



# Management of full-thickness rotator cuff tears: appropriate use criteria



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**Background:** The appropriate use criteria (AUC) were developed for full-thickness rotator cuff tears to determine when it is reasonable to recommend nonoperative care, partial repair/débridement, repair, reconstruction, or arthroplasty. The goal of this report was to interpret and summarize the results of the AUC process into clinically relevant terms.

**Methods:** Using the results of the AUC methodology, we systematically interpreted the clinical importance attributed to the various patient and pathologic variables. We then assessed the combination of considerations that would justify the various treatment options using “preference tables.”

**Results:** A nonoperative program was *appropriate* if the patient had a positive response to conservative care. However, a repair could be *maybe appropriate* was also accepted. Rotator cuff repair was *appropriate* when conservative treatment failed in symptomatic patients. Reconstructive measures were recognized primarily in those with chronic massive tears. Most found arthroplasty *maybe appropriate* only in healthy patients, pseudoparalysis, and chronic massive tears. Surprisingly, neither factors that decreased healing nor adversely affected outcome had a strong influence on the panel’s treatment recommendations.

**Conclusions:** The AUC process accounts for clinical experience and considers individual patient and pathologic characteristics of the condition. Overall, the outcome of this exercise does support the current practice for the management of rotator cuff tears (ie, repair of symptomatic tears). However, the minimal importance given to patient and pathologic considerations, well documented to influence outcome, prompts an ongoing effort to refine this important and clinically relevant process.

**Level of evidence:** Level V, Expert Opinion, Summary of Consensus-Based Criteria.

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**Keywords:** Appropriate use criteria; rotator cuff; full thickness rotator cuff tears; nonoperative care rotator cuff; partial repair/débridement; rotator cuff repair; arthroplasty

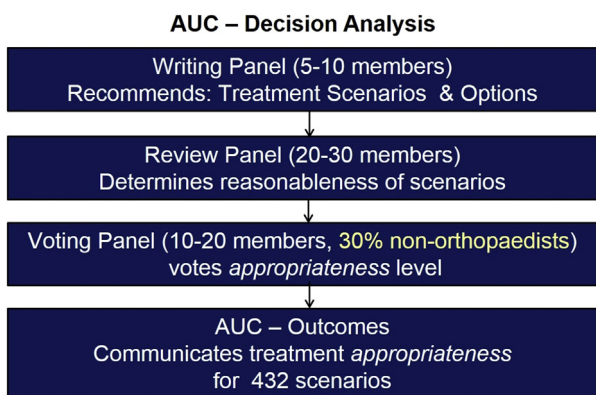
The American Academy of Orthopaedic Surgeons (AAOS) has promoted evidence-based medicine by sponsoring the clinical practice guideline (CPG) and appropriate

Investigational Review Board approval was not applicable to this study.

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use criteria (AUC) for the treatment of full-thickness rotator cuff tears. The CPG on Optimizing the Management of Rotator Cuff Problems consists of multiple systematic reviews of the available literature designed to rate the level of evidence supporting specific disease statements, where preference is given to higher-quality studies.<sup>41</sup> The CPG is designed to define what treatment the literature supports. The AUC is an established decision analysis that uses the same literature used during the CPG, but in addition



**Figure 1** The appropriate use criteria (AUC) process/methodology is a decision analysis that uses 3 panels (writing, review, and voting) to make treatment appropriateness decisions.<sup>9</sup>

**Table I** Patient factors considered by the appropriate use criteria<sup>36</sup>

Response to conservative treatment
Yes or No
Symptom severity
Mild: work, some pain
Moderate: work, requires restrictions
Severe: pseudoparalysis
ASA status
1: Normal, healthy
2: Mild systemic disease
3: Severe systemic disease
Adverse healing factors
Smoking
Poorly controlled diabetes
History of infection
Use of immunosuppressive medications
Advanced age
Adverse patient factors
Psychiatric disorder
Litigation
Worker's compensation
Substance abuse

ASA, American Society of Anesthesiologists Physical Status Classification.

considers clinical experience and patient and disease factors to arrive at the “appropriateness” level of a given intervention for a specific clinical scenario.<sup>36</sup> The AUC determines when a treatment is indicated.

The CPG concluded that the strength of recommendation for repair of symptomatic full-thickness tears was “weak,” because of the lack of supporting high-quality studies.<sup>41</sup> One major reason for this deficiency partly relates to the ethical and practical difficulty of designing and conducting research that includes randomizing surgical decisions and blinding caregivers in prospective investigations.<sup>25,49</sup> Specifically, the CPG methodology is

**Table II** Disease factors considered by the appropriate use criteria<sup>36</sup>

Size of tear
C1: small complete
C2: moderate (<2 cm)
C3: large (3-4 cm)
C4: massive (≥2 tendons, retracted and scarred)
Chronicity of tear (atrophy/fatty infiltration)
G0-2: acute pathology
G 3-4: chronic pathology

**Table III** Treatment options and appropriateness rating<sup>36</sup>

Treatment options
Nonoperative management
Débridement/partial repair
Repair (open or arthroscopic)
Reconstruction (muscle transfer or processed tissue)
Arthroplasty (hemi or reverse shoulder)
Appropriateness of treatment
<i>Appropriate</i> : benefits outweigh risks
<i>Maybe appropriate</i> : benefits equal risks
<i>Rarely appropriate</i> : risks outweigh benefit

designed to limit the effect of expert opinion, which in some surgical and even nonsurgical settings may be the highest quality input in the decision-making process.<sup>21,25,40,43</sup> The AUC embraces expert opinion and can find a treatment in certain scenarios efficacious even without support of high-level evidence.

Details of the AUC process as applied to rotator cuff management have been recently published.<sup>36,39</sup> The methodology is reviewed in Figure 1. Briefly, combinations of patient and disease factors (Tables I and II) were considered in determining the appropriateness of 5 different treatment possibilities (Table III). This combination of different patient and disease factors and treatment options yielded 432 unique clinical scenarios ([www.aaos.org/aucapp](http://www.aaos.org/aucapp)).<sup>36,39</sup>

Finally, the level of “appropriateness” was stratified into three groups: (1) *appropriate*: benefits outweigh risks, (2) *maybe appropriate*: benefits equal risks, and (3) *rarely appropriate*: risks outweigh benefits (Table III).<sup>36</sup> The voting panel (70% orthopedists and 30% nonorthopedists) then attributed a level of appropriateness for a given treatment to each patient scenario. Each panel member opined his or her appropriateness level based on the specific features of the given scenario.<sup>9,36</sup>

Despite the tremendous amount of input used and data collected during the AUC process, it stops short of placing the findings in the context of current practice. Our goal was therefore to generalize the AUC’s detailed results into clinically relevant terms. In doing so, we also were able to offer a critique of the AUC process. To the best of our knowledge, neither of these goals has been addressed in any of the prior AAOS AUC efforts.

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