Smith TO, Back T, et al. Diagnostic accuracy of ultrasound for rotator cuff tears in adults: A systematic review and meta-analysis. Clinical Radiology 2011;66:1036-1048.

Design: meta-analysis of studies of diagnostic test accuracy

Study question: what is the diagnostic accuracy of ultrasound for the detection of full and partial thickness rotator cuff tears?

Reasons not to cite as evidence:

- Lenza 2013 is a stronger study due to several factors
    - Lenza excluded a number of studies which were included in this meta-analysis for reasons that are relevant to the topic; Lenza excluded studies in which things like arthrography were the reference standard; Smith 2011 includes them
    - In Lenza, the summary ROC curves include a point which represents the summary sensitivity and specificity estimates for the combined studies, which are not apparent in Smith 2011
- Some implausible and unexplained estimates undermine the main conclusion that ultrasound is a good diagnostic tool for rotator cuff tears
    - An analysis of transducer frequency is presented in which the diagnostic accuracy of 7.5 MHz and 10 MHz transducers are compared
    - For partial tears, the pooled sensitivity of the 7.5 MHz transducer is reported as 0.90 but the specificity is only 0.10 (95% confidence interval from 0.08 to 0.12)
        - This abysmal specificity reduces the likelihood ratio for a positive test to exactly 1.0, making it a perfectly uninformative test
    - Similarly, for full thickness tears, the sensitivity is 0.94 but the specificity is 0.06; again, the positive likelihood ratio is a perfectly uninformative 1.0
- The results of Lenza 2013 are more useful and are better reported than Smith 2011

Reference

Lenza M, Buchbinder R, et al. Magnetic resonance imaging, magnetic resonance arthrography and ultrasonography for assessing rotator cuff tears in people with shoulder pain for whom surgery is being considered. Cochrane Database of Systematic Reviews 2013, Issue 9. Art # CD009020