

Rotator Cuff Tear^{1,2}

Narrative Section

HISTORICAL VIGNETTE - Perhaps no trio of combined abnormal findings has greater predictive accuracy, and greater clinical significance, than the exam findings of a rotator cuff tear. 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 to predict a myocardial infarction. It's like sitting in the center seat of an airplane on a long flight. The discomfort of reaching cross-chest for a drink (supraspinatus), above your head to turn on the light (impingement), or pressing out your arms to read a newspaper (infraspinatus) is each an annoyance; but in combination, the three maneuvers can highlight the pinch of your situation. So it is with the pinch of a torn rotator cuff. For the aware clinician, recognizing and interpreting these collective signs can be the difference between referring to a physical therapist—or a surgeon.



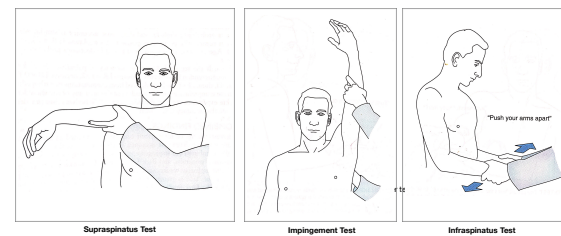
CONTEXT AND USEFULNESS - In 2012, Murell² established the benefit of these clinical maneuvers when he published his series of 400 consecutive patients with shoulder pain. Properly interpreting the exam maneuvers involves suspecting a torn rotator cuff (pre-test probability) then using the proper exam technique to increase or decrease the likelihood of that condition being present. But it starts with a clinical suspicion.

¹ Chi J *et. al.* "The Five Minute Moment." *Am J Med.* 2016 Aug; 129 (8): 792-795.

² Walton and Murrell. "Clinical Tests Diagnostic for Rotator Cuff Tear." *Techniques in Shoulder and Elbow Surgery.* 13 (1): 2012.

Physical Maneuver

Model Proper (And Improper) Technique³ - With the patient modestly covered but the shoulders exposed, examine for muscle atrophy. Next, test the **supraspinatus muscle** by asking the patient to reach across the chest (adduction) with a straight arm, thumb down—as if back-handing a drink from the flight attendant. Upward resistance of the arm in this position tests for tenderness and weakness. Then, check for **impingement**. The *Neer's sign* places the fossa of the elbow *near the ear* as the arm is lifted up (as if turning on the plane seat-light). The key is for the clinician to push against the ipsilateral scapula while raising the arm into position, thereby pinching the humerus against the acromion. (Pain suggests impingement, but not its cause.) Finally, test the **infraspinatus** muscle by having the patient, with elbows pressed against the axilla and flexed (as if pinned by armrests), press outward as if opening a newspaper.



INTERPRETATION - Alone, none of these three tests strongly moves the needle of suspicion toward a diagnosis of rotator cuff tear: supraspinatus atrophy (LR=2.0) and weakness (LR=2.0); a positive Neer's impingement (LR=1.7); and infraspinatus weakness (LR=2.6) each hint at a problem. 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 weighed in clinical calculations.

³ McGee, Steven. *Evidence-Based Physical Diagnosis, 4th ed.* Philadelphia, PA: Elsevier; 2018.

The Five Minute Moment