



# Evaluation of American Academy of Orthopaedic Surgeons Appropriate Use Criteria for the management of full-thickness rotator cuff tears



James B. Cowan, MD<sup>a</sup>, Asheesh Bedi, MD<sup>a</sup>, James E. Carpenter, MD<sup>a</sup>,  
Christopher B. Robbins, PhD<sup>a</sup>, Joel J. Gagnier, ND, MSc, PhD<sup>a,b</sup>,  
Bruce S. Miller, MD, MS<sup>a,\*</sup>

<sup>a</sup>Department of Orthopaedic Surgery, University of Michigan, Ann Arbor, MI, USA

<sup>b</sup>Department of Epidemiology, University of Michigan, Ann Arbor, MI, USA

**Background:** The American Academy of Orthopaedic Surgeons (AAOS) recently released Appropriate Use Criteria (AUC) to aid in determining the appropriateness of treatment options. This study compares AAOS AUC recommendations with a cohort of patients treated for known full-thickness rotator cuff tears (RCTs).

**Methods:** Prospectively collected demographic information, treatment allocation, and American Shoulder and Elbow Surgeons (ASES) shoulder and Western Ontario Rotator Cuff Index scores of 134 patients were retrospectively reviewed. Other criteria required by the AAOS AUC were collected by retrospective record review. Criteria were entered into the AAOS AUC Web-based application to rate the “appropriateness” of treatment options. Ratings were compared with actual treatments and outcomes at 32- or 48-week follow-up.

**Results:** There was excellent agreement between the AUC recommendations and the actual treatment administered ( $\kappa = .945$ ; 95% confidence interval, 0.892–1.000;  $P < .0001$ ). The administered treatment was “appropriate” for 79% of patients, “may be appropriate” for 19%, and “rarely appropriate” for 2%. Response to previous treatment ( $P < .0001$ ), American Society of Anesthesiologists Physical Status Classification ( $P < .0001$ ), and presence of muscle atrophy or fatty infiltration ( $P = .047$ ) were the only variables that significantly and independently predicted discordance between treatment and the AUC recommendation. In the cases ( $n = 3$ ) of discordance, the American Shoulder and Elbow Surgeons score improved significantly more ( $P = .049$ ) than when there was agreement.

**Conclusions:** Improved clinical outcomes may be achieved for full-thickness RCTs when AAOS AUC recommendations are followed; however, because improved clinical outcomes may also be achieved when the recommendations are not followed, further investigation is needed in a population of patients in whom there is discordance between AAOS AUC recommendations and the treatment administered.

**Level of evidence:** Basic Science Study; Development or Validation of Outcomes Instrument/Classification System/Clinical Pathway

© 2016 Journal of Shoulder and Elbow Surgery Board of Trustees. All rights reserved.

**Keywords:** rotator cuff tear; AAOS; Appropriate Use Criteria; shoulder; discordance; treatment consensus

The University of Michigan Institutional Review Board approved the study and exempted the study from ongoing review (Study ID HUM00088409).

\*Reprint requests: Bruce S. Miller, MD, MS, MedSport, Department of Orthopaedic Surgery, University of Michigan, 24 Frank Lloyd Wright Dr, Ann Arbor, MI 48106-0391, USA.

E-mail address: [bsmiller@med.umich.edu](mailto:bsmiller@med.umich.edu) (B.S. Miller).

Rotator cuff tears (RCTs) are among the most common causes of musculoskeletal pain and disability; however, there is no consensus for treatment due to a paucity of randomized controlled trials and evidence-based algorithms for management. A recent survey of expert shoulder surgeons found greater than 50% agreement on only 49% of questions regarding common rotator cuff repair practices.<sup>1</sup> Cost-effective management that optimizes clinical outcomes is of paramount importance for our aging population as full-thickness RCTs become increasingly prevalent with age and symptomatic over time.<sup>11,16,26,27</sup> Furthermore, given the importance of cost containment in our evolving health care system, the appropriate management of RCTs can have a widespread social and economic effect.<sup>12</sup>

The American Academy of Orthopaedic Surgeons (AAOS) released “Appropriate Use Criteria” (AUC) based on the best available evidence and expert opinion to guide physicians in the management of acute or chronic full-thickness RCT.<sup>2,17,22</sup> Three panels collaborated in creating 434 patient scenarios, each of which accounts for symptom severity, American Society of Anesthesiologists (ASA) Physical Status Classification class, factors that negatively affect rotator cuff healing, factors that negatively affect rotator cuff outcomes, tear size and retraction, degree of muscle atrophy and fatty infiltration, and response to previous treatment (Table I lists the definitions used by the AAOS AUC). For each scenario, the AUC rates treatment options as “appropriate,” “may be appropriate,” or “rarely appropriate.” Pappou et al<sup>18</sup> provide useful case examples illustrating how a clinician may use this AUC. The goal of this AUC is to guide the treating physician in determining appropriate treatment options to optimize patient care and outcomes.

The purpose of this study was to use a cohort of patients with full-thickness RCTs to compare and validate the appropriateness recommendations provided by the AAOS AUC with the actual treatment administered and retrospective outcomes in a high-volume clinical practice. We hypothesized that there would be good to excellent agreement between the actual treatments administered and the recommendations provided by the AAOS AUC.

## Materials and methods

Between March 2012 and January 2014, 197 patients of 3 surgeons were enrolled in a prospective cohort study of full-thickness RCT. Patient data collected as part of this cohort study were used to complete the present retrospective study on the AAOS AUC. Inclusion criteria were patients aged 18 to 99 years with full-thickness RCTs diagnosed by clinical history, physical examination, and imaging (magnetic resonance imaging [MRI] or ultrasound). Prospectively collected data included demographic information, previous treatments, duration of symptoms, tear size, treatment allocation, American Shoulder and Elbow Surgeons (ASES) shoulder score, and Western Ontario Rotator Cuff Index (WORC) score.

The ASES is a 100-point scale including physician-reported and patient-reported outcomes accounting for pain, instability, and ac-

tivities of daily living.<sup>24</sup> Higher ASES scores indicate better outcome. The WORC is a patient-reported scoring tool that correlates with numerous upper extremity measures and accounts for physical symptoms, sport/recreation, and work, lifestyle, and emotional function.<sup>8</sup> A lower WORC score indicates better outcome. We calculated mean changes for the ASES and WORC separately for the AAOS AUC choice and surgeon choice for 4 groups: nonoperative, surgical repair, débridement, and arthroplasty.

For each patient, the necessary criteria were entered into the AAOS AUC Web-based application. Criteria required by the AAOS AUC that were missing for some patients in our database were collected by retrospective record review because the AAOS AUC were developed more recently than the initiation of the aforementioned prospective cohort study. These data included ASA classification, tear size, muscle atrophy or fatty infiltration on MRI or ultrasound, and response to previous treatment.

The AUC definitions for symptom severity as mild, moderate, or severe account for pain and functional loss during activities of daily living, work, recreation, sleep, and pain at rest (Table I). Given the retrospective nature of this study, this level of detail was not always available from our prospectively collected data or the record review. We used the baseline ASES score as an unvalidated proxy for symptom severity. We classified symptom severity according to ASES scores as mild, 70-100; moderate, 30-69; or severe, 0-29.

To determine agreement or discordance, the “appropriateness” rating for treatment options was recorded and compared with the actual treatment administered (Table II). The actual treatment administered was determined by record review and according to the definitions of treatment provided by the AUC (Table I). The agreement analysis excluded patients for whom the treatment administered received an AUC rating of “may be appropriate” because in every AUC scenario, nonoperative treatment is rated “appropriate” or “may be appropriate” (ie, it was never considered “rarely appropriate”). Thus there would be 100% agreement for patients treated nonoperatively simply on the basis of treatment allocation, and this would artificially inflate our calculated level of agreement. Agreement or discordance of treatment was also compared with the aforementioned outcome scores recorded at the most recent (32- or 48-week) follow-up appointment.

## Statistical analysis

Statistical analysis was performed using STATA 10.0 software (StataCorp LP, College Station, TX, USA). We calculated agreement for treatment allocation between the AUC and actual patient allocation using the  $\kappa$  coefficient according to the Landis and Koch criteria.<sup>9</sup> We used single-variable logistic regression modeling with agreement or not as the outcome variables and the following variables as predictors: factors negatively affecting healing, factors negatively affecting outcomes, ASA score, atrophy (yes or no), and responsive to previous treatment. We used ordinal logistic regression for symptom severity (mild, moderate, severe), tear size (small, medium, large, massive), and ASA score. Factors negatively affecting healing, factors negatively affecting outcome, and the presence of muscle atrophy or fatty infiltration were coded in binary fashion as being present or absent, so if multiple factors in either category were present, the cumulative effect of these factors was not accounted for.

An analysis of variance (ANOVA) was completed for ASES and WORC changes at the most recent follow-up (32 or 48 weeks) and

Download English Version:

<https://daneshyari.com/en/article/4072972>

Download Persian Version:

<https://daneshyari.com/article/4072972>

[Daneshyari.com](https://daneshyari.com)