

The SHOULDER

The Glenohumeral Joint

The Shoulder

Bony Anatomy of the Shoulder include:

- Clavicle
- Scapula
- Humerus
- Sternum

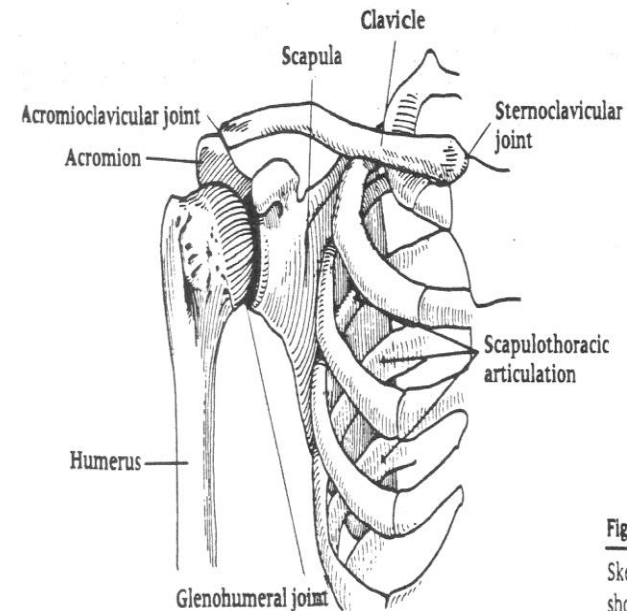


Figure 18-2

Skeletal anatomy of the shoulder complex

The Clavicle

- The clavicle runs from the sternum to the scapula.
- The point at which the clavicle changes shape is its weakest point. This is where a large number of fractures occur.
- The clavicle is a very superficial bone with little or no muscle or fat protection.

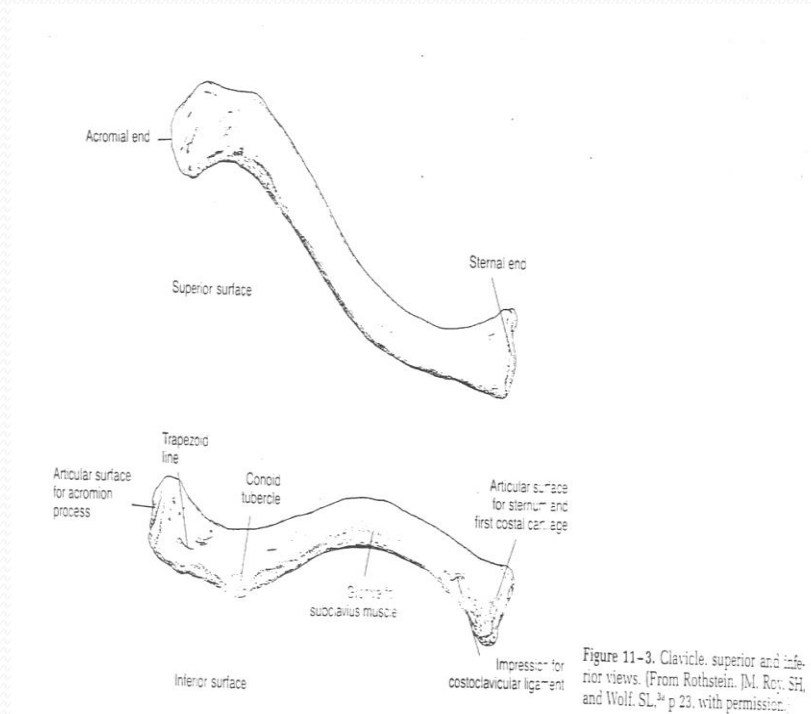
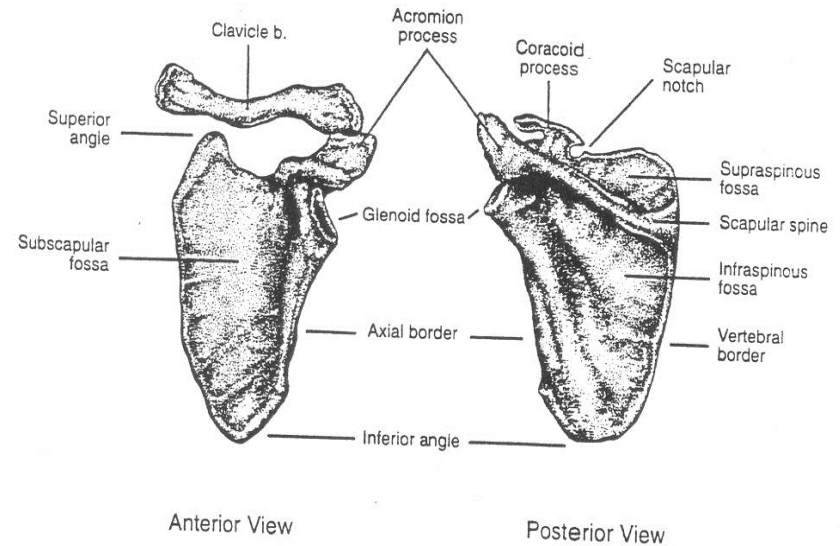


Figure 11-3. Clavicle, superior and inferior views. (From Rothstein, JM, Roy, SH, and Wolf, SL, 3rd p 23, with permission.)

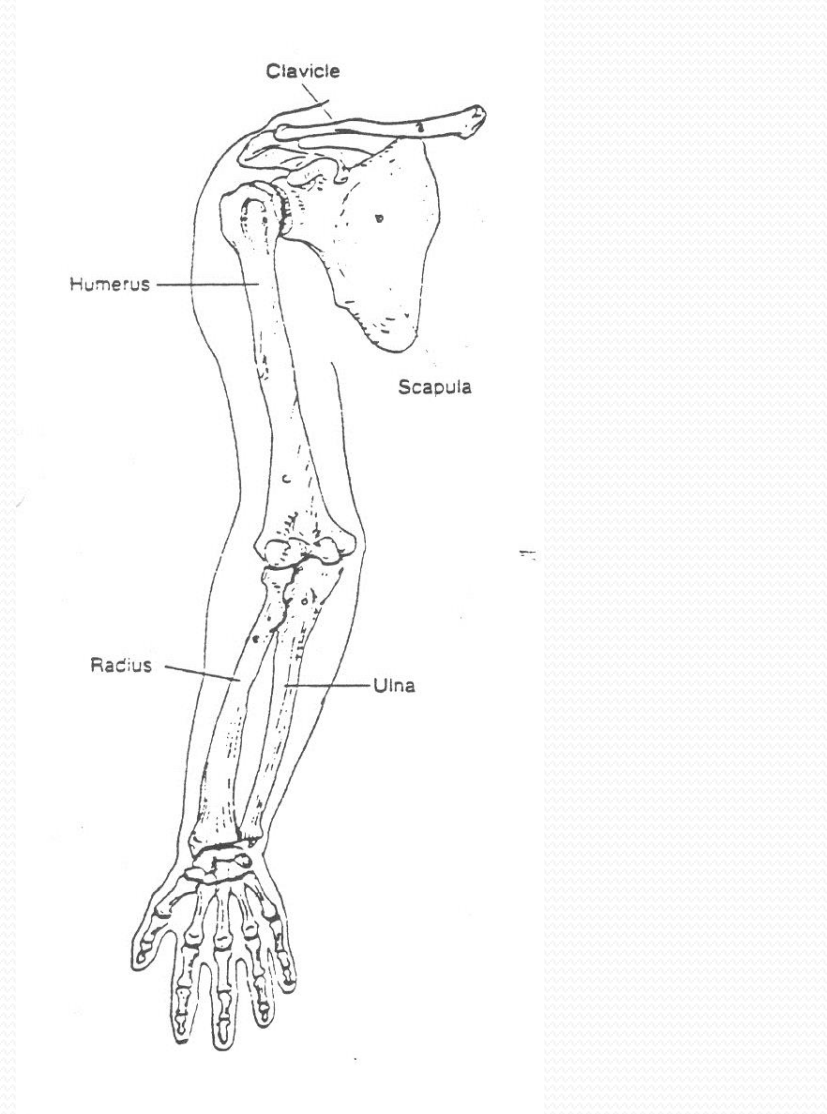
The Scapula

- The scapula articulates with the humerus and it glides across the rib cage.
- It has three prominent projections. They are the scapular spine, the acromion process, and the coracoid process.
- The Glenoid Fossa and the Humerus come together to form the shoulder joint.



The Humerus

- The Humerus is the upper arm bone that articulates with the scapula's shallow Glenoid Fossa.



Cartilage at the Shoulder Joint

- Glenoid Labrum

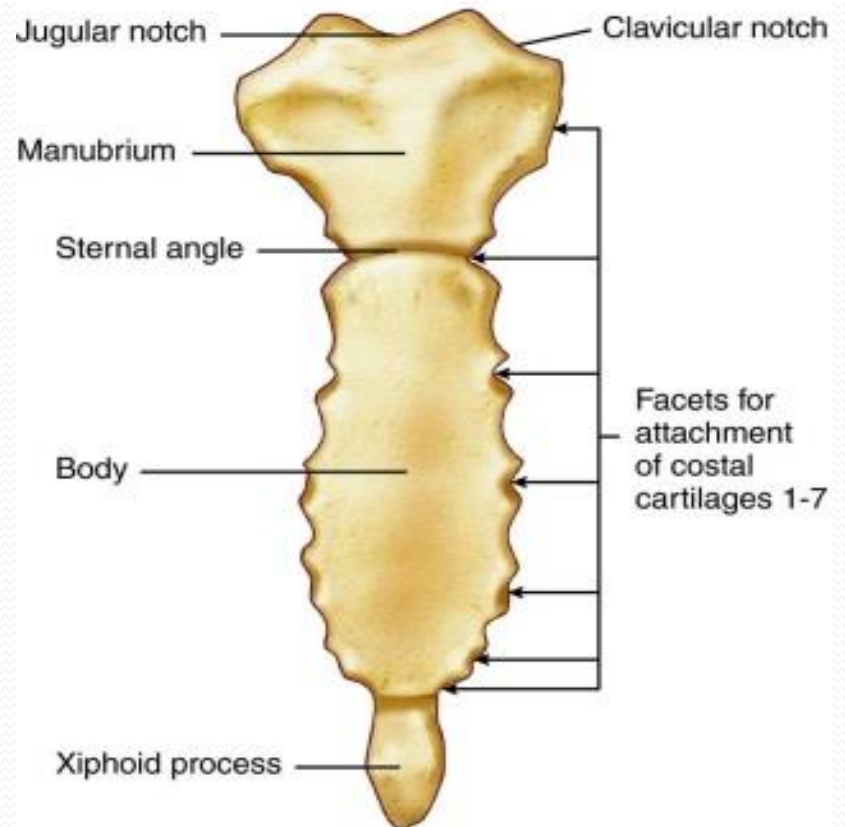


The Sternum

- The Sternum is also known as the breast bone.

The three main parts:

- Manubrium
- Body
- Xiphoid Process



Joints of the Shoulder

- **Glenohumeral Joint (GH Joint)** - main joint of the shoulder. This joint is categorized as a **Ball and Socket Joint**.
- **Acromioclavicular Joint (AC Joint)** - at the tip of the shoulder. **Commonly injured joint**.
- **Sternoclavicular (SC Joint)**
- **Coracoclavicular Joint (CC Joint)**
- **Scapulothoracic Joint (ST Joint)** - **NOT A TRUE JOINT** but it is critical in shoulder motion.

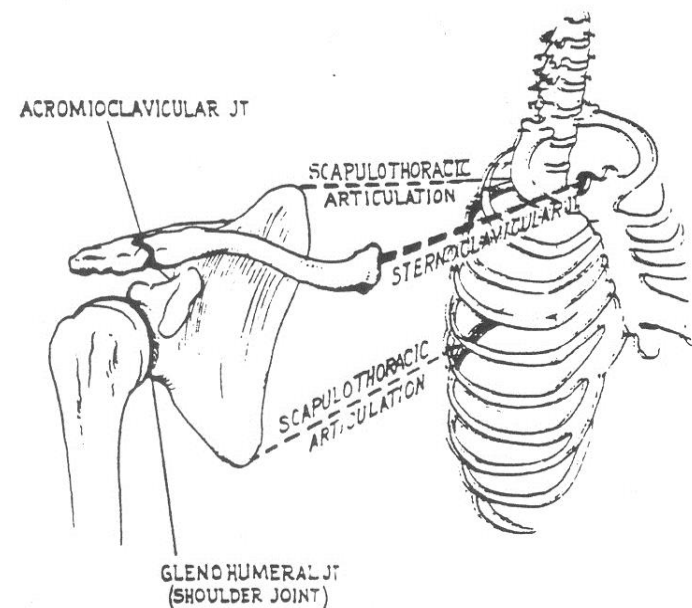
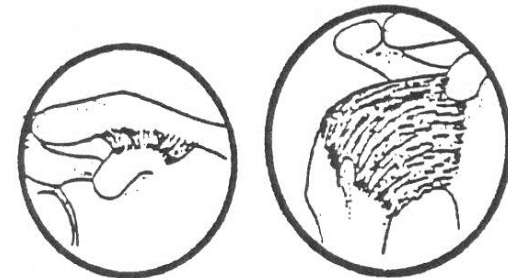


Fig. 1. The shoulder girdle.

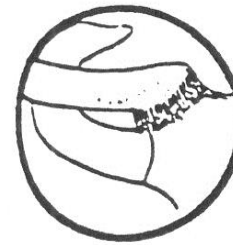
Ligaments of the Shoulder

- **Acromioclavicular Ligament**
- **Coracoclavicular Ligament**
- **Glenohumeral Ligament**
- **Sternoclavicular Ligament**
- **Also Coracoacromial and Coracohumeral Ligaments**

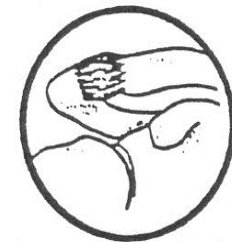


Coracoclavicular

Glenohumeral



Sternoclavicular



Acromioclavicular

Bursas of the Shoulder-FYI!!!

- Subacromial Bursae- most important bursa located between the Coracoacromial arch and the Glenohumeral capsule and reinforced by the supraspinous tendon. It is easily subjected to trauma when the humerus is in the overhead position compressing the bursa under the Coracoacromial arch.

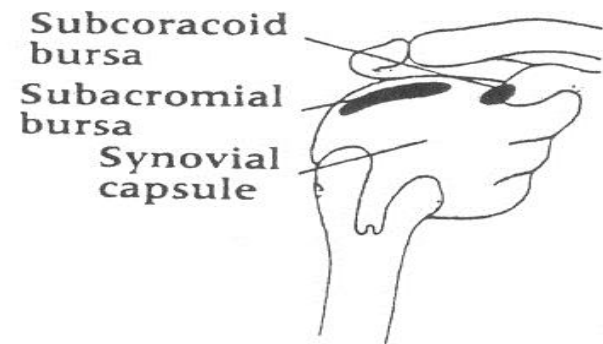


Figure 21-6

Synovial capsule and bursae of the shoulder.

The Brachial Plexus-FYI!!!

- Nerve Supply- The spinal nerve roots from the 5th cervical vertebrae through the 1st thoracic vertebrae create the complex nerve network called the Brachial Plexus.
- Stemming from the plexus is the following peripheral nerves that innervate muscles of the upper extremity. The following are the nerves and where they are located on the spine, also included are the muscles that they innervate.
- Axillary Nerve (C5-C6) – Deltoid, Teres Minor
- Musculocutaneous Nerve (C5-C7) – Biceps, Brachialis, Coracobrachialis
- Subscapular Nerve (C5-C6) – Subscapularis, Teres Major
- Suprascapular Nerve (C5-C6) – Suprasspinatus, Infraspinatus
- Dorsal Scapular Nerve (C5) – Levator Scapulae, Rhomboid Major/Minor
- Pectoral Nerve (C5-T1) – Pectoralis Major/Minor
- Radial Nerve (C5-T1) - Triceps
- Median Nerve (T1)
- Ulnar Nerve (T1)

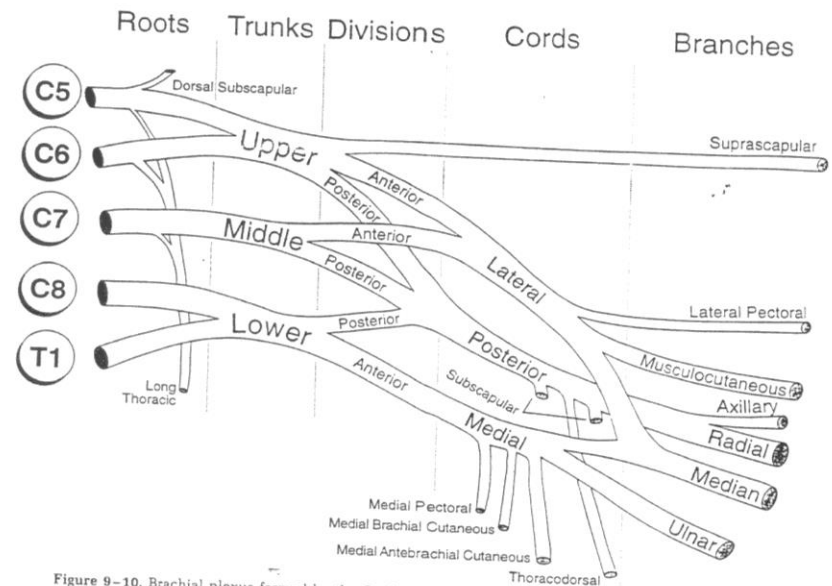


Figure 9-10. Brachial plexus formed by the C5 through C8 and T1 spinal nerve roots. Note that some texts include the C4 and/or T2 nerve roots as a part of the brachial plexus. (The nerve plexus in Figures 9-10, 9-11, and 9-12 were adapted from Hollingshead, WH, and Jenkins, DB.)

Blood Supply-FYI!!!

- Blood Supply- the carotid artery, the subclavian artery, turn to Axillary artery, to the brachial artery.

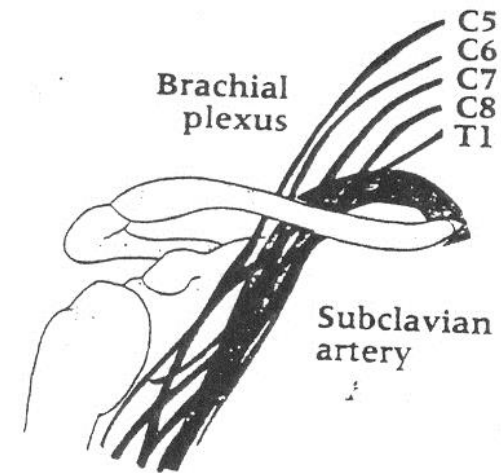


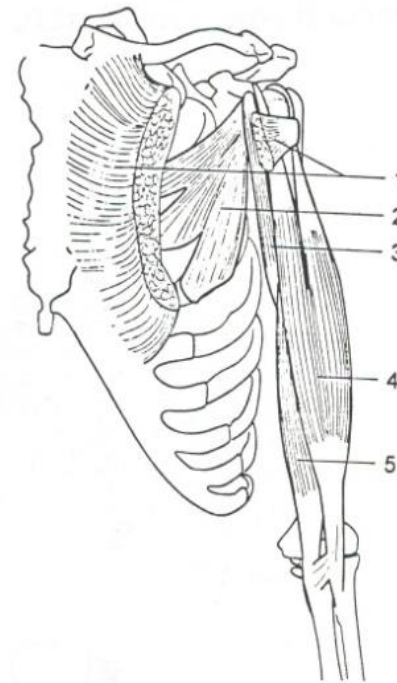
Figure 21-7

Brachial plexus and subclavian artery.

Shoulder Muscles=Anterior

- Pectoralis Major/Minor – chest muscles
- Coracobrachialis – at the coracoid process
- Biceps Brachii – on front of the humerus
- Subscapularis – rotator cuff muscle; on front of the scapula; very deep muscle and it is impossible to palpate
- Deltoid – at tip of the shoulder (posterior, anterior, middle portion)

MUSCLES OF THE ANTERIOR CHEST AND ARM



Shoulder—anterior view

1. Pectoralis major (cut)
2. Pectoralis minor
3. Coracobrachialis

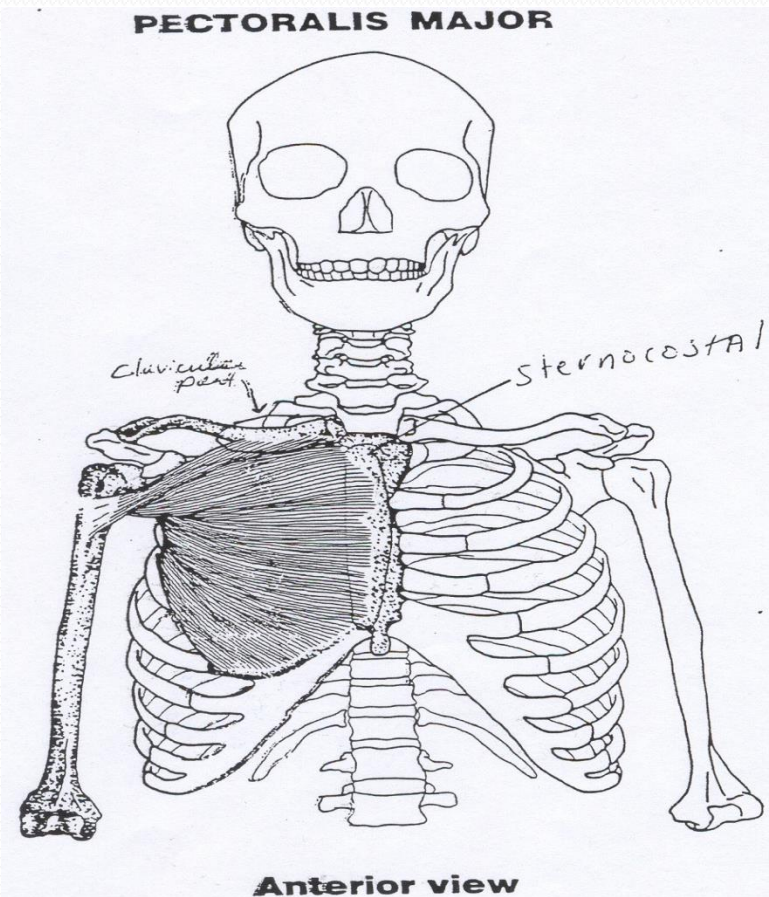
4. Biceps brachii
5. Brachialis

Anterior Muscles- Colors Needed

1 Function	2 Functions	3 Functions	5 Functions
Biceps Brachii (Green)	Coraco-brachialis (Blue)	Pectoralis Major (Purple)	Deltoideus (Orange)
Subscapularis (Brown) Rotator Cuff		Pectoralis Minor (Red)	

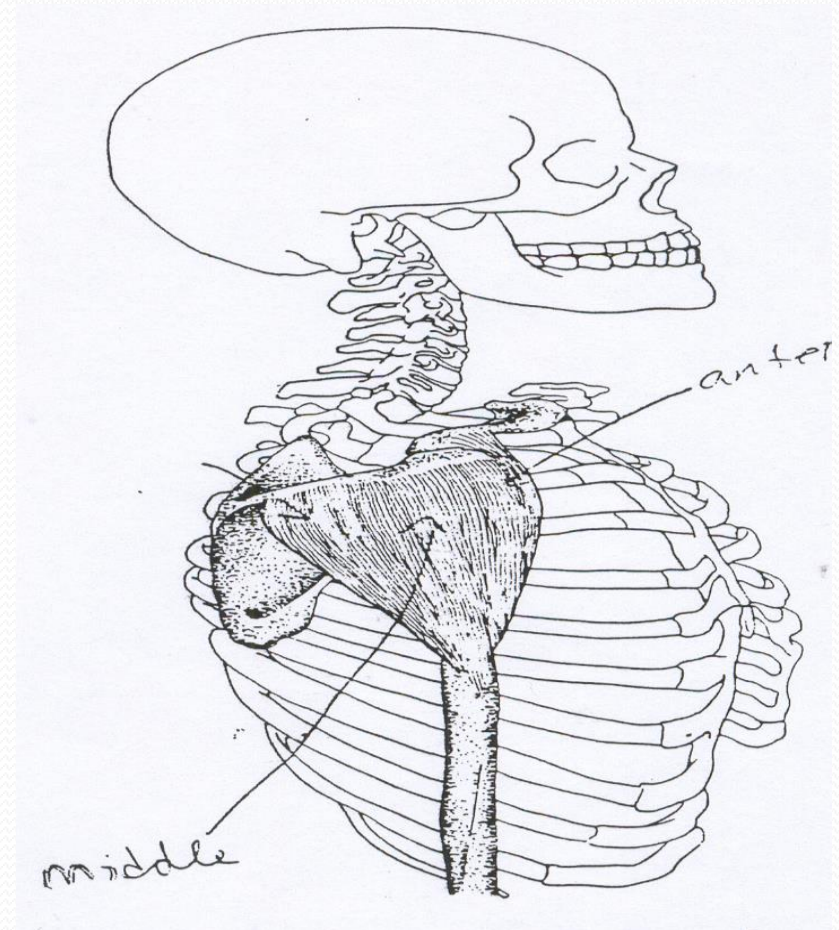
Pectoralis Major (Purple)

- Action: (3)
 - Flexion
 - Internal Rotation
 - Horizontal Adduction
- Larger of the two Chest Muscles.



Deltoideus (Orange)

- Action: (5)
 - Anterior Section:
 - Flexion
 - Internal Rotation
 - Middle Section:
 - Abduction
 - Posterior Section:
 - Extension
 - External Rotation

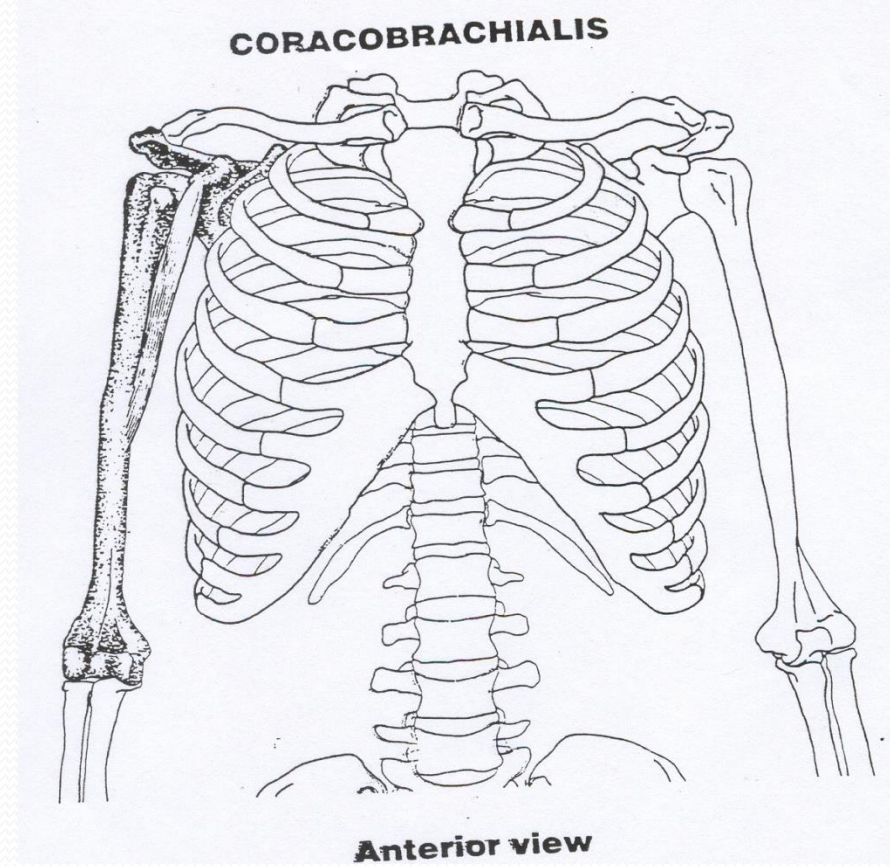


Coracobrachialis- (Blue)

- Action: (2)
 - Adduction
 - Flexion

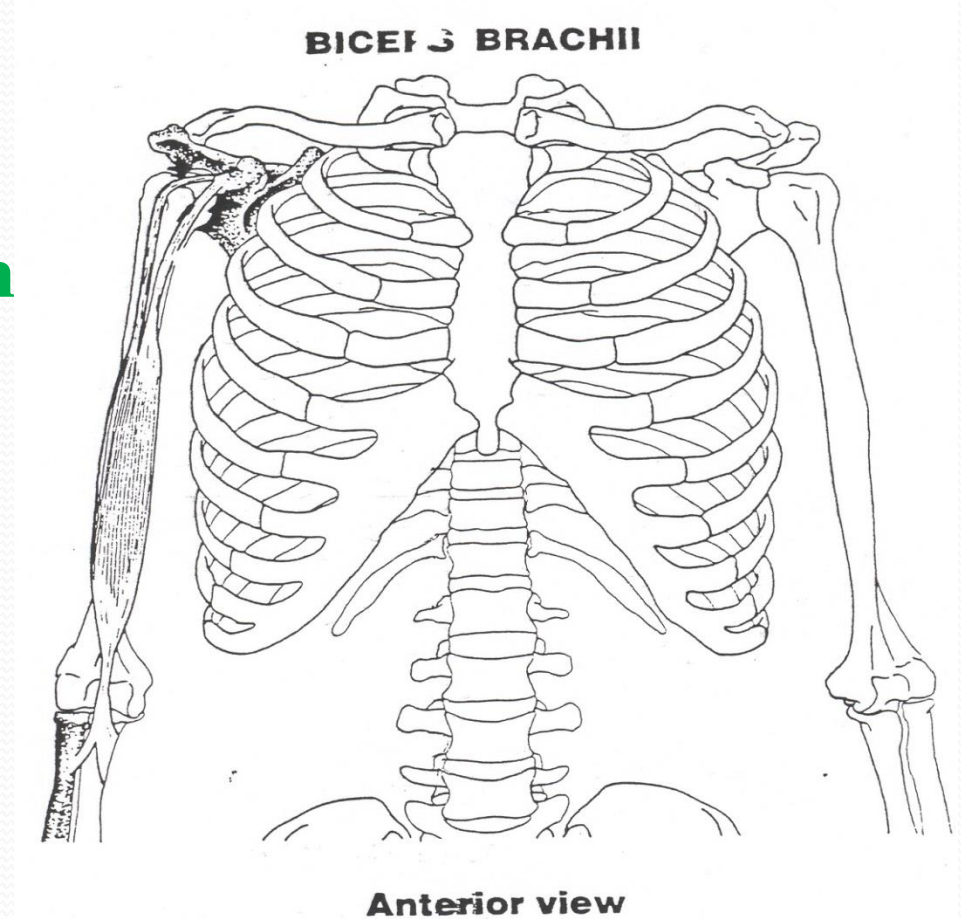
Originates at the Coracoid Process.

- At Elbow- Pronation



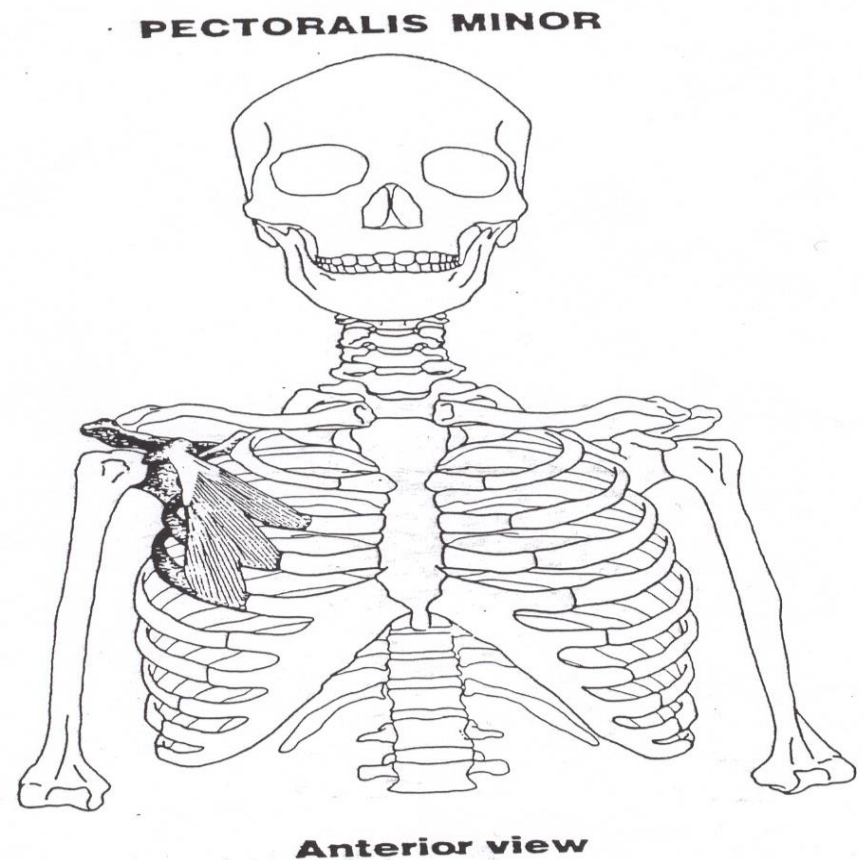
Biceps Brachii (Green)

- Action: (1) Flexion
- At Elbow-Supination and Flexion



Pectoralis Minor (Red)

- Action: (3)
 - Raises Ribs-inspiration
 - Draws Scapula Forward (Protraction)
 - Depression
- Sits deep to the Pectoralis Major; also smaller.

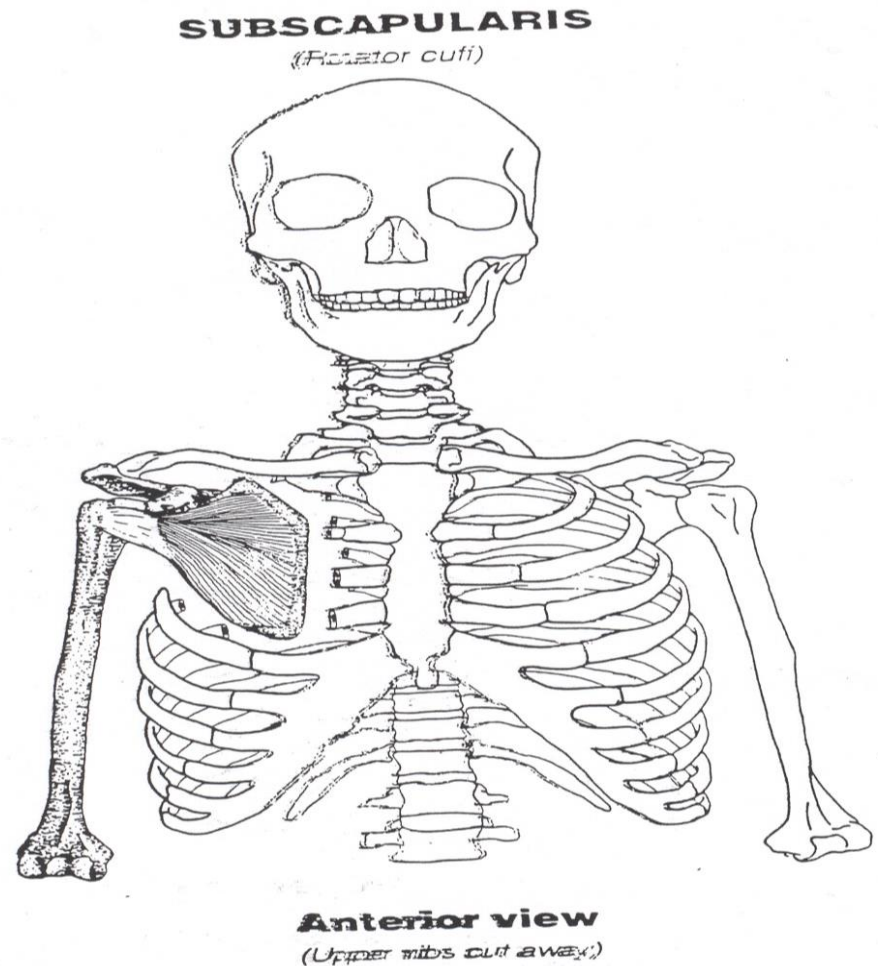


Subscapularis (Brown)

- Action: (1) Internal Rotation (IR)

Rotator Cuff Muscles:

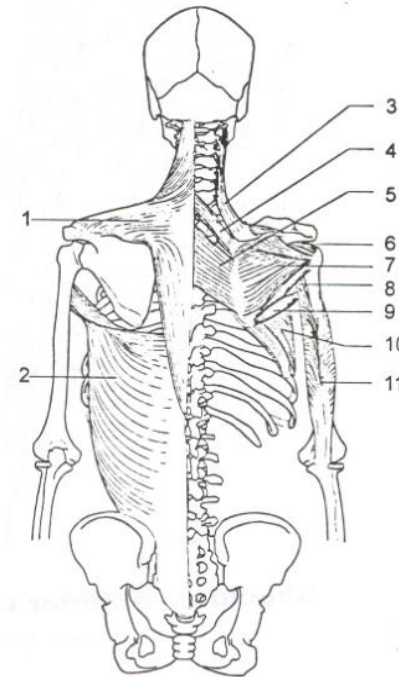
- S
- I
- T
- Subscapularis



Shoulder Muscles=Posterior

- Trapezius – diamond shaped
- Latissimus Dorsi – lower back (very large muscle)
- Levator Scapula – elevates scapula (scapula to neck)
- Rhomboids – spine to scapula
- Teres Major – lateral border of scapula
- Teres Minor – rotator cuff muscle (lateral border of scapula)
- Serratus Anterior – on ribs; assist with breathing
- Triceps Brachii – back of humerus
- Supraspinatus – rotator cuff muscle; above spine of scapula
- Infraspinatus – rotator cuff muscle; below spine of scapula

POSTERIOR BACK, SHOULDER, AND ARM MUSCLES



Trunk—dorsal view

Superficial layer

1. Trapezius
2. Latissimus dorsi

Deep layer

3. Levator scapulae
4. Rhomboideus minor
5. Rhomboideus major

6. Supraspinatus (rotator cuff)

7. Infraspinatus (rotator cuff)

8. Teres minor (rotator cuff)

9. Teres major

10. Serratus anterior

Posterior arm

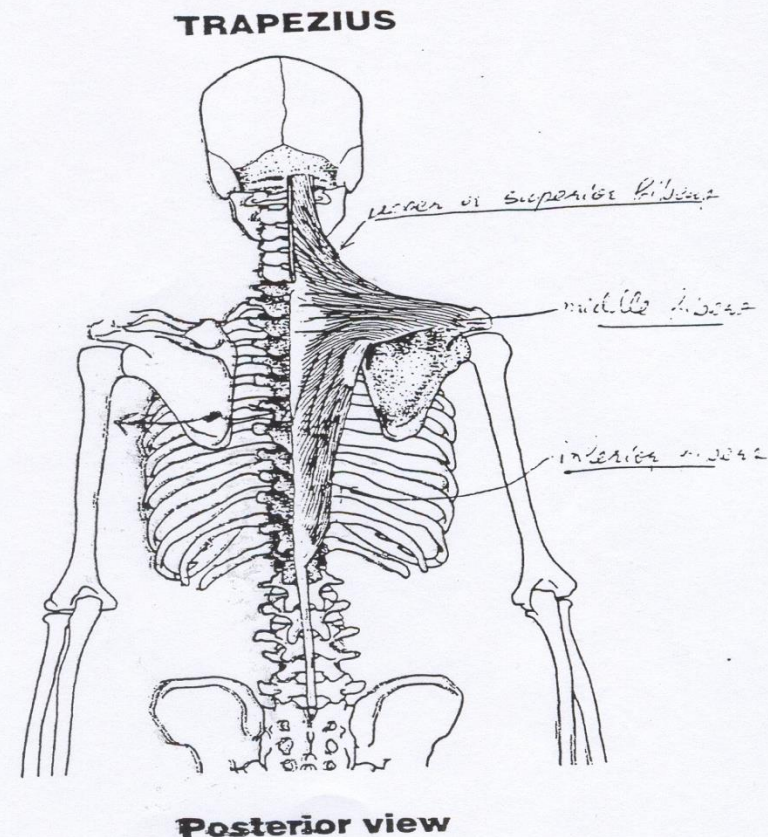
11. Triceps brachii

Posterior Muscles-Colors Needed

1 Function	2 Functions	3 Functions	5 Functions
Levator Scapulae (Turquoise)	Rhomboideus Major (Light Green)	Latissimus Dorsi (Light Pink)	Trapezius (Black)
Supraspinatus (Yellow) Rotator Cuff	Rhomboideus Minor (Dark Blue)	Teres Major (Lavendar)	
Infraspinatus (Dark Pink) Rotator Cuff	Serratus Anterior (Tan)		
Teres Minor (Gray) Rotator Cuff			
Triceps Brachii (Light Blue)			

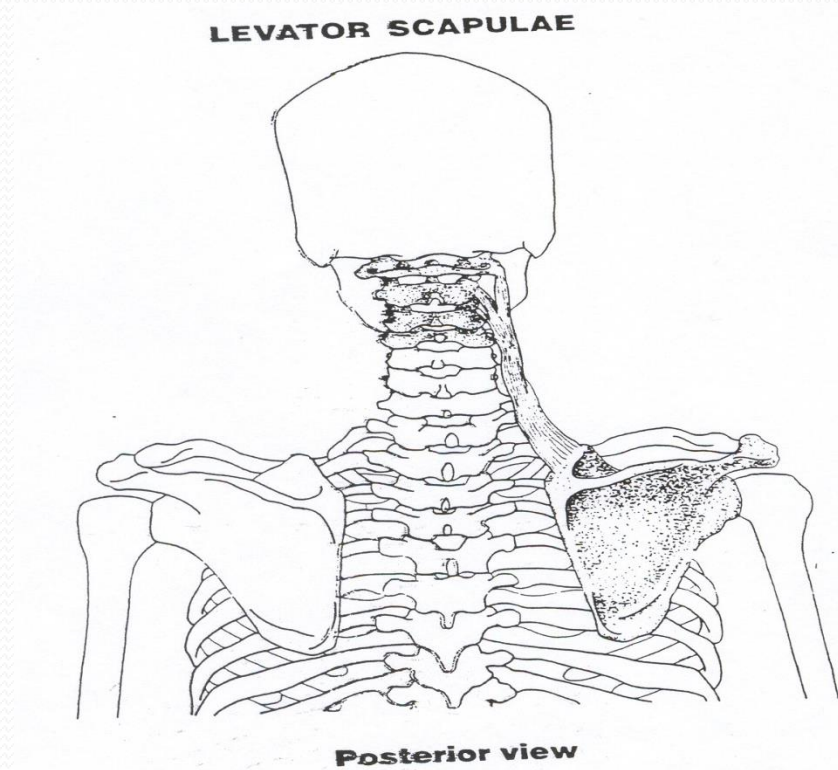
Trapezius (Black)

- Action: (5)
 - Upper-Elevation;
Upward Rotation
 - Middle: Retraction
 - Lower-Depression;
Downward Rotation
- Diamond Shaped on the Upper Back.



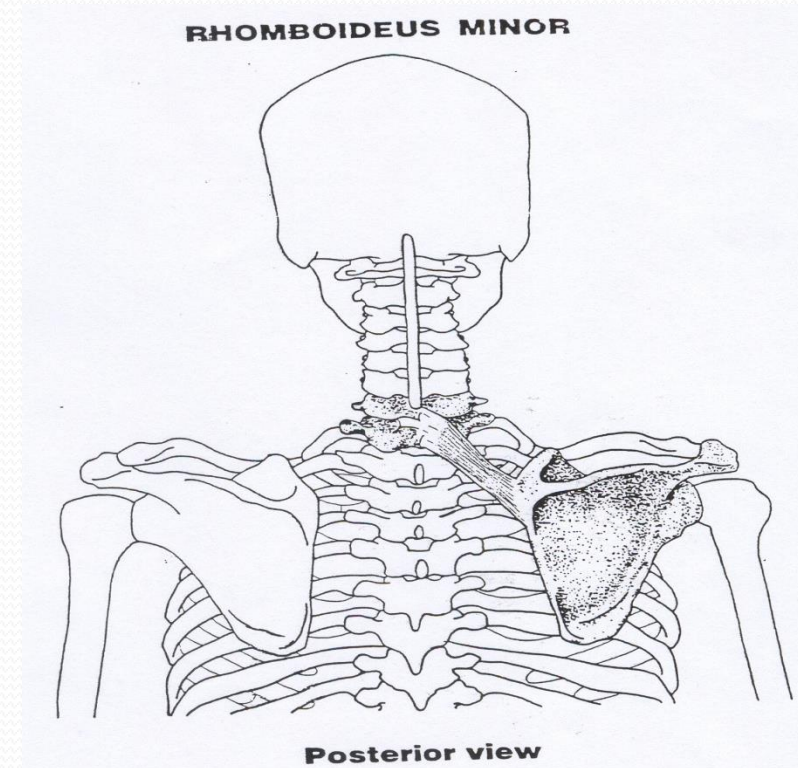
Levator Scapulae (Turquoise)

- Action: (1) Elevation



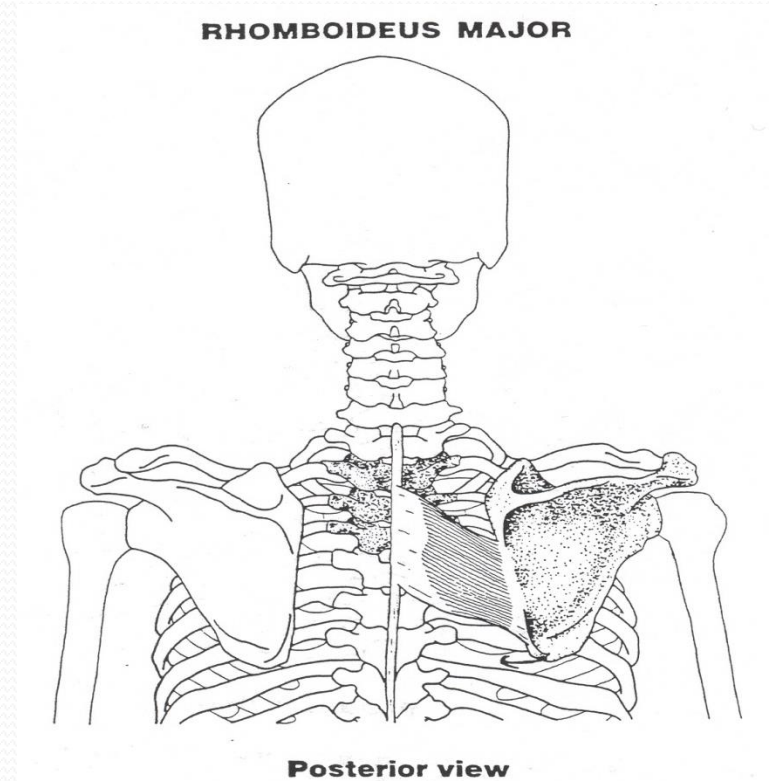
Rhomboideus Minor (Dark Blue)

- Action (2):
 - Retraction
 - Downward Rotation
- Sits in between the spine and the scapula; sits superior to the Rhomboideus Major.



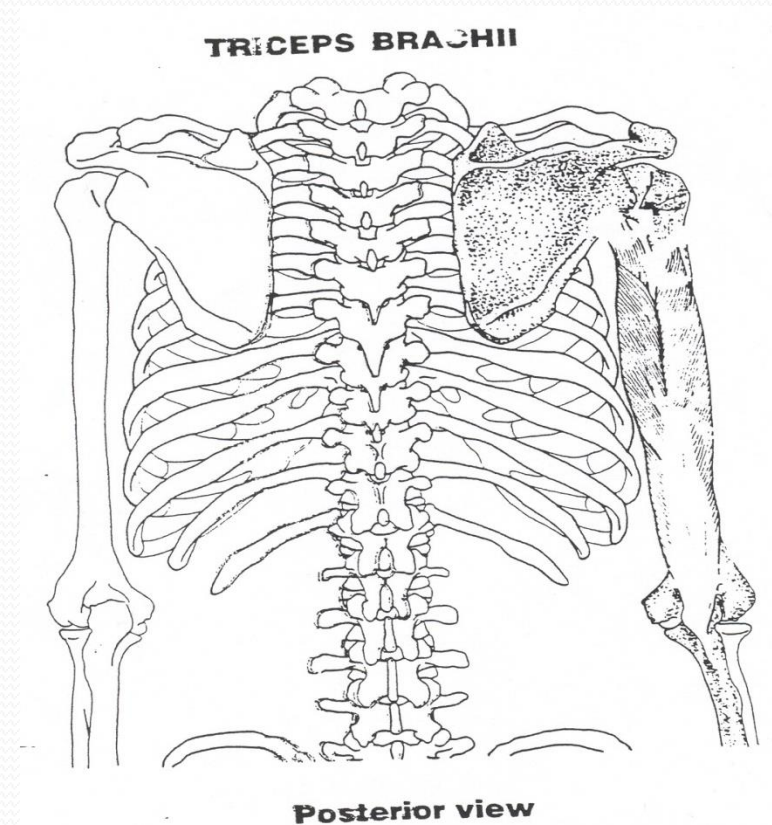
Rhomboideus Major (Light Green)

- Action (2):
 - Retraction
 - Downward Rotation
- Sits between the Spine and the Scapula; Sits inferior to the Rhomboideus Minor



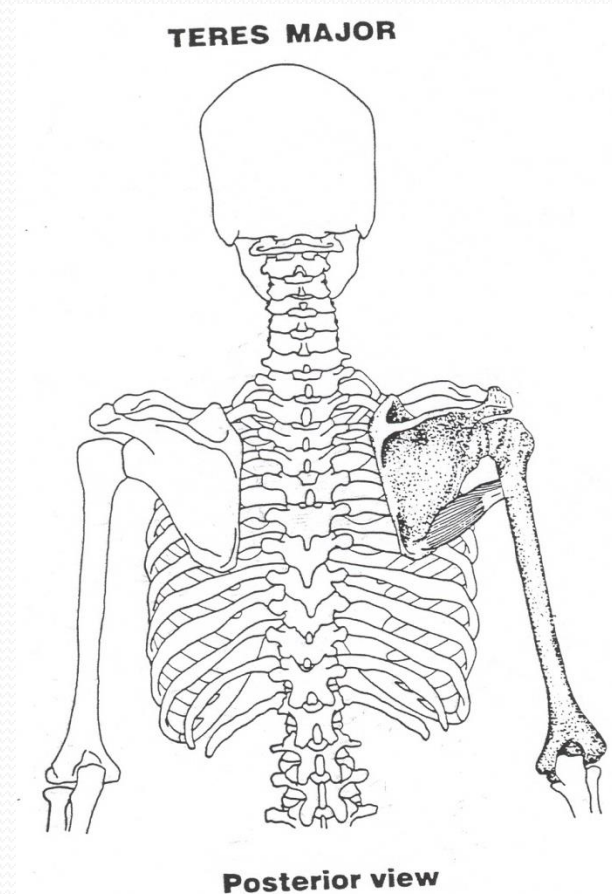
Triceps Brachii (Light Blue)

- Action: (1)
 - Extension
 - At the Elbow-Extension



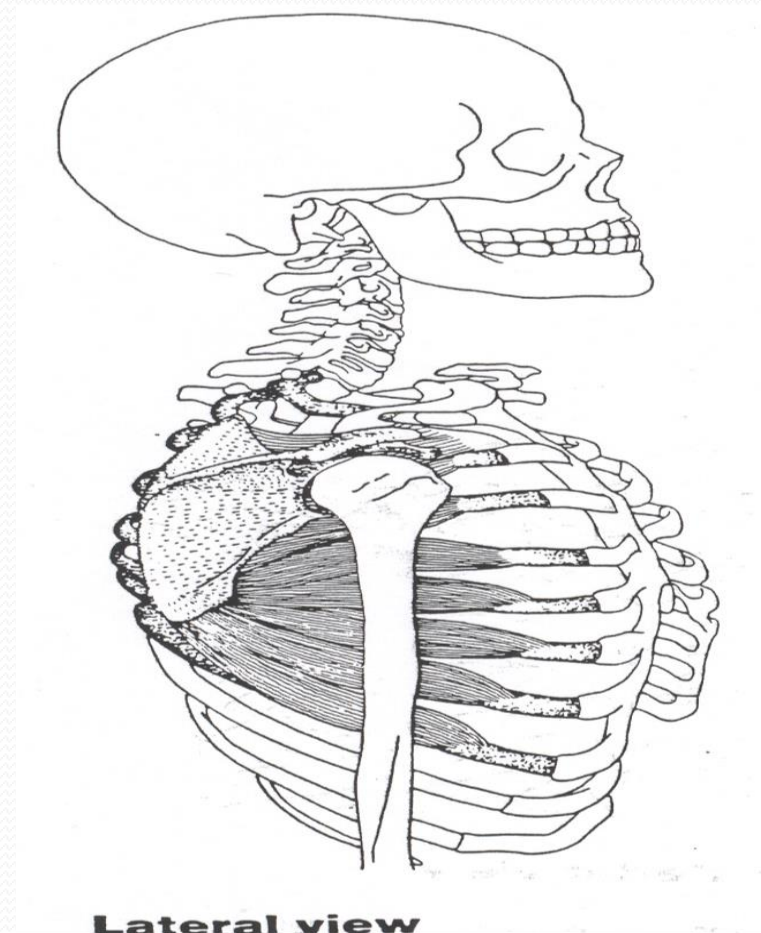
Teres Major (Lavendar)

- Action (3):
 - Internal Rotation
 - Adduction
 - Extension
- Sits inferior to the Teres Minor Muscle; also larger in size.



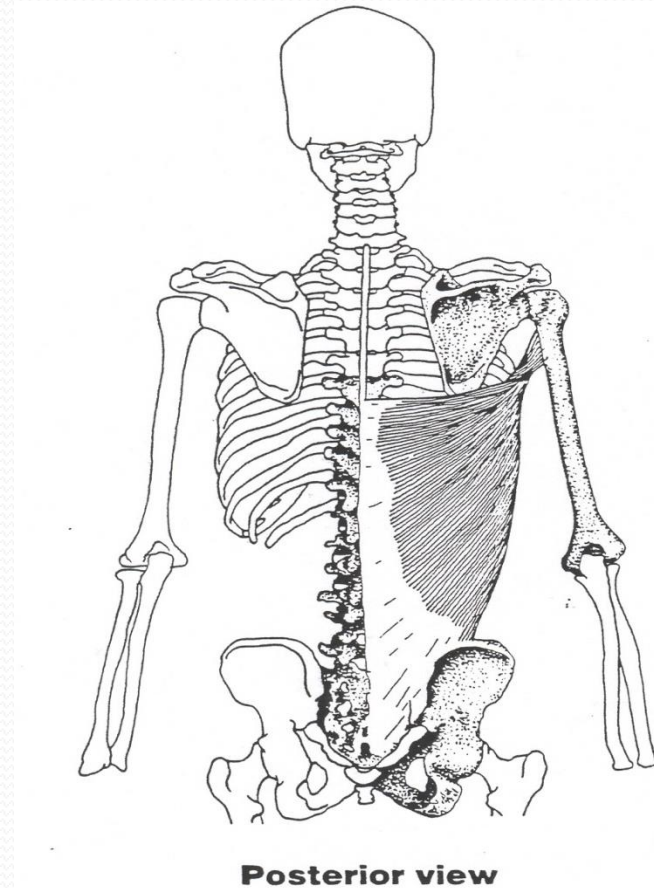
Serratus Anterior (Tan)

- Action (2):
 - Upward Rotation
 - Protraction
- Runs from ribs to scapula
- Works against the Rhomboids



Latissimus Dorsi (Light Pink)

- Action: (3)
 - Extension
 - Adduction
 - Internal Rotation
- Superficial Lower Back Muscle but moves the Shoulder; Rowing Muscle.

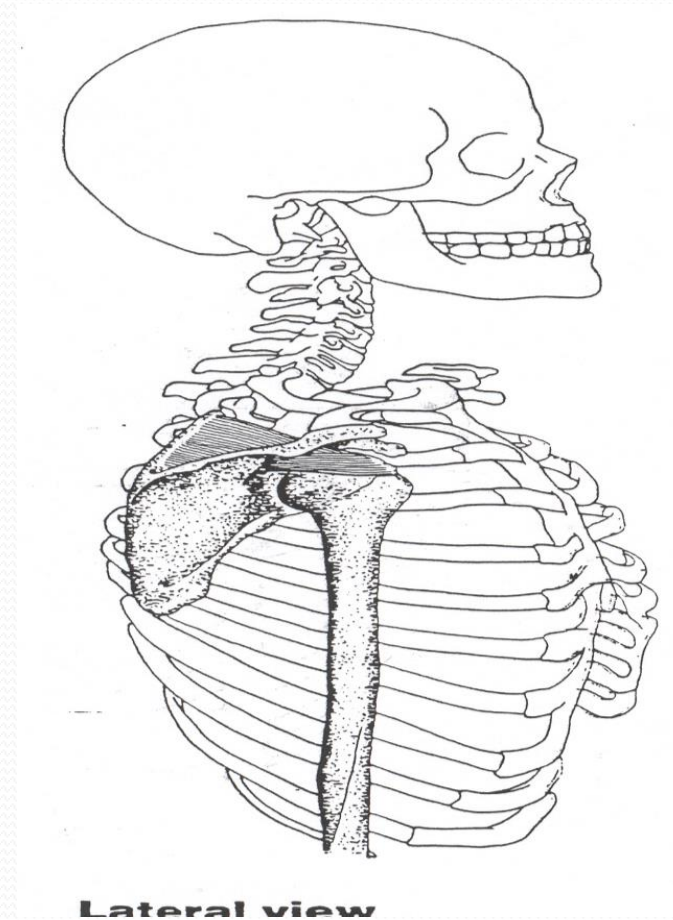


Supraspinatus (Yellow)

- Action: (1)
 - Abduction

Rotator Cuff Muscles:

- Supraspinatus
- I
- T
- S

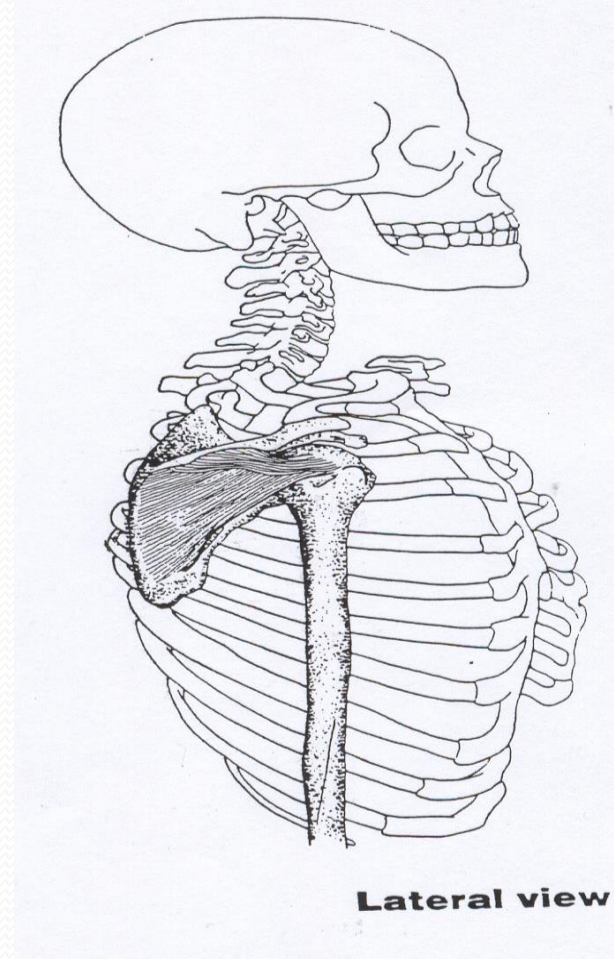


Infraspinatus (Pink)

- Action (1):
 - External Rotation (ER)

Rotator Cuff Muscles:

- S
- Infraspinatus
- T
- S

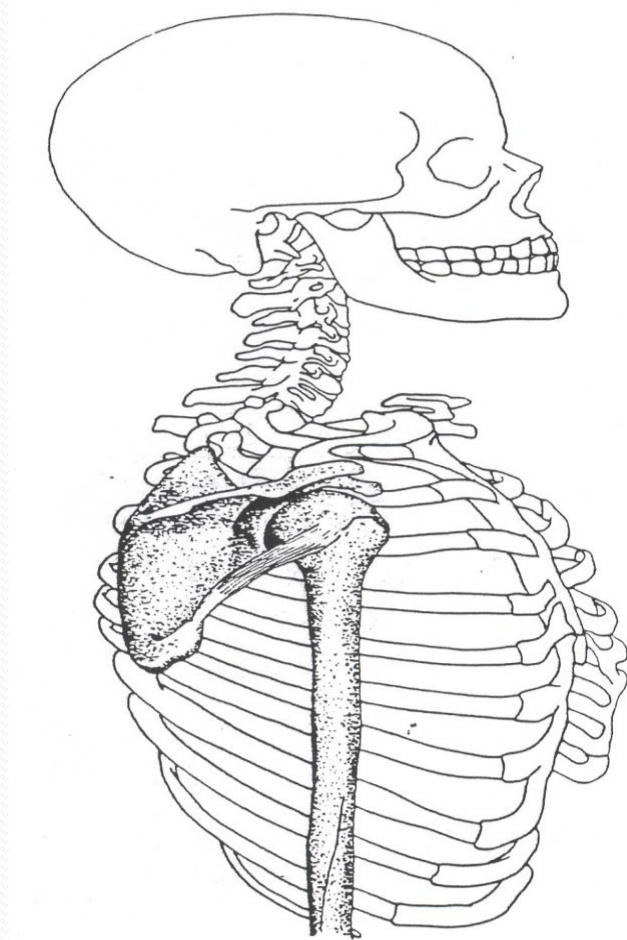


Teres Minor (Gray)

- Action (1):
 - External Rotation (ER)

Rotator Cuff Muscles:

- S
- I
- Teres Minor
- S



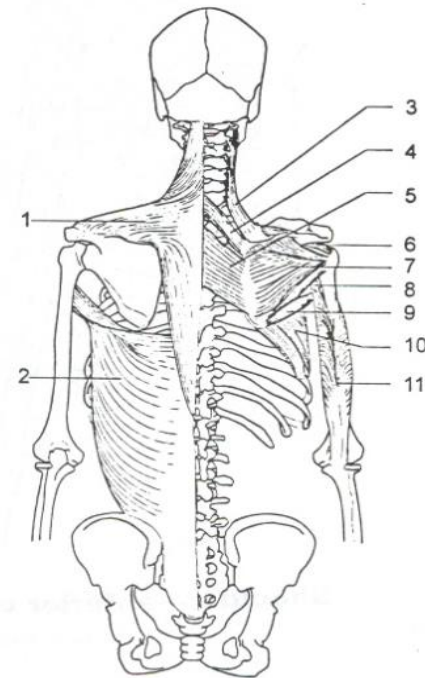
Lateral view

Rotator Cuff Muscles

Function to hold shoulder joint in place.

- **S: Supraspinatus-ABD**
- **I: Infraspinatus-ER**
- **T: Teres Minor-ER**
- **S: Subscapularis-IR**

POSTERIOR BACK, SHOULDER, AND ARM MUSCLES



Trunk—dorsal view

Superficial layer

1. Trapezius
2. Latissimus dorsi

Deep layer

3. Levator scapulae
4. Rhomboideus minor
5. Rhomboideus major

6. Supraspinatus (rotator cuff)
 7. Infraspinatus (rotator cuff)
 8. Teres minor (rotator cuff)
 9. Teres major
 10. Serratus anterior
- Posterior arm
11. Triceps brachii

Anterior Muscles-Colors Needed

1 Function	2 Functions	3 Functions	5 Functions
Biceps Brachii (Green)	Coraco-brachialis (Blue)	Pectoralis Major (Purple)	Deltoideus (Orange)
Subscapularis (Brown) Rotator Cuff		Pectoralis Minor (Red)	

Anterior Muscles

1 Function	2 Functions	3 Functions	5 Functions
Flexion At Elbow- Supination and Flexion	Adduction Flexion At Elbow- Pronation	Flexion Horizontal Adduction Internal Rotation (IR)	Flexion IR Abduction Extension ER
Internal Rotation (IR)		Raises Ribs- Inspiration Draws Scapula Forward- Protraction Depression	

Posterior Muscles

1 Functions	2 Functions	3 Functions	5 Functions
Levator Scapulae (Turquoise)	Rhomboideus Major (Light Green)	Latissimus Dorsi (Light Pink)	Trapezius (Black)
Supraspinatus (Yellow) Rotator Cuff	Rhomboideus Minor (Dark Blue)	Teres Major (Lavendar)	
Infraspinatus (Dark Pink) Rotator Cuff	Serratus Anterior (Tan)		
Teres Minor (Gray) Rotator Cuff			
Triceps Brachii (Light Blue)			

Posterior Muscles

1 Functions	2 Functions	3 Functions	5 Functions
Elevation	Retraction Downward Rotation	Extension Adduction Internal Rotation	Elevation Upward Rotation Retraction Downward Rotation Depression
Abduction	Retraction Downward Rotation	Internal Rotation Adduction Extension	
External Rotation (ER)	Upward Rotation Protraction		
External Rotation(ER)			
Extension At Elbow-Extension			