

Supplement A. Methods Commonly Utilized Clinically to Assess Scapular Dyskinesis

Scapular Dyskinesis Test (SDT)

This test initially described and evaluated by McClure et al¹ involves individuals performing five repetitions of weighted bilateral shoulder flexion and abduction each. The weight being raised is determined by body mass, 3-pound weights are utilized for individuals under 150 pounds and 5-pound weights are utilized for those weighing 150 pounds or over. Examiners then rate if both the flexion and abduction movements contain normal motion, subtle abnormality or obvious abnormality. Operational definitions for normal scapulohumeral rhythm and scapular dyskinesis are also supplied by McClure et al in this study. The final determination of the rating is made by combining both the flexion and abduction motion and are as follows:

Normal – either both motions are normal or one is normal and the other has subtle abnormalities.

Subtle abnormality – both motions are rated as subtle abnormalities.

Obvious abnormality – one of the motions is rated as having an obvious abnormality.



Lateral Scapular Slide Test (LSST)

Three measurements are taken bilaterally for this test. The first measurement (A) is taken with the hands resting at the side, the second (B) with the hands on the hips, and the third (C) with the arms out to the side at or just below 90 degrees of abduction with full glenohumeral joint internal rotation. For each position a measurement is taken from the nearest spinous process to the medial border of the scapula on both sides. According to Kibler et al² a difference of 1.5 centimeters from side to side in any of the positions is the threshold for scapular abnormality.



SICK Scapula (Scapular malposition + Inferior medial border prominence + Coracoid pain and malposition + dysKinesis of scapular movement)

This test is based on static visual observation of various parts of the scapula and determined to be either type I, type II, or type III. The determination is described as follows by Burkhart et al³

Type I – inferior medial scapular border prominence

Type II – medial scapular border prominence

Type III – superior medial border prominence

*This test has been modified several times to include dynamic movement assessment using the above types as well as the addition of Type IV to indicate a “normal” scapula



Visual Observation (yes/no)

This test relies on visual observation and a single determinate of yes scapular dyskinesis exists or no it does not. As describe by Uhl et al⁴ this determination is made following 3 to 5 movements of arm elevation in both the scapular and sagittal planes. The method of determining yes or no has been adopted and studied by many including those that originally proposed methods described above.



References

1. McClure P, Tate AR, Kareha S, Irwin D, Zlupko E. A clinical method for identifying scapular dyskinesis, part 1: reliability. *J Athl Train*. Mar-Apr 2009;44(2):160-4. doi:10.4085/1062-6050-44.2.160
2. Kibler WB. The role of the scapula in athletic shoulder function. *Am J Sports Med*. Mar-Apr 1998;26(2):325-37. doi:10.1177/03635465980260022801
3. Burkhart SS, Morgan CD, Kibler WB. The disabled throwing shoulder: spectrum of pathology Part III: The SICK scapula, scapular dyskinesis, the kinetic chain, and rehabilitation. *Arthroscopy*. Jul-Aug 2003;19(6):641-61. doi:10.1016/s0749-8063(03)00389-x
4. Uhl TL, Kibler WB, Gecewich B, Tripp BL. Evaluation of clinical assessment methods for scapular dyskinesis. *Arthroscopy*. Nov 2009;25(11):1240-8. doi:10.1016/j.arthro.2009.06.007