

# Scapular Dyskinesia: Fact or Fiction?



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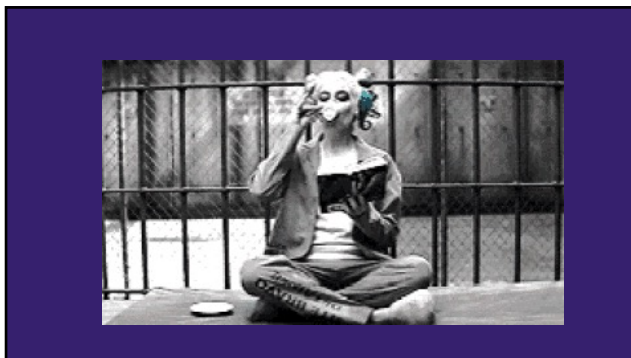
## Disclosures

*I have relevant financial relationships and arrangements with:*

- Structure & Function Education, PLLC
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- On Target Publications
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### LITERATURE REVIEW

**Clinical Implications**  
 Current measurement instruments aimed at assessing scapular dyskinesia should not be used, as they are prone to misinterpretation. Future research to establish a robust theoretical framework on how to interpret scapular movement in individuals with shoulder complaints is warranted.<sup>10,27</sup>

**CONCLUSION**  
 CLINICAL EXAMINATION OF SCAPULAR function is based on questionable evidence. Given the low quality of evidence for instruments measuring scapular posture and scapular movement and assessing scapular dyskinesia, it is not possible to recommend any specific measurement instrument. ⦿

**Recommendation**  
 Assessing Scapula and Dysfunction

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*This is the worst!*

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Phys Med Rehabil Clin N Am 34 (2023) 427–451

## Managing Scapular Dyskinesia

W. Ben Kibler, MD<sup>a</sup>, John William Lockhart, PT, PhD<sup>b</sup>, Robin Cromwell, PT<sup>b</sup>, Aaron Sciascia, PhD, ATC, PES, SMT-C, FNAP<sup>c,\*</sup>

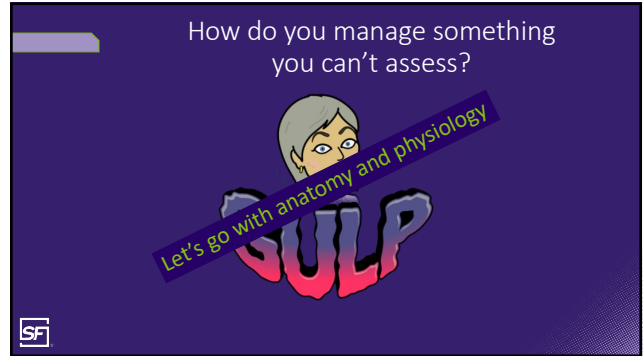
**NEW DEVELOPMENTS**

Although clinicians can become well trained at distinguishing between clinically significant and benign scapular dyskinesia,<sup>1,13</sup> the inherent flaw with observational analysis is the natural subjectivity of the assessment method. Multiple methods of quantitative analysis have been proposed but have not been found to be clinically useful due to lack of consistent reliability,<sup>100,109</sup> limitation of data to one scapular kinematic component,<sup>100</sup> large error of the data in relation to actual bone motion,<sup>100,110</sup> or inability to use the assessment method(s) in a clinical setting due to inconveniences of cost and set-up (bone pins, electromagnetic tracking, computed tomography scans).<sup>111–114</sup> As a result, even with the known limitations,<sup>10,110</sup> the visual observational method is still the most frequently selected by clinicians to identify the presence or absence of dyskinesia in the evaluation of the patient,<sup>115</sup> and to make generalized assessments of change during the treatment process. Precise and effective quantitative assessment of scapular motion in the clinical setting that encompasses all

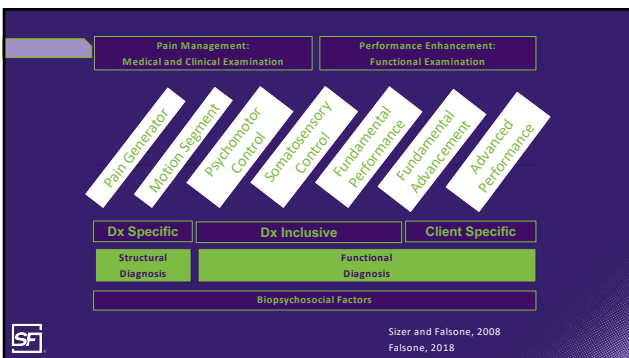
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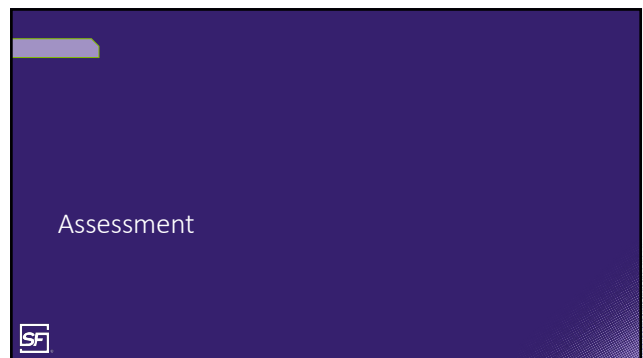
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### Causes

Pathoanatomical:

- Clavicle fracture
- Scapular body/ glenoid fracture
- AC joint injury
- GH joint internal derangement (labral injury, GH instability, biceps tendon injury, arthritis, adhesive capsulitis)
- Rotator cuff injury
- Post-traumatic scapular muscle injury
- Snapping scapula
- Neurologic injury (long thoracic nerve, spinal accessory nerve, dorsal scapular nerve, cervical radiculopathy)

Pathophysiological:

- Soft tissue tightness
- Pectoralis minor, upper trapezius, latissimus dorsi, biceps, posterior GH capsule, posterior shoulder muscles
- Muscle weakness, inhibition
- Serratus anterior-weak
- Lower trapezius-weak
- Altered activation
- Rotator cuff-impingement, weakness, imbalance
- Core weakness-seen in as many as 50% of cases of dyskinesia

Kibler et al, 2023

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### Associated Osteokinematics

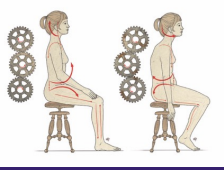
- The thoracic spine:
  - \*Acts like the lower cervical spine all the way down to T4
- Unilateral elevation of the arm = rotation down to T6
- Head rotation = rotation down to T4
- It's RELATIVE mobility and rigidity
  - \*Lower c-spine needs mobility
  - \*Upper t-spine needs stability
  - \*1<sup>st</sup> rib needs mobility with breath
  - \*2,3,4 ribs are stiffer for optimal shoulder mobility
  - \*Lower t-spine needs mobility
  - \*Lumbar spine needs stability

Cook and Boyle napkin discussion

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### Brugger's Cogwheel Diagram

- Favoring of the older system in static posture
- Can affect breathing
- Creates a nociceptive chain
  - Lewitt, The Journal of Orthopedic Medicine 21(1) 1999, 52-57



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### Apical Breathing at Rest

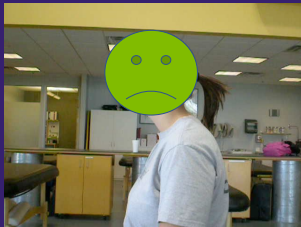
- Indicates an individual's inability to alternate between periods of work and rest
  - In a constant heightened state
- Increases at rest respiration rate
  - Increase the amount of carbon dioxide that is exhaled
    - Leading to an alkaline state
  - State of respiratory alkalosis makes red blood cells hold on to oxygen
    - This decreases amount of oxygen to brain and muscles
    - Results in changes in magnesium, potassium and calcium
    - This ALL interferes with muscle control, proprioception, postural balance, increased muscle tension and decreased motor control

Nelson, 2012

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### Apical Breathing at Rest



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### Inspiratory Position of the Chest



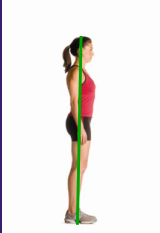

Kolar, 2008

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### "Ideal" Alignment

- Upright posture
- Co-activation of flexors and extensors
- Co-activation of adductors/abductors
- Co-activation of internal/external rotators

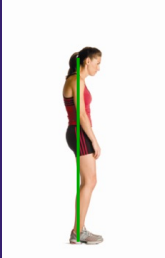

Lewitt, "Lessons for the Future", Internal Musculoskeletal Medicine, 30(3), 2008, 133-140.

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### Alignment

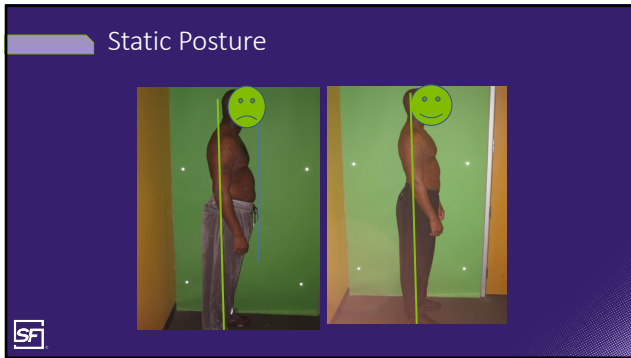
- Balance is disturbed in the body
- "Old system" takes over
- Occurs with injury, central nervous dysfunction, and even fatigue

Lewitt, "Lessons for the Future", Internal Musculoskeletal Medicine, 30(3), 2008, 133-140.

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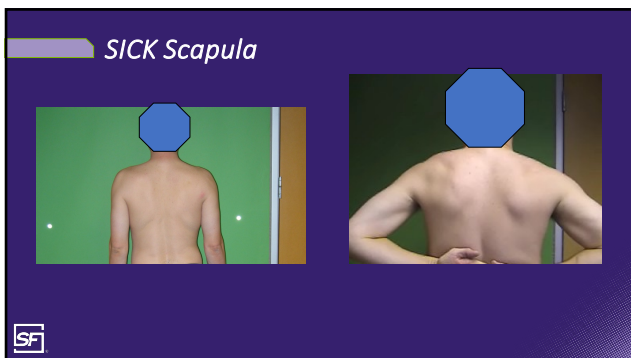
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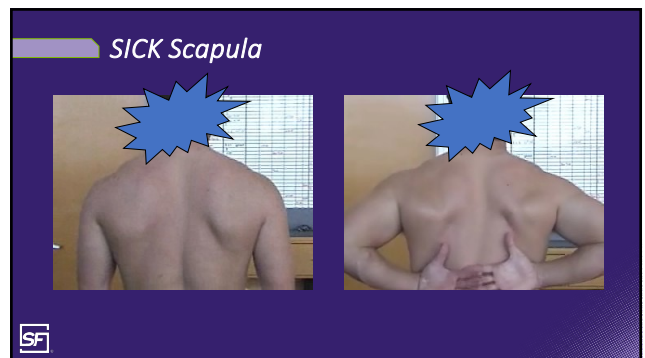
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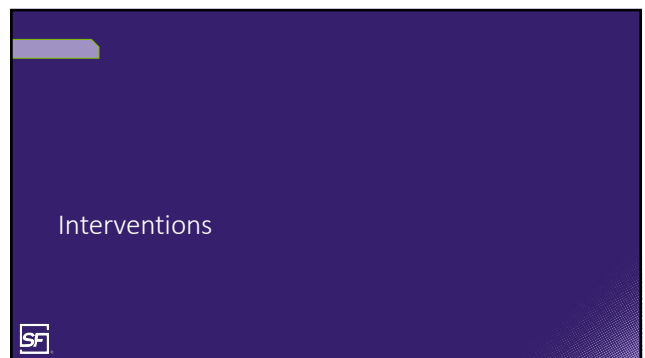
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### Types of Interventions

- Mobility and Flexibility
  - In the long term/ chronic situations
- Strength
- \*Motor Control

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### Thoracic Mobility




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### Brugger's UE Exercise



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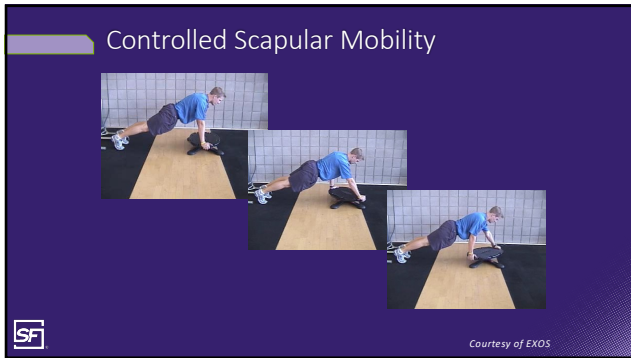
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### Controlled Scapular Mobility

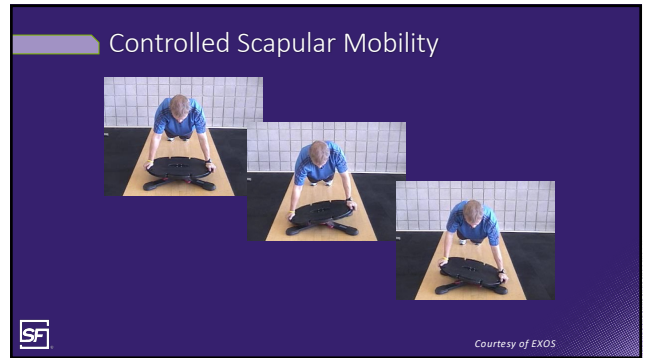


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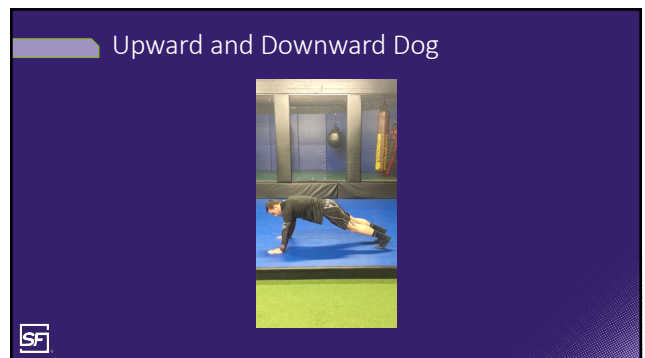
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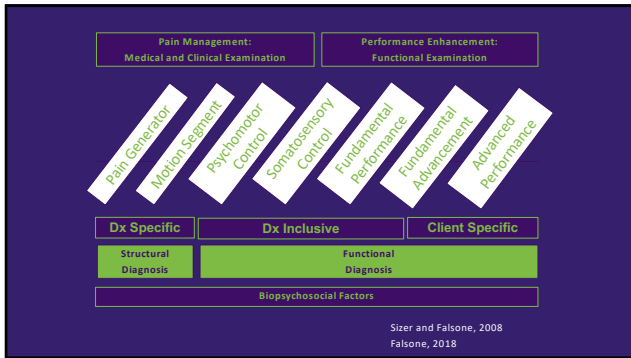
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### In Summary

**01**

Visual observation may be the most clinically relevant tool we have

**02**

Consider mobility, flexibility and strength needs, but most importantly, **MOTOR CONTROL**

**03**

Scapulothoracic care for the athlete needs to consider **MUCH** more than the scapula

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### STAY IN TOUCH!

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