

# Evaluation of Shoulder

## Scan Examination for Neuromuscular and Cervical Involvement

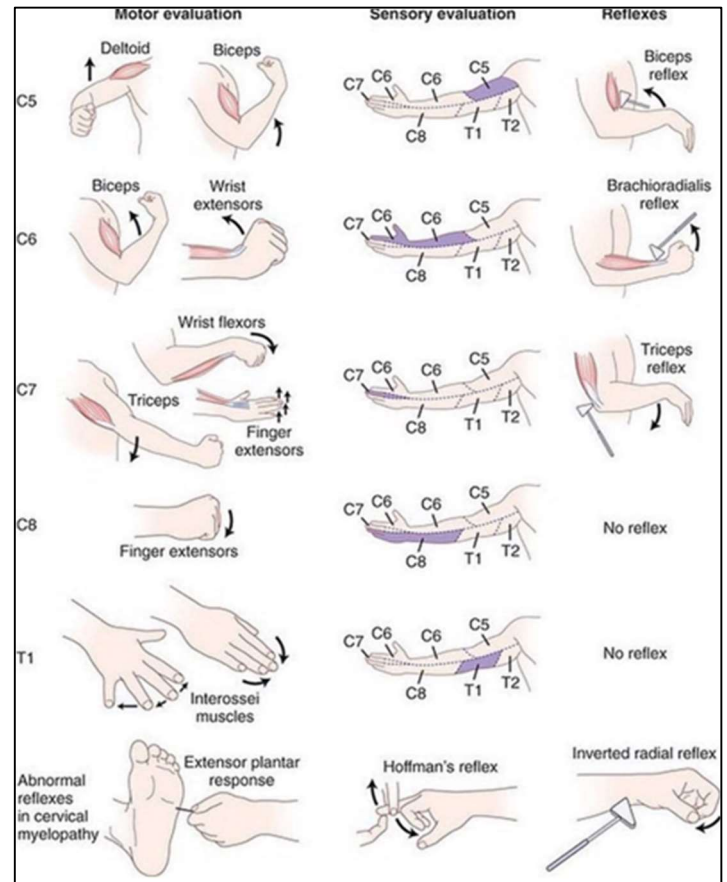
### Cervical Spine:

- Active, Passive & Resisted Ranges of Motion
  - Rotation
  - Side Bend/ Lateral Flexion
  - Flexion
  - Extension
- Compression
- Spurling's Maneuver – Referred pain down the arm to elbow
- Distraction

*Upper Motor Neuron Involvement (optional approach to complete neurological screen first)*

- Hoffman's Sign/Reflex
- Plantar Response for Babinski Reflex in supine
- Myoclonus in supine- 2 beats normal
- Slump test to evaluate Dural signs if suspicious of CNS involvement

- Sitting
- Hands behind the back, head flexed on neck, neck flexion, thoracic flexion, adducted hips, knee extended, & ankle dorsiflexed with toes extended. Discern a normal stretching sensation from abnormal symptom provocation.



## Shoulder Examination

### Three key categories

- 1) Sub-Acromial Pathologies: (tendinopathies): gradual onset typically but can be acute or chronic symptoms, pain with arm elevation or rotations, with or without noise, pain may or may not be localize to anterior lateral or posterior shoulder, sleeping on shoulder is disturbed. Occupation and recreational demands are important to understand [Rotator cuff tendinopathy, Rotator cuff tear, Biceps tendinopathy, Superior labral lesion]
- 2) Hypomobility: insidious onset, limits in reaching activity, particular positions increase pain, more activity aggravates, constant ache, sleeping can be disturbed. Secondary to traumatic event in Upper Extremity [Adhesive capsulitis]
- 3) Hypermobility: conditions: traumatic onset common or micro traumatic or gradual onset, pain minimal until extreme positions or activities are performed in sub-acute or chronic conditions, arm feels heavy or dead, uneasy feeling or apprehension with motions. [Anterior, Posterior, or MDI instability]

### Observation for postural abnormalities

1. Standing Posture: Neck and complete spine, work posture should be considered with insidious or chronic onset
2. Posterior view with scapula exposed
3. Scapular symmetry at rest and with motion should be noted (Obvious or severe scapular winging consider neurological involvement of cranial nerve 11 if severe downward rotation of scapula or long thoracic nerve palsy with severe medial border scapula winging)
4. Swollen and sunken areas visual and to touch for muscular wasting
5. Skin: scars, bumps, and growths

6. Standing single leg balance, single leg squat (core stability) key for overhead workers and throwing athletes

Active, Passive, & Resistive Testing: helps you discriminate hypomobility from subacromial pain

Motion and sequence: AROM, PROM, RROM watching from the rear

1. Flexion
2. Abduction
3. External Rotation
4. Internal Rotation

Interpretations:

- Limited AROM could be musculotendinous lesion or capsular tightness
- PROM evaluates capsular tightness by feeling for restriction at pain provocation. Little to no resistance suggest pain due to tendinopathy vs restricted motion due to stiffness is capsular restriction. Further confirm if motion is 50% of uninvolved side.
- RROM – can they hold arm in position likely rotator cuff is not completely torn, hold against resistance with reproduction of pain suggest tendinopathy of muscles you are testing. Inability to hold arm against gravity or light resistance suggest rotator cuff tear

## Specific muscle tests for RROM

Infraspinatus – actively or assist if need have the patient externally rotate arm at the side or with some abduction. Ask the patient to hold the arm in the position apply resistance toward internal rotation grade their strength and pain provocation. If the arm cannot be maintained and starts to return to starting position and reproduces severe pain this would be a positive lag sign\* for external rotation likely indicating the infraspinatus is torn.

During resistive testing observe the scapula to evaluate medial scapular border. If medial border becomes prominent from the thoracic, suggest either rhomboid or middle trapezius not functioning normally. This could be a neurological or muscular issue (Dorsal scapular & Cranial Nerve XI, common with patients with history of neck cancer)

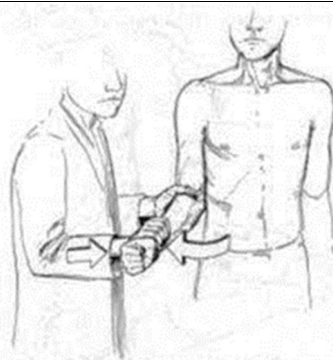


Fig. 61. Test for external rotation of the shoulder.

Supraspinatus – Actively or assist arm to 90° in the scapular plane (30° anterior to the frontal plane) Instruct the patient to point their thumb up (full can) some clinician use thumb down (empty can). Apply resistance in a downward direction just above or below the elbow to grade their strength and pain provocation. If unable to hold this position due to pain or weakness this would be considered a (+) drop arm sign



## Subscapularis Muscle Tests

1. The Lift off test in which the person with our without your assistance places the arm behind their back at their waist band level. You ask the patient to lift the arm away from the waist and ask them to hold their arm there. You can apply light resistance but if you apply heavy resistance you are testing the tricep and the posterior deltoid not the subscapularis. If the arm cannot be maintained (starts to drop) and reproduces severe pain this would be a positive Lift-off Sign\* indicating a rotator cuff tear most likely of the subscapularis.<sup>1</sup>

2. Belly Press test is performed by pressing the palm into their belly while keeping their elbow forward and not flexing the wrist. This test evaluates the muscle but not at extreme end range of motion. You apply resistance at the palm or wrist to determine if they can maintain this position without flexing the wrist or bringing their elbow back toward their side. Grade the resistance and determine if this provokes pain. If the patient does not maintain the position or painful symptoms increase you should suspect subscapularis tendinopathy. A severe response would suggest a subscapularis tear.

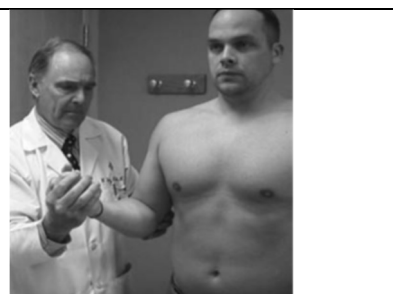


*Belly Press Test*

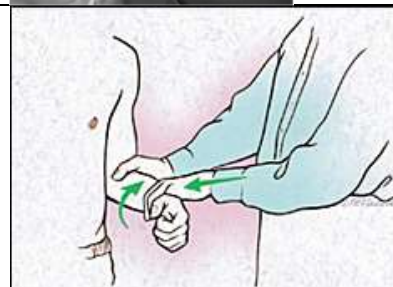
*Lift Off Test*

## Subacromial pain tests for Bicep Tendinopathy

1. Upper Cut Test – Patient is upright standing, elbow flexed to 90° and forearm supinated, with a full fist, Ask the patient to rapidly elevate arm like a boxer performing an upper cut. The examiner places hand over the fist and resists the motion as the hand comes up. (+) test if elicits pain or pop occurs in the painful shoulder. <sup>2</sup>






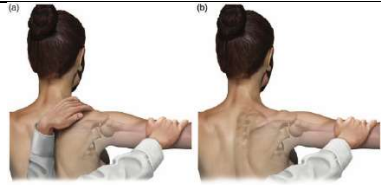
2. Yergason's Test – Patient is asked to flex elbow and supinate while the clinician resists both motions simultaneously. (+) test is pain in anterior shoulder in bicipital groove

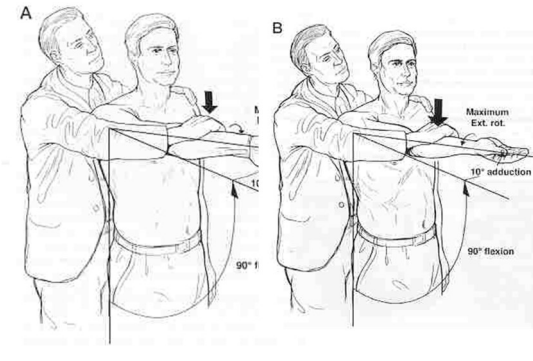


3. Speed's Test – Patient is upright with shoulder flexed to 60°, elbow extended, and palm up. The therapist ask the patient hold this position while the therapist applies and downward pressure. (+) test with pain in shoulder in bicipital groove.



Sensitive Tests are helpful to rule out impingement if Negative	Often positive in most shoulder pathologies
Hawkins-Kennedy Test – Passive internal rotation of humerus starting at 90° shoulder flexion at 90° (+) recreates pain.	
Neer Impingement Test – Passive elevation of internally rotated arm with scapula stabilized through full motion (+) recreates pain	

Test for Rehabilitation Focus on Scapular musculature in patients with RC tendinopathy	
Scapular Assistance is performed when a painful arc is (+) or when patient has pain during elevation. The therapist places their hand or thumb over the inferior angle of the scapula applying an anteriorly and laterally directed force to assist with scapular posterior tilt and upward rotation as the patient elevates their arm. (+) test is reduction in pain or increased motion prior to symptoms. <sup>3</sup> This test suggests that scapula movement or malposition may need to be addressed in managing this patient	
The Scapular Retraction Test helps <u>strength assessment</u> - has the therapist ask the patient to squeeze the shoulder blade together then the therapist assists by stabilizing the medial scapular border with the forearm and again resists shoulder elevation again. (+) if more strength. <sup>4,5</sup>	

Subacromial pain tests for SLAP Test	
<p>Active compression test by O'Brien - The involved arm was placed at 90° of forward flexion and 10° of horizontal adduction with the thumb pointed down (internal rotation).</p> <p>The examiner placed his hand over the patient's elbow and instructed the patient to isometrically resist downward pressure from the examiner and to denote any pain in the shoulder that may occur.</p> <p>The patient was then asked to externally rotate the arm to a palm-up position and asked again to resist a downward force applied by the examiner.</p> <p>(+) test if pain was located deep in the joint and was elicited in the internally rotated position and improved or eliminated in the externally rotated position.</p>	

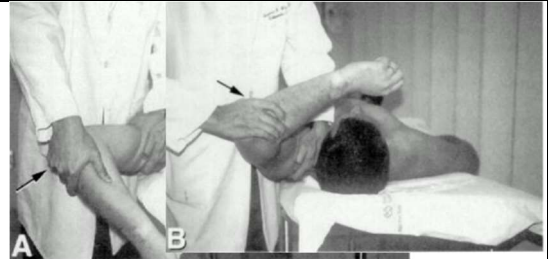
**Anterior Slide** - The patient was standing, and the hand of the involved arm was placed on the ipsilateral hip with the thumb pointing posteriorly. The examiner placed 1 hand on the glenohumeral joint line and placed the other hand on the elbow. The examiner applied an axial load in an anterosuperior direction from the elbow to the shoulder. (+) test was denoted by pain or a painful click on the anterior or posterior joint line.



**Dynamic Labral Shear Test** – The shoulder is passively elevated in the scapular plane by the examiner to 120°. The humerus is externally rotated and maximally horizontally abducted. The examiner then applies a shear load by maintaining these positions as the arm is adducted from 120 to 60°. (+) Test is by reproduction of pain or a painful click/catch around the joint line.



**Crank Test** – can be performed in sitting or supine, supine is more comfortable for the patient. Arm elevated 160°. Apply axial compression through the humerus with one hand and perform humeral IR and ER with the other hand. (+) Test is reproduction of symptoms, may have click during the maneuver or pain. <sup>6</sup>

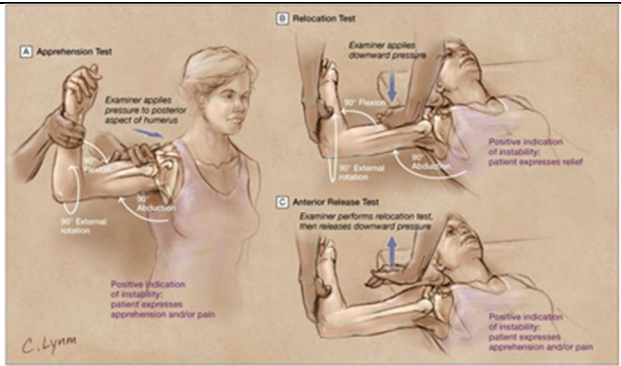

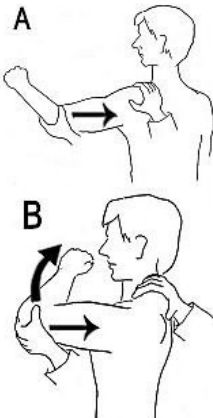
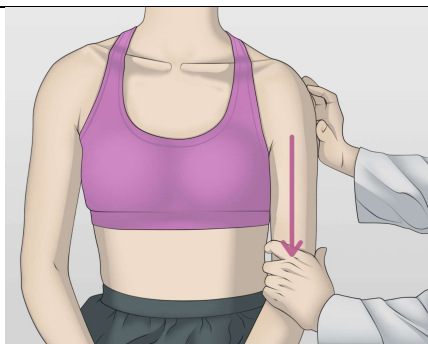


## Diagnostic Accuracy for Sub-Acromial pathologies

	<b>Tendinopathy</b>		<b>Cuff Tear</b>	
	<b>(+) LR</b>	<b>(-) LR</b>	<b>(+) LR</b>	<b>(-) LR</b>
Battery of three tests for cuff tear <sup>7</sup> -Drop Arm -Painful arc of motion -Weak external rotation			15.6	
Battery of test 3/5 positive indicates rotator cuff tendinopathy / impingement <sup>8</sup> -Painful arc -Neer -Hawkins-Kennedy -Jobe test -External Rotation weakness	2.9			
Belly-Press <sup>9</sup>			19.2	0.61
Lift off <sup>9</sup>			Infinity / No False (+)	0.82
<b>Biceps Tendon injury</b>				
Upper Cut <sup>2,10</sup>	3.4, 1.63	0.34, 0.62		
Yeargason's <sup>2,10</sup>	1.9, 2.2	0.74, 0.76		
Speed's <sup>2,10</sup>	2.8, 2.1	0.58, 0.55		

<b>SLAP lesions</b>		
	<b>(+) LR</b>	<b>(-) LR</b>
Crank Test <sup>6</sup>	Infinity	0.17
Dynamic Labral Shear Test <sup>2</sup>	31.6	0.29
Anterior Slide <sup>2</sup>	2.6	0.64
Anterior Compression <sup>2</sup>	3.8	0.47
Crank Test <sup>6</sup>	13.6	0.1
Cluster Tests for SLAP <sup>11</sup> History of Catching/Popping and Anterior Slide -included Active Compression, Crank test, history of trauma, & sudden onset	6.0	0.64



<p><b>Anterior Instability</b></p> <p>1) Apprehension test patient supine with arm at 90° and externally rotate to 90°. Test is positive if the patient reports symptoms of instability (Not Pain) as you approach end range of motion. You may note muscle guarding.</p> <p>2) Relocation test repeat Apprehension test with a posteriorly directed force on the anterior aspect of the humerus. Test is positive if sense of instability is reduced or more mobility is achieved before a sense of apprehension occurs.</p> <p>3) Surprise test is to remove the posteriorly directed force in the 90/90 position and symptoms of instability reoccur. Rarely need and reduces patient confidence. [Not Recommended or Necessary]</p>	 <p>The illustrations show three tests for anterior instability. The Apprehension Test (A) shows a patient supine with the arm at 90° flexion and 90° external rotation; the examiner applies pressure to the posterior aspect of the humerus. The Relocation Test (B) shows the same position but with the examiner applying a downward pressure on the anterior aspect of the humerus. The Anterior Release Test (C) shows the examiner performing the relocation test and then releasing the downward pressure. Positive indications of instability are noted for each test: patient expresses apprehension and/or pain for the Apprehension and Release tests, and patient expresses relief for the Relocation test.</p> <p>Source: Simel DL, Rennie D: The Rational Clinical Examination: Evidence-Based Clinical Diagnosis. <a href="http://www.jama-evidence.com">http://www.jama-evidence.com</a>. Copyright © American Medical Association. All rights reserved.</p>
<p><b>Posterior Instability</b></p> <p>Posterior Apprehension – Patient is supine, and the arm is brought into forward flexion by the examiner. Simultaneous apply a posterior force with horizontally adducting and internally rotating the arm. (+) Test would be patient apprehension to placing this arm in the position. You may appreciate and subluxation or click with this maneuver or during return toward starting position.</p>	 <p>A photograph showing a healthcare provider performing a posterior apprehension test on a patient lying supine. The provider is flexing the patient's arm forward while applying a posterior force.</p>
<p>Jerk Test: patient is sitting or supine arm in 90° abduction, elbow flexed, apply an axial load along the humerus and the examiner horizontally adducts the arm toward sternum. Positive test is pain or clunk of the humerus translating along the glenoid out of place. Reversing the movement, you will feel a reduction as the humeral head slides back in</p> <ul style="list-style-type: none"> <li>➤ (+) LR= 34.7</li> <li>➤ (-)LR = 0.27<sup>12</sup></li> </ul>	 <p>The illustrations show the Jerk Test in two positions. Position A shows the arm in 90° abduction and flexion, with an axial load applied. Position B shows the arm being horizontally adducted toward the sternum.</p>
<p><b>Multi-Directional Instability</b></p> <p>Sulcus Sign – Examiner has the patient relax and grasp hold of the elbow and pulls the humerus inferiorly while palpating with the other hand the displacement between the acromion and humeral head. This is a relative test to compare to the opposite side and is grade</p> <p>1+ = less than 1cm displacement  2+ = 1-2 cm displacement  3 = &gt;2cm displacement</p>	 <p>An illustration showing a patient in a seated position with the arm relaxed. The examiner is pulling the humerus inferiorly while palpating the displacement between the acromion and the humeral head.</p>

<p>Beighton Scale for Generalize Laxity scored for 9 points</p> <ol style="list-style-type: none"> <li>(1) Palms to the floor</li> <li>(2) Little finger MCP past 90° bilaterally</li> <li>(3) Thumb to forearm bilaterally</li> <li>(4) Elbows hyperextend &gt;10° bilaterally</li> <li>(5) Knees hyperextend &gt;10° bilaterally</li> <li>(6) A score of 5-6 for adults and children consider collagen disorder such as Ehler-Danlos Syndrome</li> </ol>	<p><b>Beighton Score (for hypermobility)</b> Score is out of 9 points. &gt;5/9 indicates hypermobility</p>
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## Hypomobility Assessment using Passive Accessory Motions

<b>Hypomobility Tests and Treatment compare to the opposite side</b>	
<p><b>Lateral Distraction:</b> With patient supine and glenohumeral joint placed in loose packed position, distraction can be completed by latera forces away from the glenoid while stabilize the torso with yourself.</p> <p>Enhance appreciation of this this distraction will occur if the scapula is stabilized by a belt or another person. This can be used with all directions of mobility assessments</p>	
<p><b>Caudal/Inferior Glide:</b> With patient in supine, the therapist controls the arm with one hand and positions the other hand superior to the humeral head. After first distracting, the glide is administered by shifting the therapist shifting body weight caudally (toward the patient's feet). This is often initiated at less than the full abduction position then increased.</p>	
<p><b>Dorsal/Posterior Glidel</b> With the patient in supine, the therapist stands between the patient's arm and trunk. A folded strap weight may offer better stabilization to the scapula. The therapist supports the patient's arm with one hand and arm while the therapist's mobilizing hand is placed on the humeral head. After minimal distracting, the translating or mobilizing force is applied dorsally and laterally to be consistent with the plane of the glenohumeral joint.</p>	



#### Anterior Glide:

With the patient in supine, the therapist stands or sits between the patient's arm and trunk. Scapula stabilized with weight posteriorly or towel and examiners hand anteriorly.

Patients arm is abducted and extended to a comfortable position then an anterior glide is provided while scapula is stabilized.



#### References

1. Bartsch M, Greiner S, Haas NP, Scheibel M. Diagnostic values of clinical tests for subscapularis lesions. *Knee Surgery, Sports Traumatology, Arthroscopy: Official Journal Of The ESSKA*. 2010;18(12):1712-1717.  
<http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=20376624&site=ehost-live&scope=site>.
2. Kibler WB, Sciascia AD, Hester P, Dome D, Jacobs C. Clinical utility of traditional and new tests in the diagnosis of biceps tendon injuries and superior labrum anterior and posterior lesions in the shoulder. *Am J Sports Med*. 2009;37(9):1840-1847.0363546509332505 [pii]  
10.1177/0363546509332505
3. Kibler WB, McMullen J. Scapular dyskinesis and its relation to shoulder pain. *Journal of American Academy of Orthopaedic Surgeons*. 2003;11:142-151.
4. Kibler WB. Scapular involvement in impingement: signs and symptoms. *Instr Course Lect*. 2006;55:35-43.  
[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list\\_uids=16958437](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=16958437)
5. Kibler WB, Sciascia A, Dome D. Evaluation of apparent and absolute supraspinatus strength in patients with shoulder injury using the scapular retraction test. *Am J Sports Med*. 2006;34(10):1643-1647.  
[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list\\_uids=16735587](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=16735587)
6. Liu SH, Henry MH, Nuccion SL. A prospective evaluation of a new physical examination in predicting glenoid labral tears. *The American Journal of Sports Medicine*. 1996;24(6):721-725.
7. Park HB, Yokota A, Gill HS, El Rassi G, McFarland EG. Diagnostic accuracy of clinical tests for the different degrees of subacromial impingement syndrome. *J Bone Joint Surg Am*. 2005;87(7):1446-1455.87/7/1446 [pii]  
10.2106/JBJS.D.02335
8. Michener LA, Walsworth MK, Doukas WC, Murphy KP. Reliability and diagnostic accuracy of 5 physical examination tests and combination of tests for subacromial impingement. *Arch Phys Med Rehabil*. 2009;90(11):1898-1903.S0003-9993(09)00456-0 [pii]  
10.1016/j.apmr.2009.05.015
9. Barth JR, Burkhart SS, De Beer JF. The bear-hug test: a new and sensitive test for diagnosing a subscapularis tear. *Arthroscopy*. 2006;22(10):1076-1084.10.1016/j.arthro.2006.05.005
10. Cardoso A, Amaro P, Barbosa L, Coelho AM, Alonso R, Pires L. Diagnostic accuracy of clinical tests directed to the long head of biceps tendon in a surgical population: a combination of old and new tests. *J Shoulder Elbow Surg*. 2019;28(12):2272-2278.10.1016/j.jse.2019.07.007
11. Michener LA, Doukas WC, Murphy KP, Walsworth MK. Diagnostic accuracy of history and physical examination of superior labrum anterior- posterior lesions. *J Athl Train*. 2011;46(4):343-348. <http://www.ncbi.nlm.nih.gov/pubmed/21944065>. Published 2011/09/29.
12. Kim SH, Park JS, Jeong WK, Shin SK. The Kim test: a novel test for posteroinferior labral lesion of the shoulder--a comparison to the jerk test. *Am J Sports Med*. 2005;33(8):1188-1192.  
[http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list\\_uids=16000664](http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=16000664)