

Chapter 3 The Shoulder



From Kinetic Anatomy, Second Edition, by Robert S. Behnke, 2006, Champaign, L: Human Kinetics.



*LANDMARKS

Clavicle

Anatomical landmarks

Scapula

Anatomical landmarks

Humerus

Anatomical landmarks



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- *Key bony landmarks
 - *Manubrium
 - * Clavicle
 - *Coracoid process
 - *Acromion process
 - *Glenoid fossa
 - *Lateral border
 - * Inferior angle
 - *Medial border



*Key bony landmarks *Acromion process * Glenoid fossa *Lateral border * Inferior angle * Medial border *Superior angle * Spine of the scapula



*ARTICULATIONS

Shoulder Girdle (clavicle & scapula)

* Sternoclavicular (SC)

* Sternum and clavicle

* Acromioclavicular (AC)

* Acromium process and clavicle

Shoulder Joint (scapula and humerus)

* Glenohumeral (GH)

* Glenoid fossa (scapula)

* and humerus

Elevation Depression?

Abduction (upward rotation and lateral tilt) Protraction (both sides)

Adduction (downward rotation and medial tilt) Retraction (both sides)

*SCAPULAR MOVEMENTS

*Shoulder girdle movements = scapula movements
*Wherever econyle goes classic

*Wherever scapula goes, clavicle follows and vice-versa







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*SEPARATIONS

* MUSCLE & MOVEMENTS

Shoulder joint movements Sagittal Plane: Flexion, extension, and hyperextension Frontal Plane: Abduction and adduction Transverse Plane: Internal and external rotation Circumduction



*Scapular movements



*Anterior tilt (upward tilt)

- * rotational movement of scapula about frontal axis occurring during glenohumeral hyperextension
- * superior border moving anteroinferiorly & inferior angle moving posterosuperiorly
- *Posterior tilt (downward tilt)
 - * rotational movement of scapula about frontal axis occurring during glenohumeral hyperflexion

* superior border moving posteroinferiorly & inferior angle moving anterosuperiorly

> Manual of Structural Kinesiology

The Shoulder Girdle

*Synergy with muscles of glenohumeral joint

- * As shoulder joint goes through more extreme ranges of motion, scapular muscles contract to move shoulder girdle so that its glenoid fossa will be in a more appropriate position from which the humerus can move
- * Without the accompanying scapula movement humerus can only be raised into approximately 90 degrees of total shoulder abduction & flexion * Movements

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*Synergy with muscles of glenohumeral joint

- * This works through the appropriate muscles of both joints working in synergy to accomplish the desired action of entire upper extremity
- * Ex. to raise our hand out to side laterally as high as possible, the serratus anterior & trapezius (middle & lower fibers) muscles upwardly rotate scapula as supraspinatus & deltoid initiate glenohumeral abduction
- * This synergy between scapula & shoulder joint muscles enhances movement of entire upper extremity



*5 muscles primarily involved in shoulder girdle movements

- *All originate on axial skeleton & insert on scapula and/or clavicle
- * Do not attach to humerus & do not cause shoulder joint actions
- * Essential in providing dynamic stability of the scapula so it can serve as a relative base of support for shoulder joint activities such as throwing, batting, & blocking



Manual of Structural Kinesiology *Scapula muscles

*Important in spinal posture

* Forward shoulder due to scapula protractors & depressors becoming stronger & tighter and retractors becoming weaker

* Contributes to kyphosis

- * Less functional position for glenohumeral joint
- * Important to maintain lumbar lordosis & keep head over trunk in balanced postion

* Good posture enhances easier inspiration



*Shoulder Girdle Muscles

*6 muscles primarily involved in shoulder girdle movements

- * Trapezius upper, middle, lower
- *Rhomboid deep
- *Levator scapula
- * Serratus anterior
- * Pectoralis minor deep
- * Subclavian



Structural Kinesiology

* SHOULDER GIRDLE MUSCLES



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*Stabilizers of the GH Joint

*External and internal rotation, Abduction

*SITS

- *Subscapularis -
- *Infraspinatus
- * Teres Minor
- *Supraspinatus

*Rotator Cuff Muscles

* IMPINGEMENT SYNDROME

Impingement of the rotator cuff muscles as they pass through the subacromonial space. Impinged between the acromion and greater tubercle of humerus.

*Causes:

- * Muscular imbalances
 - *Internal rotators
 - * Shoulders rounded forward
 - * Weak external rotators
 - * Overtraining
 - * Biomechanical issues

Treatment:

- * Strengthening external
- * Stretching Internal
- * Retraining for proper biomechanics





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* SHOULDER JOINT MUSCLES

Muscles Crossing the Shoulder Joint





*Shoulder Girdle Muscles

- *Pectoralis Minor aDduction and DW Rotation
- *Serratus Anterior aBduction, UW Rotation
- *Subclavius provide stability
- *Levator Scapulae Elevation (DW rotation & aDduction)
- *Rhomboids Elevation and aDduction
- *Trapezius 1. Elevation & ADduction 2. Mostly aDduction 3 aDduction 4, aBduction

*Muscle Actions

*Anterior

- * Pectoralis Major Flexion, ADduction & Int Rotation
- * Coracobrachialis Flexion and assists with Add
- * Biceps Brachii LH, Flexion, aBduction. SH, flexion, aDduction, int rotation
- * Subscapularis int rotation and flexion

Superior

Deltoid- Entire muscle -Abd. Posterior - aDduction, ext and int rotation. Anterior - aDduction, flexion and int rotation.

Supraspinatus

Primary initiator of Abd up to 30 degrees.

* Shoulder Joint Muscle Actions

Posterior

Infraspinatus - Ext rotation and extension Teres Minor - Ext rotation and extension

*Inferior

* Latissimus Dorsi - Int rotation, extension and aDduction

* Teres Major - Int rotation, extension and aDduction

* Triceps Brachii - Extension and aDduction

* Shoulder Joint Muscle Actions

Scapulohumeral rhythm

* initial abduction GH joint action

- *Combination of rotation and abduction results in 180 degree abduction
- *1 degree scapular rotation for every 2 degree GH abduction

* COMBINER ACTIONS