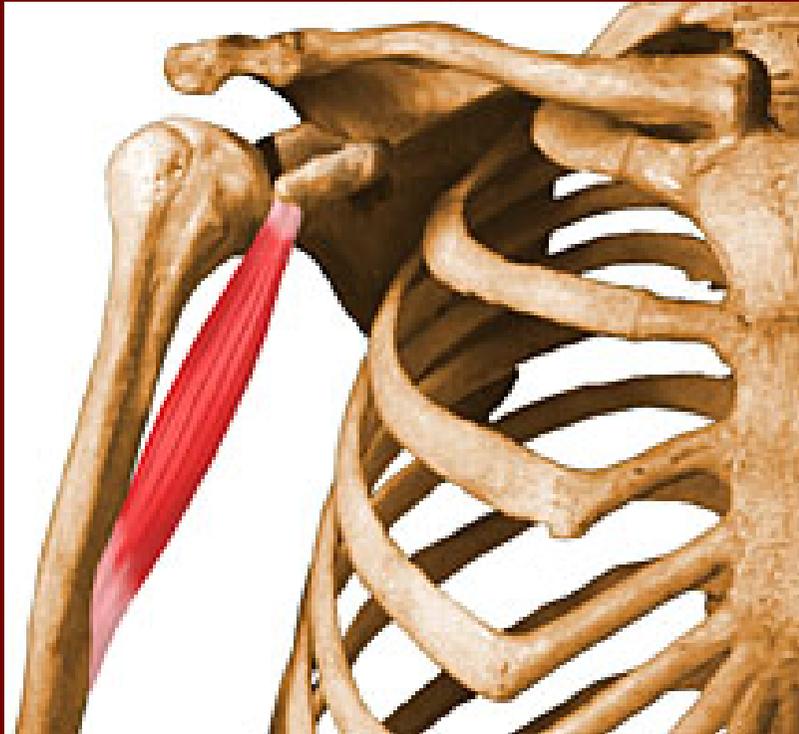
Glenohumeral Muscles

Biceps Brachii



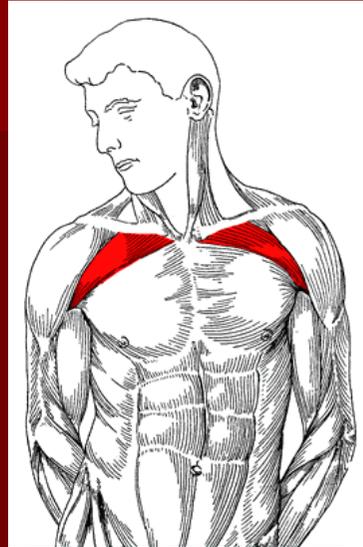
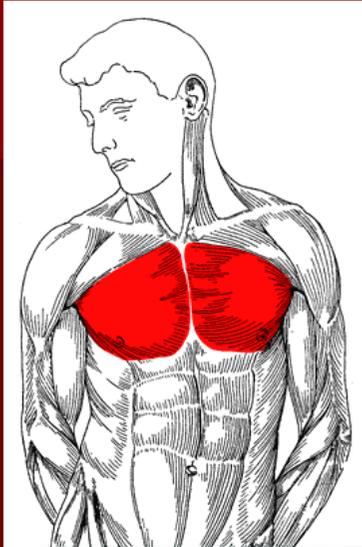
- O
 - Short head – coracoid process
 - Long head – supraglenoid tubercle of scapula
- I –
 - Radial tuberosity
 - Biceps brachii aponeurosis
- N – Musculocutaneous
- F –
 - Shoulder – flexion
 - Elbow – flexion, forearm supination

Coracobrachialis



- O –
 - Coracoid process
- I –
 - Medial surface of mid-humerus, opposite to deltoid tuberosity
- N – Musculocutaneous
- F –
 - GH flexion, adduction, Hor. Adduction

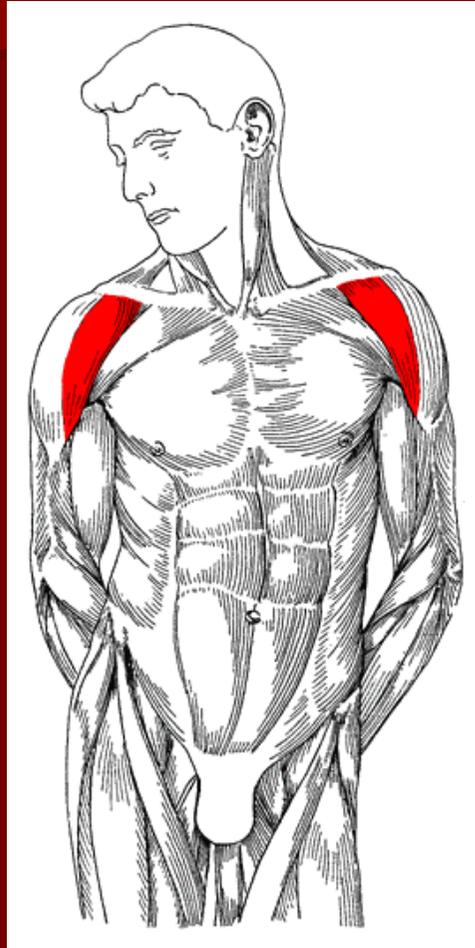
Pectoralis Major



Fibers twist in themselves

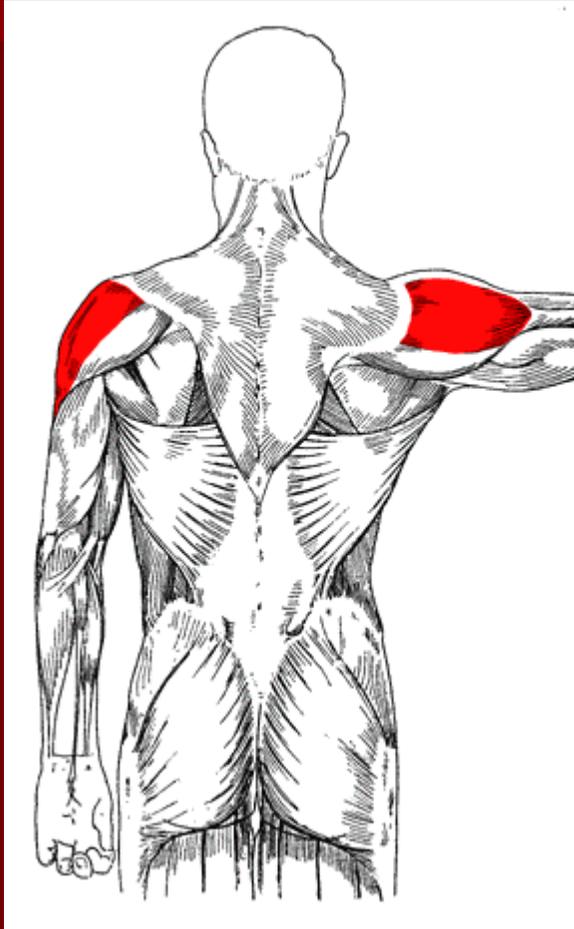
- O –
 - Sternal – anterior surface of sternum, cartilages of ribs 1-6 or 7
 - Clavicular – anterior surface of sternal ½ clavicle
- I –
 - crest of humerus's greater tuberosity
- N –
 - Sternal – medial pectoral
 - Clavicular – lateral pectora
- F –
 - GH ADD, H. ADD and IR

Anterior Deltoid



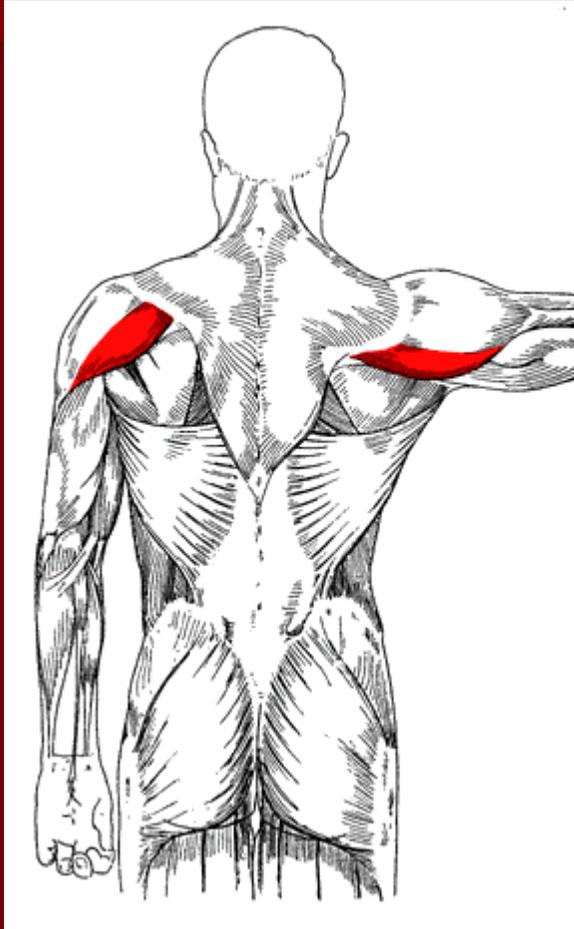
- O –
 - Anterior border, superior surface of lateral third of clavicle
- I –
 - Deltoid tuberosity
- N – Axillary
- F –
 - GH H. ADD, flexion
 - IR when in supine position

Middle Deltoid



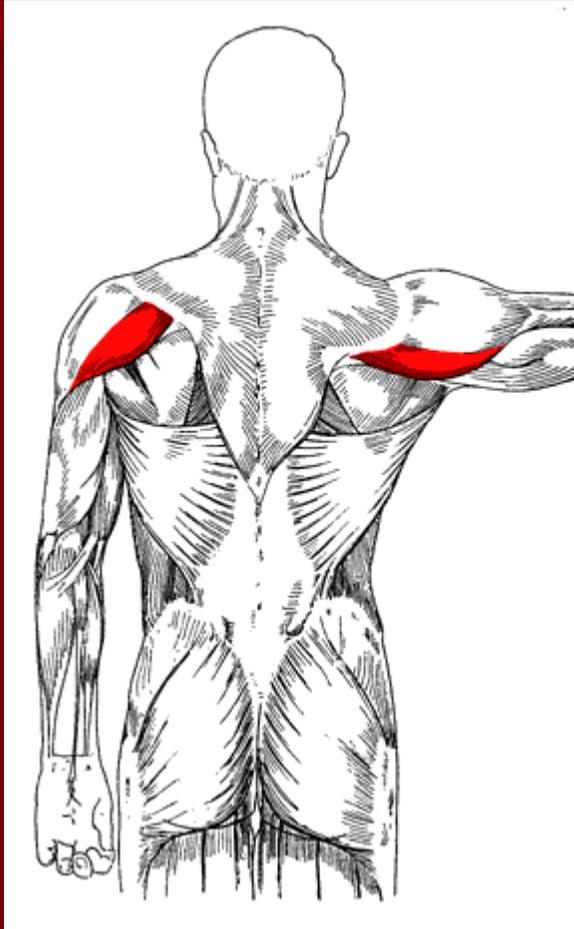
- O –
 - Lateral margin and superior surface of acromion
- I –
 - Deltoid Tuberosity
- N –
 - Axillary
- F –
 - GH ABD

Posterior Deltoid



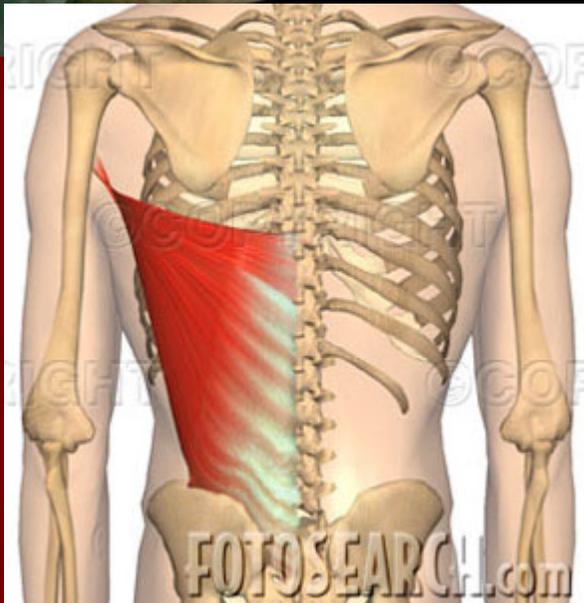
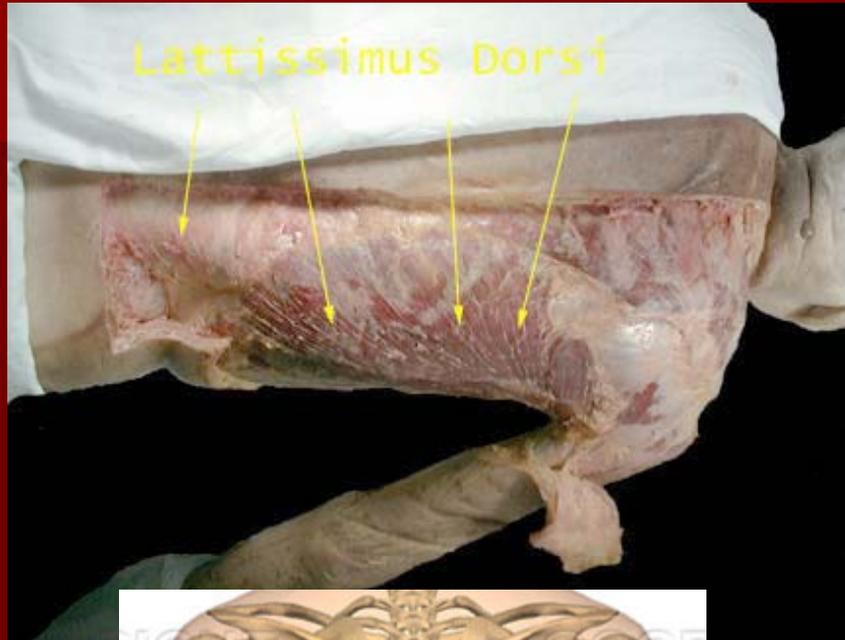
- O –
 - Inferior lip of posterior border of spine of scapula
- I –
 - Deltoid tuberosity
- N – Axillary
- F –
 - GH extension, H. ABD,
 - ER when in prone position

Triceps Brachii



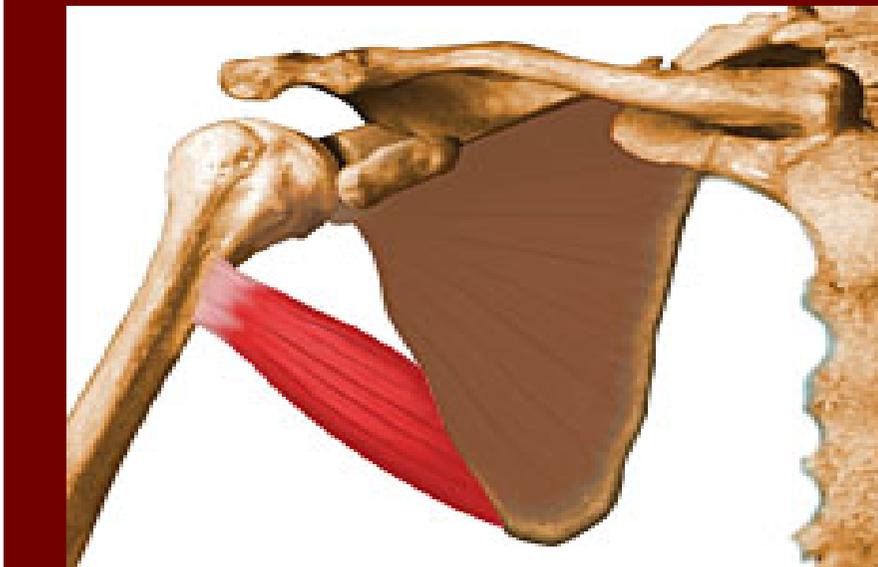
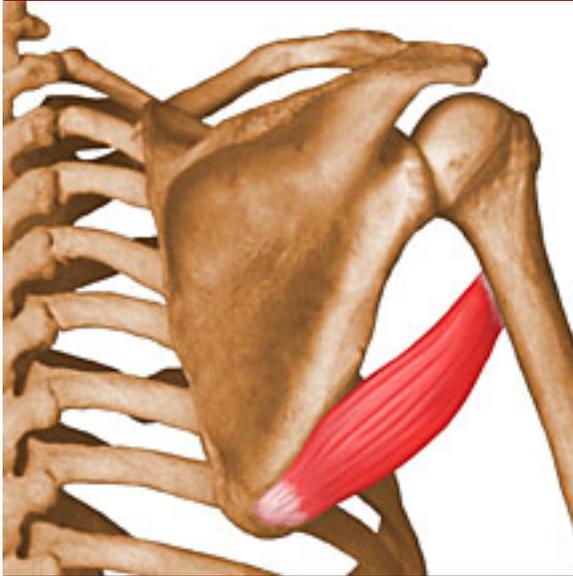
- O –
 - Long Head – infraglenoid tubercle
 - Lateral Head – lateral and posterior surface of proximal $\frac{1}{2}$ of body of humerus
 - Medial Head – distal $\frac{2}{3}$ of medial and posterior surfaces of humerus below radial groove
- I –
 - Posterior surface of olecranon process
- N – Radial
- F –
 - Shoulder – long head – Ext and ADD
 - Elbow -- extension

Latissimus Dorsi



- O –
 - Posterior layer of lumbodorsal fascia, then attaching to the T6-T12, lumbar and sacral vertebrae
 - External lip of iliac crest lateral to erector spinae
 - Ribs 9-12
 - Slip from inferior angle of scapula
- I –
 - Intertubercular groove (distal aspect)
- N – Thoracodorsal
- F –
 - GH IR, ADD, Ext,

Teres Major (Lat's Little Helper)



- O –
 - Dorsal surface of inferior angle
 - Lower 1/3 of scapula lateral border
- I –
 - Crest of lesser tuberosity
- N – Lower Subscapular
- F –
 - GH IR, ADD, Ext

Rotator Cuff

Suprspinatus



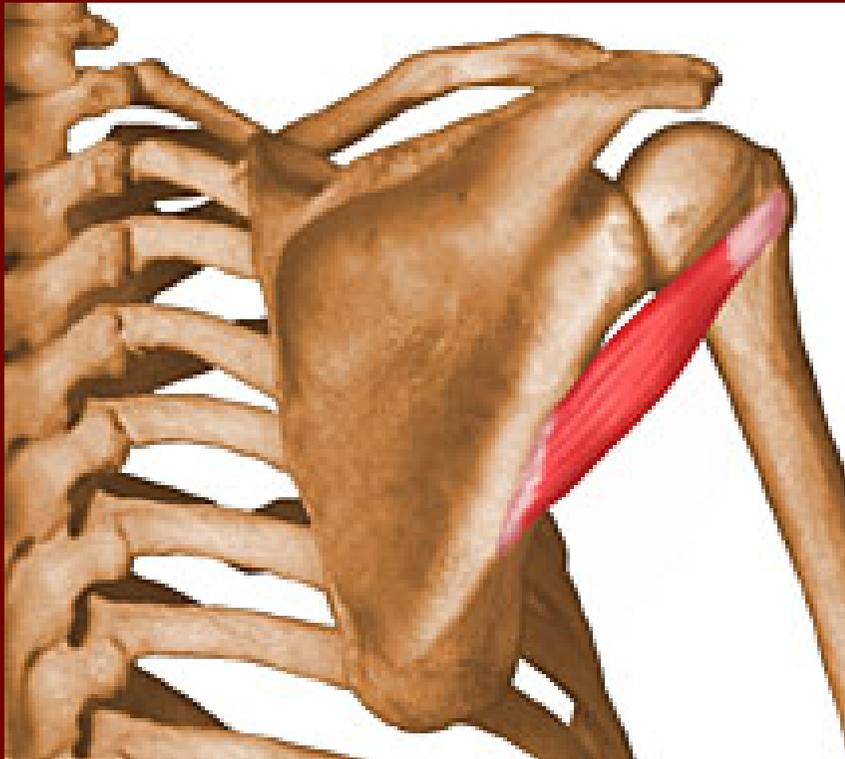
- O –
 - Medial 2/3 supraspinatus fossa
- I –
 - Superior portion of greater tuberosity
- N – Suprascapular
- F –
 - Initiates shoulder ABD
 - Humeral head stabilization

Infraspinatus



- O –
 - Medial 2/3 infraspinatus fossa
- I –
 - Middle portion of greater tuberosity
- N – Suprascapular
- F –
 - GH ER
 - Humeral head stabilization

Teres Minor



- O –
 - Upper 2/3 dorsal surface of lateral border of scapula
- I --
 - Lowest portion of greater tuberosity
- N –
 - Axillary
- F –
 - GH ER
 - Humeral head stabilization

Subscapularis

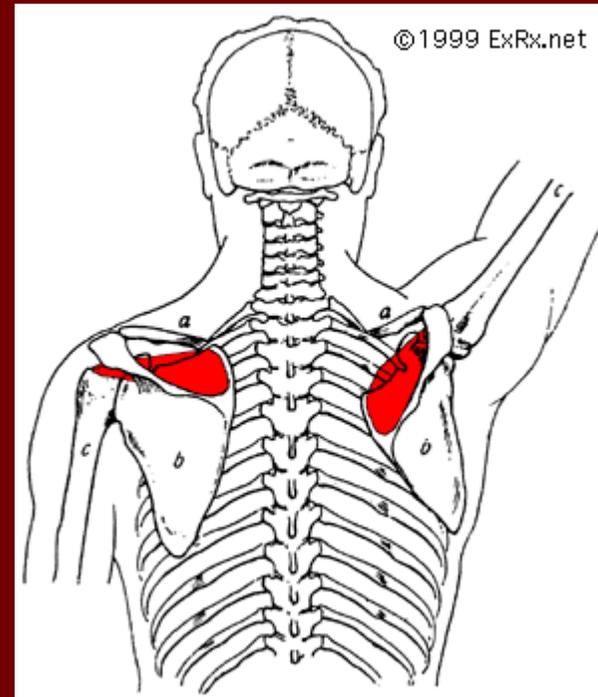


- O –
 - Subscapular Fossa
- I –
 - Lesser tuberosity
 - Anterior capsule of GH joint
- N –
 - Upper and lower subscapular
- F –
 - GH IR
 - Humeral head stabilization

Basic Shoulder Complex Mechanics

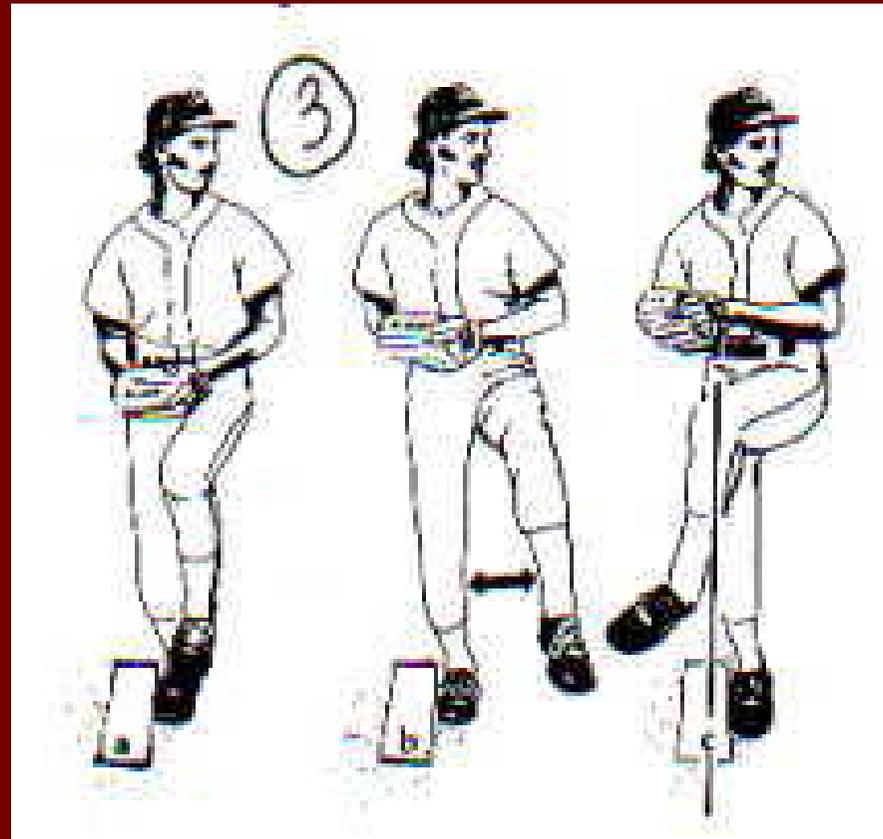
Performing Abduction

- Initiation
- Scapulohumeral Rythm
 - First 30 degrees
 - > 30 degrees
- Clavicle

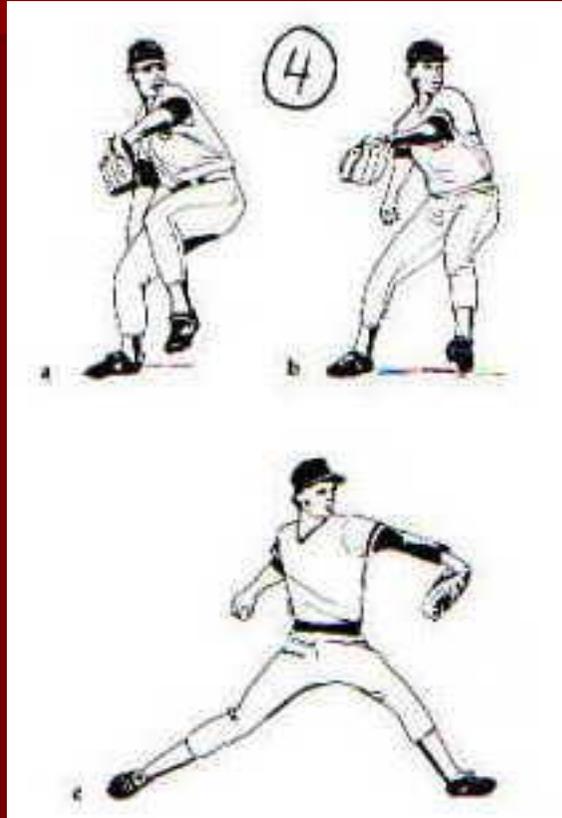


Throwing Mechanics

- Windup
 - Begin
 - Ends



Throwing Mechanics

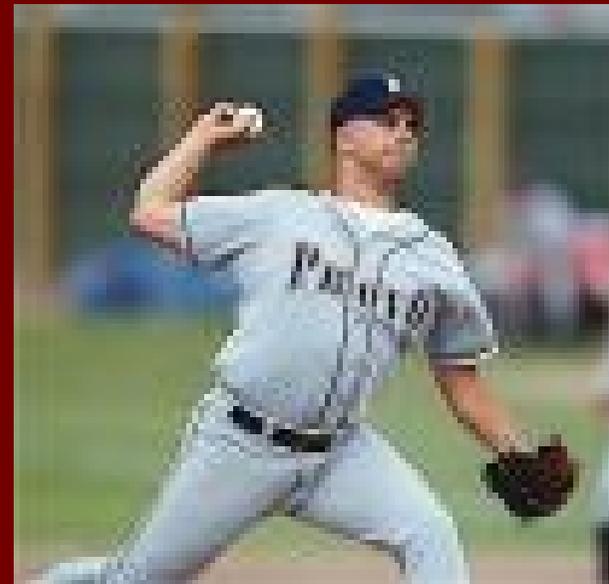


- Stride Phase
 - Begin
 - Ends

Throwing Mechanics

- Arm Cocking Phase

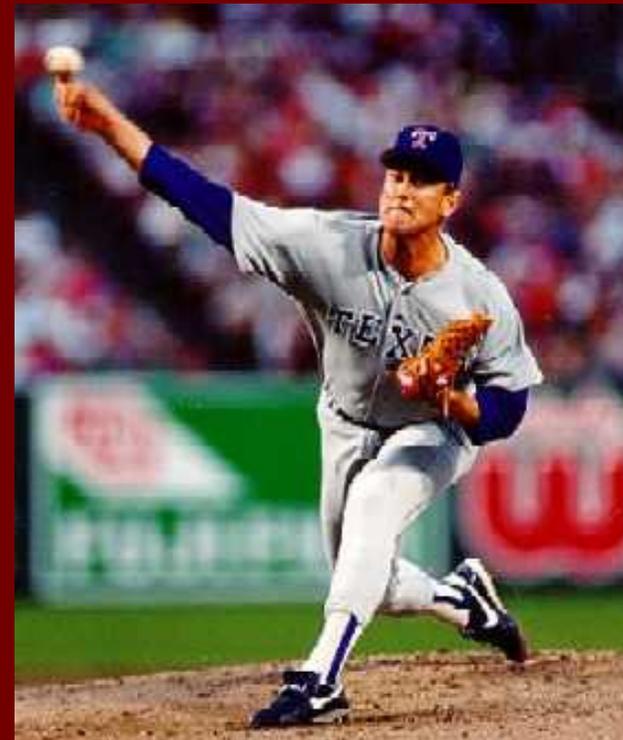
- Begins
- Ends



Throwing Mechanics



- Arm Acceleration
 - Begins
 - Ends



Throwing Mechanics



- Follow-through
 - Begins
 - Ends

Pathomechanics of Throwing



- Shoulder
- Rotator Cuff
- Labrum
- Impingement
- SLAP Lesion

