



Physician Update

Shoulder Impingement – Differential Diagnosis

Utilizing Peer Reviewed Research and Evidence-Based Practice to Maximize Outcomes for patients suffering with shoulder impingement syndrome.

Patients often come to our office with shoulder pain. They may have had an injury and had a gradual onset of pain in the shoulder or upper arm that isn't going away on its own. They may also start to notice weakness. Shoulder impingement syndrome is a common cause of pain around the shoulder joint. Patients may have rotator cuff tendinopathy and/or subacromial bursitis. If they have further symptoms or paresthesias into the arm we will assess the cervical spine as well.

Evaluation:

At Christine F. Hayes, PT, PC our comprehensive evaluations include: history of the injury, strength, ROM and Special Testing. Common findings include painful abduction (often with a painful arc of motion overhead), pain with horizontal adduction and/or IR up the back. Limited AROM in the early stages of impingement is also common; chronic impingement may demonstrate limited PROM and capsular restrictions from painful avoidance. As part of our differential diagnosis, we screen the neck using Wainner's Clinical Prediction rule of: cervical Distraction Test, Spurling's test, cervical ROM less than 60° and Upper Limb Tension Test to test for cervical radiculopathy. Thoracic Outlet Testing is also done in combination with nerve tension tests when patients report paresthesias into the arm. Special tests are an important part of the evaluation. Evaluation of the current evidence and using the most effective tests will help form a diagnosis with the best use of time.

Using the Evidence:

A study in the Journal of Bone and Joint Surgery by Park et al reviewed [Special Tests in diagnosing three different shoulder problems](#):

- Bursitis *without* rotator cuff tear
- Partial thickness rotator cuff tear
- Full thickness rotator cuff tear



Hawkins-Kennedy Sign
90 degrees of flexion + IR
with pain



Neer Sign
Flexion OV with pain
typically end-range



Infrapinatus Muscle Test
Elbow 90, Adducted arm +
resisted ER with pain

In this study patients were tested prior to surgery with the following tests: **Hawkins-Kennedy Sign, Neer Sign, Painful Arc Sign, Speed test, Cross Body Adduction Test, Drop Arm Test and Infrapinatus Muscle Test.** Several tests are pictured above. The study definition of painful arc was complaint of pain or painful catching between 60° and 120° of elevation in the scapular plane. In the cross body adduction test, the arm was placed in 90° of flexion and was adducted across the body by the examiner and was positive if painful. Patients then underwent shoulder arthroscopy which confirmed the diagnosis.

The patients were divided into an impingement group and a non-impingement group. There were 359 patients in the impingement group. Patients in this group had a history of pain in the deltoid region or radiating down the arm and had temporary relief of pain after a subacromial injection.

These 359 patients were further divided according to severity:

- Group 1 included patients who were thought to have subacromial impingement only.
- Group 2 were diagnosed with partial rotator cuff tears
- Group 3 had full thickness tears

For patients in all groups the **PAINFUL ARC TEST** was the most sensitive test at 73.5% and had the highest negative predictive value. This shows it is good for ruling out the diagnosis. **The INFRASPINATUS MUSCLE TEST** was the most specific at 90.1% and had the highest positive predictive value at 90.6% for any rotator cuff disease. This is a good test for ruling in the diagnosis.

For patients in group 1 with impingement due to bursitis or tendonitis but no rotator cuff tears; both the Neer and Hawkins-Kennedy impingement signs were highly sensitive at 75.4%. The Neer sign had the highest positive and highest negative predictive values. The cross body adduction test was the most specific at 78.5%.

After further analysis, a group of tests was found to be more effective than any single test. If the HAWKINS-KENNEDY IM-PINGEMENT SIGN, the PAINFUL ARC SIGN and the INFRASPINATUS MUSCLE TEST were all positive, the likelihood ratio was 10.56. A patient who tested positive on all three tests had a >95% chance of having impingement syndrome. A patient who tested negative on all three tests had a <24% chance of having impingement syndrome.

Reference: Park, Yokota, Gill, Rassi, McFarland. Diagnostic Accuracy of Clinical Tests for the Different Degrees of Subacromial Impingement Syndrome. J Bone and Joint Surgery. 2005;87A:1446-1455

Treatment: Once shoulder impingement is confirmed, our PT practice implements a great deal of manual therapy to create more space under the acromion to improve both caudal and posterior humeral translation to assist in clearing the impingement. Capsular restrictions are addressed with myofascial release, active release, soft tissue and joint mobilization. Additional mobilization of the scapula and thoracic vertebrae is also a key element to improve motion of the shoulder joint complex. Our strengthening program begins with the foundation muscles of the scapulothoracic joint for stability proceeding to defined weaknesses in the rotator cuff and patterns of movement. Each patient will receive individualized treatment taking into consideration their strength, weaknesses, posture and functional needs.

Patients will also receive a **FUNCTIONAL MOVEMENT ASSESSMENT** to highlight other areas of the body which may be moving inefficiently and causing either direct or indirect stress to the shoulder. At Christine F. Hayes, PT, PC we believe that “no injury exists in an isolated vacuum” therefore a holistic approach will address other faulty areas in addition to the shoulder.

Success Story: “Before starting PT I was not using my left arm much. Within 2 weeks I was amazed by how much I was progressing! This of course gave me the incentive to continue and be diligent with my exercises at home. My abilities to reach and use my left arm increased each week once I started using small weights. I feel I was instructed to do exercises that will be with me for life and I am very grateful for this. My greatest improvements have been in using my arm to reach behind my back and to dress. Most importantly, I was able to avoid surgery!! Finally the staff is excellent, knowledgeable and professional and were a pleasure to be around. I won’t hesitate to recommend them to anyone in need of their many services.
“-----Sue Holton

Our Commitment to your Patients:

- 1. Continuity of Care.....we encourage patients to schedule follow-up treatments with the same PT and PTA each visit!***
- 2. No waiting room wait greater than 5 minutes....we value your patient’s time as much as we value our own.***
- 3. Complimentary theraband for all first visits.***
- 4. The very best hands-on care and corrective exercise for inefficient movement patterns for complete rehabilitation and injury prevention.***

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