Rotator Cuff Tendonitis\textsuperscript{1,2}

**Narrative Section**

**HISTORICAL VIGNETTE** - During the in-person physical exam, a trio of combined clinical findings has great accuracy and significance in predicting rotator cuff problems. In isolation, these abnormal findings only hint at the underlying pathology behind an aching shoulder. But together, given the proper clinical scenario, the likelihood ratio exceeds that of an ST-elevation on ECG to predict a myocardial infarction. Does the physical exam with a provider-directed patient self exam provide similar diagnostic benefit? Probably so.

To help remember the key findings, imagine instructing someone to put on a long-sleeve shirt. The motions used for sliding the arm into the sleeve, positioning the cuff, and tucking in the shirt-tail mimic the motions used to assess the shoulder. Soreness in these movements points towards a tendonitis. Inability to perform them points toward a tear or frozen shoulder. For the aware clinician, directing the patient to perform a self-exam during a telemedicine visit, recognizing and interpreting these collective signs can be the difference between referring to a physical therapist—or a surgeon.

**CONTEXT AND USEFULNESS** - In 2012, Murrell\textsuperscript{2} established the benefit of these clinical maneuvers when he published his series of 400 consecutive patients with shoulder pain. Properly interpreting the exam maneuvers involves suspecting a torn rotator cuff (pre-test probability) then using the proper exam technique to increase or decrease the likelihood of that condition being present. But it starts with a clinical suspicion.


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**Physical Manuever**

**Model Proper (And Improper) Technique**\textsuperscript{3} - Confirming a safe environment for a telemedicine visit, ask the patient to modestly expose the shoulders. Look for for muscle atrophy. Next, bilaterally assess range of motion by lifting arms laterally (assessing painful arc) and flexing arms forward from waist to ears (the “touchdown sign” of American football). Then, have the patient cross arms in full abduction (“self hug”) and fully internally rotate (like tucking in a shirt-tail). Finally, assess external rotation (scratch the upper back). Check next for impingement in two ways: the Hawkins's sign positions the elbow out and thumb down on the affected side (like sliding the arm into the sleeve), checking for pain; the Neer’s sign extends the arm on the affected side, thumb down (“like stretching an arm through a sleeve”), then places the opposite hand on the affected shoulder to press down, lifting the outstretched arm against resistance. Proceed to check for weakness or tenderness of the supraspinatus (pretend to pour out two cans with outstretched arms and then lift up arms); of the infraspinatus (pin elbows to the side, hold, then press out hands); and of the subscapularis (again, the tucking in the shirt, now assessing strength).

**INTERPRETATION** - Alone, none of these three tests (supraspinatus atrophy or weakness; a positive impingement test; or infraspinatus weakness) strongly increases suspicion of rotator cuff tear. But when the three signs are present simultaneously (weakness, impingement), the likelihood ratio shoots up to a LR = 48. Conversely, their collective absence gives a LR = 0.02, suggesting tendonitis rather than tear.

**CAVEAT AND COMMON ERRORS** - Co-morbid shoulder pathology (instability, adhesive capsulitis, osteoarthritis) may limit successful execution of the exam maneuvers. The age of the patient with shoulder pain has its own predictive value —less than 40 makes a tear less likely while older than 60 makes a tear more likely—and must be considered.

Special thanks to Dr. Maja Artandi for assisting with this 5M2. Find out more with this video: