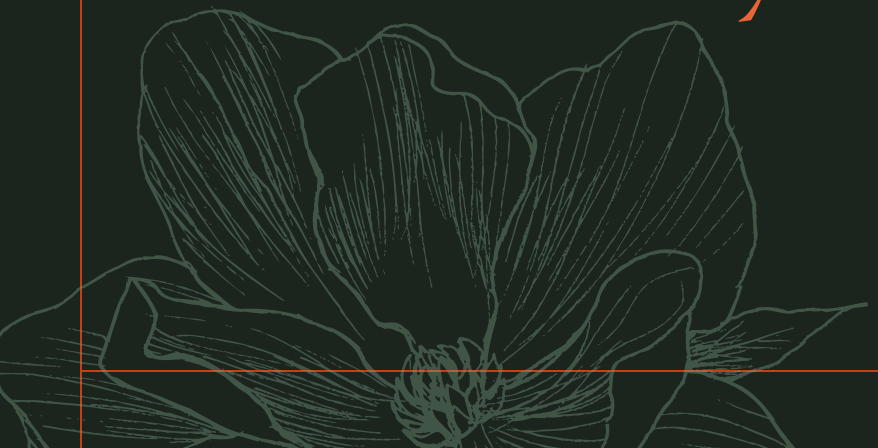
Managing Scapular Dyskinesia

Josh Gerrity, OTR/L, CHT

The scapula is a critical connecting point in the kinetic chain that allows for transfer of strength from the core to the arm efficiently.



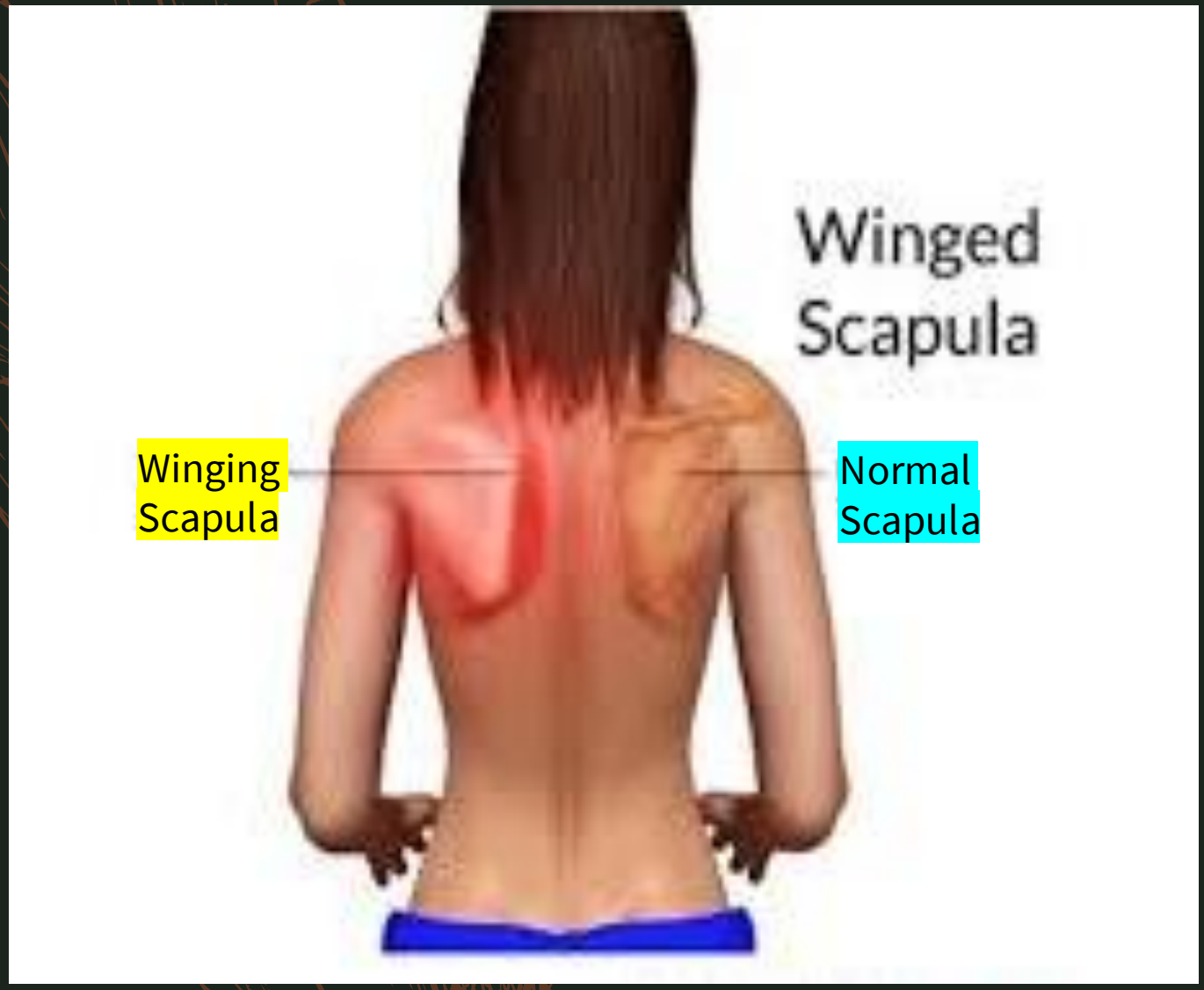
- Altered scapular motion contributes to the decrease of subacromial space and can precipitate common shoulder pathologies such as rotator cuff tears.

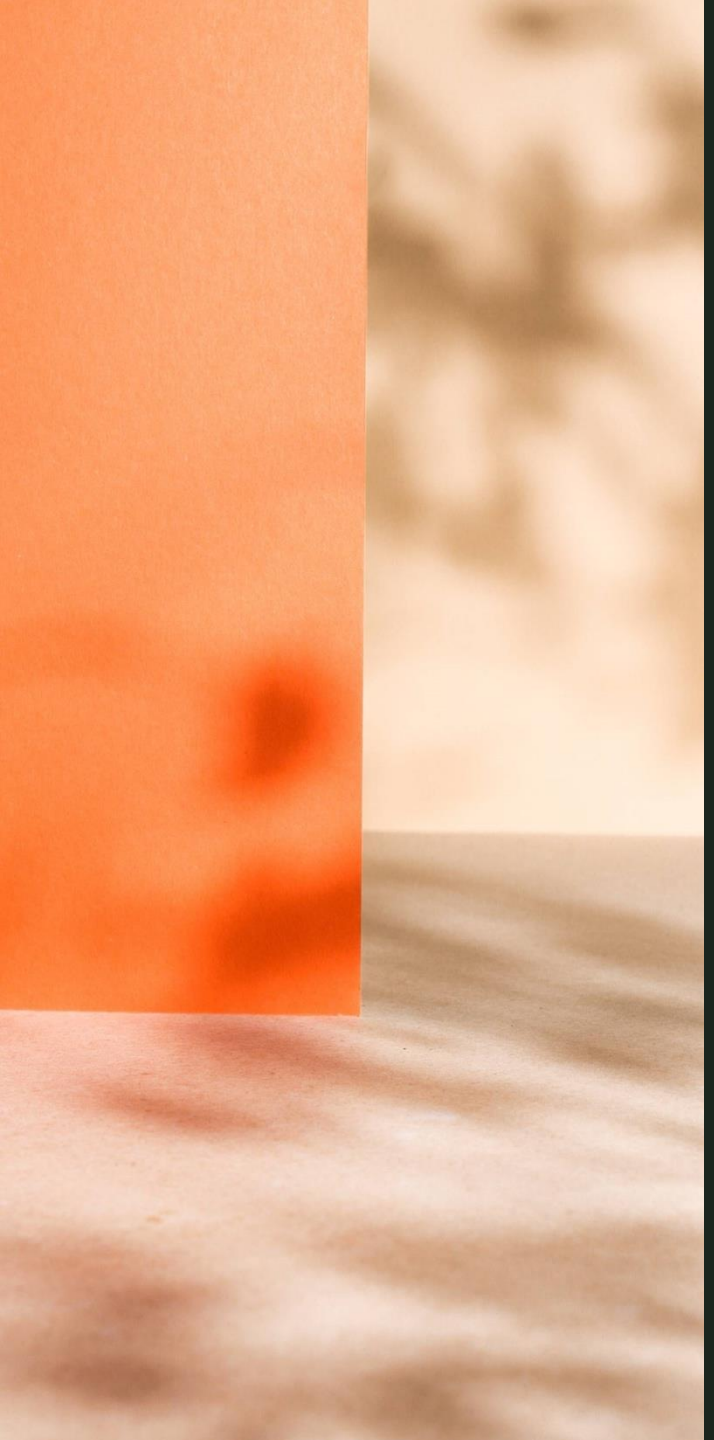
- It also increases strain on the anterior glenohumeral ligaments while decreasing rotator cuff strength.

Scapular Dyskinesia (SD)

Described as any alteration of scapular position or motion that can impair shoulder stability or function.

Unknown if it is a cause, consequence, or compensatory mechanism of a rotator cuff lesion.

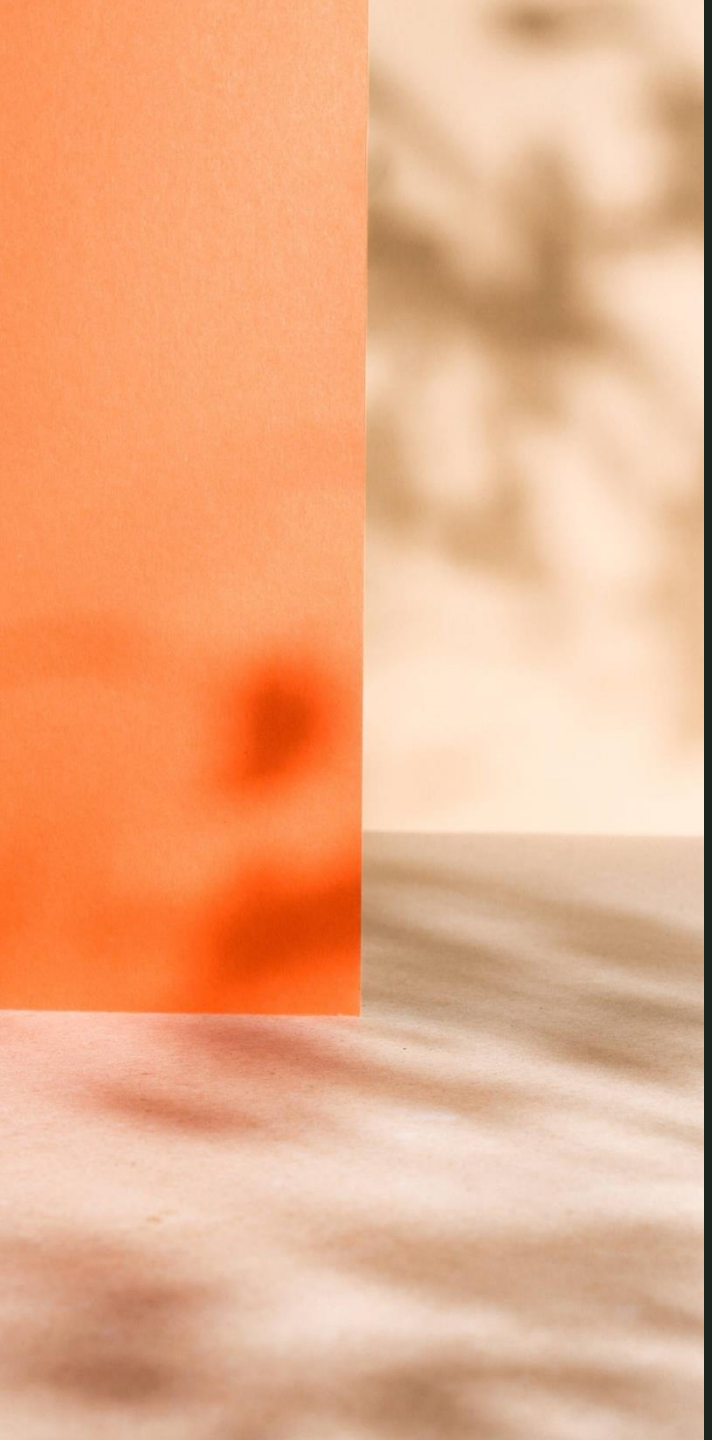




It is generally seen as an impairment as it can be present in asymptomatic individuals.

Higher prevalence in overhead athletes (61%) vs non-overhead (33)

(2016, Burn, et al)



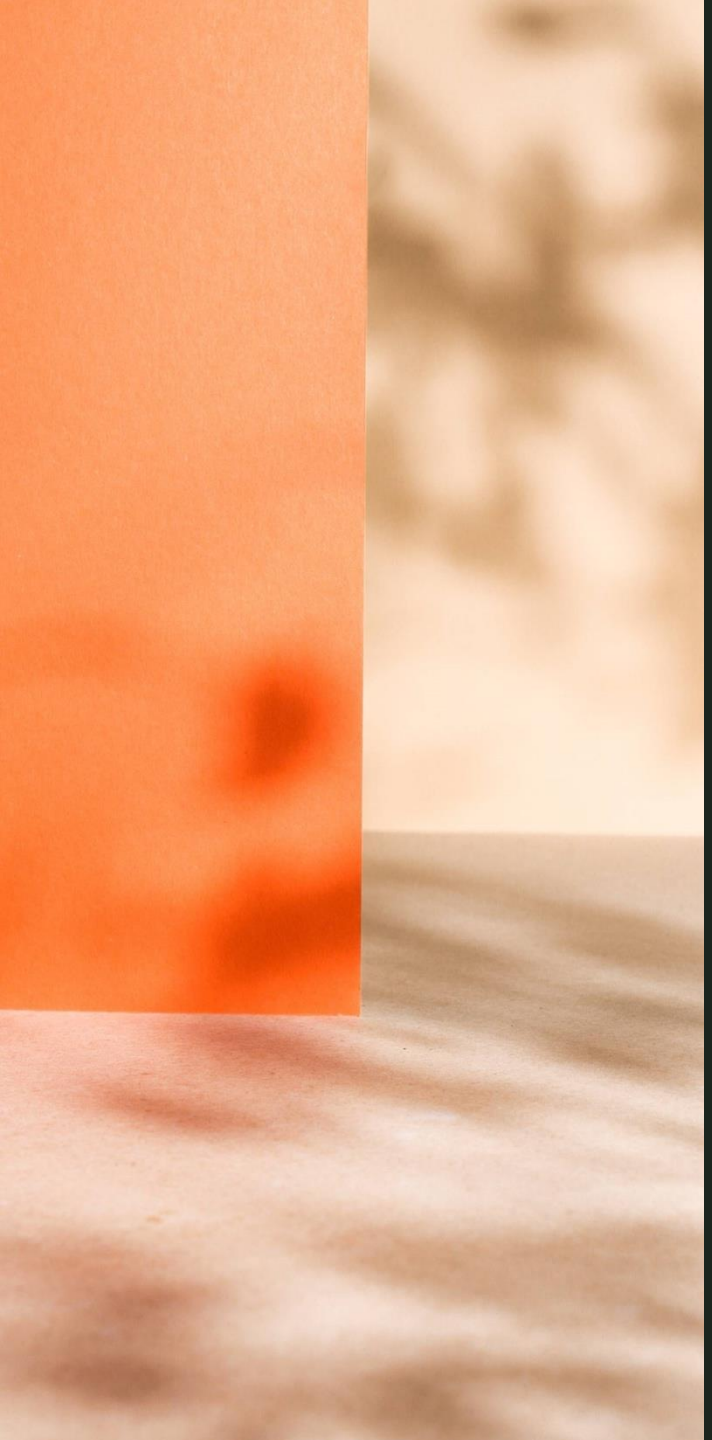
- Scapular Dyskinesia is present in 94% of athletes with injured overhead throwing athletes.

- Also is associated with 67-100% of all shoulder injuries.

(2016, Kibler)

Overhead athletes display increased scapular movement which is an adaptive change to preserve subacromial space and avoid rotator cuff compression.

An injured throwing shoulder results from successive kinetic chain alterations in response to high demands.



- A shoulder with dyskinesia is 43% more at risk of injury and will fail earlier with the same exposure and load.

(Hickey, 2017)

Patients with symptomatic impingement had significantly less posterior tilting (approx. 10%)

Leading to increased chances of impingement.

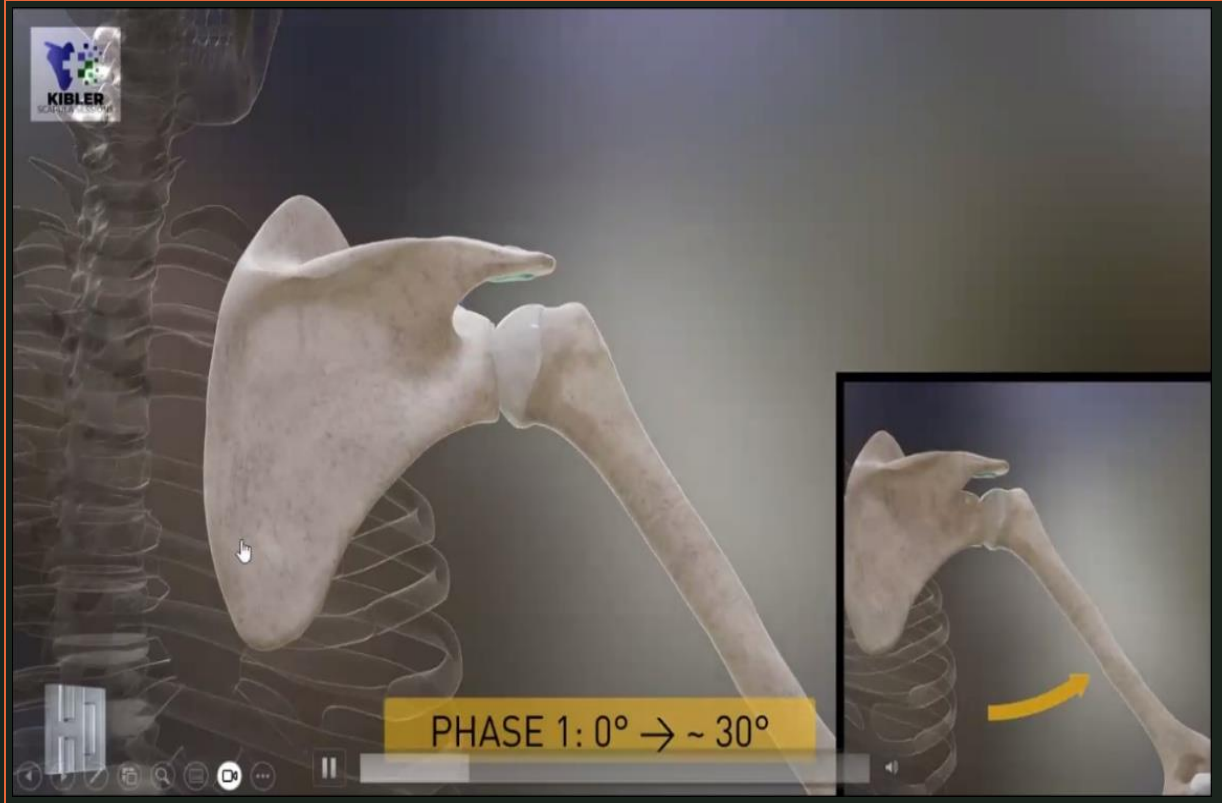
Dr. Kibler describes the shoulder as a "SCAPULOCENTRIC JOINT"

Proximal stability leads to distal mobility

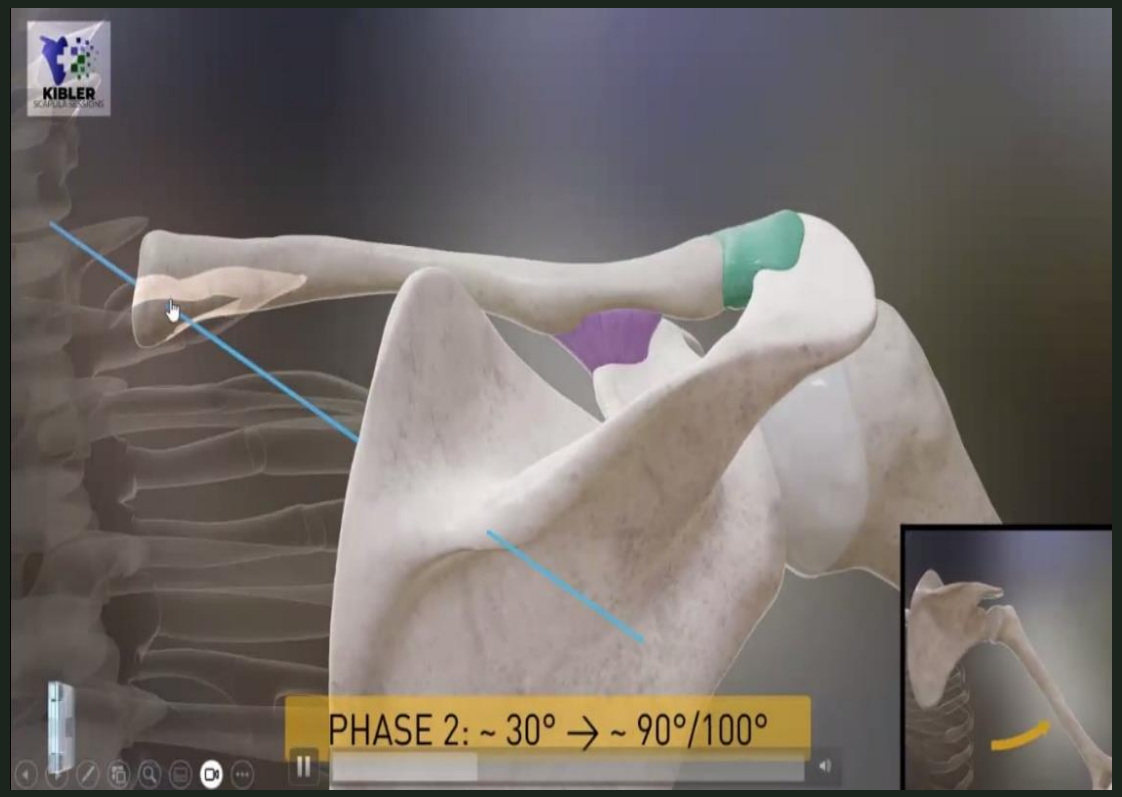
Clavicle functions to hold the scapula in a stable position

4 Phases of Glenohumeral Rhythm need all 4 phases to demonstrate full range of motion

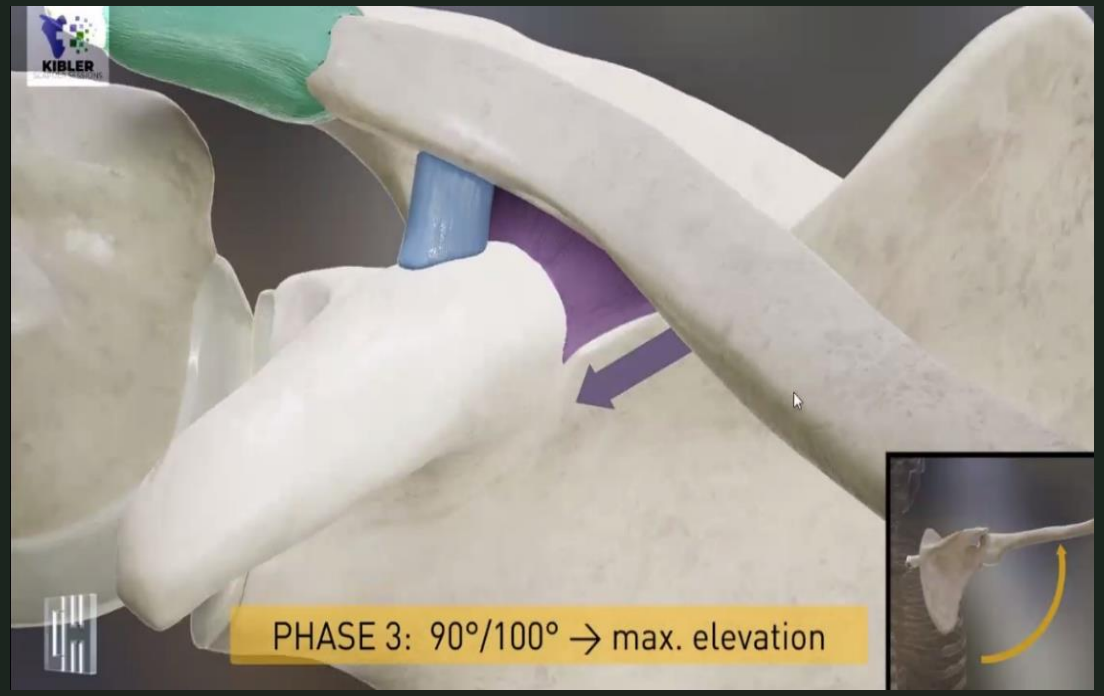
Kibler, Dec 2024: Ground Rounds



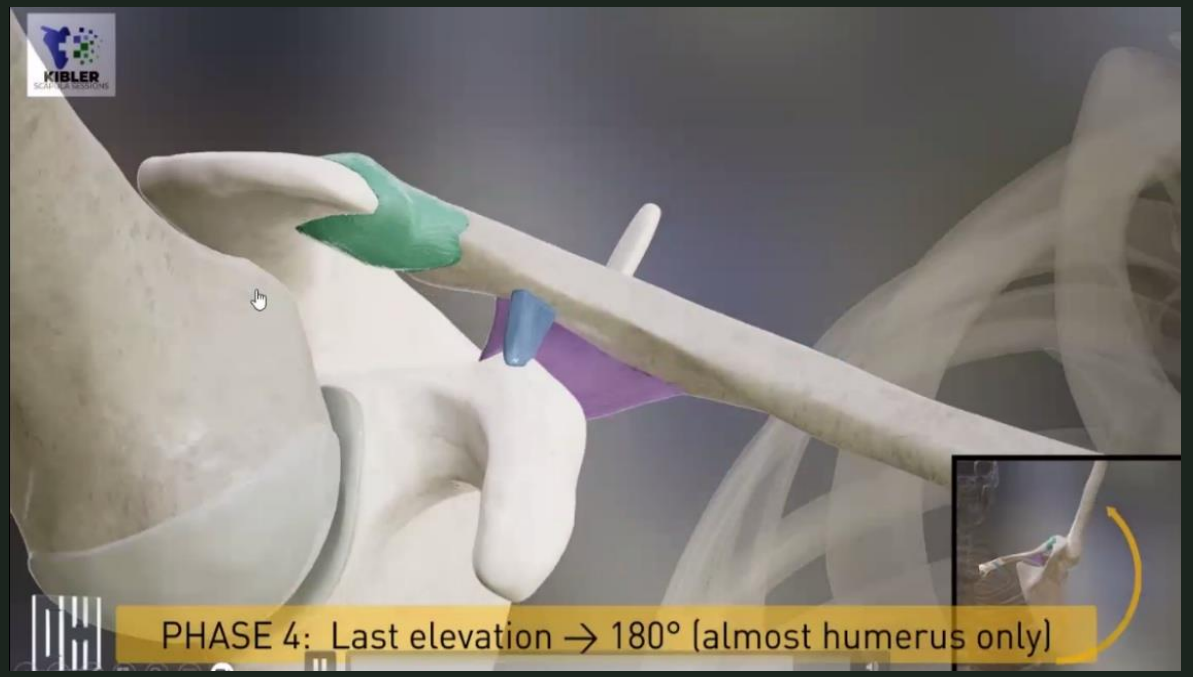
- Shoulder elevation occurs mainly through glenohumeral joint.



- Glenohumeral and Scapulothoracic joints move simultaneously.
- Overall a 2:1 ratio of GH to ST movement



- Humerus abducts 60° and laterally rotates 90°
- Scapula lateral rotates 40°
- Clavicle rotates 30-50° posteriorly and elevates 15°



- Primarily all humerus at this level

Etiology

Neurological	Musculoskeletal	Postural abnormalities
Cervical radiculopathy	Tightness in pectoralis minor and bicep[short head] (posterior shoulder tightness)	Thoracic kyphosis
Long thoracic palsy (serratus ant. weakness)	Posterior shoulder inflexibility	
Spinal accessory palsy (trapezius function)	Periscapular muscle lesions	
	Muscular activation alterations	
	Strength imbalances	
	Clavicle fractures	
	AC or glenohumeral instability	

(2013, Kibler)

Consequences of Scapular Dyskinesia

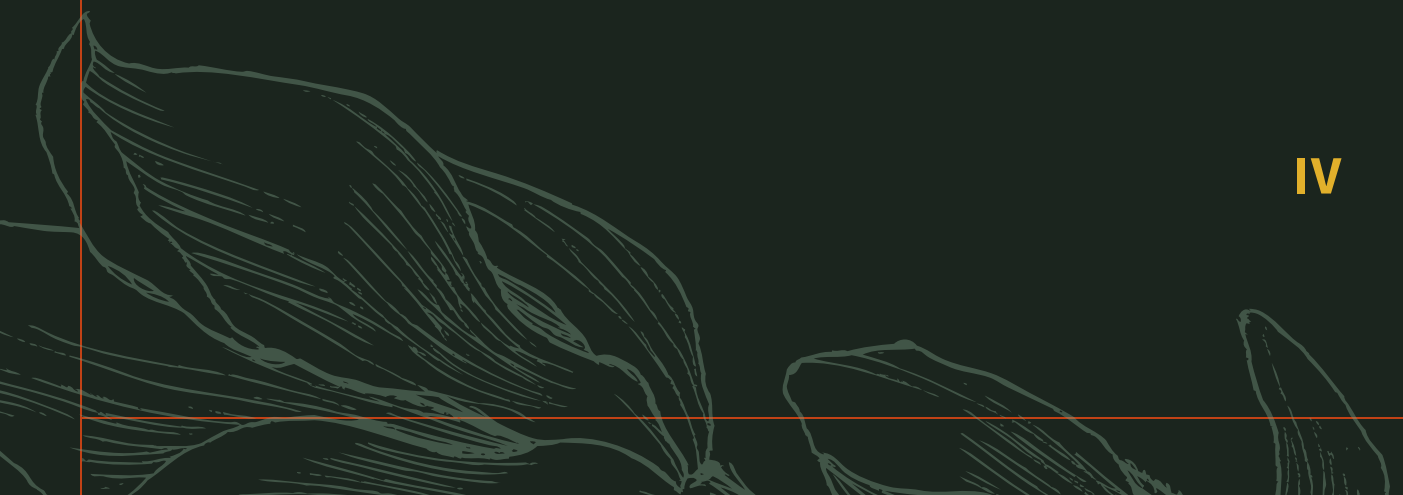
SICK SHOULDER SYNDROME

- Scapular malposition
- Inferior medial border prominence
- Coracoid pain
- Dyskinesis of scapular motion

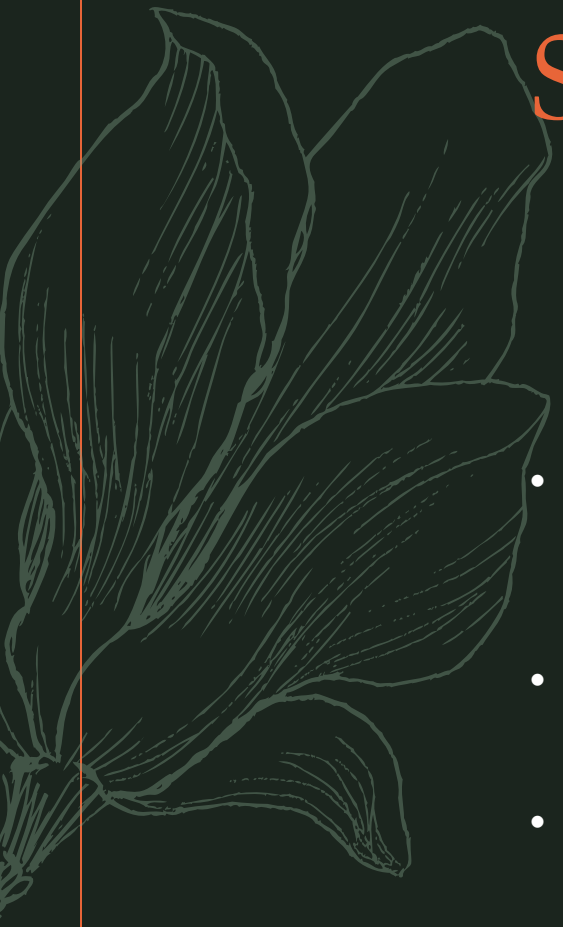
The scapula must be dynamically stabilized in a retracted position during movement of the arm until optimal activation of the periscapular muscles are triggered.

Classification of Scapular Dyskinesia

Types	SCAPULAR POSTION AND MOTIONS
I	Prominence of the inferomedial angel of the scapula due abnormal posterior tilt
II	Entire medial border is prominent due to excessive external rotation
III	Prominence of superomedial border with upward rotation of the scapula
IV	Both position and scapular motion are normal and symmetrical



Dynamic Assessment of Scapular Dyskinesia



Scapular Assistance Test

- Manually stabilize the scapula and assist its upward rotation.
- Mimics coupling force of serratus and low trap.
- ***If improved ROM or pain considered positive.***
- Focus on scapular stabilization exercises

(Kibler et al AJSM 2006)

Scapular Retraction Test

- Manually stabilize the scapula in a retracted position against the thorax.
- Grants a stable origin for the rotator cuff.
- ***Considered positive if pain decreases and strength improves***.
- Can assist in identifying internal impingement.

Shoulder Symptom Modification Procedure

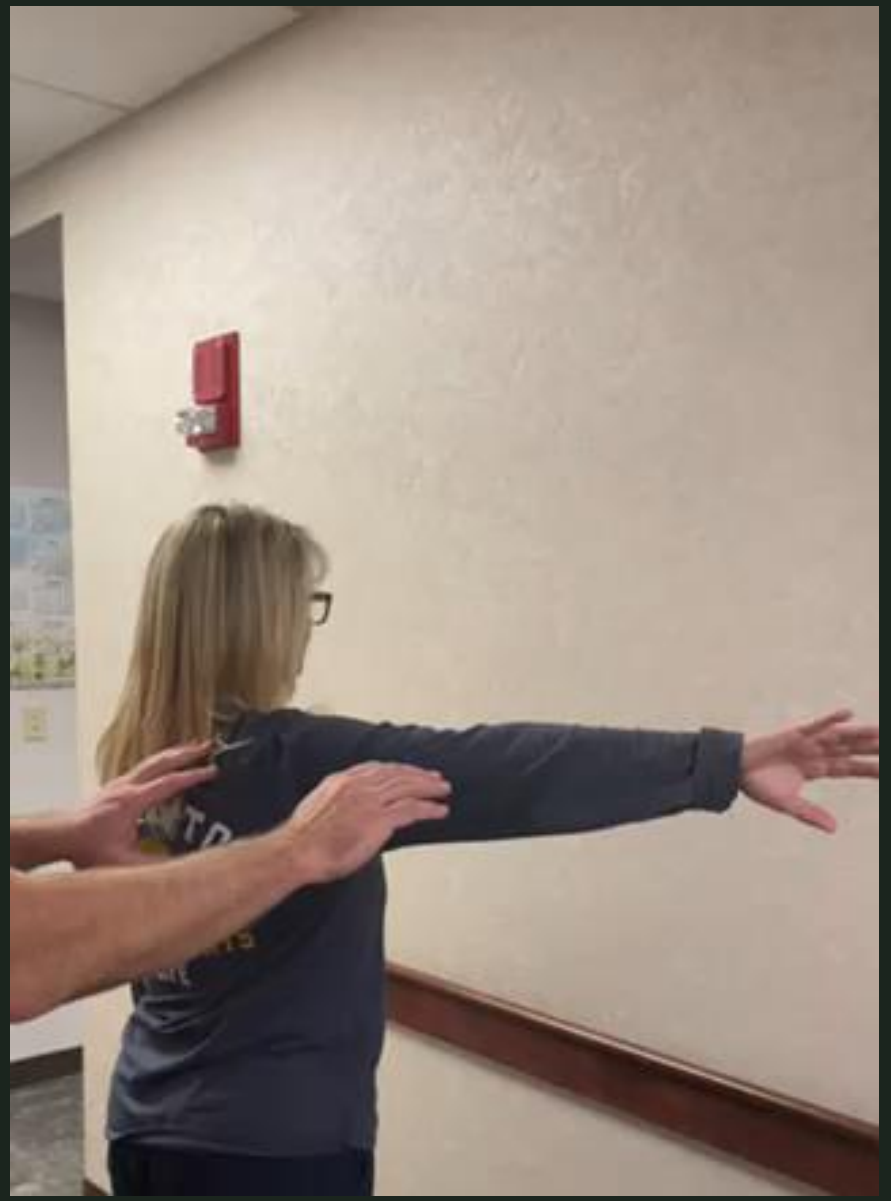
- Consists of 4 techniques: thoracic kyphosis reduction, scapular positioning, humeral head positioning, plus pain and symptom neuromodulation.
- Sequentially applied while patient performs activity that produces symptoms.
- ***Record techniques that reduce pain/symptoms***

Scapular Assistance Test

Kappa coefficient and percent of agreement are .53 and 77% in scapular plane.

Orthrop Sports Phys Ther 2006 Sep;36(9):653-60

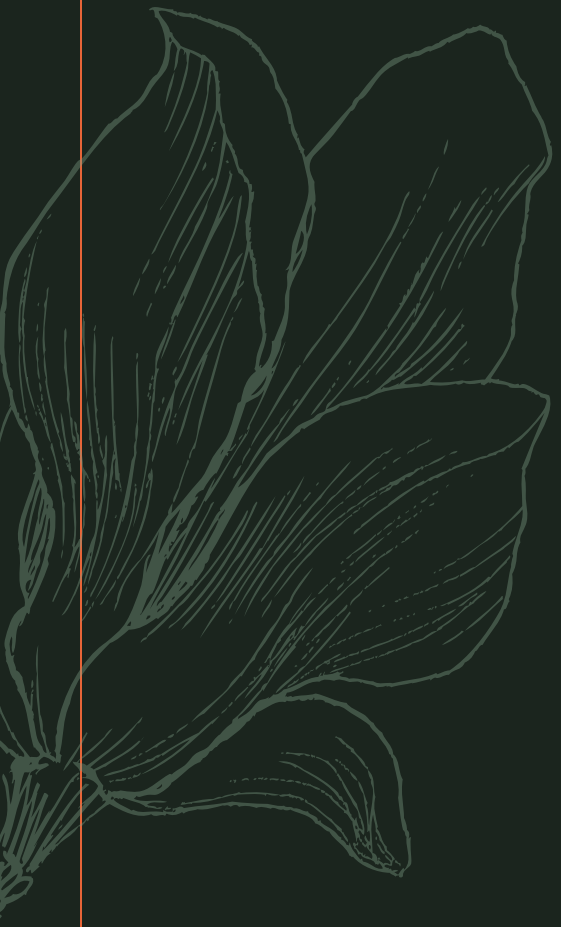
Scapular Retraction Test



ICC with muscle strength is .861 with CI 95%
and with pain is .821 with CI of 95%

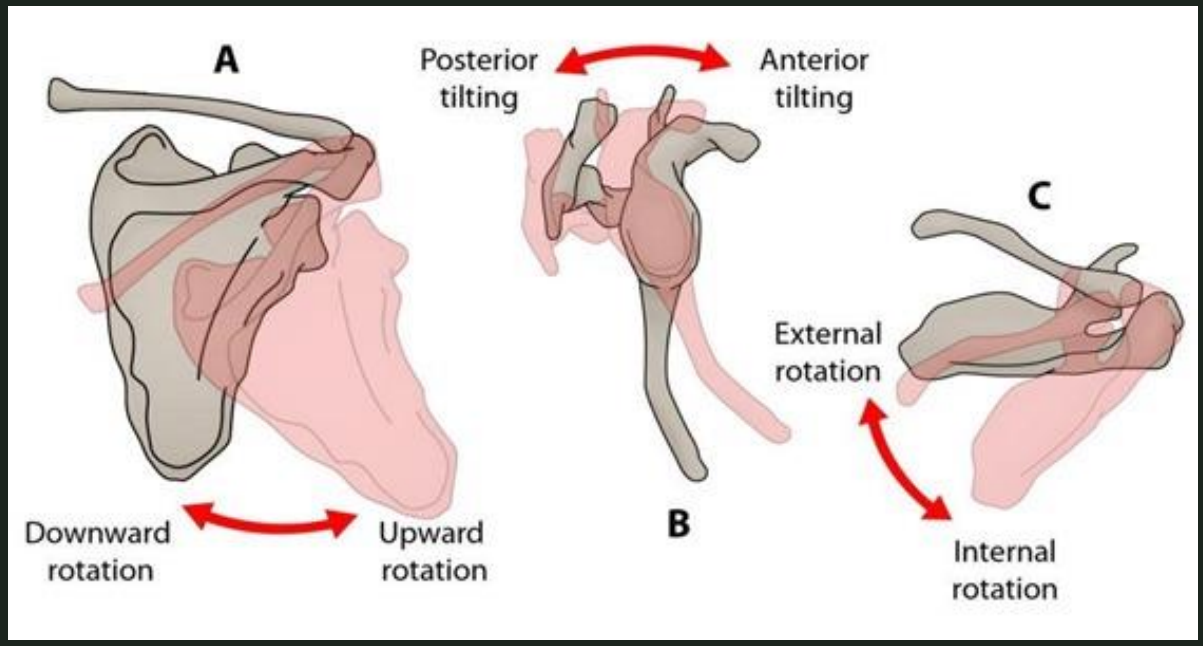
Journal of Orthropedic Reports 2024Sep(3)

Normal Three- Dimensional Kinematic Pattern of the Scapula During *Arm Elevation*

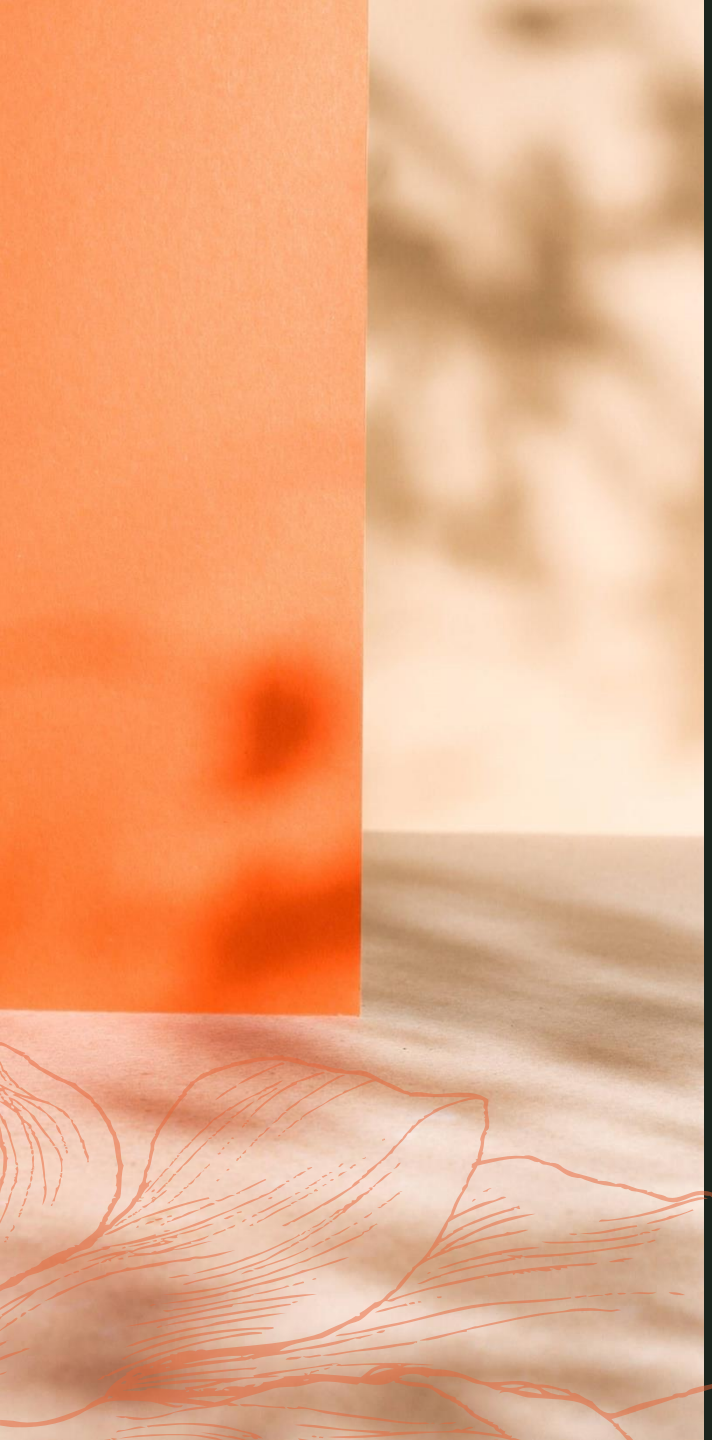


Upward Rotation

Posterior Tilting



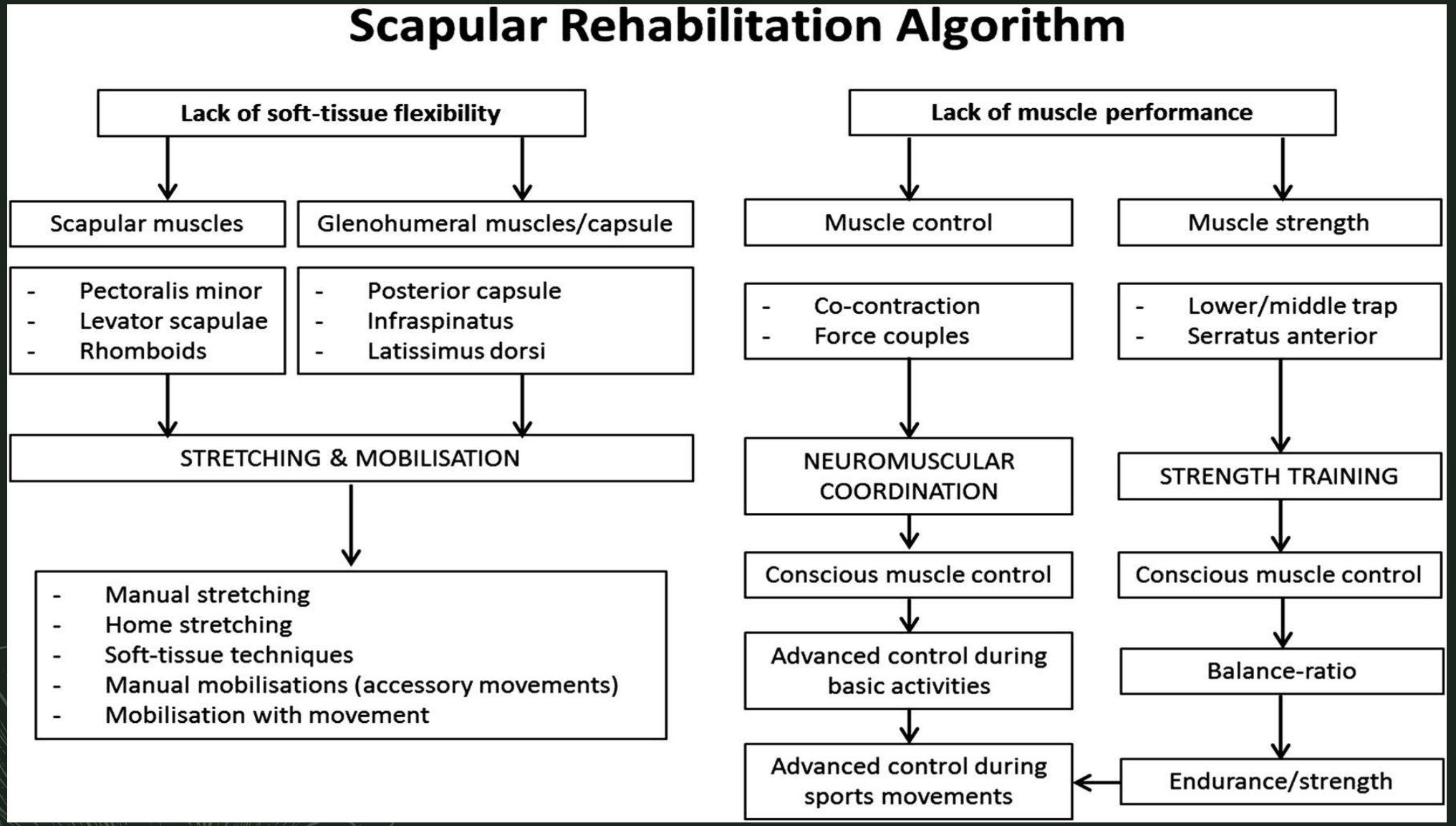
External Rotation



Primary Goals

- **Correct tightness in the chest and posterior shoulder**
- **Strengthen the scapular stabilizers. (start with short lever arm)**
- **Work on dynamic stabilization**
- **Assess mechanics and return to sport activity**

Scapular Rehabilitation Algorithm



(Ellenbecker and Cools BJSM, 2010,2014)

Areas of focus for Treatment

Positional Abnormalities

- Start proximally with core musculature stability.
- Stretching the pectoralis minor, short head of the biceps, and posterior shoulder.

Muscular Force Abnormalities

- Strengthen the scapular stabilizers: low trap, mid trap, serratus anterior, and rotator cuff.
- Work on proprioception and dynamic stabilization.

Treatment based on type of dyskinesia

- Type 1: PM stretching + SA strengthening + MT &LT Strengthening.
- Type 2: TM stretching+ SA strengthening + MT&LT Strengthening + RM Strengthening.
- Type 3: PM stretching + UT Stretching + LS stretching + MT&LT Strengthening.

PM- PEC MAJOR
SA- SERRATUS ANT
MT- MIDDLE TRAP
LT- LOW TRAP
RM- RHOMBOID
UT- UPPER TRAP
LS- LEVATOR SCAP

Tang, et al. 2021; 22: 713

Pectoralis Minor Stretches

Posterior Capsule Stretches

Work the core!

Planks

Single Arm Lift

Bird Dog

Dead Bug

Single Arm With Rotation

Bridge

Grade your activities based on symptoms

Dr. Kibler states “start with short lever arm exercises and avoid exercises in position of impingement.”

Straight arm extension

Bent elbow scap. retraction

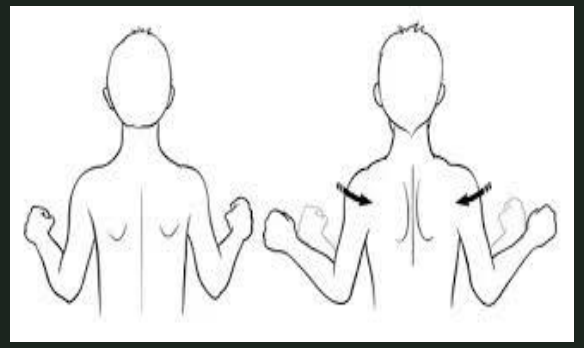
Prone robber

No Supine Ceiling Punch Initially(creates protraction of the scapula)

Dynamic Stabilization Activities

Pushup plus to sunken chest

Bear crawl



Robber exercises

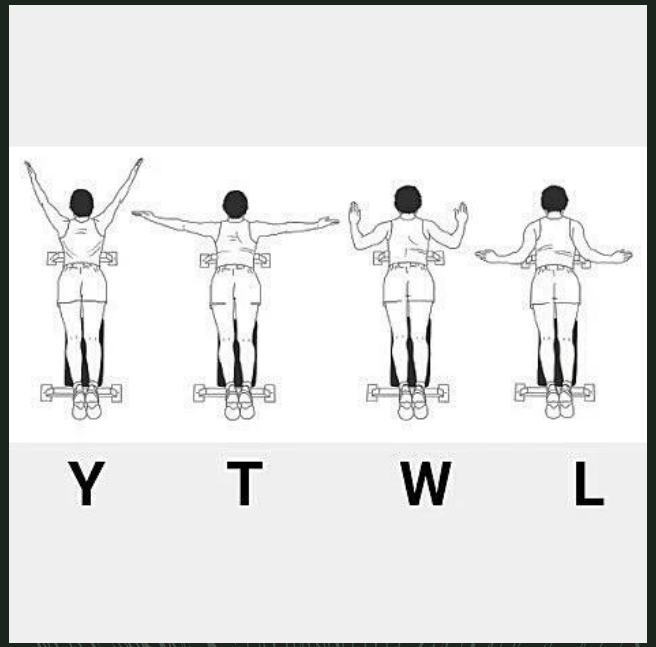
Full body lawn mower

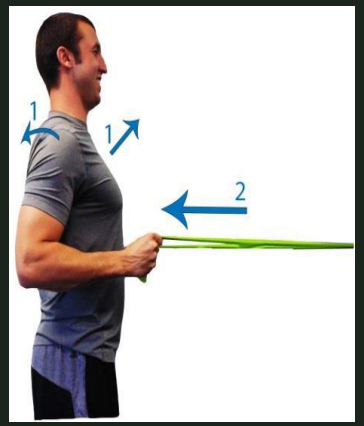
Quad. Flex, scaption, horizontal abduction

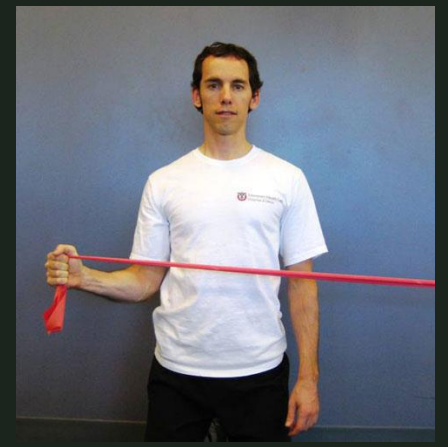
Closed eye alphabet

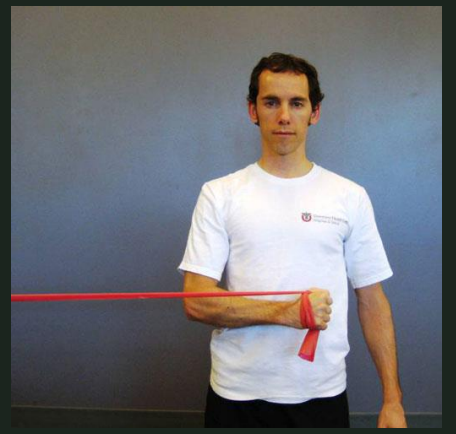
Wall slides with ER

Strengthen the RC & Scapular Stabilizers









Core

Scapular Depression

Scapular Protraction/ Serratus

Scapular Retraction Mid and Low Trap

Summary

- As a clinician we must consider and work for early recognition and treatment of scapular dyskinesia to achieve optimal outcomes with our shoulder patients.
- Treatment needs to start proximally with strengthening the core and ensuring there is no tightness interfering with normal scapulohumeral rhythm.
- Treatment then should progress to strengthening the scapular stabilizers and rotator cuff; followed by dynamic stabilization activities and slow return to sport.

Thank you

Josh Gerrity, OTR/L, CHT

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